Swiss Breeding Bird Atlas 2013–2016

Distribution and population trends
of birds in Switzerland and Liechtenstein

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Peter Knaus, Sylvain Antoniazza, Samuel Wechsler,
Jérôme Guélat, Marc Kéry, Nicolas Strebel and Thomas Sattler

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Impressum

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Preface

Dear reader

Birds are fascinating creatures. Our feathered neighbours are sources of delight and admiration to us as we listen to birdsong in spring, watch their acrobatic feats of flight, or ponder the extraordinary performance of migrant birds. But the coexistence of humans and birds is not always easy. Knowledge of their distribution is the foundation for measures and provides guidance on how to protect them.

In 2013–2016, twenty years after the last atlas, the Swiss Ornithological Institute in Sempach again surveyed the populations and distribution of all breeding bird species throughout the country. Thanks to the dedication of more than 2000 volunteer collaborators, a wealth of data was collected that describes the state of our native birdlife in detail.

Comparing the new results with the 1993–1996 breeding bird atlas allows for a comprehensive description of changes in bird communities over the past 20 years. Birds are a reliable measure of the quality of the environment, especially the state of landscapes and habitats. They are important indicators that respond with sensitivity to both natural environmental changes and those caused by humans, allowing us to recognise and analyse positive and negative developments and use this knowledge to design conservation measures.

For example, detailed information on bird distribution reveals gaps in our country's ecological infrastructure, showing us where improvements are necessary and where urgent action is needed. But it also highlights the success of the conservation efforts for Bearded Vulture and Middle Spotted Woodpecker, among others. The results are a challenge and an invitation for us to create an environment that accommodates the needs of breeding birds and other wildlife.

Based on the collected data, the new breeding bird atlas focusses on several important topics: «Agriculture has a responsibility for bird conservation», for example, discusses the current trends, shortcomings and measures regarding the conservation of birds in farmland habitats. «Switzerland needs large wetlands with plenty of water» draws our attention to the challenges posed by the disappearance of wetland habitats. And «Problematic coexistence – sharing our buildings with birds» illustrates how close birds are to our own living spaces and highlights the important role that settlements play in the promotion of biodiversity. These fields of action are of great significance and are increasingly being addressed by the Federal Office for the Environment FOEN in the context of the Swiss Biodiversity Strategy.

For many people, birdwatching is probably the most common and most intense form of contact with wildlife. Many of us take pleasure in the return of the swallows in spring or in early-morning birdsong. It is our duty to preserve these experiences for future generations. Bird communities and biodiversity in general deserve our attention and support, because they contribute to our quality of life and are part of Switzerland's rich natural heritage.

Marc Chardonnens

Director of the Federal Office for the Environment FOEN

The results of the 2013–2016 atlas: an overview

The state of birdlife reflects our relationship with nature and the environment. The fact that 39 % of Swiss breeding birds are on the 2010 Red List and a further 16 % are considered Near Threatened is a clear warning sign and an indication of the poor overall state of habitats.

Thanks to the help of countless volunteers, the 2013–2016 breeding bird atlas documents the current distribution, abundance and altitudinal distribution of all breeding birds in Switzerland and Liechtenstein. Together with the three previous atlases, it highlights the marked changes that have taken place in the Swiss avifauna in the past 20 to 60 years.

Looking back over 60 years

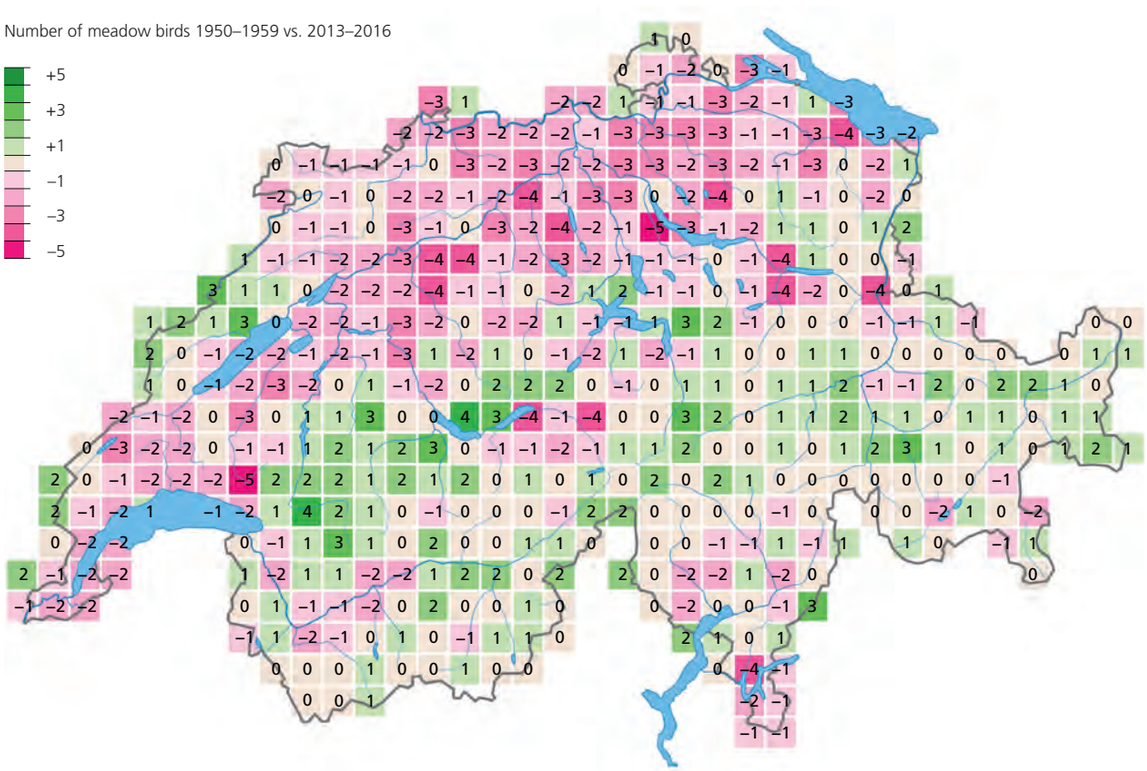
The greatest changes in bird communities since the 1950s have occurred in the lowlands. Among other factors, agricultural intensification has caused Grey Partridge, Little Owl, Common Hoopoe, Tree Pipit and Whinchat to all but disappear from lower altitudes. This trend has continued in the past 20 years and has now also progressed to medium and high altitudes. Species that breed in meadows and on arable land are particularly affected.

But there have been positive changes since the 1950s as well: water quality in once polluted lakes and rivers has greatly improved, and new sanctuaries in shallow-water bays and adjacent reed stands provide better protection for breeding birds. These habitats have been newly colonised by several species, such as Tufted Duck, Gadwall, Yellow-legged Gull and Bearded Reedling. Nevertheless, the improvements were unable to prevent the disappearance of Common Snipe and Eurasian Curlew as breeding birds. Thanks to the decline in direct persecution and the ban on several environmental toxins, almost all raptors and owls occur in large numbers again – in some cases, such as the Red Kite, probably even the largest ever.

Widespread species on the rise, migrants in decline

The population trend of breeding birds in Switzerland, the Swiss Bird Index SBI®, shows a slightly positive overall trend. This is partly a consequence of the population growth in widespread species. Several rare and threatened birds, on the other hand, have become even scarcer, their index having declined to a low 55 % since 1990 (SBI® sub-index Red List).

Most particularly, long-distance migrants that winter in sub-Saharan Africa are declining throughout Switzerland. They are more specialised and more affected by



Change in the presence of six meadow birds (Common Quail, Corncrake, Eurasian Skylark, Tree and Meadow Pipit and Whinchat) per atlas square between 1950–1959 and 2013–2016. The disappearance of these species from the lowlands is a huge loss. The apparent increase in some parts of the Jura and especially in the Alps is due to incomplete survey coverage in 1950–1959.

habitat and climate changes in their breeding and wintering grounds than residents and short-distance migrants, and are therefore more vulnerable. The fact that long-distance migrants have mainly disappeared from the Swiss lowlands, where the impact of human activity is especially strong, is an indication that the decline is largely «home-made».

Woodland birds increasing

60 species, or almost a third of Swiss breeding birds, mainly occupy woodland, with several species also occurring in settlements where there are trees. The index for this group (SBI® sub-index Woodland) increased from 100 % in 1990 to 116 % in 2016. The 2013–2016 atlas shows that many woodland birds have benefited from near-natural forest management (more regeneration, fewer uniform spruce stands in the lowlands) as well as from the twofold increase in deadwood over 20 years and the expansion of forest area, especially in the Alps. However, the volume of deadwood remains small in forests on the Central Plateau and in the Jura. On the other hand, the overall timber stock has also increased, which means that there are fewer suitable habitats for species that depend on open and richly structured woodland, such as the Western Capercaillie.

Dramatic loss of farmland birds

For 25 years now, farmers have received substantial subsidies for ecological services. The farmland birds selected for special protection are listed in the federal government's «Environmental Objectives in Agriculture» (EOA). The index for this group (SBI® sub-index Target species EOA) declined from 100 % in 1990 to 42 % in 2016. The 2013–2016 atlas shows that there are fewer EOA species in large parts of the country today than there were 20 years ago. A closer look at areas where recent losses are small reveals that these areas already held few farmland species back in 1993–1996.

Agricultural intensification is progressing to medium and high altitudes, with the result that nutrient-poor meadows are becoming scarcer and grass is mowed ever earlier in the year. Meadows cut so early in the season turn into ecological traps for ground breeders like Eurasian Skylark and Whinchat, as the nests are destroyed in the process.

Thus, the implemented measures have not even slowed the pace of species loss, let alone halted it. Still, several positive examples demonstrate that species conservation is possible using the instruments available. Measures have not succeeded at a large scale because the importance of high-quality biodiversity promotion areas like wildflower strips has been underestimated, and because habitat connectivity projects are insufficiently oriented towards the needs of target species.

Nevertheless, some species have increased in the lowlands, including Red Kite, Common Kestrel and Carrion Crow. But these are all highly adaptable species that build their nests in habitats adjacent to arable land (e.g. on forest edges), rather than in the fields, and do not depend on insects as a source of food.

The change in distribution since 1993–1996 for long-distance migrants (30 species) is almost entirely negative at low and medium altitudes.

Positive trend since 1993–1996 of eight common species that require deadwood and old-growth stands (Eurasian Green Woodpecker, Black Woodpecker, Great Spotted Woodpecker, Middle Spotted Woodpecker, Lesser Spotted Woodpecker, Crested Tit, Alpine and Willow Tit, Eurasian Treecreeper).

In Switzerland, farmland birds are among the most vulnerable species: distribution change since 1993–1996 of EOA species («Environmental Objectives in Agriculture»). The map combines the distribution change maps of 35 species.

The distribution in 2013–2016 of the ten rarer duck species (Common Eider, Mandarin Duck, Red-crested Pochard, Common Pochard, Ferruginous Duck, Tufted Duck, Garganey, Northern Shoveler, Gadwall, Common Teal) reflects the location of wetlands with diverse habitat structures. These sites are home to other specialised wetland species, too.

Wetlands and waterbodies: hotspots of species diversity under pressure

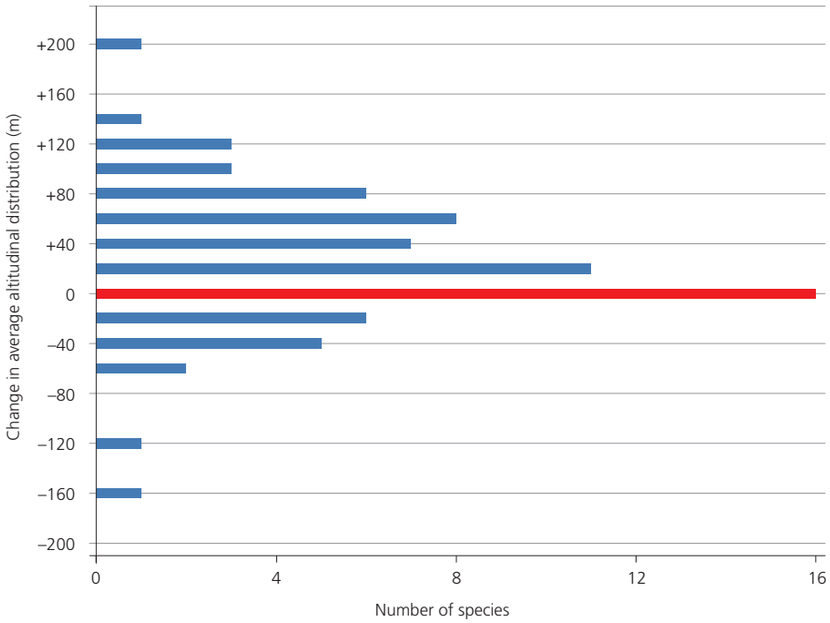
The few remaining wetlands are now well protected and management has improved in many places. As a result, the populations of many wetland species have increased since the 1990s, but they remain small and unable to compensate for the losses that occurred in the past. Besides loss of area and isolation, the main problems relate to nutrient input and the human influence on wetland hydrology through water-level regulation and drainage. In addition, disturbance from human activities is increasing at these sites despite their protected status. Restorations can improve the situation, but a sufficiently large surface area, appropriate management and well-controlled visitor flow are essential if these areas are to attract rarer breeding birds such as Western Water Rail and Common Little Bittern.

Only few species benefit from the growth of settlements

The area covered by settlements in Switzerland increased by 23 % from 1985 to 2009. In the transition zones between settlements and farmland in particular, many ecologically valuable habitats (e.g. traditional orchards) have been lost to building development and the last semi-natural plots of land have disappeared. Only few birds benefit from the spread of settlements, even though species richness is often higher in settlements than in the intensively cultivated farmland that surrounds them. But settlements are becoming more densely built up and impervious surfaces are increasing, while the remaining green spaces are often over-maintained or contain few near-natural structures. Ruderal habitats and edge structures managed at low intensity, which would offer an abundant supply of seeds and insects, are more and more rare. Birds that nest on buildings, like Common Swift and Northern House Martin, also face difficulties, as they are highly dependent on the willingness of humans to tolerate their presence. Moreover, few new nest holes are created as a consequence of our modern «flawless» building design, and many existing nooks and crannies disappear when buildings are renovated.

The Alps – a world in upheaval

The Alps cover 60 % of the territory of Switzerland. Because of the large altitudinal gradient and diverse landscapes, many negative trends are somewhat mitigated in the Alps: species like Common Cuckoo or Common Redstart have practically disappeared from the Central Plateau, but still have substantial populations in the Alps. But the effects of agricultural intensification are becoming apparent here too, and the populations of Whinchat and Eurasian Skylark, for example, are in steep decline. Moreover, many open, often species-rich sites in areas of marginal economic importance have been abandoned and taken over by shrubs. Due to tourist infrastructure and leisure activities, fewer and fewer habitats are free from disturbance. Climate warming in the Alps is twice as great as the average for the northern hemisphere. The consequences are already evident,



Change in average altitude for 71 species between 1993–1996 and 2013–2016. The species showing an upward range shift (above the red column) are more numerous than those that experienced a downward shift (below).

for example in the declining populations of Rock Ptarmigan and Ring Ouzel.

Climate change causes many species to move to higher ground

The climate in Switzerland has become much warmer in the past 30 years. Winters are shorter and spring vegetation develops earlier. This is one possible reason why Mediterranean species are becoming more common in Switzerland. Moreover, the altitudinal distribution of breeding birds shifted upwards by 24 m on average between 1993–1996 and 2013–2016. Almost two thirds of 71 relatively common species have seen an upward shift in average altitudinal distribution, 22 of them by more than 50 m. In contrast, only four species experienced a downward range shift of 50 m or more.

A common pattern has emerged for 20 species with different habitat requirements (e.g. European Pied Flycatcher, Alpine Accentor, Tree Pipit) that is particularly alarming: their populations are decreasing at lower altitudes while increasing in the upper reaches of the range. This effect is expected to become even more pronounced in the future. Because surface area decreases with rising altitude, the described trend will eventually lead to population declines.

Trend reversals thanks to species recovery programmes

The conservation of certain threatened birds requires species-specific measures. Since 2003, the Swiss Species Recovery Programme for Birds has provided added support for the protection of selected bird species. The results of the 2013–2016 atlas confirm that the efforts have met with success. Some species benefit from the provision of artificial nest sites, such as Common Barn-owl, Common Tern, Common Hoopoe and Eurasian Jackdaw. Other species require targeted measures to improve habitat quality. The examples of Little Owl, Eurasian Wryneck and Middle Spotted Woodpecker show that this approach works. To secure the survival of these populations in the long term, conservation efforts must continue. Other species with declining populations will need to be included in the species recovery programme. Besides the necessary funds, meeting these urgent challenges requires mutual understanding and close collaboration between authorities, conservationists, land owners and land users.

Conclusion

The 2013–2016 atlas shows encouraging trends for many bird species. Most of them are woodland birds that have benefited from the improvements in forest habitats. But this cannot mask the fact that many rare species have become even scarcer since 1993–1996 and that elaborate measures are needed to stop them from disappearing completely.

Human activities have a growing impact on bird communities. Besides landscape change, disturbance from leisure pursuits in particular is increasing. Therefore, we need to create refuges for birds in the form of quiet zones and times. Semi-natural forest management must be continued and the volume of deadwood increased, especially on the Central Plateau and in the Jura. In farmland, much greater efforts are required to restore the ecological balance. Wetlands and waterbodies need to be protected from adverse influences (e.g. disturbance, nutrients, pesticides, drainage) and should benefit from more large-scale restoration projects. In settlements, open spaces and especially areas of high ecological value should be preserved, or replaced if they are used for construction. Building development outside of the building zones must be stopped. Valuable alternative habitats such as gravel pits and quarries need to be preserved even when exploitation has ended. Consumers can also make an important contribution to the conservation of our native biodiversity by consciously choosing to buy biodiversity-friendly and regional products. In our gardens and on our balconies, native plants, a rich variety of structures and the absence of pesticides go a long way in supporting native birdlife.

The 2013–2016 atlas contains a wealth of data and points to the problems faced by breeding birds in Switzerland. We hope that the atlas can help to develop solutions and contribute to the successful recovery of threatened species.

A new reference work in the field of environmental monitoring: the 2013–2016 breeding bird atlas

The evolution of the distribution of Swiss breeding birds is a reflection of our relationship with nature and the environment. This atlas presents the distribution of breeding birds over a period of 60 years and documents the many changes in population density and altitudinal distribution since 1993–1996.

Switzerland is home to more than 200 species of breeding birds that require a diverse range of habitats and structures. The evolution of breeding-bird distribution is therefore a good measure of landscape change and its effects on nature. Many anthropogenic changes progress at a rapid pace. The effect on the distribution of many species is dramatic, as the two previous Swiss breeding bird atlases based on field surveys in 1972–1976 and 1993–1996 have already shown. Since the last atlas, the pace of landscape change has accelerated, and with it the impact on the distribution of certain bird species, as revealed by the Swiss Ornithological Institute's various monitoring projects. They document, for example, the decline of once common species like the Eurasian Skylark. In recent decades, the effects of climate change on the distribution and abundance of several species have intensified.

What are the consequences of increasing building development on the Central Plateau or the renewed spread of forests in the Alps? Did the introduction of ecological compensation measures in agriculture halt the decline of farmland birds? What impact does climate warming have on bird communities – have southerly species become more common, as predicted? In our time, it is more important than ever to find answers to these questions. The answers and findings provide guidance on how to manage our natural environment and landscapes, and show us what adjustments are necessary to our current actions.

Documenting long-term and short-term changes

The Swiss Ornithological Institute's declared aim is to document the distribution and population numbers of all breeding birds in an atlas every 20 years. The 2013–2016 atlas is the third in this series. Together with the «Historical Atlas of Breeding Birds», which documents the distribution of breeding birds in 1950–1959, it allows us to illustrate changes in distribution over a period of 60 years. Following the 1993–1996 atlas, this is the second atlas to provide information on population density, and the first to analyse changes in density. The thinning out of breeding populations while distribution remains largely unchanged – observed or at least suspected in many areas – has now been documented for the entire country for the first time. Such quantitative data helps to answer questions on the effects of biodiversity promotion areas or the altered composition of forests. In addition, we have the means today to conduct more detailed analyses of altitudinal distribution.

Ingrid Fürderer

The Eurasian Skylark is among the «losers»: although its habitat requirements are simple, it cannot adapt to current practices in agriculture and is declining dramatically.

The 2013–2016 atlas compiles the following main results for all breeding bird species in Switzerland and Liechtenstein:

- distribution (10 × 10 km grid) as well as the change in distribution compared to 1950–1959, 1972–1976 and 1993–1996
- density or occurrence probability (modelled for 1 × 1 km) and its change since 1993–1996
- altitudinal distribution and its change since 1993–1996
- national population size

Tremendous volunteer effort

Birds fascinate us with their colourful plumage and their song, which is why there are many qualified and experienced ornithologists. The Swiss Ornithological Institute is extremely grateful for the commitment of its volunteer observers – by investing countless hours of work mapping territories, counting colony breeders, or searching for rare and secretive species, they made a decisive contribution to the success of this atlas. The more than 2300 surveyed kilometre squares were selected at random and are therefore representative. Besides farmland and woodland, surveys were conducted in city centres, residential and industrial zones, and areas of bare terrain far above the tree line, but also in extremely species-rich habitats like alluvial forests or wetlands. Not all places were the kind one would normally choose to birdwatch. But when it comes to the atlas field surveys, normal is not a term that applies! During the four field seasons, collaborators visited areas that are rarely explored by ornithologists. We are very grateful that we were able to draw on this extraordinary pool of expertise and extend our warmest thanks to the many fieldworkers whose dedication made the atlas surveys possible.

Important data source for future research

We have high expectations for the 2013–2016 atlas: like its predecessors, it will become a standard work of reference in ornithology and bird conservation in Switzerland and Liechtenstein. It lays an indispensable foundation from which targeted conservation measures for endangered birds can be developed. The results provide a basis for future work, for example for the next revision of the Red List of threatened birds in Switzerland. To ensure access to the results for everyone who is interested, the Swiss Ornithological Institute devoted a lot of effort to making the findings available online in four languages (www.vogelwarte.ch/atlas). The field surveys for the 2013–2016 breeding bird atlas have given a fresh impetus to ornithology in Switzerland. We hope that this collaborative effort, which was only possible thanks to the support of more than 3000 ornithologists from all parts of the country, will excite a fascination for birds in as many people as possible.

Peter Knaus

Markus Jenny

The 2013–2016 atlas shows that substantial populations of farmland birds persist in areas with biodiversity-friendly agriculture. The atlas thus provides an important foundation to develop targeted measures for the conservation of threatened birds.

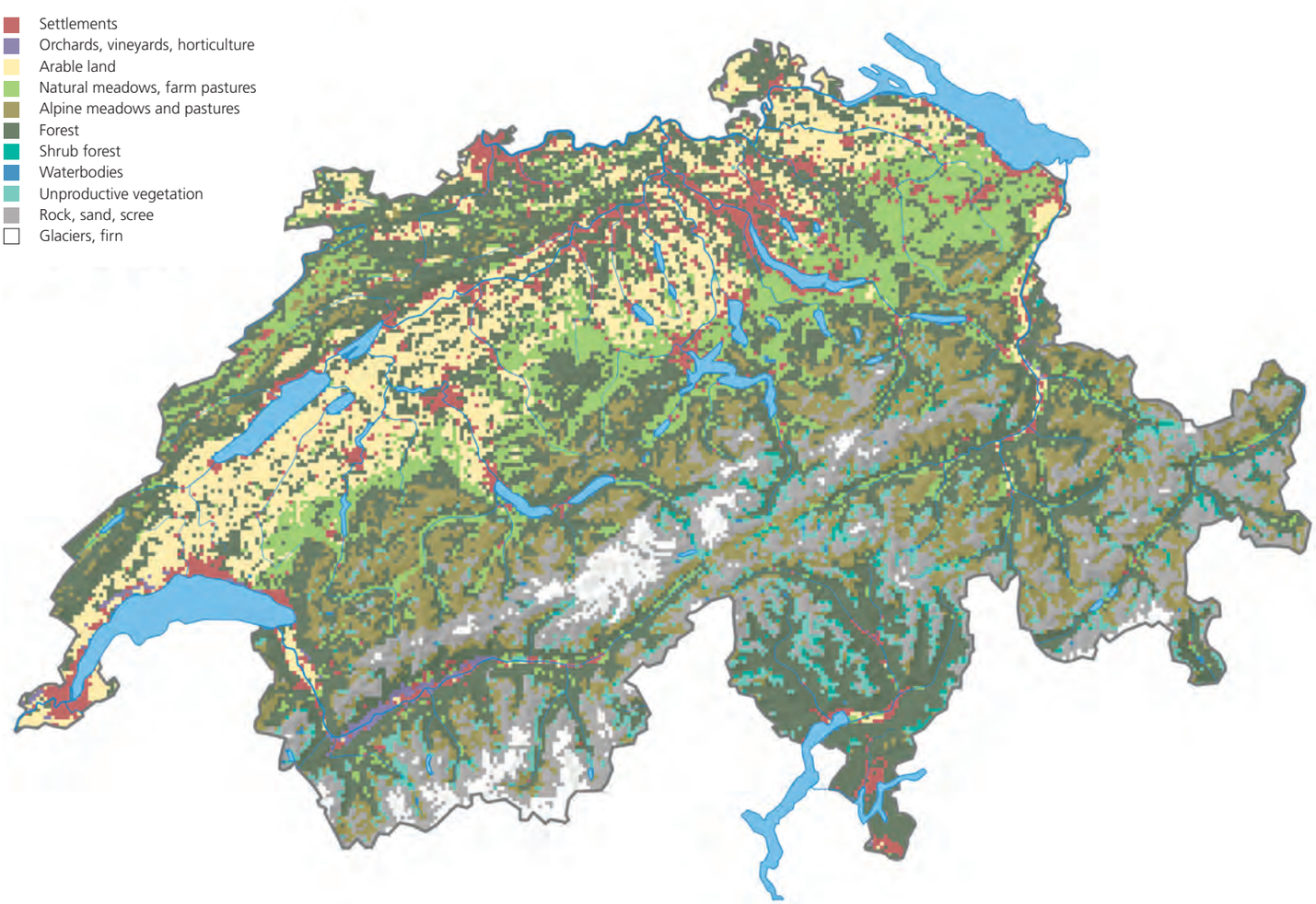
Changes in the habitat conditions for breeding birds in Switzerland

Switzerland has a total surface area of 41 285 km². Farmland covers 35.9 % of the territory, and 31.3 % is woodland. Unproductive areas account for 25.3 %. While settlements only cover 7.5 %, they grew by more than 23 % between 1985 and 2009, or by 0.9 % per year. Over two thirds of settlement areas lie below 600 m[8].

Land use changed significantly between 1985 and 2009. With an expansion of almost one fourth, settlements showed by far the strongest growth. In percent, the growth of woodland is much smaller at 3.1 %, but it still amounts to two thirds of the increase in settlements in terms of area.

These two main categories are responsible for the landscape changes that dominate at a small scale in most parts of the country – in the form of building development in the lowlands, and growth of new forest or shrub at high altitudes. These changes have occurred at the expense of agricultural land (due to housing developments or shrub encroachment following land abandonment) and other natural habitats (due to the spread of forest)[8].

Main types of land use in Switzerland in 2004–2009 at a resolution of 1 × 1 km. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.



Forest

Our woods are of comparatively good ecological quality thanks to nature-friendly forest management. Deficits exist in the open pioneer phases and in the late stages of succession rich in deadwood and old growth. However, future challenges such as climate change, intensified forestry practices as a result of the transition to renewable energy, and excessive recreation pressure could have adverse effects.

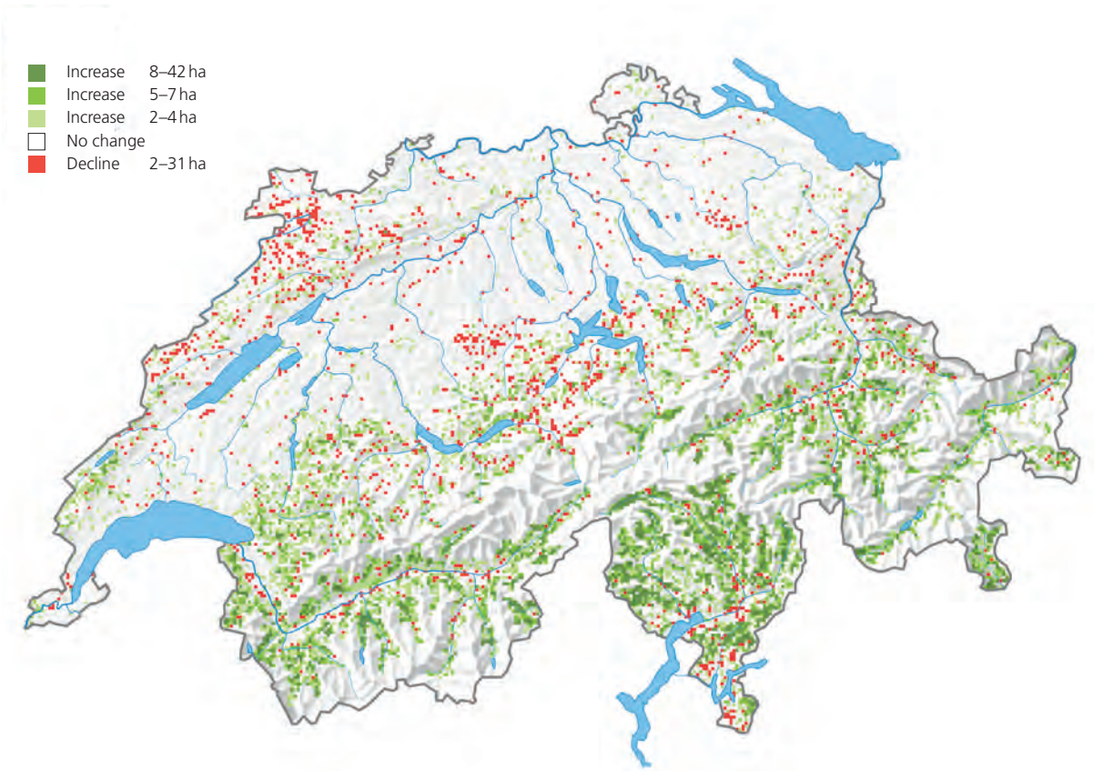
Woodland (including shrub forest) covers about one third of the area of Switzerland. The most densely wooded regions are in the southern Alps (52 % of forest cover) and the Jura (41 %), while the Alps (27 %) and the Central Plateau (25 %) have the least forest cover. The Pre-Alps are in the middle range at 35 % [7].

The larger part of forest area consists of conifer woods at 62 %, compared to deciduous woods at 38 % [1]. The respective proportions of conifer and deciduous forest differ greatly depending on altitude: the lowlands are characterised by naturally occurring deciduous woods dominated by beech, in southern Switzerland also with sweet chestnut. Maple, sycamore, ash and oaks often occur too, and are more dominant than beech in dry or damp locations. Mixed stands with spruce and fir also occur in the lowlands, as well as pure conifer stands that are not well adapted to this type of site. Conifer stands account for about 20 % of the area that would naturally be covered with deciduous trees [15, 18]. The proportion of conifers grows with increasing altitude, and deciduous trees become scarcer. Beech-fir forests are the rule, followed by fir-spruce forests higher up. High altitudes are dominated by naturally occurring pure conifer forests, composed mainly of spruce, with some pine, larch and stone pine, and transitioning to very open woodland or shrub forest close to the tree line, with shrub-like green alder and mountain pine.

Silviculture has become less diverse

Almost 90 % of forest area in Switzerland consists of managed forests. Trees are often harvested in their optimal phase of growth, i.e. no later than when they reach half their biologically possible age. Two thirds of stands contain trees of the same age, or the same diameter at breast height. Another feature of these forests is a vertical structure showing distinct layers. On about 20 % of forest area, in contrast, stands are made up of trees of various ages – from young growth to old trees with thick trunks. Such stands have a highly complex vertical structure.

Distribution of deciduous forest, conifer forest and various forms of mixed forest in Switzerland. Deciduous woods dominate in Ticino, in parts of the Jura and at the southern foot of the Jura range. Large parts of the Central Plateau are covered with mixed forests. Source: Waser et al. (2017).



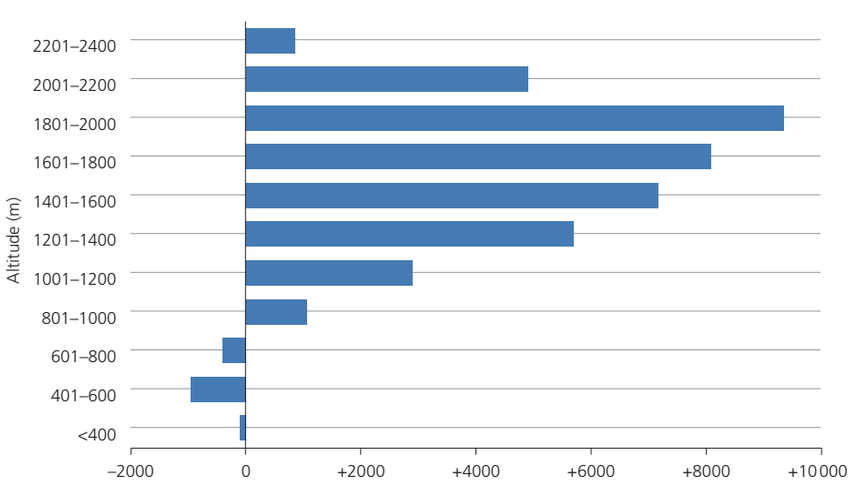
Change in forest cover in ha between 1979–1985 and 2004–2009. Changes are shown at a resolution of 1 × 1 km. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.

These two forms of managed forest, created by two different types of cultivation – high forest with area felling and permanent or plenter forest – are generally characterised by a large timber volume of living trees (i.e. growing stock). In fact, at 352 m^3/ha, Switzerland has one of the highest average values in Europe [1].

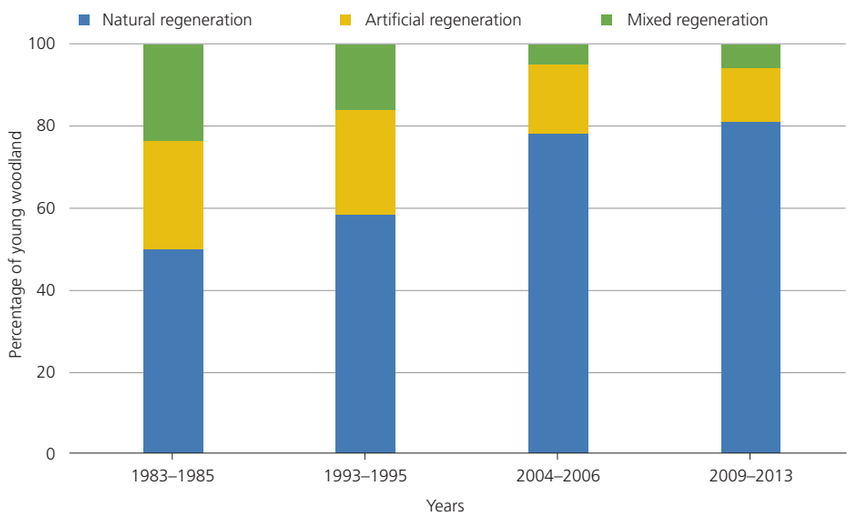
Other management forms such as coppice forests or coppice with standards (5 %) in the lowlands of the Central Plateau and Jura, wooded pastures in the Jura, Grisons and Valais (7 %) and chestnut orchards in Ticino (0.2 %) only take up small areas. These traditional forms of management that created nutrient-poor and light-flooded forest types and contributed to woodland diversity are becoming less and less important [13]. Remaining patches of old, unmanaged natural and alluvial forests, where natural processes can take place unhindered and all forest phases can be present, are also scarce. Virgin forests have practically vanished in Switzerland (0.01 % of forest area) [15].

Continued increase in forest area and growing stock

Changes in the forest are periodically recorded in the National Forest Inventory (NFI). A comprehensive catalogue of features has been inventoried three times so far since 1983 (1983–1985, 1993–1995 and 2004–2006). Continuous annual surveys have been in progress since 2009 as part of the fourth NFI, of which results are available up to 2013 [7].

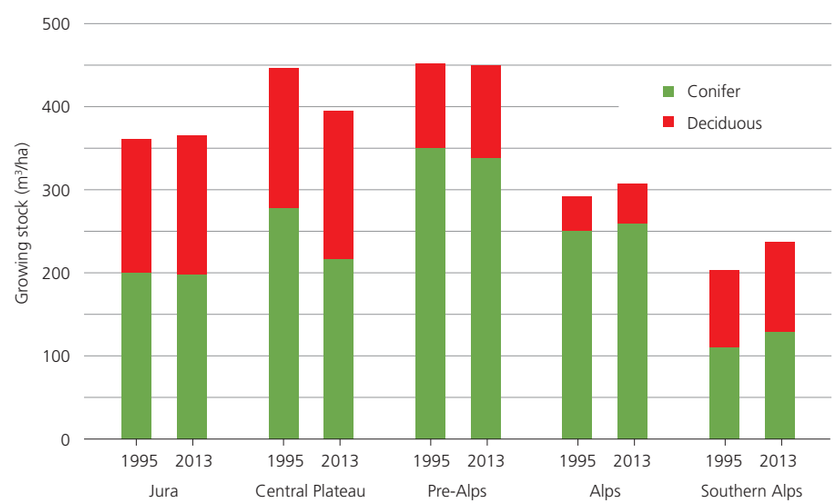


Change in wooded area per altitude level in 1985–2009. Forest cover has increased above 800 m, mainly due to the abandonment of farmland. Below 800 m, there was a slight decrease in forest cover, mostly in favour of settlements. Source: Bundesamt für Statistik (2015a).



The area of young woodland with artificial and mixed regeneration is steadily declining and currently accounts for about 20 % of the overall area of young woodland. Source: BAFU (2017a).

Growing stock of deciduous and conifer trees in five regions according to the National Forest Inventory of 1993–1995 and 2009–2013. Source: Rigling & Schaffer (2015a).

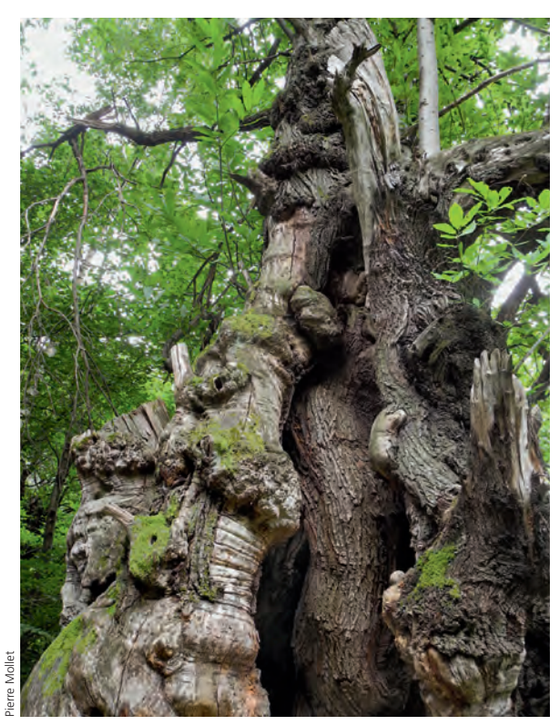


The increase in forest area and growing stock has continued uninterrupted ever since the first federal Forest Police Act of 1876 prohibited any reduction in forest area [11]. Overall, forest area increased by 7 % on average between 1993–1995 and 2009–2013 and growing stock by 3 %, although there are large regional differences [1, 7]. Forest area did not increase during this period on the Central Plateau and in the Jura, and growing stock actually decreased (by 11 % on the Central Plateau). In contrast, forest area grew by 8 % in the northern Alps and by as much as 15 % and 12 %, respectively, in the central and southern Alps [1]. Growing stock increased significantly in the central Alps (15 %) and southern Alps (30 %) [15]. The increase occurred mainly above 1200 m and is not accounted for by the reforestation of protection forest; rather, it is a result of the abandonment of land that is marginally productive or difficult to access. In addition, climate warming stimulates the growth of trees at higher altitude and on unproductive soil, causing the forest and tree line to shift upwards. Other factors driving the increase in growing stock are declining timber exploitation in areas where access is difficult, high harvesting costs, and sinking wood prices.

Nevertheless, from an ecological point of view, forests in Switzerland are quite young. On the Central Plateau, only 11 % of all forest stands are more than 120 years old and only 0.5 % are older than 180; in the Alps, only 7 % are more than 180 years old [15]. In all of Switzerland, 0.4 % of forests are more than 250 years old [7]. Forest stands with trees older than 120 years that are no longer profitable have been in decline since 1993–1995 both in Switzerland as a whole (–18 %) and in the individual biogeographical regions [1].

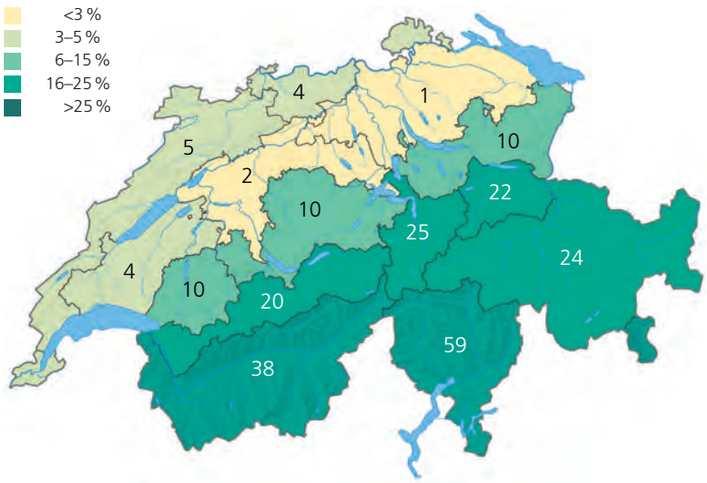
More natural structures through natural regeneration, deadwood and habitat trees

The practice of natural and site-adapted forest regeneration has been implemented throughout the country since the start of the millennium. This practice has reduced stands that are not natural to the site they grow

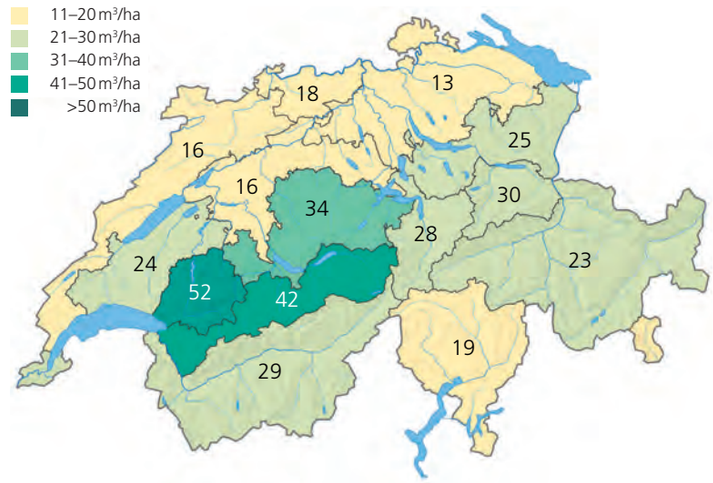


Pierre Mollet

Very old trees (so-called habitat trees) like this sweet chestnut tree in Ticino offer holes, crevices, cracks and deadwood where specialised organisms live.



Proportion of forest area where no forestry interventions have taken place for over 50 years. Source: Brändli et al. (2015d).



The average volume of deadwood in forests is largest in the western Pre-Alps. Source: Brändli et al. (2015d).

on – stands with a larger proportion of conifer trees than would naturally occur – by one fifth and increased naturally occurring deciduous woods by 19 %, especially in the lowlands [1]. The economically profitable but not naturally occurring spruce stands in the lowlands have decreased by one third in volume or, in terms of area, from 11 % to 6 % [1]. Storms «Vivian» in 1990 and «Lothar» in 1999, the subsequent bark beetle infestations and the dry periods in 2003 contributed to this development. The storms also increased structural diversity in the affected areas of forest.

The concept of biodiversity-friendly management has increasingly been incorporated into forestry practices, with the result that deadwood more than doubled in volume from 11 to 26 m³/ha between 1993–1995 and 2009–2013 [1]. In fact, the average volume of deadwood in Switzerland is currently among the highest in Europe [17], though there are large regional differences. Despite a significant increase in deadwood in the more intensively used forests of the Jura and the Central Plateau (127 % and 256 %, respectively) between 1993–1995 and 2009–2013, the amount of deadwood in these regions is still only half that of the Alps and Pre-Alps [1]. In heavily used forests, deadwood is concentrated in the windthrow sites created by storm «Lothar» and is still largely absent from other areas. Many areas in the Jura and on the Central Plateau have not yet reached the federal target of 20 m³/ha, to be achieved by 2030, and the distribution of deadwood is unsatisfactory [3].

Promoting biodiversity has also led to an increase in trees with thick trunks (diameter of at least 80 cm, so-called giants) as compared to 1993–1995 (from 1.1 to 1.7 trees/ha) [15]. As they age and are exposed to external influences, large old trees often form rot, cracks, crevices, cavities as well as moss and lichen growth; these so-called habitat trees provide shelter and food for a wide range of organisms [13, 14]. However, there is still a large gap between the current number of giants in our managed woods and the number typical for natural forests [12]. In the primeval beech forests of the Ukrainian Carpathians there are about 30 times as many giants [6].

Distribution of forest types between 1985 and 2013. Pure conifer forests are still the most common, despite a slight decline. Source: Rigling & Schaffer (2015a).

On the way to becoming an ecological hotspot?

The Forest Act of 1991 requires owners and foresters to use a close-to-nature approach to forest management. Thanks to this practice of nature-friendly silviculture and the fact that the total extent of forest area is protected by law, the ecological quality of woodlands is high compared to other habitats [3, 15]. As promising as the increasing use of biodiversity-friendly methods in forestry is, there have been other changes in recent years that are less encouraging from an ecological point of view.

Most forests are medium-aged with a large growing stock, while only a few small areas of open, light-flooded woodland remain, so there is little suitable habitat for species that need a lot of light and warmth [9]. Similarly, mature forests with lots of old trees and large amounts of

ETH-Bibliothek, Sammlung Documenta Natura, Hans Kobi; Roger Huber

In Val de Cafegns/Schluein GR, the forest is reclaiming its former territory. Since 1989, the clearance has become more and more overgrown and forest edges are disappearing (left). Eleven years later, the cabin is barely visible among the trees. Forest encroachment mainly affects remote Alpine valleys.

deadwood also only take up a fraction of the overall forest area, especially in the lowlands. Although the volume of deadwood continues to increase, the quality and distribution of deadwood are unsatisfactory in terms of biodiversity. More dead trees with a large diameter and in advanced stages of decay would be of benefit in many areas, not only those that have little deadwood[19]. Due to the increased use of wood for fuel, which involves removing not only stemwood but also the crown of the tree as well as ecologically valuable trees of low timber quality, the proportion of deadwood could decline again in the future if no measures are taken to prevent this[10].

So far, forest reserves, which cover about 6 % of forest area and are protected by contract from commercial timber use[4], have not been able to alleviate the lack of either open or mature, deadwood-rich forest phases. Moreover, the reserves are unevenly distributed across Switzerland.

Similarly, the increase in forest area is not all positive. In fact, the encroachment of forest into ecologically valuable habitats such as dry grassland and the loss of forest edges as patches of forest grow together are undesirable processes in terms of overall species diversity. Many remaining forest edges are of poor ecological quality. 84 % of forest edges lack a sufficiently broad and well-structured shrub belt bordered by a herb fringe on the outside, especially on the Central Plateau, in the Jura and in the Pre-Alps[15].

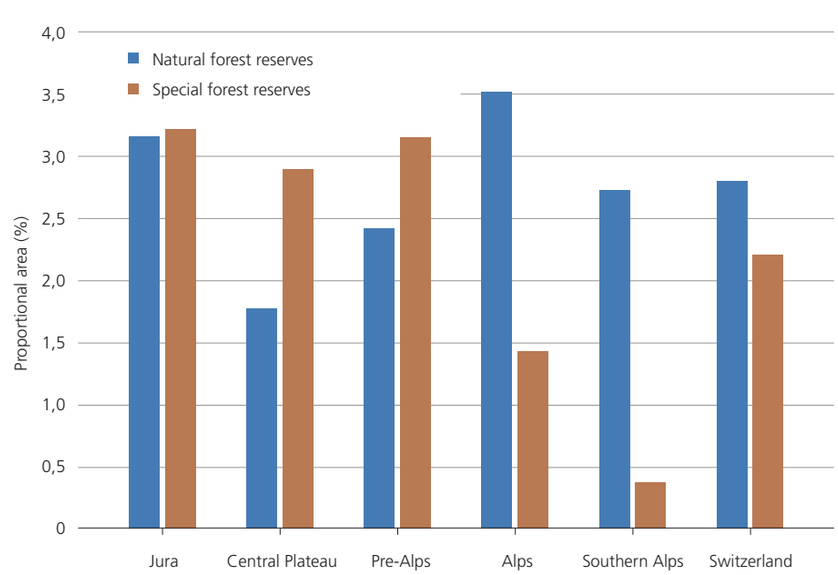
Forests are also becoming more and more popular with leisure seekers. Visitor numbers and the range of activities are growing, especially in woodland areas located near urban centres, and even extending into the night. But even relatively low degrees of human disturbance during the day can reduce the density and richness of breeding bird communities[5]. Finally, trends in forest management that involve ever larger wood-harvesting machinery and interventions at all times of the year – including during the breeding season – affect the quality of the forest as a habitat. For example, the total length of forest roads that are wide enough for lorries has increased significantly since 1993–1995: 969 km of road were newly built or expanded[3].

Future challenges

Along with greater volumes of deadwood (> 20 m³/ha), more habitat trees and more old-growth patches, the federal government's ecological targets propose that forest reserves are to take up 10 % of forest area in Switzerland by 2030. «Natural forest reserves» are to enable natural forest succession without intervention all the way to the decay stage, while the purpose of «special forest reserves» is to promote valuable habitats like open woodland. A further objective is the ecological enhancement of suitable forest edges. The rigorous implementation of measures to achieve these targets is critical for the conservation of organisms that rely on forest habitats[13].

The forest must satisfy many demands, not only as a habitat, but also as a provider of protection, resources and

Area of natural and special forest reserves in percent of the total forest area in five regions. In natural forest reserves, the forest is denser and contains more deadwood and giants (large trees with a diameter at breast height of at least 80 cm) than in other forest areas. In special forest reserves, targeted interventions in favour of certain habitats and species result in greater biodiversity. Source: Rigling & Schaffer (2015a).



Forests provide valuable services for the public such as protection against natural hazards like floods, debris flows, unstable slopes, avalanches or rockfall – frequently offering protection against several of these threats at once.

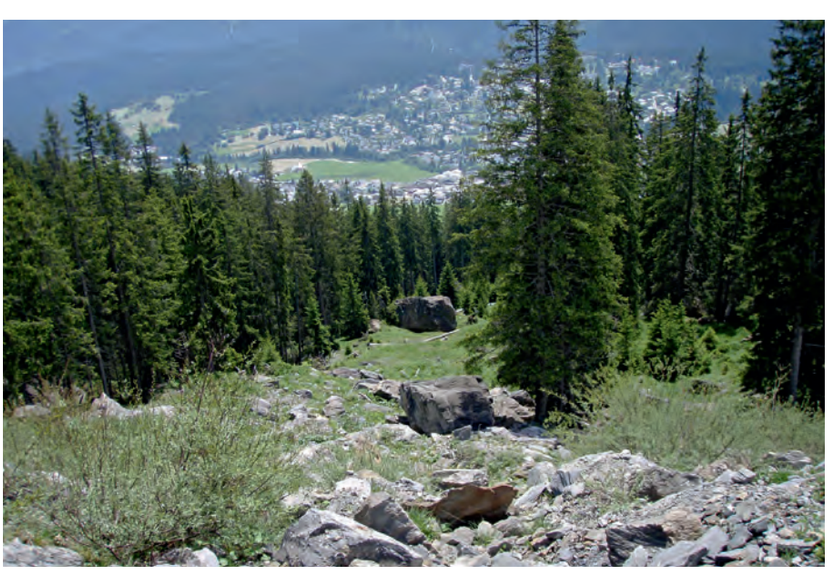
Verena Keller

recreation. As a system with developmental cycles that last hundreds of years – in current commercial forests 80–120, in beech forests up to 350 years – forests are coming under pressure in a changing socio-economic environment that gives rise to diverse and sometimes conflicting needs. The effects of climate change, which will alter the composition of tree species in the long term [2], and the growing influence of wildfires, storms, hail storms and dry periods will further increase the pressure on the forest and its functions. An additional threat comes from harmful organisms introduced to our forests as a result of global trade (e.g. the Asian longhorn beetle or the fungus that causes ash dieback). Next to suitable native tree species, several non-native trees are present in our forests, such as Douglas fir or red oak. From the point of view of biodiversity, the use of non-native species should be discouraged.

On the whole, the forestry sector faces great challenges. Balancing different interests and demands, defining priority functions and taking advantage of synergies that arise from the forest's various functions will be critical going forward [15, 16]. The targeted promotion and safeguarding of valuable woodland habitats that has begun in recent years must continue in the future. Targeted interventions as well as information and awareness campaigns must strive to reconcile recreation with other forest functions, and forest management should continue to seek alignment with natural processes and sustainability. It remains to be seen whether these measures are sufficient in view of the rapid changes expected in the coming decades, and whether forests will be able to continue fulfilling their many functions [9, 15].

Karin Feller

Swiss forests offer protection against natural hazards on 42 % of forest area; protection forests are most common in the Alps and in southern Switzerland. In the long term, the lack of natural regeneration and increasing damage of important tree species by browsing game animals compromise the protective effect of the forest.



Rudolf Zuber-Thoma

[1] Abegg et al. (2014a–d); [2] Allgaier Leuch et al. (2017a–b); [3] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [4] BAFU (2017b)/OFEV (2017a); [5] Bötsch et al. (2017); [6] Brändli & Abegg (2013); [7] Brändli et al. (2015a–d); [8] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [9] Bundesamt für Umwelt (2013)/Office fédéral de l'environnement (2013)/Ufficio federale dell'ambiente (2013)/Federal Office for the Environment (2013); [10] Fischer et al. (2015b–c); [11] Ginzler et al. (2011); [12] Heiri et al. (2012); [13] Imesch et al. (2015a–b); [14] Niedermann-Meier et al. (2013); [15] Rigling & Schaffer (2015a–d); [16] Scherzinger (1996); [17] Vallauri et al. (2003); [18] Waser et al. (2017); [19] Wermelinger (2017)

Focus pages 164, 298, 357, 542, 552

Wetlands, lakes and rivers

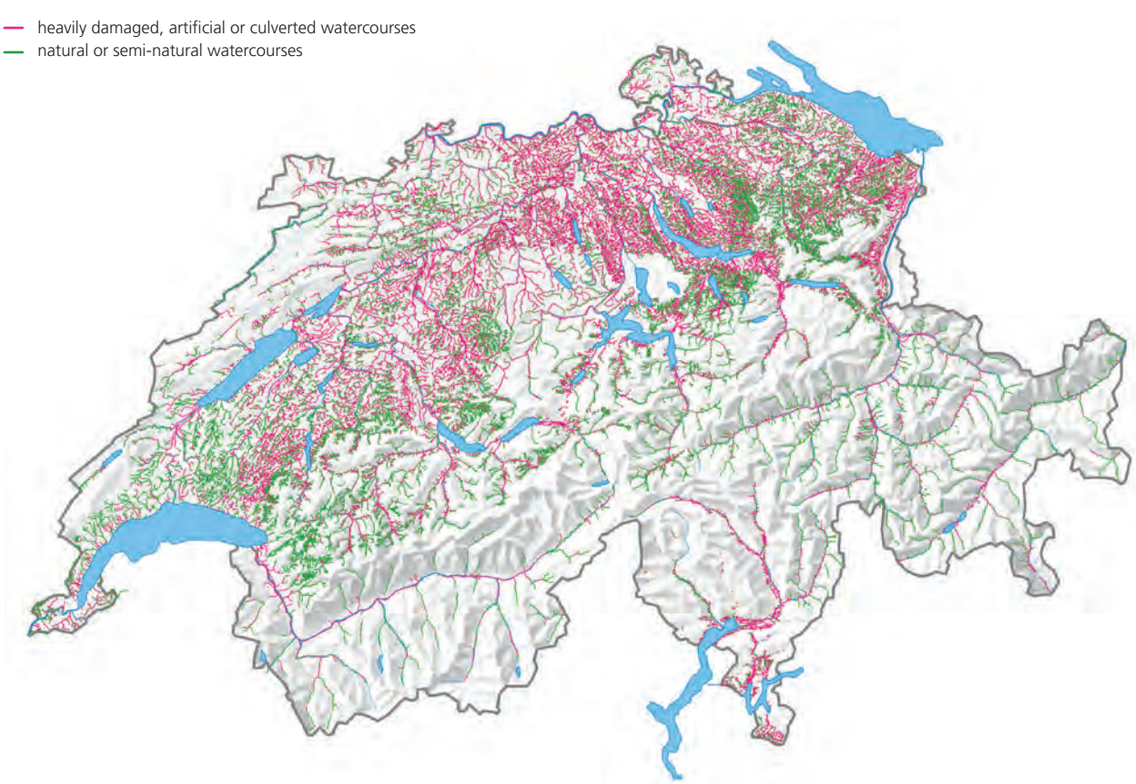
Many waterbodies and wetlands in our country have been significantly altered or even destroyed in the past 200 years. Wastewater input or the spread of non-native species have caused further damage to many of these ecosystems. Attempts are in progress to remedy the losses by restoring the natural functions of wetlands and reducing contaminants.

Switzerland has been called the «reservoir of Europe» due to our country's abundance of water. Four large European rivers – Rhine, Rhone, Inn and Ticino – begin here and flow into three different oceans. All waterbodies combined occupy 1769 km^2, or 4.3 % of the country's territory. Standing waters (79 lakes of at least 50 ha and 6668 small lakes) cover an area of 1422 km^2, while watercourses account for 317 km^2. The dense and ramified network of rivers and streams has a total length of approximately 65 000 km [19].

While the surface area of lakes hardly changed between 1979–1985 and 2005–2009, watercourses showed a significant increase in area of almost 10 km^2 (2.9 %), mostly between 1992–1997 and 2005–2009. On the one hand, regulated rivers were given more space following flooding or as a result of targeted restoration measures; on the other hand, many culverted streams were daylighted. Significant increases in area took place in the eastern half of the country in particular, for example in the cantons of Aargau and Zurich [5].

Only half of all watercourses are in a semi-natural condition

While many waterbodies above 1200 m have largely retained their natural structure, the proportion of semi-natural, largely unaltered watercourses on the Central Plateau and in Alpine valleys below 600 m only just exceeds 50 %. On the Central Plateau, watercourses are culverted along 14 % of their length [19]. Approximately 101 000 artificial obstacles over 50 cm high separate the streams into countless sections, impeding or preventing the migration of water organisms [19]. Sudden discharge fluctuations caused by hydropower stations (hydropeaking) [18] and insufficient residual water flow lead to a decline in biodiversity and in the population density of fish and small aquatic invertebrates (macrozoobenthos). Overall, 2700 km of watercourses (divided into 1300 residual flow sections) are affected by the use of hydropower. Of these, 28 % have very little residual flow or none at all; a further 40 % for which no data is available probably also have insufficient residual water [7]. Areas with control structures to prevent flooding increased by almost 20 % from 1985 to 1997 and again



The lower and middle courses of rivers are often poor in structure or strongly affected by human influence, while the upper courses and tributaries largely retain their natural structures. Source: Federal Office for the Environment (FOEN) & cantonal offices.

Schweizerische Greina-Stiftung (SGS)

Water is withdrawn from many rivers to produce electricity, affecting 2700 kilometres of our rivers and streams. More than a quarter of residual flow sections have very little residual flow or none at all.

Roman Graf

Many wetlands are small and isolated. Causes include intensified land use, but also the construction of roads and settlements.

by just over 10 % from 1997 to 2009[5]. Finally, the water levels of almost all larger lakes in Switzerland (except Lake Constance and Walensee) are controlled by weirs. To prevent high water and flooding, the regulation of lake levels has intensified in recent years. This causes natural seasonal fluctuations in the water level (spring floods, low water levels in winter) to be even smaller on average, both in waterbodies with control structures and in semi-natural ones, and leads to the disappearance of valuable periodically wet sites, such as marshes and alluvial zones[2].

In the shore and shallow-water zones of lakes, protection and exploitation interests are often in conflict. The shores of many Swiss lakes are built up with walls and harbours. On Lake Geneva, for example, only 3 % of the lake shore is in a natural condition[7]. Bank protection structures diminish the ecologically valuable transition zones between water and land, drastically reducing the naturally high diversity of habitats and species in this zone. In addition, reed belts – particularly valuable from an ecological point of view – are unable to develop. A two- to fourfold increase in shallow-water zones would be necessary to preserve the biodiversity and the ecosystem services provided by our lake shores[8].

Waterbodies are biodiversity hotspots. While many rivers and streams were canalised in the past, they are now being given more space, an approach that also improves flood protection.

Markus Forte/Ex-Press

Need for river restorations

The Federal Act on the Protection of Waters, revised in 2011, proposes the ecological enhancement of rivers, streams and lake shores. Apart from providing adequate space for waterbodies, the plan envisages restorations and a reduction of the harmful effects of hydropower use. According to the Waters Protection Act, 4000 of the 15 000 km of watercourses that are in poor ecological condition are to be revitalised by the end of the 21st century. So far, some river sections have been restored and streams daylighted, but only about 15 km per year. Small and isolated projects generally only result in a marginal increase in biodiversity[7]. Larger projects and restorations that establish connectivity between areas (e.g. Auenschutzpark Aargau, Thur River mouth ZH, Inn GR) are much more successful[1, 16].

Improved water quality thanks to better legislation

The increased construction of chemical sewage treatment plants starting in the 1960s and the ban on phosphates in laundry detergents in 1986 greatly reduced the input of pollutants and nutrients from settlements in rivers and lakes. As phosphorus inputs diminished, the oxygen supply in the deep-water zones of many lakes gradually improved. However, in some lakes this is only achieved thanks to artificial aeration. In areas with intensive livestock farming, where large quantities of liquid manure are applied to farmland, some lakes still contain

Verena Keller

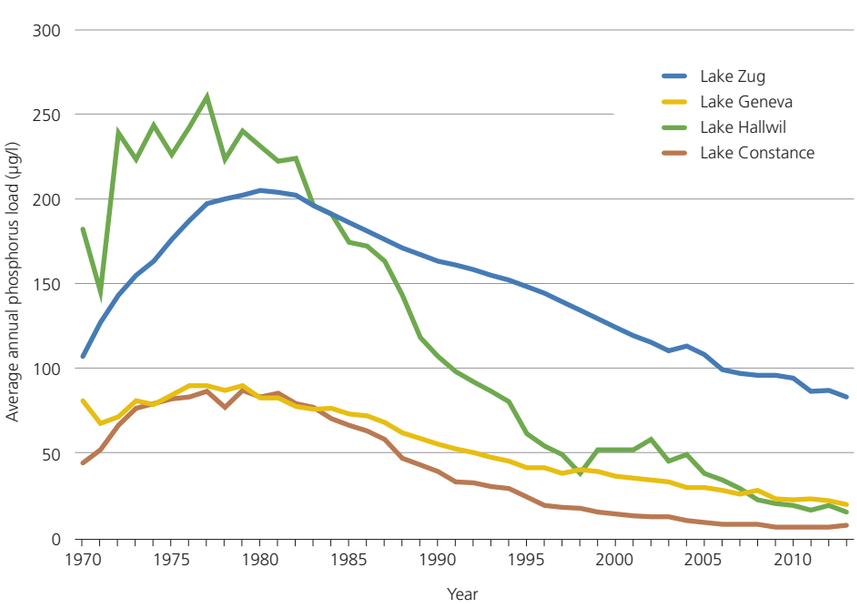
Various adverse influences (e.g. nitrogen deposition from the air, ditches and other drainage measures) cause wetlands to become richer in nutrients, more compacted and drier.

excessive levels of phosphorus; this is known as diffuse nutrient input because it cannot be centrally treated in sewage works. The data collected in small streams on small aquatic invertebrates (macrozoobenthos) show that many of these waterbodies are in poor biological condition. Certain pesticides from agriculture can seriously damage aquatic organisms and reduce biodiversity in waterbodies at a regional scale[7, 9]. Almost all pesticides used in agriculture are found in Swiss rivers[2, 6, 12]. More than 104 different plant protection products and biocides were detected in five watercourses; the limits set out in the Waters Protection Ordinance were exceeded for 31 substances[2]. Land-use analyses in the catchment areas of the studied watercourses revealed significant deficiencies in ecological quality, especially in intensively used settlement and agricultural areas.

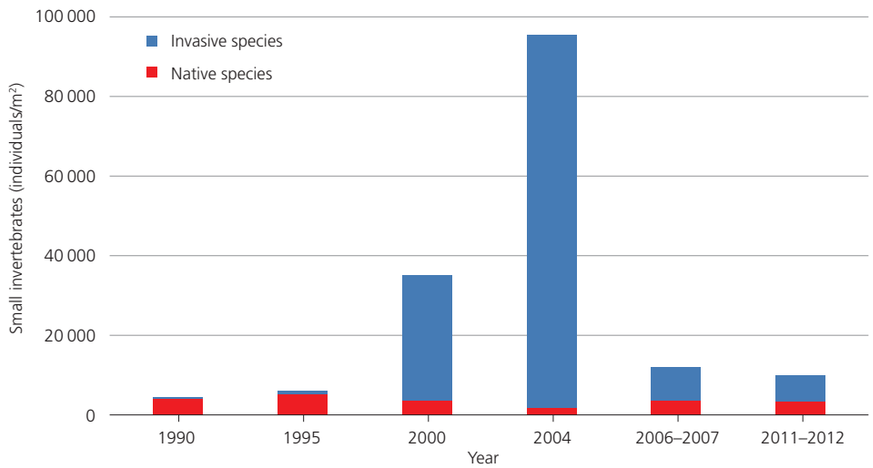
Threats: warmer water temperature and invasive species

The water temperature in the Rhine in Basel has risen by more than 2 °C since the 1960s. Heated water discharged by cooling systems or wastewater treatment plants, but also climate change, have contributed to this development[2]. The habitat conditions for aquatic organisms that are sensitive to increased temperature and for several species of fish have deteriorated as a result.

Invasive non-native animal and plant species enter our waterbodies in various ways. They are increasingly causing problems[14, 15]. In the Rhine in Basel, for example, native invertebrate species accounted for less than 5 % of individuals in 2004, while the remaining 95 % consisted of a few dominant invasive species[13]. The percentage of alien species decreased again up until 2011–2012, as one



The construction of wastewater treatment plants starting in the 1960s and later the introduction of phosphate precipitation as well as the ban on phosphates in laundry detergents in 1986 led to a significant reduction of the phosphorus concentration in most Swiss waterbodies. The water quality improved greatly as a result. Source: Federal Office for the Environment (FOEN).

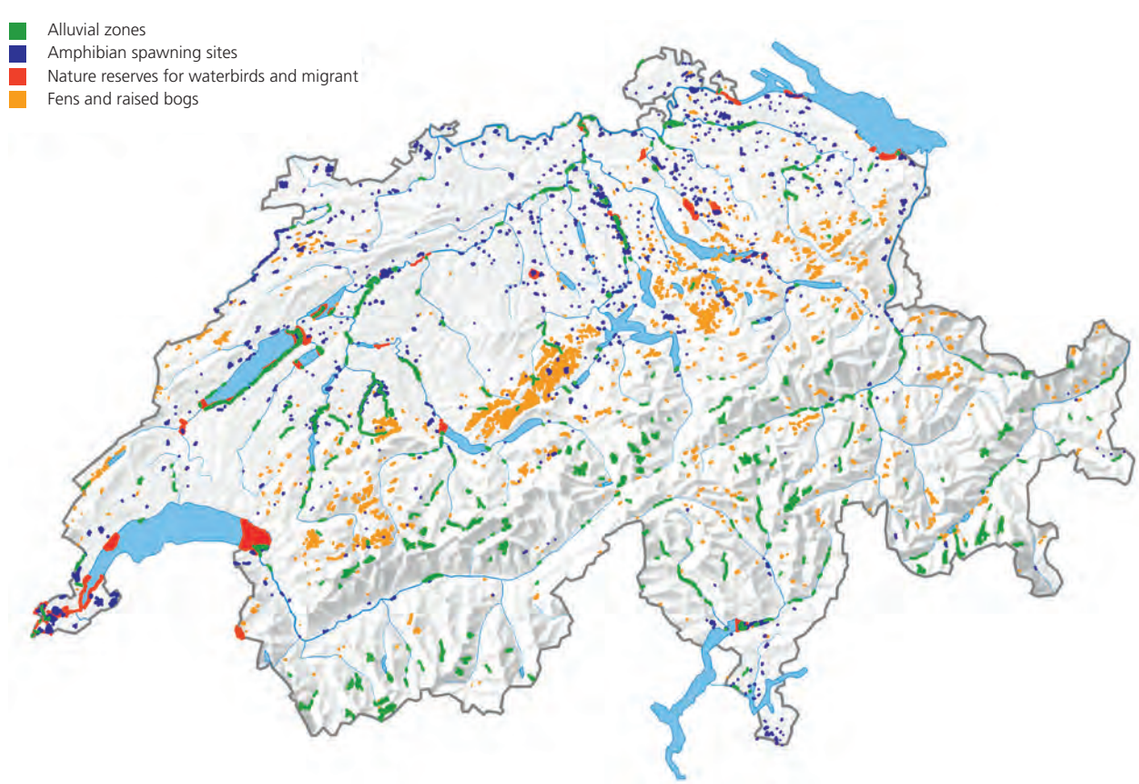


Small invertebrates in the riverbed of the High Rhine near Basel between 1990 and 2011–2012. This stretch of river has been colonised by invasive alien species since about 1994. Together with the zebra mussel, which arrived much earlier, non-native invertebrates now constitute a clear majority in the number of individuals and in biomass, while native species are crowded out. Sources: Rey et al. (2005, 2015).

invasive species that had reached extremely high densities in 2004 was replaced by the next one; however, non-native species still make up 65 % of the total number of individuals [14]. The invasive zebra mussel was first detected in Lake Geneva in 1962 and rapidly colonised other lakes. It crowded out some native species but provided a new source of food for wintering waterbirds [ABo3, 10].

A plethora of problems for fens and raised bogs, despite constitutional protection

Mires have lost more than 90 % of their area in Switzerland since 1850, and most were destroyed before 1950 [17]. Although mires in Switzerland have been protected by the constitution since 1987, the quantitative and qualitative losses continue. For example, the area covered by mires decreased by another 10 % between 1997–2001 and 2002–2006, 25 % of mires became much drier, and woody plants further increased in 30 % of them [11]. Ditches and other drainage structures are often not removed, disrupting the hydrological balance in mires and causing them to dry out. 55 % of the remaining mires are now managed at low intensity, which slows down or even prevents shrub encroachment, but in many sites, mire-friendly management practices are still a distant concept. Despite the mitigation of threats (drying out, increasing nutrient load, shrub encroachment), many mires are so small in size and so isolated that they lack the potential for regeneration and are unable to meet the requirements of characteristic



The remaining wetland biotopes of national importance are scattered across Switzerland. Alluvial zones under national protection account for 0.55 % of the territory, federal nature reserves for waterbirds and migrant birds also make up 0.55 %, while fens and raised bogs account for 0.51 % and amphibian spawning sites for 0.34 %. Despite their small size, these habitats are critical for the conservation of biodiversity. Source: Federal Office for the Environment (FOEN).

species in terms of habitat size. In 2010, only five large mires of more than 500 ha existed in Switzerland (three in the Grande Cariçaie, the raised bog near Rothenthurm SZ, and the Robenhauser Riet ZH on Pfäffikersee). Moreover, 70 % of fens and 50 % of raised bogs do not have adequate buffer zones [7]. Finally, the input of liquid manure and nitrogen from the air is still much too high in 84 % of fens and 100 % of raised bogs [3], causing the gradual deterioration of these sites [4, 11].

Some examples of restored mires show that they have become damper and contain a larger amount of peat [7]. To preserve the biodiversity and ecosystem services of mires, the surface area of raised bogs would have to be expanded by 190 % and that of fens by 170 % [8].

First steps have been taken, but much remains to be done

Although the waterbodies and wetlands under national protection only cover about 2 % of Swiss territory, they are essential for the conservation of biodiversity [2]. Compared to other countries, however, only a small portion of these habitats is protected by national legislation in Switzerland.

The current plans for the restoration of waterbodies in Switzerland are a step in the right direction. Nevertheless, in many places, the designated space is insufficient for many species because there is nowhere to retreat in case of flooding. The adverse effects of hydropower use also need to be reduced.

Martin Spiess

[1] Arlettaz et al. (2011); [2] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [3] BAFU & BLW (2016)/OFEV & OFAG (2016); [4] BirdLife Schweiz & Stiftung Landschaftsschutz Schweiz SL (2017); [5] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [6] Doppler et al. (2017); [7] Fischer et al. (2015b–c); [8] Guntern et al. (2013a–b); [9] Hallmann et al. (2014); [10] Keller (2011a–b); [11] Klaus (2007a–b); [12] Munz et al. (2012); [13] Rey et al. (2005); [14] Rey et al. (2015); [15] Rey et al. (2016); [16] Schelbert (2015); [17] Stuber & Bürgi (2018); [18] Tonolla et al. (2017a–c); [19] Zeh Weissmann et al. (2009a–b)

Focus pages 124, 130, 147, 181, 195, 208, 229, 380

BirdLife Switzerland

In many protected mires, ditches and draining continue to disrupt the hydrological balance; the image shows a drainage ditch that has been dug much too deep. The excavated earth has been deposited on the mire, adding to the damage. In many places, the buffer zones required by law are insufficient, and disturbance has an additional negative impact.

Mountains and Alpine habitats

The Alps are not only Switzerland's most characteristic landscape feature, they are also a symbol of our history and culture. The fate of their diverse habitats and rich biodiversity is inextricably linked to developments in agriculture, tourism and climate.

Of the 82 peaks that exceed four thousand metres in the Alps, 48 are located in Switzerland or on the Swiss border. This figure alone gives a sense of the tremendous importance of the Alps for our country. The Alps cover more than 60 % of Swiss territory. 23 % of this area lies above 2000 m and accommodates a remarkable biological diversity.

Where the sub-Alpine and Alpine zones meet, the mountain landscapes in the Alps and on the Jura ridges alternate between dwarf-shrub vegetation and Alpine pastures. In the Alps, this is also where the last larches and stone pines grow. On more open terrain, green alder groves, tall forb meadows and willowherb shape the landscape along with screes and rushing mountain streams. In 2009, Alpine agricultural areas (Alpine meadows and pastures) in Switzerland covered 5139 km^2, which corresponds approximately to the area of the Canton of Valais [11]. In the Alpine zone, woody vegetation is replaced by rocky, nutrient-poor grassland and pastures. Glacier forelands and moraines with their pioneer vegetation are also typical features of this environment. Above 2800 m lies the nival level with perpetual snow, boulder fields and screes, where very little vegetation survives. In 2010, glaciers covered an area of 944 km^2 in Switzerland [15].

Piz Bernina GR (left, 4049 m) is the highest summit of the eastern Alps and the only one exceeding four thousand metres.

Felix Wesch

Agriculture in transformation

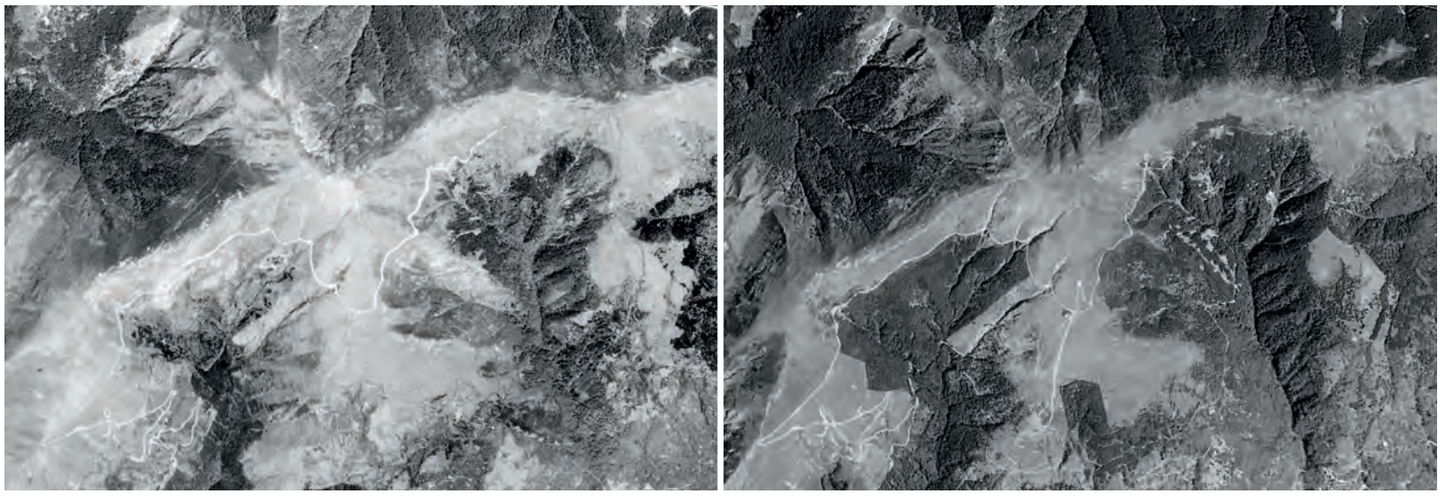
Mountain farming is in decline throughout Switzerland. The number of mountain farms decreased by 2 % per year between 2000 and 2016 [5]. The area of cultivated land remained largely unchanged, however, shrinking by only 0.9 % between 1996 and 2016. The losses are thus much smaller than in the lowlands, where they amount to 3.2 %. However, these figures do not include the summering pastures, which decreased in area by 5.4 % between 1985 and 2009 [11]. While the losses apply to the entire Alpine region and a large part of the Jura, it is Valais and Ticino that are most heavily affected. Only in very few regions did pastures expand thanks to clearings, mainly in the Jura, the Napf region and Toggenburg SG [10].

Alpine pastures are losing area for several reasons, the most important being the decline of pastoralism. While the numbers of cattle and goats have remained stable in the past few years, the number of sheep held in mountain farms decreased by 26 % between 2000 and 2016 [12]. Every year, summering pastures the size of the Walensee (24 km^2) are encroached by forest in Switzerland because the cultivation of the often steep slopes is no longer economically viable. The potential natural vegetation on about 60 % of current summering pastures is forest; the pastures exist only as long as they are grazed. The spread of forest, amounting to 3.1 % between 1985 and 2009, occurs to 93 % at the expense of species-rich meadows and pastures [10, 16].

Manure is still brought out to many Alpine pastures, leading to a decrease in the supply of arthropods. At these altitudes, the vegetation is generally adapted to low nutrient contents but is exposed to fertilisation by atmospheric nitrogen at a rate of 10 kg/ha [23]. In the long term, this leads to the disappearance of plant species [6, 16]. Among the more recent agricultural practices, the use of stone crushers in low-intensity pastures is particularly disastrous, as the machines break up field and stone formations as well as tree stumps, creating large expanses of level, uniform ground. This practice is already quite widespread in the Jura and has recently been employed in some Alpine regions as well [2, 3].

The mountains – a popular destination for leisure seekers

The mountain regions have the lowest population density and the lowest rate of population growth of all Swiss regions. In 2010, the Alpine tourist destinations and the peripheral rural areas that consist of small communities in the Alps, Pre-Alps and Jura far from the urban centres covered 35 % of the territory, but were home to only 4 %



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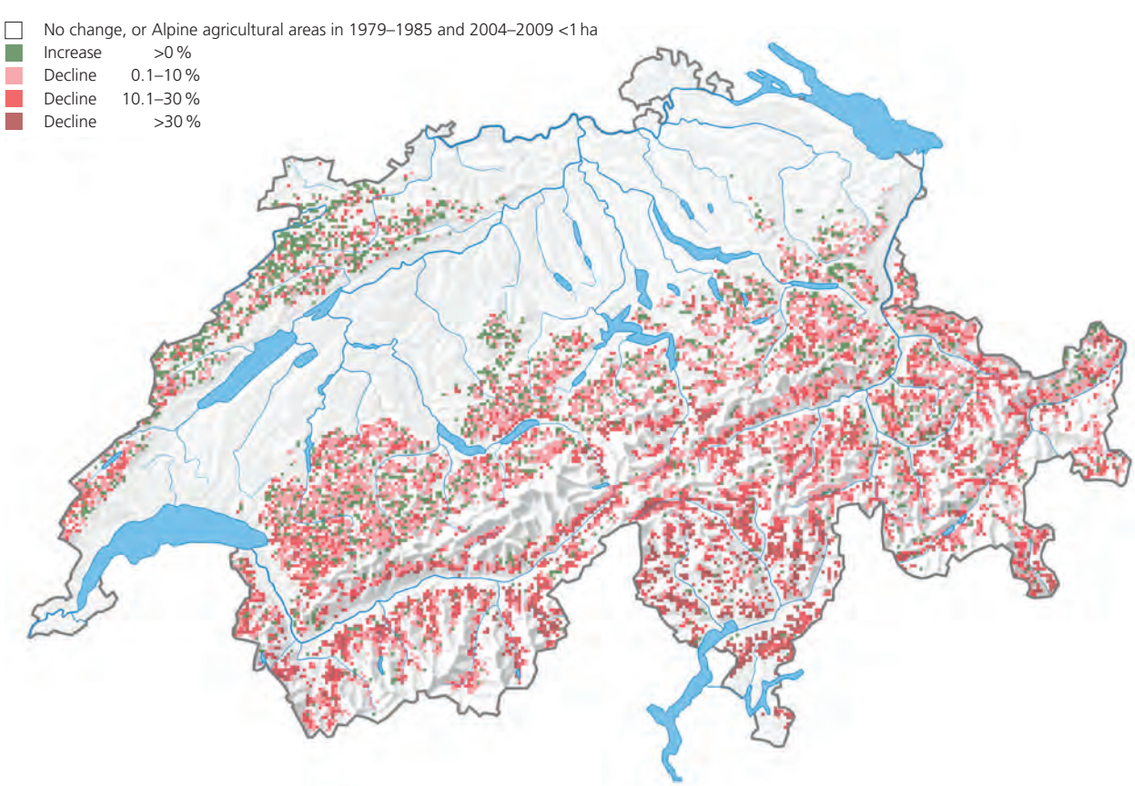
Satellite images clearly show the increase in forest area (dark grey) on the slopes of Monte Bar/Capriasca TI (1816 m) between 1983 (left) and 2015 (right).

of the population[9]. And yet the majority of tourism activities in Switzerland are concentrated in these regions. Although only 1 % of the Swiss Alps have winter-sports infrastructure[16], it is a dominating feature of the landscape in certain areas. According to estimates, places like Verbier VS or Crans-Montana VS with populations of 3200 and 3400, respectively, in 2016–2017[17, 20], each accommodate at least 50 000 guests during the peak season.

In particular, mechanical interventions in the terrain and the use of artificial snow constitute a problem for the Alpine environment. Each alteration of the rocky terrain, especially levelling the ground, increases the warming of the ground and thus accelerates the thawing of permafrost[19]. Snow canons, now employed on 50 % of ski slopes in Switzerland[28], result in nutrient deposition and cause the decline of specialised and non-competitive plant species. Even several years after the ground has been mechanically levelled, ski slopes harbour fewer species, have patchier vegetation cover and are less productive as farmland than areas that have not had the same treatment[16, 26].

The range of leisure activities in the Alps and in the Jura is much more varied today than it was in the 1990s. But trends differ between sectors. Skiing and snowboarding, for example, are declining in popularity: the number of



Change in Alpine agricultural areas between 1979–1985 and 2004–2009, depicted in 1 × 1 km-squares. Mountain farmland is declining in area throughout the Alpine region, most especially in the southern Alps and in Valais. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.

Georges Zambiasi, Treize Étoiles, Médiathèque Valais – Martigny

Mark Shapiro

The increase in building development in Verbier VS between the 1970s (left) and recent years (2010, right) was huge: the residential area almost doubled in size between 1979–1985 and 2004–2009.

skier days decreased by 25 % between 1993–1996 and 2013–2016[31]. Ski touring, on the other hand, is on the rise. Like other outdoor activities, ski touring generally takes place off-piste. To reduce conflicts between humans and wildlife, a substantial number of refuge zones have been established in the past few years[35].

Via ferratas are another type of leisure sport that has recently emerged and that is popular with tourism agencies, because it extends the range of activities available outside of the winter season. In 2015, almost 70 via ferratas were recorded, most of them presumably established after 2000[32]. It is hard to determine exactly how many followers these new types of leisure activities have gained, but the marked increase in members of the Swiss Alpine Club (SAC) is an indirect measure of the trend in mountain sports in Switzerland: SAC membership rose from 87 000 in 1995 to more than 150 000 in 2016[21, 27].

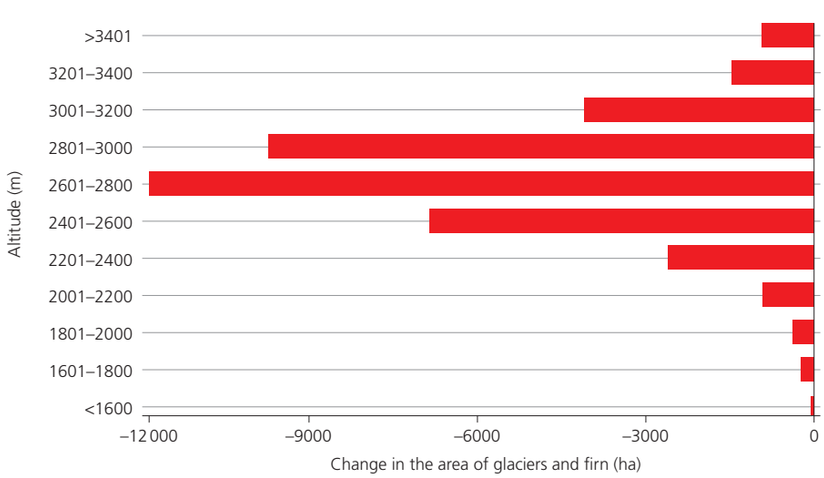
Finally, mountain areas also play a role in energy production. 56 % of all reservoirs with a volume of more than ten million m^3 are located in the Alps at 1800 m and above. In 2016, 49 % of wind-power plants in Switzerland were concentrated on the ridges of the Jura, the Alps and the Pre-Alps. Several additional wind parks are planned in these areas[7, 8].

The Alps are getting warmer

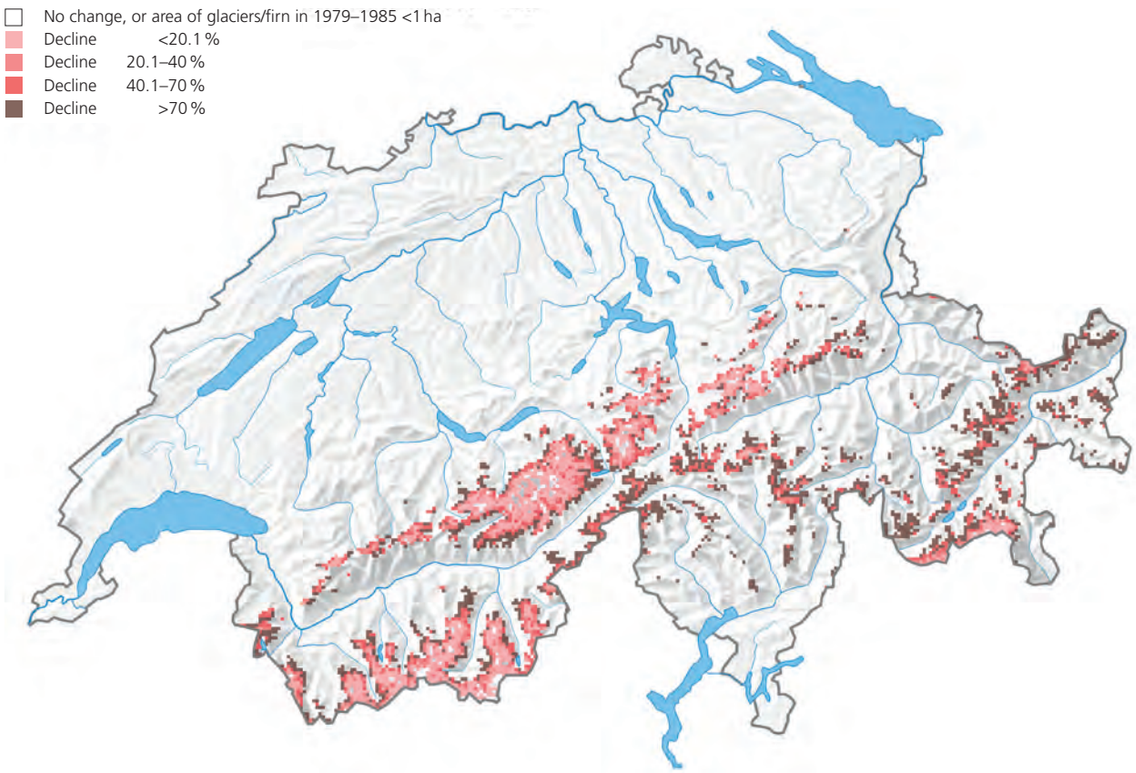
Mountain ecosystems are much more heavily affected by the effects of climate change than the lowlands[22]. For example, the average temperature in the Alps has risen by almost 2 °C since the end of the 19th century. That is twice the rate of the average temperature increase in the northern hemisphere[1].

The impact of climate warming is most visible in the accelerated retreat of glaciers. Signs of permafrost thawing are evident in unstable slopes and increasing ground movements. Rockfall and debris flows ensue, which in turn increase the risk of damage to infrastructure[13, 14, 30].

Climate change has a significant influence on the upward shift of certain specialised high-altitude plants[24, 29]. In the course of the 20th century, botanical diversity increased by 86 % on 37 surveyed summits[33]. At lower altitudes, the same process has become apparent: between 2003 and 2010, butterflies were found to have shifted their range upwards by 38 m[25]. However, this strategy has its limits, as the area of potential habitat shrinks with increasing altitude. Accordingly, declines have already been recorded for several bird species and other groups of animals[34].



Change in the area of glaciers and firn per altitude level between 1985 and 2009. The largest losses occurred between 2600 and 3000 m. But even in the highest zones, the annual accumulation of ice through snowfall can no longer compensate for the melting of glaciers in summer. Source: Bundesamt für Statistik (2015a).



Change in the area of glaciers and firn between 1979–1985 and 2004–2009, depicted in 1 × 1 km-squares. Glaciers are retreating throughout the Alps, though regions with summits higher than 3400 m are less affected than lower-lying mountain areas like the Gotthard and Adula region or the Engadine GR. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.

The fact that less and less precipitation falls as snow is a further consequence of climate change with far-reaching effects. Apart from the negative impact on hydrological balance and glaciers, the reduction in snowfall also affects the economy in mountain regions, as these are still highly dependent on winter tourism[1]. The length of the winter season in ski resorts decreased by more than five weeks between 1970 and 2015, despite the increasing number of ski runs prepared with artificial snow. Today, the season starts an average of 12 days later and ends 26 days earlier[18].

An ecosystem worth protecting

Mountain regions have undergone radical change in the past 200 years. Long considered threatening and inhospitable, they inspired the romantic movements in the 19th century and beyond, challenged the first Alpinists, and have more recently attracted crowds of winter-sports enthusiasts. But it is this very appeal of the Alps, heightened by their reputation as the last untouched landscapes in Switzerland, that now presents new challenges. The continuing development of the Alpine region is a balancing act that needs to reconcile transformations in the agricultural sector, a growing variety of tourist activities, and threats to biodiversity, all in the context of global warming. The Alps may appear massive, but the Alpine ecosystems are fragile and require special and well-coordinated monitoring efforts on the part of the eight Alpine countries that take into account both environmental and societal issues.

Jérémy Savioz

[1] Akademien der Wissenschaften Schweiz (2016)/Académies suisses des sciences (2016); [2] N. Apolloni, pers. comm.; [3] Apolloni et al. (2017); [4] Bausch et al. (2016); [5] BLW (2017)/OFAG (2017)/UFAG (2017); [6] Boutin et al. (2017); [7] Bundesamt für Energie (2017)/Office fédéral de l'énergie (2017)/Ufficio federale dell'energia (2017); [8] Bundesamt für Energie (2018)/Office fédéral de l'énergie (2018)/Ufficio federale dell'energia (2018); [9] Bundesamt für Raumentwicklung (2012)/Office fédéral du développement territorial (2012)/Ufficio federale dello sviluppo territoriale (2012); [10] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [11] Bundesamt für Statistik (2016a)/Office fédéral de la statistique (2016b); [12] Bundesamt für Statistik (2017b)/Office fédéral de la statistique (2017a); [13] Duvillard et al. (2015); [14] Einhorn et al. (2015); [15] Fischer et al. (2014); [16] Fischer et al. (2015b–c); [17] Kantonales Amt für Statistik und Finanzausgleich (2018)/Office cantonal de statistique et de péréquation (2018); [18] Klein et al. (2016); [19] Lambiel & Reynard (2003); [20] Michellod (2018); [21] Observatorium Sport und Bewegung Schweiz/Observatoire sport et activité physique suisse, pers. comm.; [22] Pepin et al. (2015); [23] Rihm & Achermann (2016); [24] Rixen & Wipf (2017); [25] Roth et al. (2014a); [26] Roux-Fouillet et al. (2011); [27] Schweizer Alpen-Club (2017)/Club Alpin Suisse (2017); [28] Seilbahnen Schweiz (2017)/Remontées Mécaniques Suisses (2017); [29] Steinbauer et al. (2018); [30] Stoffel et al. (2014); [31] Vanat (2017a–b); [32] Visinand (2015); [33] Vittoz et al. (2009); [34] Vittoz et al. (2013); [35] Wildtier Schweiz (2014a–c)

Focus pages 98, 308, 484, 506

Farmland

Compared to our neighbouring countries, agriculture in Switzerland is largely dominated by small family farms. However, farming is generally very intensive. The process of intensification is increasingly spreading to mountain regions, too. Despite the introduction of biodiversity promotion areas in the 1990s, the decline in biological diversity has not been stopped.

Farmland covers 36 % of the territory of Switzerland. Regions in which more than half the surface area is used for agriculture are located on the Central Plateau, in the southern Jura and in the Pre-Alps of eastern Switzerland. The proportion of agricultural land is low in Ticino, Valle Mesolcina GR and parts of Valais. Each of the following land uses account for about a third of Swiss farmland: arable crops (30.9 %), permanent grassland (34.4 %) and Alpine agricultural areas (summering pastures, 34.7 %) [10].

Agricultural land is divided into different zones depending on climate conditions, accessibility and surface structure. The plain region is most suitable for agriculture and accounts for 47 % of farmland (areas used year-round, not including summering pastures, total of 1049 km^2); the hill region accounts for 25 %, and the rest is divided into mountain regions I to IV [6]. The area of farmland has decreased by about 23.4 km^2 since 2000 [6]. In the valley bottoms, cultivated land is contracting twice as fast as in the colline and mountain zones, giving way mainly to building development (settlements, industrial plants, roads). In the mountain regions, the reduction in grassland is predominantly a result of forest encroachment on marginal, labour-intensive land.

Arable fields and Alpine pastures each account for 35 % of lost farmland, followed by orchards, vineyards and horticultural land (27 %). Proportionately, orchards suffered the greatest loss of area. Not surprisingly therefore, it is this type of land use that is most affected by the loss of farmland in the typical fruit-growing regions of Switzerland (Lower Valais, northern Jura, Central Plateau between the Napf region and Lake Zurich, Thurgau) [10].

Small mixed farms

Swiss farms tend to be quite small compared to those in neighbouring countries. On average, a typical family farm manages about 20 ha of land (2016). The number of farms has decreased by about one fourth since 2000, a decline that is much greater than the loss of area. The smallest farms are most affected by structural change.

Most farms are mixed operations with both crop and animal production. Crops dominate in the western part of

Main forms of agricultural land use in Switzerland according to the Land-use statistics 2004–2009. The graph shows the most common form of land use in the categories arable land, grassland used year-round, special crops (orchards, vineyards, horticulture) and Alpine pastures only grazed in summer. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.

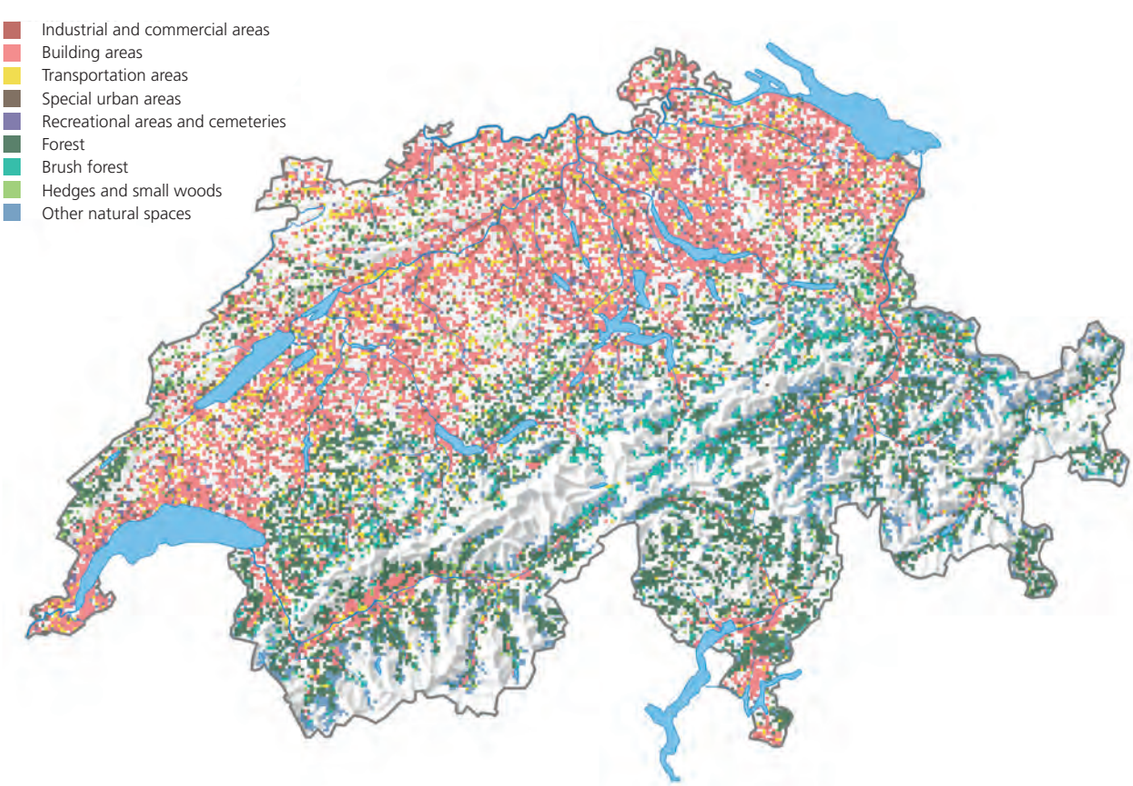
Indicator	2000	2016	Change in %
Agricultural land (ha)	1 072 492	1 049 071	–2
of which			
– arable land (ha)	292 548	272 697	–7
– improved grassland (ha)	115 490	125 998	+9
– natural grassland (ha)	629 416	611 572	–3
Livestock units	1 336 719	1 315 243	–2
of which			
– cattle	1 013 585	963 804	–5
– pigs	194 417	188 550	–3
– poultry	42 649	63 320	+48
Farms	70 537	52 263	–26
Full-time farms	49 239	37 325	–24
Average farm size (ha/farm)	15.2	20.1	+32

Key figures in agriculture in 2000 and 2016. Source: BLW (2017).

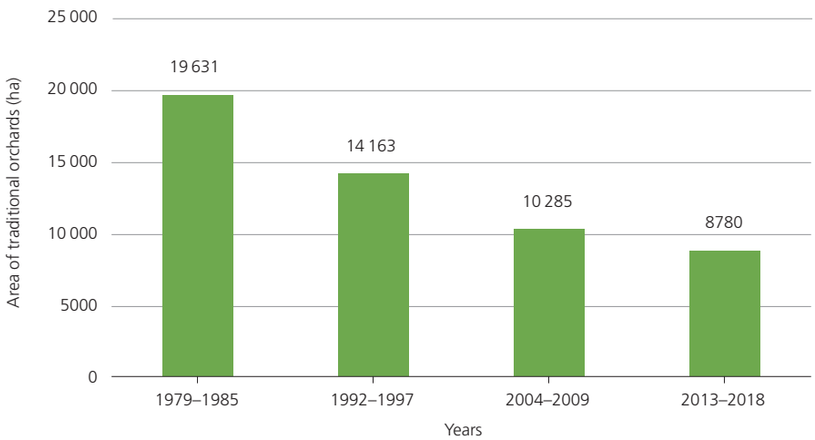
the Central Plateau with a large share of cereals in crop rotations. In the eastern part of the Plateau, livestock is more important and as a result, the proportion of improved grassland and maize is larger. In fruit-growing regions, orchards shape much of the landscape. However, traditional orchards with standard trees are increasingly being replaced by intensively managed orchards with dwarf-tree varieties. The number of traditional orchards registered as biodiversity promotion areas fell by 11 % between 2000 and 2016, while the total area of orchards increased by 30 %. Locations with a mild climate are used locally for viticulture (about 157 km² in total). At 52 km² each, the largest areas of vineyards are in Valais and the Lake Geneva area, followed by Ticino (14 km²) and the region around Lakes Biel, Neuchâtel and Murten (10 km²). Vineyards covering more than 1 km² are also found in the cantons of Zurich, Schaffhausen, Grisons, Aargau, St. Gallen, Thurgau and Basel-Landschaft [11]. In the past few decades it has become standard procedure to allow ground vegetation to grow between the rows of vines. This practice significantly increases the food supply for birds [17]. However, only about 20 % of vineyards in the Valais have ground vegetation due to the dry climate.

Intensive agriculture

Farming is generally very intensive, involving large and powerful machinery. Modern harvesting and forage-conservation techniques (baled silage) resulted in the further rationalisation of intensive grassland management as many as 20 years ago. Today, mowing is faster and takes place at a larger scale. In 1990, a tractor was able to mow two hectares in one hour; when front mowers were introduced, that area increased to five hectares. Five to six cuts from March to November are common practice in the lowlands.



New types of land use at the expense of agricultural land in 1985–2009: the graph shows the land use with the greatest increase per square of 1 × 1 km and includes all squares where agricultural land decreased by at least one hectare. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.



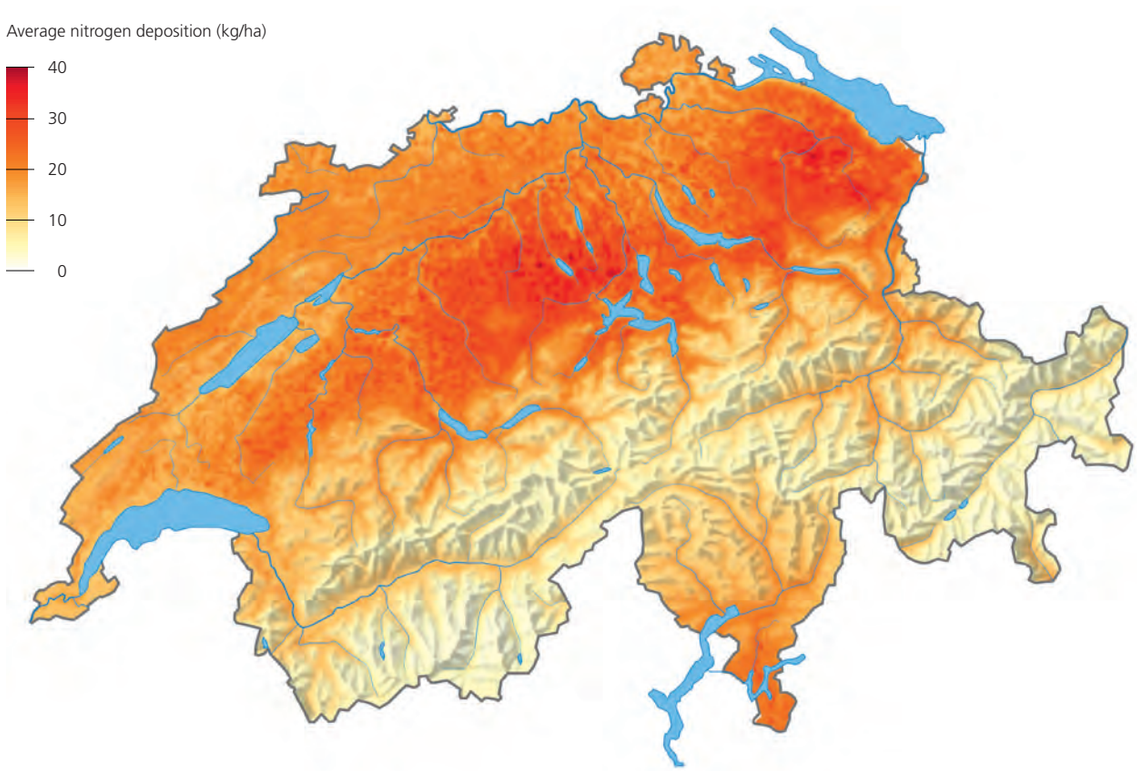
Change in the area of traditional orchards. The decline has slowed somewhat in recent years. The numbers apply to western Switzerland, for which the data from the latest land-use statistics are already available. Source: Federal Statistical Office (FSO).

A much larger amount of feed concentrates are used in meat and milk production today. The import of feed concentrates has more than doubled since 1990, totalling about one million tons in 2015[1]. The area of land used abroad to produce these feed concentrates (mainly cereals and soy) amounts to about three quarters of the total arable land in Switzerland[24]. One consequence of the import of feed concentrates is that the manure produced on many farms exceeds the maximum amount these farms can use, and is therefore transported over long distances to other farms. High livestock numbers also lead to high nitrogen emissions (especially ammonia) – emissions are produced by the animals, but also during the storage and application of manure. In consequence, the nitrogen emissions in areas with lots of livestock are very high. In 2005, agriculture was responsible for about 65 % of nitrogen emissions into the atmosphere[18]. These nutrients are deposited back onto land as immissions from the air. In many areas, the depositions exceed the so-called critical loads considered acceptable for semi-natural ecosystems[2, 23].

Heavy use of pesticides and increasing indoor production systems

The volume of pesticides applied in Switzerland has remained fairly constant since 1990 and amounts to about 2200 t per year. However, there has been a shift towards more toxic substances (by a factor of 1000 or more) which in fact have a much greater impact even in substantially smaller doses; therefore, the intensity of pesticide treatment and with it the burden on the environment is expected to increase[8].

In recent years, a trend towards indoor production has become apparent. Poultry fattening units and greenhouses for vegetable production are steadily increasing and take up large areas of farmland. Temporary greenhouses and especially fields of early potatoes, vegetables, berries and other crops covered with plastic sheeting already take up the largest part of agricultural land in some areas. The number of bird species and individuals decreases as the area of covered fields expands[25]. Unlike in some of our neighbouring countries, there is no political support in Switzerland for the cultivation of energy crops (renewable resources) because it would compete with food production.



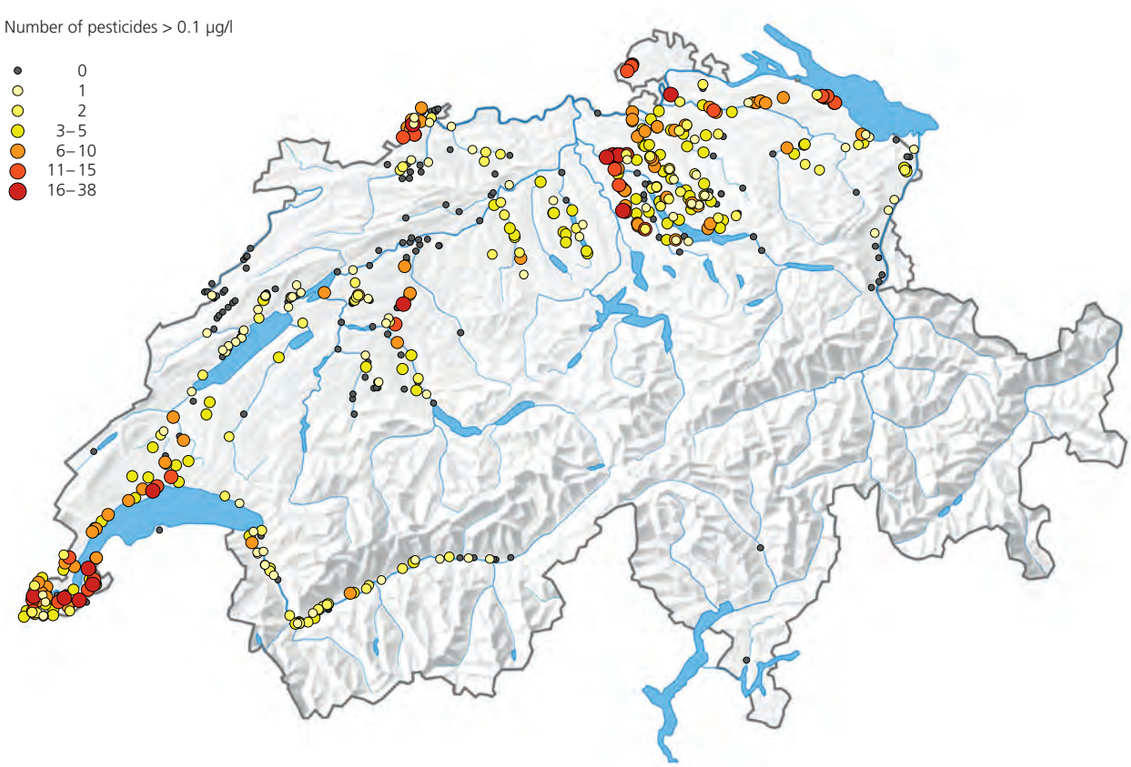
Average nitrogen deposition per ha and year in 2010. Agriculture is responsible for about 65 % of total nitrogen emissions into the atmosphere. These nutrients are deposited back onto land as immissions from the air. Source: Federal Office for the Environment (FOEN) & Meteotest AG.

Markus Jenny

In recent years, pesticides are again being applied as a preventive measure; the substances used are becoming stronger and affect large areas.

The decline of dry meadows is dramatic, as is the loss of flower-rich low-intensity meadows that were traditionally only fertilised with manure. On the Central Plateau, these meadows dwindled to 2–5 % of their original area due to intensified land use, and dry meadows and pastures lost about 95 % of their area between 1900 and 2010. In the past 20 years, the remaining area has further contracted by one fifth [2].

While the intensification of agriculture began early in the lowlands, the process of intensification and rationalisation picked up speed at mid-elevation (about 800–1400 m) in the 1990s. At the time, species-rich areas managed in site-appropriate ways were still quite widespread. Today, these sites are now also dominated by a small number of forage grasses and herbs like dandelion that thrive on nutrient-rich soils. Grassland vegetation at higher altitudes has gradually come to resemble the uniform green of the lowlands. While in 1950, 95 % of mountain meadows were species-rich Alpine wildflower meadows, that figure is now down to 2 % [3]. In the Engadine GR, the area of intensively managed pastures tripled between 1988 and 2010; fertile meadows increased by 15 %. These changes have been at the expense of species-rich dry meadows, which have shrunk by 55 %. Unproductive meadows on marginal land have been abandoned, allowing the forest to spread [14]. The process has been accelerated by measures for «structural improvement»: the relocation of farms outside of villages, the widening of roads



Pesticides are extremely damaging to the environment. The map shows the number of different pesticides in watercourses recorded in excess of 0.1 µg/l (565 sites with measurements from 2005 to 2012). Source: Munz et al. (2012).

Chiara Scandolara

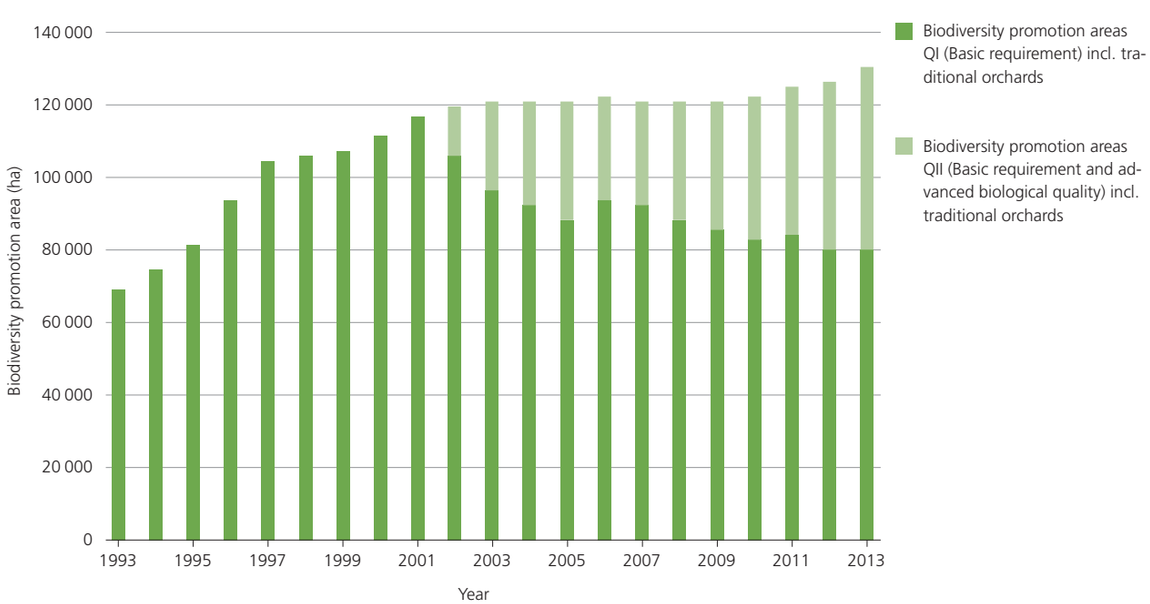
Biodiversity is kept out of large areas through the use of film, plastic or netting.

to improve accessibility to remote areas, irrigation systems in dry regions, land consolidation and other measures receive federal and cantonal subsidies and generally provide a boost to intensification.

Agricultural policy

One of the objectives set out in the Swiss constitution (Art. 104) is to ensure that agriculture in Switzerland is not only competitive, but also sustainable and respectful of nature, the environment and animals. In the past three decades, the agricultural policy framework and instruments needed to achieve these goals have been developed step by step in several reform processes. With the «proof of ecological performance» (PEP) that farmers need to provide in order to receive direct payments, a system is in place that has great potential for nature conservation and environmental protection. For example, as part of PEP, at least 7 % of agricultural land must be managed in the form of biodiversity promotion areas. These biodiversity promotion areas provide a valuable foundation for the implementation of conservation projects in farmland. Federal funding is an extremely important policy instrument in the Swiss agricultural sector. Every year, about four billion francs are allocated to agriculture; of these, 2.8 billion are paid directly to the farmers (direct payments)[6, 9]. Subsidies for the promotion of biodiversity, introduced in the 1990s, currently account for 14.2 % of all direct payments[6]. The aim of these measures is to preserve and enhance species diversity in farmland.

However, none of the «Environmental Objectives in Agriculture» defined in 2008[3] have been achieved so far[4]. The objectives have not been attained, or only partially, because many financial incentives exist that oppose the promotion of biodiversity, and because several of the measures are not effective enough[9]. Also, some measures have not been well implemented. In particular, there are several negative examples of habitat connectivity projects, which are supposed to be oriented towards the needs of target species. But too often, the wrong measures are implemented, or they are carried out in the wrong place[19].



Change in biodiversity promotion areas in Switzerland (in ha). Larger subsidies have been paid for biodiversity promotion areas at quality level II (QII) since 2002. These areas need to reach a defined level of biological quality, i.e. contain certain indicator plants or certain habitat structures. Source: Rey et al. (2017b).

Markus Jenny

Powerful machinery cultivates large areas in short periods of time, making the land unavailable as a breeding site.

For example, Whinchats near Intyamon FR breed in the valley bottom, while conservation measures were put in place on the slopes [15].

Bio Suisse and IP-Suisse

A wide public is becoming increasingly aware of the negative effects of intensive agricultural production on biodiversity, soil, air, water and human health. Consumers influence production methods by the purchases they make, and therefore constitute an economic factor [20]. Bio Suisse (federation of 32 organic-farming organisations, 13 % of agricultural land) and IP-Suisse (association of farmers using integrated methods of production, about a quarter of total agricultural land) are two large producer organisations whose guidelines contain advanced measures to promote biodiversity. The majority of organic farms are found in mountain regions.

Since 2009, IP-Suisse has required its approximately 9000 producers to achieve a minimum score in its «point system for biodiversity» [22]. Most IP-Suisse farms had to make considerable improvements in their efforts to enhance biodiversity to achieve the required score. Despite some initial scepticism among members, the approach significantly increased the number of biodiversity promotion areas. Within four years, the proportion of valuable habitats such as species-rich meadows, hedges and wildflower strips increased from 60 to 99 km^2, or by 65 % [26]. Moreover, an assessment of 133 farms showed that a farm's efforts in terms of biodiversity are well represented by the point system [5] and that an environment-friendly approach is also profitable for farmers [12, 16].

Bio Suisse has compiled a catalogue of biodiversity measures and requires its approximately 6200 producers to implement a minimum number of them. The catalogue contains similar measures to those included in the biodiversity point system.

Future prospects

Despite various measures, biodiversity in farmland is decreasing, especially among breeding birds. This is due to

Markus Jenny

Since the 1990s, farmers have been required to designate biodiversity promotion areas. The image shows a particularly good example, where a farmer has created new groups of bushes, various fringes, and low-intensity meadows as well as planting standard fruit trees.

the fact that agricultural intensification continues to progress and has now also reached mountain regions, but also to the insufficient implementation of agri-environmental measures.

A new agricultural policy will take effect in 2022 and will have the task of addressing the current deficiencies. Solutions must not be limited to improving biodiversity measures, but must also target the reduction of emissions from agriculture (nutrients, pesticides). Agricultural production needs to be brought into better alignment with a site's potential and with the sustainability limits of ecosystems. Milk and meat production needs to rely largely on feed produced on site (reduction of nitrogen input), and crops must be farmed in a resource-efficient way (fewer pesticides, biodiversity-friendly production methods). For ground-breeders like Eurasian Skylark and Whinchat, which like to nest in the fields, resource-efficient production systems for both arable land and grassland need to be developed. For example, cereal farmers are currently experimenting with widely spaced crop rows, and maize farmers with undersown crops. In both cases there is justified hope that this will have a positive impact on Eurasian Skylarks, brown hares and other species. Incentives for a marked reduction in pesticides must be introduced, on arable land in particular, but also in orchards, vegetable farms and vineyards [8]. Last but not least, compliance with the regulations already in place must be guaranteed.

There is also a lack of ecological training and advisory services for farmers [21]. A better system of learning opportunities and support regarding the topics of biodiversity and sustainability needs to be put in place. Experience has shown that farmers can dramatically improve their environmental efforts when they are supported by advisers [13].

Near-natural production has also become a selling point in recent years. Several labels have been introduced for foods produced in a sustainable manner, a trend that is expected to gain even more momentum in the future. It is important that farmers are fairly remunerated for their additional efforts and services. The economic sector and consumers are in a position to encourage this development in the future.

Simon Birrer

[1] Agristat (2016); [2] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [3] BAFU & BLW (2008)/OFEV & OFAG (2008); [4] BAFU & BLW (2016)/OFEV & OFAG (2016); [5] Birrer et al. (2014); [6] BLW (2017)/OFAG (2017)/UFAG (2017); [7] Bosshard (2016a); [8] Bosshard (2016b–c); [9] Bosshard et al. (2010); [10] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [11] Bundesamt für Statistik (2016b)/Office fédéral de la statistique (2016c); [12] Chevillat et al. (2012a–b); [13] Chevillat et al. (2017a–b); [14] Graf et al. (2014c); [15] Graf et al. (2015a–b); [16] Graf et al. (2016a–b); [17] Guyot et al. (2017); [18] Heldstab et al. (2010); [19] Hertach (2015); [20] Jenny (2011b); [21] Jenny & Obrist (2012a–b); [22] Jenny et al. (2009a–b); [23] Rihm & Achermann (2016); [24] F. Schläpfer, in litt.; [25] Skórka et al. (2013); [26] Zellweger-Fischer et al. (2016a–b)

Focus pages 234, 276, 314, 392, 402, 428, 478, 532

Markus Jenny

Ecological consultations often result in improved efforts to promote biodiversity and change farmers' attitudes towards ecological issues. Moreover, farmers have the chance to improve their income by providing biodiversity services.

Settlements and urban areas

Settlements are among the fastest growing types of land use in Switzerland. Built-up space expanded by almost one quarter between 1985 and 2009, outpacing population growth. Residential areas and leisure facilities in particular showed a strong increase. The spread of settlements appears to have slowed somewhat in recent years.

Based on the 2004–2009 land-use statistics, settlements and urban areas cover an area of approximately 3079 km². This corresponds to 7.5 % of the surface area of Switzerland, or an area about twice the size of the Canton of Lucerne. Besides buildings, settlement areas include all types of sealed surfaces, meaning asphalt or other artificial surfaces that do not allow water to filter into the ground. Settlements also include unsealed areas that serve residential or transportation purposes, such as private gardens, parks, sports and recreation facilities, green spaces next to transport infrastructure, and motorway embankments.

Half of the settlement area is covered by buildings. Transport accounts for almost one third of the area, or about 1000 km². The remaining space is taken up by industrial and commercial areas (7.8 %), recreational areas and cemeteries (6.4 %,) and special urban areas (5.5 %); these include, for example, gravel pits and quarries, dumps, and building sites. On the Central Plateau, settlements cover 16 % of the surface area, more than twice the national average [1]. Sealed surfaces make up 62 % of the total settlement area. The area of unused industrial and commercial spaces, so-called industrial wasteland, was estimated at 18 km² in 2008. This corresponds to an area greater than the city of Geneva [7].

Growth at the expense of agricultural land

Between 1985 and 2009, settlements grew by 584 km², or 23.4 %. This corresponds to an area larger than Lake Murten every year. The rate of growth has slowed somewhat in the past three decades. Averaging 1.1 % per year between 1982 and 1994, or 0.86 m²/s, it was down to 0.8 % per year, or 0.69 m²/s, between 1994 and 2006. The latest land-use statistics show an annual increase in settlements in western Switzerland of 0.7 % between 2006 and 2015 [5]. Of the new settlement areas, 89 % were built on agricultural land and 9 % on wooded land [3].

Settlements increased in all cantons with growth ranging from 14 % (Canton of Schaffhausen) to 40 % (Canton of Appenzell Innerrhoden). The Canton of Basel-Stadt was an exception, with settlement area remaining almost constant (plus 1.3 %) [3].

Settlement areas

Distribution of settlement areas according to the 2004–2009 land-use statistics. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.

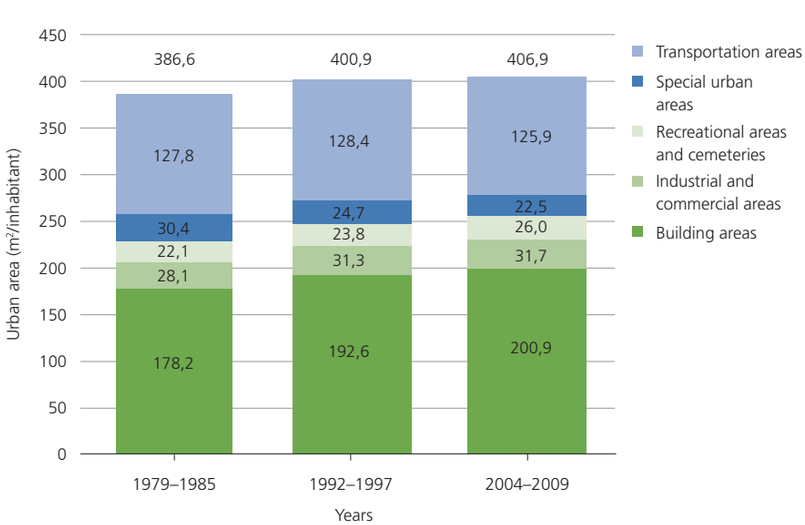
Change in settlement area between 1979–1985 and 2004–2009 in ha. Changes are represented at a grid resolution of 1 × 1 km. Source: Land-use statistics – Federal Statistical Office (FSO) & Office of Construction and Infrastructure of the Principality of Liechtenstein.

The spread of settlements destroys natural habitats: compared to the agricultural zones, the building zones of nine municipalities in the Canton of Basel-Landschaft contain six times more trees, 21 times more point features (e.g. bushes, stone piles), 30 times more linear features (e.g. hedges, ditches, herb fringes) and 2.5 times more area features (e.g. ruderal areas, copses)[8]. All these elements are lost when the space is built up.

Growth of settlements exceeds population growth

The increase in settlement area is related to population growth. Between 1995 and 2016 the number of inhabitants in Switzerland increased from 7 to 8.4 million, or by 17.5 %. However, settlement area has increased even more steeply than the population. In 2009, every inhabitant occupied 20 m² more settlement area on average than in 1985[1]. Overall, settlement area per inhabitant corresponds to the size of two tennis courts (407 m²). Residential areas (area used for residential buildings and the surrounding space, not including agricultural buildings) grew by as much as 44.1 % between 1985 and 2009, which is two-and-a-half times the increase in population[3]. The Canton of Basel-Stadt has the smallest settlement area per inhabitant (about 130 m²), while the largest are found in the rural cantons of Jura, Valais and Grisons (630–820 m²)[3].

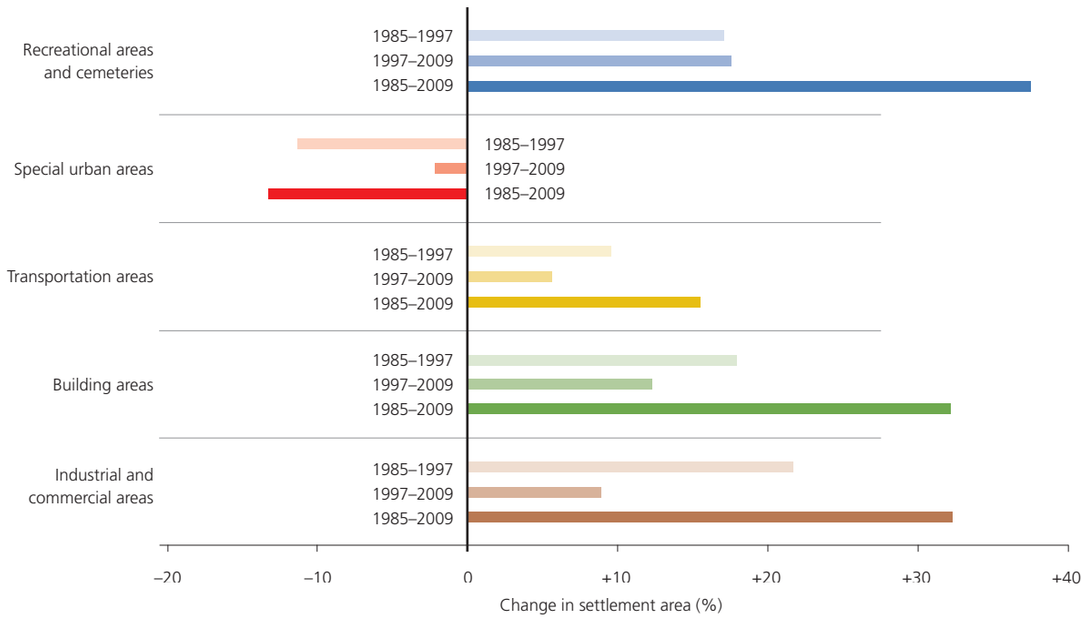
Settlement area is divided into five categories; the largest part is taken up by buildings and transport infrastructure. Settlement area expanded by 20 m² per person between 1979–1985 and 2004–2009. Source: Bundesamt für Statistik (2013a).



Buildings and golf courses show the greatest increase

The largest share of new settlement areas between 1985 und 2009 is taken up by buildings (368 km², or 63.4 %) and transport areas (128 km², or 21.9 %)[3]. However, the greatest percentage change occurred in recreational areas and cemeteries (+37.5 %). Buildings and industrial and commercial areas increased by 32.2 % each, transport areas by 15.5 %[1]. In contrast, the category «special urban areas» declined by 13.2 % due to the decrease in building sites and the restoration of gravel pits.

In the category recreational areas and cemeteries, public parks and sports facilities account for the largest part of the increase. Cemeteries and camping sites only increased marginally[1]. Allotments are the only type of recreational



At almost 40 %, recreational areas and cemeteries saw the largest growth between 1985 and 2009 (mainly golf courses). The increase in transport areas, buildings as well as industrial and commercial areas slowed down in the second period between 1997 and 2009. Special urban areas, which include gravel pits and quarries, dumps and building sites, were the only category to shrink in size. Source: Bundesamt für Statistik (2015a).

space that shrank in area, mainly in favour of buildings and roads[3]. The proportion of semi-natural gardens in settlements is low, fluctuating between 7 und 20 % in Binningen BL, for example, depending on the neighbourhood[8]. Golf courses experienced the largest increase by far (280 %). More than 80 % of this growth occurred between 1997 and 2009[1].

In the case of industrial and commercial areas, a shift was recorded away from cities to agglomerations and locations near motorway junctions and railway lines. 71 % of these new areas were built on agricultural land[3].

Niklaus Wächter

Between 1985 and 2009, new industrial and commercial areas were built mainly in peripheral agglomerations and near motorway junctions and railway lines, in most cases on agricultural land.

Transport areas and fragmentation of the landscape

About a third of settlement space is taken up by transport infrastructure. The Swiss road network (national, cantonal and municipal roads) totals more than 71 500 km (not all municipal roads are included). The length of motorways increased from 1200 km in 1996 to 1447 km in 2016. However, the largest expansion of national roads occurred prior to 1985[2].

Switzerland has one of the densest road networks in Europe, with 1.7 km of roads per km² (excluding private roads)[2]. The spaces between roads, settlements and other artificial barriers are described in terms of mesh size; smaller roads (classes 3 and 4) were not included in the calculation. While mesh size was 10 km² on the Central Plateau in 1980, it was down to 8 km² in 2007, or 20 % smaller[6, 10]. Mountain regions tend to have considerably more space between artificial barriers. In the Jura,

Roman Graf

Transport infrastructure such as motorways account for almost a third of settlement area.

Marcel Burkhardt

While green spaces in settlements may be plentiful, they are often manicured and uniform, like on this housing estate, and provide little habitat for native plants and animals.

these spaces are 7.5 times larger, in the Alps they are 56–71 times larger than on the Central Plateau. But road construction is increasing in the mountains as well. The change was most pronounced in the Jura, where mesh size decreased by 14.8 % between 1980 and 2007; in the Alps, it decreased by 1.5–4.5 % [6, 10].

Future growth of settlements

Settlements will continue to spread in Switzerland in the future. The latest land-use statistics for 2013–2018 show that settlement growth in western Switzerland has slowed only slightly [5]. The increase in buildings, industrial areas and transport areas is also a consequence of economic growth. The need for more living space per person, the rising population and growing mobility will continue to drive the spread of settlements in the future. Scenarios for population growth project a slight deceleration. By the year 2045, the total population is expected to reach between 9 and 11 million people [4]. The greatest potential for slowing down the expansion of settlements lies in the use of empty buildings and in increasing the density of buildings in existing areas. However, it is important to ensure that semi-natural green spaces are preserved despite the process of densification [11]. According to estimates, 18 % of settlement area should consist of semi-natural green spaces to preserve biodiversity and ecosystem services in settlements. In addition, settlements should also have 13 trees or other types of woody vegetation per square kilometre and several small, unsealed surfaces. The proportion of ruderal areas in settlements should be at least doubled [9].

Dominik Hagist

Schematic representation of the effective mesh size as a measure of landscape fragmentation in Switzerland's biogeographical regions in 2007. Mesh size is smallest on the Central Plateau (8 km²) and largest in the southern Alps (595 km²). Source: modified from Jaeger et al. (2007).

[1] Bundesamt für Statistik (2013a)/Office fédéral de la statistique (2013a)/Ufficio federale di statistica (2013)/Swiss Federal Statistical Office (2013); [2] Bundesamt für Statistik (2013b)/Office fédéral de la statistique (2013b); [3] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [4] Bundesamt für Statistik (2015b)/Office fédéral de la statistique (2015b); [5] Bundesamt für Statistik (2016c)/Office fédéral de la statistique (2016a)/Ufficio federale di statistica (2016); [6] Bundesamt für Umwelt (2009); [7] Bundesamt für Umwelt (2010); [8] Fischer et al. (2015b–c); [9] Guntern et al. (2013a–b); [10] Jaeger et al. (2007a–c); [11] Rey et al. (2017a–b)

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Human recreation

The natural environment is exposed to ever greater pressure from human recreation. Leisure activities in nature have seen a massive rise in popularity, and tourism infrastructure is constantly being expanded. Refuges for animals that are sensitive to disturbance have become rare in our country, even more so since the promotion of «unspoilt nature» has become a marketing strategy.

Outdoor activities are relaxing and can have a positive impact on human health [8]. They are gaining in popularity worldwide and have become a significant economic sector [1]. Outdoor pursuits are popular in our country too. For example, more than two thirds of the Swiss population regularly go on hikes or picnics [10]. Hikers have 65 000 km of trails at their disposal in Switzerland. Almost 1500 km of these lead through mires and almost 500 km through alluvial landscapes [11].

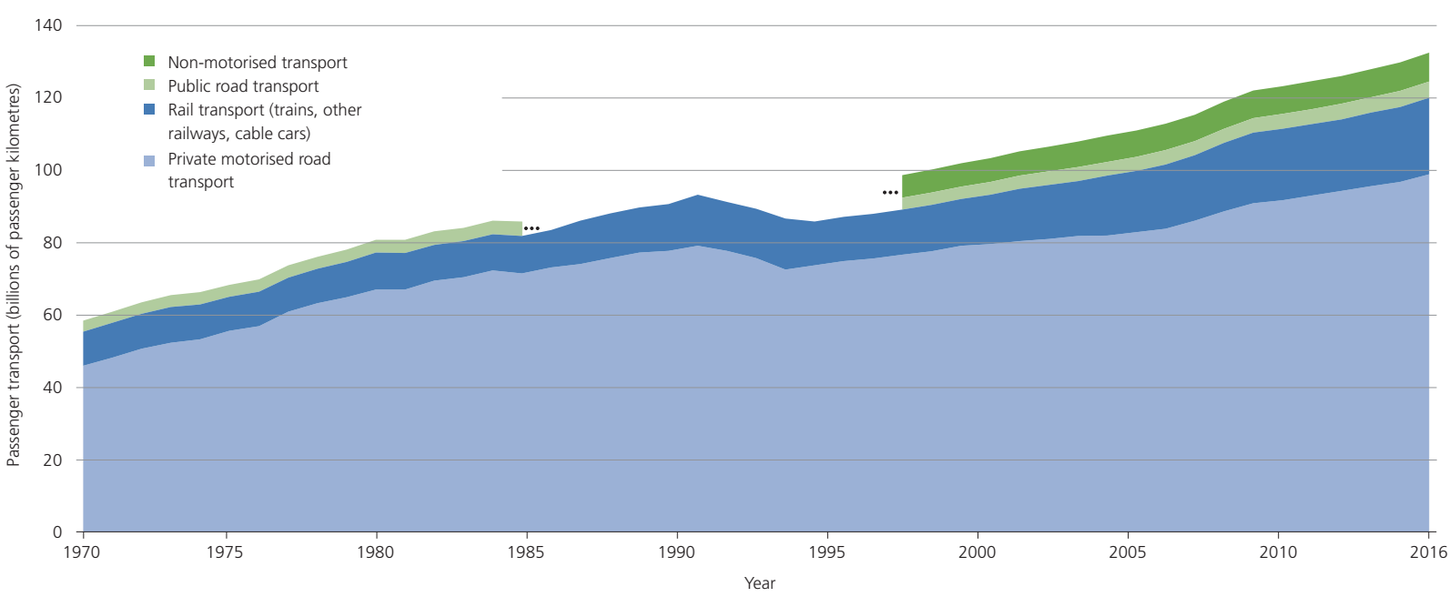
Growth in leisure activities

The popularity of various outdoor sports is growing: the number of people who named hiking as one of the sports they engage in rose by about one third between 2000 and 2014; the number of regular snowshoe trekkers more or less doubled between 2008 and 2014 [4].

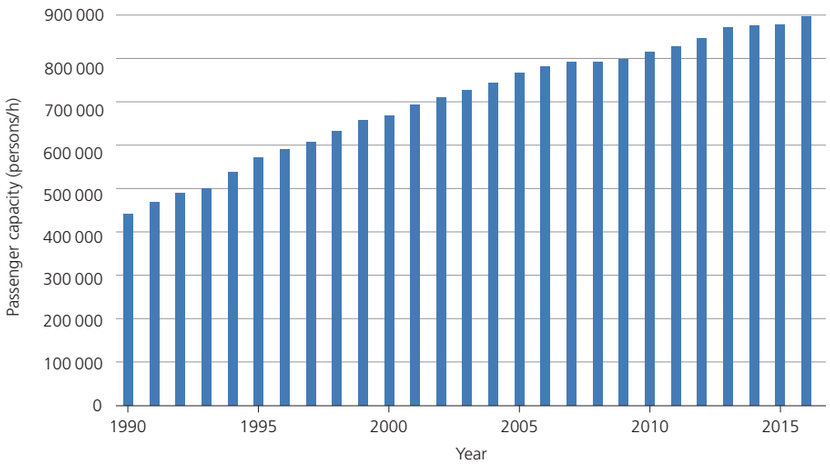
Many regions depend on revenue from tourism, so infrastructure is constantly expanded. For example, 345 million francs were invested in the large-scale project «Andermatt Swiss Alps» between 2007 and 2013 [13]. The passenger capacity of cable cars in Switzerland has about doubled since 1990. While the proportion of ski runs using artificially produced snow was close to zero

Stephan Trösch

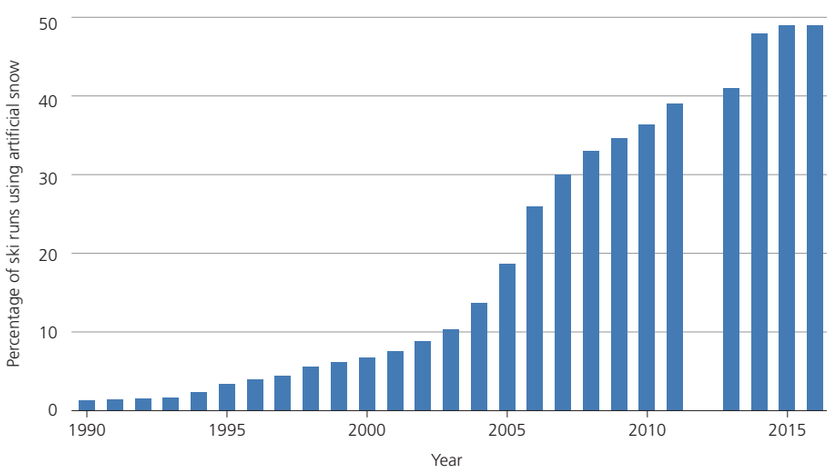
Two stand-up paddlers on 29 January 2017 in Ermatinger Becken TG/D, an international reserve for waterbirds and migratory birds. This kind of disturbance can cause thousands of birds to take flight.



Change in passenger transport performance from 1970 to 2016. The volume of private motorised transport and public transport has more than doubled since 1970. In 2016, travel amounted to 132.6 billion passenger kilometres. About three quarters were accounted for by private motorised road transport (cars, motorbikes, coaches), corresponding to almost five times the volume of rail travel. Non-motorised transport (on foot, bicycles) totalled 8.0 billion passenger kilometres, public road transport (trams and buses) 4.5 billion passenger kilometres. Source: Federal Statistical Office (2017).



Change in passenger capacity of cable cars in Switzerland from 1990 to 2016. The number of cableways has hardly changed in the past 15 years, but capacity is steadily growing, indicating that there has been a hike in performance (greater load capacity and/or greater speed). Source: Seilbahnen Schweiz (2017).



Change in the area of ski runs using artificial snow in Switzerland from 1990 to 2016 (no data for 2012). About 49 % of ski slopes currently have snowmaking facilities. Artificial snowmaking is much more common in Austria and Italy, but much less widespread in Germany and France. Source: Seilbahnen Schweiz (2017).

in the early 1990s, half of the 225 km² of ski slopes now have snowmaking facilities [12]. Overall mobility has increased massively, with almost 100 billion passenger kilometres travelled annually in Switzerland by private motorised transport [2]. In 2015, leisure and shopping accounted for 57 % of passenger kilometres; the largest part is travelled by car [3].

Anytime, anywhere

While tourist activities in the Alps used to take place mainly in the winter season, the current trend is towards year-round tourism, not least to compensate for declining winter revenues [12]. Mountain railways, for example, advertise downhill mountain-bike routes; the website «Tripadvisor» offers dozens of outdoor activities available all year round.

Moreover, several outdoor pursuits that can cause great disturbance to wildlife have emerged. Stand-up paddling is just one example of a sport that can be engaged in year-round at an affordable cost thanks to high-quality equipment. Stand-up paddling did not appear on Europe's lakes until the 21st century [14] and is now offered all year round in some places, for example on Lake Constance [6]. Kitesurfing is another new sporting activity that is problematic for waterbirds in particular. The escape distance of waterbirds with regard to kitesurfers can be several hundred metres [7].

For birdwatchers and nature photographers as well, experiencing nature is a central part of their hobby. In general, they behave with care and try not to cause unnecessary disruption. Nevertheless, they also like to visit «pristine» environments that have experienced little disturbance, thus further restricting the habitat available to sensitive animals. Along with nature lovers, outdoor-sports enthusiasts have begun to seek out formerly

Fränzi Korner-Nievergelt

Even areas with no cable cars and ski lifts are used for a growing range of outdoor sports; the image shows off-piste skiers near Tiefenbach/ Realp UR.

secluded places and habitats. Rockfaces are used for base jumping or via ferratas. Approximately 32 000 geocaches are hidden in Switzerland[5] in all kinds of places, mostly far from paths and trails.

Change in sight?

Nature's sensitivity to disturbance from human recreation is rarely a subject of public debate. At most, the guidance of visitor flow is an issue in nature reserves, and refuge zones are established to protect wildlife from human disturbance in winter especially[15]; the attempts are often successful, thanks to signs put up on site. In urban zones and nearby green spaces, it is often impossible to limit access to near-natural areas for walkers, dogs and bathers. While the nature parks created in recent years count nature and landscape conservation among their aims, the main goal is to attract tourists to the region[9], leading to an increase in visitors and, in turn, more disturbance from leisure activities.

Nicolas Strebel

[1] Balmford et al. (2009); [2] Bundesamt für Statistik (2017a)/Office fédéral de la statistique (2017b)/Ufficio federale di statistica (2017)/Federal Statistical Office (2017); [3] Bundesamt für Statistik & Bundesamt für Raumentwicklung (2017)/Office fédéral de la statistique & Office fédéral du développement territorial (2017)/Ufficio federale di statistica & Ufficio federale dello sviluppo territoriale (2017); [4] Fischer et al. (2015a); [5] Geocache.ch (2018); [6] Jacoby (2017); [7] Krüger (2016); [8] Martinez-Juarez et al. (2015); [9] Netzwerk Schweizer Pärke (2018)/Réseau des parcs suisses (2018)/Rete dei parchi svizzeri (2018); [10] Moeschler & Herzig (2016–c); [11] Schweizer Wanderwege (2014); [12] Seilbahnen Schweiz (2017)/Remontées Mécaniques Suisses (2017); [13] St. Galler Tagblatt (2013); [14] Stand Up Magazin (2011); [15] Wildtier Schweiz (2014a–c)

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Jochen Ihle

Refuge zones are an effective legal instrument to regulate visitor flow in a targeted manner. They protect wildlife from disturbance in certain areas during sensitive time periods.

Ski touring and snowshoe trekking are becoming more and more popular, increasing the risk of disturbance to grouse and other wild animals.

Yves Bötsch

Climate

The climate in Switzerland has shown a marked change in mean annual temperature in the past 30 years, with a steep rise in the late 1980s. Winters are becoming shorter, vegetation develops earlier in the year, and glaciers are in rapid retreat.

A network of weather stations has been established in Switzerland ever since record keeping began in 1864. Thanks to this information, we have an excellent level of knowledge about the Swiss climate in the past decades. The mean annual temperatures for the reference period 1981–2010 are 8–10 °C on the Central Plateau. Somewhat higher temperatures are recorded in the areas around Geneva and Basel, known for their mild climate. Temperatures are warmest in the lowlands of Ticino [16].

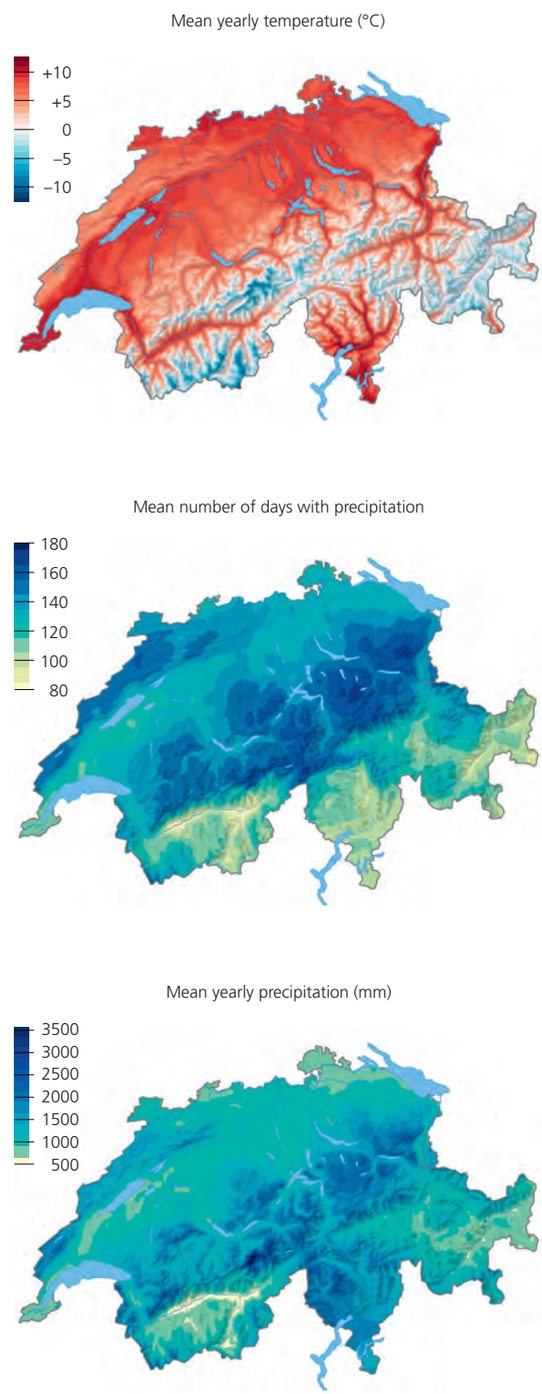
Above-average temperatures since the 1990s

The period since the 1993–1996 atlas surveys has been characterised by exceptionally warm years compared to the 1961–1990 period, although the greatest rise in temperature occurred in the 1980s. The 1990s entered the history books as a series of exceptionally warm years. Since then, mean annual temperatures have risen yet again, albeit not as steeply as in the 1980s. 2011 and 2015 were the warmest years so far, with temperatures just over 2 °C above the long-term average of 1961–1990.

The increase in average temperatures applies to all seasons, but is more pronounced in spring and summer than in autumn and winter [16]. The warmest summer by far since records began was in 2003, when temperatures rose 5 °C above the long-term average. The second warmest summer with a plus of 3.5 °C followed in 2015 [15]. Throughout the 1990s, winters were generally mild, while a few colder winters with below-average temperatures occurred after the turn of the millennium [16]. The last severe cold spell took place in Switzerland in February 2012 and counts among the ten coldest two-week periods since 1864 [13].

The number of extremely hot days, i.e. days when temperatures rise above 30 °C, has increased considerably since 1990 – from five to 12 per year in Lucerne, for example [17]. At the same time, the number of frost days with below-zero temperatures appears to have declined somewhat. In Davos GR, the decline amounts to about 10 % since 1990 (from about 200 to 180 days per year) [16]. Many weather stations on the Central Plateau have recorded a fairly constant number of 80–100 frost days per year since 1990 – albeit with annual fluctuations; there were 10–15 frost days more between 1960 and 1990 [18].

The temperature increase is apparent in waterbodies as well, as the average water temperature is correlated to the average air temperature. In rivers and streams, a temperature increase of 0.1–1.2 °C was recorded between 1970 and 2010 [3]. The ice cover on mountain lakes also thaws earlier in the year, as the example of Lake



Mean yearly temperature, mean number of days with precipitation, and mean yearly precipitation in Switzerland for the period 1981–2010. Source: MeteoSwiss.

St. Moritz GR illustrates. The ice currently melts ten days earlier on average than in 1980[4].

A further consequence of the higher temperatures is the retreat of glaciers. Between 1973 and 2010, the area covered by glaciers in Switzerland shrank by 27.7 %, or 0.75 % per year[7].

The melting of the ice masses causes ground that is normally permanently frozen (permafrost) to gradually thaw, leading to unstable ground and an increase in debris flows and landslides[6].

Earlier onset of spring

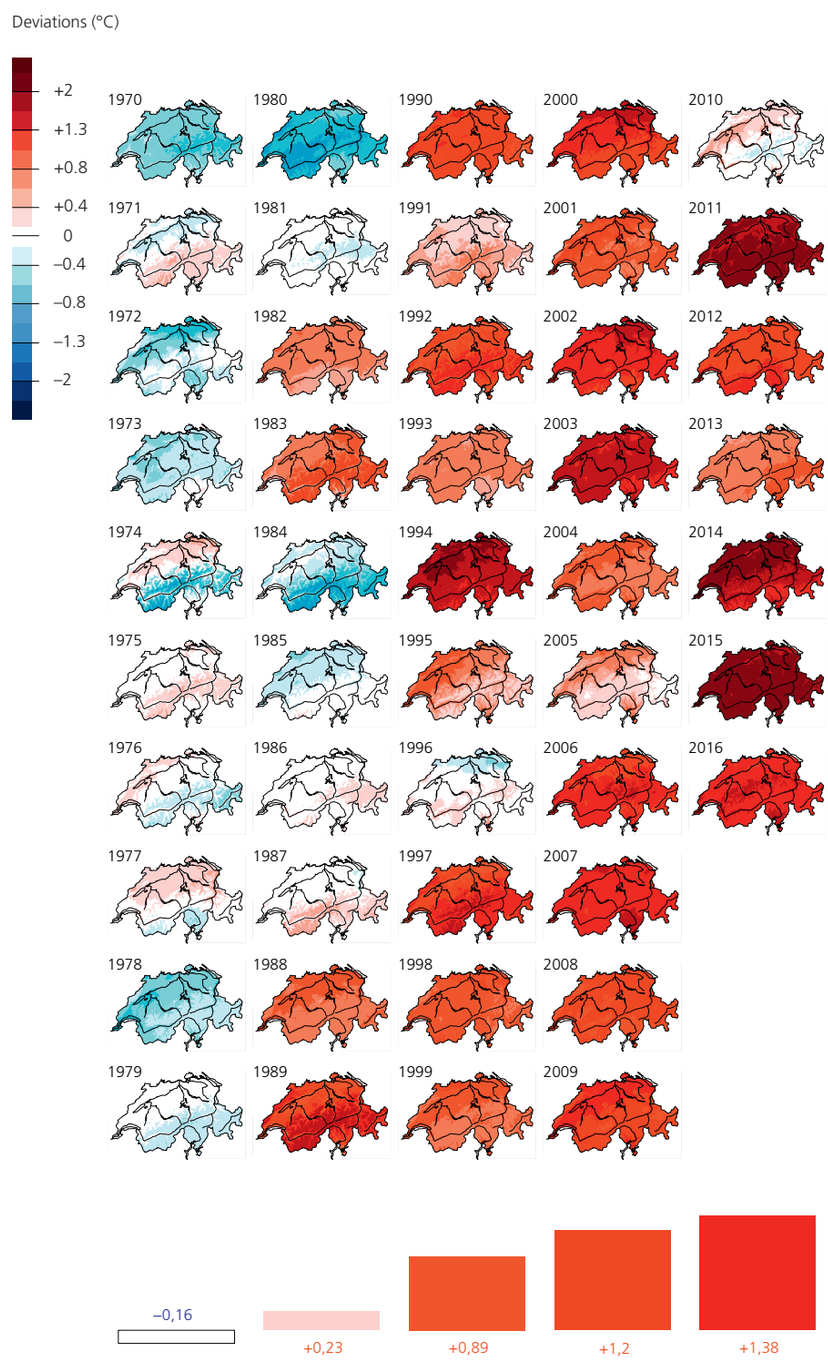
The higher temperatures have an effect on the vegetation. Today, hazel bushes below 600 m generally bloom in mid-February, 13 days earlier than in 1951[19]. This trend, together with the flowering and new leaf formation of eight other plant species, is revealed by the spring index[16]. An abrupt rise in the late 1980s is particularly striking: since then, spring has begun much earlier than the 1981–2010 average. At the same time, weather stations below 800 m have observed a marked drop (minus two weeks) in the number of days with snow cover[11]. A similar trend is visible with regard to snow cover between 1100 and 2500 m of altitude. Today, snow melts an average of 25 days earlier in spring than it did in 1970. In autumn, snow cover begins 12 days later on average; the change in autumn is thus only half as large as in spring. Since 1990, most weather stations have recorded no further decrease in the number of days with snow cover[10]. The average number of days with snow cover per year between 1981 and 2010 was 79 in St. Gallen, 37 in Bern, and 17 in Geneva[18]. A further difference can be observed at various altitude levels. In the mountains, the onset of spring has advanced more rapidly than in the valleys. In 1960, the difference in the timing of new leaf formation was 34 days per 1000 m of altitude; today, the difference has dropped to 22 days per 1000 m[24].

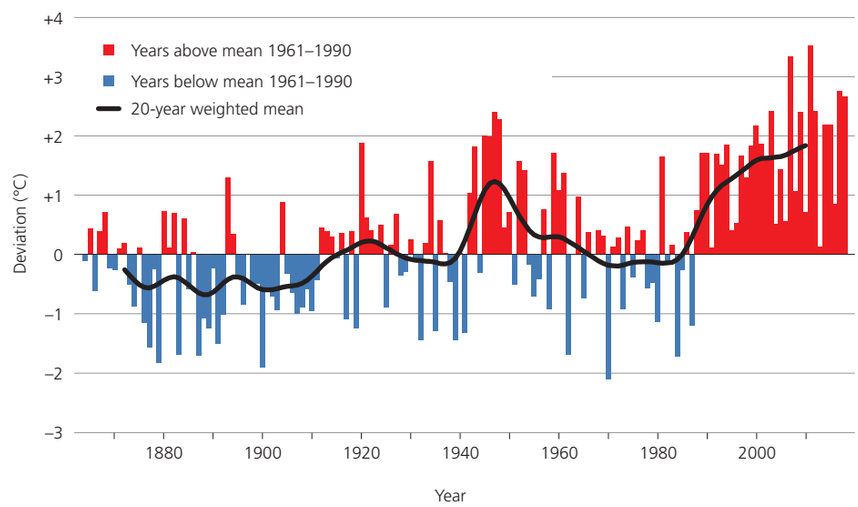
Constant precipitation levels in the long term

The Central Plateau experiences 110–150 days of precipitation per year on average. Precipitation levels range between 900 and 1200 mm. Higher levels of precipitation are reached in the Jura mountains and in the southern Alps. The Säntis area AR/AI/SG tops the list with an average of 2837 mm per year. The driest locations are in Valais and Engadine GR. With a yearly average of 545 mm, Stalden VS records the lowest amounts of precipitation. The southern Alps occupy a special position, with high levels of precipitation falling on relatively few days. Accordingly, strong rainfall is most frequent in Ticino. At the same time, the areas south of the Alps are among the sunniest in Switzerland. In Switzerland as a whole, the greatest amount of rain falls in summer[18].

In contrast to the rising temperatures, no trend is visible in terms of rainfall in Switzerland overall. South of the Alps, spring has become drier on average, while slightly more rain has fallen in spring in the north of the country in recent years[17]. However, more relevant than average

Deviations from the long-term average (1961–1990) in Switzerland in °C for every year since 1970. 0 °C corresponds to the long-term average. Areas with below-average temperatures are shown in blue, those with above-average temperatures in red. At the bottom of the graph, the deviation for each decade is depicted as a coloured column. Source: MeteoSwiss.





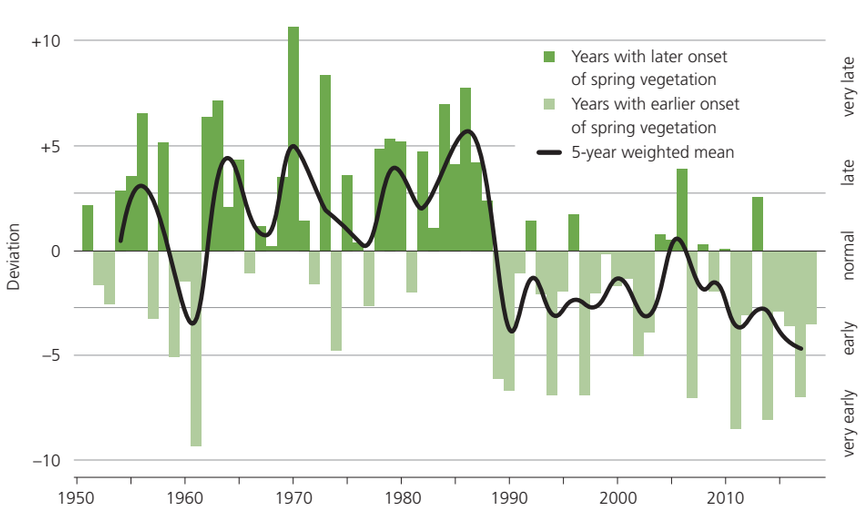
Deviation of mean spring temperatures (1 March – 31 May) from the 1961–1990 average in Switzerland for the period 1864–2017. Since 1988, every spring has been warmer than average. Spring was warmest in 2007 and 2011, when temperatures were more than 3 °C higher than the long-term average of 1961–1990. Source: MeteoSwiss.

values in terms of breeding success are extreme amounts of precipitation as well as the number of days with rainfall. Heavy rain occurs mainly in summer and autumn in the form of thunderstorms. While the highest levels of daytime rainfall per year have increased since 1980, they have remained fairly constant since 1995. The largest changes occurred on the Central Plateau and in the Pre-Alps, while many inner-Alpine weather stations show no trend towards more heavy rain[23]. However, there are indications that the timing of flood events is changing, with floods occurring at unusual times.

What lies ahead?

In Switzerland, average temperatures have risen by 1.8 °C since the mid-19th century. That means that climate warming is about twice the global average[1]. Climate models project that temperatures in Switzerland will increase by another 0.5–3.6 °C up until 2060[14]. Warm weather spells are expected to become more frequent in Switzerland in the next few years. The temperature increase will probably be more pronounced in summer than in the other seasons, and more rainfall is expected in winter and less in summer. Southern Switzerland will presumably become drier and warmer, and a greater increase in temperatures is expected at higher altitudes[1].

The vegetation period, which currently lasts about 250 days on the Central Plateau and 180 days in the Pre-Alps, is expected to increase by about 40 days, in the Alps and Pre-Alps by as much as two months[14]. In the distribution of Alpine plants, an upward shift of 20–35 m between 1911–1970 and 2014–2015 has been observed[22]. The tree line has moved upwards by 5 m per decade on average, mainly due to the abandonment of cultivated land, but also because of climate change[9, 20]. These trends are expected to continue. The composition of tree species will also gradually change. Of the three most common tree species in Switzerland, firs are expected to cope best with warmer and drier conditions, while the climatic changes will be more problematic for beech and especially spruce. Warmth-loving species such as oaks could stand to benefit[8, 20]. In the case of prolonged dry periods, we may see further areas of Scots pine forest dying



Spring index in Switzerland for 1951–2017. The spring index is a measure of plant phenology in spring. It shows the timing of flowering and new leaf formation for nine different plant species. Years in which vegetation development was late compared to the mean 1981–2010 are shown in dark green, years with early vegetation development are shown in light green. The black curve represents the five-year weighted mean. In the late 1980s, there was an abrupt advancement in the onset of spring. Source: MeteoSwiss.

Sammlung Gesellschaft für ökologische Forschung

Climate change has taken a toll on glaciers. The area covered by glaciers in Switzerland shrank by about one quarter between 1973 and 2010; the image shows the Oberaargletscher BE.

off, as harmful organisms can spread more easily[5]. This is a well-known phenomenon in the Valais. Following the dry and hot summer of 2003, the mortality rate of Scots pines near Visp VS was almost 30 %. Similar instances occurred in 2010[21] and 2016[12] after prolonged periods of dry weather. As summers become drier, the risk of forest fires will increase throughout the country[2]. According to model calculations, glaciers will shrink by another 50 % between 2000 and 2050, and small glaciers will disappear completely[1]. As permafrost continues to thaw, landslides, slope instability and rockfall will likely occur more often[1].

Dominik Hagist

Andreas Rigling, WSL

Scots pines suffer during prolonged periods of dry weather. They become vulnerable to pest infestations, visible in the brown colour, and may die off.

[1] Akademien der Wissenschaften Schweiz (2016)/Académies suisses des sciences (2016); [2] Allgaier Leuch et al. (2017a–b); [3] Bundesamt für Umwelt (2012)/Office fédéral de l'environnement (2012); [4] Bundesamt für Umwelt (2017b)/Office fédéral de l'environnement (2017a); [5] Dobbertin et al. (2006); [6] Fischer et al. (2006); [7] Fischer et al. (2014); [8] Frank et al. (2017); [9] Gehrig-Fasel et al. (2007); [10] Klein et al. (2016); [11] Marty (2008); [12] Meier et al. (2017a–c); [13] MeteoSchweiz (2013)/MétéoSuisse (2013)/MeteoSvizzera (2013); [14] MeteoSchweiz (2014)/MétéoSuisse (2014); [15] MeteoSchweiz (2016)/MétéoSuisse (2016)/MeteoSvizzera (2016); [16] MeteoSchweiz (2017)/MétéoSuisse (2017)/MeteoSvizzera (2017); [17] MeteoSchweiz (2018a)/MétéoSuisse (2018a)/MeteoSvizzera (2018a)/MeteoSwiss (2018a); [18] MeteoSchweiz (2018b)/MétéoSuisse (2018b)/MeteoSvizzera (2018b)/MeteoSwiss (2018b); [19] MeteoSchweiz & Globe Schweiz (2016); [20] Pluess et al. (2016a–b); [21] Rigling & Schaffer (2015a–d); [22] Rumpf et al. (2018); [23] Scherrer et al. (2016); [24] Vitasse et al. (2018)

Focus pages 284, 414, 425

Methods: from data collection to final results

Organising the atlas surveys

Following an approach that has proven effective for fieldwork and the presentation of results, Switzerland was divided into 467 squares of 10 × 10 km, so-called atlas squares. Many of the atlas squares were surveyed by volunteers. They attended various workshops in preparation for fieldwork and were given regular updates on progress.

The main objective of the 2013–2016 atlas was to document the current distribution and abundance of breeding birds throughout Switzerland. The aims were similar to those of the 1993–1996 atlas:

1. As far as possible, we wanted to document the presence of all breeding bird species in each atlas square (10 × 10 km). To this end, every atlas square was surveyed as comprehensively as possible. However, complete coverage would not have been realistic, especially in the mountains. Efforts therefore concentrated on special habitats, which were visited several times wherever possible.
2. Abundance was recorded as well as distribution. We used a simplified territory mapping method in kilometre squares (1 × 1 km), an approach that has proven effective in both the 1993–1996 atlas project and the common breeding bird monitoring scheme.
3. We wanted to record rare species and colony breeders as comprehensively as possible throughout Switzerland.

Survey area

We used the same perimeter for the 2013–2016 atlas as in 1993–1996. Switzerland, Liechtenstein and adjacent areas across the Swiss border were again divided into 467 atlas squares of 10 × 10 km. This guaranteed that the results would be comparable with the earlier atlases.

In principle, the total area of each atlas square was surveyed. In most cases, parts of a square that were situated beyond the Swiss border were surveyed in the same manner as the Swiss areas. However, 13 atlas squares, most of them along Switzerland's southern border, were only visited on the Swiss side, like in 1993–1996. These atlas squares are often at high altitude on the Swiss side while reaching far into the valley on the other side of the border. The additional effort required to survey the areas across the border (e.g. long travel distance to reach these parts) was considered too great. In total, the surveyed area covered 46 202 km^2.

Assigning the atlas squares

In the course of 2012, we looked for one or several designated observers to conduct or coordinate the survey effort in each of the 467 atlas squares. The designated observers were charged with organising the species search in the entire atlas square as well as recording colony breeders and mapping territories in the kilometre squares. They were allowed to involve additional collaborators if necessary. We first contacted the observers who had been responsible for at least one atlas square in 1993–1996. In the end, 75 squares (16 %) were taken on by the same persons as last time. Following the first field season in 2013, 86 % of atlas squares had been assigned to designated observers. Volunteers for several more squares were found later in the project. Eventually, 420 atlas squares (90 %) had been allocated. For the remaining atlas squares, especially those in remote parts of the Alps, we employed contracted fieldworkers or persons on civilian service duty to conduct the territory mapping surveys in kilometre squares as early as 2013 or 2014. These observers also searched for species that had not yet been detected in the atlas squares.

Atlas team and support group

Fieldwork was mainly organised and directed by four coordinators at the Swiss Ornithological Institute: Peter Knaus, Sylvain Antoniazza (from July 2012), Samuel Wechsler (from 2013) and Bertrand Posse (from 2015). This core atlas team was supported by further collaborators in the areas of data validation, statistics, modelling, Geographical Information System (GIS), information technology (IT), marketing and public relations. An internal steering committee was set up, consisting of the following persons: Sylvain Antoniazza, Jérôme Duplain, Roman Graf, Jérôme Guélat, Guido Häfliger, Lukas Jenni, Verena Keller, Marc Kéry, Matthias Kestenholz, Peter Knaus (project management), Roberto Lardelli, Claudia Müller, Bertrand Posse, Thomas Sattler, Michael Schaad, Hans Schmid, Martin Spiess, Bernard Volet, and Samuel Wechsler.

Regional atlas coordinators

Besides the designated observers for each atlas square, we worked with regional atlas coordinators. The survey area was divided into 20 regions that each had one or two coordinators: Edi Baader, Albert Bassin, Jean-Daniel Blant, Jérôme Duplain, Martin Gerber, Jérôme Gremaud, Alain Jacot, Roberto Lardelli, Bernard Lugrin, Christoph Meier-Zwicky, Claudia Müller, Bertrand Posse, Pierre-Alain Ravussin, Martin Roost, Michael Schaad, Hans Schmid, Natalina Signorell, Silvana Signorell, Stephan Trösch, Martin Weggler, and Georg Willi. Their main task was to act as

a liaison between the region's volunteers and the atlas team at the Ornithological Institute. They also supported the volunteers in a number of ways (for example with regard to fieldwork) and helped to organise regional atlas meetings and interpret unusual observations.

Recruiting and training volunteer observers

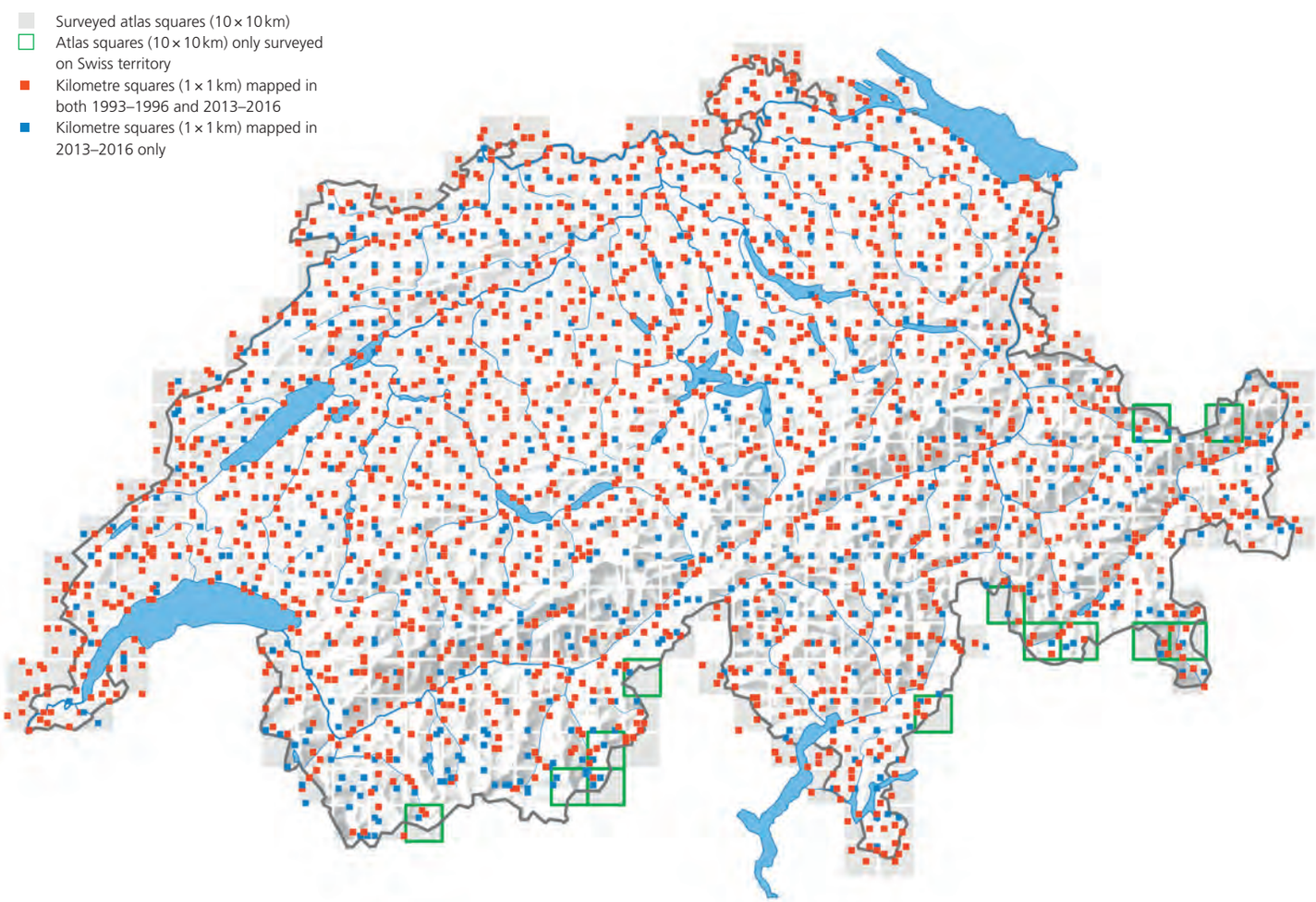
To recruit volunteers for the atlas fieldwork, we informed people about the project through various channels. We created a website as well as calling for participation at numerous events. Special workshops were organised and collaborators regularly updated on progress.

In August 2012, the website www.vogelwarte.ch/atlas was launched in German, French and Italian, providing all relevant information concerning the 2013–2016 atlas. Apart from explanatory notes on methods and opportunities for participation, the site included additional guidance on detectability, habitat, special features or the recording of population size for several species, especially those considered difficult to find. In total, there were 36 such notes covering 65 species.

In the run up to the first field season in 2013, the launch of the atlas was marked with an event at the University of Fribourg on 1 December 2012. The atlas was regularly given central stage at the conferences for volunteer collaborators held at the Ornithological Institute in Sempach and the other national gatherings, the «Assemblée romande des collaboratrices et collaborateurs» (since 2014) and the «Giornata sugli Uccelli della Svizzera italiana».

Leading up to the field surveys in February and March 2013, we held half-day training workshops in 20 locations throughout Switzerland. These regional atlas meetings continued in the subsequent three winters and served to provide feedback on progress, regional particularities and remaining gaps in coverage.

During the fieldwork periods, participants received email newsletters at 2–3 week intervals, containing, for example, guidance on favourable survey periods for certain



467 atlas squares (10 × 10 km) were surveyed in 2013–2016 (light grey). In 13 atlas squares, most of them along the southern border, only the Swiss side was surveyed (squares outlined in green). Red dots represent kilometre squares (1 × 1 km) where territory mapping was carried out in both 1993–1996 and 2013–2016, blue dots those surveyed in 2013–2016 only.

species, the use of Atlas Codes, or the recommended timing of survey visits. Starting in April 2014, detailed weekly weather forecasts for the following weekend were sent to help fieldworkers time their survey visits.

From August 2012, news and results were reported in the magazine «Avinews», published three times a year by the Swiss Ornithological Institute, under the heading «Atlasnews». A leaflet dedicated to the atlas introduced the aims of the project as well as opportunities for participation.

Starting in 2012, more than a dozen courses on territory mapping were held in all parts of the country. We also scheduled six bird-song classes, six workshops on «Terrimap online» and four introductory courses on www.ornitho.ch. Five «Atlas camps» were held starting in 2014 to improve the coverage of rarely visited atlas squares. These mapping and observation weekends took participants to Martina GR, Trun GR, Domodossola I, Château-d'Œx VD and St-Ursanne JU.

On 17 September 2016, a closing event took place at the University of Fribourg to celebrate the conclusion of fieldwork and thank volunteers for their tremendous effort.

«Terra incognita» and «Atlas Auction»

Fieldwork for the 2013–2016 atlas was successfully launched with the first field season in 2013. In early 2014, we identified 12 atlas squares where survey activity was still very low. Many of these areas were in the Alps, some in the Jura. The project «Terra incognita» in 2014 encouraged the participation of further volunteers to search these atlas squares for species that had not yet been detected. 19 observers joined in, covering all the atlas squares targeted by the project.

The project «Atlas Auction» served to recruit volunteers for territory mapping in squares that had not yet been assigned. In 2015 and 2016, observers could sign up online for territory mapping surveys in remaining kilometre squares. The «auction» was widely used in both years.

Peter Knaus

Survey methods

Different species require different survey methods depending on their occurrence, abundance and biology. We grouped species into five categories that in turn defined the survey methods. The minimum target was to record each species at least once per atlas square.

In most atlas squares, a breeding Black Redstart is easy to find, whereas detecting the Eurasian Woodcock may require considerable effort and special surveys. To account for such differences, we divided all breeding species into five categories. In addition to the categories «widespread species», «rare species» and «colonial species» used in 1993–1996 [AtCH2], the 2013–2016 atlas defined two additional groups, namely «rare species on the Central Plateau and in the Jura» and «colonial species in settlements».

Since our aim was to record all breeding species present in each atlas square, we set a minimum target of one valid record per atlas square for all species. The habitats of species not classed as widespread were to be surveyed with special care, so that data on these species would be available from as many square kilometres as possible. The following guidelines applied to the five categories:

Widespread species (W)

93 species were classed as widespread species (W). These are species considered widespread throughout Switzerland or at least in certain regions. They were mainly recorded using simplified territory mapping in preselected kilometre squares. If the species were not found during the surveys, the search was extended to the remaining areas of the atlas square.

Rare species (R and R*)

The «rare species» category (R) comprised 126 species. All observations had to be recorded with their exact location. Fieldworkers were asked to search as many potential habitats as possible in each atlas square. The aim was to obtain records from several square kilometres per atlas square, if possible. Eleven of these rare species (mainly nocturnal species) were considered difficult to record (R*). To prevent fieldwork effort from becoming too onerous, one valid record per atlas square was sufficient for these species. Observers were advised to use call playback very sparingly, if at all.

While one valid record per species was considered sufficient for all rare species during the 1993–1996 surveys, observers for the 2013–2016 atlas were encouraged not to reduce the search effort once a species had been detected, but rather to extend their search to further potential habitats. The additional records gave us a more comprehensive picture of the species' distribution and allowed us to generate more accurate distribution maps.

Rare species on the Central Plateau and in the Jura (R^{PJ})

This category (R^{PJ}) comprised nine species that are more or less widespread in the Alps, but rare or in steep decline on the Central Plateau and/or in the Jura: Common Cuckoo, Eurasian Wryneck, Eurasian Crag Martin, Wallcreeper, Ring Ouzel, Northern Wheatear, Water Pipit, Redpoll and Citril Finch. In an approach similar to the «rare species» category, observers were asked to visit as many potential habitats as possible per atlas square within the biogeographical regions of the Central Plateau and the Jura [1].

Colonial species (C)

The following ten species were classed as colonial species (C): Alpine Swift, Grey Heron, Great Cormorant, Northern Lapwing, Black-headed Gull, Yellow-legged Gull, Common Tern, Eurasian Jackdaw, Rook and Collared Sand Martin. All known colonies of rare colony breeders such as Great Cormorant, Northern Lapwing, Black-headed Gull, Yellow-legged Gull and Common Tern have been well documented for many years via the Swiss Ornithological Institute's ongoing monitoring schemes. The atlas surveys therefore focussed on Alpine Swift, Grey Heron, Rook, Eurasian Jackdaw and Collared Sand Martin, whose populations are only systematically monitored in a few areas. Special priority was accorded these five more common colony breeders in 2014, when we asked observers to search for the species throughout the atlas square and record colony size and location as accurately as possible. In many cases, the colonies were counted every year. Our aim was to record distribution and colony size as fully as possible in each atlas square.

Colonial species in settlements (C^S)

Common Swift and Northern House Martin mainly breed in colonies in settlements (C^S), often in scattered sites. Attempting to count all colonies of these two species throughout their range would not have been realistic. We therefore focussed on colonies of at least ten pairs while welcoming records of smaller colonies.

Peter Knaus

[1] Gonseth et al. (2001)

Species list with species-specific inclusion criteria and available maps. The list includes four subspecies that were recorded separately (Carrion Crow and Hooded Crow, Red-spotted and White-spotted Bluethroat) as well as Alpine and Willow Tit, two forms of Poecile montanus *distinguished by their song.*

Category:	*assignment of the species to one of the five species categories*
Atlas Code:	*minimum requirement for inclusion in the atlas*
Date:	*reference date for inclusion in the atlas; before this date, only confirmed breeding records were included*
Species notes:	*guidance on detectability, habitat, special features or the recording of population size for species that are difficult to find; available online*
Additional criteria:	*if the minimum criteria were not sufficient to properly assess breeding distribution (e.g. because of late passage migrants, wandering summer visitors or non-breeders), additional criteria were defined, often for a specific region*
Map of situation in 2013–2016:	*method of analysis for the map showing the situation in 2013–2016. [1)] realised occurrence; [2)] occurrence derived from density estimate, see page 70 for details*
Change map:	*method of analysis for the map showing the change from 1993–1996 to 2013–2016. [3)] including uncensored data from the common breeding bird monitoring scheme, see page 69 for details*
Altitude limit:	*altitude limit used in the density and distribution maps*

Species categories

W	*Widespread species: territory mapping in kilometre squares, or at least one valid record per atlas square*
R	*Rare species: search in all potential habitats, distribution per kilometre square, exact location recorded*
*R**	*Rare species, but difficult to detect: at least one valid record per atlas square, exact location recorded*
R[PJ]	*Rare species on the Central Plateau and in the Jura: search in all potential habitats on the Central Plateau and in the Jura, distribution per kilometre square, exact location recorded; outside of the Central Plateau and the Jura, these species are treated as widespread species*
C	*Colonial species: recording of all colonies and breeding numbers (especially in 2014, when recording colonial species was a special priority), with exact location*
C[S]	*Colonial species in settlements: recording of all colonies with more than ten breeding pairs, with exact location*

English name	Scientific name	Category	Atlas Code	Date	Species notes	Additional criteria	Map of situation in 2013–2016	Change map 1993–1996 vs. 2013–2016	Altitude limit
Common Quail	*Coturnix coturnix*	W	2	1.5.	×		Distribution	Distribution	3200
Rock Partridge	*Alectoris graeca*	W	2	1.4.	×		Distribution	Distribution	3400
Red-legged Partridge	*Alectoris rufa*	R	7				–	–	
Common Pheasant	*Phasianus colchicus*	R	2	15.4.		×	Point	Atlas square	
Grey Partridge	*Perdix perdix*	R	2	1.4.			Point	Point	
Hazel Grouse	*Bonasa bonasia*	R*	2	1.4.	×		Distribution	Distribution	2700
Rock Ptarmigan	*Lagopus muta*	W	2	1.4.	×		Distribution	Distribution	3600
Western Capercaillie	*Tetrao urogallus*	R*	2	1.4.	×		Distribution[1)]	Atlas square	3200

English name	Scientific name	Category	Atlas Code	Date	Species notes	Additional criteria	Map of situation in 2013–2016	Change map 1993–1996 vs. 2013–2016	Altitude limit
Black Grouse	*Lyrurus tetrix*	W	2	1.4.	×		Distribution[2)]	Distribution	2800
Black Swan	*Cygnus atratus*	R	11				–	–	
Mute Swan	*Cygnus olor*	W	2	15.4.			Point	Atlas square	
Barnacle Goose	*Branta leucopsis*	R	11		×		–	–	
Canada Goose	*Branta canadensis*	R	11		×		–	–	
Greylag Goose	*Anser anser*	R	11		×		Point	Point	
Common Eider	*Somateria mollissima*	R	11		×		Point	–	
Common Goldeneye	*Bucephala clangula*	R	11		×		–	–	
Red-breasted Merganser	*Mergus merganser*	R	7		×		Point	Atlas square	
Goosander	*Mergus serrator*	R	11		×		Point	–	
Egyptian Goose	*Alopochen aegyptiaca*	R	11		×		Point	–	
Ruddy Shelduck	*Tadorna tadorna*	R	11		×		Point	–	
Common Shelduck	*Tadorna ferruginea*	R	11		×		Point	–	
Muscovy Duck	*Cairina moschata*	R	11				–	–	
Wood Duck	*Aix sponsa*	R	7		×		–	–	
Mandarin Duck	*Aix galericulata*	R	11		×		Point	–	
Red-crested Pochard	*Netta rufina*	R	11		×		Point	Point	
Common Pochard	*Aythya ferina*	R	11		×		Point	–	
Ferruginous Duck	*Aythya nyroca*	R	11		×		Point	–	
Tufted Duck	*Aythya fuligula*	R	11		×		Point	Point	
Garganey	*Spatula querquedula*	R	11		×		Point	–	
Northern Shoveler	*Spatula clypeata*	R	11		×		Point	–	
Gadwall	*Mareca strepera*	R	11		×		Point	–	
White-cheeked Pintail	*Anas platyrhynchos*	W	2	15.4.			Density	Density[3)]	2800
Northern Pintail	*Anas bahamensis*	R	11				–	–	
Common Teal	*Anas acuta*	R	11		×		–	–	
Mallard	*Anas crecca*	R	11		×		Point	–	
Little Grebe	*Tachybaptus ruficollis*	R	2	15.4.			Distribution[1)]	Atlas square	3200
Red-necked Grebe	*Podiceps grisegena*	R	11				–	–	
Black-necked Grebe	*Podiceps cristatus*	R	2	15.4.	×		Point	Atlas square	
Great Crested Grebe	*Podiceps nigricollis*	R	7				Point	–	
Rock Dove	*Columba livia*	W	2	15.4.			Density	Atlas square	2400
Stock Dove	*Columba oenas*	R	2	15.4.		×	Density	Density	2200
Common Woodpigeon	*Columba palumbus*	W	2	15.4.			Density	Density	2600
European Turtle-dove	*Streptopelia turtur*	R	2	15.5.		×	Distribution	Distribution	3200
Eurasian Collared-dove	*Streptopelia decaocto*	W	2	15.4.			Density	Density[3)]	2400
European Nightjar	*Caprimulgus europaeus*	R	2	10.5.	×	×	Point	Atlas square	
Alpine Swift	*Tachymarptis melba*	C	7				Point	Point	
Pallid Swift	*Apus pallidus*	R	7		×		Point	–	
Common Swift	*Apus apus*	C[S]	2	15.4.	×		Density	Density[3)]	3000
Common Cuckoo	*Cuculus canorus*	R[PJ]	2	15.4.			Density	Density	2800
Western Water Rail	*Rallus aquaticus*	R	2	15.4.			Distribution[1)]	Atlas square	3200
Corncrake	*Crex crex*	R	2	25.5.	×	×	Point	Atlas square	
Spotted Crake	*Porzana porzana*	R*	2	1.5.	×	×	Point	–	
Little Crake	*Zapornia parva*	R*	2	15.5.	×	×	Point	–	
Baillon's Crake	*Zapornia pusilla*	R*	2	15.5.	×	×	Point	–	
Common Moorhen	*Gallinula chloropus*	R	2	15.4.			Distribution[1)]	Atlas square	1900
Common Coot	*Fulica atra*	W	2	15.4.			Density	Atlas square	2500
White Stork	*Ciconia ciconia*	R	11				Point	Point	

English name	Scientific name	Category	Atlas Code	Date	Species notes	Additional criteria	Map of situation in 2013–2016	Change map 1993–1996 vs. 2013–2016	Altitude limit
Eurasian Bittern	*Botaurus stellaris*	R	7				–	–	
Common Little Bittern	*Ixobrychus minutus*	R	2	20.5.		×	Point	Atlas square	
Black-crowned Night-heron	*Nycticorax nycticorax*	R	7			×	Point	–	
Grey Heron	*Ardea cinerea*	C	11				Point	Point	
Purple Heron	*Ardea purpurea*	R	7				Point	Point	
Great White Egret	*Ardea alba*	R	7				Point	–	
Little Egret	*Egretta garzetta*	R	7				Point	–	
Great Cormorant	*Phalacrocorax carbo*	C	11				Point	Atlas square	
Black-winged Stilt	*Himantopus himantopus*	R	7				Point	–	
Eurasian Dotterel	*Eudromias morinellus*	R	7		×		Atlas square	Atlas square	
Little Ringed Plover	*Charadrius dubius*	R	7				Point	Atlas square	
Northern Lapwing	*Vanellus vanellus*	C	7				Point	Point	
Eurasian Curlew	*Numenius arquata*	R	7				Point	–	
Black-tailed Godwit	*Limosa limosa*	R	7				–	–	
Common Snipe	*Scolopax rusticola*	R*	3	1.4.	×	×	Distribution	Atlas square	2600
Eurasian Woodcock	*Gallinago gallinago*	R	3	20.4.			Point	–	
Common Sandpiper	*Actitis hypoleucos*	R	7				Point	Atlas square	
Common Redshank	*Tringa totanus*	R	7				–	–	
Black-headed Gull	*Larus ridibundus*	C	11				Point	Point	
Mediterranean Gull	*Larus melanocephalus*	R	7				Point	Point	
Mew Gull	*Larus canus*	R	7				Point	–	
Lesser Black-backed Gull	*Larus fuscus*	R	11				Point	–	
Yellow-legged Gull	*Larus michahellis*	C	7		×	×	Point	Point	
Arctic Tern	*Sterna hirundo*	C	11				Point	Point	
Common Tern	*Sterna paradisaea*	R	7				Point	–	
Common Barn-owl	*Tyto alba*	R*	2	1.4.			Distribution	Atlas square	3200
Eurasian Pygmy-owl	*Glaucidium passerinum*	R*	2	1.3.	×		Distribution	Atlas square	2600
Little Owl	*Athene noctua*	R	2	1.4.			Distribution	Distribution	3200
Boreal Owl	*Aegolius funereus*	R*	2	1.2.	×		Distribution	Atlas square	2600
Eurasian Scops-owl	*Otus scops*	R	2	10.5.			Point	Atlas square	
Northern Long-eared Owl	*Asio otus*	R*	2	1.3.	×		Distribution	Atlas square	3200
Tawny Owl	*Strix aluco*	W	2	1.2.			Atlas square	Atlas square	
Eurasian Eagle-owl	*Bubo bubo*	R	2	1.2.	×		Atlas square	Atlas square	
Osprey	*Pandion haliaetus*	R	7				–	–	
European Honey-buzzard	*Pernis apivorus*	W	2	15.5.	×		Distribution	Distribution	2600
Bearded Vulture	*Gypaetus barbatus*	R	7				Atlas square	Atlas square	
Golden Eagle	*Circaetus gallicus*	R	7				Atlas square	Atlas square	
Short-toed Snake-eagle	*Aquila chrysaetos*	R	7				Point	Point	
Western Marsh-harrier	*Circus aeruginosus*	R	7				Point	–	
Hen Harrier	*Circus cyaneus*	R	7				–	–	
Montagu's Harrier	*Circus pygargus*	R	7				–	–	
Eurasian Sparrowhawk	*Accipiter nisus*	W	2	1.5.			Distribution	Atlas square	2900
Northern Goshawk	*Accipiter gentilis*	W	2	1.4.			Distribution	Atlas square	2800
Red Kite	*Milvus milvus*	W	2	15.4.		×	Distribution	Atlas square	2000
Black Kite	*Milvus migrans*	W	2	15.4.		×	Distribution[2)]	Distribution[2)]	2100
Eurasian Buzzard	*Buteo buteo*	W	2	15.4.			Distribution[2)]	Distribution[2)]	2400
Common Hoopoe	*Upupa epops*	R	7				Distribution[1)]	Atlas square	3200
European Bee-eater	*Merops apiaster*	R	7		×		Point	Point	
Common Kingfisher	*Alcedo atthis*	R	2	1.4.		×	Point	Atlas square	

English name	Scientific name	Category	Atlas Code	Date	Species notes	Additional criteria	Map of situation in 2013–2016	Change map 1993–1996 vs. 2013–2016	Altitude limit
Eurasian Wryneck	*Jynx torquilla*	R[PJ]	2	1.5.		×	Density	Density	2700
Grey-faced Woodpecker	*Picus canus*	R	2	20.2.			Distribution	Atlas square	3200
Eurasian Green Woodpecker	*Picus viridis*	W	2	20.2.			Density	Density	2800
Black Woodpecker	*Dryocopus martius*	W	2	15.4.			Distribution[2)]	Distribution[2)]	2800
Three-toed Woodpecker	*Picoides tridactylus*	W	2	20.2.	×		Distribution	Atlas square	2700
Middle Spotted Woodpecker	*Leiopicus medius*	W	2	20.2.	×		Distribution	Distribution	1500
Lesser Spotted Woodpecker	*Dryobates minor*	W	2	20.2.			Distribution	Distribution	3200
White-backed Woodpecker	*Dendrocopos leucotos*	R*	2	20.2.	×		Point	Atlas square	
Great Spotted Woodpecker	*Dendrocopos major*	W	2	15.4.			Density	Density[3)]	2800
Common Kestrel	*Falco tinnunculus*	W	2	15.4.			Distribution[2)]	Distribution[2)]	3400
Eurasian Hobby	*Falco subbuteo*	W	2	15.5.		×	Distribution	Atlas square	1800
Peregrine Falcon	*Falco peregrinus*	R	2	20.2.		×	Atlas square	Atlas square	
Rose-ringed Parakeet	*Psittacula krameri*	R	7				–	–	
Eurasian Golden Oriole	*Oriolus oriolus*	W	2	10.5.		×	Density	Density	1800
Red-backed Shrike	*Lanius collurio*	W	2	15.5.			Density	Density	2600
Lesser Grey Shrike	*Lanius minor*	R	7				–	–	
Great Grey Shrike	*Lanius excubitor*	R	7				–	–	
Woodchat Shrike	*Lanius senator*	R	4	20.5.			Atlas square	Atlas square	
Red-billed Chough	*Pyrrhocorax pyrrhocorax*	R	2	1.4.			Distribution	Atlas square	3200
Yellow-billed Chough	*Pyrrhocorax graculus*	W	2	15.4.			Density	Density[3)]	3900
Eurasian Jay	*Garrulus glandarius*	W	2	15.4.			Density	Density	2600
Eurasian Magpie	*Pica pica*	W	2	15.4.			Density	Density	2600
Northern Nutcracker	*Nucifraga caryocatactes*	W	2	15.4.			Density	Density[3)]	2900
Eurasian Jackdaw	*Corvus monedula*	C	7		×		Point	Point	
Rook	*Corvus frugilegus*	C	11		×		Point	Point	
Common Raven	*Corvus corax*	W	2	1.3.			Distribution[2)]	Distribution[2)]	3200
Carrion Crow	*Corvus corone corone*	W	2	15.4.	×		Density	Density[3)]	2800
Hooded Crow	*Corvus corone cornix*	W	2	15.4.	×	×	Density	Density[3)]	2400
Coal Tit	*Periparus ater*	W	2	15.4.			Density	Density	3000
Crested Tit	*Lophophanes cristatus*	W	2	15.4.			Density	Density[3)]	3000
Marsh Tit	*Poecile palustris*	W	2	15.4.	×		Density	Density[3)]	2400
Alpine or Willow Tit	*Poecile montanus*	W	2	15.4.	×		Density	Density[3)]	3200
Alpine Tit	*Poecile montanus montanus*	W	2	15.4.	×		Density	–	2700
Willow Tit	*Poecile montanus rhenanus/salicarius*	R	2	15.4.	×		Density	–	2400
Eurasian Blue Tit	*Cyanistes caeruleus*	W	2	15.4.			Density	Density[3)]	2400
Great Tit	*Parus major*	W	2	15.4.			Density	Density[3)]	2800
Eurasian Penduline-tit	*Remiz pendulinus*	R	7				Point	–	
Greater Short-toed Lark	*Calandrella brachydactyla*	R	7				–	–	
Woodlark	*Lullula arborea*	R	2	1.4.	×		Distribution[1)]	Distribution	3200
Eurasian Skylark	*Alauda arvensis*	W	2	15.4.	×	×	Density	Density[3)]	3200
Crested Lark	*Galerida cristata*	R	7				Atlas square	Atlas square	
Bearded Reedling	*Panurus biarmicus*	R	2	1.4.		×	Point	Point	
Zitting Cisticola	*Cisticola juncidis*	R	3	1.3.			Point	–	
Melodious Warbler	*Hippolais polyglotta*	W	2	15.5.			Distribution	Atlas square	3200
Icterine Warbler	*Hippolais icterina*	R	2	15.5.		×	Distribution[1)]	Atlas square	3200
Moustached Warbler	*Acrocephalus melanopogon*	R	3	1.3.			Point	–	
Sedge Warbler	*Acrocephalus schoenobaenus*	R	7				Point	–	
Marsh Warbler	*Acrocephalus palustris*	W	2	20.5.			Distribution[1)]	Atlas square	2600
Common Reed-warbler	*Acrocephalus scirpaceus*	W	2	1.5.		×	Density	Atlas square	1500

English name	Scientific name	Category	Atlas Code	Date	Species notes	Additional criteria	Map of situation in 2013–2016	Change map 1993–1996 vs. 2013–2016	Altitude limit
Great Reed-warbler	*Acrocephalus arundinaceus*	R	2	15.5.		×	Distribution[1)]	Atlas square	3200
Savi's Warbler	*Locustella luscinioides*	R	2	1.5.		×	Distribution[1)]	Atlas square	3200
River Warbler	*Locustella fluviatilis*	R	2	15.5.			–	–	
Common Grasshopper-warbler	*Locustella naevia*	R	2	15.5.		×	Distribution[1)]	Atlas square	3200
Northern House Martin	*Delichon urbicum*	C[S]	2	15.4.	×		Distribution[1)] und Point	Distribution	3200
Barn Swallow	*Hirundo rustica*	W	2	15.4.			Density	Density[3)]	2400
Eurasian Crag Martin	*Ptyonoprogne rupestris*	R[PJ]	2	15.4.			Distribution[1)]	Distribution	3400
Collared Sand Martin	*Riparia riparia*	C	11		×		Point	Point	
Western Bonelli's Warbler	*Phylloscopus bonelli*	W	2	1.5.			Density	Density	3000
Wood Warbler	*Phylloscopus sibilatrix*	W	2	1.5.		×	Density	Density	2400
Willow Warbler	*Phylloscopus trochilus*	R	2	1.5.		×	Density	Density	2400
Common Chiffchaff	*Phylloscopus collybita*	W	2	15.4.			Density	Density[3)]	3000
Greenish Warbler	*Phylloscopus trochiloides*	R	3	1.6.			Point	–	
Cetti's Warbler	*Cettia cetti*	R	3	1.3.			Point	–	
Long-tailed Tit	*Aegithalos caudatus*	W	2	15.4.			Density	Density[3)]	2400
Eurasian Blackcap	*Sylvia atricapilla*	W	2	15.4.			Density	Density[3)]	3000
Garden Warbler	*Sylvia borin*	W	2	10.5.			Density	Density[3)]	3000
Barred Warbler	*Sylvia nisoria*	R	2	20.5.			Point	Point	
Western Orphean Warbler	*Sylvia hortensis*	R	7				Atlas square	Atlas square	
Lesser Whitethroat	*Sylvia curruca*	W	2	10.5.		×	Density	Density[3)]	3100
Subalpine Warbler	*Sylvia cantillans*	R	7				Point	–	
Common Whitethroat	*Sylvia communis*	R	2	10.5.		×	Distribution	Distribution[2)]	2600
Spectacled Warbler	*Sylvia conspicillata*	R	7				–	–	
Short-toed Treecreeper	*Certhia brachydactyla*	W	2	15.4.			Density	Density[3)]	1800
Eurasian Treecreeper	*Certhia familiaris*	W	2	15.4.			Density	Density[3)]	3200
Eurasian Nuthatch	*Sitta europaea*	W	2	15.4.			Density	Density[3)]	2800
Wallcreeper	*Tichodroma muraria*	R[PJ]	2	15.4.			Distribution[1)]	Atlas square	3500
Northern Wren	*Troglodytes troglodytes*	W	2	15.4.			Density	Density[3)]	3000
White-throated Dipper	*Cinclus cinclus*	W	2	1.3.			Distribution	Distribution	2900
Common Starling	*Sturnus vulgaris*	W	2	15.4.			Density	Density	2600
Mistle Thrush	*Turdus viscivorus*	W	2	15.4.			Density	Density[3)]	3000
Song Thrush	*Turdus philomelos*	W	2	15.4.			Density	Density[3)]	2800
Eurasian Blackbird	*Turdus merula*	W	2	15.4.			Density	Density	2800
Fieldfare	*Turdus pilaris*	W	2	15.4.			Density	Density	3000
Ring Ouzel	*Turdus torquatus*	R[PJ]	2	15.4.			Density	Density[3)]	3400
Spotted Flycatcher	*Muscicapa striata*	W	2	10.5.			Density	Density[3)]	2600
European Robin	*Erithacus rubecula*	W	2	15.4.			Density	Density[3)]	2800
Red-spotted Bluethroat	*Cyanecula svecica svecica*	R	2	15.5.	×		Point	Point	
White-spotted Bluethroat	*Cyanecula svecica cyanecula*	R	7		×		–	–	
Common Nightingale	*Luscinia megarhynchos*	W	2	1.5.			Distribution[1)]	Distribution	1800
Red-breasted Flycatcher	*Ficedula parva*	R	7		×		–	–	
European Pied Flycatcher	*Ficedula hypoleuca*	W	2	25.4.		×	Density	Density[3)]	2300
Collared Flycatcher	*Ficedula albicollis*	R	2	1.5.			Point	Atlas square	
Black Redstart	*Phoenicurus ochruros*	W	2	15.4.			Density	Density[3)]	3600
Common Redstart	*Phoenicurus phoenicurus*	W	2	25.4.			Density	Density[3)]	2800
Rufous-tailed Rock-thrush	*Monticola saxatilis*	W	2	15.4.			Distribution	Atlas square	3500
Blue Rock-thrush	*Monticola solitarius*	R	2	1.4.			Point	Atlas square	
Whinchat	*Saxicola rubetra*	R	2; <1000 m: 4	20.5.			Distribution[1)]	Distribution	3200

English name	Scientific name	Category	Atlas Code	Date	Species notes	Additional criteria	Map of situation in 2013–2016	Change map 1993–1996 vs. 2013–2016	Altitude limit
Common Stonechat	*Saxicola torquatus*	R	4	15.4.			Distribution [1)]	Distribution	3200
Northern Wheatear	*Oenanthe oenanthe*	R[PJ]	2; <1000 m: 7	15.4.			Density	Density [3)]	3500
Goldcrest	*Regulus regulus*	W	2	15.4.			Density	Density [3)]	2700
Common Firecrest	*Regulus ignicapilla*	W	2	15.4.			Density	Density [3)]	2800
Alpine Accentor	*Prunella collaris*	W	2	15.4.			Density	Density	3800
Dunnock	*Prunella modularis*	W	2	15.4.			Density	Density [3)]	3400
House Sparrow	*Passer domesticus*	W	2	15.4.	×		Density	Atlas square	2800
Italian Sparrow	*Passer italiae*	W	2	15.4.	×		Density	Atlas square	2800
Eurasian Tree Sparrow	*Passer montanus*	W	2	15.4.			Density	Density [3)]	2400
White-winged Snowfinch	*Montifringilla nivalis*	W	2	1.5.			Distribution	Distribution	3900
Tree Pipit	*Anthus trivialis*	W	2	25.4.		×	Density	Density	2700
Meadow Pipit	*Anthus pratensis*	R	2	15.4.		×	Distribution	Distribution	3200
Water Pipit	*Anthus spinoletta*	R[PJ]	2	15.4.			Density	Density	3600
Tawny Pipit	*Anthus campestris*	R	2	20.5.			Point	–	
Citrine Wagtail	*Motacilla flava*	R	4	20.5.			Point	Atlas square	
Western Yellow Wagtail	*Motacilla cinerea*	W	2	15.4.			Density	Density	3200
Grey Wagtail	*Motacilla citreola*	R	7				Point	–	
White Wagtail	*Motacilla alba*	W	2	15.4.			Density	Density	3200
Common Chaffinch	*Fringilla coelebs*	W	2	15.4.			Density	Density [3)]	2800
Brambling	*Fringilla montifringilla*	R	7				–	–	
Hawfinch	*Coccothraustes coccothraustes*	W	2	15.4.		×	Density	Density [3)]	2400
Common Rosefinch	*Carpodacus erythrinus*	R	2	20.5.			Point	Atlas square	
Eurasian Bullfinch	*Pyrrhula pyrrhula*	W	2	15.4.			Density	Density [3)]	2800
European Greenfinch	*Chloris chloris*	W	2	15.4.			Density	Density [3)]	2600
Common Linnet	*Linaria cannabina*	W	2	15.4.			Density	Density [3)]	3200
Redpoll	*Acanthis flammea*	R[PJ]	2; <1000 m: 7	15.4.			Density	Density [3)]	3400
Red Crossbill	*Loxia curvirostra*	W	2	15.4.			Density	Density	2900
European Goldfinch	*Carduelis carduelis*	W	2	15.4.			Density	Density	2600
Citril Finch	*Carduelis citrinella*	R[PJ]	2	15.4.		×	Density	Density	3000
European Serin	*Serinus serinus*	W	2	15.4.			Density	Density	2600
Eurasian Siskin	*Spinus spinus*	W	2; <1000 m: 7	15.4.			Density	Density	2800
Corn Bunting	*Emberiza calandra*	R	2	15.4.		×	Distribution [1)]	Distribution	3200
Rock Bunting	*Emberiza cia*	W	2	15.4.			Density	Density [3)]	2800
Ortolan Bunting	*Emberiza hortulana*	R	2	15.5.			Point	Atlas square	
Cirl Bunting	*Emberiza cirlus*	W	2	15.4.			Distribution [1)]	Distribution	3200
Yellowhammer	*Emberiza citrinella*	W	2	15.4.			Density	Density [3)]	2600
Reed Bunting	*Emberiza schoeniclus*	R	2	15.4.		×	Distribution [1)]	Atlas square	3200

Data collection

The online portal www.ornitho.ch served as the data collection centre for the 2013–2016 atlas, enabling users to view the current state of progress for every atlas square and species. The species-specific inclusion criteria involved a minimum Atlas Code and a reference date, and in many cases matched the criteria used in the 1993–1996 atlas. Priorities were defined for fieldwork in each field season.

The 2013–2016 atlas builds on data collected in four field seasons from 2013 to 2016. Additional data gathered in 56 kilometre squares in 2012 for the federal scheme «Biodiversity Monitoring Switzerland (BDM)» were also incorporated. One BDM survey round lasts five years (with one fifth of the total number of squares surveyed each year), so we decided to integrate an entire period from this monitoring project.

Compared to the 1993–1996 atlas, collecting records was much easier in 2013–2016. During 1993–1996, volunteers had to record observations on special paper forms or A6-size recording cards, look up the geographic coordinates, and send the documents to the Swiss Ornithological Institute by post. Observers also had access to a programme called «IDEXT», made available back in 1989 to facilitate the recording process[AN1]. For the 2013–2016 atlas, records were entered on www.ornitho.ch, often including information on the exact location. Looking up coordinates was no longer necessary thanks to the map background available in the online system. «NaturaList» became available in 2015, an app that allowed georeferenced records to be entered directly in the field (only for Android smartphones at the time).

The 2013–2016 atlas was the first atlas to be developed «live». To make this possible, a special atlas tool was added to www.ornitho.ch. The new addition allowed users to check the progress of fieldwork anytime. Thanks to real-time updates of maps and atlas-square overviews, users could check, for example, which species had already been detected by other observers. This saved hours of unnecessary search effort. Moreover, the standardised entry procedure eliminated many sources of error. For example, required data fields on the online entry form made sure that important information (e.g. Atlas Codes) was not forgotten. To ensure that the real-time maps and atlas-square overviews were reliable at all times, additional effort was required on the part of the Swiss Ornithological Institute to check entries on an ongoing basis (and not only upon completion of fieldwork). Protected data (e.g. observations of sensitive species) remained hidden in the new atlas tool and could not be viewed publicly. The restriction also applied to the designated observers responsible for an atlas square and their collaborators. The only information publicly available on these species was whether they had already been recorded in the atlas square or not.

Regular email updates and the regional atlas meetings helped to elicit a strong response, and recording activity was high from the beginning, including in peripheral regions.

Special atlas features on www.ornitho.ch

The atlas tool on www.ornitho.ch allowed users to consult the map showing the number of recorded species per atlas square as well as the atlas square maps for individual species for the 2013–2016 atlas and the earlier atlases (1972–1976 and 1993–1996). The records used to generate the maps could also be accessed with ease. Comparison maps at atlas-square resolution illustrated the change in a species' distribution between two survey periods. A list of contact persons and collaborators for each atlas square was provided, as well as a direct link to «Terrimap online».

Species-specific inclusion criteria

A minimum Atlas Code (AC) and a reference date were defined as inclusion criteria for each species. For most species, they were the same as in 1993–1996. Defining a reference date had proven useful in 1993–1996, as it provided a clear rule that helped to exclude many controversial records, most of them relating to late passage migrants. Observations made after the reference date in suitable habitat were included. We also accepted indirect evidence such as droppings or feathers, if they were attributed to a species with certainty by specialists. Observations of displays in autumn, however, were not accepted.

For most «widespread species», 15 April was determined as the reference date (except in 2013: 13 April). This was the earliest possible date for territory mapping surveys. An earlier date was determined for resident species (e.g. woodpeckers, grouse) and a later one for late migrants. All observations had to occur in suitable habitat (AC of at least 2). Observations that strongly indicated breeding (≥ AC 7) were included even if they were made before the reference date. On the other hand, observations that occurred after the reference date but that probably concerned late migrants were not included. Additional criteria had to be met for Eurasian Siskins below 1000 m; only records that strongly indicated breeding (≥ AC 7) were included.

Criteria for the categories «rare species» and «rare species on the Central Plateau and in the Jura» varied. For many species, an observation during the breeding season in suitable habitat (≥ AC 2) after the reference date was sufficient. For some species (e.g. Western Yellow Wagtail), the criteria of probable breeding (≥ AC 4) had to be met. For rare breeders (e.g. Black-crowned Night-heron) and some other species (e.g. Goosander), observations that strongly indicated breeding (≥ AC 7) were required. The same applied to Northern Wheatear and Redpoll below

Code	Definition
	Possible breeding (30)
1	Species heard or observed within safe dates, but not in suitable breeding habitat.
2	Species heard or observed within safe dates, and in suitable breeding habitat.
3	Territorial behavior, including counter singing males, territorial singing, drumming in woodpeckers, or aggressive interactions between same-sex individuals of same species.
	Probable breeding (40)
4	Pair (male and female) within safe dates, and in suitable breeding habitat.
5	Pair (male and female) present at the same location two or more days apart.
6	Courtship behavior (aerial displays, courtship feeding) or copulation.
7	Visiting probable nest site.
8	Agitated behavior and/or anxiety calls from an adult, suggesting presence of nearby nest or young.
9	Brood patch (Note: code only applies to birds observed in hand).
10	Nest building observed at nest site (Note: for nest building by wrens, woodpeckers, kingfishers …).
	Confirmed breeding (50)
11	Distraction display or attacking/dive-bombing humans in defense of unobserved nest or young.
12	Used nest (occupied within period of survey); includes inactive nests.
13	Recently fledged young that are incapable of sustained flight.
14	Occupied nest, but contents not observed; adults entering and remaining for a period of time, then leaving or exchanging duties.
15	Adult carrying a fecal sac.
16	Adult carrying food for young.
17	Eggshells found below nest.
18	Nest with adult incubating.
19	Nest with nestlings or eggs.
	Absence records
99	Species not recorded despite active search.

International Atlas Code (modified).

1000 m (at higher altitudes, ≥ AC 2 was sufficient). For most waterbirds and for the White Stork, confirmation of breeding was required (≥ AC 11), as they often occur during the breeding season without necessarily attempting to breed. For example, valid observations included a nest containing eggs, an incubating adult, or a family with young not yet capable of flying. No reference date was fixed for species requiring an Atlas Code of 7 or 11.

In the case of «colonial species», there had to be strong indication of breeding (≥ AC 7, e.g. Northern Lapwing, Alpine Swift, Eurasian Jackdaw) or confirmed breeding (≥ AC 11, e.g. Great Cormorant, Collared Sand Martin). «Colonial species in settlements» (Northern House Martin and Common Swift) were subject to the reference date of 15 April and an Atlas Code of at least 2.

Additional criteria

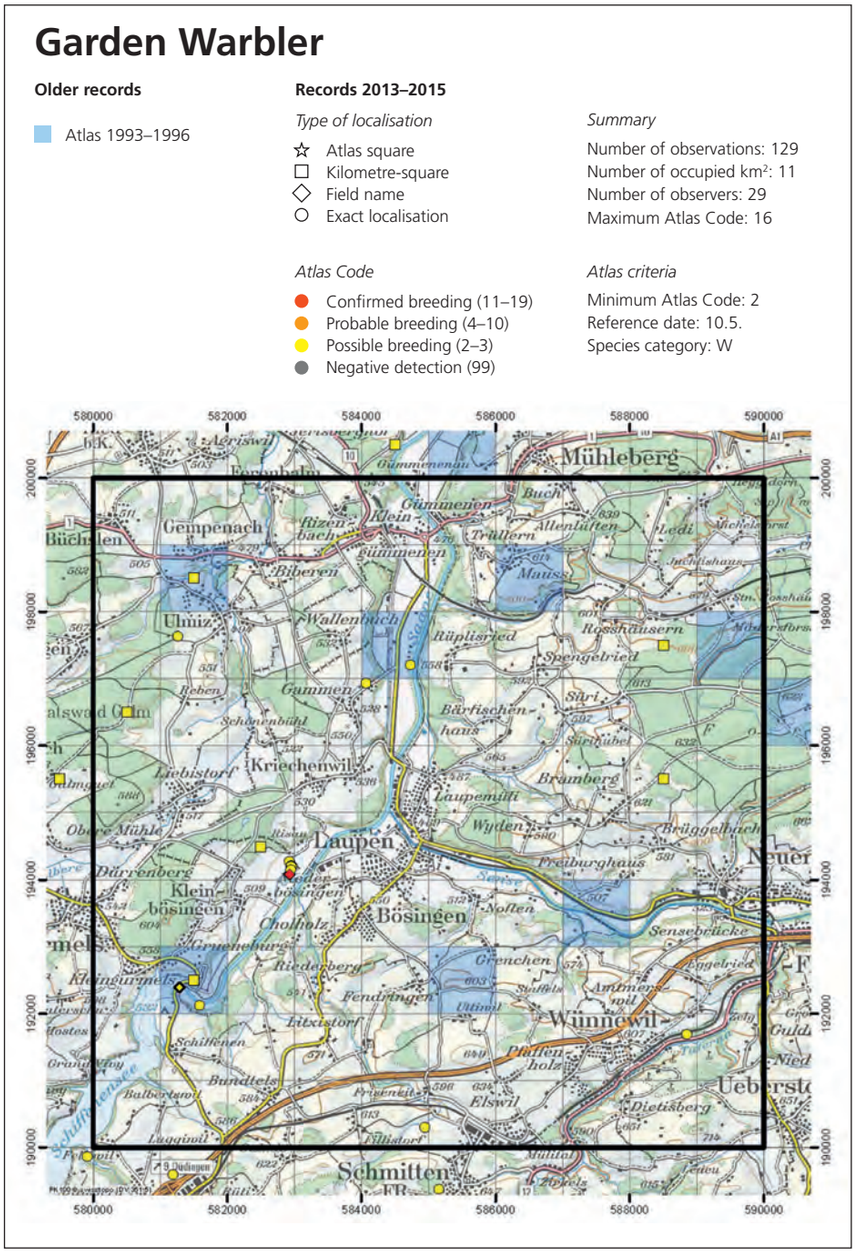
For some species, the minimum criteria were insufficient to obtain a satisfactory picture of breeding distribution. The reason, in most cases, was the presence of passage migrants, wandering summer visitors or non-breeders, especially in areas at the edge of the known breeding range. Additional criteria were defined for these species (e.g. Red Kite, Common Kingfisher, Eurasian Golden Oriole, Willow Warbler, European Pied Flycatcher), involving, for example, a higher Atlas Code (≥ AC 7), a later reference date, the prolonged presence of a singing male, or presence at the same site across several years. The additional criteria ensured that these observations could be assessed consistently by the atlas team.

Priorities in the four field seasons

Across all four years, the survey effort centred around the species search in the atlas squares and the territory mapping in the kilometre squares. Starting with the second field season (2014), we undertook additional targeted surveys.

In 2014, the aim was to survey colonial species as comprehensively as possible. A special focus was given to Grey Heron, Alpine Swift, Collared Sand Martin, Eurasian Jackdaw and Rook.

In 2015, Mute Swan, Goosander, Great Crested Grebe, Yellow-legged Gull and Common Kingfisher were surveyed on large lakes and rivers. In many places, these counts were carried out in mid-May, mostly by ornithological working groups or by fieldworkers contracted by



An example from the mini-atlas of atlas square 58/19 (Laupen). The map shows the status of Garden Warbler records after three out of four field seasons. Reproduced with permission of swisstopo (BA180142).

the Swiss Ornithological Institute (some stretches of river were not surveyed until 2016). However, early and exceptional flooding interfered with the surveys. A further focus in 2015 was on counting displaying Eurasian Woodcocks, a species for which considerable gaps in coverage existed in the cantons of Valais, Uri, Grisons and Ticino. A spatial expert model based on habitat variables was developed for this purpose. The model identified areas of potentially suitable habitat for the Woodcock, which could then be targeted in the surveys.

Finally, in 2016, efforts focussed on surveying Common Swift and Northern House Martin colonies with more than ten breeding pairs, provided this had not already been accomplished in previous years. Also, contracted fieldworkers supported the territory mapping of Woodlarks in the Jura and conducted a systematic survey of Western Yellow Wagtail populations in northeastern Switzerland, western Switzerland and Ticino.

In all four field seasons, contracted fieldworkers, interns and persons on civilian service duty were enlisted besides the volunteer observers to survey remote kilometre squares, visit underrepresented atlas squares, search for nocturnal birds or other elusive species, and fill in any other gaps.

Species list and «mini-atlas» per atlas square

One aim of the 2013–2016 atlas was to record all breeding bird species present in a given atlas square. The species list from the 1993–1996 atlas served as a reference, indicating which species were to be expected. After every field season, the designated observers responsible for an atlas square and their collaborators received an email

with the updated species list for their square and a comparison with 1993–1996. They therefore knew prior to the next breeding season which species were still missing, for which species further observations were desirable, and which species had been confirmed or recorded for the first time.

Leading up to the 2015 field season, the first «mini-atlas» in PDF-format was produced for the observers in charge of an atlas square. The mini-atlas plotted the recent records of each species as well as those from 1993–1996 on a map of the atlas square. In squares with low coverage, the records from 1997–2012 were included as an additional reference, enabling a targeted search for species that had not yet been confirmed. A further three maps displaying the number of breeding species, the number of records, and the number of observation days per kilometre square illustrated the progress that had been made so far in the atlas square. Further mini-atlases in updated form were provided in early 2016 and upon completion of fieldwork in early 2017. Together with the special atlas features on www.ornitho.ch and the annual species list, the mini-atlas provided valuable support for subsequent fieldwork. By showing the records from 1993–1996 as well as the current ones, it motivated observers to continue their search for missing species. Thus, the mini-atlas almost certainly contributed to the excellent level of coverage in many atlas squares.

Weather conditions in the four field seasons

Of the four field seasons, only the spring of 2014 was mostly warm. The other three seasons were cooler and/or more humid than the long-term average, with severe cold spells in April 2013 and 2016.

In 2013, many lowland areas experienced the coldest March since 1987. From mid-March to early April, the weather was cold with snow in the lowlands. Temperatures plummeted again in the second half of April, with snowfall below 1000 m, especially in western Switzerland. May was the coolest since 1991. It was also wet in many places, with a storm bringing record amounts of rain towards the end of the month. Summer weather gradually arrived in June.

The second year saw early warm and sunny weather in March. April was also milder than average throughout Switzerland, with above-average sunshine especially on the Central Plateau and in Ticino. In May, the weather was cooler and changeable, with just a few warm and sunny days towards the end of the month. June was again warmer than average and very dry in Valais and northern Switzerland.

In 2015, breeding activity got off to a fast start thanks to mild conditions in April, despite a brief resurgence of winter weather in late March. In early May, heavy rainfall caused water levels on lakes and rivers to rise to record levels. Further precipitation followed, making it the wettest May since records began in 1864. June, in contrast, was the fourth warmest on record in many places. The warm weather continued into July, and some places experienced the hottest July on record. Especially the first week of July saw record temperatures.

The weather was at its most contrary in 2016: A very mild winter was followed by overly cool temperatures in March. Temperatures in April were average, despite several severe cold snaps, but there was more rain than usual, both in April and in May. Some places experienced the wettest May since records began in 1864. Snow fell to below 1000 m in late May, and 20–30 cm of fresh snow accumulated at higher altitudes. June was also dull and rainy. Some locations recorded one of the wettest months of June. Water levels were high on lakes and rivers, with some flooding. Only a few days in the second half of the month reached summer temperatures.

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Overview of the 2013–2016 atlas data	
Data	
Total records	3 169 412
Records originating from territory mapping surveys	1 524 429
Kilometre squares	
Number of square kilometres with at least one record	36 002 (corresponds to 77 % of square kilometres within the atlas perimeter)
of these, surveyed kilometre squares	2318 (corresponds to 5 % of the atlas survey area)
Observers	
Number of observers having contributed at least one record	3096
Observers having contributed at least 1000 records	687
Observers involved in the territory mapping surveys	776

Territory mapping in kilometre squares

Widespread species were surveyed in 2318 kilometre squares using a simplified territory mapping method. In each atlas square, we selected three to five kilometre squares that were representative in terms of habitat types and altitude. The survey results were processed using «Terrimap online».

Thanks to the 1993–1996 atlas and the common breeding bird monitoring scheme, many volunteers were already acquainted with the simplified territory mapping method[AN1, 1]. Applying the same method to the 2013–2016 atlas was therefore a natural choice. The method involves surveying a kilometre square three times during the breeding season following a predetermined route. Only two visits per breeding season are required in kilometre squares above the tree line. Territories are then mapped based on the observations recorded during the visits. This method has the advantage of not having to survey the atlas square in full; rather, a representative sample of selected kilometre squares allows us to derive information for the whole area. Simulations run prior to fieldwork showed that a sample of five kilometre squares per atlas square was sufficient given the modelling methods that had been developed since the last atlas. Only three to four kilometre squares were selected in high-altitude atlas squares and those containing large areas of open water. In the end, 2318 kilometre squares were surveyed for the 2013–2016 atlas compared to 2943 in 1993–1996. Thus, 5 % of the total area within the atlas perimeter were mapped in 2013–2016.

Selecting the kilometre squares

Three conditions had to be met when selecting the five kilometre squares per atlas square:

1. All kilometre squares surveyed for the common breeding bird monitoring scheme («Monitoring Häufige Brutvögel MHB») and «Biodiversity Monitoring Switzerland (BDM)» were included in the atlas sample. The annual surveys of the 267 MHB-squares continued through 2013–2016. One fifth of the 264 BDM-squares are surveyed every year, which means that each square is surveyed every five years. To allow for the inclusion of all BDM-squares in the atlas calculations, we incorporated data from 56 BDM-squares surveyed in 2012.
2. Of the kilometre squares surveyed in 1993–1996, as many as possible were retained.
3. The five kilometre squares were representative of the atlas square in terms of habitat and altitude. The following habitat types and their respective area were considered when making the final selection: forest, open landscape, settlements, wetlands including lakes, length of roads and pathways.

Accessibility was also taken into account, especially at high altitudes. Kilometre squares that were poorly accessible and considered too dangerous to survey were omitted. While kilometre squares above 2300 m were underrepresented in 1993–1996 and none above 2600 m were included, the altitudinal distribution of the kilometre squares in 2013–2016 was more balanced. The highest kilometre square reached an altitude of 3100 m.

Ultimately, a total of 2318 kilometre squares were surveyed, including 267 MHB-squares, 264 BDM-squares, 1600 kilometre squares surveyed in 1993–1996, and 187 newly selected kilometre squares. The survey visits (except MHB-squares) were distributed over the four field seasons as follows: 505 kilometre squares in 2013, 606 in 2014, 569 in 2015 and 315 in 2016.

Survey procedure

A simplified territory mapping survey was to be conducted in each kilometre square in one of the four field seasons 2013–2016. Only the MHB-squares were surveyed annually. The survey year was fixed in the case of BDM-squares, but for all other kilometre squares, observers were free to choose the year in which to conduct the surveys.

To make sure surveys were comparable across kilometre squares, we made the following recommendations: In lowland squares, the first visit should take place between 15 and 30 April; 2013 was an exception, when fieldwork was allowed to start on the weekend of 13 and 14 April. The second visit followed in the first half of May. The third and last visit was to be carried out between mid-May and mid-July. At higher altitudes, we asked that visits be scheduled between the end of April and the end of June, in high-mountain areas between late May and mid-July, depending on snow conditions.

We chose to start the field season on 15 April in accordance with the 1993–1996 atlas and the MHB. By this date, many residents and short-distance migrants have established their territories, at least at lower altitudes. Only a few species whose singing activity peaks early in the year (e.g. woodpeckers, Eurasian Nuthatch and tits) were at risk of being underestimated as a result. Phenological data for several species were analysed prior to the atlas surveys to assess whether the timing of the field surveys had to be advanced. The results showed that according to the available data, the activity peaks had not changed substantially since 1993–1996[2]. The reference date of 15 April was therefore retained.

In view of the territory mapping that would follow, records of simultaneous observations were particularly important (e.g. two singing males observed at the same time). We therefore regularly reminded our volunteers to pay particular attention to simultaneous observations.

The routes for all kilometre squares were predetermined by the atlas team, an approach that had proven

effective in the MHB. However, if deviation from the defined route was unavoidable, the adjusted route had to be drawn onto the field maps and followed during subsequent visits. The routes were chosen so as to cover as much of the kilometre square as possible and were generally 3–6 km long. Observers were asked to choose a different starting point or direction on each visit, if possible. Areas that were inaccessible, e.g. due to cliffs, were surveyed as well as possible using binoculars. During the 1993–1996 surveys, by contrast, observers were free to choose a different route for each visit.

In keeping with the MHB surveys, we aimed to record the total population of each species. Also, we required all observations of individuals of all species to be recorded. This approach differed from 1993–1996, when we had defined an upper limit for territories of widespread species; once this limit was reached, the species no longer had to be reported in that kilometre square. In the case of Common Chaffinch, for example, recording could stop once more than ten territories had been noted. In addition, the list of species to be recorded in 1993–1996 was more or less limited to those classed as widespread.

Processing the survey results

The field maps used for territory mapping were redesigned and tested during the MHB surveys in 2012. The new A3-size maps were fitted with four QR codes (Quick Response Codes) for automatic georeferencing. Following the survey visits, observers sent the field maps by post to the Swiss Ornithological Institute, where they were scanned and uploaded to «Terrimap online» for further processing.

Digitising all species records marked on the field maps and mapping the territories was the observers' responsibility. Only observations that met the species-specific inclusion criteria were used to define territories. The «Terrimap online» system would not allow users to map a territory based exclusively on observations made before the reference date or on insufficient Atlas Codes. On the other hand, observations that met the criteria could be used to define a territory even if they were recorded during a single visit. Territories that extended beyond the square's border were counted as long as one observation was located within the kilometre square. No territories were defined for birds that were obviously passage migrants, altitudinal migrants or wandering individuals. Foraging birds such as hunting raptors were included as long as there were potential nest sites nearby.

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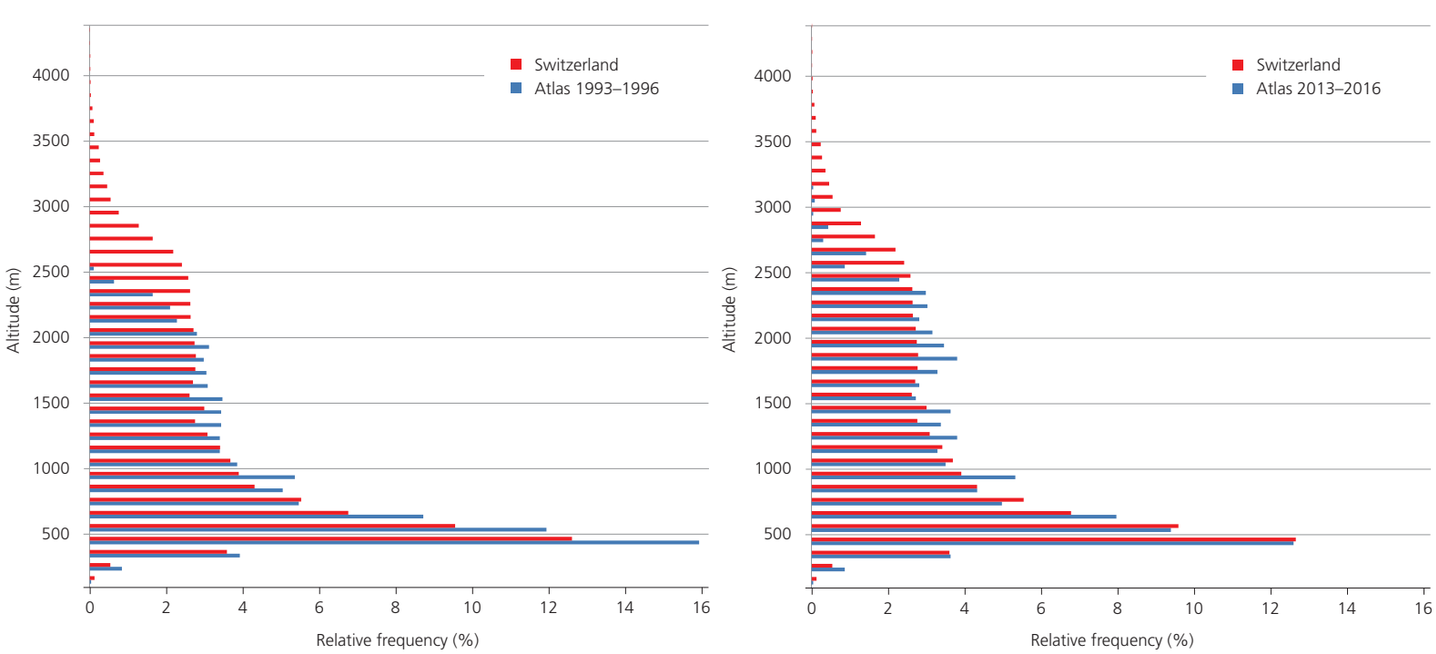
[1] Schmid et al. (2004b); [2] Strebel et al. (2014)



Altitudinal distribution of kilometre squares. The red bars show the frequency of each altitude level in Switzerland as a whole. The blue bars show the frequency of each altitude level in the total area of surveyed kilometre squares. In the 1993–1996 atlas, lowland squares were overrepresented, while high mountain squares were underrepresented.

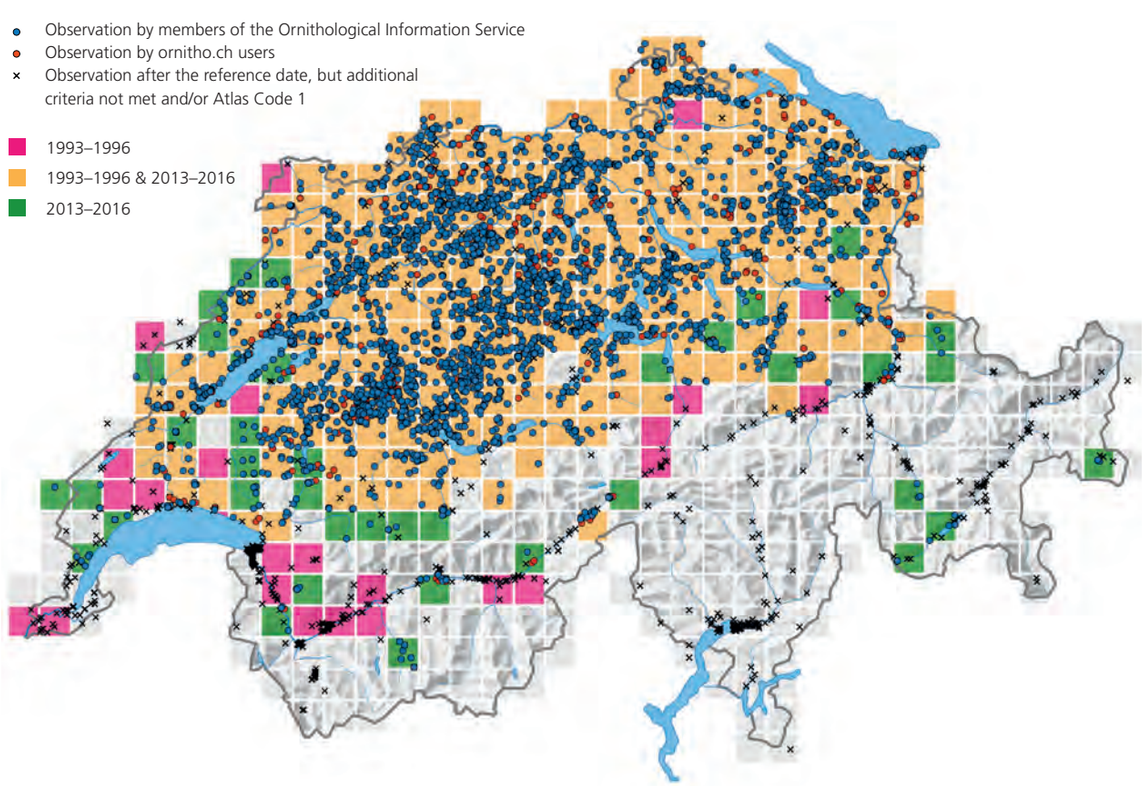
Data validation

The collected data was carefully reviewed and validated in several stages. Together with the regular, close contact with the field ornithologists, this process ensured a high quality of data and guaranteed a particularly thorough review of records at the range margins.

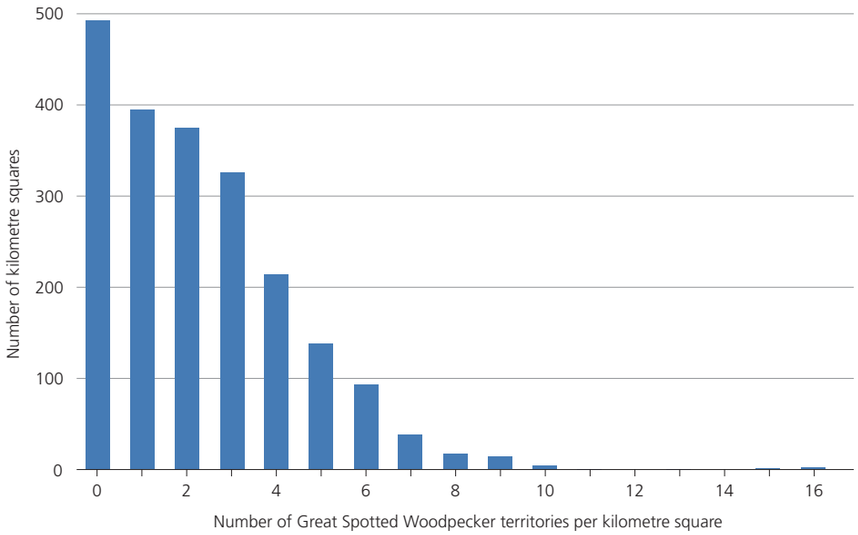
The 2013–2016 atlas is based on two main types of data: territory mapping surveys in kilometre squares and individual records (including complete species lists, colony counts, etc.). Individual records refer to those submitted on www.ornitho.ch by more than 3000 observers. Such records were made in part by observers registered as volunteer collaborators of the Swiss Ornithological Institute (members of the Ornithological Information Service), i.e. field ornithologists with considerable experience who report observations regularly following specific guidelines[AN1]. But records submitted by other ornitho.ch users were also accepted; in general, these users vary more widely in their ability to identify birds, and many do not record on a regular basis. To ensure that the distribution maps at atlas-square resolution available on www.ornitho.ch were as accurate as possible, the entries needed to be checked regularly. Automated filters provided initial validation, detecting anomalies regarding altitudinal distribution or seasonal occurrence, for example, and forcing users to confirm. Secondly, records were checked by about two dozen regional coordinators of www.ornitho.ch, who see the observations that have been submitted in their region and follow up any unusual records. Finally, the records were reviewed by the atlas team in the process described below.

Validation of individual records

Weekly review: In addition to the standard checks described above, the atlas team reviewed new breeding-season records at weekly intervals, focussing mainly on records of species that had not yet been found in a given atlas square. We asked observers for further details, especially if the atlas square had not been occupied in 1993–1996, if the record seemed unusual, or if it was not sufficiently documented. Other ornitho.ch users, who were not members of the Ornithological Information Service, also had to describe the criteria used to identify the species. The objective was to recognise erroneous records as early as possible and correct them. Compared to a final validation carried out at the end of the breeding season, the advantage of these ongoing queries was that memories of the observations were still fresh and records could be verified in the field if necessary. If observations fell outside



All observations during the breeding season were reviewed, especially for atlas squares (10 × 10 km) that were newly occupied compared to 1993–1996 or that had only one or two records. We also carefully checked observations on the margins of a species' continuous range. The example of the European Pied Flycatcher illustrates the effects of the additional criteria, introduced if the species-specific inclusion criteria were insufficient to make sure that records did not include late passage migrants. Without the additional criteria, several atlas squares in the Alps would have been considered occupied although breeding has never been suspected in the area.



Following the regular review process for the territory mapping surveys in kilometre squares, extremely high territory numbers were checked again. In the case of the Great Spotted Woodpecker, for example, the territory maps for all kilometre squares with more than eight territories underwent an additional systematic review.

of the known breeding range, we required additional evidence of breeding (e.g. for Red Kite, European Pied Flycatcher, Willow Warbler and European Pied Flycatcher in the Alps). We therefore advised ornithologists to attempt to record at least probable breeding evidence (e.g. pair during courtship display, bird carrying nest material).

Annual review: Following each field season, we carried out an annual review of all breeding-season records. This included checking the records from the territory mapping surveys uploaded to www.ornitho.ch via «Terrimap online». Again, we focussed on records of new species that had not been recorded in the atlas square in 1993–1996 and on species that had only been observed once or twice in a given atlas square. This stage of the process also included a particularly careful review of records at the periphery of the range. For some species we introduced additional criteria if the species-specific inclusion criteria alone did not yield an accurate representation of the breeding distribution, mainly due to late passage migrants, wandering summer visitors or non-breeders.

Final review: During the final validation round in early 2017, we conducted further queries and made detailed corrections, for example concerning records outside of a species' known altitudinal distribution. We checked breeding-season records one last time in many atlas squares and followed up with observers where necessary. Although additional criteria had been defined for several species, a few borderline cases remained where the atlas team had to decide whether an atlas square could be considered occupied or not.

All in all, we conducted more than 10 000 queries. In addition, the observers themselves regularly drew our attention to entries that were possibly incorrect.

Review of territory mapping in kilometre squares

Once fieldworkers had digitised the observations made during the survey visits and defined territories on «Terrimap online», the results were verified by employees of the Swiss Ornithological Institute with a lot of field experience. To ensure consistency, the results were reviewed following a 12-point checklist. We checked whether all observations had been digitised, the seasonal timing of visits, the number of simultaneous observations, and whether all expected species had been found. The main part of the process involved validating the defined territories according to species-specific considerations. A compilation of examples from the common breeding bird monitoring scheme and «Biodiversity Monitoring Switzerland (BDM)» served as a guideline to ensure that territories were defined in a consistent manner[1]. Finally, an overall assessment of the mapping results in each kilometre square was made and individual feedback sent to the observers. The observers were given opportunity to comment on the corrected results before the review process was concluded. If the quality of a survey was insufficient, it was repeated in one of the subsequent years.

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[1] Schmid & Spiess (2008)

Maps and altitude charts

For most species, the 2013–2016 atlas shows the current distribution as well as the change in distribution since 1993–1996. Depending on the available data, we were able to produce maps at various levels of detail. An altitude chart displays the species' altitudinal distribution and the change since 1993–1996.

Along with abundance and distribution, the type of data available to us differs from species to species. For some species, all nest sites are known; for others, we can calculate the density per kilometre square based on the territory mapping surveys. In the case of species that are difficult to detect, we can only estimate the probability of occurrence, but have no information on density. To account for these differences, we designed several map types to represent a species' occurrence and the changes since 1993–1996. We decided for each species which map type would be most informative. The table in the section «Survey methods» (p. 53–59) indicates which map types were used to depict the situation in 2013–2016 and the changes since 1993–1996.

The 16 environmental variables used for modelling, including a description and the data set for 1993–1996 and 2013–2016. Sources: see text.

No.	Environmental variable	Description	Data set 1993–1996	Data set 2013–2016
1	Lakes (% of area)	Lakes, ponds, oxbow lakes etc.	Land-use statistics 1992–1997	Land-use statistics 2004–2009
2	Agricultural grassland (% of area)	Farm pastures, Alpine pastures, meadows etc.	Land-use statistics 1992–1997	Land-use statistics 2004–2009
3	Forest (% of area)	Forest, afforestations, open woodland etc.	Land-use statistics 1992–1997	Land-use statistics 2004–2009
4	Structured grassland (% of area)	Brush forest, bushes & shrubby vegetation, clusters of trees, hedges, golf courses, parks etc.	Land-use statistics 1992–1997	Land-use statistics 2004–2009
5	Arable land (% of area)	Arable land	Land-use statistics 1992–1997	Land-use statistics 2004–2009
6	Screes & rocks (% of area)	Screes, rocks	Land-use statistics 1992–1997	Land-use statistics 2004–2009
7	Glaciers (% of area)	Glaciers	Land-use statistics 1992–1997	Land-use statistics 2004–2009
8	Lake shores (m)	Length of lake shores	VECTOR25 (Version 2008)	VECTOR25 (Version 2008)
9	Buildings (m^2)	Ground area of buildings	VECTOR25 (Version 2004)	Topographic Landscape Model
10	Watercourses (km)	Length of all watercourses (incl. ditches)	VECTOR25 (Version 2008)	Topographic Landscape Model
11	Rivers and streams (m)	Length of large watercourses (stream order ≥3)	VECTOR25 (Version 2008)	VECTOR25 (Version 2008)
12	Wetlands (m^2)	Area of wetlands	VECTOR25 (Version 2007)	Topographic Landscape Model
13	Nitrogen deposition (kg N/ha/year)	Average nitrogen deposition per hectare and year	Meteotest 1990	Meteotest 2010
14	Exposure (–)	Average north-south index, slope exposure (e.g. north-facing, …)	Digital height model	Digital height model
15	Altitude (m a.s.l.)	Average altitude	Digital height model	Digital height model
16	Slope gradient (°)	Average slope gradient	Digital height model	Digital height model

Density map 2013–2016

For 75 relatively widespread and at least locally abundant species we were able to generate density maps using the territory mapping data.

Based on the number of mapped territories per survey visit and 16 different environmental variables, we estimated the number of territories per species for all kilometre squares in Switzerland and Liechtenstein. We used a binomial mixture model [14], which corresponds to a Poisson regression model that also incorporates the species' detection probability. This allowed us to account for the fact that not all birds present were detected during the visit.

We calculated the values of the 16 environmental variables for all kilometre squares located fully or partly in Switzerland as well as for the surveyed kilometre squares in neighbouring countries. For seven land-cover variables (1–7 in the table), the percentage area in each kilometre square in Switzerland and Liechtenstein was elicited from the Swiss Land-use statistics based on the NOAS04 nomenclature [3, 4]. For the 2013–2016 period, we used the 2004–2009 land-use statistics. For kilometre squares beyond the Swiss border (not including Liechtenstein), the values were derived from the CORINE Land Cover data 2012 (data collected in 2011–2012) [1], maintaining consistency with the Swiss Land-use statistics as far as possible. Five further variables (8–12 in the table) were calculated for 2013–2016 based on the Swiss Topographic Landscape Model [2] or the VECTOR25 data set [2]. For a few square kilometres beyond the Swiss border, the necessary data were digitised based on the current national maps at a scale of 1:25 000. Data concerning nitrogen deposition (13 in the table) were compiled by the company Meteotest for the Federal Office for the Environment; the values are those for 2010 [13]. Three variables (14–16 in the table) are based on the digital height model of Switzerland [15], which covers the surface of Switzerland with a grid at a resolution of 25 m. A value is indicated for each node (e.g. altitude above sea level). All nodes within a kilometre square are averaged to yield the value of the covariable for that square.

It was often not possible to estimate the influence of each variable on a species' density, especially since certain variables were quite strongly correlated. Therefore, variables were omitted in a step-by-step process for each species if their influence was difficult to estimate and, given the species' biology, no effect on density was expected. We used penalised 2D splines to model spatial autocorrelation [5, 8]. This was important because regional differences in a species' population density can occur despite

suitable habitat. Including kilometre squares on the other side of the Swiss border allowed us to avoid boundary effects that can occur when using spline functions. Finally, density was set to zero in all kilometre squares above a certain species-specific altitude to avoid artefacts in high-mountain areas. Using the parameter values estimated by the model, we were able to estimate the number of territories for each of the approximately 41 000 kilometre squares in Switzerland and Liechtenstein. For most species, the estimates were unrealistically high in a small number of squares. We adjusted these values downwards for the visual representation. All values above a defined upper limit were reduced to the value of that upper limit. For five species, we set the upper limit manually (Wood Warbler, Willow Warbler, House Sparrow, Italian Sparrow, Grey Wagtail). For the other species, the 99.5 %-quantile of the estimates for all kilometre squares was defined as the upper limit. Squares with an estimated density of less than 0.05 were excluded prior to calculating the 99.5 %-quantile. To improve the visual presentation, the estimated values were slightly smoothed by interpolation [10].

Density change map

Of the 75 species with a density map for 2013–2016, 70 also feature a density change map showing the change in density from 1993–1996 to 2013–2016. While we were able to account for detection probability when estimating density for 2013–2016, the same was not possible with the 1993–1996 data. This is because the 1993–1996 data set only contained the final number of territories per species and kilometre square, but not the number of territories confirmed by an observation at each visit (hereafter «territory per visit»). Applying the same approach used to produce the density maps, we estimated the density for each kilometre square during 1993–1996 and during 2013–2016, only this time without accounting for detection probability. The data came from the territory mapping surveys in each period. In contrast to the model accounting for detection probability, where the number of detected «territories per visit» was the target variable, we now used the number of detected territories per kilometre square as the target variable.

The same 16 environmental variables used for the density maps served as explanatory variables. For the variables rivers and streams, lake shores, altitude above sea level, exposure and gradient we used the same values for both survey periods. Values for the remaining variables were determined separately for 1993–1996 based on the Swiss Land-use statistics 1992–1997, the CORINE Land Cover data 1990 and the VECTOR25 data set. Data on nitrogen deposition was provided by Meteotest; they refer to 1990 [13]. We used the same set of environmental variables per species for 1993–1996 and 2013–2016. The analysis was performed using a generalised linear model instead of a binomial mixture model.

We also had to take into consideration that an upper limit had been set for territory counts in 1993–1996. For example, once more than ten territory-marking Common Chaffinches had been found, the observer did not have to continue recording this species. To be able to estimate the actual number of territories, we had to incorporate this so-called censoring into the model. To make the two sets of data comparable, the 2013–2016 survey data was censored to match the 1993–1996 approach. Some of the results obtained this way were unsatisfactory and did not correspond well with expert assessments or regional trends generated in the common breeding bird monitoring scheme (MHB). In these cases, we supplemented the censored data from the territory mapping surveys with uncensored data from the MHB scheme. The territory mapping data from 1993–1996 was supplemented with MHB data from the year 2000, the 2013–2016 data with MHB data collected in 2016. This allowed us to improve the estimates of density and density change for several species.

The density estimates for 1993–1996 and 2013–2016 were smoothed separately for presentation. For each kilometre square, we first averaged the density estimates of nine squares in a 3 × 3 km matrix with the corresponding square at its centre and used this value for the central kilometre square. We then calculated the difference between these smoothed values in the 1993–1996 and the 2013–2016 periods.

Distribution map 2013–2016

For 47 species, we created distribution maps that depict the probability of occurrence per kilometre square rather than the density. These species are comparatively rare, and the records collected during the territory mapping surveys in the kilometre squares were insufficient to produce density maps. Data was sourced from the territory mapping surveys as well as from the complete species lists and the individual observations recorded by the Ornithological Institute's volunteer collaborators (registered members of the Ornithological Information Service) [AN1]. As we did not model density, but only occurrence (presence/absence), we reduced the territory mapping data to presence/absence data (values >1 were set to 1). Thus, we only considered whether a species was detected during a visit or not. The complete species lists also gave us information about each species' presence/absence. For the individual observations, we constructed absences as described in Kéry et al. [6]: for example, if a volunteer collaborator reported a Eurasian Sparrowhawk but no Middle Spotted Woodpecker, this was considered an absence record for the Middle Spotted Woodpecker. Only the species in the reporting categories A and B (scarce species) could be treated in this way; regarding species in category C (widespread species), we were confined to data from the territory mapping surveys and the complete species lists (for definitions of reporting categories, see Schmid et al.) [AN1]. Using these three types of data (territory mapping surveys, complete species lists and individual observations) allowed us to combine the advantages of each data set: the territory mapping surveys ensured

that geographic distribution was adequate and covered the various habitats, while the species lists and individual observations greatly increased spatial coverage.

For seven wetland species (Little Grebe, Common Little Bittern, Western Water Rail, Common Moorhen, Common Grasshopper-warbler, Savi's Warbler and Great Reed-warbler) we also included data collected during the survey visits for the wetland monitoring scheme[AN1] as presence/absence data. Because access to some of the most important wetlands is restricted in spring due to their status as protected sites, they are underrepresented in the other data sources.

The same 16 environmental variables used for the density maps again served as explanatory variables. As for the density maps, we pared down the set of environmental variables for certain species, modelled the spatial autocorrelation with penalised 2D splines, and set occurrence to zero in all kilometre squares above a species-specific altitude limit. We chose a site-occupancy model for the analysis[7]. Like in the binomial mixture model, this approach allowed us to include detection probability. Detection probability was estimated separately for each data type (territory mapping surveys, complete species lists and individual observations). Like in the density maps, the spatial unit for modelling was one kilometre square. For each kilometre square in Switzerland, we thus estimated the probability of a species occurring there as a breeding bird.

In most cases, we depicted the occurrence probability estimated by the model. In some cases, we showed the «realised occurrence», which results from a combination of model estimate and raw data. In practice, it means that an area where a species was recorded was always shown as occupied, regardless of whether the model estimated a high occurrence probability or not. If an area had yielded no records, then realised occurrence corresponded to the occurrence probability estimated by the model. On the one hand, we used this approach for species like the Woodlark, where a large part of the population was actually found and recorded by observers. On the other hand, we applied it to various wetland species, because many wetlands are frequently visited by ornithologists, or because the wetland monitoring scheme provides a good level of coverage and the likelihood of detecting the species present is therefore high.

Similar to the density maps, the values were slightly smoothed for presentation.

Distribution change map

We were able to generate distribution change maps for 21 species, most of them scarce. In order to produce an estimate of the species-specific occurrence probability per kilometre square for the 1993–1996 survey period as well, we used data collected in 1993–1996 in territory mapping surveys, complete species lists and individual observations, analysing them with a site-occupancy model.

For 608 of the 2934 territory maps produced in 1993–1996, the results of all survey visits were transferred from paper to digital form. For these areas, repeated records within the same season were now available, allowing us to estimate detection probability using a site-occupancy model. For a large portion of the 1993–1996 surveys, however, we only knew whether a species had been detected at some point during the three visits or not. In order to include this data type in the analysis, we expanded the site-occupancy model as follows: if a species had not been recorded, it was either absent or had remained undetected three times. This occurs at a probability of $(1-p)^3$, where p is a species' detection probability during a visit, estimated based on the 608 digitised maps. Using the various types of data available to us, we were thus able to determine the occurrence probability per kilometre square for the 1993–1996 period.

As we had done for the density change maps, we smoothed the occurrence probability estimates using a 3×3 km matrix, then calculated the difference between the smoothed values for 1993–1996 and 2013–2016.

Distribution map based on density estimate

For widespread species with large territories, we often had enough records from territory mapping in the kilometre squares to produce a density map. However, the resulting density tended to be too high, because observers had often counted birds whose territories lay mostly beyond the limits of the kilometre square. For Black Kite, Eurasian Buzzard, Common Kestrel, Black Woodpecker and Common Raven as well as for the non-territorial Black Grouse, we therefore decided to convert the density estimates to estimates of occurrence probability using the formula $v = 1 - e^{-N}$, where N corresponds to the estimated number of territories per kilometre square and v to the derived occurrence probability[16]. For these six species, we depicted the distribution in 2013–2016 and the change since 1993–1996 based on the data thus transformed.

Point map 2013–2016

The distribution of 77 rare species and colony breeders was represented using a point map. The underlying data set was made up of the results of territory mapping surveys in the kilometre squares, complete species lists and individual observations as well as special surveys (e.g. territory mapping surveys for the wetland monitoring scheme, data from the Rook monitoring programme). Based on this data, we calculated the number of territories or breeding pairs per site and year. A point on the map corresponds to the number of territories or breeding pairs per spatial unit, averaged across the 2013–2016 period. For colonial species, the spatial unit is a colony. In settlements, we generally summarised the data for a whole town or district. In the case of waterbirds, the spatial unit was a lake or pond or a stretch along the shore of a river or large lake. For very rare species, we plotted a point if the species was recorded at a site with a sufficiently high Atlas Code in at least one year during 2013–2016.

Point change map

We produced point change maps for 21 species showing the change in the number of territories or breeding pairs per spatial unit. This was only possible for those species for which we knew the location and average number of breeding pairs in each colony or breeding site for the 1993–1996 survey period. The location of colonies or breeding sites in 1993–1996 was often uncertain. To account for this uncertainty and to improve legibility, sites that were very close together were combined into one point on the point change map. Certain sites depicted on the point map are therefore not displayed separately on the point change map.

Altitude chart

Besides geographical distribution, the 2013–2016 atlas also illustrates each species' distribution along the altitudinal gradient. To this effect, we divided the data shown on the maps into 100-m altitude bands. We summed up the estimated occurrence information per level and divided it by the total for the whole of Switzerland. This gave us the proportion of the total population per altitude level, which we then plotted on the altitude charts.

For many species, we were also able to display the change in altitudinal distribution. For each altitude level, we calculated the difference between the figures in 1993–1996 and in 2013–2016. We then divided this figure by the Swiss total in 2013–2016. This gave us the relative change in numbers per altitude level as a proportion of the total for the 2013–2016 period. The result was displayed on the right hand side of the altitude charts. In this approach, the length of the bars on the two graphs is directly comparable. The altitudinal distribution for 1993–1996 can be elicited simply by subtracting the gains from the current status or by adding the losses.

The change in altitudinal distribution could only be shown for those species for which there was a large amount of data from 1993–1996. Where this was not the case, we provide only the current altitudinal distribution.

Validation

The maps and altitude charts were reviewed by various species experts. If the result was not satisfactory, we tried to improve the estimates by adjusting the selection of environmental variables, giving special consideration to the species' ecological requirements. If no improvement was achieved, we took a more conservative approach. Where it was not possible to produce a satisfactory density map, we generated a distribution map. If the distribution map was inadequate, we used the raw data to represent the distribution at atlas-square resolution. We used this approach to represent the current status in 2013–2016 and the change since 1993–1996.

The models were often unable to correctly estimate a species' upper distribution limit, as the surface area – and with it the amount of available data – decreases rapidly with increasing altitude. Incorrect estimates were particularly apparent in the altitude chart. In such cases we manually set the density or the occurrence probability to zero beyond a certain altitude limit.

Software

We processed the data in R 3.3.2 [12]. For statistical analysis, we used JAGS 4.2.x [9]. Data for the point maps were processed in QGIS [11].

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[1] Bossard et al. (2000); [2] Bundesamt für Landestopografie (2007); [3] Bundesamt für Statistik (2014); [4] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [5] Kammann & Wand (2003); [6] Kéry et al. (2010); [7] MacKenzie et al. (2002); [8] Péron et al. (2011b); [9] Plummer (2016); [10] Press et al. (1996); [11] QGIS Development Team (2017); [12] R Core Team (2016); [13] Rihm & Achermann (2016); [14] Royle (2004); [15] Swisstopo (2005); [16] Wright (1991)

Species richness per kilometre square and per atlas square

We estimated species richness per kilometre square and atlas square as the total number of species observed or estimated by modelling. In addition, we estimated the difference in the number of species per kilometre square and atlas square between 1993–1996 and 2013–2016. This approach allowed us to represent both the current state of species richness and its change since the last atlas.

Besides the distribution and density maps for each species, we also generated maps showing the number of species per kilometre square or atlas square and its change since 1993–1996. Depending on the map type, we used either the recorded observations (including observations made during the territory mapping surveys) or the modelled species maps. As it was not possible to model the change in occurrence for all species, only a part of all breeding bird species was taken into consideration.

Number of species per kilometre square

We produced either a modelled density or distribution map for 128 species. For species with a density map, we first converted the density per kilometre square into an occurrence probability using the formula $v = 1 - e^{-N}$ by Wright[1], where *N* corresponds to the estimated number of territories per kilometre square and *v* to the derived occurrence probability. A point map was generated for a further 77 rare or colonial species based on records from a range of data sources. In these cases, the occurrence probability per kilometre square was considered equal to 1 or 0, depending on whether the species occurred in the square or not. We then added the occurrence probability per kilometre square for all 205 species to arrive at an estimate of the number of species for each kilometre square.

The focus texts contain maps showing the number of species per kilometre square for a certain group of species (e.g. meadow birds). These maps were produced using the same approach.

Change in the number of species per kilometre square

For 97 species, we were able to produce modelled density or distribution maps for both the 2013–2016 and the 1993–1996 period. This in turn allowed us to determine the change in occurrence probability in each kilometre square for these species. Where density maps were involved, we started by converting the density estimates into estimates of occurrence probability using the above-mentioned formula[1]. For a further 21 species (mainly rare and colonial species) we produced a point change map based on the individual observations recorded during the two atlas periods. For these species too, we were able to identify every kilometre square in which they were newly recorded or from which they disappeared. Finally, we estimated the change in the number of species per kilometre square by adding up the changes per square for all 118 species included in the sample.

As far as the remaining species are concerned, no reliable calculation of the change at kilometre-square resolution was possible, as the data set from the 1993–1996 period was insufficient. These species could therefore not be taken into account.

Number of species per atlas square

Besides the number of species per kilometre square, we also show the number of species per atlas square. To do this, we simply added up the number of species found in each atlas square, as long as there were records that met the species-specific inclusion criteria. Unlike the species number per kilometre square, the species number per atlas square is not based on modelled data, but corresponds to the actual number of species observed. As some species may have been overlooked, the produced value should be considered a conservative minimum estimate.

Change in species richness per atlas square based on the modelled data

As mentioned above, we were able to model the occurrence of 97 species for both the 2013–2016 and the 1993–1996 periods. Based on these results, we were able to estimate both the change per kilometre square and the change per atlas square for each species. To do this, we determined the occurrence probability per atlas square for both periods using the following formula:

$$v.aq = 1 - \prod_{(kq=1)}^{100} (1 - v[kq])$$

v[kq] corresponds to the estimated occurrence probability per kilometre square, while *v.aq* corresponds to the occurrence probability for the entire atlas square. In the case of density maps, the density estimate per kilometre square was first converted into an estimate of occurrence probability using the above-mentioned formula[1]. If an atlas square contains at least one kilometre square with a high density or occurrence probability, the estimate for the entire atlas square will therefore be close to 1, or 100 %. If none of the kilometre squares hold substantial populations, the estimate for the entire square will be close to 0. Using this approach, we were also able to calculate the difference in occurrence probability between the 1993–1996 and the 2013–2016 period for each of the 97 species. For 21 species, we generated a point change map based on the individual observations. For these species too, we were able to determine the atlas squares where they had either been newly recorded or where they had no longer been found. Finally,

we added up the changes for each atlas square across all 118 species to arrive at an estimate of the change in species richness per atlas square.

Regarding the remaining species, for which there were no results at the kilometre-square level, we could have calculated the change in occurrence per atlas square based on the observations from the two atlas periods. However, the results were influenced by the massive increase in observer effort in 2013–2016 compared to 1993–1996, so we chose not to include these species. We believe that this approach has yielded a fairly accurate estimate of the gains and losses in species richness per atlas square.

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[1] Wright (1991)

The table shows which species were included when producing the various maps to illustrate the state of species richness in 2013–2016 as well as the change in species richness between 1993–1996 and 2013–2016: 0 = species not included, 1 = species included, 1+ = several subspecies and/or hybrids were combined into one species.

		State in 2013–2016		Change between 1993–1996 and 2013–2016		
English name	**Scientific name**	**Kilometre square**	**Atlas square, raw data**	**Kilometre square**	**Atlas square, modelled**	**Atlas square, raw data**
Common Quail	*Coturnix coturnix*	1	1	1	1	1
Rock Partridge	*Alectoris graeca*	1	1	1	1	1
Common Pheasant	*Phasianus colchicus*	1	1	0	0	1
Grey Partridge	*Perdix perdix*	1	1	1	1	1
Hazel Grouse	*Bonasa bonasia*	1	1	1	1	1
Rock Ptarmigan	*Lagopus muta*	1	1	1	1	1
Western Capercaillie	*Tetrao urogallus*	1	1	0	0	1
Black Grouse	*Lyrurus tetrix*	1	1	1	1	1
Black Swan	*Cygnus atratus*	0	0	0	0	0
Mute Swan	*Cygnus olor*	1	1	0	0	1
Barnacle Goose	*Branta leucopsis*	0	0	0	0	0
Canada Goose	*Branta canadensis*	0	0	0	0	0
Greylag Goose	*Anser anser*	1	1	1	1	1
Common Eider	*Somateria mollissima*	1	1	0	0	1
Common Goldeneye	*Bucephala clangula*	0	1	0	0	1
Goosander	*Mergus merganser*	1	1	0	0	1
Red-breasted Merganser	*Mergus serrator*	1	1	0	0	1
Egyptian Goose	*Alopochen aegyptiaca*	1	1	0	0	1
Common Shelduck	*Tadorna tadorna*	1	1	0	0	1
Ruddy Shelduck	*Tadorna ferruginea*	1	1	0	0	1
Muscovy Duck	*Cairina moschata*	0	0	0	0	0
Wood Duck	*Aix sponsa*	0	0	0	0	0
Mandarin Duck	*Aix galericulata*	1	1	0	0	1
Red-crested Pochard	*Netta rufina*	1	1	1	1	1
Common Pochard	*Aythya ferina*	1	1	0	0	1
Ferruginous Duck	*Aythya nyroca*	1	1	0	0	1
Tufted Duck	*Aythya fuligula*	1	1	1	1	1
Garganey	*Spatula querquedula*	1	1	0	0	1
Northern Shoveler	*Spatula clypeata*	1	1	0	0	1
Gadwall	*Mareca strepera*	1	1	0	0	1

		State in 2013–2016		Change between 1993–1996 and 2013–2016		
English name	**Scientific name**	**Kilometre square**	**Atlas square, raw data**	**Kilometre square**	**Atlas square, modelled**	**Atlas square, raw data**
Mallard	*Anas platyrhynchos*	1	1	1	1	1
White-cheeked Pintail	*Anas bahamensis*	0	0	0	0	0
Northern Pintail	*Anas acuta*	0	1	0	0	1
Common Teal	*Anas crecca*	1	1	0	0	1
Little Grebe	*Tachybaptus ruficollis*	1	1	0	0	1
Red-necked Grebe	*Podiceps grisegena*	0	1	0	0	1
Great Crested Grebe	*Podiceps cristatus*	1	1	0	0	1
Black-necked Grebe	*Podiceps nigricollis*	1	1	0	0	1
Rock Dove	*Columba livia*	1	1	0	0	1
Stock Dove	*Columba oenas*	1	1	1	1	1
Common Woodpigeon	*Columba palumbus*	1	1	1	1	1
European Turtle-dove	*Streptopelia turtur*	1	1	1	1	1
Eurasian Collared-dove	*Streptopelia decaocto*	1	1	1	1	1
European Nightjar	*Caprimulgus europaeus*	1	1	0	0	1
Alpine Swift	*Tachymarptis melba*	1	1	1	1	1
Pallid Swift	*Apus pallidus*	1	1	0	0	1
Common Swift	*Apus apus*	1	1	1	1	1
Common Cuckoo	*Cuculus canorus*	1	1	1	1	1
Western Water Rail	*Rallus aquaticus*	1	1	0	0	1
Corncrake	*Crex crex*	1	1	0	0	1
Spotted Crake	*Porzana porzana*	1	1	0	0	1
Little Crake	*Zapornia parva*	1	1	0	0	1
Baillon's Crake	*Zapornia pusilla*	1	1	0	0	1
Common Moorhen	*Gallinula chloropus*	1	1	0	0	1
Common Coot	*Fulica atra*	1	1	0	0	1
White Stork	*Ciconia ciconia*	1	1	1	1	1
Eurasian Bittern	*Botaurus stellaris*	0	1	0	0	1
Common Little Bittern	*Ixobrychus minutus*	1	1	0	0	1
Black-crowned Night-heron	*Nycticorax nycticorax*	1	1	0	0	1
Grey Heron	*Ardea cinerea*	1	1	1	1	1
Purple Heron	*Ardea purpurea*	1	1	1	1	1
Great White Egret	*Ardea alba*	1	1	0	0	1
Little Egret	*Egretta garzetta*	1	1	0	0	1
Great Cormorant	*Phalacrocorax carbo*	1	1	0	0	1
Black-winged Stilt	*Himantopus himantopus*	1	1	0	0	1
Eurasian Dotterel	*Eudromias morinellus*	0	1	0	0	1
Little Ringed Plover	*Charadrius dubius*	1	1	0	0	1
Northern Lapwing	*Vanellus vanellus*	1	1	1	1	1
Eurasian Curlew	*Numenius arquata*	1	1	0	0	1
Black-tailed Godwit	*Limosa limosa*	0	1	0	0	1
Eurasian Woodcock	*Scolopax rusticola*	1	1	0	0	1
Common Snipe	*Gallinago gallinago*	1	1	0	0	1
Common Sandpiper	*Actitis hypoleucos*	1	1	0	0	1
Black-headed Gull	*Larus ridibundus*	1	1	1	1	1
Mediterranean Gull	*Larus melanocephalus*	1	1	1	1	1
Mew Gull	*Larus canus*	1	1	0	0	1
Lesser Black-backed Gull	*Larus fuscus*	1	1	0	0	1
Yellow-legged Gull	*Larus michahellis*	1	1	1	1	1
Common Tern	*Sterna hirundo*	1	1	1	1	1
Arctic Tern	*Sterna paradisaea*	1	1	0	0	1
Common Barn-owl	*Tyto alba*	1	1	0	0	1
Eurasian Pygmy-owl	*Glaucidium passerinum*	1	1	0	0	1
Little Owl	*Athene noctua*	1	1	1	1	1
Boreal Owl	*Aegolius funereus*	1	1	0	0	1

		State in 2013–2016		Change between 1993–1996 and 2013–2016		
English name	**Scientific name**	**Kilometre square**	**Atlas square, raw data**	**Kilometre square**	**Atlas square, modelled**	**Atlas square, raw data**
Eurasian Scops-owl	*Otus scops*	1	1	0	0	1
Northern Long-eared Owl	*Asio otus*	1	1	0	0	1
Tawny Owl	*Strix aluco*	0	1	0	0	1
Eurasian Eagle-owl	*Bubo bubo*	1	1	0	0	1
Osprey	*Pandion haliaetus*	0	1	0	0	1
European Honey-buzzard	*Pernis apivorus*	1	1	1	1	1
Bearded Vulture	*Gypaetus barbatus*	0	1	0	0	1
Short-toed Snake-eagle	*Circaetus gallicus*	0	1	0	0	1
Golden Eagle	*Aquila chrysaetos*	1	1	1	1	1
Western Marsh-harrier	*Circus aeruginosus*	1	1	0	0	1
Hen Harrier	*Circus cyaneus*	0	1	0	0	1
Montagu's Harrier	*Circus pygargus*	0	1	0	0	1
Eurasian Sparrowhawk	*Accipiter nisus*	1	1	0	0	1
Northern Goshawk	*Accipiter gentilis*	1	1	0	0	1
Red Kite	*Milvus milvus*	1	1	0	0	1
Black Kite	*Milvus migrans*	1	1	1	1	1
Eurasian Buzzard	*Buteo buteo*	1	1	1	1	1
Common Hoopoe	*Upupa epops*	1	1	0	0	1
European Bee-eater	*Merops apiaster*	1	1	1	1	1
Common Kingfisher	*Alcedo atthis*	1	1	0	0	1
Eurasian Wryneck	*Jynx torquilla*	1	1	1	1	1
Grey-faced Woodpecker	*Picus canus*	1	1	0	0	1
Eurasian Green Woodpecker	*Picus viridis*	1	1	1	1	1
Black Woodpecker	*Dryocopus martius*	1	1	1	1	1
Three-toed Woodpecker	*Picoides tridactylus*	1	1	0	0	1
Middle Spotted Woodpecker	*Leiopicus medius*	1	1	1	1	1
Lesser Spotted Woodpecker	*Dryobates minor*	1	1	1	1	1
White-backed Woodpecker	*Dendrocopos leucotos*	1	1	0	0	1
Great Spotted Woodpecker	*Dendrocopos major*	1	1	1	1	1
Common Kestrel	*Falco tinnunculus*	1	1	1	1	1
Eurasian Hobby	*Falco subbuteo*	1	1	0	0	1
Peregrine Falcon	*Falco peregrinus*	1	1	0	0	1
Rose-ringed Parakeet	*Psittacula krameri*	0	0	0	0	0
Eurasian Golden Oriole	*Oriolus oriolus*	1	1	1	1	1
Red-backed Shrike	*Lanius collurio*	1	1	1	1	1
Woodchat Shrike	*Lanius senator*	0	1	0	0	1
Red-billed Chough	*Pyrrhocorax pyrrhocorax*	1	1	0	0	1
Yellow-billed Chough	*Pyrrhocorax graculus*	1	1	1	1	1
Eurasian Jay	*Garrulus glandarius*	1	1	1	1	1
Eurasian Magpie	*Pica pica*	1	1	1	1	1
Northern Nutcracker	*Nucifraga caryocatactes*	1	1	1	1	1
Eurasian Jackdaw	*Corvus monedula*	1	1	1	1	1
Rook	*Corvus frugilegus*	1	1	1	1	1
Common Raven	*Corvus corax*	1	1	1	1	1
Carrion or Hooded Crow	*Corvus corone*	1+	1+	1+	1+	1+
Coal Tit	*Periparus ater*	1	1	1	1	1
Crested Tit	*Lophophanes cristatus*	1	1	1	1	1
Marsh Tit	*Poecile palustris*	1	1	1	1	1
Alpine or Willow Tit	*Poecile montanus*	1+	1+	1+	1+	1+
Eurasian Blue Tit	*Cyanistes caeruleus*	1	1	1	1	1
Great Tit	*Parus major*	1	1	1	1	1
Eurasian Penduline-tit	*Remiz pendulinus*	1	1	0	0	1
Greater Short-toed Lark	*Calandrella brachydactyla*	0	1	0	0	1
Woodlark	*Lullula arborea*	1	1	1	1	1

		State in 2013–2016		Change between 1993–1996 and 2013–2016		
English name	**Scientific name**	**Kilometre square**	**Atlas square, raw data**	**Kilometre square**	**Atlas square, modelled**	**Atlas square, raw data**
Eurasian Skylark	*Alauda arvensis*	1	1	1	1	1
Crested Lark	*Galerida cristata*	0	1	0	0	1
Bearded Reedling	*Panurus biarmicus*	1	1	1	1	1
Zitting Cisticola	*Cisticola juncidis*	1	1	0	0	1
Melodious Warbler	*Hippolais polyglotta*	1	1	0	0	1
Icterine Warbler	*Hippolais icterina*	1	1	0	0	1
Moustached Warbler	*Acrocephalus melanopogon*	1	1	0	0	1
Sedge Warbler	*Acrocephalus schoenobaenus*	1	1	0	0	1
Marsh Warbler	*Acrocephalus palustris*	1	1	0	0	1
Common Reed-warbler	*Acrocephalus scirpaceus*	1	1	0	0	1
Great Reed-warbler	*Acrocephalus arundinaceus*	1	1	0	0	1
Savi's Warbler	*Locustella luscinioides*	1	1	0	0	1
River Warbler	*Locustella fluviatilis*	0	1	0	0	1
Common Grasshopper-warbler	*Locustella naevia*	1	1	0	0	1
Northern House Martin	*Delichon urbicum*	1	1	1	1	1
Barn Swallow	*Hirundo rustica*	1	1	1	1	1
Eurasian Crag Martin	*Ptyonoprogne rupestris*	1	1	1	1	1
Collared Sand Martin	*Riparia riparia*	1	1	1	1	1
Western Bonelli's Warbler	*Phylloscopus bonelli*	1	1	1	1	1
Wood Warbler	*Phylloscopus sibilatrix*	1	1	1	1	1
Willow Warbler	*Phylloscopus trochilus*	1	1	1	1	1
Common Chiffchaff	*Phylloscopus collybita*	1	1	1	1	1
Greenish Warbler	*Phylloscopus trochiloides*	1	1	0	0	1
Cetti's Warbler	*Cettia cetti*	1	1	0	0	1
Long-tailed Tit	*Aegithalos caudatus*	1	1	1	1	1
Eurasian Blackcap	*Sylvia atricapilla*	1	1	1	1	1
Garden Warbler	*Sylvia borin*	1	1	1	1	1
Barred Warbler	*Sylvia nisoria*	1	1	0	0	1
Western Orphean Warbler	*Sylvia hortensis*	0	1	0	0	1
Lesser Whitethroat	*Sylvia curruca*	1	1	1	1	1
Subalpine Warbler	*Sylvia cantillans*	0	1	0	0	1
Common Whitethroat	*Sylvia communis*	1	1	1	1	1
Spectacled Warbler	*Sylvia conspicillata*	0	1	0	0	1
Short-toed Treecreeper	*Certhia brachydactyla*	1	1	1	1	1
Eurasian Treecreeper	*Certhia familiaris*	1	1	1	1	1
Eurasian Nuthatch	*Sitta europaea*	1	1	1	1	1
Wallcreeper	*Tichodroma muraria*	1	1	0	0	1
Northern Wren	*Troglodytes troglodytes*	1	1	1	1	1
White-throated Dipper	*Cinclus cinclus*	1	1	1	1	1
Common Starling	*Sturnus vulgaris*	1	1	1	1	1
Mistle Thrush	*Turdus viscivorus*	1	1	1	1	1
Song Thrush	*Turdus philomelos*	1	1	1	1	1
Eurasian Blackbird	*Turdus merula*	1	1	1	1	1
Fieldfare	*Turdus pilaris*	1	1	1	1	1
Ring Ouzel	*Turdus torquatus*	1	1	1	1	1
Spotted Flycatcher	*Muscicapa striata*	1	1	1	1	1
European Robin	*Erithacus rubecula*	1	1	1	1	1
Red-spotted Bluethroat	*Cyanecula svecica svecica*	1	1	0	0	1
Common Nightingale	*Luscinia megarhynchos*	1	1	1	1	1
Red-breasted Flycatcher	*Ficedula parva*	0	1	0	0	1
European Pied Flycatcher	*Ficedula hypoleuca*	1	1	1	1	1
Collared Flycatcher	*Ficedula albicollis*	1	1	0	0	1
Black Redstart	*Phoenicurus ochruros*	1	1	1	1	1
Common Redstart	*Phoenicurus phoenicurus*	1	1	1	1	1

		State in 2013–2016		Change between 1993–1996 and 2013–2016		
English name	**Scientific name**	**Kilometre square**	**Atlas square, raw data**	**Kilometre square**	**Atlas square, modelled**	**Atlas square, raw data**
Rufous-tailed Rock-thrush	*Monticola saxatilis*	1	1	0	0	1
Blue Rock-thrush	*Monticola solitarius*	1	1	0	0	1
Whinchat	*Saxicola rubetra*	1	1	1	1	1
Common Stonechat	*Saxicola torquatus*	1	1	1	1	1
Northern Wheatear	*Oenanthe oenanthe*	1	1	1	1	1
Goldcrest	*Regulus regulus*	1	1	1	1	1
Common Firecrest	*Regulus ignicapilla*	1	1	1	1	1
Alpine Accentor	*Prunella collaris*	1	1	1	1	1
Dunnock	*Prunella modularis*	1	1	1	1	1
House Sparrow	*Passer domesticus*	1	1+	0	0	1+
Italian Sparrow	*Passer italiae*	1	1	0	0	1
Eurasian Tree Sparrow	*Passer montanus*	1	1	1	1	1
White-winged Snowfinch	*Montifringilla nivalis*	1	1	1	1	1
Tree Pipit	*Anthus trivialis*	1	1	1	1	1
Meadow Pipit	*Anthus pratensis*	1	1	1	1	1
Water Pipit	*Anthus spinoletta*	1	1	1	1	1
Tawny Pipit	*Anthus campestris*	1	1	0	0	1
Western Yellow Wagtail	*Motacilla flava*	1+	1+	0	0	1+
Grey Wagtail	*Motacilla cinerea*	1	1	1	1	1
Citrine Wagtail	*Motacilla citreola*	1	1	0	0	1
White Wagtail	*Motacilla alba*	1	1	1	1	1
Common Chaffinch	*Fringilla coelebs*	1	1	1	1	1
Hawfinch	*Coccothraustes coccothraustes*	1	1	1	1	1
Common Rosefinch	*Carpodacus erythrinus*	1	1	0	0	1
Eurasian Bullfinch	*Pyrrhula pyrrhula*	1	1	1	1	1
European Greenfinch	*Chloris chloris*	1	1	1	1	1
Common Linnet	*Linaria cannabina*	1	1	1	1	1
Redpoll	*Acanthis flammea*	1	1	1	1	1
Red Crossbill	*Loxia curvirostra*	1	1	1	1	1
European Goldfinch	*Carduelis carduelis*	1	1	1	1	1
Citril Finch	*Carduelis citrinella*	1	1	1	1	1
European Serin	*Serinus serinus*	1	1	1	1	1
Eurasian Siskin	*Spinus spinus*	1	1	1	1	1
Corn Bunting	*Emberiza calandra*	1	1	1	1	1
Rock Bunting	*Emberiza cia*	1	1	1	1	1
Ortolan Bunting	*Emberiza hortulana*	1	1	0	0	1
Cirl Bunting	*Emberiza cirlus*	1	1	1	1	1
Yellowhammer	*Emberiza citrinella*	1	1	1	1	1
Reed Bunting	*Emberiza schoeniclus*	1	1	0	0	1

Population estimates

We estimated the national population size for all bird species breeding in Switzerland in the 2013–2016 period. Population estimates are given as number of territories or – in the case of rare and colonial species – number of breeding pairs. Various methods were used. A complete count was possible for some species, but in most cases, the estimates are based on extrapolation.

As part of the atlas project, we produced an estimate of the size of the current breeding population for every species. In each case, we calculated a lower and upper confidence limit for the estimate. The approach differed depending on the species, and in many cases, there were several possible options. Thus, most of the specified lower and upper limits are based on the results of various methods, introduced in the following sections.

Complete count

For several rare and colonial species, population size could be determined based on the records from www.ornitho.ch or special monitoring projects (e.g. Great Cormorant, Common Tern, Black-headed Gull, Rook). For species that mainly occur in wetlands, the results from the wetland monitoring scheme [AN1] were supplemented with the records collected in other areas to arrive at an estimate of the total population.

Complete counts were conducted for 64 species; for a further 22 species, the results from well-monitored areas were supplemented with estimates from areas with poorer coverage. In the case of very rare species as well as those monitored on a yearly basis, the upper and lower limits specified in the atlas correspond to the highest and lowest annual count within the 2013–2016 period. In all other cases, they reflect the uncertainty of the estimate.

Extrapolation of results from the territory mapping surveys

Based on the territory mapping data, we used four different methods of extrapolation that vary in complexity. While more complex methods account for a range of influences, they also require a large quantity of data in order to estimate all the parameters included in the model. Simpler methods require fewer data, but they also integrate fewer factors. The extrapolation methods described below were used for about 100 species. Rather than choosing a single method, we often took advantage of the results produced by different analyses to establish a reasonable lower and upper estimate.

1. The simplest method of extrapolation involved dividing the sum of all territories recorded during the surveys by the proportion of the surface area of Switzerland covered by the surveys and extrapolating to 100 % of the surface area. We restricted the surface area to the altitude belt occupied by the species concerned, i.e. we only took into account the area between the lowest and highest altitude at which the species was recorded during the surveys.
2. We analysed the results of the territory mapping surveys using a Poisson regression model and extrapolated the population for the whole of Switzerland, without accounting for detection probability but accounting for the environmental variables (details on p. 68) and spatial auto-correlation.

   While the surveyed areas were selected to be representative of the atlas square in terms of habitats and altitude, certain habitats and their characteristic species may be over- or underrepresented in the sample, which could produce a systematic error in a simple extrapolation. However, the various environmental variables at least partly correct for this possible bias.
3. A further available option is to add up the estimates per kilometre square represented on the density maps across the entire area of Switzerland. These estimates are based on a binomial mixture model [14]. In addition to the factors considered in a normal Poisson regression (environmental variables and spatial autocorrelation), this model also accounts for detection probability, an approach that generally leads to significantly higher population estimates.
4. In a collaboration with the Patuxent Wildlife Research Institute in the United States, Andy Royle also processed the territory mapping data using a spatial capture-recapture model [15]. In addition to the factors accounted for by the binomial mixture model, this approach also estimates and accounts for territory size. The spatial capture-recapture model corrects for the fact that species with small territories or low detection probability are often not found if their territories lie within the kilometre square but far from the survey route. The model also corrects for the fact that species with large territories may be observed within the square even though the centre of their territory lies outside of it. Not taking this circumstance into account can lead to overestimates.

Extrapolation of occurrence-probability estimates

For just under 50 species, we produced a distribution map using a site-occupancy model [12] based on data from the territory mapping surveys as well as the complete species lists and individual observations supplied by the Swiss Ornithological Institute's volunteer collaborators (registered members of the Ornithological Information Service) [AN1]. This resulted in an estimate of occurrence probability for each kilometre square. Adding up the occurrence probability for all of Switzerland produces an estimate of the number of occupied kilometre squares. This value can be used as a basis for the following extrapolations:

1. For species with large territories, we multiplied the estimated number of occupied kilometre squares with large-scale density estimates taken from the literature. This was the approach taken for Eurasian Sparrowhawk and European Honey-buzzard, for example.
2. Species with large territories may be recorded in a kilometre square although the centre of their territory lies outside of the surveyed area. Theoretically, this extends the area covered during the survey of a kilometre square by the species' average territory radius and can result in an overestimation of the total population. We tried to correct for this by dividing the estimated number of occupied kilometre squares by $1 + \text{radius}^2 * \pi + 4 * \text{radius}$, which corresponds to the extended area of the kilometre square. We used information offered in the literature to determine a territory's average radius. This approach served to estimate the populations of Grey-faced Woodpecker and Lesser Spotted Woodpecker, for example.
3. In the case of species with small territories, a single kilometre square may hold several territories. With the help of the survey results, we calculated the relationship between the estimated occurrence probability and the number of recorded territories and were thus able to convert the estimated occurrence probability into a density estimate for every kilometre square. We then added up these density estimates across the whole of Switzerland. Population estimates for Rock Partridge and Meadow Pipit, for example, were produced using this approach.

Extrapolation of regional population estimates

Fairly accurate population estimates exist in some areas of Switzerland with a precisely defined perimeter as well as in Liechtenstein for certain species, species groups, or even all breeding birds that occur in that area. These estimates were established in special monitoring schemes or in regional atlas projects. We used them to calculate a population estimate for all of Switzerland applying the rule of three with the help of the following formula:

$$N_{CH} = N_{reg} / occ_{reg} * occ_{CH}$$

N_{reg} corresponds to the regional population estimate, and occ_{reg} to the sum of the occurrence probabilities estimated within the project perimeter using a site-occupancy model. Occ_{CH} is the sum of the occurrence probabilities for all of Switzerland. N_{CH} corresponds to the resulting population estimate for all of Switzerland. For certain species, we replaced the estimated occurrence probability with the estimated density, calculated using a binomial mixture model.

Name	Species included	Reference code
Bodensee-Brutvogelatlas, 2010–2012	all	AtBo
Atlas des oiseaux nicheurs du canton de Genève	all	AtGE
Brutvogelatlas des Fürstentums Liechtenstein	all	AtFL
Les oiseaux nicheurs du canton de Neuchâtel	all	AtNE
Brutvogelbestände im Kanton Zürich 2008 und Veränderungen seit 1988	all	AtZH
Les oiseaux de Haut-Intyamon	all	2
Les oiseaux du Pays-d'Enhaut	all	3
Die Vogelwelt der Aareebene westlich von Solothurn, 1980–2016	all	7
Monitoring Grosses Moos BE/FR	species of open landscapes	6
Monitoring agricultural areas of Basel-Landschaft	species of open landscapes	13
Monitoring Klettgau SH	species of open landscapes	11
Monitoring Rhine Valley in the Canton of St. Gallen	species of open landscapes	19
Monitoring Grande Cariçaie	wetland species	1
Rock Ptarmigan census	Rock Ptarmigan	10
Black Grouse census	Black Grouse	10
Monitoring Boreal Owl in the western Jura	Boreal Owl	9
Monitoring Northern Long-eared Owl in the Reuss Valley AG/ZG/ZH	N. Long-eared Owl	4
Monitoring Northern Long-eared Owl in Wauwiler Plain LU	N. Long-eared Owl	5
Population survey Northern Long-eared Owl in the western Plateau	N. Long-eared Owl	8
Monitoring Northern Goshawk in eastern Switzerland	Northern Goshawk	17
Red Kite project	Red Kite	16
Monitoring Eurasian Hobby in the Canton of Fribourg	Eurasian Hobby	18

Atlas projects and monitoring schemes used in the extrapolation of regional population estimates.

In general, we chose this approach when none of the other methods yielded satisfactory results. Northern Goshawk and Northern Long-eared Owl are examples of two species whose population estimates were produced using this approach.

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[1] Antoniazza (2018); [2] Beaud & Beaud (2018); [3] Beaud et al. (1995); [4] Birrer (2001); [5] Birrer (2017); [6] Birrer et al. (2016); [7] Christen (2017b); [8] Henrioux (1999); [9] Henrioux (2017); [10] Isler & Bossert (2015); [11] Jenny (2018); [12] MacKenzie et al. (2002); [13] Martinez & Birrer (2017); [14] Royle (2004); [15] Royle et al. (2011); [16] Scherler (2017); [17] Schlosser & Schlosser (2013); [18] Vigneau & Duc (2001); [19] Willi et al. (2016)

Trends in species richness and population numbers

Number of breeding bird species

In 2013–2016, Switzerland accommodated 210 species of breeding birds. Between 8 and 140 species were found per atlas square. At low and medium altitudes, between 40 and 50 breeding bird species occupy each kilometre square; above the tree line, significantly fewer species occur.

In 2013–2016, 210 species bred or attempted to breed in Switzerland. A further six species bred in neighbouring countries close to the Swiss border, but still within the atlas perimeter.

Number of species per atlas square in 2013–2016
The number of breeding bird species found per atlas square (10 × 10 km) ranges from eight (65/15 Finsteraarhorn) to 140 (55/13 Vouvry). The most species-rich atlas squares are located all over Switzerland. In many cases, these squares contain nature reserves (mostly wetlands) and/or span a large altitudinal gradient. Besides atlas squares in the Rhone and Rhine Valleys, areas around Lakes Neuchâtel, Thun, Constance, Zurich and Lago Maggiore are particularly rich in species. When comparing the different biogeographical regions, the Jura comes out on top with an average of about 100 species per atlas square. On the Central Plateau and in the northern Alps, 97 species were found on average per atlas square, and 85 in the central Alps. The southern Alps present a mixed picture. In general, species richness declines with increasing altitude. The lowest species numbers are found in atlas squares high up in the mountains.

Number of species per kilometre square in 2013–2016
The highest species numbers per kilometre square (1 × 1 km) are found in lowland wetlands. Based on the modelled data and the point maps, 70 species of breeding birds per kilometre square occur in the Fanel BE/NE on Lake Neuchâtel; other wetlands accommodate a similarly high number of species. More than 50 species per kilometre square are found in the Ajoie JU and in Lower Engadine GR. Squares in the Jura and on the Central Plateau generally hold 40 to 50 species in areas without wetlands. In southern Ticino, the number of species per kilometre square tends to be lower than in the lowlands north of the Alps. Urban centres such as Zurich or Basel show somewhat lower species numbers than the surrounding area. Above the tree line, species richness declines rapidly.

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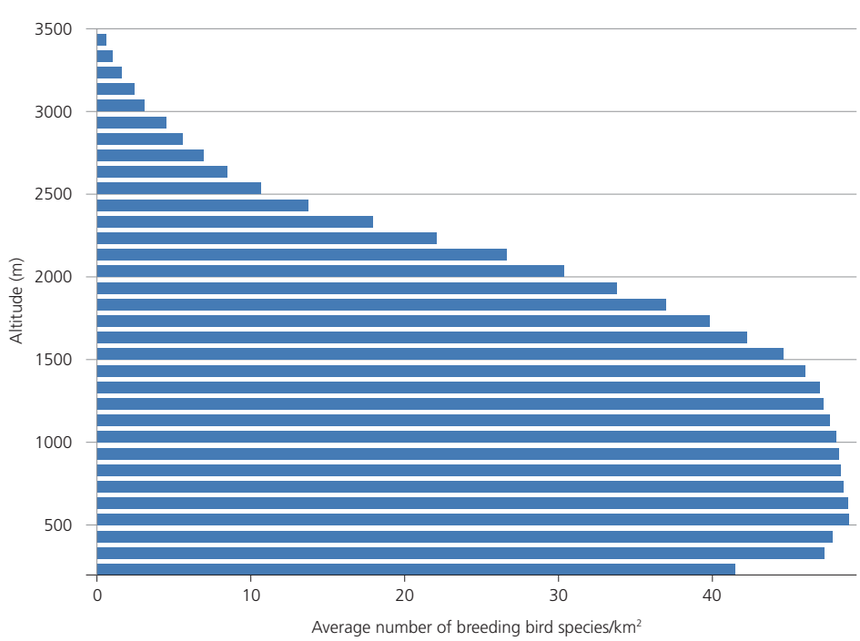
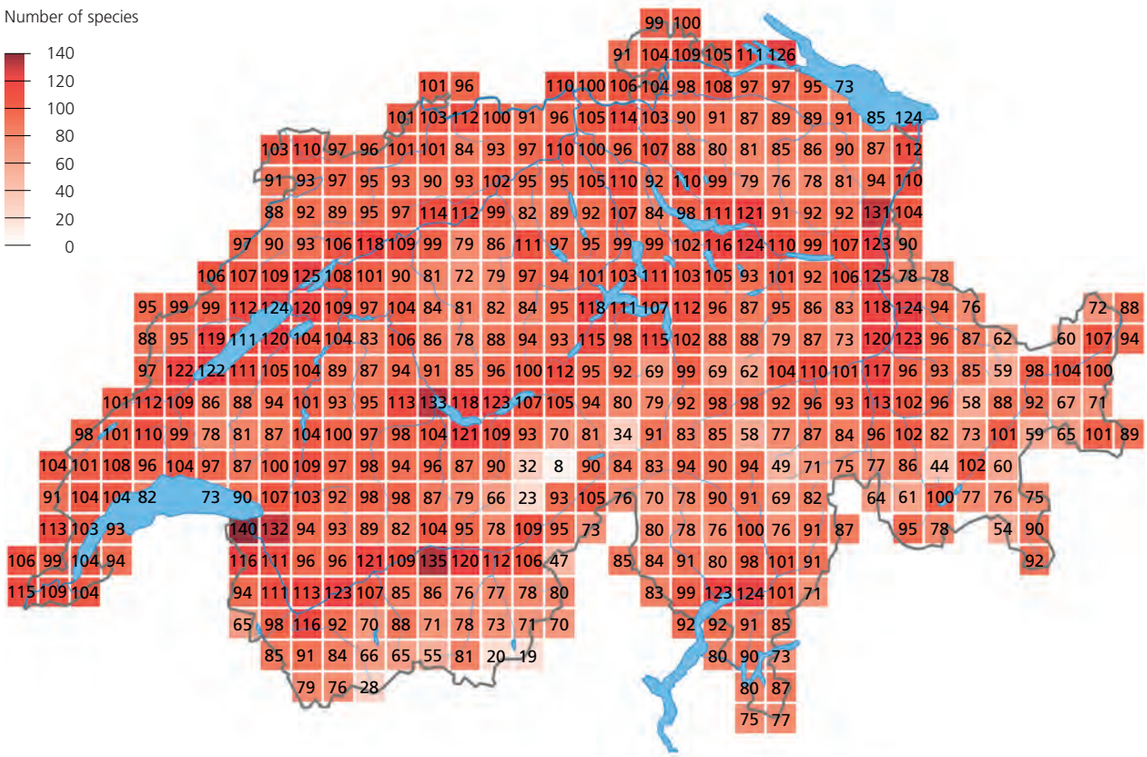


Average number of breeding bird species per kilometre square for each altitude level in 2013–2016. Kilometre squares containing only water were not included.



Number of breeding bird species per atlas square (10 × 10 km) in 2013–2016.

Number of breeding bird species per kilometre square (1 × 1 km) in 2013–2016. The map is based on the modelled density and probability-of-occurrence maps and on the point maps. The sample includes 204 out of 210 breeding bird species.

Population numbers

Adding the estimated number of breeding pairs or territories in Switzerland for all species yields a total of just over ten million. About half of all birds breed below 1000 m. Urban and woodland areas accommodate the most breeding birds. The highest numbers of breeding pairs per kilometre square are found in areas that host large colonies.

Based on population estimates for each species, about ten million pairs breed – or at least occupy a territory – in Switzerland every year. The ten most common species account for about half of all breeding pairs (Common Chaffinch, Eurasian Blackcap, European Robin, Eurasian Blackbird, Northern Wren, House Sparrow, Coal Tit, Great Tit, Common Firecrest and Goldcrest). The two most abundant species – Common Chaffinch and Eurasian Blackcap – together have a combined population of about two million pairs.

Population numbers per atlas square in 2013–2016

Based on the point maps, the density and the occurrence estimates for each species, we calculated the number of breeding pairs per atlas square (10 × 10 km). Only atlas squares with at least 50 % of their area in Switzerland and Liechtenstein were included. The highest population densities were generally found in atlas squares with a lot of settlement areas. Settlements accommodate many colonial species or species that gather in flocks, such as Rook, feral pigeon or House Sparrow. Together with the often large numbers of common songbirds, breeding-pair density can reach remarkable levels. Moreover, settlement areas in urban centres are often adjacent to woodland, while farmland, where species richness tends to be low, is scarce.

Population numbers per kilometre square in 2013–2016

The highest numbers of breeding pairs are found in kilometre squares (1 × 1 km) with large colonies (Rooks, gulls). This is the case in the cities of Basel or Bern, for example, and as many as 1000 pairs breed in one kilometre square in the Fanel nature reserve BE/NE. In general, high territory numbers occur in low-altitude squares with large areas of settlements or woodland, reaching 500, sometimes even 600 pairs/km². Above 1500 m, numbers rapidly decrease, with about 100 pairs/km² on average at 2000 m. Few birds breed above 3000 m.

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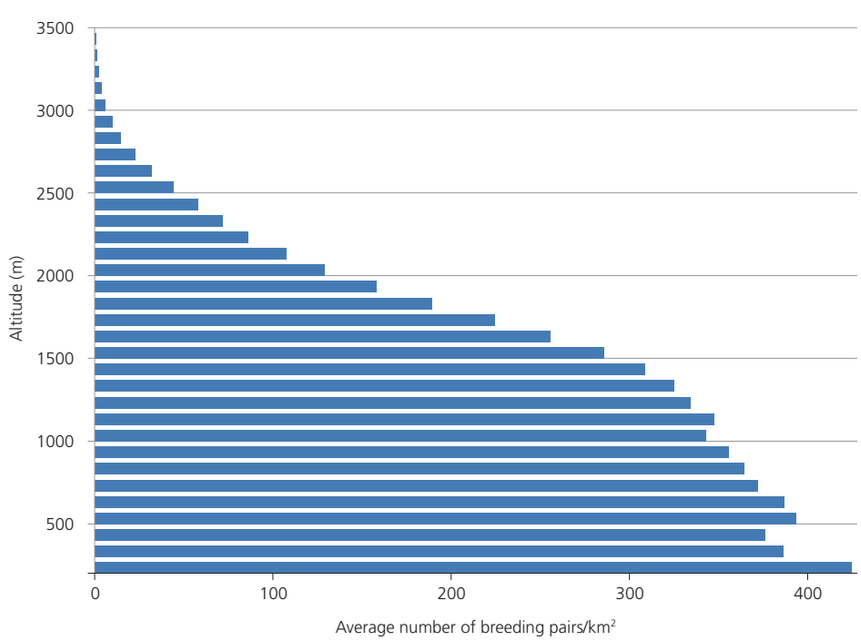
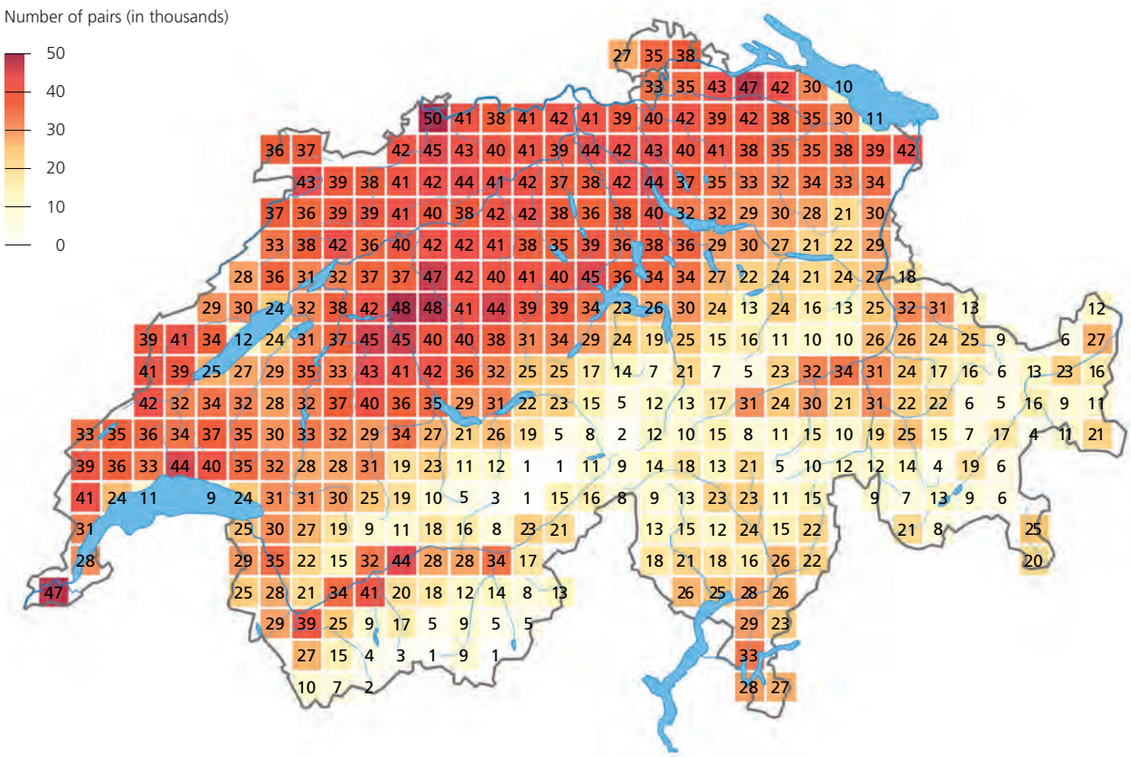
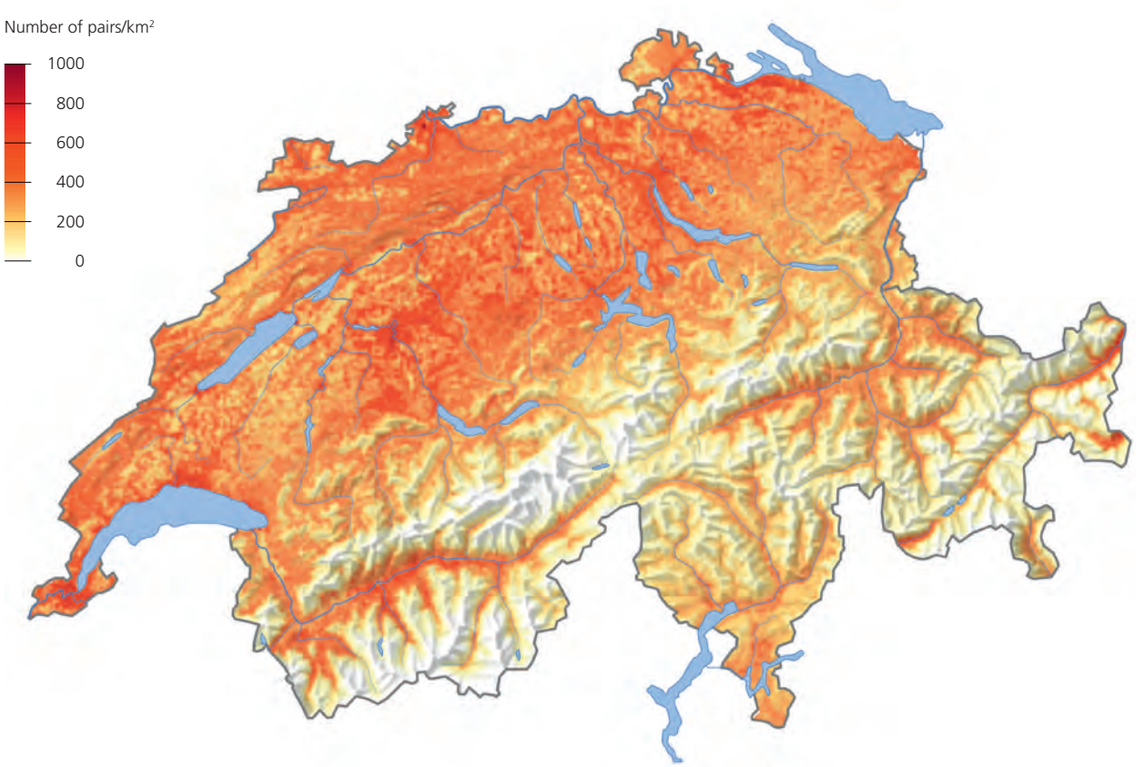


Average number of breeding pairs per kilometre square for each altitude level in 2013–2016.



Estimated number of breeding pairs per year and per atlas square (10 × 10 km) in 2013–2016, in thousands of pairs.



Estimated number of breeding pairs per kilometre square (1 × 1 km) in 2013–2016.

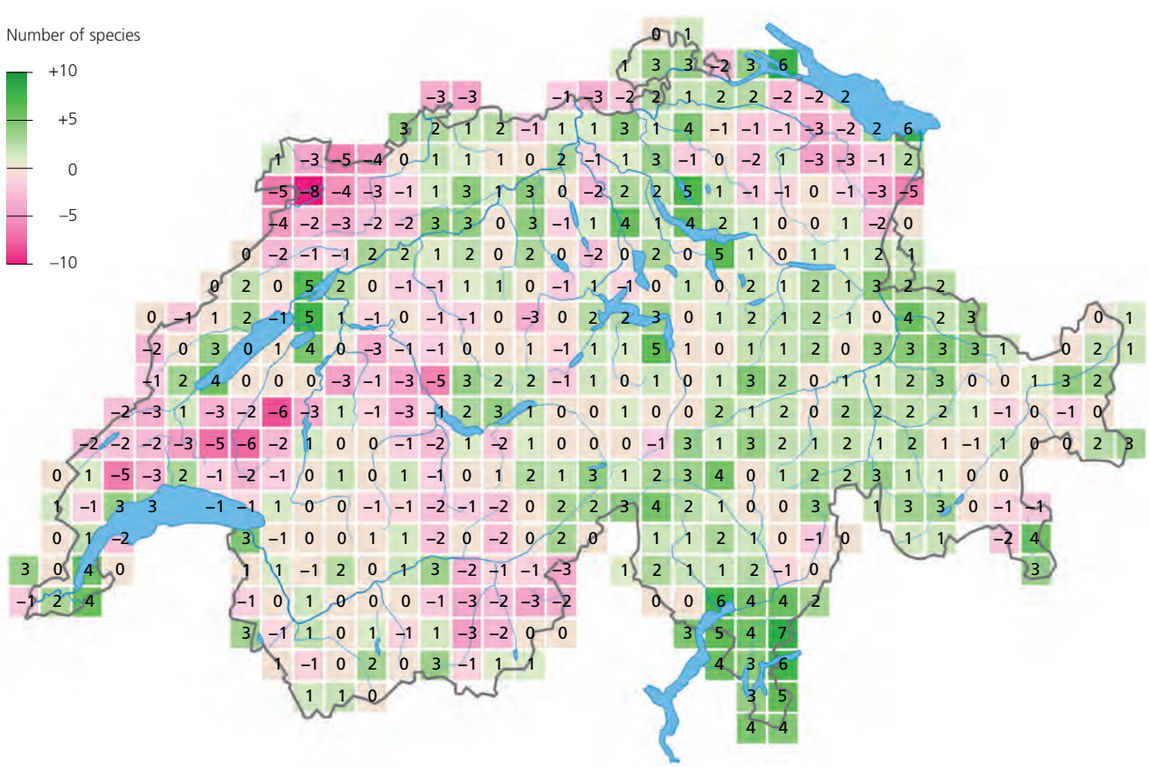
Change in species richness between 1993–1996 and 2013–2016

There are marked regional differences in the change in species richness. In Switzerland overall, the number of breeding bird species increased between 1993–1996 and 2013–2016. The average number of species per atlas square is also slightly higher. At the kilometre-square level, gains and losses are fairly balanced.

Regional patterns of change in species richness between 1993–1996 and 2013–2016 differ depending on the spatial scale. This is hardly surprising, as different factors influence the overall picture at each level of resolution (kilometre square or atlas square). For example:

- The isolated, widely dispersed new records for the White Stork mainly affect results at the atlas-square level (10 × 10 km).
- Large-scale increases or declines like the decline of the Wood Warbler are more visible at the kilometre-square level (1 × 1 km). As long as there are a few remaining populations, the species will not disappear at atlas-square resolution.
- When formerly common species like the Eurasian Skylark not only decline in number but actually disappear from large areas, the change is visible at both levels of resolution.
- Species that are closely associated with deciduous trees, such as the Eurasian Blue Tit, are gradually occupying new areas in the Alpine valleys. This trend is apparent at kilometre-square resolution. If the newly occupied areas are at some distance from existing populations, the number of occupied atlas squares increases as well.
- A further phenomenon is not visible on either map: if a widespread species shows a slight increase or decline in numbers (without disappearing completely), there is no change in species richness per kilometre square or atlas square.

The maps presented below are based solely on data of species for which a modelled change map (density or occurrence) or a point change map could be generated. Species for which changes were only recorded at atlas-square resolution were not included. We chose this approach because we assume that increased observer effort compared to 1993–1996 (about six times higher) has led to more complete species sets in the atlas squares and that an overall comparison of the two atlas periods would present too optimistic a picture. In the case of the modelled maps, in contrast, we were able to correct for the increase in effort. The point change maps are not affected by the bias either, as only species were included whose breeding sites were already fully surveyed in 1993–1996. We were thus



Change in the number of species per atlas square (10 × 10 km) between 1993–1996 and 2013–2016. The map is based on the modelled change maps and point change maps for each species; the sample includes 118 out of 210 breeding bird species.

Change in the number of species per kilometre square (1 × 1 km) between 1993–1996 and 2013–2016. The map is based on the modelled change maps and point change maps for each species; the sample includes 118 out of 210 breeding bird species.

able to make sure that the results presented here are not biased by the increase in observer effort.

Change in species richness in Switzerland

In total, the 2013–2016 atlas surveys recorded 13 breeding bird species more in Switzerland than in 1993–1996. 17 species that had not bred in Switzerland in 1993–1996 were newly recorded as breeding birds. These are Great Cormorant, Common Shelduck, Purple Heron, Great White Egret, Little Egret, Bearded Vulture, Short-toed Snake-eagle, Baillon's Crake, Eurasian Dotterel, Black-winged Stilt, Arctic Tern, Moustached Warbler and Greenish Warbler as well as the following escapes from captivity: Barnacle Goose, Canada Goose, Muscovy Duck and White-cheeked Pintail. In the case of Little Egret and Black-winged Stilt, the breeding attempts were unsuccessful. Black-crowned Night-heron, Eurasian Curlew, Western Orphean Warbler and Woodchat Shrike no longer bred in Switzerland in 2013–2016.

Change in species richness per atlas square

The changes per atlas square between 1993–1996 and 2013–2016 range between losses of up to eight species and gains of up to six species. In Switzerland overall, an average increase of 0.5 species per atlas square was recorded.

In Ticino, the increase in the number of species per atlas square is quite striking. The increase is mainly driven by the spread of species that were already common in the rest of the country, such as Mallard, Eurasian Collared-dove or Eurasian Magpie. Species richness has also increased in some parts of the Central Plateau. Most cases relate to atlas squares that contain wetlands or waterbodies. New species detected in these atlas squares include, for example, Goosander, Red-crested Pochard, Common Nightingale or Yellow-legged Gull. Common Stonechat and Middle Spotted Woodpecker as well as colony breeders like Rook or Alpine Swift were also newly recorded in several atlas squares on the Central Plateau. Gains were also observed in easterly regions of the northern Alps. New species in this area include, for example, Tufted Duck, Stock Dove or Rock Bunting, as well as the White Stork in the valley bottoms.

The steepest declines in the number of species per atlas square were recorded in agricultural areas in western Switzerland. The losses in western Switzerland and the Lake Constance area were mainly caused by the large-scale

disappearance of farmland birds such as Northern Lapwing, Eurasian Skylark, Whinchat or Corn Bunting. In many other atlas squares on the Central Plateau, these species had already disappeared prior to 1993–1996. Species richness per atlas square has also declined somewhat in the Upper Valais, where several species that were already scarce in 1993–1996 have disappeared from large areas, including Spotted Flycatcher, Hawfinch and Corn Bunting.

Change in species richness per kilometre square

In Switzerland as a whole, the average number of species per kilometre square remained largely unchanged between 1993–1996 and 2013–2016. There are, however, marked regional differences. The gains in Ticino and parts of Grisons and the losses in the western part of the Central Plateau and in parts of the Upper Valais, which are also visible at the atlas-square level, are particularly striking. At kilometre-square resolution, species richness has also decreased in large parts of northern Switzerland and in easterly regions of the northern Alps.

The drop in species richness was mainly caused by declines in widespread species of long-distance migrants, like Wood Warbler and Spotted Flycatcher. In addition, several birds of open landscapes have lost ground, such as Red-backed Shrike and Whinchat. Finally, a striking number of finches have experienced local declines or even disappeared completely, including species with very different habitat requirements such as Citril Finch, Common Linnet and Eurasian Bullfinch. The gains are in part related to the spread to higher altitude of common woodland species like tits or thrushes. In addition, several species have colonised new areas at a large scale, for example Common Woodpigeon or various corvids. Finally, the population increase of Eurasian Magpie and Mallard in Ticino is apparent at both atlas-square resolution and kilometre-square resolution. Other species common in the rest of Switzerland, like the Song Thrush, have increased at the kilometre-square level in Ticino as well.

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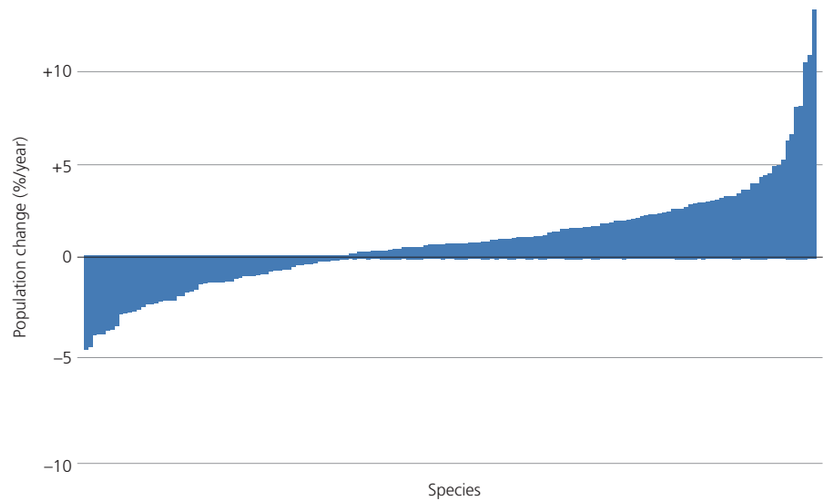
Population trends between 1993–1996 and 2013–2016

The population trends of the individual breeding bird species between 1993–1996 and 2013–2016 are largely positive. The Swiss Bird Index SBI® has also increased slightly since 1990.

Breeding bird indices are calculated for 174 regular breeders based on their population numbers since 1990[1, 2, 3]. We used these indices to determine the relative change in breeding population sizes between 1993–1996 and 2013–2016. The positive trends outnumber the negative ones. In two thirds of species, numbers have increased, while one third have seen declines. About 40 % of all species show an increase in their breeding populations by more than 1 % per year; about 20 % decreased by more than 1 % per year. The median value of change per species is + 0.6 % per year.

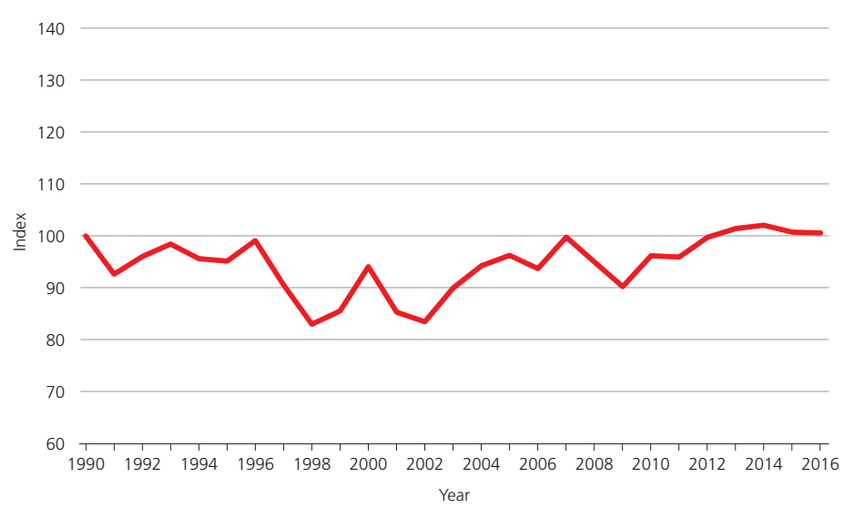
Similarly, the Swiss Bird Index SBI®, which combines the individual breeding bird indices, increased slightly between the two atlas periods[1]. Similarly, the total number of territories increased significantly between 1993–1996 and 2013–2016, driven in part by the positive trends of several species that were already abundant in 1993–1996.



Average annual change in the populations of regular breeders between 1993–1996 and 2013–2016. Each species is represented by a bar that specifies the average population change per year.

Differences compared to previous population estimates

For some species the population estimate given in this atlas is higher than the one specified in the 1993–1996 atlas, although the population has decreased according to the breeding bird index. Such discrepancies are related to methodological changes in the calculation of the breeding populations. Population numbers were last updated in 2013/2014, but much older estimates were used for many species. Improved methodological possibilities and the excellent body of data collected for the 2013–2016 atlas allow us to more accurately determine the size of breeding populations as well as the uncertainty of the estimate. In particular, the new methods enabled us to correct for imperfect detection (e.g. birds that were overlooked) and inaccessible sections of the survey area. Accordingly, the population estimates for several species were revised upwards. A direct comparison of the figures given in 1993–1996 and 2013–2016 should therefore be avoided, as it may result in an inaccurate impression of the development of breeding populations. The breeding bird index also depicted in the atlas for each species is a more accurate representation of the population trend.



The combined breeding bird index for all 174 regular breeders (Swiss Bird Index SBI®) increased slightly between 1993–1996 and 2013–2016.

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[1] Sattler et al. (2017e–h); [2] Zbinden et al. (2005a); [3] Zbinden et al. (2005b)

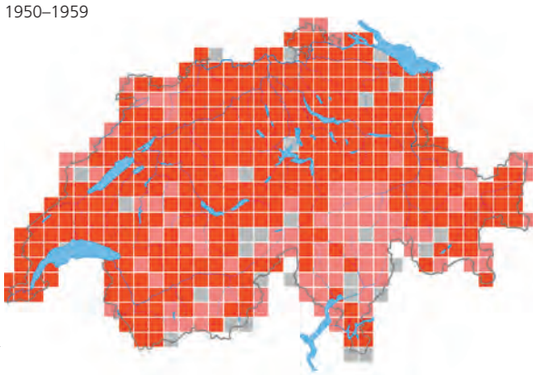
Interpreting species accounts and focus texts

Species selection
All bird species that have bred regularly in Switzerland since 1950 (i.e. in at least nine of ten consecutive years) are featured in a full-length species account. Species with fewer than 25 pairs, irregular or exceptional breeders that bred during 2013–2016, and species that used to breed here regularly but became extinct in Switzerland after 1950 are presented in a short account. Finally, the appendix includes the following species groups:

1. species present within the atlas perimeter in 2013–2016 with no confirmed breeding record;
2. species having bred within the atlas perimeter at least once since 1800, but not in 2013–2016;
3. escapes from captivity that bred within the atlas perimeter at least once between 1997 and 2017.

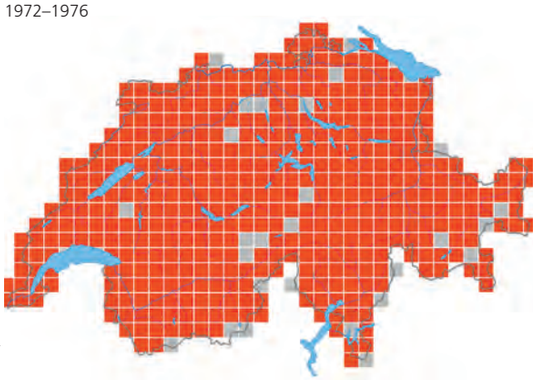
The atlas follows the taxonomy and English nomenclature used by BirdLife International[1]. Names in other languages follow the list provided by Volet[2].

1950–1959



Tree Pipit

1972–1976



Tree Pipit

Atlas square map
Four maps illustrate a species' distribution in the four atlas periods 1950–1959, 1972–1976, 1993–1996 and 2013–2016. The atlas squares (10 × 10 km) are colour-coded as follows:

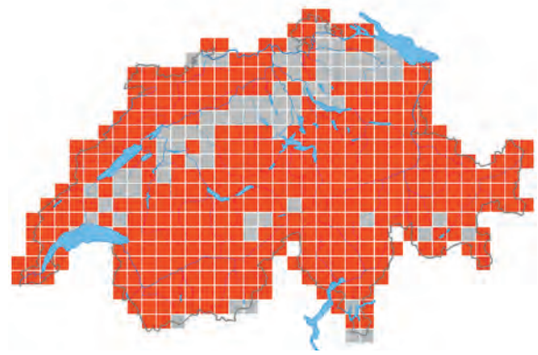
Red: Occupied atlas square with at least one record that meets the inclusion criteria for the respective atlas period; the criteria for the 2013–2016 atlas are listed on p. 54. Note that the 1972–1976 atlas used less rigorous criteria for some species, namely ducks and colonial breeders, than the other three atlases. To account for this difference in methodology, the current inclusion criteria were applied to 34 species for the 1972–1976 period. This means that the maps for these species do not match those published at the time (Goosander, Red-crested Pochard, Common Pochard, Tufted Duck, Garganey, Northern Shoveler, Gadwall, Common Teal, Black-necked Grebe, Alpine Swift, Black-crowned Night-heron, Grey Heron, Purple Heron, Little Ringed Plover, Northern Lapwing, Common Sandpiper, Yellow-legged Gull, Golden Eagle, Western Marsh-harrier, Montagu's Harrier, Common Hoopoe, Woodchat Shrike, Eurasian Jackdaw, Rook, Eurasian Penduline-tit, Zitting Cisticola, Sedge Warbler, Collared Sand Martin, Cetti's Warbler, Western Orphean Warbler, Whinchat, Common Stonechat, Western Yellow Wagtail, Eurasian Siskin).

Light red: Some atlas squares, especially in the Alps and the Jura, were rarely visited during the 1950–1959 atlas period, and few data were available for these areas.

These atlas squares were classed as «poorly surveyed» in the «Historical Atlas of Breeding Birds» [AtCH0] if the number of recorded species was less than half the average of 1972–1976 and 1993–1996. In the case of common species especially, which were vastly underreported at the time, atlas squares poorly surveyed in 1950–1959 were coloured light red if they were occupied in 1972–1976. The assumption was thus made that these squares had already been occupied in the past. These adjustments helped to avoid incongruities with the rather detailed descriptions of breeding bird distribution around 1950 in the book «Die Brutvögel der Schweiz» (Breeding Birds of Switzerland) [BCH]. In many cases, records are lacking even for those atlas squares that were adequately surveyed, despite the species being present at the time. The atlas square maps for 1950–1959 therefore probably underestimate the true distribution of some species or display gaps that were not there.

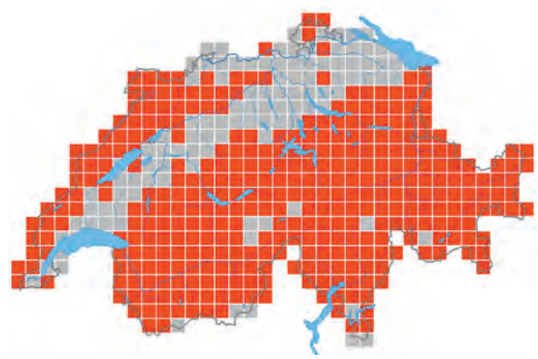
Grey: Unoccupied atlas square, i.e. no record of the species in this atlas square that met the inclusion criteria.

1993–1996



Tree Pipit

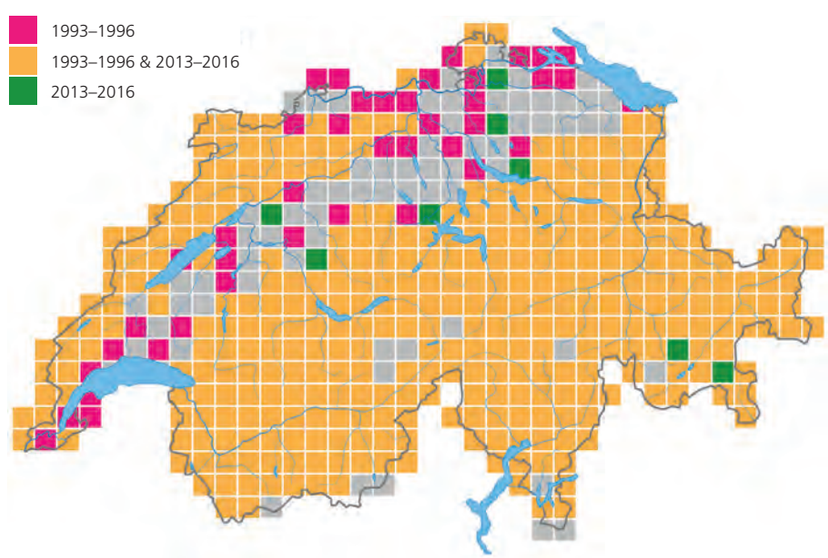
2013–2016



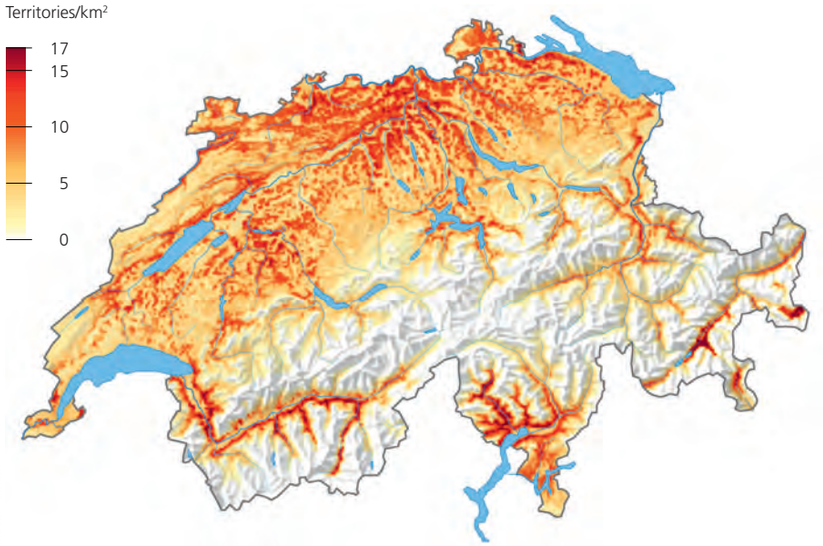
Tree Pipit

Comparison map at atlas-square resolution

This map shows the 2013–2016 distribution compared to 1993–1996. Atlas squares with records only for the 2013–2016 period are coloured green, confirmed atlas squares with records in both 1993–1996 and 2013–2016 are ochre. Abandoned atlas squares, where the species was recorded in 1993–1996 but not in 2013–2016, are pink. It is important to bear in mind that survey effort increased from one atlas to the next, including from 1993–1996 to 2013–2016, so an apparent increase in occupied atlas squares does not necessarily equal a range expansion.



Tree Pipit



Eurasian Nuthatch

Density map

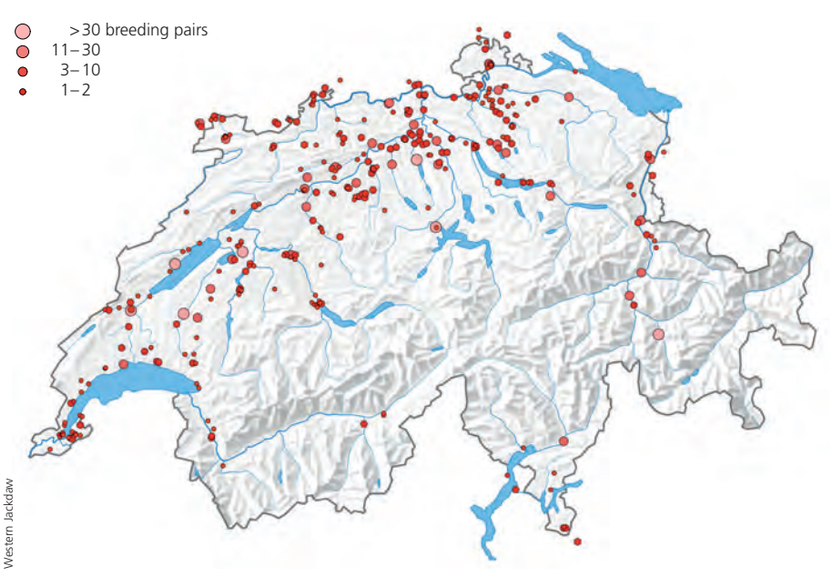
This map is displayed for widespread species and is based exclusively on the results of terri-tory mapping surveys in 2318 kilometre squares during 2013–2016. It represents the number of territories per km², modelled as a function of environmental variables (e.g. altitude, forest area), spatial autocorrelation (accounts for the fact that adjacent areas tend to exhibit similar densities) and the species' probability of detection (i.e. the likelihood that a bird present during the survey is actually detected).

All density maps use the same colour scheme, but the scale varies from species to species, so comparisons of density maps between species must be interpreted with caution (details on p. 68).

European Stonechat

Distribution map

The distribution of scarce species is presented using modelled maps. The map shows a species' probability of occurrence per km² in 2013–2016; a value of 0.5 means that the species occurred as a breeder in that kilometre square with a probability of 50 %. Thus, the distribution map does not directly depict a species' abundance per km², but its probability of occurrence. To produce these maps, we used the territory mapping surveys in kilometre squares as well as additional records. A species' occurrence was modelled using the same set of environmental variables as the density maps. Spatial autocorrelation and the species' detection probability were also taken into account (details on p. 69).



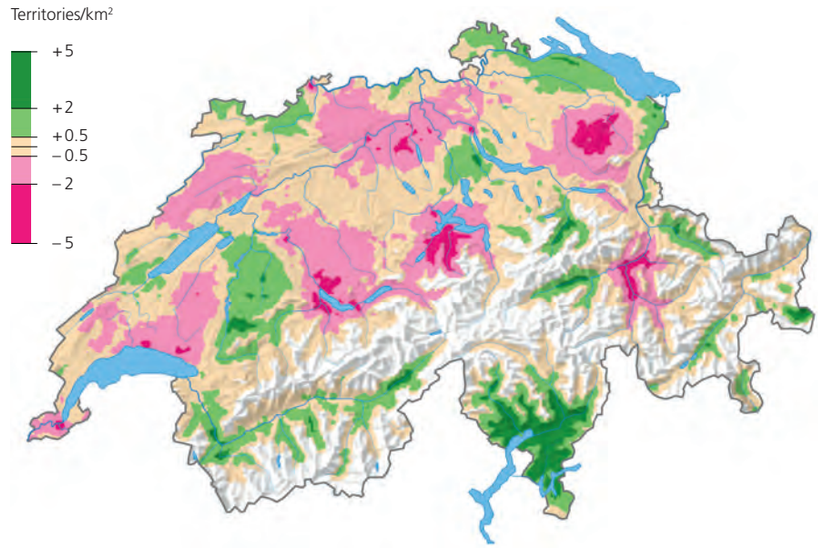
Western Jackdaw

Point map

For colonial breeders and species that are quite rare, observations made in 2013–2016 were grouped into colonies or territories and displayed in various size classes. These maps are based on actual observations rather than modelled values. The point map may therefore be incomplete due to gaps in coverage or because the species went undetected (details on p. 70).

Density change map

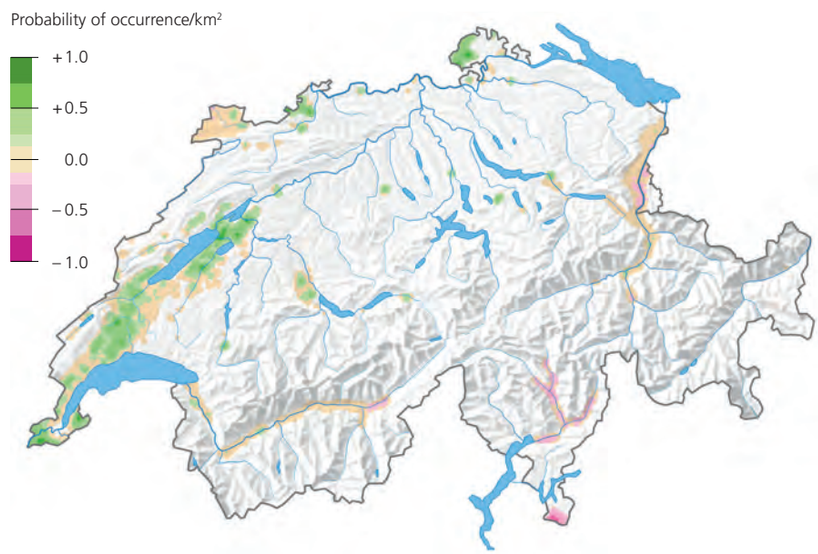
Most species accounts that feature a density map also show a density change map, depicting the change in the number of territories per km² from 1993–1996 to 2013–2016. This map was produced by modelling the 1993–1996 and 2013–2016 survey results using the method de-scribed above. The difference in density between the two atlas periods resulted in the density change map (details on p. 69).



Eurasian Nuthatch

Distribution change map

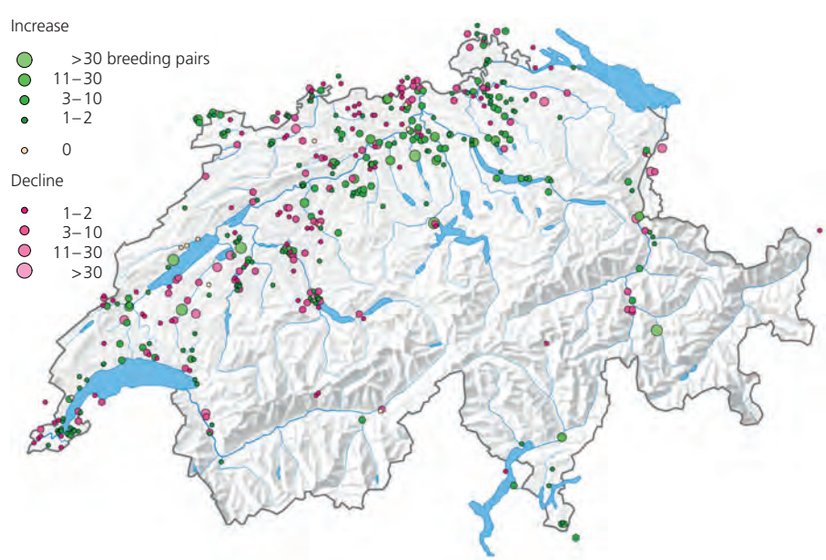
Many species with a distribution map also feature a distribution change map. This map depicts the change in occurrence probability per km² from 1993–1996 to 2013–2016. Again, the map does not present a species' change in abundance, but in its likelihood of occurrence (details on p. 70).



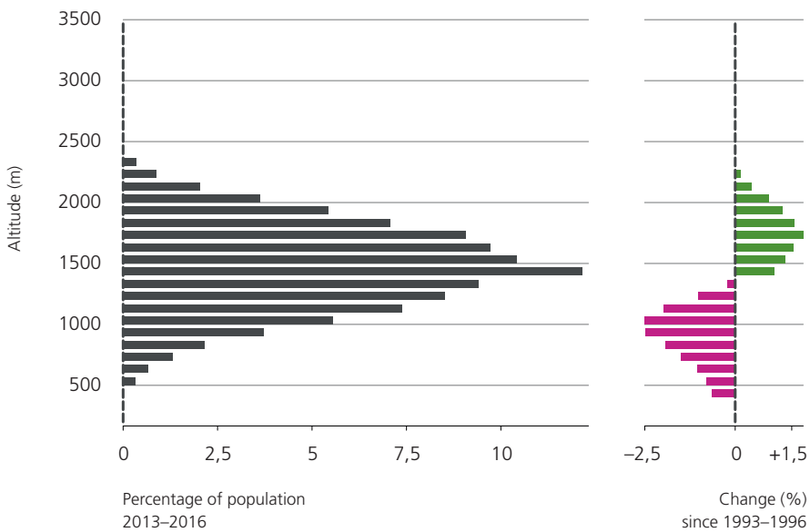
European Stonechat

Point change map

For colonial breeders and some other species, the number of breeding pairs or territories in 1993–1996 and 2013–2016 were compared and the difference displayed on the map. Note that colonies within a radius of 2–3 km were combined to create this map. This is because a colony's location can shift over the course of the years (details on p. 71).



Western Jackdaw

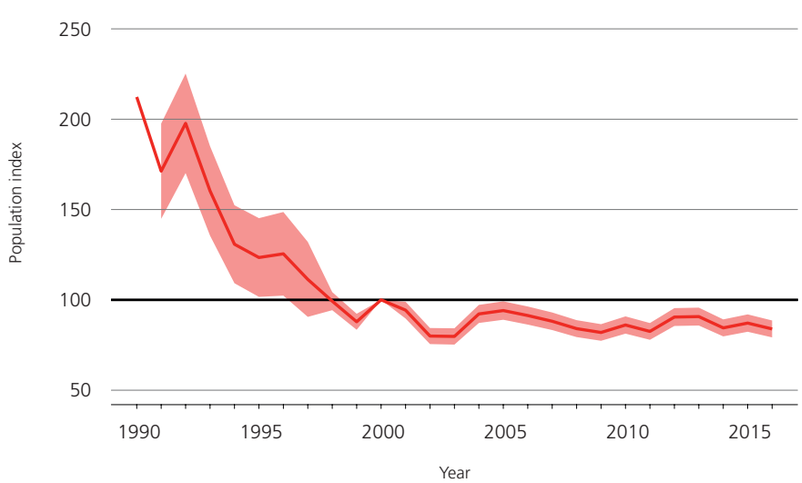


Tree Pipit

Altitude chart

The altitudinal distribution per species in 2013–2016 was calculated using the density or dis-tribution maps, or the territory or colony locations from the point maps. The proportion of the population that occurs per 100 m of altitude is shown in black.

For many species, coloured bars on the right hand side of the chart plot the percentage change in altitudinal distribution from 1993–1996 to 2013–2016. If the proportion of population per 100 m of altitude increased, the bar is green and points to the right. If the proportion decreased, the bar is pink and points to the left. Both charts are set to the same scale, so the altitudinal distribution for 1993–1996 can be derived by adding the pink and black bars or subtracting the green bars from the black ones (details on p. 71).



Tree Pipit

Population trend

The population trend (in most cases from 1990) is given for 174 species that have been regular breeders at least once since 1990 (i.e. they have bred in at least nine of ten consecutive years) and for which we have the necessary data. The standard error for the estimate is shown in light red. Where the trend is based on exact counts, no standard error is given. The base year (with an index value of 100) was set to the year 2000. We could not calculate indices for White-backed Woodpecker, Collared Flycatcher and Italian Sparrow due to lack of data. No index was generated for introduced species (e.g. Common Pheasant, Mute Swan, Ruddy Shelduck).

Species account
The species accounts describe the distribution in Switzerland and Liechtenstein, altitudinal distribution (including the highest breeding records or breeding-season observations when possible; m = metres above sea level) and occupied habitats. They also compare distribution, density and altitudinal distribution in 1993–1996 and 2013–2016. Information on density from recent publications is presented for certain species, based mostly on small-scale surveys in prime habitat. Sometimes the maximum number of territories from the 2013–2016 surveys are given; these are values recorded in a kilometre square, which generally did not consist only of prime habitat for the species in question, in contrast to the small-scale surveys. The population trend and possible reasons for the observed trend are also discussed. Finally, there may be references to focus texts that mention the species.

Focus text
The purpose of the focus texts is to illuminate overarching themes and relate them to the results of the atlas surveys. Each topic falls into one of the following categories: woodland, wetlands and waterbodies, mountains and Alpine habitats, farmland, settlements and urban habitats, human recreation, climate, threats and species conservation, distribution of birds (biogeography) and population monitoring. An overview of all focus topics can be found on p. 6.

References
Commonly cited publications have been given a code of letters and sometimes numbers. The full references can be found at the beginning of the reference section (p. 604).

Specialist literature for each species is numbered and listed in alphabetical order (authors and year). The numbers inserted in the species account refer to this list. The full references can be found in the reference section (p. 605–640). If a study was published in several languages, all language versions are listed and separated by a slash (the German title first, followed by French and any other available languages). Any unreferenced species records are drawn from the archive of the Swiss Ornithological Institute.

Peter Knaus

[1] BirdLife International (2017b); [2] Volet (2016)

Cantons

AG	Aargau	NE	Neuchâtel
AI	Appenzell Innerrhoden	NW	Nidwalden
		OW	Obwalden
AR	Appenzell Ausserrhoden	SG	St. Gallen
		SH	Schaffhausen
BE	Bern	SO	Solothurn
BL	Basel-Landschaft	SZ	Schwyz
BS	Basel-Stadt	TG	Thurgau
FR	Fribourg	TI	Ticino
GE	Geneva	UR	Uri
GL	Glarus	VD	Vaud
GR	Grisons	VS	Valais
JU	Jura	ZG	Zug
LU	Lucerne	ZH	Zurich

Countries

A	Austria
D	Germany
F	France
FL	Liechtenstein
I	Italy

Common Quail

Coturnix coturnix
Wachtel
Caille des blés
Quaglia
quacra

Markus Varesvuo

Red List Least Concern (LC)
Population 500–2000 males (2013–2016)

Focus pages 428, 478

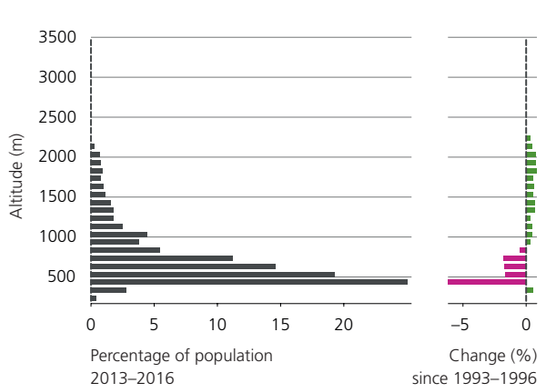
In Switzerland, the distribution of the Common Quail is concentrated on the Central Plateau and in the Jura between 400 and 1200 m, where it mainly inhabits open, arable farmland dominated by cereals. Preferred crops include winter barley, wheat, patchy wildflower strips as well as fields of clover and lucerne. It also occupies species-rich Alpine meadows that are mown late in the season. The highest nest was found in the Upper Engadine GR at 1940 m [AEn]. The highest calling birds were recorded at 2400 m near Evolène VS (C. Fosserat) [10] and Albinen VS (E. Revaz) [10] and at 2350 m near Zernez GR (J. von Hirschheydt). The distribution maps for the Common Quail are based almost entirely on records of calling males. Several males gather together, usually in a very small area, to attract females with their calls. However, the number of females cannot be inferred from the number of calling males. In addition, the females' secretive behaviour makes it difficult to tell whether they actually breed in a given area.

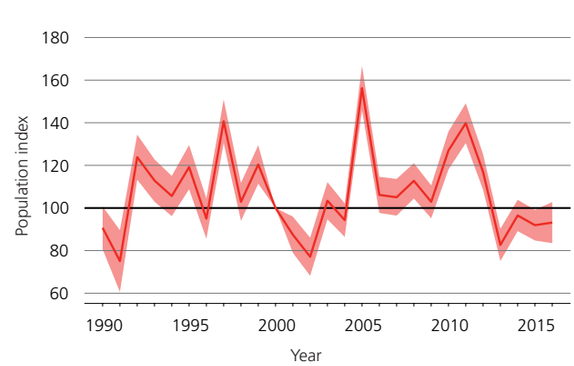
When it comes to selecting suitable habitat, the Quail is an opportunist and highly mobile. In consequence, numbers fluctuate widely from year to year. Populations below 900 m have been in slight decline since 1993–1996, while they appear to be increasing somewhat above that altitude. No influxes occurred during 2013–2016 like they did in 1997, 2005 and 2011. Since 2012, a reduction in calling activity has been documented, especially in the arable farmland surrounding Lakes Biel, Neuchâtel and Murten [1, 3], in the Lake Geneva area [8] and in the Klettgau SH [5].

In Germany, numbers increased significantly from 1990 to 2007 thanks to the large-scale EU set-aside scheme. When the scheme was suspended, the decline set in again [AtD]. The French and Austrian populations are also dwindling [4, 7, 11], whereas the trend in Italy has been slightly positive since 2000 [2]. Since 1990, the overall European population appears to be in decline as well [RLEU, 9]. Observations in ecologically restored areas show that the Common Quail uses low-density cereal crops, fallows and low-intensity meadows for breeding [5, 6]. Therefore, promoting wildflower plots, widely spaced crop rows and rotational mowing of meadows (leaving refuges that are not cut until mid-July or later) would help to improve breeding conditions for the Common Quail.

Markus Jenny

[1] Birrer et al. (2016); [2] Campedelli et al. (2012); [3] Christen (2017a); [4] Dubois et al. (2017); [5] Jenny (2016b); [6] Jenny et al. (2002a–b); [7] Jiguet (2017); [8] Meichtry-Stier et al. (in prep.); [9] Perrenou (2009); [10] Posse (2006); [11] Teufelbauer & Seaman (2017)



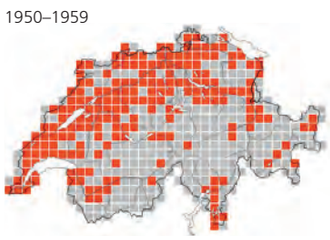


Occurrence 2013–2016

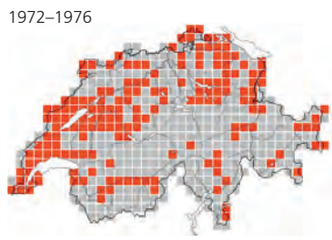
Occurrence change since 1993–1996

Sponsored by
Anonymous donor

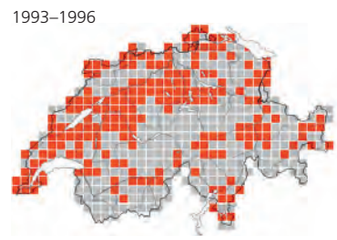
1950–1959



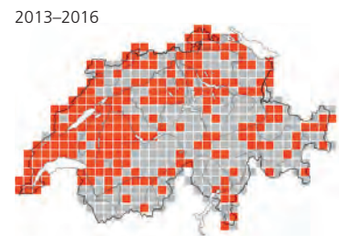
1972–1976



1993–1996



2013–2016



Rock Partridge

Alectoris graeca
Steinhuhn
Perdrix bartavelle
Coturnice
pernisch da gonda

Olivier Born

Red List Near Threatened (NT)
Population 2500–4500 pairs (2013–2016)

Focus pages 98, 552

The Alps form the northern boundary of the Rock Partridge's range, which extends from the Alps, the Apennines and Sicily to Greece. Preferred habitat consists of sunny, structurally rich mountain slopes with boulders, rocky outcrops, scattered trees and dwarf shrubs. In Switzerland, the Rock Partridge mainly occurs in the Alps of Valais, Ticino and Grisons as well as in the western Pre-Alps, mostly between 1700 and 2500 m. In the central Valais in particular, calling males are also regularly found between 600 and 1000 m, like the one observed at 600 m near Varen VS (M. Eichenberger). The highest records of a family party come from 2860 m in the Val Ferret VS [VdS] and more recently from 2790 m near Bever GR (T. Wehrli).

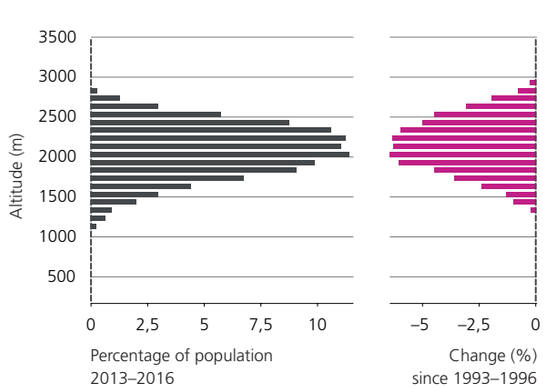
In some atlas squares occupied in 1993–1996, mainly in parts of Grisons and Valais, the Rock Partridge could not be confirmed. In contrast, small range gains were charted on the northern slopes of the Alps, and a calling male was again recorded in the Alpstein massif in 2017 (V. Sohni). Climatic variations have always caused marked fluctuations in population size. The lowest levels since 1990 were reached in 2002 and 2011, whereas numbers peaked in 1993 and to a lesser extent in 2006 and 2016. Marked declines since 1993–1996 have been noted in several parts of the Alps. These were partially offset by gains in the western part of the northern Alps, for instance in Haut-Intyamon FR [1].

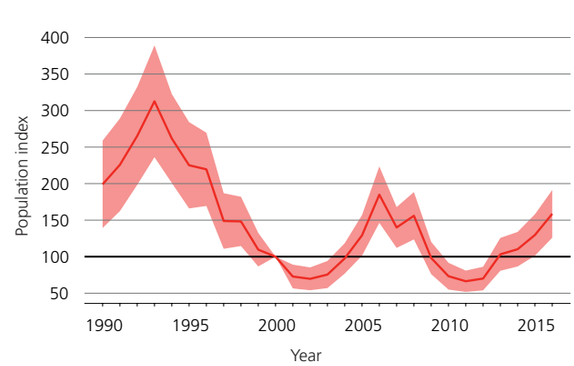
The Rock Partridge is not very well adapted to winter in the Alps and is sensitive to extreme weather events and long periods of bad weather [2, 3, 4]. The species partially compensates by being highly mobile [3].

Switzerland supports more than 6 % of the global population and therefore has an important responsibility in the conservation of this species [7]. In some countries, numbers are declining steeply [RLEU, 5]. Threats to the Rock Partridge include habitat loss in cultivated Alpine landscapes either through shrub encroachment or intensified use, which exacerbates the fragmentation of remaining populations [3, 6]. Disturbance from human recreation and tourism infrastructure can cause problems in some areas [8].

Benjamin Homberger

[1] Beaud & Beaud (2018); [2] Lüps (2004a); [3] Lüps (2004b); [4] Maurino et al. (2013); [5] Nardelli et al. (2015); [6] Rippa et al. (2011); [7] Sattler et al. (2016a–d); [8] Spaar et al. (2012a–b)



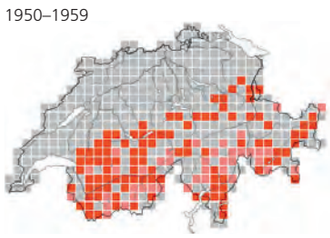


Occurrence 2013–2016

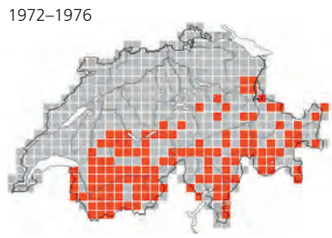
Occurrence change since 1993–1996

Patenschaft
Hans-Peter Clausen, Bitsch
Simon & Sandra Steiner, Boll

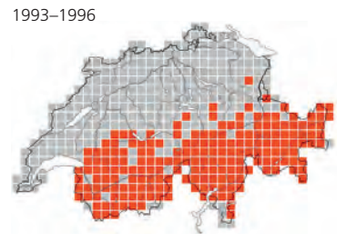
1950–1959



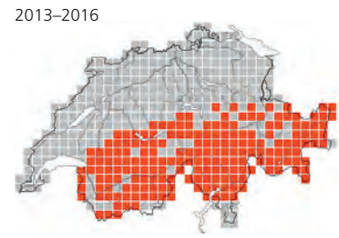
1972–1976



1993–1996



2013–2016



Grouse and Rock Partridge – herbivores at the mercy of the weather

The breeding success of grouse is extremely variable, mainly because of weather conditions during the rearing of the chicks. If the weather is cool and rainy, the population declines. Population fluctuations are a typical feature of all grouse and partridge species. In the case of the Rock Partridge in particular, this is also reflected in range losses and gains.

Four grouse species – Rock Ptarmigan, Black Grouse, Hazel Grouse and Western Capercaillie – and the Rock Partridge inhabit the Swiss mountains. Rock Ptarmigan and Rock Partridge are species of open landscapes, the Rock Ptarmigan being restricted to areas above the tree line in the Alps. The other three species rely on trees or forest, with the Black Grouse occupying only very open forest along the upper tree line.

Adapted to winter in the mountains

Grouse benefit from various anatomical and behavioural adaptations that allow them to remain in their mountain habitat even in winter. Their plumage provides particularly good insulation. The Rock Ptarmigan even has feathered toes. In addition, the birds adapt their behaviour to save energy. Apart from short periods of activity to feed, several species spend a lot of time in burrows they dig into the snow; here, temperatures are only slightly below zero, even when the outside temperature falls to almost –20 °C [12].

Adult grouse eat a vegetarian diet, favouring food that is easy to digest such as berries and seed, which they find in the low ground vegetation. Dwarf shrubs are particularly popular. Grouse find enough food even in winter, as they can subsist on shoots, buds and needles of dwarf shrubs, bushes and trees. In order to derive nourishment from these fibrous foods, grouse have a specially adapted digestive tract. They ingest grit to break up hard food, and they have two long caeca (intestinal pouches) in which cellulose is digested by bacteria. This high-fibre food with low nutrient content is challenging for the gastrointestinal system, and it can only process as much food as is necessary for survival. Extra energy expenditure caused by disturbance is hard to make up for.

The Rock Partridge, on the other hand, does not cope as well with the harsh conditions of Alpine winters. It depends on a year-round supply of herbaceous plants that are relatively easy to digest. If snow on the steep, southern slopes that constitute the Rock Partridge's habitat does not melt or break away quickly, it is forced to seek refuge at lower altitude, and may then be observed near mountain huts or even in villages in much lower-lying areas [4].

Breeding success highly weather-dependent

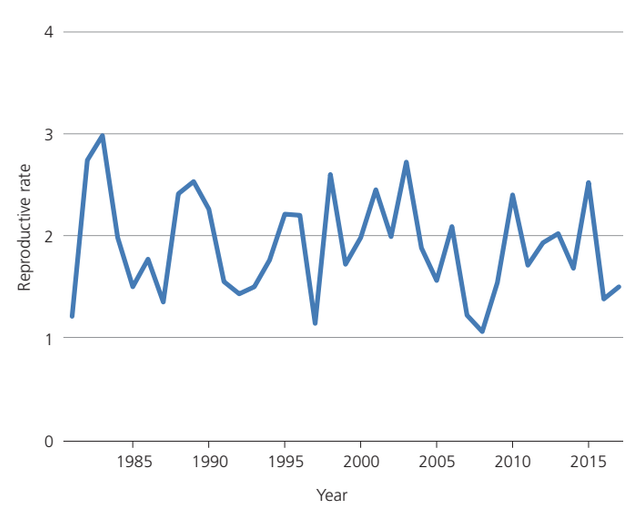
Characteristic for all grouse and partridge species are the large clutch size (Rock Partridge lay up to 14 eggs) and the influence of weather on chick survival. In the first days after hatching, the chicks cannot maintain their body temperature and have to regularly return to the hen for brooding to keep warm. If the weather is cool and rainy, not much time remains for foraging [7]. Moreover, chicks rely on invertebrates (insects, spiders) for food. In prolonged periods of bad weather, they are unable to survive.

Therefore, the breeding success of grouse and partridge is heavily dependent on weather conditions during the nesting and chick-rearing periods and can vary greatly from year to year [15, 16]. This in turn leads to large fluctuations in the following year, a phenomenon that is most pronounced in Black Grouse and Rock Partridge populations.

Rock Ptarmigan populations increase if July temperatures are around the long-term average. If July is too cool, however, the population will be smaller in the following year. Hot summer temperatures also appear to cause local declines [2].

Fluctuations in numbers and range

The population trend of Black Grouse in northern Ticino is parallel to the reproductive rate of the previous year. The population remains stable from one year to the next at a reproductive rate of about two chicks per hen [15]. In northern Ticino, the chicks hatch in the second half of July, when mean daily temperatures are at their highest. From 1981 to 2017, the reproductive rate in northern Ticino fluctuated widely with no visible long-term trend [13, 15, 16]. In southern Ticino, on the other hand, reproductive



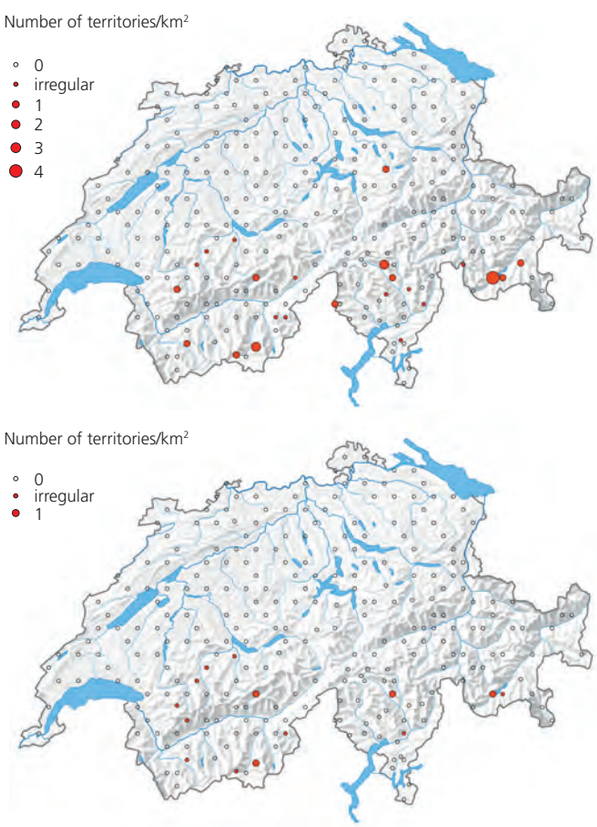
The reproductive rate of Black Grouse (number of chicks per hen) in northern Ticino (Ticino part of the biogeographical region «southern Alps») from 1981 to 2017 fluctuates widely with no visible long-term trend. Source: Ufficio caccia e pesca Canton Ticino.

Christian Marti

Grouse chicks like these Rock Ptarmigans are initially unable to regulate their body temperature. They need to regularly nestle into the hen's plumage for warmth. When the weather is cold, the chicks can only venture out on brief forays and may not take in enough food to survive.

success decreased, probably due to the abandonment of Alpine pastures [15, 16]. A range contraction will ensue if the decline continues.

The Rock Partridge population is also subject to marked fluctuations caused by the annual variation in reproductive success. Peak populations were reached in Switzerland around 1945 and 1993, with a period of low numbers in between [HVM, VdS, 3, 14]. More recently, 2006–2008 and 2015–2016 were years with large populations, whereas low numbers were recorded in 2001–2003 and 2010–2012. These fluctuations are reflected in the data from the common breeding bird monitoring scheme: In 2006–2008, a total of 71 Rock Partridge territories were recorded in 23 kilometre squares. In 2010–2012, in contrast, only 26 territories were found in 14 kilometre squares. These fluctuations affect the size of the breeding range, because the Alps constitute the northern limit of the species' distribution.



Data from the common breeding bird monitoring scheme illustrate the fluctuations in Rock Partridge populations. In 2006–2008 (above), when numbers were on the rise, almost three times as many territories were recorded as in 2010–2012 (below), when the population trend was negative.

Many species face huge challenges

Among this group of birds, Western Capercaillie and Rock Ptarmigan give particular cause for concern. In the case of Capercaillie, the urgency of the situation and the need for action were recognised many years ago [5, 6]. The necessary measures – thinning trees in overly dense stands and protecting the birds from disturbance – are being implemented via a national action plan [8] as well as cantonal plans [11].

The Rock Ptarmigan exhibits varying regional trends, suggesting that different factors are at play in each locality [2]. A decline of 13 % was recorded between 1995 and 2013. This situation is worrying, especially since the species' range is expected to shrink due to climate change [10], with a marked shift of observations to higher altitudes already apparent [9].

In the case of the Hazel Grouse, the range contraction in the central Jura is cause for concern [1]. Besides climate change, Black Grouse and Rock Partridge are most threatened by changes in their habitat. Both the abandonment of farmland and intensified land use have a negative impact, as does the increase in tourism.

Pierre Mollet

[1] Blattner (1998); [2] Furrer et al. (2016); [3] Lüps (2004a); [4] Lüps (2004b); [5] Marti (1986); [6] Marti (1995); [7] Marti & Bossert (1985); [8] Mollet et al. (2008a–b); [9] Pernollet et al. (2015); [10] Revermann et al. (2012); [11] Stettler & Christen (2010); [12] Stüwe (1989); [13] Ufficio caccia e pesca Canton Ticino, in litt.; [14] Zbinden & Salvioni (2003a–b); [15] Zbinden & Salvioni (2003c); [16] Zbinden & Salvioni (2010)

Species pages 96, 104, 106, 108, 112

Common Pheasant

Phasianus colchicus
Jagdfasan
Faisan de Colchide
Fagiano comune
fasan

Olivier Born

Red List –
Population 40–60 pairs (2013–2016)

Focus page 124

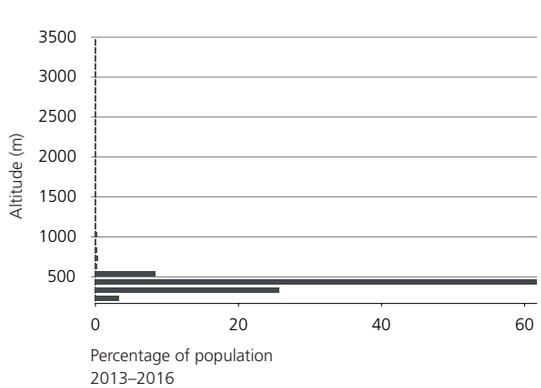
The Common Pheasant's native range lies between the Black Sea and China. Pheasants have been introduced worldwide as game birds since antiquity[VdS]. In Switzerland, distribution is limited to the Geneva area, the Ajoie JU, the Broye Valley FR/VD, Ramsen SH, the Rhine Valley in St. Gallen, and southern Ticino. The species has almost disappeared from the Central Plateau apart from occasional sightings that probably involve released birds. The Common Pheasant inhabits semi-open and open farmland, often near wetlands, where it finds cover in hedges, copses and forest edges. While breeding has been recorded up to 850 m[ABE], the Pheasant currently occurs almost exclusively below 600 m in Switzerland.

Since 1993–1996, it has abandoned large parts of the Central Plateau, the remaining populations being concentrated along the Swiss border. The largest population in Switzerland is found near Geneva, where numbers have dropped from 106 territories in 1998–2001[AtGE] to 23–31 territories in 2013–2016. In neighbouring countries, the Common Pheasant is widespread, though populations are heavily supported by releases and winter feeding[AtD, 3]. In Vorarlberg and in Austria as a whole, numbers are decreasing in line with the Pheasant's declining importance as a game bird[AtV, 5]. In Germany the trend has fluctuated since 1990[AtD], while increasing slightly in France and Lombardy[AtF, 1, 4].

The Swiss trend reflects the significant reduction of releases. In 1972–1976, an average of 16 583 birds were released annually; in 1993–1996, this number had dropped to 2090. According to federal hunting statistics, birds have subsequently been released in three cantons only: In Bern and Fribourg, the last releases occurred in 2002 and 2008, respectively. Vaud was the only canton to continue this practice, releasing a total of 147 birds during 2013–2016. Significantly, all regular occurrences are now limited to border areas and presumably relate to Pheasants from neighbouring regions across the border. In France alone, an estimated six million birds were released in 2007–2008[3]. As winters with heavy snowfall and wet summers decimate birds[2], the milder regions of Switzerland (Ticino, Geneva) are presumably the only areas where self-sustaining populations can exist.

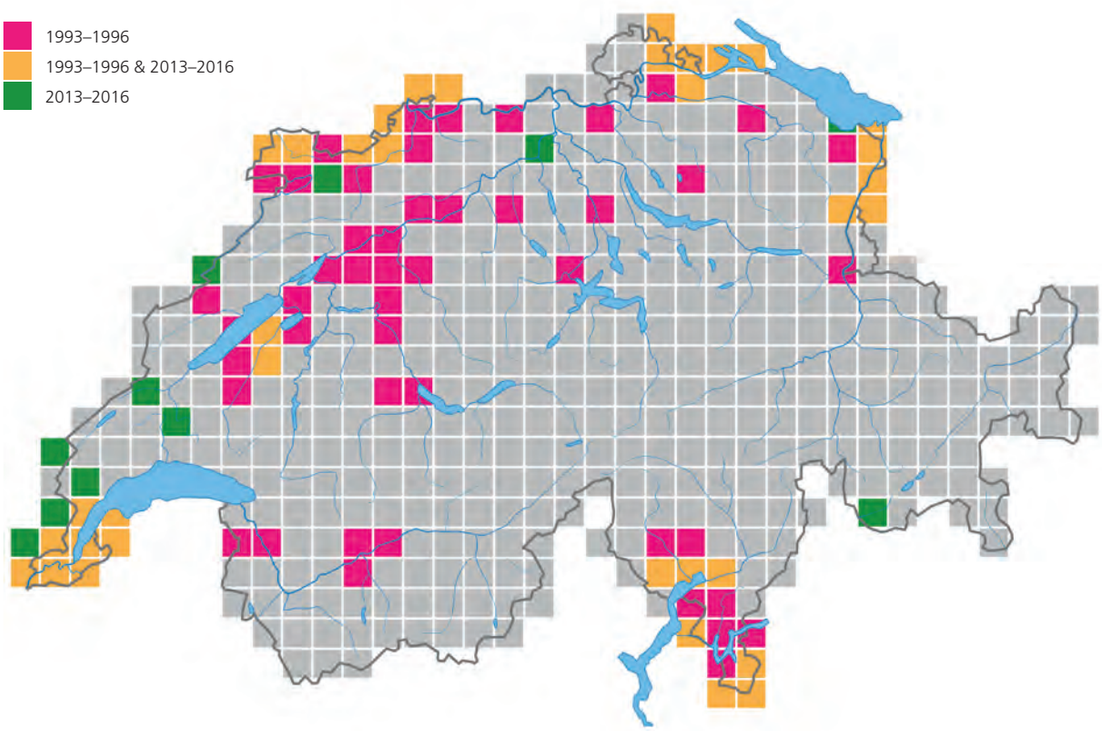
Dominik Hagist

[1] Bani et al. (2014); [2] Bauer et al. (2005); [3] Mayot & Crosnier (2012); [4] Reitz & Mayot (2017); [5] Teufelbauer & Seaman (2017)



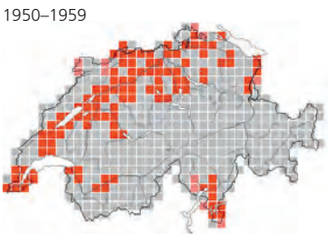
Territories 2013–2016

Distribution change since 1993–1996

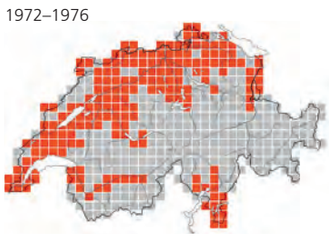


Sponsored by
Anonymous donor

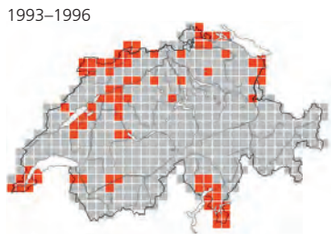
1950–1959



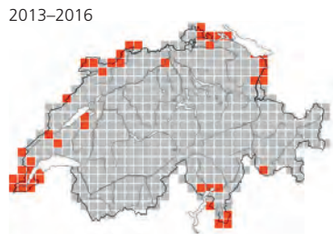
1972–1976



1993–1996



2013–2016



Grey Partridge

Perdix perdix
Rebhuhn
Perdrix grise
Starna
pernisch (grischa)

Ralf Kistowski

Red List Critically Endangered (CR)
Population 5–10 pairs (2013–2016)

Focus pages 234, 240, 362, 428

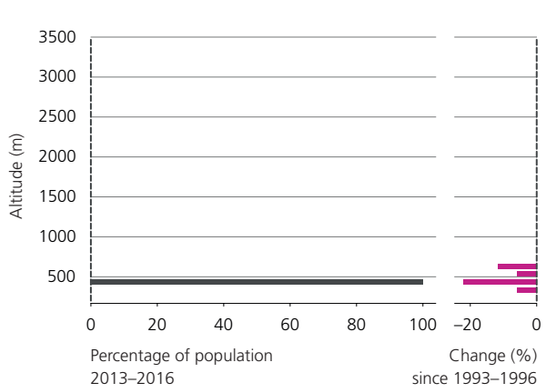
In Switzerland, the Grey Partridge occupies warm, dry regions with richly structured farmland dominated by cereal crops. Suitable habitat must have a large proportion of high-quality biodiversity promotion areas such as wildflower plots, low-intensity meadows and hedges[2, 5]. The remaining Swiss population is confined to two areas: as part of species recovery programmes, Grey Partridges were released in the ecologically restored areas of the Klettgau SH from 1998 to 2007 and in the Champagne genevoise from 2004 to 2012[4, 8, 11]. The records east of Geneva relate to immigrants from France, where Grey Partridges are released as game birds.

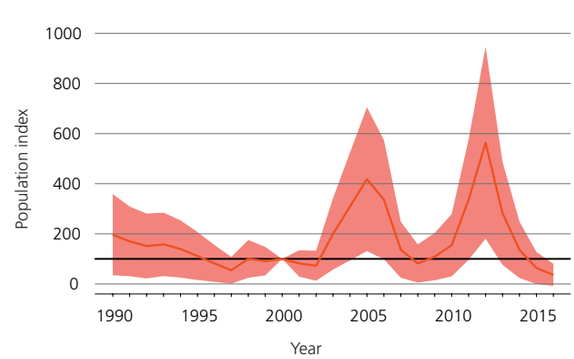
Around 1900, the Grey Partridge occupied the entire Central Plateau and other lowland regions of Switzerland. Until the 1930s, it also inhabited areas up to 1300 m[7]. In 1972–1976, it was still a widespread breeder[AtCH0], but its range contracted significantly between then and 1993–1996. While the spring population numbered about 10 000 individuals in the 1960s, only 10–15 pairs remained in 1993–1996[AtCH2]. The species disappeared from the Seeland BE/FR in the late 1990s[VdS]. Today, the Grey Partridge is on the brink of extinction in Switzerland. Despite considerable recovery efforts, there has been no trend reversal[4, 6, 8, 11]. The population in the Geneva area was estimated at 25–30 pairs in 2013, of which at least three pairs remained in 2016 (M. Lanz)[13, 14]. Releases in neighbouring countries are likely to continue to result in occasional observations of immigrant birds in border areas.

Numbers are decreasing steeply in Germany, Italy and Austria as well[AtD, 15, 18]. They have been stable in France between 1998 and 2008, but are now also decreasing[AtF, 9, 17]. The overall European population has collapsed by more than 90 % since 1980[EBCC]. Cultivated landscapes in their present form no longer provide adequate habitat for several interconnected populations. Agricultural intensification (larger plot size, loss of edge structures and fallows that provide cover, use of pesticides and herbicides, increase of maize crops) is considered the main driver of the downward trend[1, 3, 7, 10, 12, 16]. Though severe winters and predators can decimate populations, they are not responsible for the long-term decline[4, 7, 8].

Michael Lanz

[1] Aebischer & Ewald (2004); [2] Buner et al. (2005); [3] Donald et al. (2006); [4] Duplain et al. (2008); [5] Gottschalk & Beeke (2014); [6] Homberger et al. (2017); [7] Jenny et al. (2005a–b); [8] Jenny et al. (2010); [9] Jiguet (2017); [10] Kuijper et al. (2009); [11] Lanz et al. (2012); [12] Millot et al. (2011); [13] Müller (2017); [14] Müller & Volet (2014); [15] Nardelli et al. (2015); [16] Potts & Aebischer (1995); [17] Reitz & Mayot (2017); [18] Teufelbauer (2014)



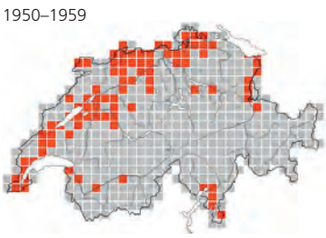


Territories 2013–2016

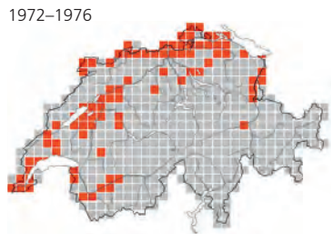
Change in the number of territories since 1993–1996

Sponsored by
Ursula Jappert

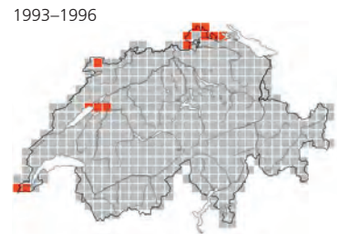
1950–1959



1972–1976



1993–1996



2013–2016

Hazel Grouse

Bonasa bonasia
Haselhuhn
Gélinotte des bois
Francolino di monte
giaglina da guaud

Dominique Nodin

Red List Near Threatened (NT)
Population 3000–5500 pairs (2013–2016)

Focus pages 98, 164, 240

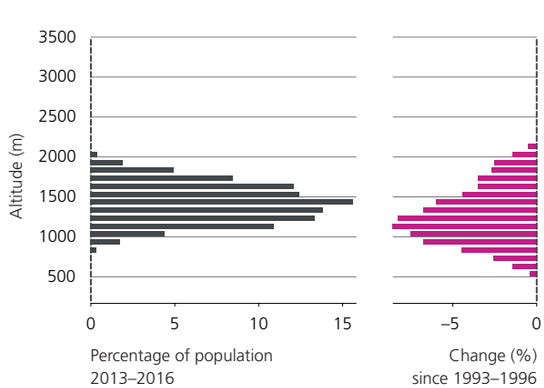
The Hazel Grouse inhabits the boreal forests of Eurasia as well as forested mountain regions in central and southern Europe. In Switzerland it occurs in the Alps and Pre-Alps and in the western and central Jura. Its altitudinal distribution reaches from 500 to 2360 m (Ergisch VS; G. Wyer)[1] with a concentration between 1000 and 1900 m. The Hazel Grouse inhabits richly structured coniferous and mixed forests where it finds cover all year round in the tree, shrub and herb layers. More rarely, it is found in pure deciduous forests, especially in the southern Alps. The species relies on the presence of soft woods whose buds, catkins and shoots provide food in the winter. It avoids closed-canopy forests with sparse shrub and herb layers. In the Neuchâtel Jura in 1999–2001, 89–100 territories were recorded on 27 km² of occupied forest (3.3–3.7 territories/km²). In the most attractive habitats, mostly grazed woodland, 5.3–5.7 territories/km² were reached[10]. The lowest breeding record in 2013–2016 came from 840 m near Trin GR (I. Cappelletti-Arnold), the highest from 2100 m near Visperterminen VS (R. Zeiter). In earlier years, breeding has been recorded at minimum and maximum altitudes of 540 m[AtCH1] and 2160 m[AtCH2].

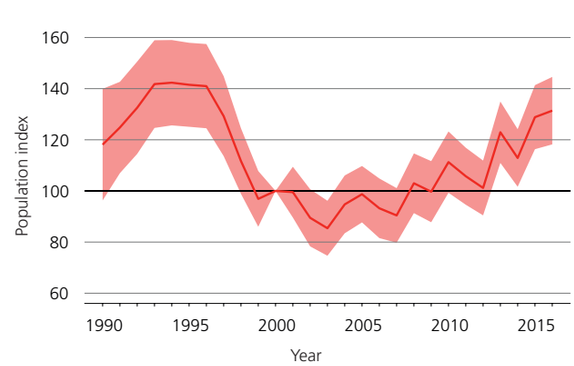
The eastern Jura is the only area where the range has contracted since 1993–1996. This negative trend has persisted for several decades[4]. The population fluctuated widely near La Sagne NE during 2002–2013 while maintaining its overall level[7]. In 2012–2013, after a long absence, several Hazel Grouse were seen during the breeding season on the Central Plateau at about 500 m between Strengelbach AG and Pfaffnau LU (L. Stanca, A. Wullschleger, B. Siegrist)[9]. In the many Alpine atlas squares that appear to be newly occupied, the species was probably overlooked during the 1993–1996 surveys due to its secretive behaviour.

The Hazel Grouse is on the brink of extinction in the Ardennes and in Baden-Württemberg[ABW, AtF, 2]. In Germany, the trend is considered to be stable overall[AtD]. Lower-lying areas in the French Jura and the Vosges have been abandoned[AtF, 8]. Austria reports a negative trend[6]. In order to maintain the population, forest management practices need to be adapted to the habitat requirements of the Hazel Grouse as far as possible[3, 5, 11].

Pierre Mollet

[1] Antoniazza (2016b); [2] Bauer et al. (2016a); [3] Bernasconi et al. (2001a–b); [4] Blattner (1998); [5] Blattner & Perrenoud (2001a–b); [6] Dvorak et al. (2017); [7] Mulhauser & Zimmermann (2014); [8] Muller et al. (2017); [9] Müller & Volet (2014); [10] Santiago et al. (2003); [11] Spaar et al. (2012a–b)



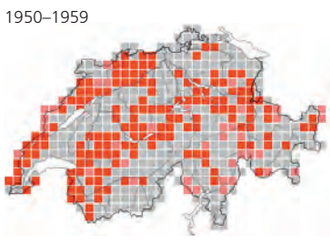


Occurrence 2013–2016

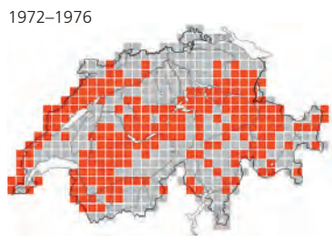
Occurrence change since 1993–1996

Sponsored by
Bernhard Herren
O. & V. Rosselet

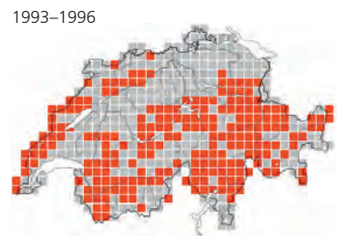
1950–1959



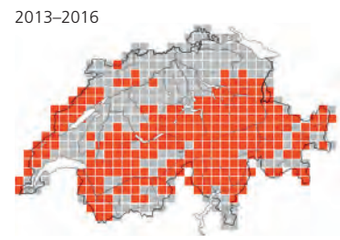
1972–1976



1993–1996



2013–2016



Rock Ptarmigan

Lagopus muta
Alpenschneehuhn
Lagopède alpin
Pernice bianca
urblauna

Olivier Born

Red List Near Threatened (NT)
Population 12 000–18 000 pairs (2013–2016)

Focus pages 98, 110, 142, 414

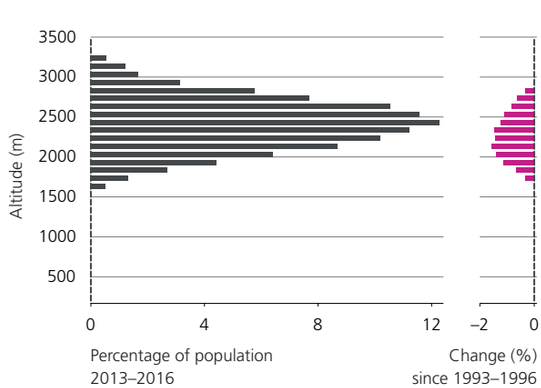
The Rock Ptarmigan populations in the Alps, the Pyrenees and Scotland are glacial relicts and, as such, isolated from those in northern Europe and Siberia. In Switzerland, the Rock Ptarmigan inhabits dwarf-shrub heath and Alpine grassland with scattered boulders and rocky outcrops where it finds cover from predators. Most of the population occurs between 2000 and 2800 m. The cocks move to higher altitudes after the chicks have hatched, the hens following later with the young, so calling cocks cannot be regarded as evidence for breeding at these higher altitudes after mid-July (e.g. calling male near Randa VS at 3380 m; E. Albegger). While nests have been found up to 2980 m [VdS], the highest nest sites in 2013–2016 were recorded at 2740 m near Pontresina GR (A. Buchli) and at 2710 m near Vals GR (W. Schmid). Breeding has been recorded at altitudes as low as 1700 m [AtCH1]. In 2013–2016, the lowest breeding record came from 1750 m near Sörenberg LU (B. Herren); a family party was even sighted at 1560 m near Innerthal SZ (S. Diethelm). Early morning counts can yield 3–5 territories/km². In the Aletsch region VS, at least ten cocks or 6.6 pairs/km² were counted in core areas [1].

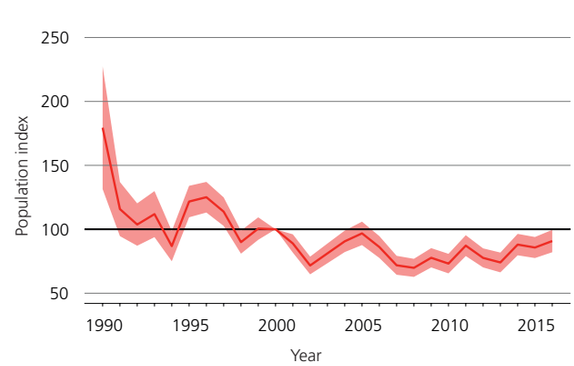
Since 1993–1996, gaps have become evident at the range margins. The average altitude of observations has shifted upward to varying degrees depending on the region [7]. Surveys in 40 census areas in the Alps reveal mixed regional trends between 1995 and 2012 (–50 % to +6 %) [4], while numbers have decreased by 13 % overall [3]. In the Aletsch region, the population decreased significantly in lower-lying areas during 1970–2015 due to the maturation of stone pines, but remained constant at higher altitudes [5].

Numbers appear to be stable in Germany and Vorarlberg [AtD, AtV]. In France, the population is decreasing in the Pyrenees as well as in the Alps [AtF]. Italy also reports a negative trend [2, 6]. Climate models suggest that rising temperatures will cause the species' range to shift to higher ground, leading to a reduction in occupied area and population size in Switzerland [8]. However, the regional differences indicate that the population trend cannot be explained by a single factor [3]. Other influences such as weather conditions during the chick-rearing period, summer and winter tourism, disturbance, hunting and the upward shift of the tree line could also play a role.

Christian Marti

[1] Bossert (1995); [2] Brichetti & Fracasso (2004); [3] Furrer et al. (2016); [4] Isler & Bossert (2015); [5] Marti et al. (2016); [6] Nardelli et al. (2015); [7] Pernollet et al. (2015); [8] Revermann et al. (2012)



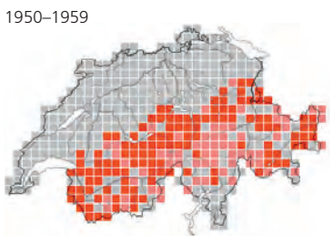


Occurrence 2013–2016

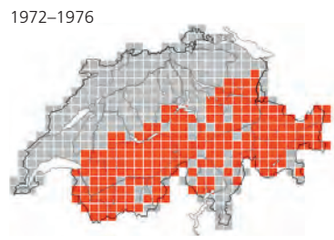
Occurrence change since 1993–1996

Sponsored by
Daniela Dubach

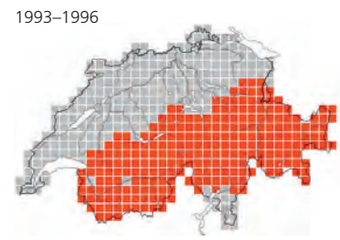
1950–1959



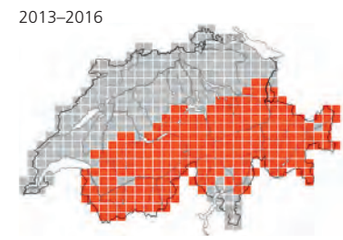
1972–1976



1993–1996



2013–2016



Western Capercaillie

Tetrao urogallus
Auerhuhn
Grand Tétras
Gallo cedrone
giaglina da taus

Olivier Born

Red List Endangered (EN)
Population 360–470 males (2013–2016)

Focus pages 98, 110, 164, 212, 542

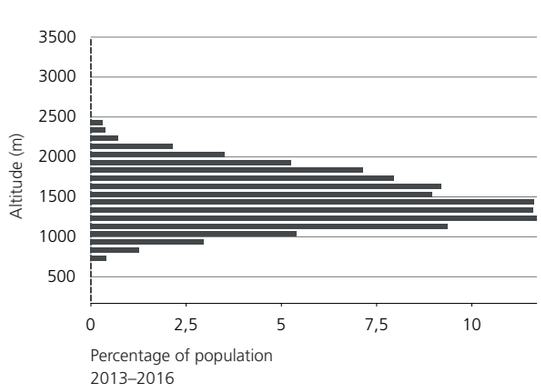
The Western Capercaillie mainly inhabits forests from northern Europe to western Siberia. There is a significant population in the Alps, and some smaller populations occur in other forested mountain ranges in central and southern Europe. In Switzerland, the Western Capercaillie currently inhabits the northern Pre-Alps, the central Alps of Grisons and the western Jura, mostly between 1000 and 2000 m. In Grisons it is found up to the tree line. The Capercaillie favours sparse, conifer-dominated forests that are richly structured, with a herbaceous layer that is well-developed but not too dense, preferably in areas where there is little disturbance from humans [1, 2, 7]. The highest nests were found near Zernez GR at 2150 m (R. Strimer). Observations below 1000 m are mainly of males exhibiting aggressive courtship behaviour, tame hens, or birds that collide with obstacles after venturing far from their home range, like the one found near Birsfelden BL at 260 m in 2013 (P. Etter).

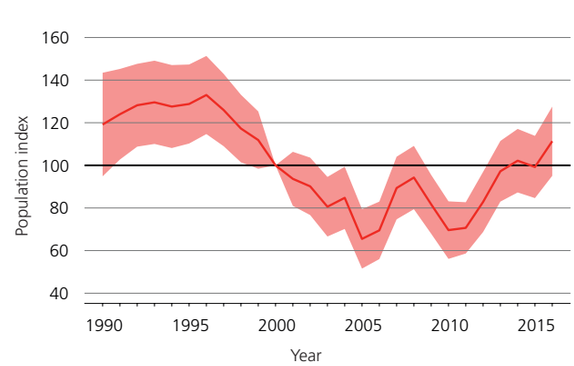
The species' range had already contracted significantly between 1972–1976 and 1993–1996, and the 2013–2016 surveys found a continuation of the trend. The Western Capercaillie has almost disappeared from the central Jura, the northern slopes of the Alps in the west and the inner-Alpine valleys of central Switzerland. Significant populations have only remained in large forests on unproductive terrain with a naturally open canopy. Cantonal monitoring data collected in the species' core area in the western Jura show that numbers have increased since the turn of the millennium; in the Canton of Schwyz, density was very high in 2009 at 7–8 birds/km^2 [12]. However, these positive examples do not change the fact that numbers are critically low.

Populations are declining steeply in Vorarlberg [AtV] and the Black Forest [4]. In the Italian Alps, the trend is negative overall, though some local populations are stable [3]. France reports marked declines in the Vosges [8, 13], likewise in the Jura until 2004, though there have been some local gains in the French Jura since then [9, 10]. The reasons for decline include denser and darker forests and increasing disturbance [5, 11, 17, 18]. Conservation measures, such as protecting birds from disturbance and thinning trees to create suitable habitat, must be widely introduced if the Western Capercaillie is to continue breeding in Switzerland [2, 6, 11, 14, 15, 16].

Pierre Mollet

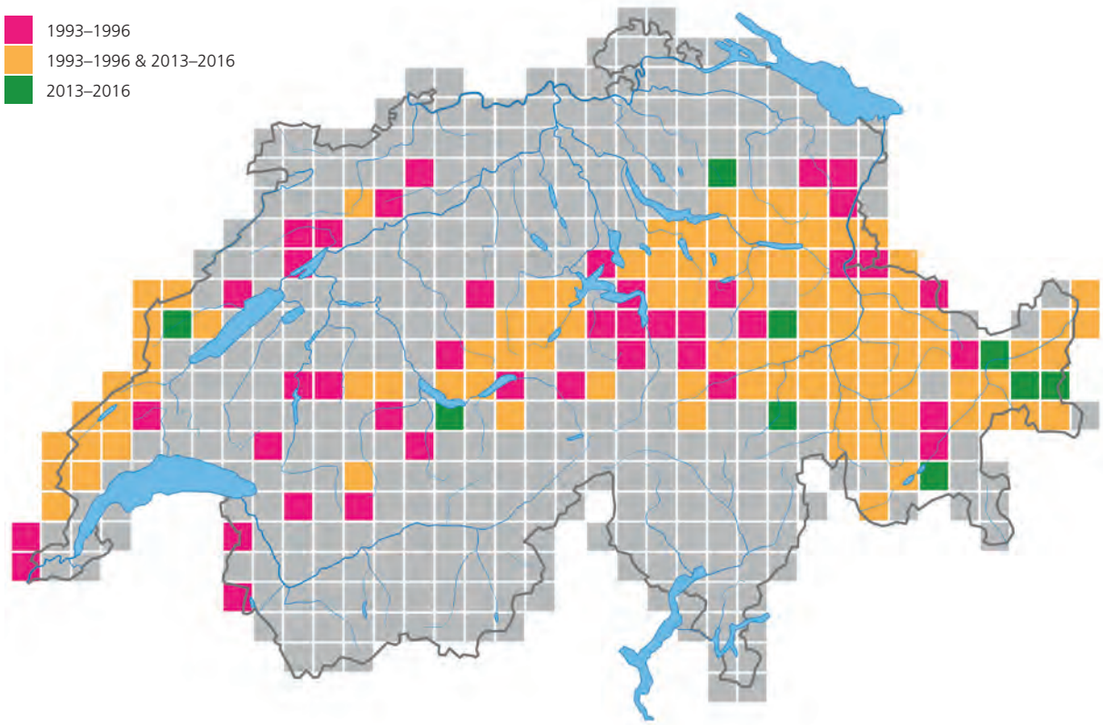
[1] Bollmann et al. (2008); [2] Bollmann et al. (2013); [3] Brichetti & Fracasso (2004); [4] Coppes et al. (2016); [5] Coppes et al. (2017); [6] Ehrbar et al. (2015); [7] Graf & Bollmann (2008); [8] Lefranc & Preiss (2008); [9] Leclercq (2008); [10] Montadert (2013); [11] Mollet et al. (2008a–b); [12] Mollet et al. (2015); [13] Muller et al. (2017); [14] Sachot et al. (2008); [15] Stettler & Christen (2010); [16] Suter & Graf (2008); [17] Thiel et al. (2008b); [18] Thiel et al. (2011)





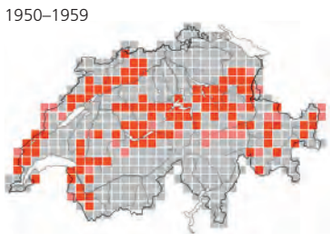
Occurrence 2013–2016

Distribution change since 1993–1996

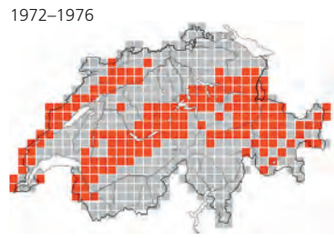


Sponsored by
Marcel Bärtsch, St. Gallen
Martin Kraft
Urs Treuthardt, Erlenbach im Simmental

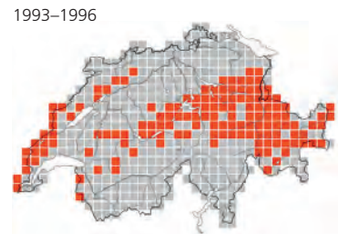
1950–1959



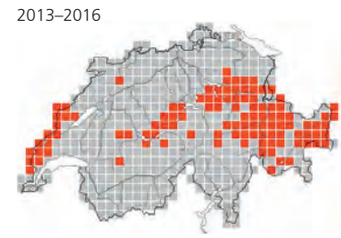
1972–1976



1993–1996



2013–2016



No limits to leisure activities?

Many bird habitats are also used by humans for recreation and leisure sports. These human activities cause varying degrees of disturbance which can lead to a decline in certain bird populations. Densely populated Switzerland is home to a vast number of outdoor recreation seekers, so species sensitive to disturbance are particularly vulnerable.

Disturbance refers to an event that leads to sudden changes in behaviour and/or metabolism. Signs of disturbance that are observed in the field include escape flights, alarm calls, increased vigilance, or distraction displays near the nest. But disturbance is not always easily recognised. Birds that react to human activities by remaining motionless may nevertheless be affected. Studies of grouse show that such situations cause the release of stress hormones and changes in heart rate[9, 10], but no striking changes in behaviour.

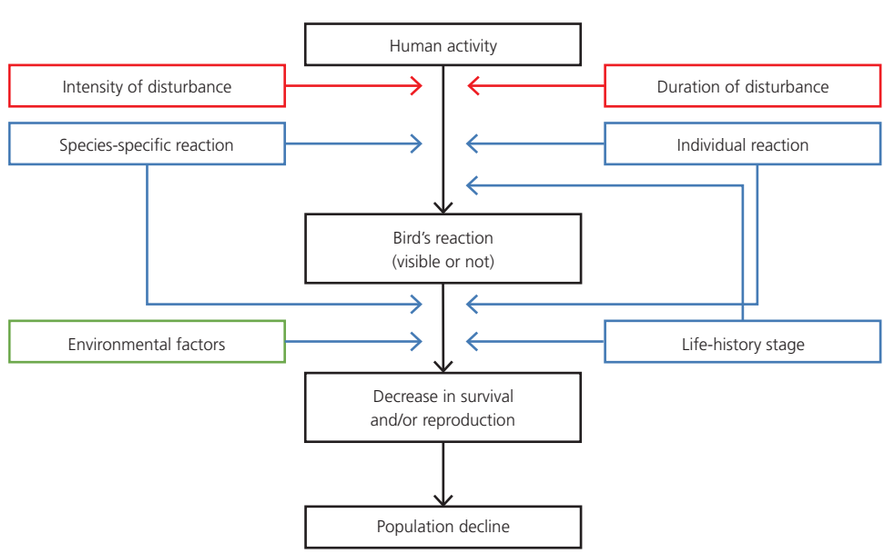
The effects of disturbance are often difficult to measure. Elaborate methods are necessary, as the same individual can display various reactions depending on its physical condition, environmental factors, and the intensity and duration of the disturbance. In addition, a combination of factors are often at play (e.g. disturbance and habitat changes), so that it can be difficult to isolate the effects of disturbance. However, there is no question that disturbance can cause birds to abandon certain areas or reduce an individual's life span or reproductive rate, leading to a decline in population size in the long run. Along with habitat loss, disturbance is now thought to be the main reason for decline in several bird species.

When is disturbance especially problematic?

Birds are particularly sensitive to disturbance during the period of territory establishment, which for most species occurs in spring, as this is when they select a suitable site for breeding. But disturbance has a huge impact during the actual breeding season as well, when it affects the future generation as well as the current one. We all admire a fantastic shot of a Golden Eagle. But such pictures often require the photographer to approach the nest, which may have fatal consequences and lead to brood loss[11]. Less spectacular species and even those living in proximity to humans are vulnerable, too: dogs on a leash and other forms of minor disturbance can reduce the density of a population and even biodiversity[3, 5]; major disturbance can cause birds to abandon their brood[4, 15]. Moderate and short-term stress can also affect the quality of the offspring, as stress hormones released during egg formation are deposited in the egg, affecting the traits of the chicks[1].

Species whose habitats are popular locations for outdoor activities are especially vulnerable to disturbance. Common Sandpiper and Little Ringed Plover, two species that nest on the few remaining gravel banks of our rivers, suffer major disruptions from paddle boats and bathers, which regularly cause the birds to abandon their broods. Climbing can lead to conflicts with cliff-breeding species such as Peregrine Falcon, Eurasian Eagle-owl and Golden Eagle. And who would have guessed that even ice climbing in winter can affect breeding Bearded Vultures?

For grouse, the breeding season is not the only sensitive time of year; in winter, these birds operate on a low energy budget. In addition, the available habitat is significantly diminished by human recreation[7, 16]. Especially off-piste winter sports (ski touring, snowshoe trekking, freeriding) intrude into the wintering habitats of Black Grouse, Western Capercaillie and Rock Ptarmigan. The flushing of Black Grouse and Capercaillie leads to extra energy expenditure and higher stress-hormone levels[2, 16, 17]. But mass



Human disturbance can lead to the decline of bird populations. The effects of human activities depend on the intensity of the disturbance (red), the characteristics of the individual bird (blue) and environmental factors (green).

Stephan Trösch

A single boater can cause hundreds of waterbirds to take flight (the picture shows mainly Red-crested Pochards). More must be done to raise awareness in the context of water-based recreation, too.

Raphaël Arlettaz

Panels placed along the ski runs explain the purpose of quiet zones for Black Grouse. Not all visitors are willing to comply with them yet.

tourism on the slopes has negative effects as well: the number of displaying Black Grouse is lower in ski resorts than in other areas [14]. In the Valais, only one fourth of the Black Grouse's wintering grounds is unaffected by winter sports [6].

Outdoor activities – anytime, anywhere

Leisure activities in nature are popular and outdoor sports will continue to increase [12]. Visitors are penetrating further and further into the remote habitats of many bird species. An example of an outdoor activity that has recently gained popularity is geocaching, a kind of treasure hunt. It can cause considerable disturbance, especially around cliffs where sensitive species have their nests, as the search for «caches» can go on for hours in otherwise undisturbed areas [8]. Another new trend is stand-up paddling, a sport that involves standing on a kind of surfboard and using a paddle to move across the water. Paddlers often fail to keep the required distance to protected zones, causing waterbirds to take flight. This happens mostly out of ignorance and often goes unnoticed by the paddlers themselves. When young waterbirds (e.g. ducks, Great Crested Grebes) are separated from their parents, they have little chance of survival [20].

Who would have thought a mere five years ago that drones would be used recreationally by civilians and become a common feature of everyday life? Today, they represent an intolerable disturbance in areas with large gatherings of birds as well as near cliffs that accommodate sensitive breeding bird species [13]. No-fly zones have already been established for conservation reasons in federal waterbird and wildlife reserves.

Besides leisure activities, events that attract large crowds can also cause significant disturbance. Fireworks, light shows and concerts in the proximity of sensitive sites can seriously affect breeding success in some species, but also habitat quality [18, 19].

Solutions and possible measures

To eliminate disturbance from human recreation and its negative impact, the needs of birds and humans need to be separated through spatial or temporal restrictions. This can be achieved by requiring visitors to stay on the trails and introducing protected zones. To be effective, such protected zones must be clearly marked. Publishing recommendations for visitors can dramatically reduce the threat to birds in unprotected areas as well. The campaign «Respect to protect» succeeded in lessening disturbance in many areas to the benefit of wildlife. It is crucial that the campaign be continued and extended to the summer season. The precautionary principle requires us to create refuges for birds. Only when visitors accept quiet zones and times and keep to the paths and slopes can we achieve long-term protection for sensitive species in such a densely populated country.

Stefan Werner & Susanne Jenni-Eiermann

[1] Almasi et al. (2015); [2] Arlettaz et al. (2015); [3] Banks & Bryant (2007); [4] Bolduc & Guillemette (2003); [5] Bötsch et al. (2017); [6] Braunisch et al. (2011); [7] Coppes et al. (2017); [8] Geidel (2014); [9] Ingold et al. (1992); [10] Jenni-Eiermann et al. (2014); [11] Jenny & Schaad (2015a–b); [12] Lamprecht et al. (2014a–c); [13] Mulero-Pázmány et al. (2017); [14] Patthey et al. (2008); [15] Tablado & Jenni (2015); [16] Thiel et al. (2008a); [17] Thiel et al. (2011); [18] Weggler (2015); [19] Werner (2015); [20] Werner (2017a–c)

Species pages 106, 108, 112, 128, 148, 206, 218, 250, 254, 256, 306

Black Grouse

Lyrurus tetrix
Birkhuhn
Tétras lyre
Fagiano di monte
giaglina da draussa

Olivier Born

Red List Near Threatened (NT)
Population 12 000–16 000 males (2013–2016)

Focus pages 98, 110, 142, 314, 414, 542

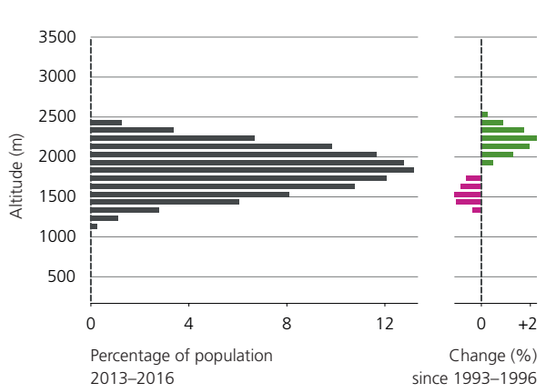
The Black Grouse occurs mainly in the Eurasian taiga belt, in certain mid-elevation mountain ranges and the Alps. Its range in Switzerland is confined to the Pre-Alps and Alps, where it mainly inhabits the zone around the upper tree line. More than 90 % of the population is found between 1400 and 2300 m. In 2013–2016, the highest nests were found at 2190 m near Brail GR (D. Godly) and at 2170 m near Fiesch VS (S. Schumacher); the lowest nest was found at 1500 m near La Roche FR (E. Christinaz). The highest and lowest altitudes at which breeding has ever been recorded are 2300 m near Tschlin GR and 1120 m in the Centovalli TI[VdS]. In 1970–2015, the density in a 5 km² large area in the Aletsch district VS fluctuated around an average of five cocks/km²[9]. In nine census areas in the Canton of Ticino, 3.9 cocks/km² were counted on average during 1981–2002[14].

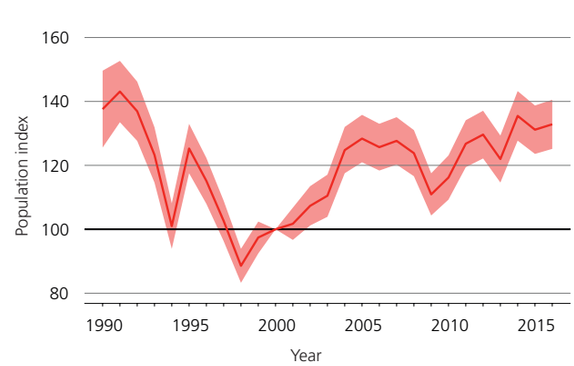
Since 1993–1996, the population has declined slightly in some places at the range margins, while gains have been recorded in the central Alps. The population index is based on a survey of displaying males in 81 areas in the entire Alpine region[8]. Following a decline that reached its lowest level in 1998, numbers increased again up to 2016, when the population almost attained the level of 1990. Overall, these movements have resulted in slight gains compared to 1993–1996. The gains were most pronounced between 1900 and 2500 m; below that altitude, the trend is negative. Surveys in 31 census areas in Grisons have yielded mixed trends[13], but none of them were negative[AGR]. The population in Ticino remained stable in the north during 1981–2009, while declining in the central and southern parts[15].

Germany and Austria report steep declines in the lowlands and mid-elevation mountains, but predominantly stable trends in the Alps[AtA, AtD, AtV, 1, 6]. In France, the Black Grouse has vanished from the Ardennes, and the trend in the Alps is negative[AtF], as it is in the Italian Alps[4, 11]. Whether the Black Grouse's range will contract due to climate warming, and to what extent, is hard to predict[17]. Some leks have shifted to higher altitudes[9]. In winter resorts, it is important to establish refuge zones for Black Grouse[2, 3, 12]. Potential threats include infrastructure development, tourism, disturbance, intensification or abandonment of mountain pastures, and hunting[5, 7, 10, 15, 16].

Christian Marti

[1] Albegger et al. (2015); [2] Arlettaz et al. (2007); [3] Arlettaz et al. (2015); [4] Brichetti & Fracasso (2004); [5] Grünschachner-Berger & Kainer (2011); [6] Feldner et al. (2006); [7] Immitzer et al. (2014); [8] Isler & Bossert (2015); [9] Marti et al. (2016); [10] Mollet et al. (2007a–b); [11] Nardelli et al. (2015); [12] Patthey et al. (2008); [13] Schmid & Jenny (2012); [14] Zbinden & Salvioni (2003c); [15] Zbinden & Salvioni (2010); [16] Zbinden et al. (2018); [17] Zurell et al. (2012)



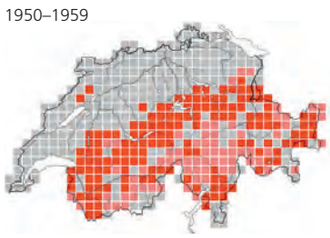


Occurrence 2013–2016

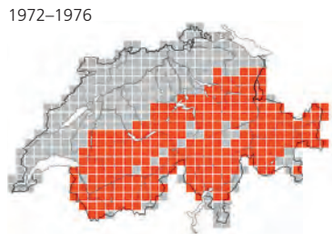
Occurrence change since 1993–1996

Sponsored by
Christian Marti

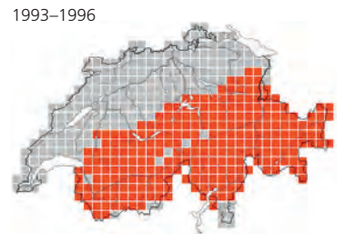
1950–1959



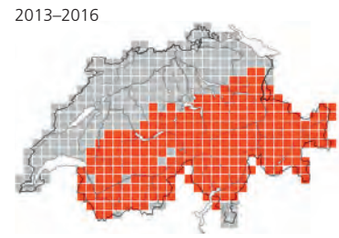
1972–1976



1993–1996



2013–2016



Mute Swan

Cygnus olor
Höckerschwan
Cygne tuberculé
Cigno reale
cign dumesti

Fabien Chenaux

Red List –
Population 590–720 pairs (2013–2016)

Focus page 124

The Mute Swan has a patchy distribution in Europe. The wild birds from northeastern Europe are partial migrants and will winter in Switzerland on rare occasions[3].

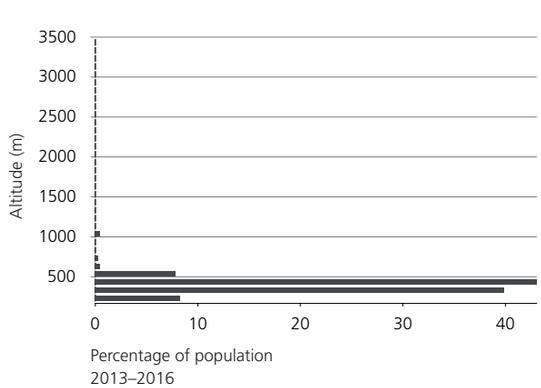
The Mute Swan breeding population in our country derives from released birds. The first release occurred in Lucerne in 1690[6]. Mute Swans were released in several places in the 19th century especially, but also in the 20th century. Today they are widespread below 600 m. In 2013–2016, the Lac de Joux VD at 1000 m was the highest breeding site in Switzerland (C. Guex, U. Poltier, A. Croisier, Y. Menétrey). Earlier nesting sites at high altitudes such as Arosa GR at 1730 m[AGR, AtCH2] are no longer occupied.

The Mute Swan occurs on lakes, large rivers (especially on dammed sections) and small waterbodies. On lakes and rivers, the average densities per kilometre of shoreline were 0.6 and 0.4 pairs, respectively. The greatest densities are reached on lakes with abundant submerged vegetation or an easily accessible food supply on adjacent grassland. The large lakes, especially Lakes Geneva, Neuchâtel and Constance, accommodate 58 % of all pairs, while the large rivers, mainly Aare and Rhine, hold 23 %. Quite remarkable is a breeding colony on a 0.25-ha-large island on the German side of Untersee, Lake Constance, with up to 56 nests[5]. High densities of breeding pairs can also occur locally where the swans are fed by humans, like on the Rhone River in Geneva. However, the highest concentrations in urban areas often consist of non-breeders.

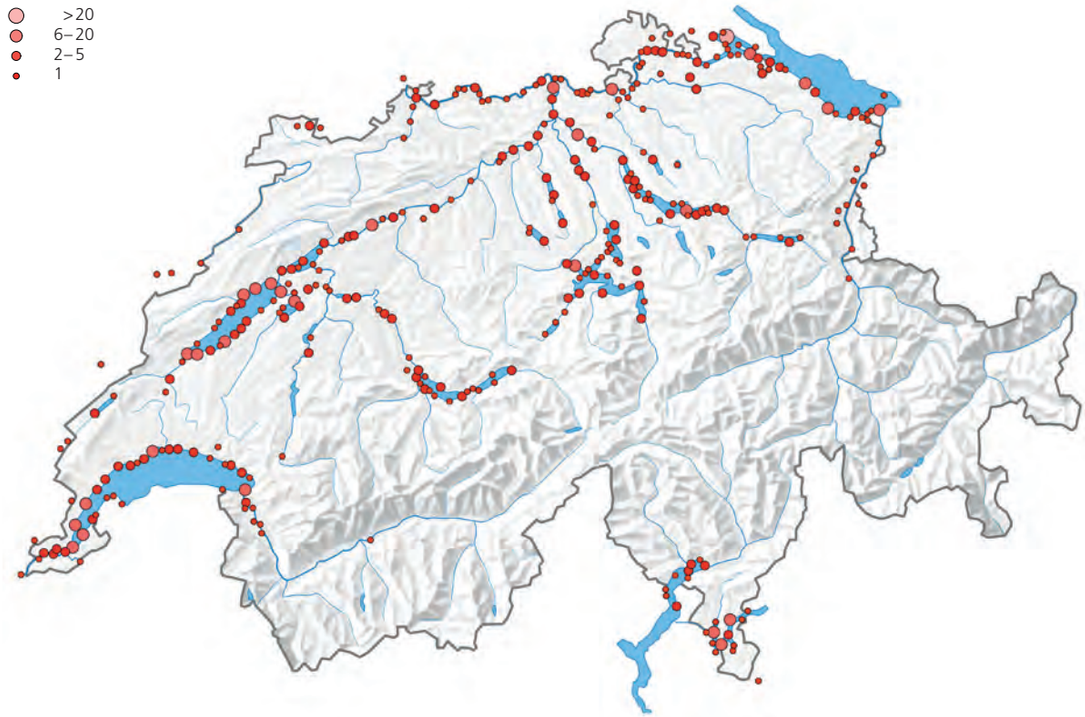
The breeding population has increased since 1993–1996. The winter waterbird counts also reveal an increase since the 1990s. As the breeding birds in Switzerland are residents, at the most moving between nearby lakes[2, 4], the winter trend presumably corresponds well with that during the breeding season. The Mute Swan benefits from mild winters and the renewed spread of underwater vegetation in Switzerland's large lakes thanks to improved water quality. Populations have declined on some waterbodies where feeding by humans has decreased, either voluntarily or because of prohibitions, but this affects mainly non-breeders. The neighbouring countries also report positive trends[AtD, AtF, 1].

Verena Keller & Isabelle Henry

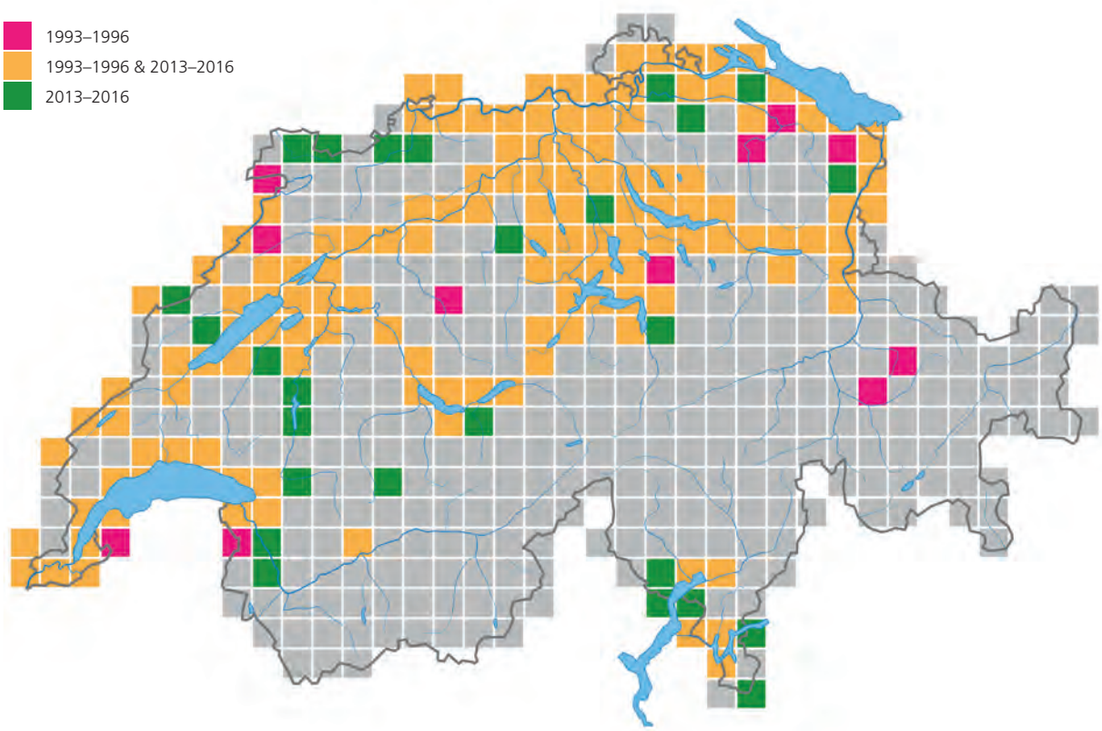
[1] Campedelli et al. (2012); [2] Forster & Wagner (1973); [3] Glutz von Blotzheim (1965); [4] Kaiser (1993); [5] Knaus et al. (2017); [6] Schaller (1938)



Territories 2013–2016

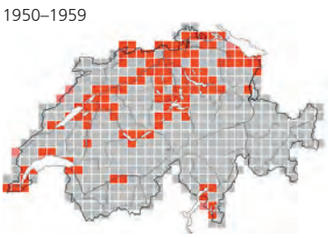


Distribution change since 1993–1996

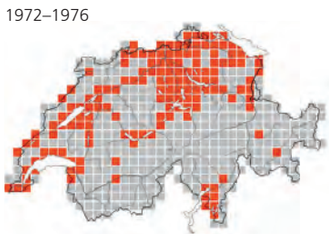


Sponsored by
Danielle Meyer, Birsfelden

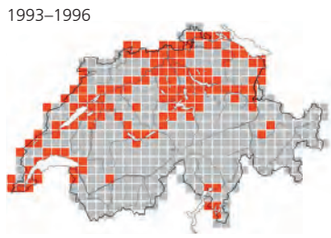
1950–1959



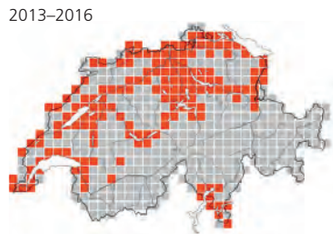
1972–1976



1993–1996



2013–2016



Greylag Goose

Anser anser
Graugans
Oie cendrée
Oca selvatica
auca grischa

Mathias Schäf

Red List –
Population 45–60 pairs (2013–2016)

Focus page 124

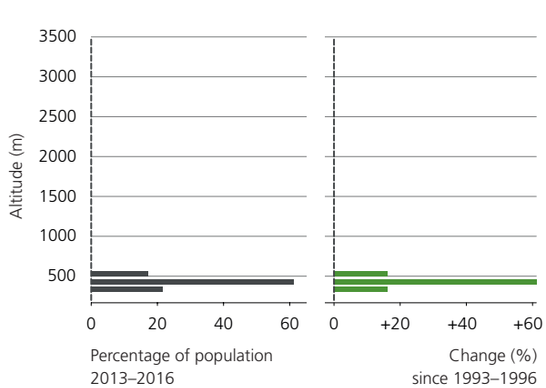
Switzerland lies at the southern edge of the species' European breeding range. In many countries, Greylag Geese are intentionally or unintentionally released from captivity. Today, it is hardly possible to distinguish between wild and feral populations, especially since these populations also mix [1].

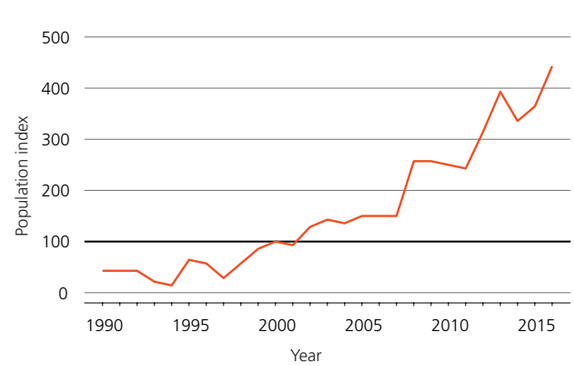
The first broods on the German side of Lake Constance in 1981 [ABo3] and in Switzerland at Flachsee Unterlunkhofen AG in 1983 [4, 5] were from released birds. Since then, the Greylag Goose has increased in both areas. It has also spread from the Reuss Valley in the Canton of Aargau (9–14 broods in 2013–2016) to neighbouring regions. The Greylag Goose bred on Lake Sempach for the first time in 1994. The population has increased here as well, and Greylag Geese have colonised smaller lakes nearby such as Mauensee LU. In 2013–2016, 8–11 broods were recorded around Lake Sempach. On Lake Zug, the first brood was found in 2000. The population peaked in 2013 with 11 confirmed broods. Since then, clutches are being destroyed as part of a management plan, as was done earlier in the Reuss Valley. Other breeding sites include the Lake Zurich area (since 2009, 4–16 broods in 2013–2016), Lake Lucerne (since 2010, 1–4 broods), Baldeggersee (since 2011, 2–4 broods) and Lauerzersee (since 2014, 0–2 broods). On the lakes at the foot of the Jura range, where Greylag Geese have occurred regularly as winter visitors in the past, breeding was recorded for the first time in 1999 on Lake Neuchâtel (9–18 broods in 2013–2016) and in 2007 on Lake Biel (1–2 broods). Isolated records outside of the main areas of distribution were reported from the Aare River (Vogelroupfi/Bannwil BE), with 1–2 broods since 2014. On Lake Geneva, in the Rhone Valley VS, on Lake Thun and on Lac de la Gruyère, breeding was only observed in the years between 1993–1996 and 2013–2016. These areas are presumably less suitable than the lakes and river valleys of the Central Plateau, where the water is skirted by open grassland.

The total population achieved its highest level so far in 2016 with 62 broods [2]. The effective breeding population is probably larger, as only successful breeding attempts as evidenced by nests and families are included. The population has increased in central Europe overall; probable causes include milder winters and an increasing supply of fertilised grassland [RLEU, 3].

Verena Keller

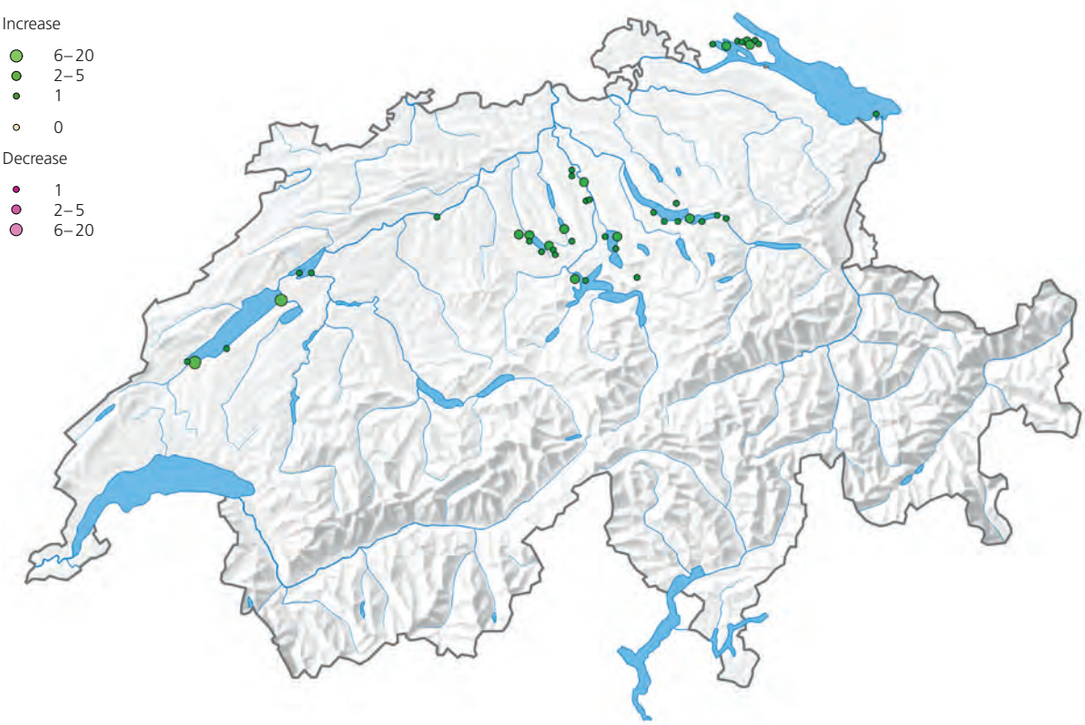
[1] Kampe-Persson (2010); [2] Müller (2017); [3] Podhrázský et al. (2016); [4] Schelbert et al. (1995); [5] Thiel (2009)





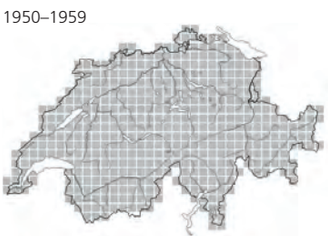
Breeding pairs 2013–2016

Change in the number of breeding pairs since 1993–1996

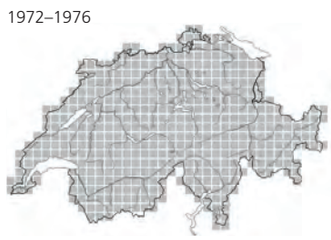


Sponsored by
Michael Götsch, Dübendorf

1950–1959

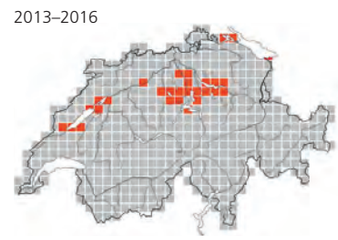


1972–1976



1993–1996

2013–2016



Common Eider

Somateria mollissima
Eiderente
Eider à duvet
Edredone
anda loma

Markus Varesvuo

Red List Vulnerable (VU)
Population 1–5 pairs (2013–2016)

Focus pages 130, 319, 369

The Common Eider occurs along the coasts of northern Europe, eastern Siberia and North America. Switzerland lies far south of its continuous range.

Large influxes, notably in the winters of 1959/60 and 1971/72 as well as in autumn 1988, resulted in an increasing number of summer visitors to Switzerland [VdS]. Breeding was recorded for the first time in 1988 [1]. Since 1992, 1–5 families have been observed every year (except in 1998, 2000 and 2004). During 2013–2016, there were 1–4 broods per year in Rapperswil SG as well as one breeding attempt each in 2013 and 2014 in the Fanel nature reserve BE/NE. In the former breeding sites on Lake Lucerne and Walensee, no broods have been reported since 1996 and 1997, respectively. The Swiss breeding habitats resemble those on the coast and include islands and rocky shorelines of large, nutrient-poor lakes.

The Common Eider has bred only occasionally on inland waters in central Europe [VdS]. The only broods recorded outside of Switzerland since 2000 were on Möhnesee (North Rhine-Westphalia D) and Lac de Coiselet (Ain and Jura F) [AtD, AtF]. The overall European population has been decreasing since 2000 [RLEU, 3, 8]. Suspected causes include coastal oil pollution, disease, hunting, and overexploitation of mussel beds [RLEU, 2, 3, 4, 5, 6, 7].

Samuel Wechsler

[1] Anderegg (1989); [2] Desholm et al. (2002); [3] Ekroos et al. (2012a); [4] Ekroos et al. (2012b); [5] Hario & Rintala (2006); [6] Kurvinen et al. (2016); [7] Lehikoinen et al. (2008); [8] Nagy et al. (2014)

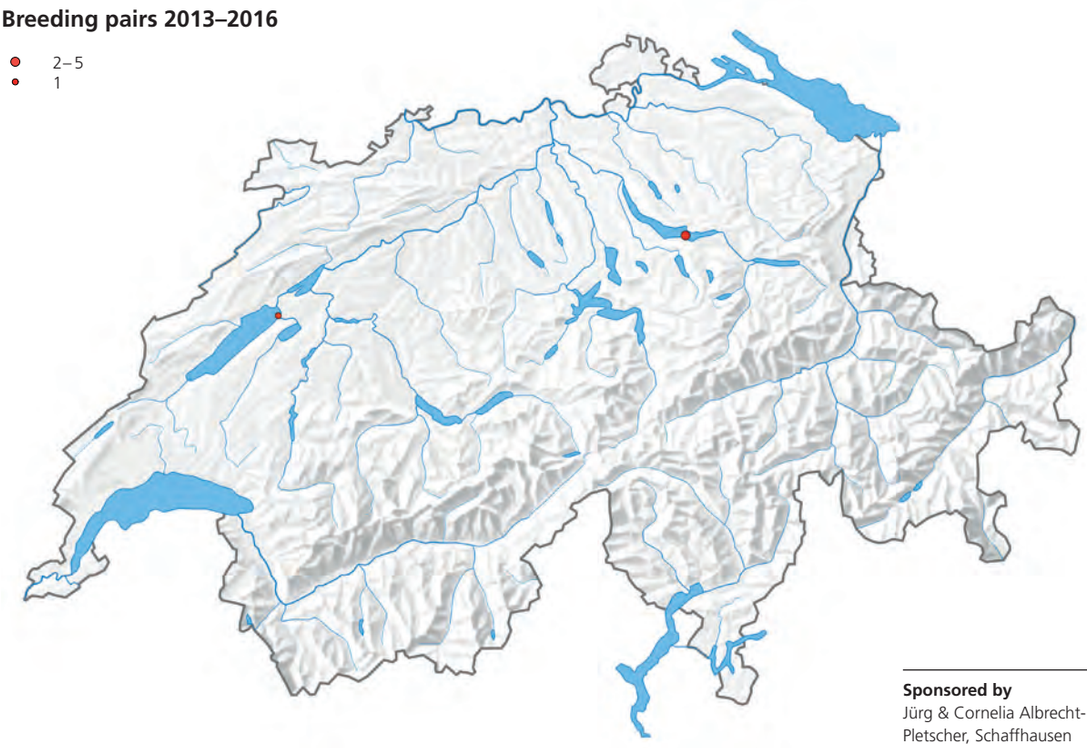
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Jürg & Cornelia Albrecht-Pletscher, Schaffhausen

Red-breasted Merganser

Mergus serrator
Mittelsäger
Harle huppé
Smergo minore
marel mesaun

Markus Varesvuo

Red List Vulnerable (VU)
Population 0–2 pairs (2013–2016)

Focus pages 130, 369

The Red-breasted Merganser mainly inhabits regions of Eurasia and North America to the north of the 50th parallel. Its range extends less far south than that of the Goosander. Unlike the latter, it not only breeds on lakes and rivers, but also along tidal coasts and estuaries. Outside of the breeding season, it is most commonly found in marine habitats, which explains why it is a much rarer breeder than the Goosander far inland from the coast. Evidence of breeding inland far south of its continuous breeding range was recorded in the Czech Republic and in Ukraine, but is very rare[EBBA1]. In Germany, several pairs breed in the Harz Foreland[AtD].

For these reasons, the first breeding record in Switzerland, recorded in 1993 in the Fanel BE/NE, was remarkable, even though the Red-breasted Merganser occurs regularly in small numbers as a winter visitor[1]. It often associates with Goosanders, which also breed on the artificial islands in the Fanel reserve. Since the first breeding record, there have been recurring observations of pairs or individuals here during the breeding season. Until 2016, a successful breeding attempt was recorded every year for eight years; in 2013, there were two[3]. A family party was also observed in 2011 near Yvonand VD on the western part of Lake Neuchâtel[2].

Verena Keller

[1] Monnier (1995); [2] Müller & Volet (2012); [3] Müller & Volet (2014)

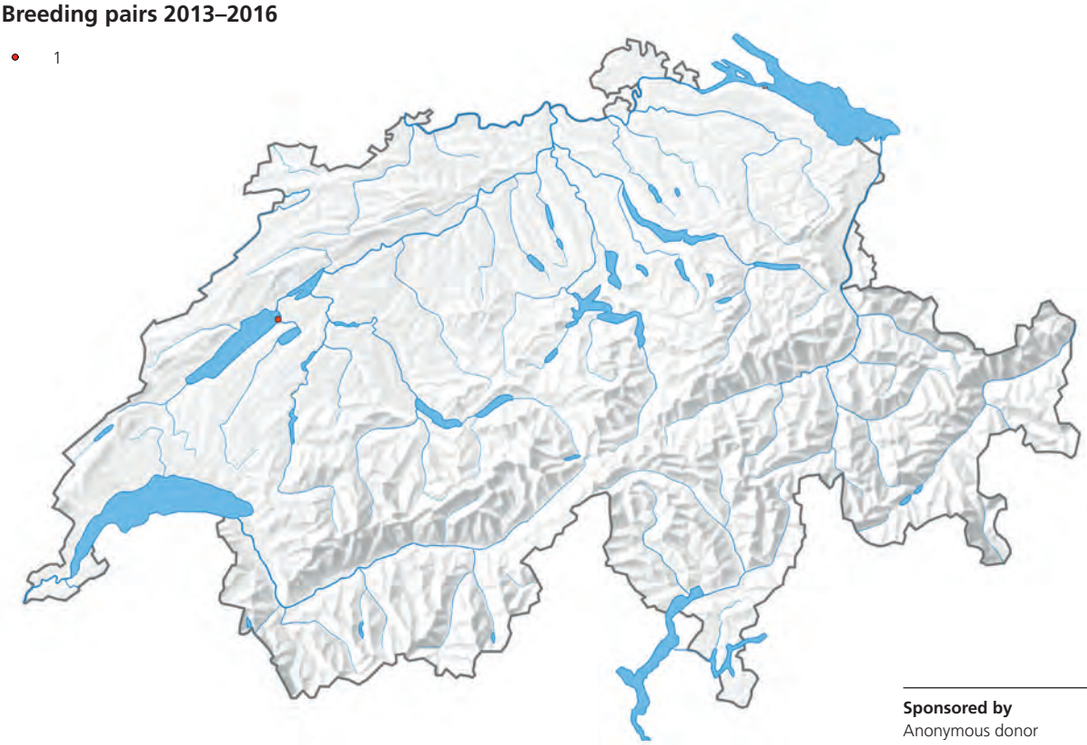
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Anonymous donor

Goosander

Mergus merganser
Gänsesäger
Harle bièvre
Smergo maggiore
marel grond

Andreas Volz

Red List Vulnerable (VU)
Population 600–800 pairs (2013–2016)

Focus pages 130, 147, 170

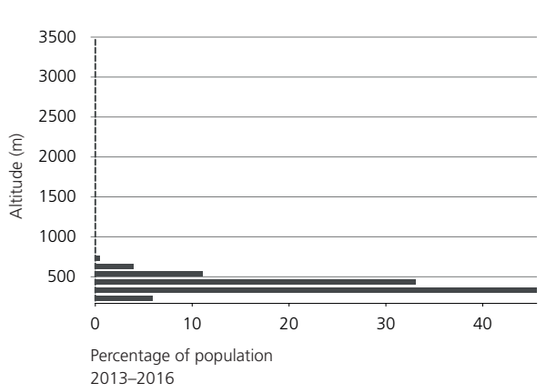
The largest Goosander populations in Europe are found in Russia and Fennoscandia. A geographically separate population that differs genetically from the northern European one breeds in the Alpine region[3, 4]. Its area of distribution stretches from the Lake Geneva region to Slovenia.

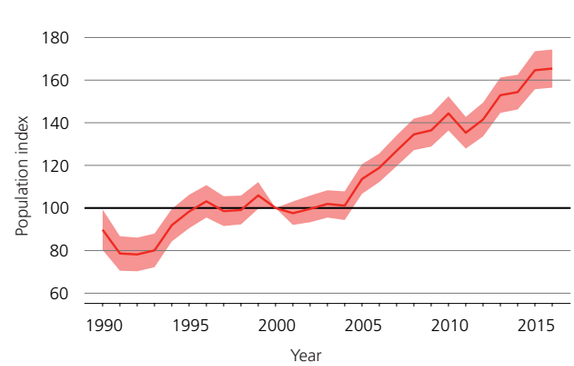
In Switzerland, the Goosander has been extending its range from western Switzerland towards the northeast. This trend continued after 1993–1996, along the Rhine especially, both downstream from where the Aare joins the Rhine and upstream, where the Goosander reached Lake Constance in Stein am Rhein SH. It has also spread along the rivers Thur and Limmat. The Reuss was probably populated from the Aare as well as from Lake Lucerne, where the Goosander has been breeding in increasing numbers since 2000. The most striking change since 1993–1996 concerns the colonisation of southern Switzerland. Following the first breeding record on Lago Maggiore in Cannero I in 1998[1], the first brood on the Swiss side of the lake was recorded in 2003 (P. Koch)[7]. The Goosander subsequently spread to the tributaries[2]. Moving up the Maggia Valley, it reached Bignasco TI in 2015 (R. Lardelli).

The Goosander inhabits large lakes and rivers. While breeding has previously been recorded at 1005 m in Le Chenit VD and above Klöntaler See GL at 900 m[VdS], the highest breeding site in 2013–2016 was at 750 m on the Sense River near Guggisberg BE (A. Aebischer, L. Favre). The Goosander nests in natural cavities in rocks and trees, but also in buildings, walls and chimneys. Families are highly mobile and can cover distances of several kilometres, especially downstream, often moving from a tributary down to the lake, making population estimates difficult. Special surveys conducted for the atlas in 2015 indicate that the population on the large lakes of western Switzerland is in decline, but that the national population, numbering 630–1110 pairs, is significantly higher than the 1998 estimate of 490–670 pairs[5]. The Alpine breeding population has probably increased, as the Goosander has spread in neighbouring countries, too[AtD, AtF, RLEU, 6].

Verena Keller

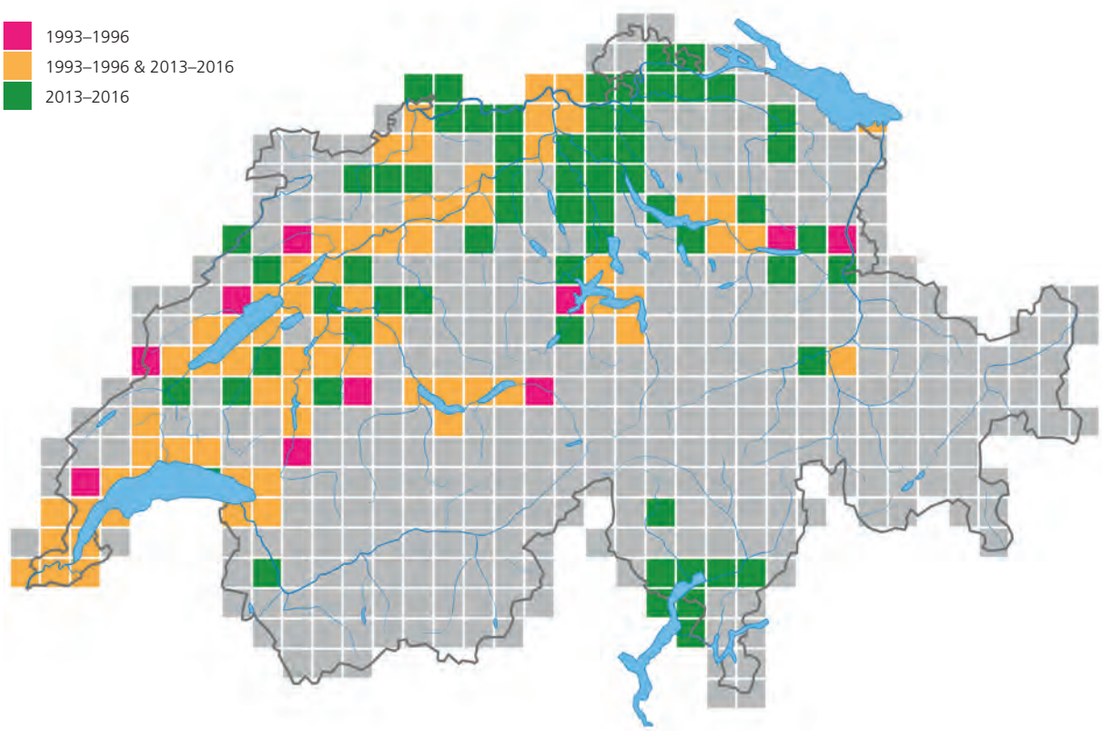
[1] Bordignon (1999); [2] Bordignon et al. (2010); [3] Hefti-Gautschi et al. (2009); [4] Keller (2009); [5] Keller & Gremaud (2003); [6] Teufelbauer (2014); [7] Volet & Burkhardt (2004)





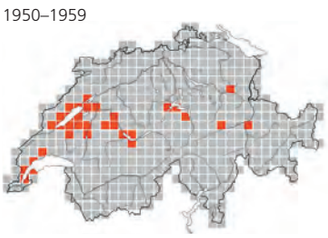
Territories 2013–2016

Distribution change since 1993–1996

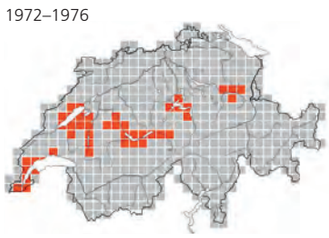


Sponsored by
Adrian Borgula, Lucerne

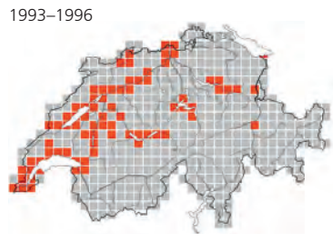
1950–1959



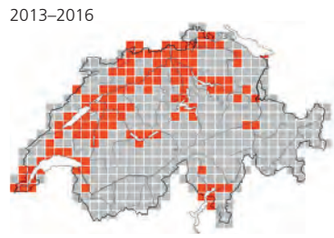
1972–1976



1993–1996



2013–2016



Egyptian Goose

Alopochen aegyptiaca
Nilgans
Ouette d'Égypte
Oca egiziana
auca egipziana

Mathias Schäf

Red List –
Population 8–13 pairs (2013–2016)

Focus page 124

The Egyptian Goose is widespread in Africa. Its population in Europe derives from birds released or escaped from captivity. The species now inhabits a continuous breeding range that stretches from England across the Benelux countries to eastern Germany[AtD, 2]. From the Netherlands, it spread to the south and east along the major rivers[AtD, 5].

The Egyptian Goose has been observed regularly in Switzerland since 1995, especially in the Basel area and along the High Rhine, where the first broods were recorded in 2003[3]. Since then, the annual number of broods has increased, reaching 13 in 2016[4]. The species' known breeding sites are at altitudes below 550 m and primarily in northern Switzerland. During 2013–2016, broods were found on five different golf courses. With their ponds and expanses of short grass, they constitute an ideal habitat, as do parks. The Egyptian Goose also breeds on lakes and dammed rivers.

The Swiss population is still quite small, but is expected to continue its increase. Germany's fast-growing population was estimated at 5000–7000 pairs in 2005–2009[AtD]. In France, the species is also spreading southwards and numbered 215–290 pairs in 2014[AtF, 1].

Verena Keller

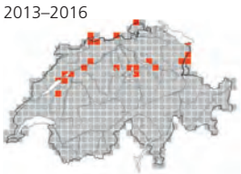
[1] Dubois et al. (2016); [2] Gyimesi & Lensink (2012); [3] Kestenholz et al. (2005); [4] Müller (2017); [5] Schropp et al. (2016)

1950–1959

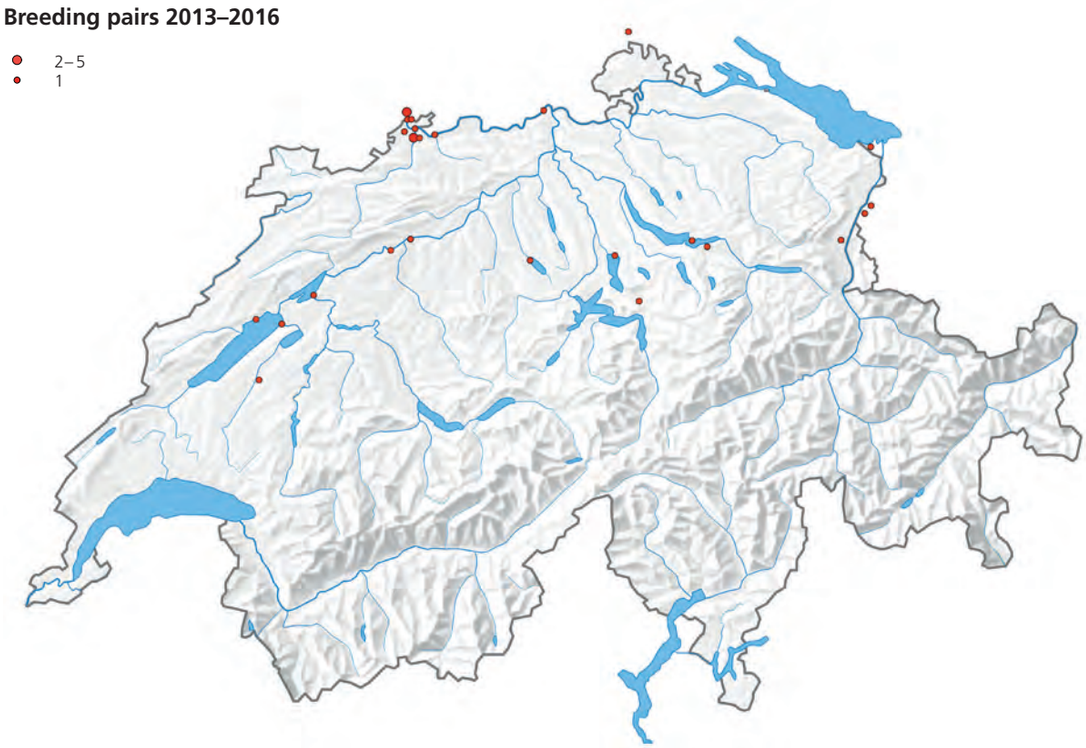
1972–1976

1993–1996

2013–2016



Breeding pairs 2013–2016



Ruddy Shelduck

Tadorna ferruginea
Rostgans
Tadorne casarca
Casarca
auca cotschna

Beat Rüegger

Red List –
Population 10–15 pairs (2013–2016)

Focus page 124

The Ruddy Shelduck population in Switzerland derives from birds escaped from captivity[2]. The nearest populations of wild birds are found in southeastern Europe.

The Ruddy Shelduck occurs in various habitats; in our country, these include shallow water areas on lakes and dammed rivers as well as small waterbodies, mainly in northern Switzerland below 500 m. It nests in buildings and in nest boxes for Western Barn Owls or Common Kestrels. Nesting sites can be located more than 1 km away from the nearest water.

The population in Switzerland started increasing for the first time in 1996. The available data in Europe showed that Switzerland was a centre of expansion along with the Dutch-German border region[2]. Ruddy Shelducks were subsequently shot and eggs removed to prevent the species from spreading further[4, 5], resulting in the local disappearance of the Ruddy Shelduck. In areas where no action was taken, new pairs were able to settle. As a consequence, the most significant spread and population increase took place on the German side of the border along the High Rhine and Untersee, Lake Constance[1]. In Switzerland, 11–13 broods per year were recorded in 2013–2016[3]. In Germany, the population was estimated at 160–200 pairs in 2005–2009[AtD].

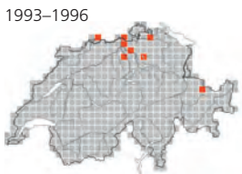
Verena Keller

[1] Bauer et al. (2011); [2] Kestenholz et al. (2005); [3] Müller (2017); [4] Stucki (2005); [5] Wittenberg (2006a–c)

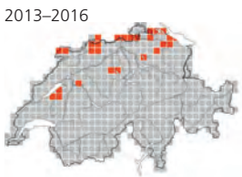
1950–1959

1972–1976

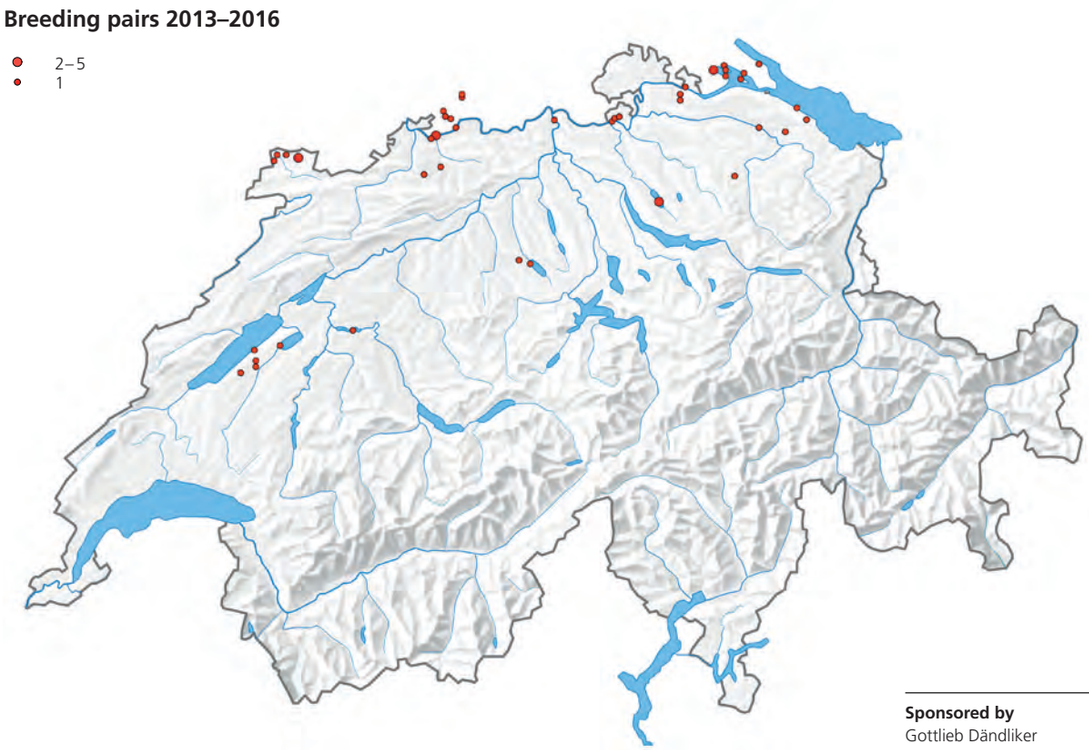
1993–1996



2013–2016



Breeding pairs 2013–2016



Sponsored by
Gottlieb Dändliker

Gaining ground: non-native bird species

For a long time, non-native birds received little attention. But today, invasive species are considered a threat to biodiversity. Monitoring these populations is therefore critical. Only then can we recognise when a species is spreading and, if necessary, take measures to stop it.

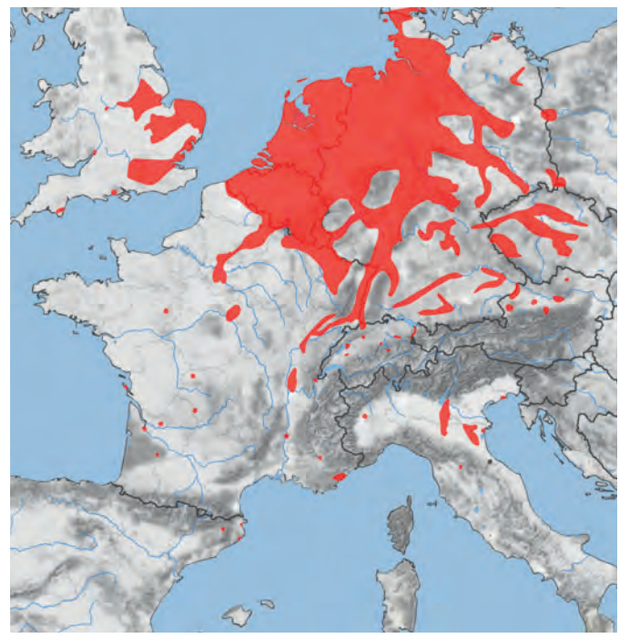
A species is considered alien or non-native when it has become established in areas outside its natural range with direct or indirect help from humans. Some species were deliberately introduced by humans, especially for hunting. In Switzerland, this mainly applies to the Common Pheasant; another example in Europe is the Canada Goose. Waterbirds were introduced to «enrich» our native birdlife with attractive species. Mute Swan and Greylag Goose first bred in Switzerland as a result of such introductions. Wild Mute Swans and Greylag Geese are native to Europe and have long wintered on Swiss lakes and rivers. Since it is no longer possible to determine whether a population derives from introduced or wild birds, these two species are not considered alien in Switzerland, and they are classified as native wild birds under federal hunting legislation. More common than deliberate introductions are accidental ones. In zoos, free-flying birds are considered an attraction, despite the risk of escape. Owners of private collections, unable to keep the young that are produced, may also sometimes let them escape.

Exotic waterbirds and parrots

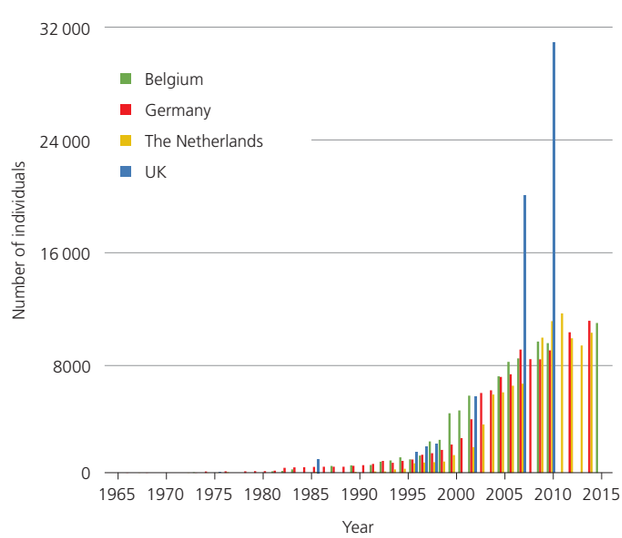
Most escapes from captivity do not survive very long or find a partner. Of the more than 150 alien bird species observed in Switzerland since 1997, only 17 have bred at all and only four breed regularly. For a long time, observers paid little attention to non-native birds, and the Swiss Ornithological Institute did not add them to its list of species to be recorded by volunteers until 1997. Compared to other European countries, Switzerland has only small populations of alien species [1, 5]. They are predominantly waterbirds. While the Ruddy Shelduck and Mandarin Duck populations originate from birds released or escaped within Switzerland, the Egyptian Goose, a native of Africa, now breeds here as a result of the species' southward expansion from the Netherlands and Germany. Parrots, in particular the Rose-ringed Parakeet, which can cause great damage in orchards and competes with other birds or bats for cavities [3, 8, 10], have only bred occasionally in Switzerland so far.

Invasive species are a threat to biodiversity

Not all non-native birds are problematic. The Mandarin Duck has bred in Switzerland since 1958 without any known conflict. The Ruddy Shelduck, in contrast, competes for nest sites with the Common Barn-owl and other species, which could become a problem if it continues to spread. In the past 20 years, the awareness that invasive alien species can pose a threat to biodiversity has increased. When the first Ruddy Ducks from North America began to breed in England outside of ornamental waterfowl collections, nobody anticipated that the species would spread to France and from there to Spain, where it threatened the White-headed Duck,



The Egyptian Goose is widespread and locally abundant in the Benelux countries and northwestern Germany especially. Background map: Natural Earth, Stamen Design & OpenStreetMap.



The Rose-ringed Parakeet has established itself in ten European countries, where numbers are growing rapidly, as illustrated by trends in the four most important countries besides Spain. Source: Pârâu et al. (2016).

Geneva, Basel BS, Zurich, Rapperswil SG, Thun BE: The overlapping breeding records of non-native waterbirds show clusters in urban centres and near zoos. Ruddy Shelduck, Egyptian Goose and Mandarin Duck also breed in rural areas.

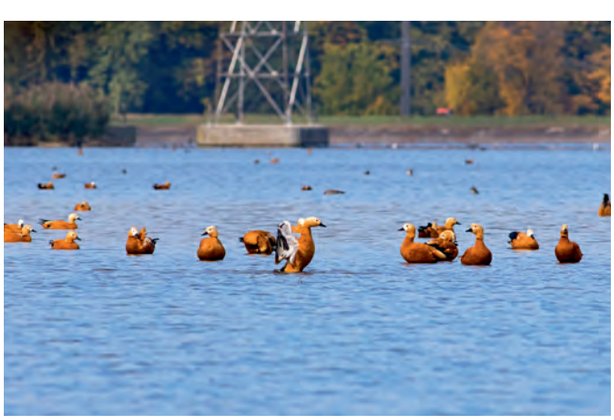
a species already struggling with habitat loss. The two species hybridise – an additional cause for conservation concern. A European action plan to protect the White-headed Duck was drawn up with the goal of eradicating the Ruddy Duck in Europe[4, 9]. Switzerland has joined the action plan, though it only applies to a handful of individual birds every year.

Prevention is crucial

The example of the Ruddy Duck illustrates how hard it can be to predict conflicts caused by non-native species and take timely action. As long as only a few pairs breed, no harm is done, so no measures are taken at this point, even though they would require little effort. Once a population has become established, however, interventions are costly and often have little chance of success. Prevention therefore plays an important role. Federal hunting legislation prohibits the release of non-native species; a ban has been placed on the Ruddy Duck, and special permits are required to import and keep several other species. Animal protection laws require that animals are kept in a way that prevents them from escaping. In the case of birds, this can only be guaranteed when they are kept in secure enclosures. Prevention can also include removing broods found in new locations, particularly if the species is potentially invasive[2, 7]. According to Swiss hunting legislation, the cantons are responsible for preventing the spread of non-native species and must remove them if they pose a threat to native biodiversity.

Non-native species are expected to continue appearing in Switzerland. The most recent example is the Ashy-throated Parrotbill from China and Vietnam. The species was suspected of breeding in Ticino in 2017 after it had become established in neighbouring Italy[HBW, 6].

Verena Keller



Fritz Sigg

Klingnau reservoir AG has a particularly high concentration of non-native waterbirds like the Ruddy Shelduck.

[1] Bauer et al. (2016b); [2] Bundesamt für Umwelt (2016)/Office fédéral de l'environnement (2016)/Ufficio federale dell'ambiente (2016); [3] Hernández-Brito et al. (2014); [4] Hughes et al. (2006); [5] Kestenholz et al. (2005); [6] Luoni et al. (2009); [7] Nentwig et al. (2016); [8] Pârâu et al. (2016); [9] Robertson et al. (2015); [10] Strubbe & Matthysen (2009)

Species pages 100, 114, 116, 122, 123, 127, 577, 578, 581, 582, 583, 584

Common Shelduck

Tadorna tadorna
Brandgans
Tadorne de Belon
Volpoca
anda faschada

Markus Varesvuo

Red List Vulnerable (VU)
Population 1–4 pairs (2013–2016)

Focus pages 319, 369

In western Europe, the Common Shelduck occupies mainly coastal regions, though it also ranges far inland along the major rivers. It searches for food on mud and silt flats. Away from the coasts, such foraging grounds are rare; in Germany and France, for example, the Shelduck is found on flooded gravel and sand pits or sewage ponds [AtD, AtF]. In Switzerland, the most suitable conditions exist around silted-up reservoirs like Klingnau AG or Verbois GE, where breeding has been recorded several times.

The first broods were found in 1998 on the Rhone River in Geneva and on Klingnau reservoir [1]. The Common Shelduck has bred annually since 2011, with 1–5 families observed every year. In the record year 2012, five broods were found on Verbois reservoir and at river mouths in Préverenges VD and St-Prex VD on Lake Geneva [2, 3]. Breeding was also recorded in Sciez F on Lake Geneva in 2009 [AtF].

Common Shelduck numbers have increased in most central European countries in the last decades [RLEU]. The growing number of observations in Switzerland during the breeding season is probably a result of this increase and of the extension of the species' range inland.

Verena Keller

[1] Knaus (2000); [2] Müller (2015); [3] Müller & Volet (2013)

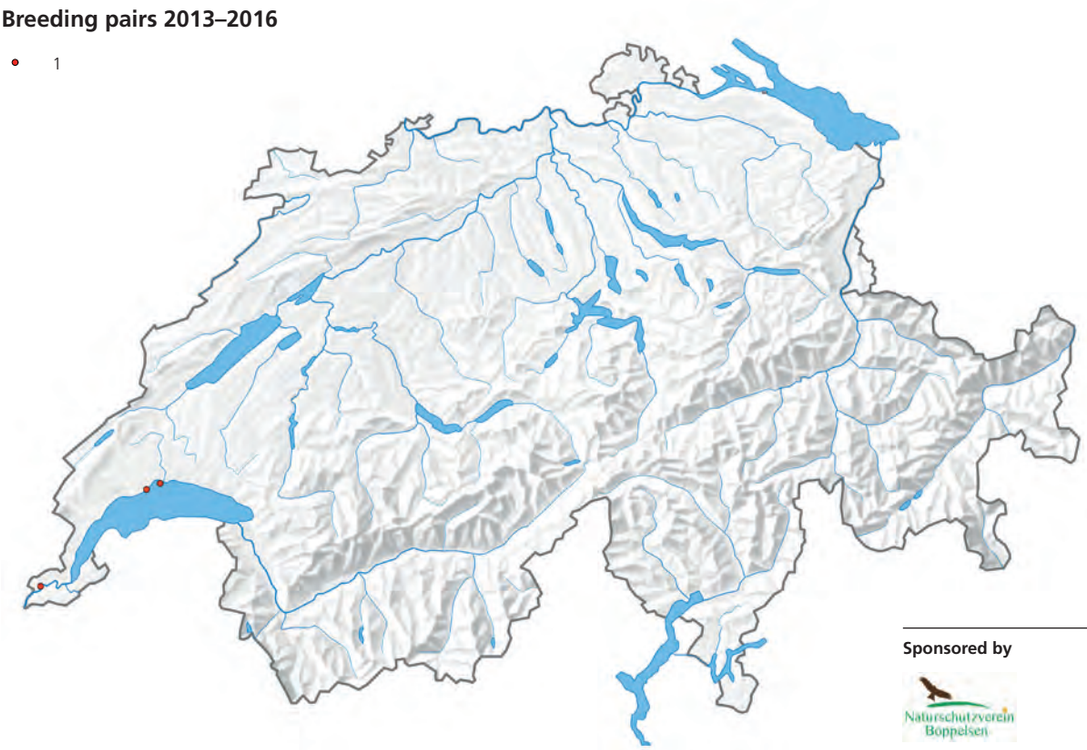
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016

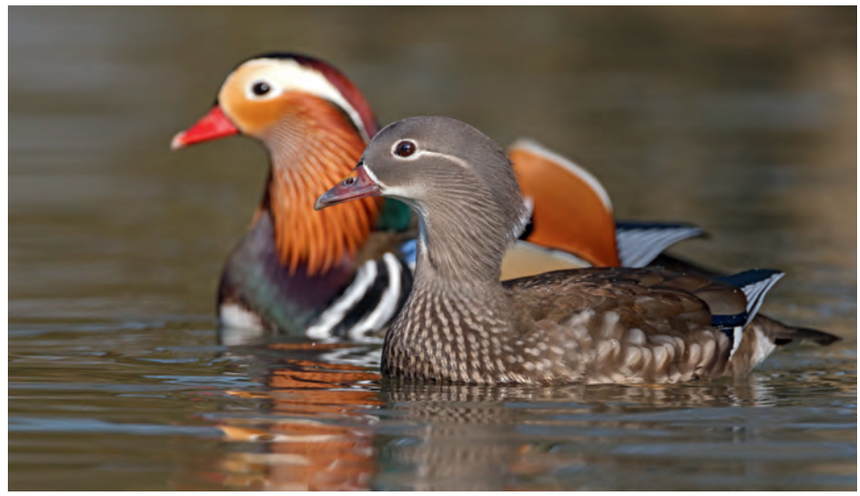


Sponsored by

Naturschutzverein Böppelsen

Mandarin Duck

Aix galericulata
Mandarinente
Canard mandarin
Anatra mandarina
anda mandarina



Christine Jung

Red List –
Population 10–20 pairs (2013–2016)

Focus pages 124, 130

The Mandarin Duck is a native of East Asia. The species has become established in many countries in Europe following escapes from captivity. In the past decades, the Mandarin Duck has increased its range and population in Germany, France and the UK [AtD, AtF, AtGB]. In Switzerland, too, where breeding was first recorded in Basel in 1958 [1], new locations have been populated since 1993–1996, mainly in eastern parts of the country. Other sites are no longer occupied. From 2013 to 2016, 10–17 broods were recorded every year; during 1997–2012, the average was 6.9 families a year. A large part of the population is found in urban areas and near zoos or private collections. In places where free-flying Mandarin Ducks are kept, it is hard to distinguish between feral birds and captive ones, as the example of Giessenpark/Bad Ragaz SG illustrates.

Mandarin Ducks nest mostly in tree cavities. In 2014 and 2016 in Malters LU, a female used a Western Barn Owl nest box (R. Bühler, R. Lüthi). At 690 m, this is the highest recorded nesting site in Switzerland. Mandarin Ducks are not easy to locate, as they often occupy sheltered stretches of water with overhanging trees. The winter population, which presumably consists mainly of local birds, numbered between 50 and 100 individuals in the last ten years.

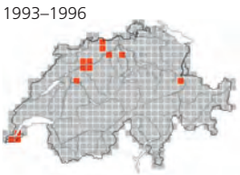
Verena Keller

[1] Kestenholz (1997)

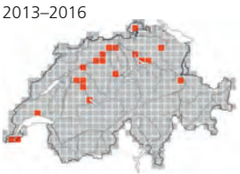
1950–1959

1972–1976

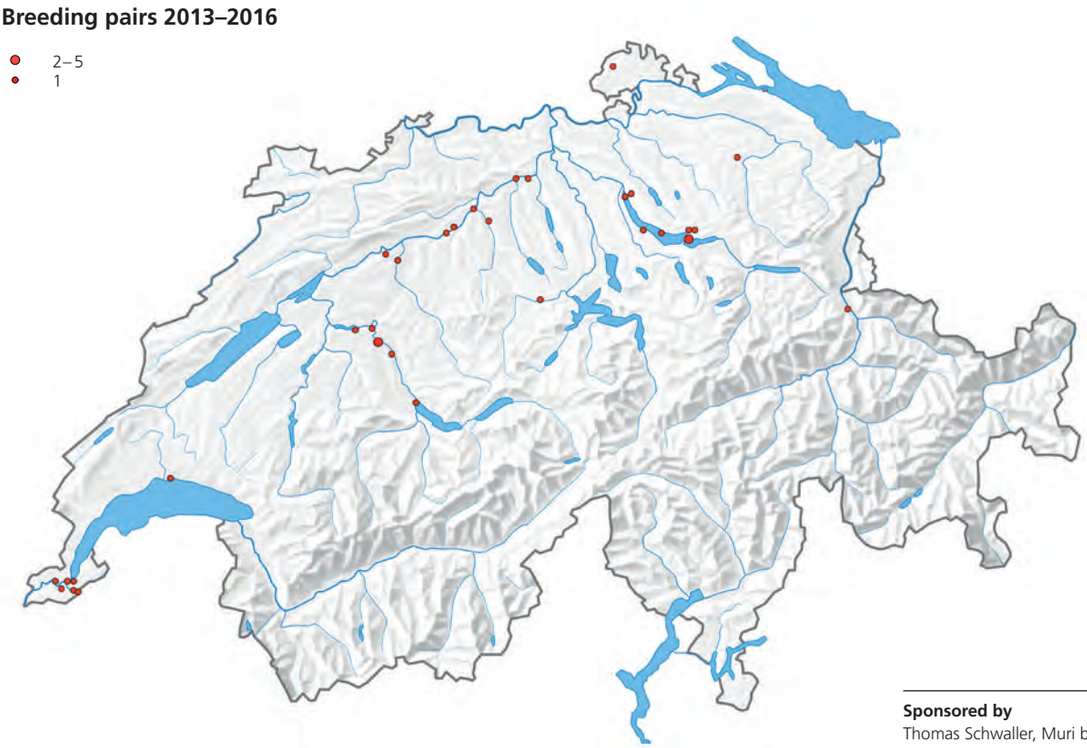
1993–1996



2013–2016



Breeding pairs 2013–2016



Sponsored by
Thomas Schwaller, Muri bei Bern

Red-crested Pochard

Netta rufina
Kolbenente
Nette rousse
Fistione turco
anda cotschna

Marcel Burkhardt

Red List Near Threatened (NT)
Population 210–300 pairs (2013–2016)

Focus pages 110, 130, 240, 319, 380, 402

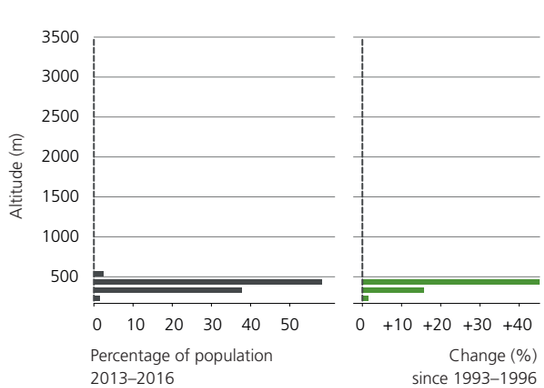
Red-crested Pochards breeding in Switzerland belong to the southwestern/central European population, which is geographically and genetically distinct from the much larger central Asian population [1].

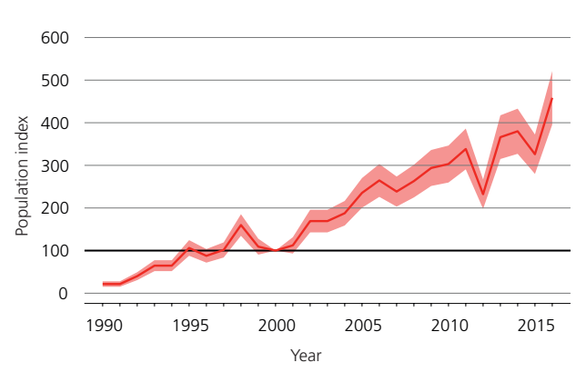
Breeding was recorded for the first time in 1927 on the Swiss side of Untersee [6]. Up until the 1960s, the population was confined to Lake Constance, and not until the 1980s was breeding recorded annually [3]. The breeding population began increasing in the nineties, along with the massive increase of the wintering population [2]. The large lakes, with their low nutrient content and dense growths of stonewarts, accommodate the largest numbers of Red-crested Pochards, both in winter and during the breeding season: Lakes Neuchâtel, Constance, Lucerne, Geneva and Zurich. Since about 2000, the species also breeds on smaller lakes, ponds, reservoirs and slow-flowing rivers. However, these habitats only accommodate a small portion of the population. Above 600 m, there are isolated breeding records, such as the two broods recorded on Lac de Joux VD at 1000 m in 2006 (Y. Menétrey) [7]. South of the Alps, only one family party has been observed so far, in Locarno TI in 2014 (J.-L. Ferrière, A. Hill, D. Crinari) [4].

The Red-crested Pochard is highly adaptable and now breeds in urban areas as well as in more natural habitats. It often chooses to nest on islands, where it can reach high densities. In 2016, for example, 53 clutches were found on the artificial island off Châble-Perron VD, and 29 clutches on the island on the Neuchâtel side of the Fanel BE/NE (M. Antoniazza, P. Rapin). There were also several mixed clutches, mainly with Mallards. The availability of islands and the ample food supply explain the high concentration of Red-crested Pochards on Lake Neuchâtel, which accommodates about half of the Swiss breeding population, estimated at about 450 pairs in 2014 [3]. The number of confirmed broods fluctuated between 212 and 298 in 2013–2016 [5]. On Lake Constance, the breeding population numbered 330–340 pairs, most of them on the German side of the lake [AtBo, AtD]. The increase in Switzerland is in line with upward trends in Spain, France, Germany and other countries of central Europe [RLEU]. Compared to the wintering population of more than 30 000 individuals, however, the Swiss breeding population is still very small.

Verena Keller

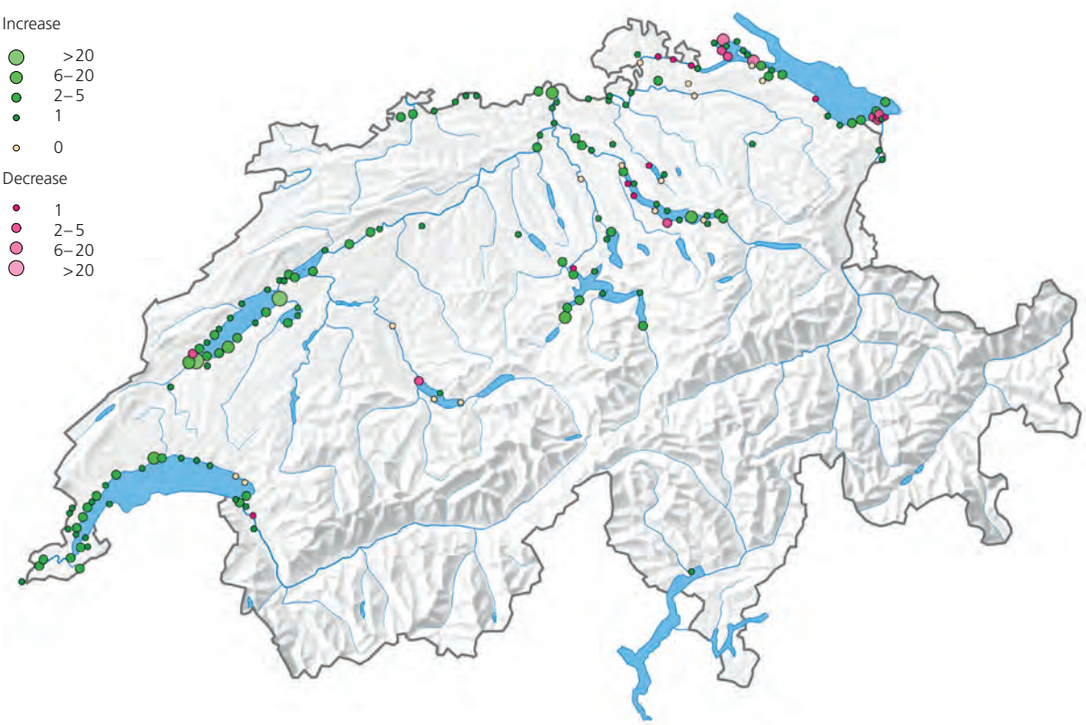
[1] Gay et al. (2004); [2] Keller (2000); [3] Keller (2014); [4] Müller (2015); [5] Müller (2017); [6] Noll (1929); [7] Volet et al. (2007)





Breeding pairs 2013–2016

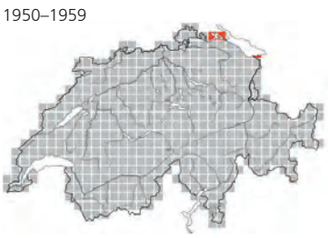
Change in the number of breeding pairs since 1993–1996



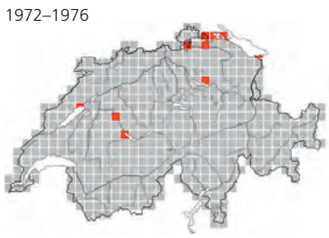
Sponsored by

Ornithologische Gesellschaft der Stadt Luzern

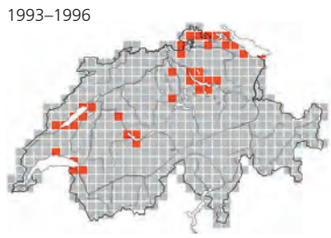
1950–1959



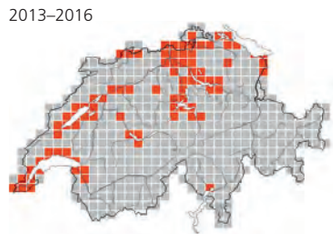
1972–1976



1993–1996



2013–2016



Waterbirds: where wintering and breeding grounds overlap

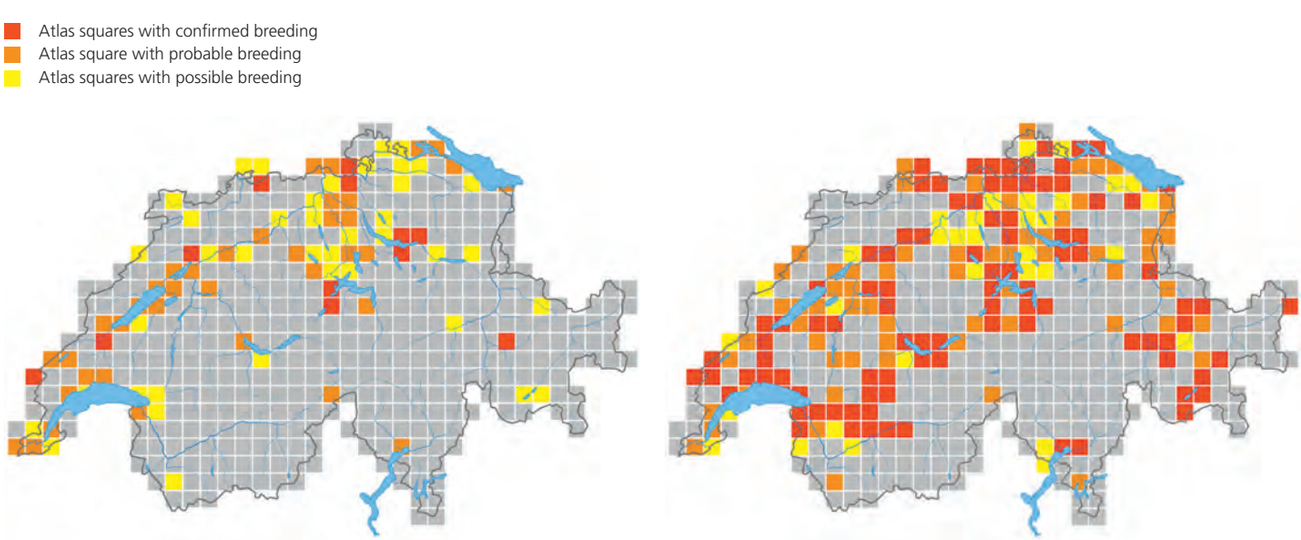
In winter, Switzerland's lakes and rivers accommodate about half a million waterbirds. The populations are much smaller during the breeding season, and only few species breed regularly in large numbers, as suitable breeding habitats are rare. Ducks are a case in point.

Switzerland has an abundance of waterbodies. The lakes on the Central Plateau rarely freeze over and never dry up, so that food is always accessible to waterbirds in winter. That makes Switzerland an attractive wintering site for waterbirds. However, ideal wintering grounds are not always suitable for breeding, as breeding requires sheltered sites for birds to nest and raise their young. Many species like to breed in reedbeds or on islands, for example, where they are better protected from ground predators than along the shore. But such sites are rare because our lakes are often very deep. Just how attractive these sites are for breeding ducks is illustrated by the artificial islands on Lake Neuchâtel or in the Reuss delta UR[1, 4, 8], which are used by several species. Marshes with a high water level and small areas of open water, where ducks can hide their nests in clumps of sedges, also offer protection from predators. These habitats have become rare due to the drainage of wetlands and the construction of bank protection works.

Only few sites exist where not only Mallards, but several other duck species breed as well. The upper part of Lake Zurich with the adjacent Kaltbrunner Riet SG is particularly notable. In 2013–2016, Common Eider, Red-crested Pochard, Common Pochard, Tufted Duck, Garganey and Northern Shoveler bred here – six of the ten rarer species. In the Ermatinger Becken TG and Wollmatinger Ried D, an area that straddles the German-Swiss border, breeding of Red-crested Pochard, Ferruginous Duck, Tufted Duck, Garganey and Gadwall was recorded.

From winter visitor to breeding bird

In Switzerland, the only common and widespread duck is the Mallard, a species that is extremely adaptable in its choice of habitat. All other duck species are rare breeders. On the lakes and rivers that serve as wintering sites, individuals or small groups of ducks can regularly be observed spending the summer in Switzerland. These are often one-year-old juveniles that do not yet breed; some are injured birds or birds in too poor a condition to return to their breeding grounds. Breeding will occasionally occur, but it is mostly sporadic as in the case of the Common Eider[3]. Only Red-crested Pochard and Tufted Duck have managed to establish themselves in Switzerland and form populations of several hundred pairs[2, 6]. The Common Pochard, on the other hand, which often associates with these two species in winter, has remained a rare and local breeder. The reasons are unclear, as Red-crested Pochards and Common Pochards breed side by side in areas such as the Doñana in Spain, the Dombes in France or the fish ponds in the Czech Republic. The mating system may play a role. While Red-crested Pochards search for a mate at the wintering sites and are thus able to rapidly colonise new areas, Common Pochards



Map of atlas squares for Common Pochard (left) and Tufted Duck (right) showing possible and probable breeding as well as confirmed breeding (cut-off date: 10 May). The map for the Common Pochard contains many squares where breeding has never been confirmed. In the case of the more common Tufted Duck, the map of confirmed broods reflects the area of distribution well.

Rolf Hauri conducted a thorough survey of the Tufted Duck population on the Lenkerseeli in the Bernese Oberland and was able to show that in many years, only half the females produce offspring.

Verena Keller

often only form pairs during spring migration or at the breeding grounds. Ducks are not the only birds to have established themselves as breeding species after wintering in Switzerland. Other waterbirds to have done the same are Red-breasted Merganser, Goosander and Black-necked Grebe.

Breeding population difficult to monitor

The simultaneous presence of late winter visitors and early breeders makes it difficult to estimate the size of the breeding population. To minimise the risk of counting birds that spend the summer here without breeding, all Swiss atlases adopted strict requirements for records concerning the rarer duck species and other waterbirds: breeding must be confirmed. As the observers do not actively search for nests, the most frequent evidence of breeding are family parties (Atlas Code 13); the artificial islands on Lake Neuchâtel are the only sites where nests are counted systematically.

Such a conservative approach that limits records to confirmed broods is problematic when it comes to documenting population trends, as it only accounts for breeding success, which fluctuates more widely from year to year than the population itself. Breeding can fail for a number of reasons. Clutches are often lost to predators or because of variations in the water level, and many of the young disappear shortly after fledging. Duck families often keep to sheltering vegetation, where they are hard to detect. As an added difficulty, families often band together, especially Tufted Ducks. Brood parasitism, where females lay their eggs in the nests of the same or other species, is well documented especially for the Red-crested Pochard. The resulting mixed families further complicate monitoring efforts. For these reasons, the size of the breeding population is often underestimated. In the case of Red-crested Pochard and Tufted Duck, doubling the number of confirmed breeding records yields a realistic estimate of the breeding population[5, 6]. A systematic census of breeding pairs at the start of the breeding season as it is done, for example, in Finland[7] could improve the accuracy of population trends.

Verena Keller

[1] Antoniazza (in prep.); [2] Birrer (1991); [3] Géroudet (1991); [4] Glutz von Blotzheim (2013); [5] Hauri (1997); [6] Keller (2014); [7] Pöysä (1996); [8] Schmid et al. (2016)

Species

pages 118, 119, 120, 127, 128, 132, 133, 134, 136, 137, 138, 140, 146

Each of the ten duck species considered rare in Switzerland (Common Eider, Mandarin Duck, Red-crested Pochard, Common Pochard, Ferruginous Duck, Tufted Duck, Garganey, Northern Shoveler, Gadwall, Common Teal) has specific habitat requirements. Still, there is some overlap, as most duck chicks depend on insects and other invertebrates for food. The areas with the highest species diversity (number of duck species besides the Mallard) in 2013–2016 are characterised by wetlands with lots of structural variation on or near the large lakes.

Common Pochard

Aythya ferina
Tafelente
Fuligule milouin
Moriglione
anda fustga

Dieter Wörlein

Red List Endangered (EN)
Population 6–9 pairs (2013–2016)

Focus pages 130, 319

Switzerland lies at the edge of the Common Pochard's breeding range, which covers mainly the steppes of eastern Europe and central Asia. In the course of the species' expansion from the mid-19th century, breeding was recorded in Switzerland for the first time in 1952 [2]. The Common Pochard has bred here regularly since 1970 (except in 1999 and 2001). In 1993–1996, 6.8 families were recorded on average. In 1997–2012, the average was 6.1 and in 2013–2016, it was 7.5 families. Despite relatively stable population numbers, the distribution has changed: in 1993–1996, breeding records to the west of the Reuss were exceptional [AtCH2]; in 2013–2016, five records were reported in that area.

The Common Pochard likes to breed on nutrient-rich, densely vegetated lakes with extensive marshes along the shores. It also inhabits dammed rivers. The highest breeding site in Switzerland, occupied since 2003 (J. Jelen, C. Meier-Zwicky) [6], is Heidsee/Lenzerheide GR at 1480 m.

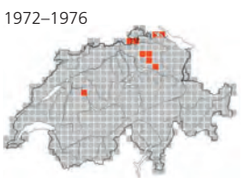
On the German side of Lake Constance, a maximum of 31 families was observed in 1989; but following two breeding occurrences in 2000, there have been no further records [ABW1]. Common Pochard breeding populations are in marked decline across Europe [AtD, AtF, 1, 3, 5, 7]. The probable causes differ by region and range from changes in the nutrient content of lakes to increasing disturbance [1, 3, 4].

Stefan Werner

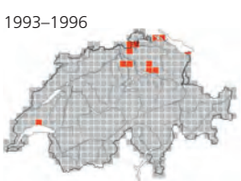
[1] Bauer et al. (2016a); [2] Capt (1953); [3] Fox et al. (2016); [4] Maceda-Veiga et al. (2017); [5] Viksne et al. (2010); [6] Volet & Burkhardt (2004); [7] Wetlands International (2017)

1950–1959

1972–1976

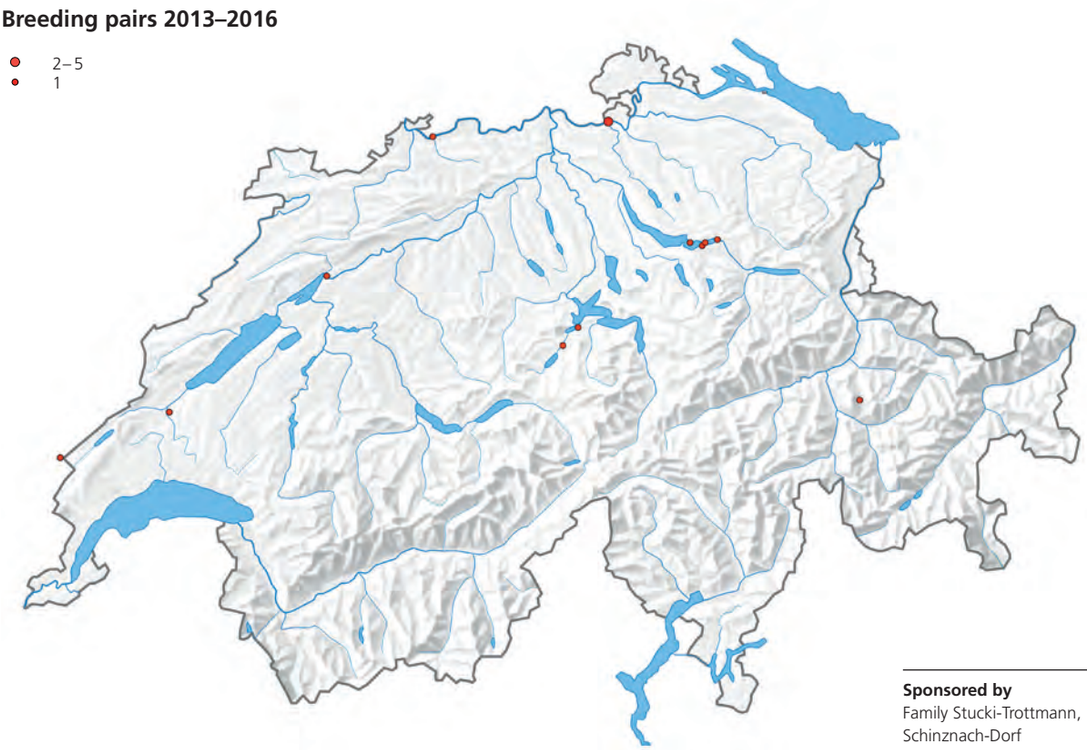


1993–1996



2013–2016

Breeding pairs 2013–2016



Sponsored by
Family Stucki-Trottmann,
Schinznach-Dorf

Ferruginous Duck

Aythya nyroca
Moorente
Fuligule nyroca
Moretta tabaccata
anda da palì

Marcel Burkhardt

Red List –
Population 0–1 pairs (2013–2016)

Focus pages 130, 369

Switzerland lies at the northwestern edge of the Ferruginous Duck's breeding range. Breeding was first recorded in 1991–1992 on Ägelsee TG, in 1999 in Bolle di Magadino TI[VdS] and in 2011 in Nuolener Ried SZ (L. Huppin, E. Weiss)[4]. Two breeding records were obtained in 2013–2016: the fifth Swiss breeding record came from Chavornay VD in 2014[3], and in 2013, a brood was recorded in Wollmatinger Ried D (S. Werner)[6]. The species' preferred breeding habitats include densely vegetated wetlands along the shores of large lakes as well as small eutrophic waterbodies in low-lying areas.

In eastern Europe, the population is increasing again in some parts following years of decline[RLEU, 7]. The Ferruginous Duck has also been breeding in the Dombes F since 2003, possibly associated with the wintering population on Lake Geneva[1]. From 1995 to 2009, ten broods were counted on the German side of Lake Constance[ABW1, AtBo]; after 2010, the only breeding record was the one in Wollmatinger Ried mentioned above. The Ferruginous Duck is often kept in captivity, and reintroduction schemes exist in neighbouring countries (e.g. in Lower Saxony D since 2012). A connection with the breeding records listed here has not been proven and is unlikely[3]. Of about 20 Italian reintroduction schemes, only two in central Italy were successful[5].

Stefan Werner

[1] Castanier & Lebreton (2016); [2] Maumary et al. (2015); [3] F. Melles, in litt.; [4] Müller & Volet (2012); [5] Robinson & Hughes (2006); [6] Trösch et al. (2013c); [7] Wetlands International (2017)

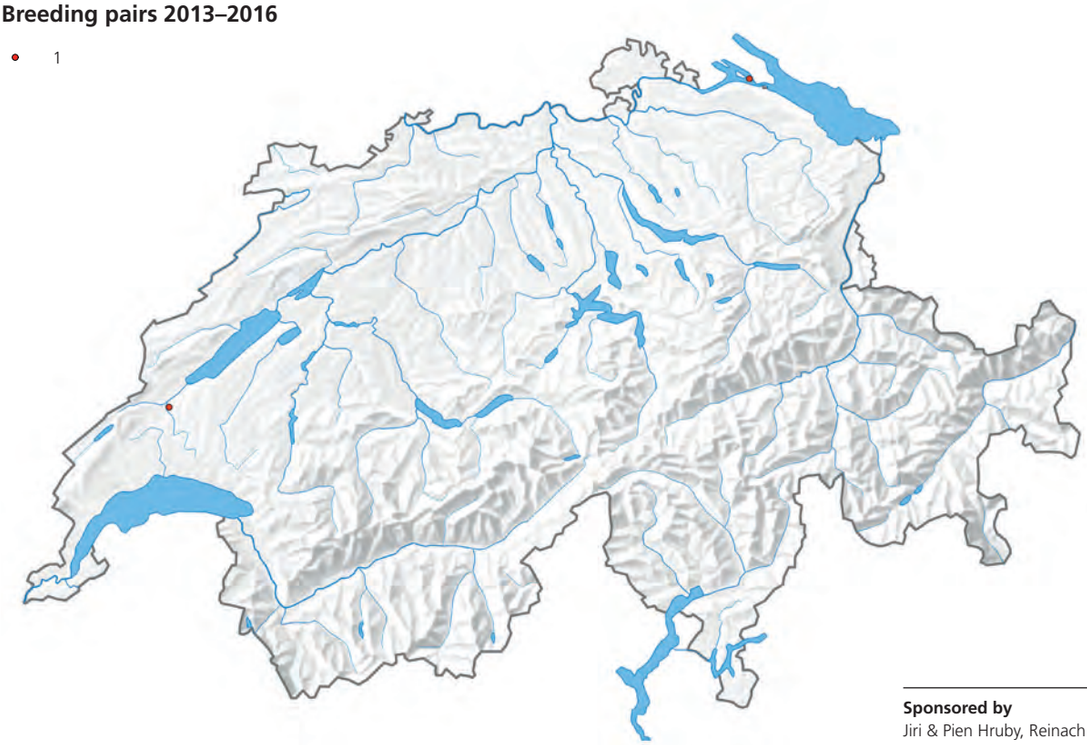
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Jiri & Pien Hruby, Reinach BL

Tufted Duck

Aythya fuligula
Reiherente
Fuligule morillon
Moretta
anda mora

Patrick Donini

Red List Vulnerable (VU)
Population 160–280 pairs (2013–2016)

Focus pages 130, 319

Switzerland lies at the southern edge of the species' range, which stretches across northern Eurasia. Range expansion to the southwest from the late 19th century led to the first breeding record in Switzerland in 1958[6]. Since then, the Tufted Duck has occupied many waterbodies on the Central Plateau, the Pre-Alps and also, to an increasing extent since the 1990s, the Alps[AtCH2, 1, 3].

It inhabits mainly shallow-water areas with dense riparian vegetation[HVM, 10]. In the past 20 years, rivers, reservoirs, ponds and especially sub-Alpine and Alpine lakes have become more important, while the population on the large lakes has remained stable or declined.

Today, mountain lakes accommodate just under half of the population. The highest breeding sites were recorded on Alp Raschil/Almens GR at 2300 m (E. Lüscher) and on Grüensee/Conters im Prättigau GR at 2110 m (J. Jelen, P. Knaus, W. Gabathuler, M. Gujan)[ID, 14].

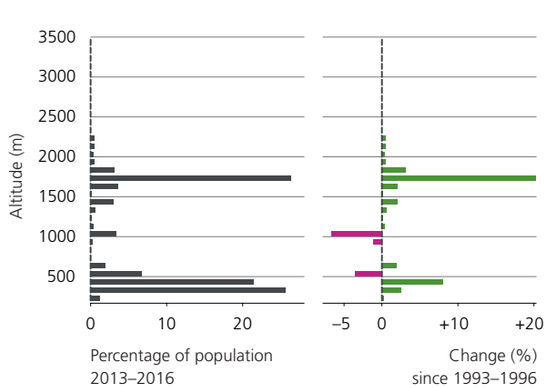
The lakes and rivers of the Upper Engadine now count among the most important breeding sites in Switzerland, with 29–120 broods (2013–2016)[4]. Other sites with an average of more than five broods per year include Klingnau reservoir AG, Kaltbrunner Riet SG, the Reuss delta UR[8], Les Grangettes VD, Heidsee/Lenzerheide GR and Lake Thun BE. However, the actual number of breeding pairs is hard to determine based on the number of confirmed broods. As an added difficulty, many sites are occupied by non-breeders as well.

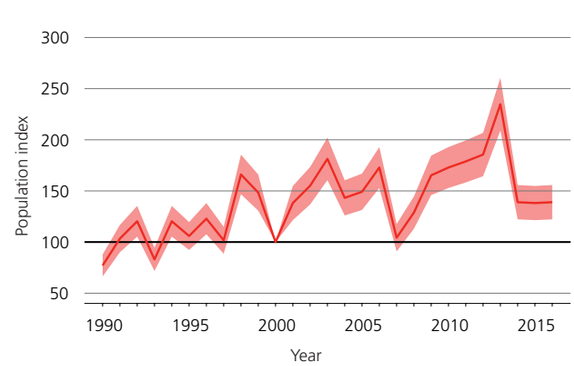
The number of broods has increased nationwide from an average of 128 (1993–1996) to 194 (2013–2016). However, steep declines were recorded on Lake Thun and on Lenkerseeli BE. On Lake Constance, too, the number of families has been declining steadily since 1990[ABW1, 13]. The populations in Germany, France, Italy and Austria are increasing[AtD, AtF, RLEU]. The overall European population is stable[RLEU].

The arrival of the zebra mussel in Switzerland has caused the wintering population of Tufted Ducks to rise since the 1960s[ABo3, AVD, 5, 7, 11]. This trend probably also helped it colonise Switzerland as a breeding bird[1]. The colonisation of inner-Alpine waterbodies that lie further away from the wintering grounds appears to have taken longer and may have been aided by lower predation pressure compared to the Central Plateau as well as earlier thaws[2, 9, 12].

Samuel Wechsler

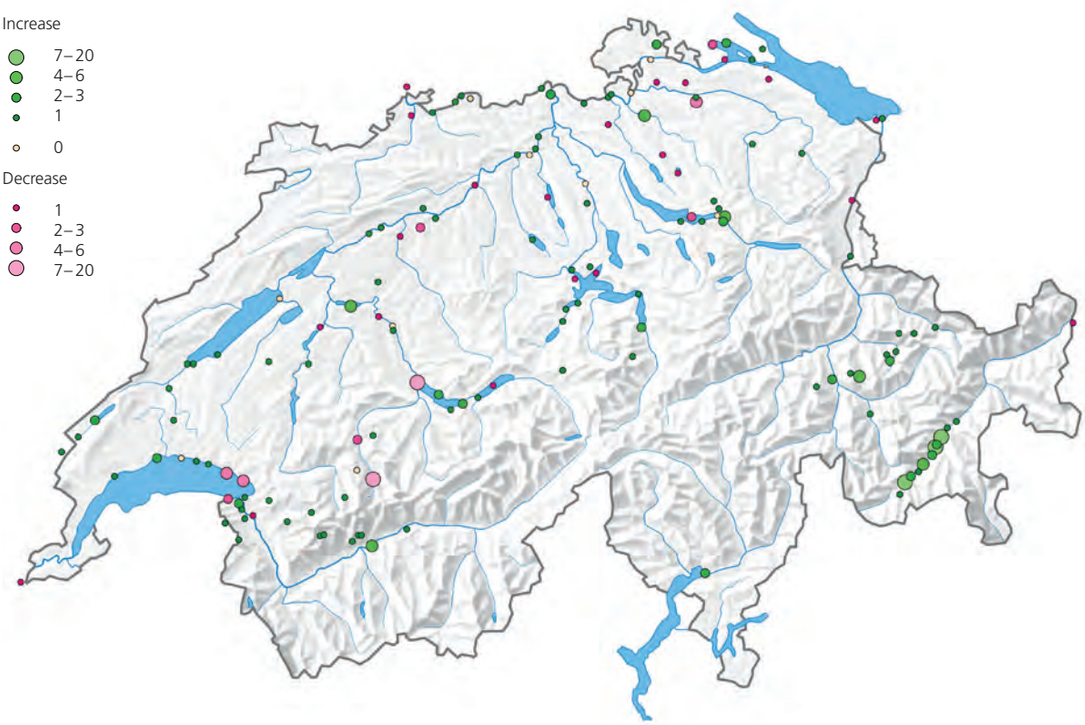
[1] Birrer (1991); [2] Bundesamt für Umwelt (2017b)/Office fédéral de l'environnement (2017a); [3] Bürkli (2010); [4] Bürkli (2017); [5] Burla & Ribi (1998); [6] Fuchs (1960); [7] Géroudet (1966); [8] Glutz von Blotzheim (2013); [9] Hauri (2004); [10] Kear (2005); [11] Olney (1963); [12] Schuster (2004); [13] Trösch et al. (2013c); [14] Volet & Gerber (2009)





Breeding pairs 2013–2016

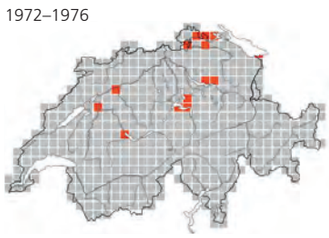
Change in the number of breeding pairs since 1993–1996



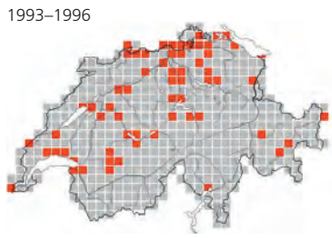
Sponsored by
Hansjürg Jenzer

1950–1959

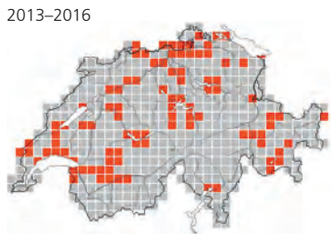
1972–1976



1993–1996



2013–2016



Garganey

Spatula querquedula
Knäkente
Sarcelle d'été
Marzaiola
anda da mars

Beat Rüegger

Red List Endangered (EN)
Population 0–1 pairs (2013–2016)

Focus pages 130, 369

The Garganey breeds in the temperate climate zones of Eurasia. Distribution becomes increasingly patchy towards central and western Europe. Three family parties were recorded in the atlas perimeter during 2013–2016: in Wollmatinger Ried D in 2013 (S. Werner)[5], in Kaltbrunner Riet SG in 2014 (K. Robin)[3] and near Chevroux VD in 2015 (P. Rapin)[1, 4]. The Garganey breeds in bays of large lakes with shallow water and a dense vegetation of reeds as well as on smaller waterbodies and flooded meadows. Due to its unobtrusive behaviour, breeding activity is hard to detect.

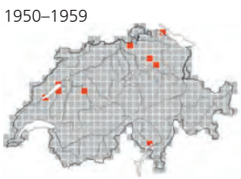
The Garganey used to be a regular breeder in Switzerland. There were six breeding records in 1972–1976, and 17 in 1977–1992. In 1993–1996, only three broods were recorded in Switzerland[AtCH2], and since 1991, the Garganey is no longer a regular breeding bird. Only four family parties were observed between 1997 and 2012.

The species' decline in Switzerland is probably related to the worldwide trend. Breeding success may often be reduced by predatory fish. Hunting and environmental changes in the Garganey's African wintering grounds contribute to the species' downward trend in large parts of Europe[RLEU, 2].

Stefan Werner

[1] Antoniazza (2016b); [2] BirdLife International (2016b); [3] Müller (2015); [4] Müller (2016); [5] Trösch et al. (2013c)

1950–1959

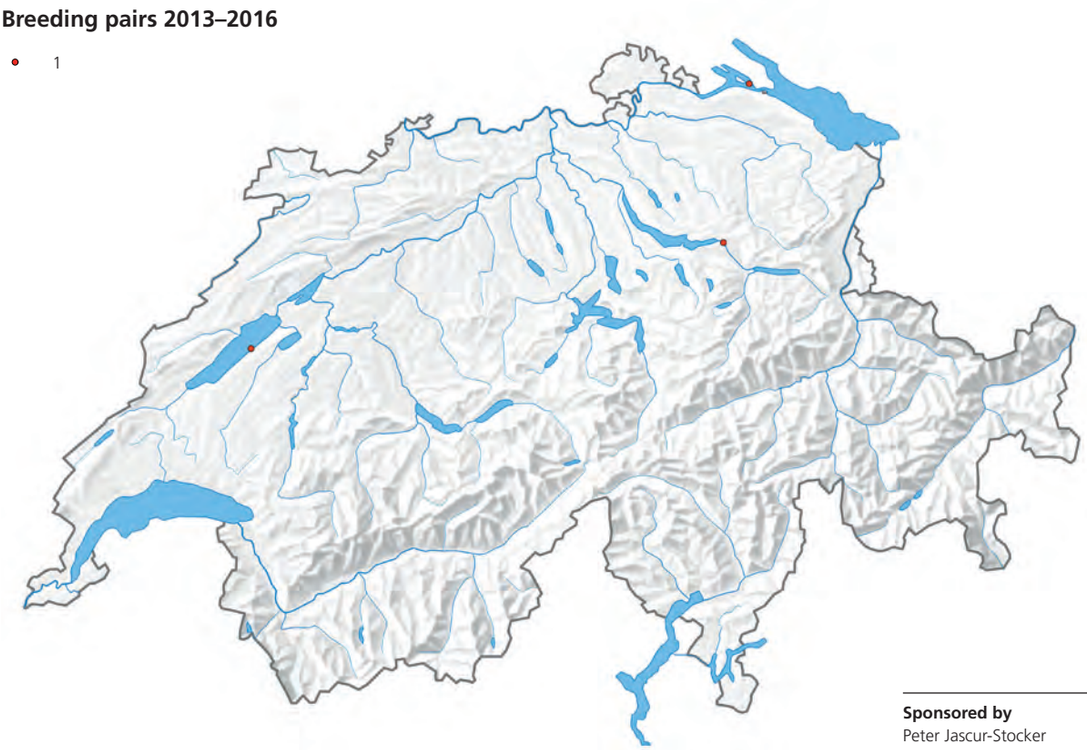


1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Peter Jascur-Stocker

Northern Shoveler

Spatula clypeata
Löffelente
Canard souchet
Mestolone
anda da la palutta

Tomi Muukkonen

Red List Endangered (EN)
Population 0–1 pairs (2013–2016)

Focus pages 130, 369

The Northern Shoveler breeds throughout the northern hemisphere and mainly inhabits boreal and temperate climate zones. It is scarce in central and western Europe. In Switzerland, the Northern Shoveler has always been an irregular breeder, mainly on the Central Plateau: there were no continuously occupied sites. Breeding habitats are small, nutrient-rich lakes and marshes as well as reedbeds. There were three breeding records in 2013–2016: in Kaltbrunner Riet SG in 2014 (J. & A.-M. Trösch, K. & M. Robin, H. P. Geisser)[1], on Flachsee Unterlunkhofen AG in 2015 (J. von Hirschheydt, P. Roth et al.)[2] and in Sionnet GE in 2016 (C. Meisser, C. Pochelon, A. Meisser, B. Kenzey)[3].

In 1972–1976, there was a single breeding record on the Mettnau peninsula D on Lake Constance [AtCH1]. Between 1977 and 1992, six family parties were observed, three of them in 1987. In 1993–1996, there was again only a single breeding record in Marais de Grône VS [AtCH2]. Five families were detected between 1997 and 2012.

The European trend is slightly negative [RLEU], although the breeding population in France has increased significantly [AtF]. Even so, the species is not expected to become a regular breeder in Switzerland any time soon.

Stefan Werner

[1] Müller (2015); [2] Müller (2016); [3] Müller (2017)

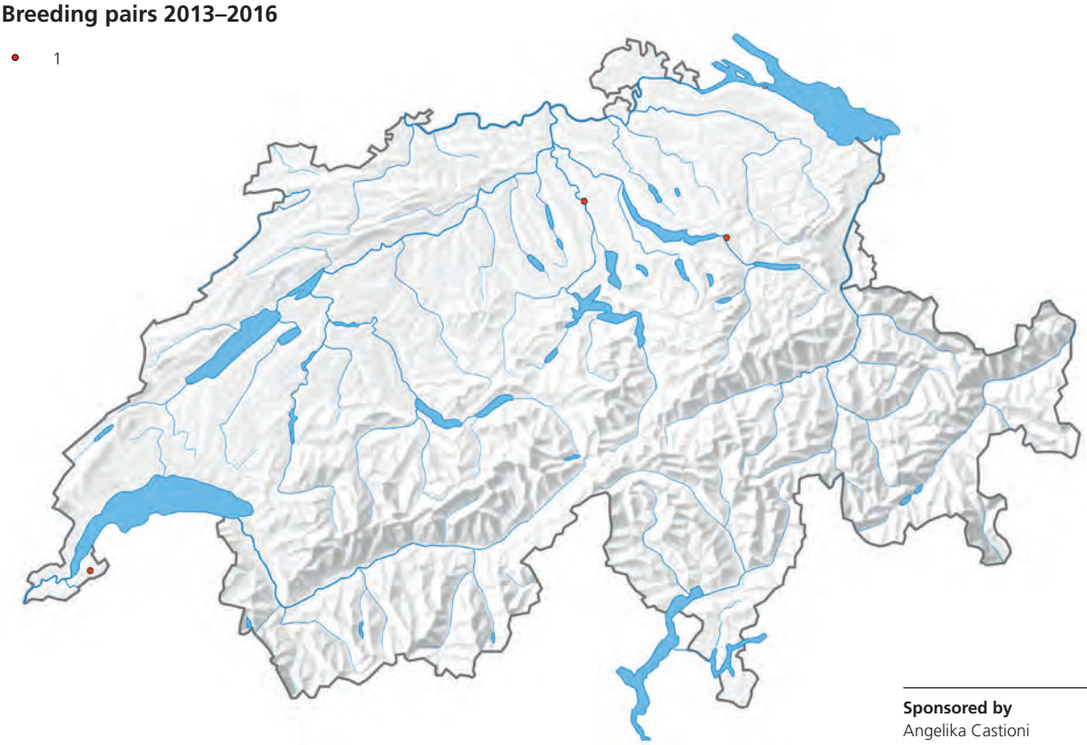
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Angelika Castioni

Gadwall

Mareca strepera
Schnatterente
Canard chipeau
Canapiglia
anda baterlunza

Marcel Burkhardt

Red List Endangered (EN)
Population 5–10 pairs (2013–2016)

Focus pages 130, 319

The Gadwall breeds in steppes and the temperate zone of the northern hemisphere. Distribution in central Europe is patchy. In 2013–2016, 54 families were recorded in total on five lakes within the atlas perimeter: German part of Untersee (23 families), Klingnau reservoir AG (19), southern shore of Lake Neuchâtel (8), Flachsee Unterlunkhofen AG (3), Greifensee (1). The Gadwall's favoured breeding habitats are undisturbed reedbeds on shallow lakes and dammed rivers.

The population trend in Switzerland is rising. Following the first breeding record in 1959[1], there were two more records between 1972 and 1976 [AtCH1]. During 1977–1992, the average number of families was 4.1 per year; in 1993–1996, it was 4.2 families (not counting those beyond Swiss borders on Lake Constance). From 1997 to 2012, the average increased to 6.1 families per year. Only Klingnau reservoir and the German part of Untersee have been continuously occupied since 1993.

The German and overall European populations are also on the rise [AtD, RLEU]; in France, the population is stable [AtF]. Water level fluctuations and disturbance from recreational activities can put broods in Switzerland at risk. Despite regular breeding records, the Gadwall is likely to remain a local and rare breeder in our country due to habitat constraints.

Stefan Werner

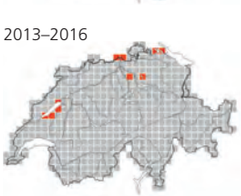
[1] Thönen (1959)

1950–1959

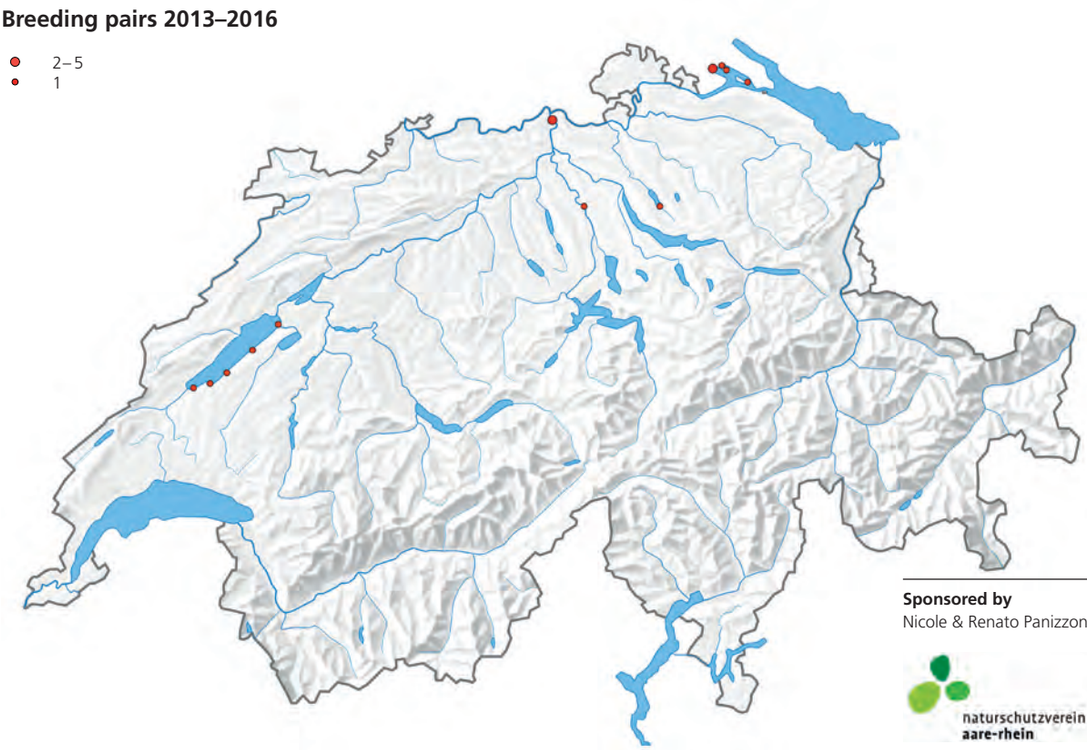
1972–1976

1993–1996

2013–2016



Breeding pairs 2013–2016



Sponsored by
Nicole & Renato Panizzon, Pully

naturschutzverein aare-rhein

Common Teal

Anas crecca
Krickente
Sarcelle d'hiver
Alzavola
anda crecca

Marcel Burkhardt

Red List Vulnerable (VU)
Population 0–2 pairs (2013–2016)

Focus page 369

The Common Teal is a widespread breeding bird of the northern hemisphere. It is scarce in western and central Europe. During 2013–2016, three breeding records were reported for this secretive breeder: two family parties were recorded in 2015 in the Grande Cariçaie near Chevroux VD (P. Rapin)[1, 2] and one in 2016 in Wauwilermoos LU (P. Wiprächtiger, S. Birrer)[3]. The Common Teal breeds in densely vegetated shore habitats of large lakes, heavily silted reservoirs and small wetlands.

In 1972–1976, there were 12 breeding records, and only 4 in 1993–1996[AtCH2]. From 1977 to 1992, an average of 2.1 families were recorded annually, dropping to 1.4 in 1997–2003. The Common Teal subsequently became an irregular breeder: the next breeding record did not occur until 2012, when a family party was observed on Wichelsee OW and one near Chavornay VD[4].

The species' population trend in Europe is largely unknown[RLEU]. Switzerland offers few habitats that are not only suitable but undisturbed as well. Both features are necessary for this species to breed successfully, and it is likely to remain very rare in our country.

Stefan Werner

[1] Antoniazza (2016b); [2] Müller (2016); [3] Müller (2017); [4] Müller & Volet (2013)

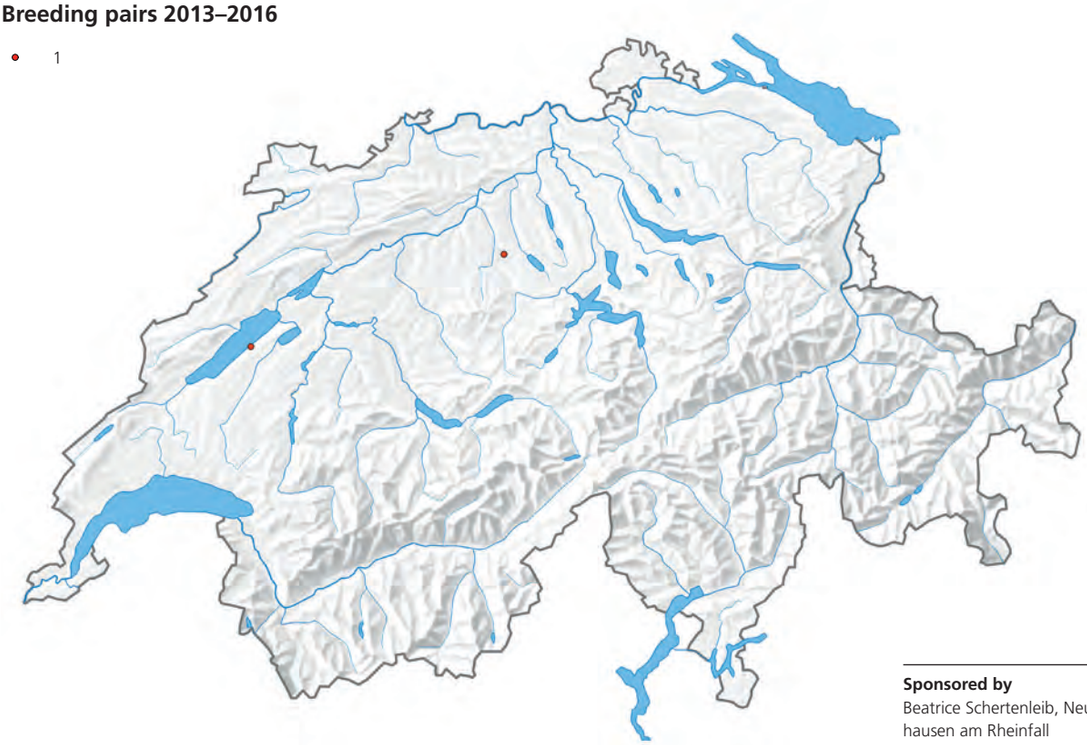
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Beatrice Schertenleib, Neuhausen am Rheinfall

Mallard

Anas platyrhynchos
Stockente
Canard colvert
Germano reale
anda selvadia

Daniele Occhiato

Red List Least Concern (LC)
Population 20 000–30 000 pairs (2013–2016)

Focus page 130

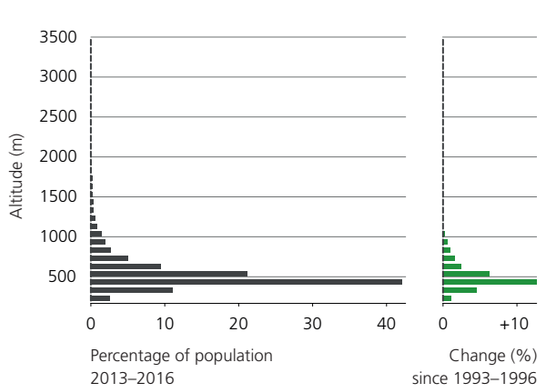
In Switzerland, the Mallard mainly inhabits large rivers and lakes between 300 and 600 m. It uses a diverse range of waterbodies as breeding habitats, including those in settlements, and it may nest up to 3 km away from water. Areas above 1000 m are sparsely populated. In 2013–2016, breeding records above 2000 m were only obtained at six sites. The highest breeding sites were near Arosa GR at 2280 m (J. Jelen) and on the Bernina Pass GR at 2220 m (T. Wehrli). The highest confirmed breeding ever recorded was in 1997 on Lai Grand/Casti-Wergenstein GR at 2385 m [AGR]. In the lowlands, densities of more than 10 pairs/km^2 have been recorded. In urban areas in particular, non-breeders may have influenced the density map, as the methodology did not require breeding to be confirmed for this widespread species. Seemingly low densities on Lake Constance, the High Rhine and Lake Neuchâtel could be related to the position of the surveyed kilometre squares in those areas, as these often did not include shore areas.

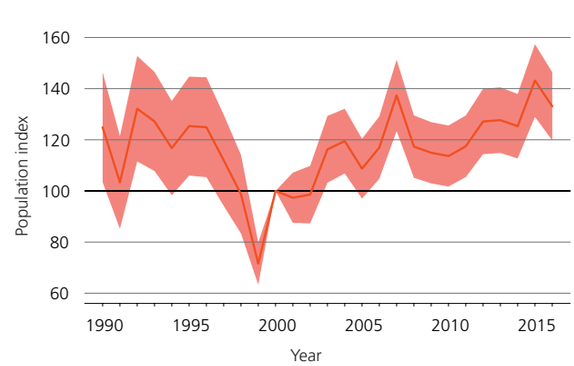
From the 1950s onwards, the Mallard gradually colonised the Rhone Valley VS as well as the Vorderrhein Valley GR and the remaining Canton of Grisons. Density has increased since 1993–1996 on large bodies of water in particular. The apparent decline on Lake Neuchâtel, however, is due to an artefact, as the counts in the Grande Cariçaie since 2000 indicate a stable population [1]. Since 1993–1996, the population has increased at all altitude levels in proportion to the overall population increase.

Compared to the wintering population of 40 000–50 000, the percentage of breeders is high. The Mallard is increasing despite or partly because of the reduction in nutrients in all lakes of the Central Plateau. Populations in Germany, Italy and Europe are considered stable [AtD, EBCC, 4]. In Austria, numbers are declining [5]. In France, in contrast, there has been a slight upward trend since 2000 [AtF]. Other places have also seen increases [AtGB, 3]. The main reason for the increase on the Central Plateau is the positive overall trend. It remains unclear to what extent the decrease of the Swiss hunting bag by more than 30 % since 1993–1996 has contributed to this. Restoration of rivers and lakes has also had a positive impact. Earlier thawing of mountain lakes [2] is likely contributing to the population increase in the Alpine region.

Stefan Werner & Verena Keller

[1] Antoniazza (2018); [2] Bundesamt für Umwelt (2017b)/Office fédéral de l'environnement (2017a); [3] Dalby et al. (2013); [4] Rete Rurale Nazionale & Lipu (2015); [5] Teufelbauer & Seaman (2017)



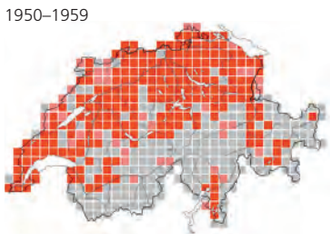


Density 2013–2016

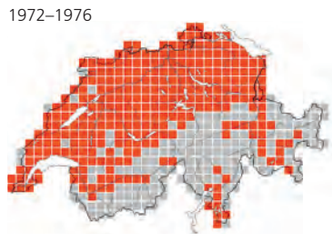
Density change since 1993–1996

Sponsored by
Sonja & Gérard Bauer-Jordi,
St-Germain (Savièse)

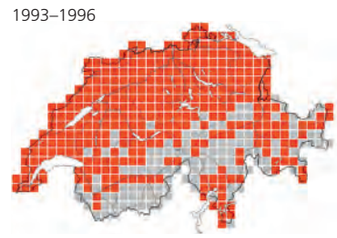
1950–1959



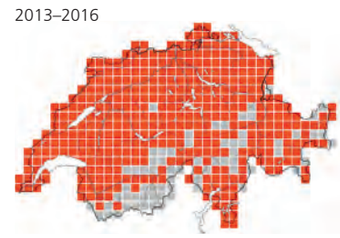
1972–1976



1993–1996



2013–2016



Hunting and persecution by humans

Humans have always used birds as a resource, while at the same time decimating species they considered undesirable. In both cases, birds are removed from a population or harmed by the side effects of such actions. Direct persecution has diminished in Switzerland thanks to better protection. Today, hunting birds is regarded as a sport and leisure activity.

To evaluate the impact of hunting and of hunting regulation, it is necessary to carefully examine whether hunting has negative effects on the distribution, population trend, demographic indicators and social structure of the species concerned. Such an examination must take into account that core areas with large, interconnected populations and a high reproductive rate are extremely important to maintain the overall population structure. Hunting regulations therefore need to consider the influence of changing environmental conditions.

Side effects of hunting: lead poisoning and disturbance

Lead ammunition is a threat to birds. Lead poisoning leads to impairment and death, affecting mainly birds of prey that feed on carrion as well as waterbirds [8, 10, 12, 16]. In the European Union, an estimated 400 000 to 1 500 000 birds die from lead poisoning every year [4]. Scavengers (e.g. Bearded Vulture and Golden Eagle) ingest the lead when they feed on animals that have been shot but not retrieved. Populations of species that are long-lived and have a low reproductive rate are particularly sensitive to the loss of individuals. Waterbirds take up lead shot when foraging, mistaking it for food or grit. In Switzerland, the use of lead shot to hunt waterbirds has been prohibited since 2012.

In many cases, hunting causes massive disturbance, as it generally takes place in areas where visitors are scarce, and because hunters are often accompanied by dogs. Disturbance has a particularly large impact on waterbirds, as it drives them from their resting and foraging grounds, sometimes for the long term [1, 14]. This can cause waterbirds to alter their temporal and spatial activity pattern or abandon the site [5, 6].

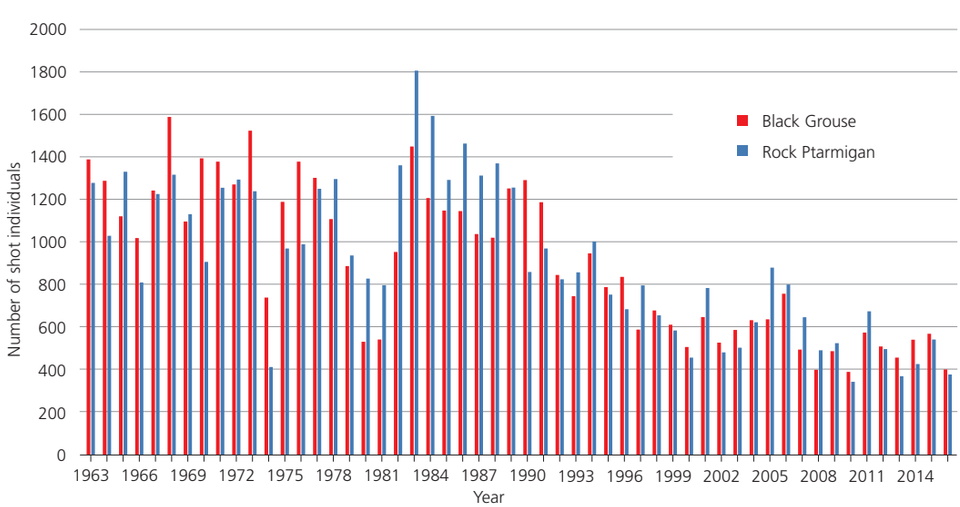
Decimation of undesirable species

In the past, humans persecuted birds they considered pests either by hunting them or destroying their nests. Breeding populations of Great Crested Grebe, Grey Heron, Golden Eagle, Northern Goshawk, Carrion Crow, Common Raven and others were decimated. Bearded Vulture and Osprey were eradicated throughout the country, the Eurasian Magpie in Ticino [HVM]. Red Kite and Eurasian Eagle-owl were on the brink of extinction in Switzerland [AtCH0, HVM].

Since the first federal hunting act in 1875, interventions at the nest have been restricted, close seasons extended, and the list of game birds continually reduced. Many species whose populations had been decimated recovered as a result. The colonisation and spread of Great Cormorant and Rook are a consequence of improved international protection. Effective protection is a fundamental requirement for the successful reintroduction of extinct species, like in the case of the Bearded Vulture.

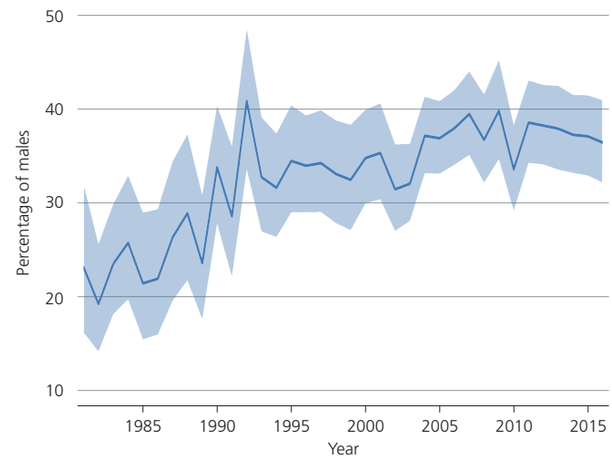
Hunting of birds along their migration routes

In many countries, migratory birds are hunted legally or illegally. The number of legally hunted migrants is hard to determine, as few hunting statistics exist [13]. In the Mediterranean region, an estimated 11 to 35 million birds are killed illegally every year [2]. While the impact of hunting abroad on Swiss breeding bird populations is difficult to gauge, it has probably contributed to the decline of native birds like European Turtle-dove or Ortolan Bunting [HBW, 7, 11]. The spring hunt in particular has a direct impact on breeding birds.



Numbers of Black Grouse and Rock Ptarmigan shot in Switzerland in 1963–2016, according to federal hunting statistics. Restrictions on hunting (e.g. reduction of the number of birds shot per year and per hunter; extension of the close season) are partly responsible for the decreasing hunting bag.

Because they are hunted, the proportion of male Black Grouse in Ticino lies far below 50 %. In the 1990s, the reduction of hunting pressure due to a decline in the number of hunting permits and the extension of the close season led to a more balanced sex ratio. However, the number of males is still about 10 % lower than would be expected in populations not affected by hunting. Source: Zbinden et al. (2018).



Hunting of Black Grouse, Rock Ptarmigan and Eurasian Woodcock in Switzerland

Black Grouse breeding populations in Switzerland show varying regional trends, and the species is considered Near Threatened. The size of local populations depends mainly on the weather during the breeding season and the intensity of disturbance from human recreation [17, 19]. In many suitable habitats, disturbance from leisure activities prevents populations from reaching capacity [17]. From 1997 to 2016, about 550 Black Grouse males were shot every year in Switzerland. The females are protected. According to data from the «Ufficio caccia e pesca Canton Ticino», hunting raises Black Grouse mortality and produces a biased sex ratio [20].

The Rock Ptarmigan is another species that is classified as Near Threatened, but whether hunting contributes to its negative population trend has not been studied. On average, about 580 individuals were shot annually in the past 20 years. Locally, excessive bag limits may contribute to the decline [9].

From 1997 to 2016, about 2000 Eurasian Woodcocks were killed in Switzerland every year, most of them originating from northern and eastern European populations. Hunting in France has been shown to increase mortality in northeastern European populations [18]. Hunting in Switzerland presumably has a similar effect. Since 1993–1996, the Eurasian Woodcock has almost completely disappeared as a breeding bird below 900 m in Switzerland. Besides habitat degradation, predation and disturbance, additional mortality from hunting is a possible cause of the negative trend. Data from birds tagged with transmitters show that while many native Woodcocks leave with the first snowfall, others remain in Switzerland, sometimes as late as mid-December and thus well beyond the close season [3, 15].

Conclusion

In the past, human persecution had a considerable impact on the populations of many of our native breeding birds. As legal protection improved, the affected species were able to recover. But still today, there are attempts to decimate the populations of species that are considered undesirable. This is unacceptable from an ecological point of view.

Given the huge number of birds affected, legal and illegal persecution abroad presumably has an effect on our native breeding populations. In Switzerland today, hunting only affects populations at the regional level and/or in the case of certain species. Hunting of species with stable or increasing populations, regulated according to the specific circumstances, can be accepted from an ecological point of view if the threat at the European and national level is taken into account and hunting has no measurable negative effects on the distribution, population size and social structure of the species concerned. Regular monitoring of populations is a prerequisite.

Michael Schaad

Rene Eller

About 2000 Eurasian Woodcocks are shot in Switzerland every year.

[1] Bregnballe et al. (2004); [2] Brochet et al. (2016); [3] Brüngger & Estoppey (2008); [4] European Chemicals Agency (2017); [5] Evans & Day (2002); [6] Ferrand et al. (2013); [7] Fisher et al. (2018); [8] Franson & Pain (2011); [9] Furrer et al. (2016); [10] Jenni et al. (2015); [11] Jiguet et al. (2016); [12] Madry et al. (2015); [13] Madsen et al. (2015); [14] Martínez-Abraín et al. (2013); [15] Mollet (2017a–c); [16] Pain et al. (2009); [17] Patthey et al. (2008); [18] Péron et al. (2011a); [19] Zbinden & Salvioni (2003c); [20] Zbinden et al. (2018)

Species pages 106, 112, 148, 158, 196, 202, 216, 250, 254, 256, 262, 266, 326, 332, 334, 336, 554, 572

Little Grebe

Tachybaptus ruficollis
Zwergtaucher
Grèbe castagneux
Tuffetto
sfunsella nanina

Mathias Schäf

Red List Vulnerable (VU)
Population 800–1300 pairs (2013–2016)

Focus –

The Little Grebe is widespread in Switzerland, occurring mainly below 700 m. It breeds on large lakes, preferably on shorelines that have dense reedbeds interspersed with areas of open water, but also on small waterbodies, both natural and artificial. It also inhabits slow-flowing rivers and oxbow lakes. The Little Grebe is often quick to colonise newly created waterbodies, but also disappears rapidly when conditions deteriorate, for instance due to predatory fish stock (e.g. pike).

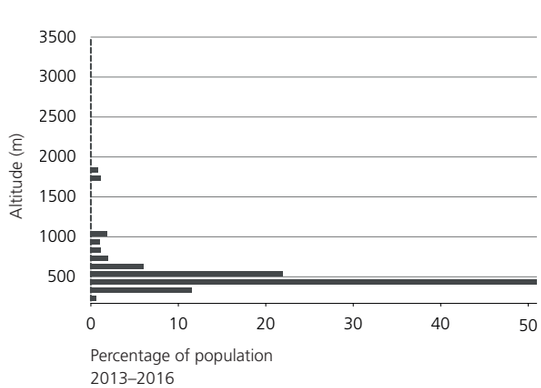
The Little Grebe has bred in the Upper Engadine GR at about 1800 m since 1966 [AEn]. More recently, an even higher site was found at 2110 m on Grüensee/Conters im Prättigau GR. Following observations in 2011–2013 of a Little Grebe making its trilling breeding call, a pair bred there successfully every year in 2014–2016 (P. Knaus, J. Jelen, T. Molinaro). In the same region, the species has bred on the Unterer Prätschsee/Arosa GR at 1910 m since 2005 [AGR].

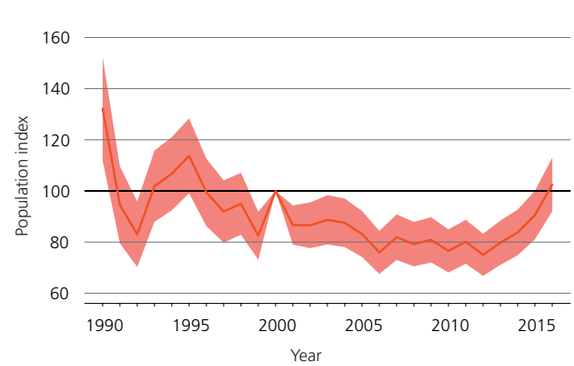
Since 1993–1996, the Little Grebe has colonised new atlas squares in areas where recently created waterbodies offer new breeding sites. Small waterbodies are often only occupied by a single pair. With 50–60 territories, the southern shore of Lake Neuchâtel accommodates a large share of the Swiss population. Following a slight decline, the population on Lake Neuchâtel has been growing again since 2000 [2, 3]. The upturn in the national trend in recent years can be attributed mainly to populations on small waterbodies, be it new colonisations or increases in existing populations. Often, several pairs have been found to breed on ponds of newly opened golf courses, like the one in Oberkirch LU where up to eight pairs were observed [6]. Artificial waterbodies can serve as alternatives to natural lakes or ponds that have become unsuitable, for example due to a loss of reedbeds. For waterbodies to remain suitable habitats for the Little Grebe, there must be no predatory fish stock, and management measures must ensure that there is sufficient shore vegetation without the ponds silting up completely.

In France, the population is fluctuating [7], while Germany has seen a slight increase in recent years due to milder winters and the colonisation of new waterbodies [AtD, 8]. However, regional surveys in both countries as well as in Austria also report declines [1, 4, 5]. The overall European trend is stable [EBCC].

Verena Keller

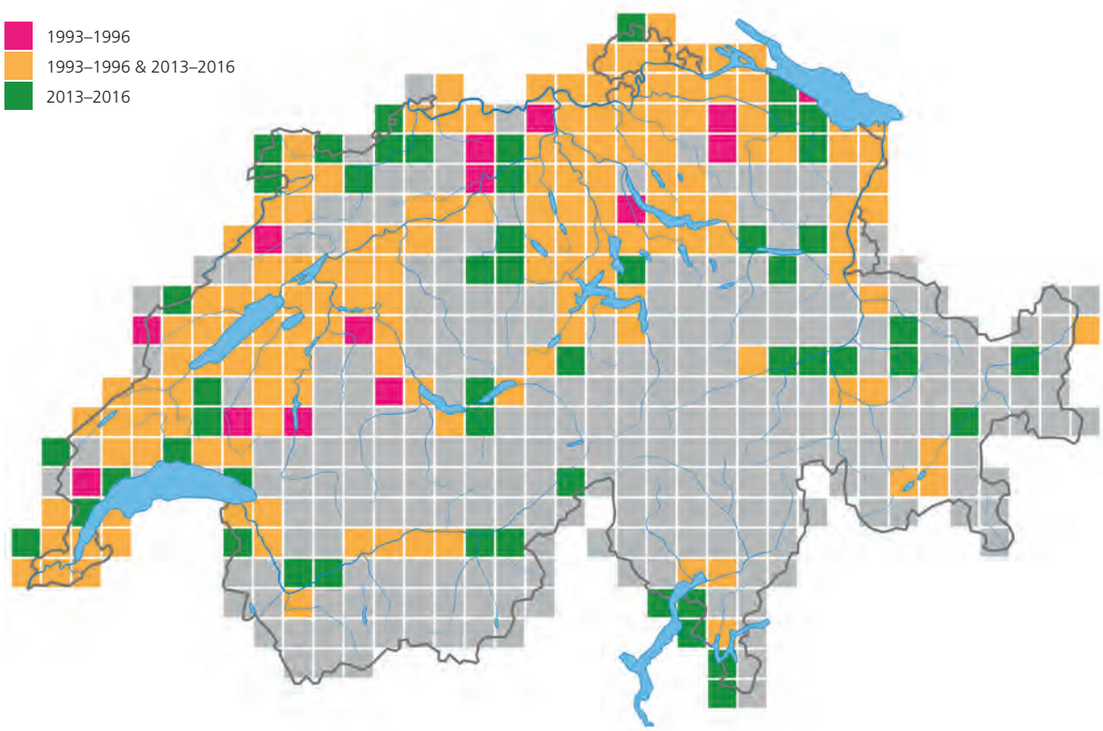
[1] Albegger et al. (2015); [2] Antoniazza (2016a); [3] Antoniazza (2018); [4] Bauer et al. (2016a); [5] Dronneau & les observateurs de la LPO Alsace (2014); [6] Hagist & Graf (2013); [7] Jiguet (2017); [8] Rödl et al. (2012)





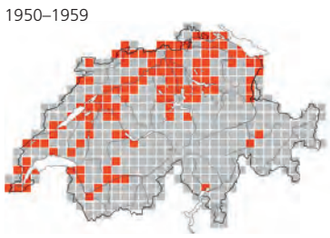
Occurrence 2013–2016

Distribution change since 1993–1996

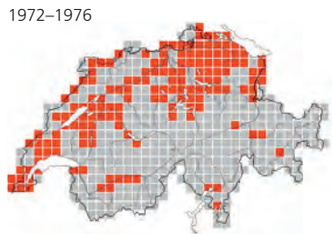


Sponsored by
Eva Wagner, Madulain

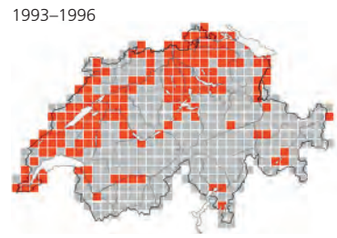
1950–1959



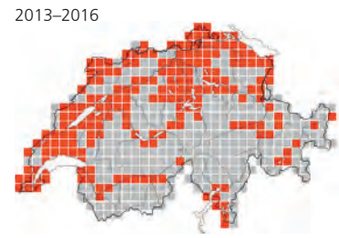
1972–1976



1993–1996



2013–2016



Black-necked Grebe

Podiceps nigricollis
Schwarzhalstaucher
Grèbe à cou noir
Svasso piccolo
sfunsella naira

Ralf Kistowski

Red List Vulnerable (VU)
Population 3–4 pairs (2013–2016)

Focus pages 130, 319

The Black-necked Grebe breeds mainly in the eastern parts of Europe; its distribution becomes patchy towards the west. Within the atlas perimeter, the species mainly occupies the German side of Untersee, Lake Constance; 6–13 broods were recorded here annually in 2013–2016[3].

The Black-necked Grebe has always been rare in Switzerland. Kaltbrunner Riet SG, once regularly occupied, has been vacant since 2008. This could be related to the disappearance of Black-headed Gull colonies, which provided some protection[HVM]. In 2013–2016, 3–4 instances of breeding were observed per year, most regularly in Les Grangettes VD and the Grande Cariçaie. The highest breeding site is on Lac de Joux VD at 1000 m, where the species last bred in 2007 (C. Guex et al.)[4]. The wintering population has greatly increased since about 2000, especially on Lake Geneva, presumably due to the spread of freshwater Mysids, non-native shrimp-like Crustaceans[1, 2]. It remains to be seen whether the breeding population will benefit as well. The wintering population on Lake Constance has also increased, presumably for the same reason[5]. However, breeding pairs there have declined, probably because water levels in spring have been too low.

In Germany, the population is stable[AtD], while a slight increase has been recorded in France[AtF]. There are no reliable data on the overall trend in Europe[RLEU].

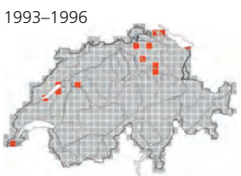
Verena Keller

[1] Golaz & Väinölä (2013); [2] Keller & Müller (2012); [3] Knaus et al. (2016a); [4] Volet & Gerber (2008); [5] Werner & Bauer (2012)

1950–1959

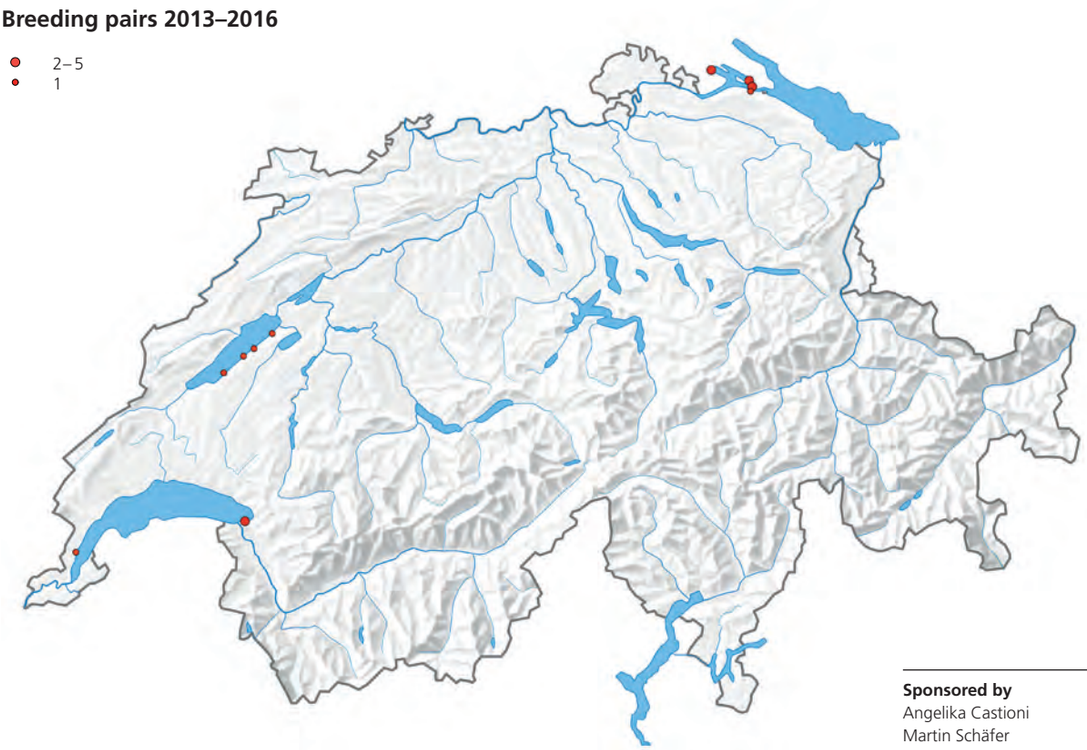
1972–1976

1993–1996



2013–2016

Breeding pairs 2013–2016



Sponsored by
Angelika Castioni
Martin Schäfer

Is Switzerland with its abundance of water a paradise for fish-eating birds?

Switzerland's lakes and rivers provide suitable habitat for fish-eaters. Distribution and abundance of most larger species have shown a positive trend since 1993–1996, but this could soon change as birds once again face persecution.

Fish-eating birds were heavily persecuted well into the 20th century. As late as 1931 the federal government and the cantons paid a two-franc bounty for each Great Crested Grebe killed[3]. Dividing birds into useful and harmful species gradually gave way to the recognition that all species have their niche in the ecological system. Scientific studies have shown that predators rarely control prey populations, but that in fact the opposite is true. Persecution abated thanks to this realisation. Close seasons were introduced, certain species placed under protection, like the Grey Heron in 1926, and no-hunting zones established, leading to a trend reversal. The protection of breeding colonies at a European level was critical for the renewed spread of the Great Cormorant[8].

Changes in water quality also played a part. Most Swiss lakes are naturally oligotrophic, meaning that they have low levels of nutrients. From the 1950s, an increase of phosphorus input from wastewater and nutrient input from fertilised farmland caused changes in fish fauna. Stocks of cyprinids (carp family) and perch increased. Fish species such as whitefish *Coregonus* sp., which typically occur in deep, oligotrophic lakes, would have disappeared in many places without artificial stocking. Initially, the Great Crested Grebe may have benefited from the increased supply of cyprinids, at least on some lakes, but only to a certain extent. In very nutrient-rich (eutrophic) waterbodies, excessive algal growth led to reduced water transparency and especially to oxygen depletion, affecting the reproduction of fish. In extreme cases such as Lake Sempach LU this led to the collapse of fish stocks followed by the collapse of the Great Crested Grebe population. Both populations only recovered once water quality improved thanks to reduced nutrient input, especially phosphorus[6].

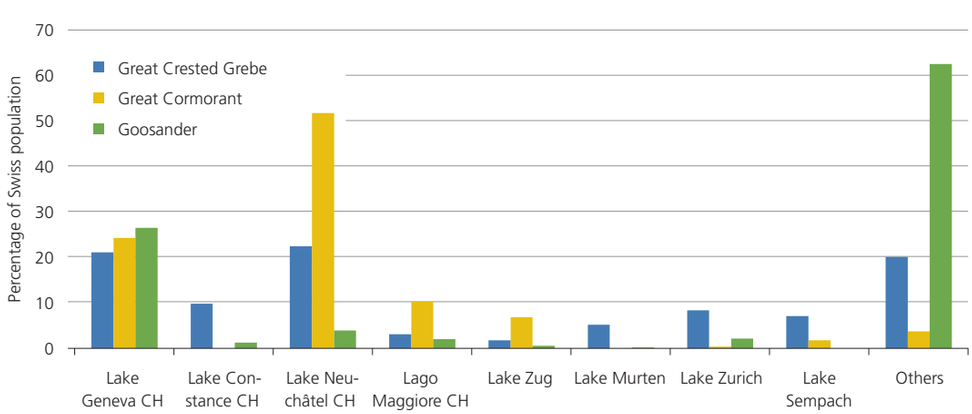
In general, the lakes and rivers of Switzerland are attractive for fish-eating birds. The three largest lakes, Lakes Geneva, Constance and Neuchâtel, support three quarters of all Great Cormorant pairs and about half of all Great Crested Grebes, but only about 30 % of Goosanders; the latter also frequently breed along rivers. Since Switzerland accommodates a large proportion of the European population of Great Crested Grebes and Goosanders, which form a separate Alpine population[4, 5], our country has an international responsibility for these species[7].

Unfortunately, fish-eating birds are again being seen as competitors and pests by hobby anglers and fisheries[1]. However, the real threats to fish stocks are water control structures, hydropower stations and pesticides[2]. Pressure from the fishery sector led to 46 Grey Herons and 19 Goosanders being shot on average per year in 2013–2016. These protected species were killed – a maximum of 96 Goosanders in 2007 and 212 Grey Herons in 2003 – without sufficient evidence of damage. Great Cormorants and Great Crested Grebes are only protected in certain cantons. At 103 individuals per year (average 2013–2016) the size of the hunting bag for the Great Crested Grebe is small compared to that of the Great Cormorant at 1313 individuals. Should the persecution of fish-eating birds intensify, an adverse effect on local populations cannot be excluded.

Verena Keller & Stefan Werner

[1] Escher & Vonlanthen (2005); [2] Fischnetz (2004a–b); [3] Hänni (1932); [4] Hefti-Gautschi et al. (2009); [5] Keller (2009); [6] Keller (2015); [7] Keller et al. (2010); [8] van Eerden & Gregersen (1995)

Species pages 120, 148, 196, 202



Lake Geneva is the only lake to support large numbers of Great Crested Grebe, Great Cormorant and Goosander. On all other lakes, the Great Cormorant or the Great Crested Grebe dominates. On Lake Constance, all Great Cormorant colonies are located beyond the Swiss border.

Great Crested Grebe

Podiceps cristatus
Haubentaucher
Grèbe huppé
Svasso maggiore
sfunsella da la cresta

Sandra Schweizer

Red List Least Concern (LC)
Population 3500–5000 pairs (2013–2016)

Focus pages 110, 142, 147, 380

The Great Crested Grebe is widespread in Switzerland, mainly inhabiting the large lakes, but also slow-flowing rivers and smaller lakes. It can defend large territories, but may also breed in colonies. Colonies are often found on large lakes with an abundant supply of fish, but only few suitable nesting sites. On Lake Geneva, for example, the species is concentrated in the few available reedbeds (e.g. about 300 pairs in Les Grangettes VD). The most significant populations are on Lakes Neuchâtel (800–1100 pairs) and Constance (more than 1000 pairs, of which 360–460 pairs breed on the Swiss side of the lake).

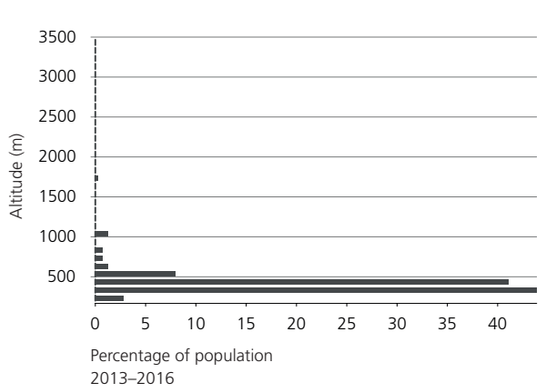
On the Central Plateau, distribution has remained largely unchanged since 1993–1996. The small number of new atlas squares were mostly occupied by a single family or individual birds. Similarly, newly occupied squares in Ticino often represented a single brood, though this still signals an expansion on the two major lakes in this area. Breeding was recorded on Walensee for the first time as well. The new records in the central Valais are due to recently colonised lakes in gravel pits. The most marked change occurred in Engadine GR. From 2005, the Great Crested Grebe colonised the lakes in the Upper Engadine at almost 1800 m [AGR]; these breeding sites are 800 m higher than the highest sites recorded in 1993–1996.

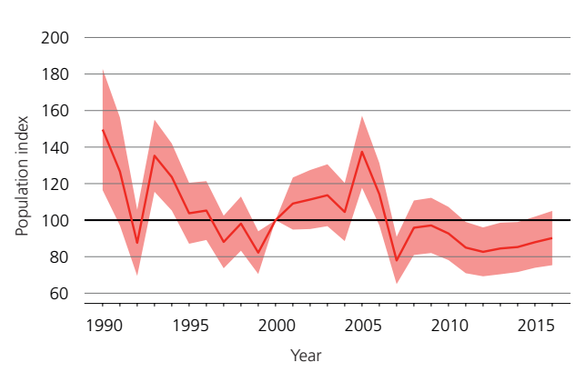
The Swiss population is estimated at 3500–5000 pairs, down from an estimated 4500–5500 pairs in 1993–1996. The substantial reduction of phosphorus and the resulting drop in cyprinid fish stocks is thought to be one of the main reasons for the decline on some lakes, especially Lake Neuchâtel, where numbers have fallen by more than 20 % since the 1980s [4]. Other waterbodies have seen an increase in numbers despite the reduced nutrient content. This was the case on Lake Constance between 1980 and 2010 [AtBo] and on Lake Sempach following the excessive phosphorus load of the 1980s [2]. Breeding sites on lakes must be sheltered from disturbance, including water-based activities, for example by establishing well-marked protected zones along the shore [3, 5].

Neighbouring countries also show mixed trends, with an increase in France [AtF] and stable populations in Germany and Italy [AtD, 1]. The overall European trend is negative [EBCC].

Verena Keller

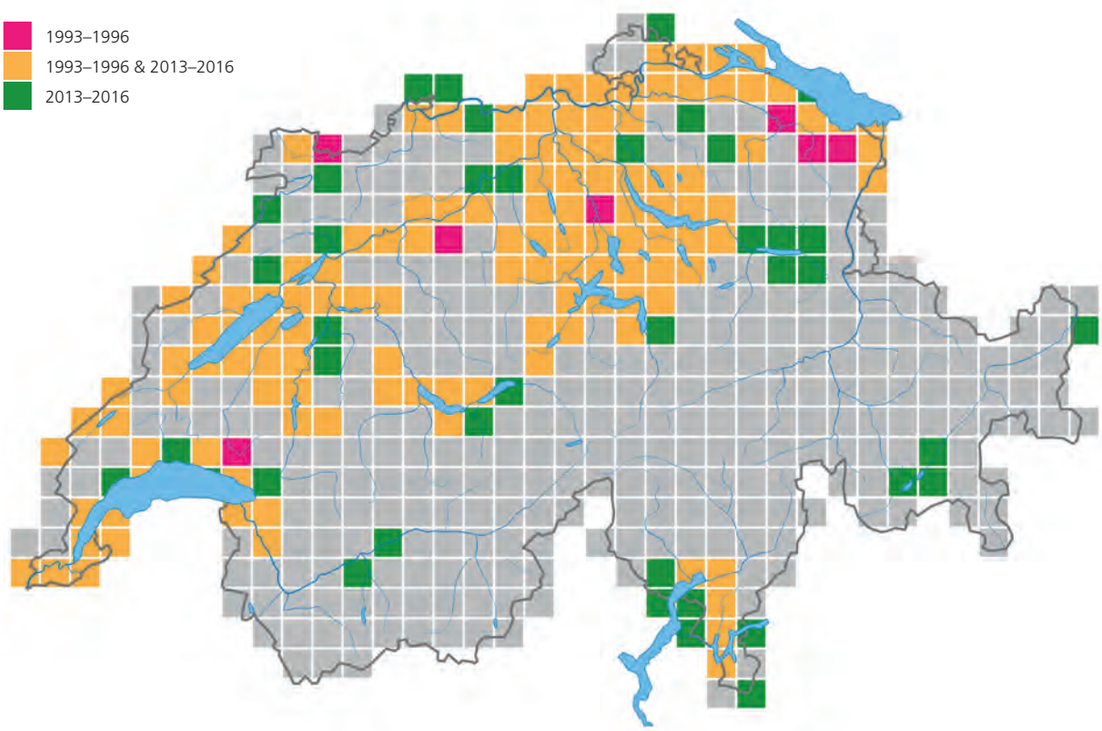
[1] Campedelli et al. (2012); [2] Keller (in prep.); [3] Morard et al. (2007); [4] Renevey (1987); [5] Weggler et al. (2011)





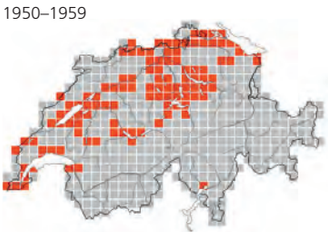
Territories 2013–2016

Distribution change since 1993–1996

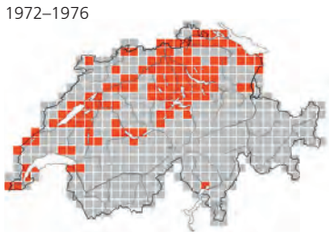


Sponsored by
Anonymous donor

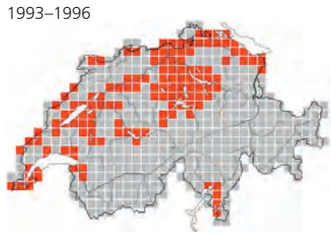
1950–1959



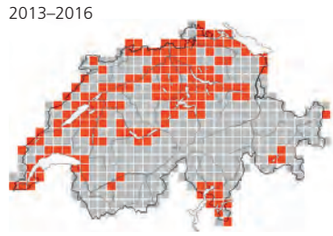
1972–1976



1993–1996



2013–2016



Feral Pigeon

Columba livia forma *domestica*
Strassentaube
Pigeon biset domestique
Piccione torraiolo
columba da chasa

Heru Fathurohman

Red List –
Population 20 000–35 000 pairs (2013–2016)

Focus page 156

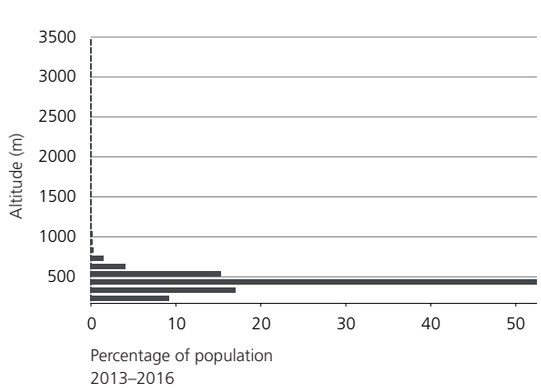
The feral pigeon is the domesticated but free-living form of the Rock Dove. In Switzerland, it is widespread on the Central Plateau and in the Jura and occupies parts of the large Alpine valleys. It generally breeds below 600 m, though breeding has occasionally been recorded above 1000 m, e.g. at 1240 m in Savognin GR (V. Döbelin) and at 1170 m in Airolo TI (J. Savioz). The feral pigeon is closely associated with the presence of humans. It is concentrated in the densely built-up centres of medium-sized and large settlements, occurring less frequently in greener residential areas[4]. In Lucerne, Zurich and Lugano TI, it was found in 25, 38 and 69 %, respectively, of sites located throughout the city[2]. The population is currently estimated at about 1000 birds in the city of Bern[3], 5000–8000 in Basel[6], 2000–3000 in Lucerne[7, 8] and about 6000 in central Zurich[9].

The feral pigeon appears to have further expanded its range since 1993–1996. However, methodological uncertainties make this a tentative observation, as feral pigeons are not always easily distinguished from domestic pigeons kept by pigeon fanciers. Moreover, earlier surveys of feral pigeons may have been incomplete[AtCH2]. On the other hand, surveys in the Lake Constance area and in the Canton of Zurich also note a range expansion[AtBo, AtZH]. Conversely, there are strong indications that the populations in cities (e.g. Lausanne, Bern, Basel, Lucerne, Zurich) have decreased significantly in the past three decades[AtZH, 4, 6, 7, 12, 13]. Declines have also been recorded in Baden-Württemberg, the whole of Germany, and Austria[AtD, 1, 11].

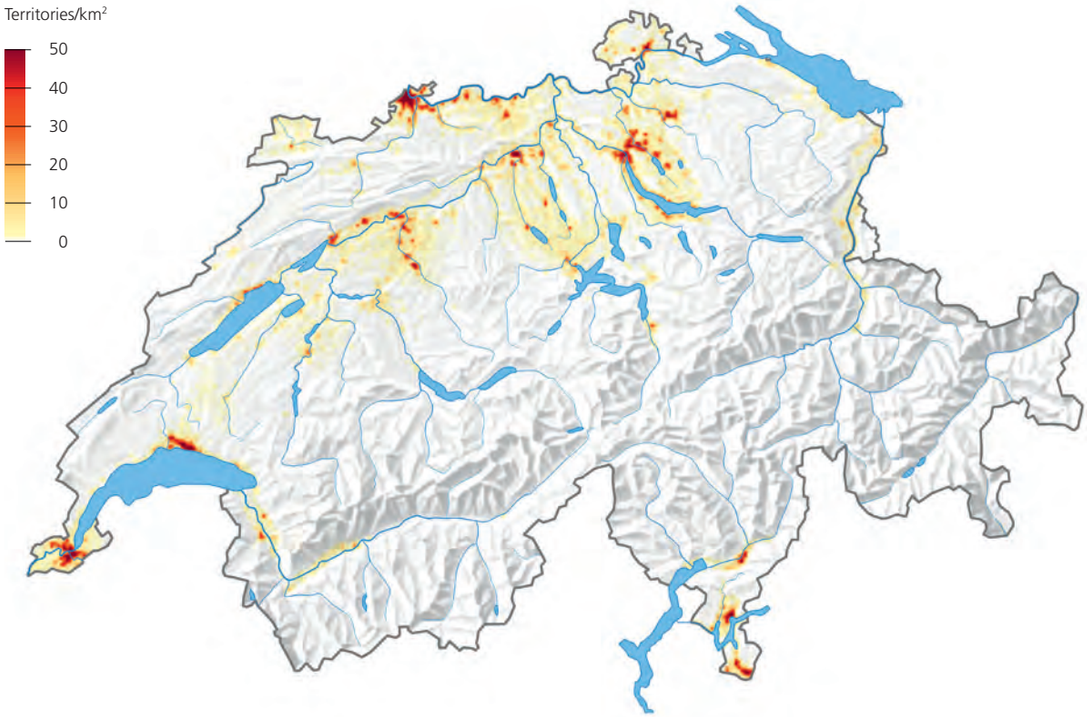
The range expansion is probably due to the urbanisation of formerly rural settlements. The declines in cities are a result of population control measures implemented by the authorities, mainly involving a reduction of the food supply (less feeding by the public thanks to information campaigns)[4, 10]. Such measures were introduced because large populations can cause significant fouling and damage to buildings (droppings). Health concerns (pigeons as carriers of disease) also play a role[4, 5].

Thomas Sattler

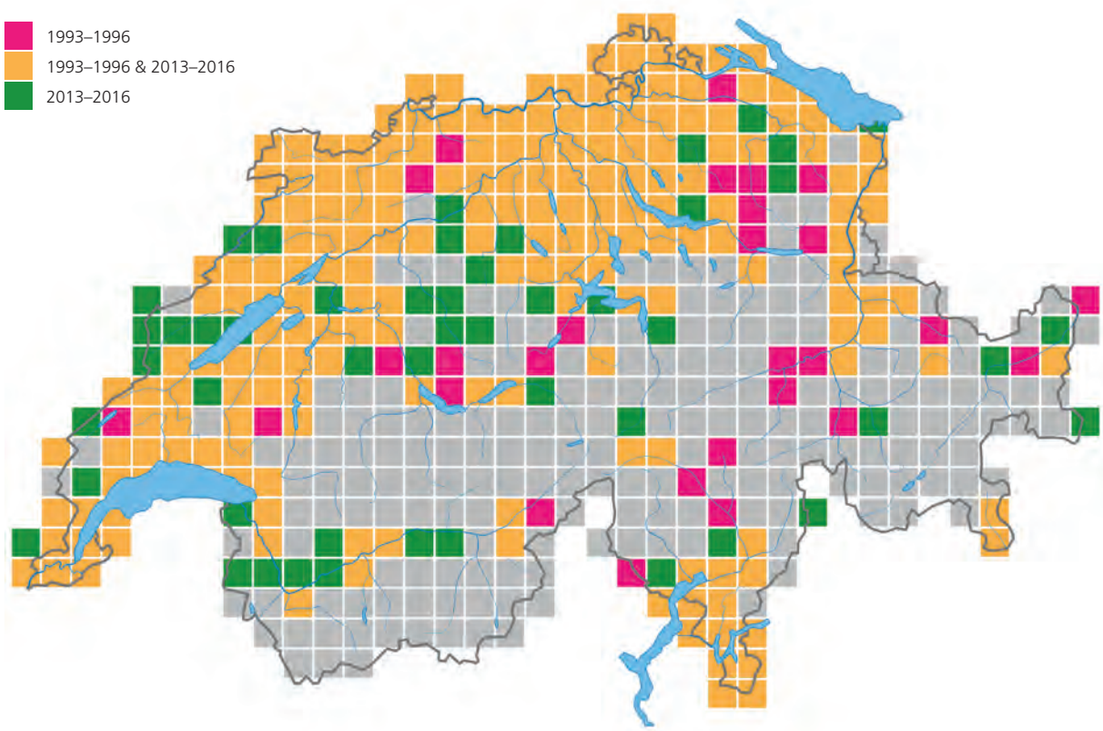
[1] Bauer et al. (2016a); [2] Fontana et al. (2011); [3] M. Frieden, pers. comm.; [4] Haag-Wackernagel (2003); [5] Haag-Wackernagel (2006); [6] Haag-Wackernagel (2016); [7] Keller (2007); [8] Stadt Luzern (2017); [9] Stadt Zürich (2011); [10] Stock & Haag-Wackernagel (2016); [11] Teufelbauer & Seaman (2017); [12] Tierpark Bern (2016); [13] Ville de Lausanne (2012)



Density 2013–2016

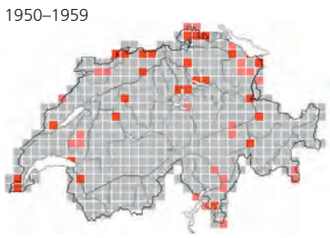


Distribution change since 1993–1996

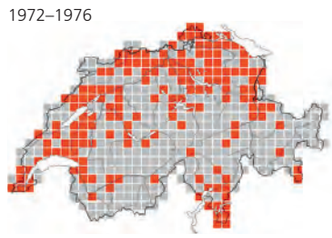


Sponsored by
Sandra Schweizer

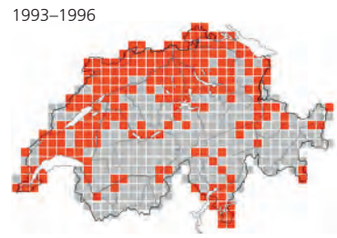
1950–1959



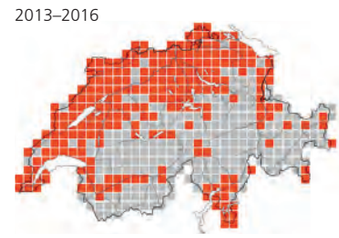
1972–1976



1993–1996



2013–2016



Stock Dove

Columba oenas
Hohltaube
Pigeon colombin
Colombella
columbella

Marcel Burkhardt

Red List Least Concern (LC)
Population 2000–4000 pairs (2013–2016)

Focus pages 314, 414

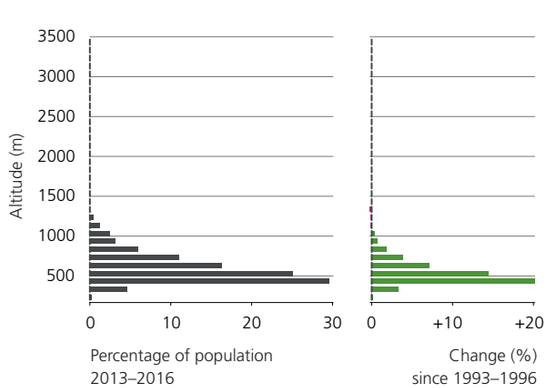
The Stock Dove is an inconspicuous bird that breeds on the Central Plateau, in the Jura and in some parts of the Pre-Alps. Densities are low outside of the Geneva area, the Ajoie JU and the northern Canton of Schaffhausen. About 90 % of the population occurs below 900 m, with only occasional observations above 1200 m. The highest confirmed breeding record comes from Noirmont JU at 1450 m [BCH]; in the 2013–2016 period, breeding was recorded at a maximum of 1400 m near Arzier VD (P. Henrioux). The highest recent observation during the breeding season came from Habkern BE at 1610 m (M. Hammel). The Stock Dove nests in tree cavities in wooded farmland and in open deciduous and mixed woodland [VdS]. In suitable kilometre squares, it is not uncommon to count five territories and more. In the Canton of Geneva, the average density is 0.7 territories/km^2, and density can reach up to nine territories/km^2 locally [AtGE].

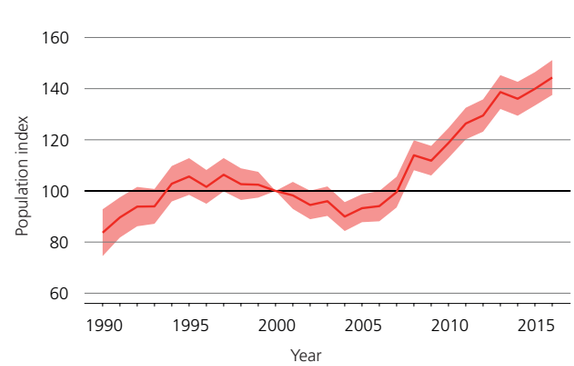
The Swiss population has increased by almost 40 % since 1993–1996. In addition to higher density in the core areas, there were also range gains that led to the (re-)colonisation of the Valais, Rhine Valley, Ticino and also the Canton of Neuchâtel, though the apparent gains in this last area are presumably a result of increased observer effort [AtNE, 2]. The past two decades also saw significant increases in the Canton of Zurich and the Lake Constance area [AtBo, AtZH]. Similarly, neighbouring countries report positive short-term trends [AtD, AtF, 5], and the overall European population has increased by at least 20 % since 1993–1996 [EBCC]. Still, it is important to bear in mind that the Stock Dove suffered considerable declines between the late 1950s and the early 1990s [VdS, 1, 3].

The reasons for the historical decline in Switzerland are not clear. The recent recovery is not well understood either, but similar to the Common Woodpigeon, it may be related to the improved food supply and the northward shift of the wintering grounds. The increase in the Black Woodpecker population and in the number of large, old trees [4] may also have had a positive impact by improving the availability of cavities.

Sylvain Antoniazza

[1] Bauer et al. (2005); [2] J.-D. Blant, pers. comm.; [3] O'Connor & Mead (1984); [4] Rigling & Schaffer (2015a–d); [5] Teufelbauer & Seaman (2017)



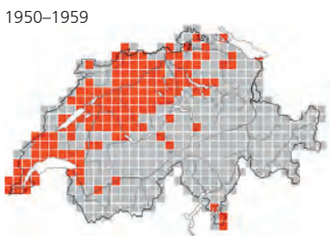


Density 2013–2016

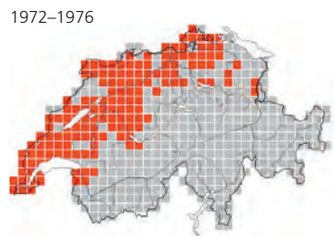
Density change since 1993–1996

Sponsored by
Thomas Schwaller, Muri bei Bern

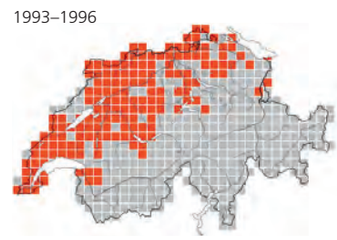
1950–1959



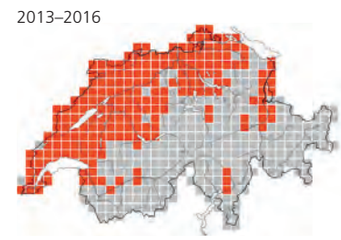
1972–1976



1993–1996



2013–2016



Common Woodpigeon

Columba palumbus
Ringeltaube
Pigeon ramier
Colombaccio
tidun

Mathias Schäf

Red List Least Concern (LC)
Population 130 000–150 000 pairs (2013–2016)

Focus pages 156, 314, 414

The Common Woodpigeon occurs throughout Switzerland up to the tree line, reaching high densities on the Central Plateau, especially in the Canton of Geneva. More than 90 % of the population breeds below 1100 m. Breeding has been recorded up to 2000 m [BCH]. Singing males may occasionally be observed up to 2100 m, e.g. near Zermatt VS at 2160 m (2016; C. Huwiler). Besides woodlands and copses, the Woodpigeon is also commonly found in gardens and parks in settlements. Average densities of more than six territories/km^2 are only reached between 300 and 900 m. In suitable kilometre squares, it is not uncommon to count 20 territories and more. Density was highest in Geneva with up to 60 territories/km^2 [AtGE].

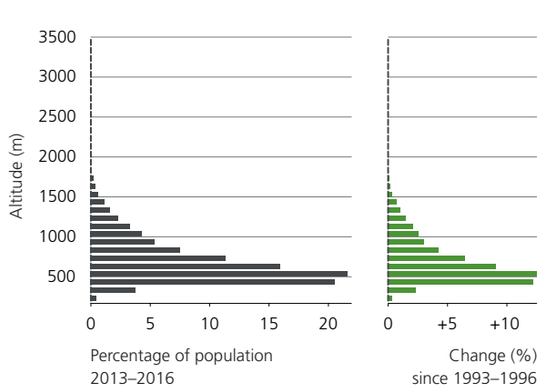
The Common Woodpigeon has more than doubled its population since 1993–1996. It has expanded its range in the Alps. But more relevant in terms of the population increase are the marked and widespread rise in density in already occupied habitats and the colonisation of settlements, a trend that has been observed since the beginning of the 21st century. In 2007, the Woodpigeon had occupied 31 % of the city of Lucerne and 9 % of Zurich, but was absent from Lugano TI [5]. The colonisation of urban areas thus started decades later in Switzerland than in other European countries [AtD, AtF, 6, 10]. The only exception is Geneva, where colonisation began in 1970 [AtGE].

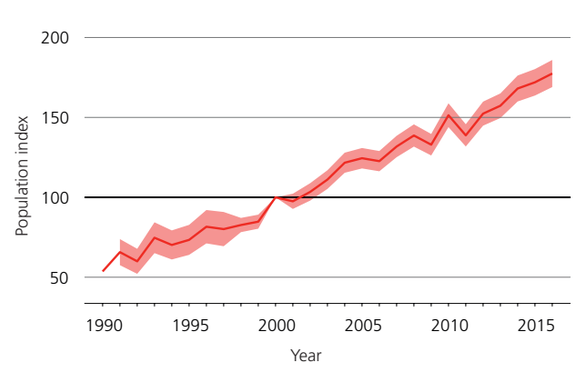
Regional surveys have also recorded substantial gains in the past decades [AtBo, AtGE, AtZH, 4, 13] as well as a marked increase in wintering birds [10, 11]. Breeding populations have increased substantially in neighbouring countries too [AtF, AtFL, 3, 9, 12], and in Europe as a whole [EBCC]. The population is considered stable in Germany overall, but is increasing significantly in Baden-Württemberg [AtD, 2].

Possible causes for the positive trend of the Woodpigeon in Europe include the increase in farmland cultivated with cereal, maize and vegetable crops, milder winters, a longer breeding season and higher breeding success in urban habitats [AtD, AtF, 1, 7, 8, 11]. The European trend probably also affects Switzerland. The fact that gains have been most marked in the lowlands and in towns, where the climate is comparatively warm, suggests that they are related to better overwintering conditions and urbanisation.

Thomas Sattler

[1] Bauer et al. (2005); [2] Bauer et al. (2016a); [3] Campedelli et al. (2012); [4] Draeger (2004); [5] Fontana et al. (2011); [6] Hewson & Noble (2009); [7] Lormée et al. (2011); [8] Møller et al. (2010b); [9] Roux et al. (2011); [10] Rüegg (2013); [11] Schuster (2017); [12] Teufelbauer & Seaman (2017); [13] Weggler & Widmer (2001)



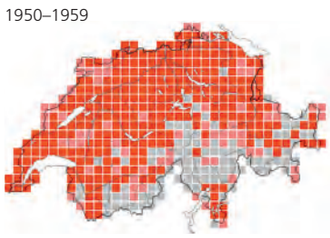


Density 2013–2016

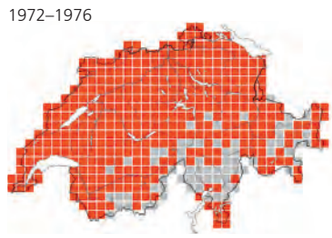
Density change since 1993–1996

Sponsored by
Renate & Roland Luder, Lenk

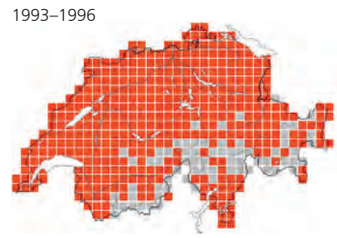
1950–1959



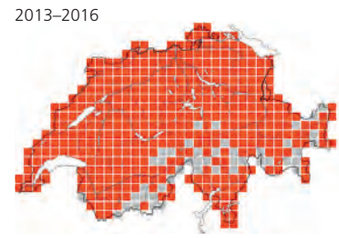
1972–1976



1993–1996



2013–2016



New species still arriving in our cities

The built-up areas of Switzerland continue to expand, crowding out species that inhabit open spaces. But some species benefit, because they can adapt to conditions in towns and cities and occupy them as new habitat. This colonisation of urban areas is still in progress – the most recent examples are Common Woodpigeon and Yellow-legged Gull.

The Eurasian Blackbird's melodious song is a familiar sound in settlements. In the early 19th century, however, the Blackbird was only found in woodlands. The species began to settle in towns from 1820, initially in Germany, and then in other countries. Moving from western Europe towards the east, this process is still ongoing in the eastern-most reaches of the Blackbird's range [HVM, 4]. Other species such as Black Redstart, Common Swift and Alpine Swift have also colonised settlements, using buildings as «artificial cliffs» for nesting. Today, the majority of their Swiss populations occur in settlements.

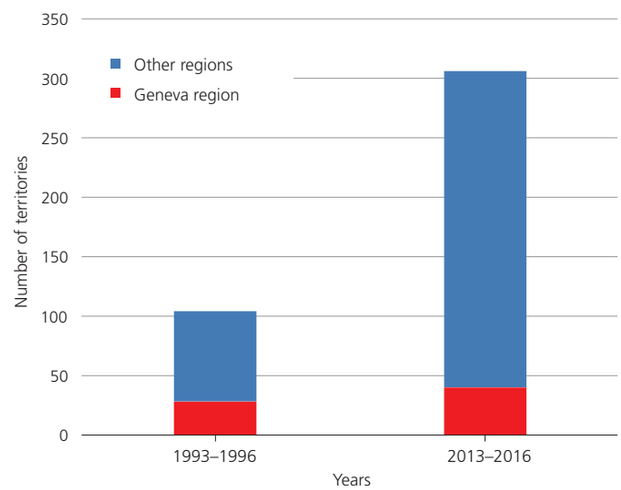
Colonisation of urban areas: a process of adaptation and claiming new territory

Species that want to survive in settlements face a host of challenges. Besides distinct habitat features, a different species composition (e.g. new competitors or predators, many non-native plants) and a range of hazards (e.g. traffic, glass windows), the direct and indirect disturbance caused by the permanent presence of humans is a particular challenge. Birds also need to adapt to noise and artificial light [2, 8]. The colonisation of towns can occur independently in several locations (e.g. Eurasian Magpie) or be initiated by a few «urban specialists» that spread with their descendants from one town to the next. In the case of the Eurasian Blackbird, for example, there seems to be a specific type of «urban Blackbird» [3, 11]. Such urban colonisation processes are still ongoing today.

The «urban Woodpigeon»

In 1993–1996, the Common Woodpigeon only occurred very locally in settlements in Switzerland, with the exception of Geneva and Basel [AtCH2]. The further colonisation of urban areas started only at the beginning of the 21st century. To determine the trend in settlements, we compared 85 kilometre squares (1 × 1 km) that lie predominantly in urban areas and were surveyed in both 1993–1996 and 2013–2016. The Woodpigeon population has tripled in these kilometre squares. Thus, the population increase in settlements is much greater than in other habitats (mainly woodland), where numbers «merely» doubled in the same period. So far, there is no indication that the colonisation of cities has reached capacity – the populations in urban areas will presumably continue to grow.

Compared with the rest of Europe, the Woodpigeon was late to colonise settlements in Switzerland. The species began to occupy cities such as Paris and London in the first half of the 19th century [HVM]. In Germany, colonisation of urban areas was hesitant at first, until the process began to accelerate in the 1960s [AtD]. Many cities in Sweden and Finland followed up until the 1990s [5, 7]. In many places, the presence of the Woodpigeon extends to the city centres [5], sometimes reaching remarkable densities of up to 25 pairs/10 ha [6]. The species has lost its fear of humans and behaves much like the feral pigeon [HBW, 2, 5]. This behavioural adaptation greatly facilitates the colonisation of settlements. A shorter escape distance than in other habitats has been observed in several other species too [9].



Comparison of Common Woodpigeon territory numbers in 85 kilometre squares with a large settlement area that were surveyed in both 1993–1996 and 2013–2016. In the 1990s, the seven squares in the Geneva region supported 27 % of all territories in settlements; 20 years later, they made up only 13 %.

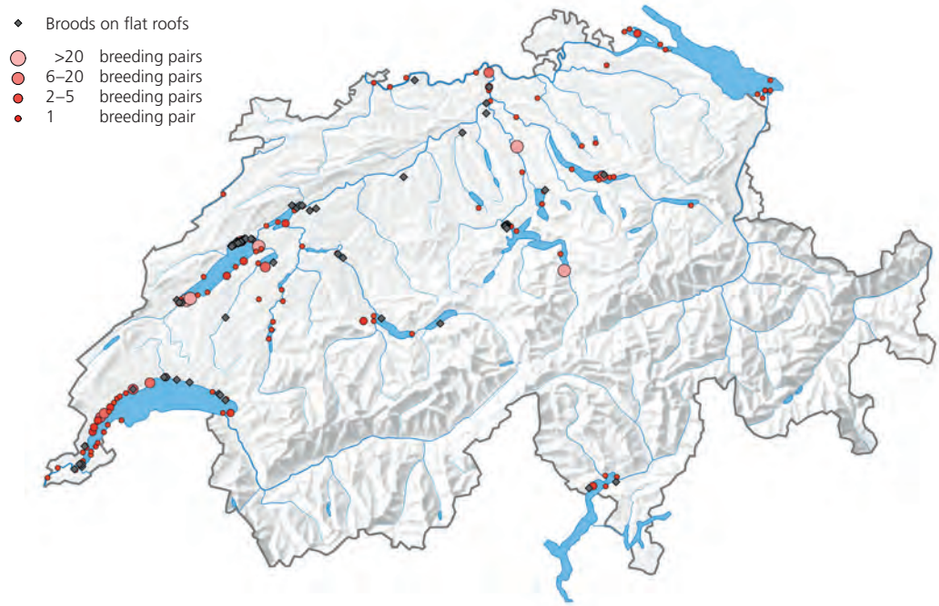
The colonisation of towns by the Woodpigeon is aided by mild winters, the ample food supply, lower predation pressure and the general increase in numbers [2, 5]. In many parts of Germany, the species' population density is greater in urban areas than in the surrounding woodlands [AtD].

Mild winters have resulted in an increase in winter observations in Switzerland ever since the 1990s. Since winter 2003/2004, there has been a sharp increase in records – many of them from settlements. Other species, such as the Blackbird, have probably also wintered in settlements prior to breeding there [2, 12]. Settlements at our latitude offer advantages for wintering birds because they are somewhat warmer than the surroundings and food is provided by humans directly or indirectly (e.g. feeding, rubbish, berries, snow removal).

Yellow-legged Gulls nest on flat roofs

Several other species have gained a foothold in settlements. The colonisation of towns by the Yellow-legged Gull, for example, is also associated with a marked population increase. In 2016, about

Roof-nesting Yellow-legged Gull colonies (grey symbols) are often observed near traditional colonies. So far at least, roof nesting rarely takes place away from the natural breeding sites.



ten times as many Yellow-legged Gull pairs bred in Switzerland as in 1993–1996. While roof nesting was first recorded back in 1994 near Versoix GE [1], the number of breeding records in settlements, mostly on flat roofs, increased mainly between 2013 and 2016, almost tripling in that period. In 2016, 104 broods were counted on buildings [10]. Compared to natural breeding sites, predation pressure is probably lower on flat roofs. On the downside, roof-nesting birds have to cope with higher temperatures. But the benefits clearly outweigh the disadvantages, as roof-nesting birds are prepared to fly large distances to their feeding grounds near water or on farmland.

Which will be the next «urban species»?

Some species have inhabited European cities for centuries. In Switzerland, the process has been slower. In Germany, for example, many more species are known to inhabit settlements, such as Dunnock, Song Thrush, Eurasian Jay, Crested Tit, Common Chiffchaff and Northern Wren, and even raptors like Eurasian Sparrowhawk, Northern Goshawk, Eurasian Eagle-owl and Northern Long-eared Owl [AtD, 13]. So far, these species are absent from gardens and parks in Switzerland, or at most breed occasionally. The reasons are not known, though the larger size of parks and gardens in Germany may be an advantage. In any case, it will be interesting to see which species shows up next in our green spaces. To make sure this happens, we need to preserve large trees and remaining near-natural habitats despite increasing urban density, and manage gardens and parks in a way that encourages biodiversity.

Thomas Sattler

Jürg Hostettler

Yellow-legged Gulls nesting on flat roofs are a recent phenomenon in Switzerland.

[1] Albrecht (1996); [2] Evans (2010); [3] Evans et al. (2009); [4] Evans et al. (2010); [5] Fey et al. (2015); [6] Flade (1994); [7] Fredriksson & Tjernberg (1996); [8] Isaksson (2015); [9] Møller (2008); [10] Müller (2017); [11] Partecke et al. (2006); [12] Rabosée et al. (1995); [13] Rutz (2008)

Species pages 150, 154, 166, 172, 226, 326, 450, 468

European Turtle-dove

Streptopelia turtur
Turteltaube
Tourterelle des bois
Tortora selvatica
turturella

Markus Varesvuo

Red List Near Threatened (NT)
Population 150–400 pairs (2013–2016)

Focus pages 142, 164, 357

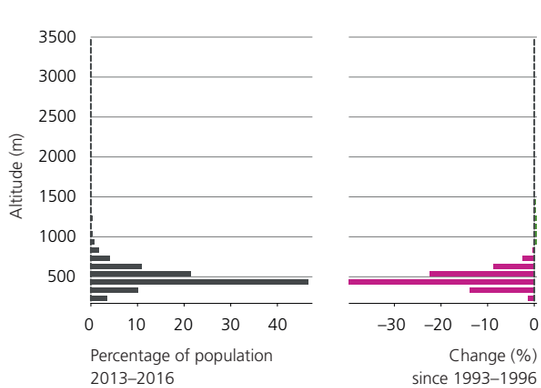
The European Turtle-dove almost exclusively inhabits the lowlands of our country, especially in western Switzerland, the Rhone Valley, southern Ticino and northern Switzerland. With its preference for warm summer temperatures, more than 90 % of the population breed below 700 m, though breeding has been confirmed at 780 m near Menziken AG and at 770 m near Schlierbach LU [AtCH1]. Grisons is an exception to the rule: the species is regularly observed here above 900 m during the breeding season; in the 2013–2016 period, for example, a singing male was recorded at 1690 m near Chamues-ch (R. Vanscheidt). However, it is not clear whether breeding occurs. European Turtle-doves inhabit deciduous woods, copses, hedgerows and alluvial woodland with nearby arable land and herbaceous vegetation [VdS, 6]. Suitable kilometre squares regularly accommodate up to five territories. Densities of 1–6 territories/km² were recorded in the Canton of Geneva in 1998–2001. The average density in the Seeland BE/FR in 1997–2009 was 0.2 territories/km² [4].

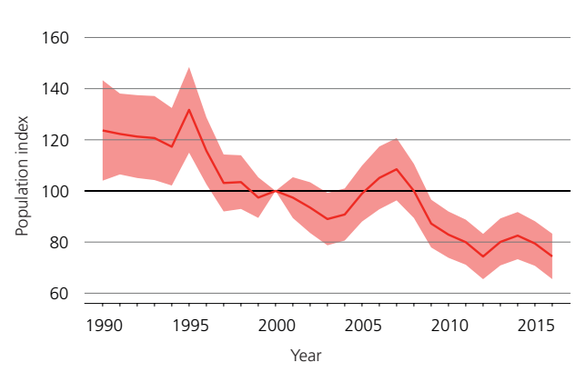
The overall Swiss population of the European Turtle-dove has declined by 40 % since 1993–1996. Significant declines in recent decades have also been recorded in several regional surveys [AtBo, AtGE, AtZH, 1, 4, 6, 9]. Trends in our neighbouring countries are negative as well [AtD, AtF, 12]. In Europe overall, numbers have dropped by almost 80 % since the 1980s [EBCC]. Only Italy reports a stable population [10], and even a slight increase in Lombardy [2].

The main driver of decline is habitat loss due to changes in land use in the breeding grounds, at stopover sites, and in the wintering grounds south of the Sahara (in that order of importance). Hunting and poaching [5, 7, 8, 11] are responsible for the deaths of an estimated 2–3 million Turtle-doves every year [8, 11]. In our country, the conservation of diverse agricultural landscapes with hedgerows, copses and stretches of open woodland is a particular priority, as is low-intensity management of meadows and fields (e.g. reduction of pesticide use) [3].

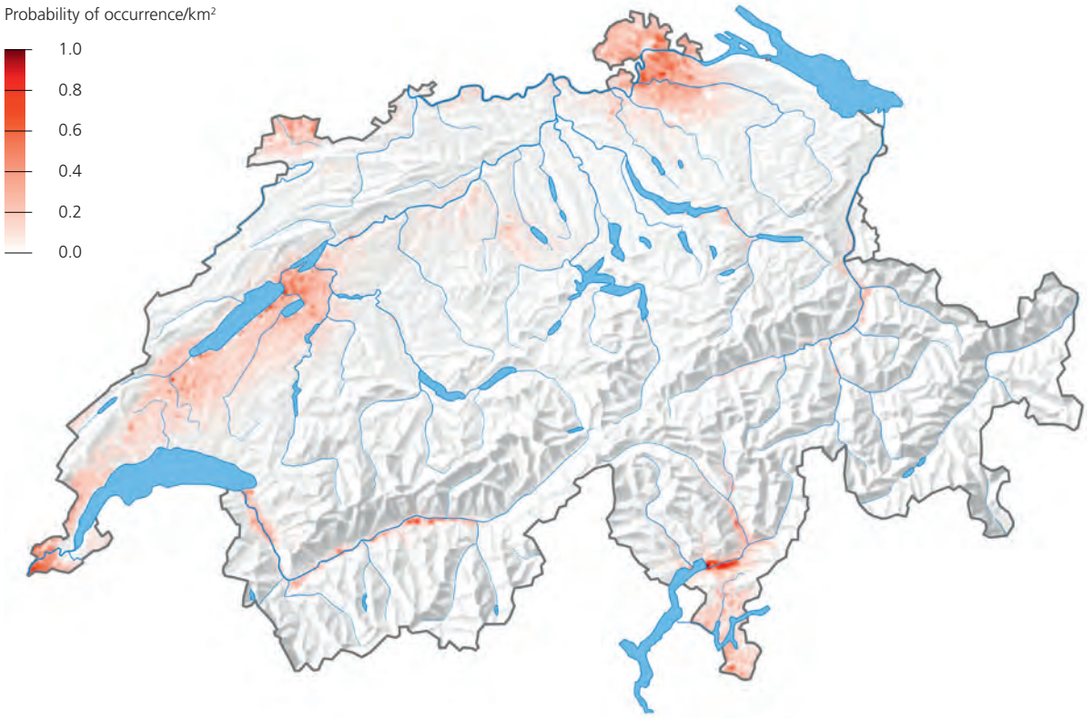
Sylvain Antoniazza

[1] Antoniazza (2018); [2] Bani et al. (2014); [3] Bauer et al. (2005); [4] Birrer et al. (2013b); [5] Caruana-Galizia & Fenech (2016); [6] Di Emidio (2010); [7] Eraud et al. (2009); [8] Fisher et al. (2018); [9] Pochelon (2018); [10] Rete Rurale Nazionale & Lipu (2015); [11] Sheehan et al. (2014); [12] Teufelbauer & Seaman (2017)

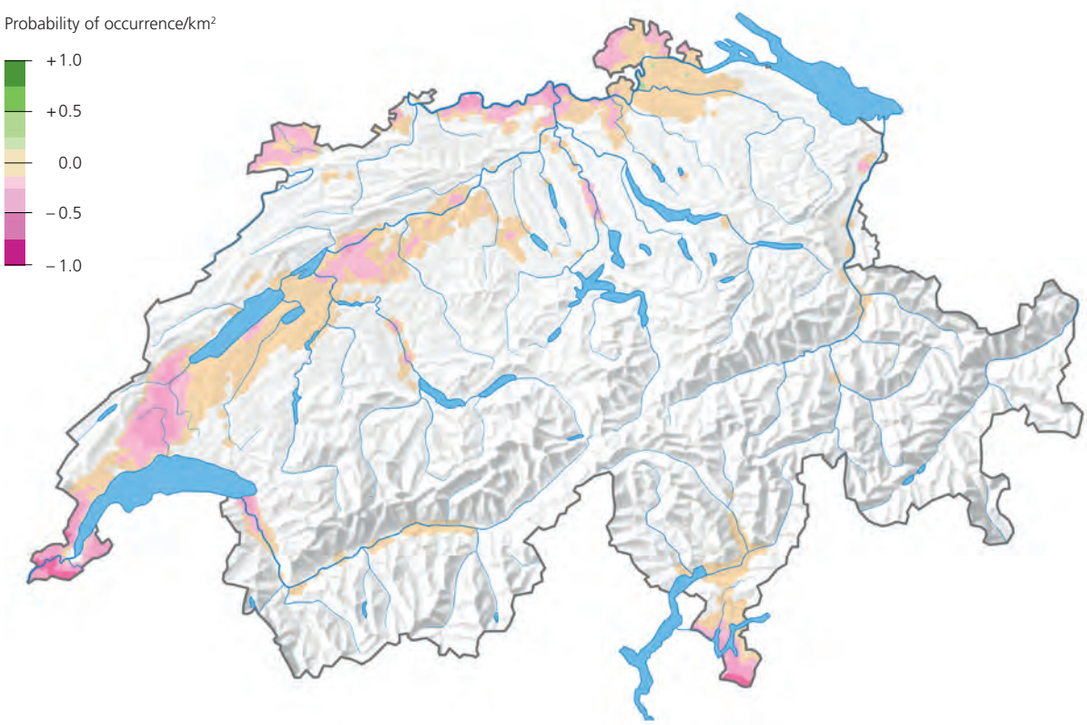




Occurrence 2013–2016



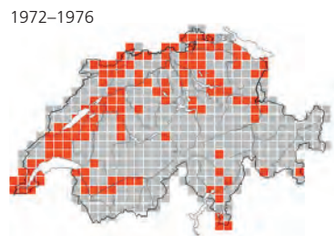
Occurrence change since 1993–1996



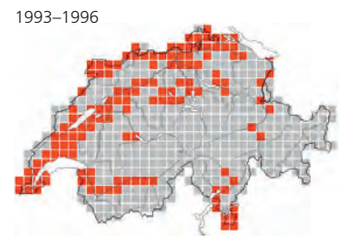
Sponsored by
Markus Hofmann, Zurich

1950–1959

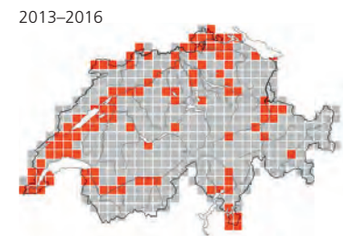
1972–1976



1993–1996



2013–2016



Eurasian Collared-dove

Streptopelia decaocto
Türkentaube
Tourterelle turque
Tortora dal collare
columba tirca

Beat Rüegger

Red List Least Concern (LC)
Population 15 000–25 000 pairs (2013–2016)

Focus pages 190, 319, 414, 420

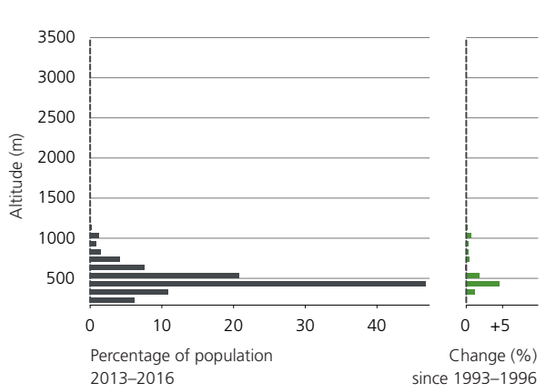
A species closely associated with humans, the Eurasian Collared-dove is now found in residential areas throughout the country wherever there are lots of trees. It avoids treeless city centres [VdS]. High densities are reached in villages and towns on the Central Plateau and in southern Ticino. In these areas, suitable kilometre squares often accommodate eight territories or more. Much higher densities can occur locally: 34 territories/km² were recorded in Lancy GE [AtGE]. More than 90 % of the population is found below 600 m. Since 2016, the highest nest site in Switzerland has been located at 1890 m near Arosa GR (J. Jelen). Occupancy of settlements in Alpine valleys is not continuous; often, only isolated pockets of distribution occur [8]. Outposts at high altitudes may be abandoned again after a few years for reasons such as harsh winters [AGR, 4, 8].

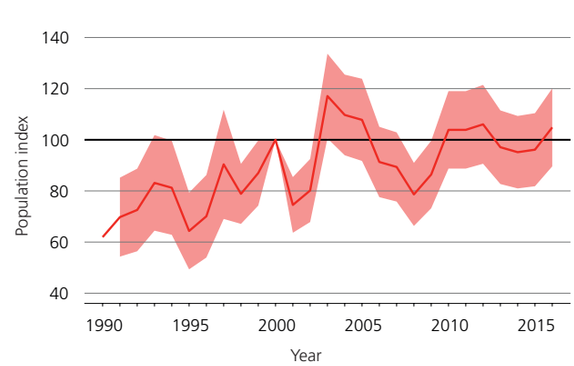
Originally confined to Asia, the Collared-dove colonised Europe within a few decades starting in the 1930s, advancing from Turkey and the Balkans. Its distribution is still expanding in the Mediterranean region [3, 5, 6]. The species was first observed in Switzerland in 1948 and is thought to have bred for the first time around 1950 or shortly after [VdS].

The Collared-dove's range expansion in Switzerland was still ongoing in 1993–1996. Since then, it has occupied higher altitudes and advanced further into the Alpine valleys. Remaining gaps in the western Jura have been closed. Consequently, the Swiss population has increased since 1993–1996, especially below 600 m. The density change map shows that wide fluctuations or even declines can occur at a local [7] or regional scale [AtBo, AtFL, AtZH]. Our neighbouring countries also report mixed trends: while the Collared-dove is in steep decline in Baden-Württemberg [1], numbers are increasing in other parts of Germany as well as in France, Italy and Austria [AtD, AtF, 2, 6, 9]. In Europe as a whole, the population has doubled since 2000 [EBCC]. It is unclear whether the fluctuations, which can be very marked, are a lingering effect of the species' rapid range expansion, or whether they are a characteristic feature of Collared-dove populations.

Thomas Sattler

[1] Bauer et al. (2016a); [2] Campedelli et al. (2012); [3] de Juana & Garcia (2015); [4] Eraud et al. (2011); [5] Rocha-Camarero & de Trucios (2002); [6] Roux et al. (2011); [7] Sattler & Tobler (2004); [8] Signorell Häusler et al. (2012); [9] Teufelbauer & Seaman (2017)



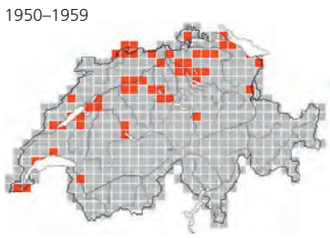


Density 2013–2016

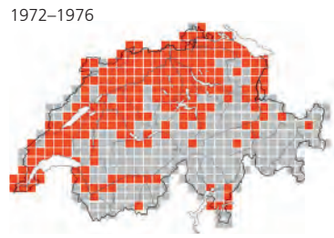
Density change since 1993–1996

Sponsored by
Jean-Philippe Ruegger

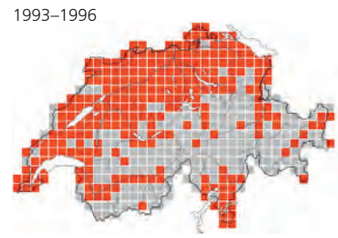
1950–1959



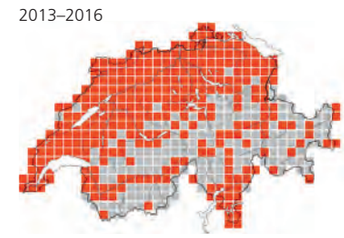
1972–1976



1993–1996



2013–2016



European Nightjar

Caprimulgus europaeus
Ziegenmelker
Engoulevent d'Europe
Succiacapre
chavret

Jonas Landolt

Red List Endangered (EN)
Population 40–50 pairs (2013–2016)

Focus page 164

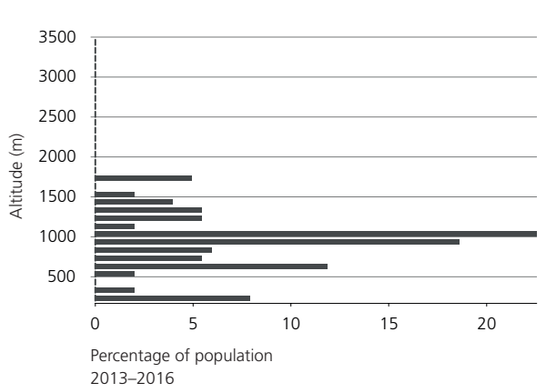
The European Nightjar occupies a wide range of habitats, from the «garrigues» of southern Europe to the forests and heaths on sandy soil further north. It used to breed regularly in central and Upper Valais, on the southern slopes of the Jura, in the western Lake Geneva basin, on dry slopes on the Central Plateau, and in some Alpine valleys in eastern Switzerland [AtCH0]. Today, its range, which reaches up to 1800 m, is confined to the Upper Valais, Ticino and some Alpine valleys in Grisons. The apparent expansion in Ticino since 1993–1996 is the result of an intensive search [5]. The reasons for the overall range loss in Switzerland, despite forestry measures to support the species [7, 8], are unclear.

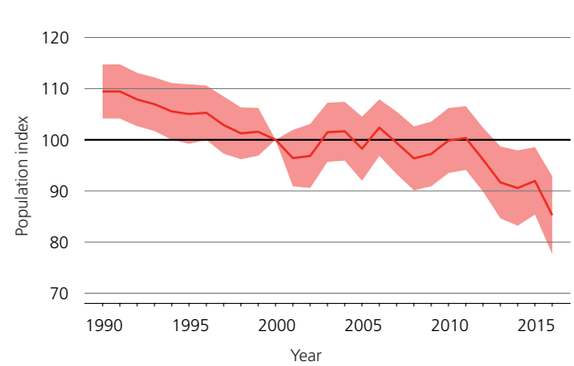
Several factors have been considered as causes for the decline, most notably the drastic loss of large-insect biomass [2, 4, 10], denser forests [1, 6, 10] and the disappearance of hunting and breeding sites. The European Nightjar occupies oak, pine and chestnut stands, favouring sites with sparsely vegetated rocky or sandy ground in open woodland and heaths [7, 11]. Meadows with an abundance of moths are its preferred hunting grounds [3], though these are increasingly being destroyed in favour of vineyards or settlements. Dense vegetation makes foraging difficult and limits the availability of ground-nesting sites. This is keenly illustrated by the example of an area of burnt forest near Leuk VS: thanks to clearings created by the forest fire in 2003, the population increased from one territory to eight territories in six years. As the forest has regrown, numbers have stabilised at five territories, all in the higher reaches of the area [7, 9].

In Europe, population trends are considered stable (France, Austria, Germany) or positive (UK, Sweden, the Netherlands) [AtD, AtF, RLEU]. In Switzerland, the largest populations survive in dry areas with unproductive soils where trees cannot grow, so that semi-open habitats are naturally preserved. To establish successful conservation measures for the European Nightjar, a better understanding of its requirements in the Alps is necessary, so that breeding and hunting grounds can be managed appropriately.

Jean-Nicolas Pradervand

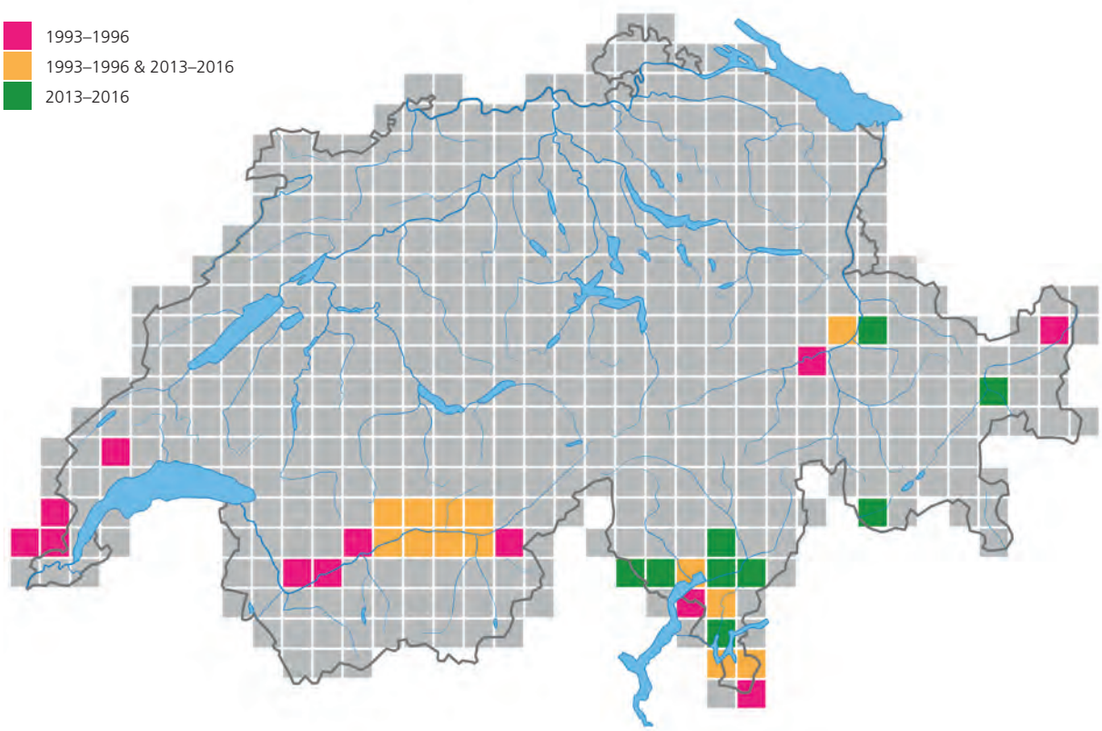
[1] Brändli (2010a–b); [2] Dirzo et al. (2014); [3] Evens et al. (2017); [4] Hallmann et al. (2017); [5] Lardelli & Scandolara (2014); [6] Sharps et al. (2015); [7] Sierro (2015); [8] Sierro (2016); [9] Sierro & Posse (2011); [10] Sierro et al. (2001); [11] Verstraeten et al. (2011)





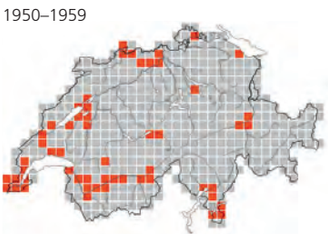
Territories 2013–2016

Distribution change since 1993–1996

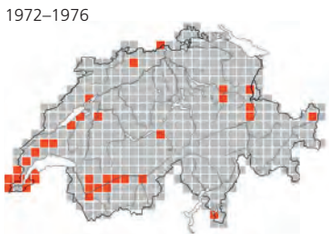


Sponsored by
Philippe Stroot

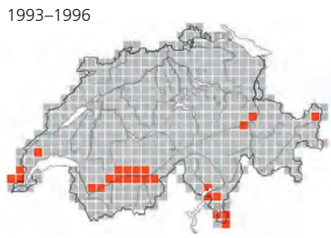
1950–1959



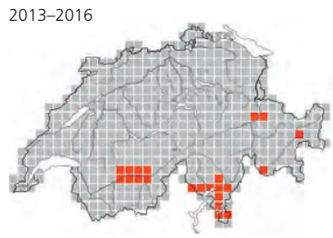
1972–1976



1993–1996



2013–2016



Many specialist species in open woodland

Open woodland is characterised by gaps in the canopy that allow a lot of light to reach the ground. Many specialist species rely on open woodland as habitat, especially plants and insects, but also some birds. A striking number of them are threatened and depend on measures for their protection and conservation. Some conservation projects are underway, but further efforts are needed.

Open woodland offers habitat for many plant and animal species that have become rare and are now considered threatened. These woods have an open canopy, allowing a lot of light to reach the forest floor or ground vegetation. Without human intervention, such woodland only exists on extremely unproductive soils, where trees and shrubs struggle to grow despite plenty of light, either because it is too dry or too wet, or because nutrient content is very low. Examples are various types of warmth-loving Scots pine forest, larch forest at the upper tree line in the southern Alps, and mountain pine forest in raised bogs [3].

But open woodland can also come about through human activity and was much more widespread in the past. Unlike the regulated silviculture common today, which focusses on the production of stemwood, the exploitation of woods used to be a lot more varied [2, 12, 13]. Almost all usable material was taken from the forest: wood, leaf litter and fresh leaves, berries, bark, conifer cones and, by means of cutting or grazing, the undergrowth. Over time, this massive exploitation of biomass and nutrients caused poor soils to develop, creating habitat for plants and animals that in more nutrient-rich locations would immediately be forced out by more competitive, «dominant» species [10]. In fact, the habitats that developed in the course of such diverse and intensive forms of exploitation can hardly be called «forests». Rather, they are mixed, park-like landscapes with scattered trees, groups of shrubs and very short ground vegetation. In the course of the 19th and 20th centuries, these diverse forms of usage lost their economic significance. They were abandoned, with the exception of woodland grazing, which continues in the Alps and Jura today. In some parts of the Alps, grazed woodland still accounts for more than 20 % of forest area [7].

Open woodland for plants and insects, but also for birds

There are hundreds of species that thrive on nutrient-poor soils, especially plants such as Round-leaved Restharrow *Ononis rotundifolia* in the «steppe pine forests» of inner-Alpine valleys [3] or Garland Flower *Daphne cneorum* as a typical plant of calcareous pine forests [1]. For many insect species too, open woods are important habitats. Geiser [6] lists 1343 species of saproxylic beetles in Germany, most of which only occupy stands of old growth and deadwood that have a dry and warm micro-climate due to their open, park-like structure [5]; examples are Great Capricorn Beetle *Cerambyx cerdo* and the Darkling Beetle *Bius thoracicus*. Some bird species also inhabit open woodland. Woods that provide suitable habitat for European Nightjar, Western Bonelli's Warbler, Middle Spotted Woodpecker, European Turtle-dove, Western Capercaillie and Hazel Grouse differ in many respects, but share the common feature of an open canopy.

Pierre Mollet

Forest dominated by mountain pine with scattered spruce on boggy ground; with its open stands, this is prime habitat for Western Capercaillie. Because of its low capacity for growth, this forest remains open over time without the need for conservation measures.

Gilberto Pasinelli

Open oak-pine forest on sandy soil in the northern part of the Canton of Zurich. Measures such as regular mowing are needed to maintain the open structure, creating valuable habitat for several orchid species

Antoine Sierro

Trees were felled in a pine forest near VS to create space for the European Nightjar.

Need for conservation programmes

Given that many birds of open woodland are threatened, at least at a regional scale, conservation programmes have a high priority. For certain species such as Western Capercaillie or European Nightjar, such programmes have been underway for several years. The Swiss Ornithological Institute launched a conservation scheme for Western Capercaillie in 1988 on behalf of the federal government. Conservation measures for the European Nightjar have been implemented by the Canton of Valais in collaboration with the Ornithological Institute since 2001. In both cases there has been some initial success, but no significant shift to positive population trends across large areas has yet been achieved [4, 11].

The Canton of Zurich has taken a different approach, focussing less on individual species and more on open woodland as a diverse type of habitat. The importance of open woodland was already emphasised in the early 1990s, when the canton developed its nature conservation strategy [9]. Later, a special action plan for the promotion of open woodland was established [1]. The federal government has also recognised the need to act [8]. An action plan is currently being devised that proposes to promote open woodland and pioneer habitats for species of national conservation concern.

A variety of measures, regular maintenance

Measures for creating open woodland can vary widely depending on soil conditions, climate, and target species. Some places might require grazing by cattle, sheep or even goats, while regular mowing may be sufficient in others. In some areas, thinning interventions may be all it takes to reduce the density of a forest. Importantly, all measures are to be implemented primarily in woods on unproductive soils. If soils are too nutrient-rich, the plentiful sunlight will cause vegetation to grow again too rapidly. There are also types of woodland, like the above-mentioned mountain pine forests in raised bogs, that are so unproductive that no measures are needed to maintain habitat quality.

Pierre Mollet & Gilberto Pasinelli

[1] Abegg et al. (2005); [2] Bürgi & Stuber (2003); [3] Delarze et al. (2015a–b); [4] Ehrbar et al. (2015); [5] Geiser (1989); [6] Geiser (1991); [7] Gotsch et al. (2002); [8] Imesch et al. (2015a–b); [9] Regierungsrat des Kantons Zürich (1995); [10] Schiess & Schiess-Bühler (1997); [11] Sierro (2016); [12] Stuber & Bürgi (2001); [13] Stuber & Bürgi (2002)

Species pages 104, 108, 158, 162, 292, 398

Alpine Swift

Tachymarptis melba
Alpensegler
Martinet à ventre blanc
Rondone maggiore
randurel grond

Sandra Schweizer

Red List Near Threatened (NT)
Population 1800–2300 pairs (2013–2016)

Focus pages 156, 170, 284, 392

The northern edge of the Alpine Swift's range lies in southern Germany. Here in Switzerland, the species originally occurred in rocky habitats, notably in Valais, Ticino and parts of Grisons. However, its main distribution has long since shifted to about 70 settlements (nests in buildings have been documented since 1768), mainly on the middle and eastern Central Plateau and in Ticino[2]. Today, more than 80 % of Alpine Swifts nest in buildings[5], mostly high-rises or bridges.

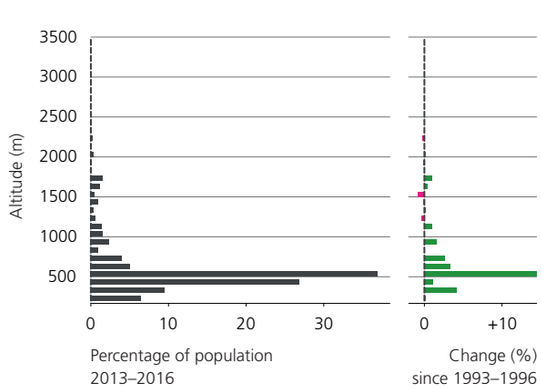
Since 1993–1996, the number of birds that nest in buildings has increased by about 50 %, and range expansion has continued. Successful conservation measures, longevity and fairly high productivity are thought to be responsible for the expansion. As a result, the species has colonised new sites in Thun BE, Wasen im Emmental BE, Zug, Brugg AG, Uster ZH, Wil SG, Flawil SG, Herisau AR and Trogen AR. A thorough search in southern Ticino in 2009–2010 revealed 389 occupied nests, 296 of them in Chiasso alone[3]. This is currently the largest population in Switzerland, followed by Bern (about 250 pairs), Fribourg (about 130 pairs), Lucerne (about 110 pairs) and Zurich (about 105 pairs). The species is less common in western Switzerland, where only Lausanne VD, Fribourg and Payerne VD have breeding colonies.

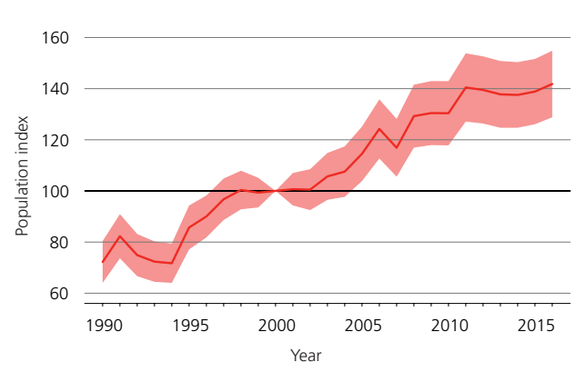
Monitoring the mostly small cliff-nesting colonies is challenging. Creux-du-Van NE in the Jura range accommodates a colony of just a few breeding pairs. In the Alps, the distribution is concentrated in Valais, Ticino, the southern valleys of Grisons, some areas in central Grisons, and the Rhine Valley near Chur GR. In Lower Engadine GR and Val Bregaglia GR, there were several breeding-season observations in 2013–2016; although none of these met the atlas criteria, breeding sites probably exist in these areas. The highest probable breeding attempts were recorded near Bedretto TI at 2490 m (J. Mazenauer), on Col de Fenestral/Fully VS (C. Luisier) at 2440 m, and north of the Alps on Suggiture BE at 1960 m (M. Hammel).

The Swiss population on the Central Plateau interacts with colonies in 18 towns in Alsace, southern Germany and Bregenz A. A continued expansion and increase is documented for this area as well, with the breeding population now numbering about 350 pairs[AtD, AtF, 1, 4, 6, 7].

Hans Schmid

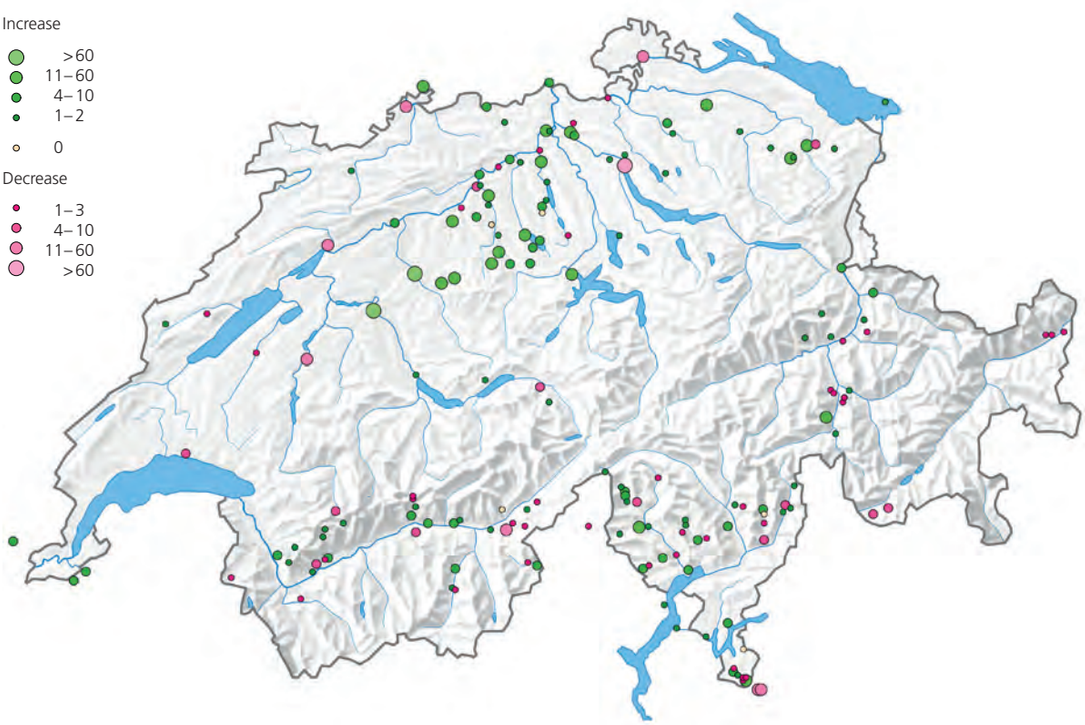
[1] Bauer et al. (2016a); [2] Engeler (1995); [3] Mombelli (2010); [4] Puchta (2012); [5] Schmid (2012a–c); [6] Schmidt (2000); [7] M. Schmidt & J. Daniels-Trautner, in litt.





Breeding pairs 2013–2016

Change in the number of breeding pairs since 1993–1996

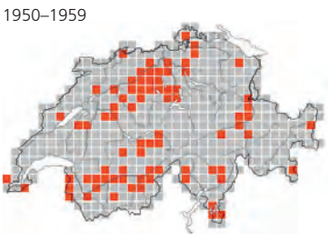


Sponsored by
Martin & Vreni Germann
Willi Witvliet, Netherlands

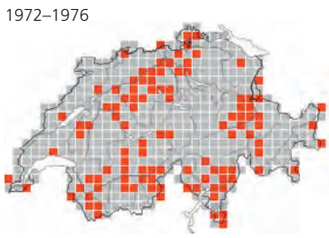
Ornithologische Gesellschaft der Stadt Luzern

Stiftung Pro Artenvielfalt
Foundation Pro Biodiversity

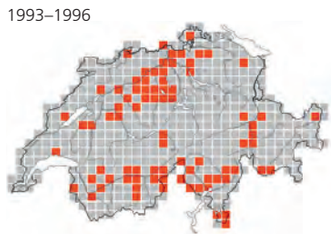
1950–1959



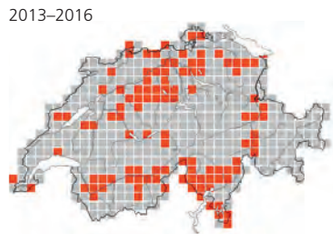
1972–1976



1993–1996



2013–2016



Pallid Swift

Apus pallidus
Fahlsegler
Martinet pâle
Rondone pallido
randurel fustg

Daniele Occhiato

Red List Vulnerable (VU)
Population 29–36 pairs (2013–2016)

Focus pages 170, 425

The Ticino lies at the northern edge of the Pallid Swift's range, which extends across the Mediterranean region[3]. The species' first Alpine breeding site was discovered in Domodossola I in 1983[7], followed by the only Swiss breeding site in Locarno TI in 1987[4]. Until 2009, the population in Locarno fluctuated between 9 and 23 pairs (average 15 pairs). Between 2010 and 2016, the numbers rose to 24–36 pairs (average 31 pairs; R. Lardelli).

A second colony within the atlas perimeter was discovered in Cannobio I in 1995[AtCH2]. In 2013–2016, this colony numbered 45–57 nests (average 50 pairs; R. Lardelli). Overall, more than 108 occupied nests in 7 locations were counted in the Swiss-Italian border region of the Pre-Alps from Domodossola I to Bozen I in 2013[3]. In this area, the Pallid Swift nests mainly in small towns with old buildings, belfries and historical stone slab roofing providing lots of nooks.

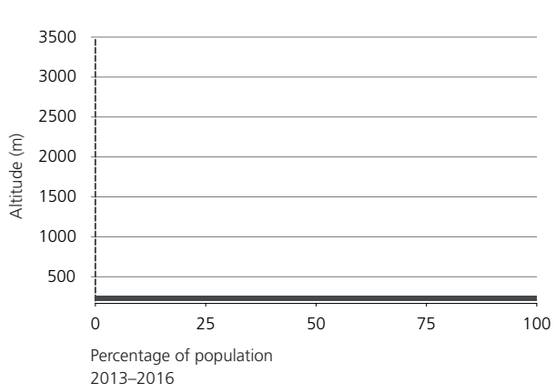
As some pairs produce a second brood, the breeding period can last until the end of October. In the past 20 years, volunteers have searched for additional Pallid Swift breeding sites in Ticino after the departure of the Common Swift in September, but without success.

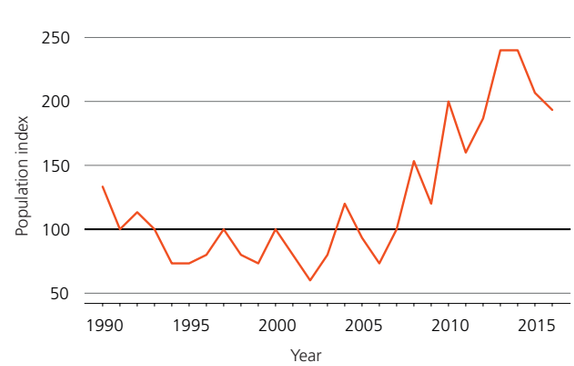
The bulk of the colony in the church of S. Antonio in Locarno is located on the north facade, especially the lower section. However, a growing number of birds has nested in the belfry in the past 20 years. In Cannobio, the species favours nooks in the lower half of the medieval belfry and the Palazzo Parasi. Numbers in both colonies have been declining slightly since 2013, as a colony of Eurasian Jackdaws has established itself in the same location, and the Jackdaws prey on the young swifts. Hooded Crows have also been observed preying on Pallid Swifts[2].

Exceptional in many respects was the case of a Pallid Swift that inhabited a Common Swift colony in the Bernese Jura in Les Reussilles/Tramelan at 1020 m. Eggs were produced in the last three seasons; in 2012, two young were raised, presumably hybrids between the Pallid and a Common Swift[6]. These observations are thought to be related to the Pallid Swift's range expansion which started around 1930 and is still ongoing[AtF, VdS, 3]. As a result of this expansion, the Pallid Swift has bred in Bordeaux F since 2014[1]. The population is increasing in Italy[5], and is considered stable in Europe overall[RLEU].

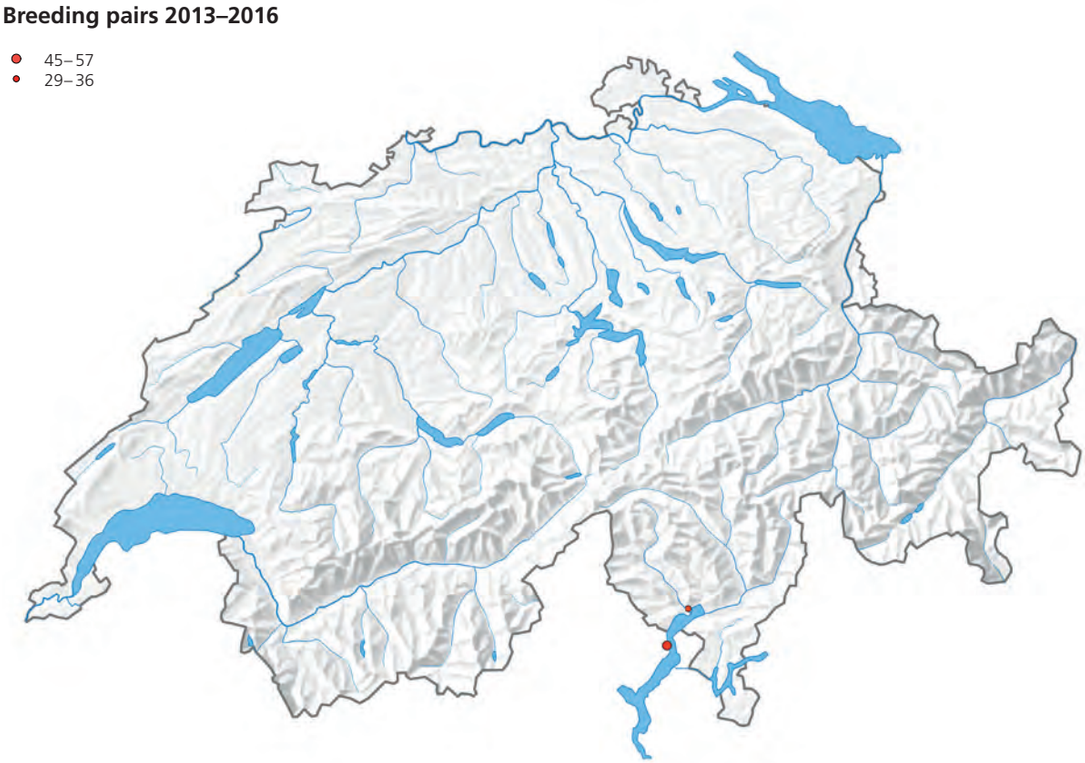
Roberto Lardelli

[1] Dubois et al. (2017); [2] Lardelli (2011); [3] Lardelli (2014); [4] Lardelli & Lardelli (1987); [5] Nardelli et al. (2015); [6] Oberli et al. (2013); [7] Pulcher & Boano (1984)





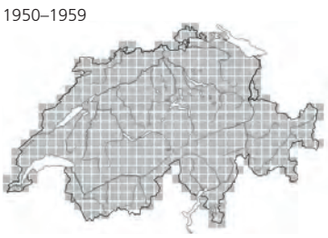
Breeding pairs 2013–2016



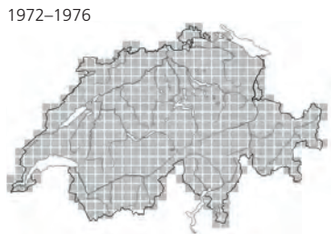
Distribution change since 1993–1996

Sponsored by
Claudia Spiess

1950–1959



1972–1976



1993–1996

2013–2016

Problematic coexistence – sharing our buildings with birds

In many areas, rock faces that provide nest sites for typical cliff-nesting birds such as raptors, swifts and swallows no longer exist or have at least become rare. When humans started to erect «artificial cliffs» in the form of buildings, cliff nesters took the leap. Today, many species nest on buildings in towns and villages, where they are highly dependent on our willingness to tolerate their presence.

Most species that nest on buildings used to nest exclusively or at least mainly in cliffs. With the emergence in ancient times of the first large buildings such as the Acropolis, Roman amphitheatres and aqueducts, new opportunities opened up for cliff nesters and other birds of human settlements. Barn Swallows were considered widespread in Ancient Greece and Italy[11]. As settlements developed, cliff-nesting birds from eastern Europe, the Mediterranean and western Asia established themselves in central Europe[12]. Large parts of central Europe were covered in forest and offered few nesting sites for these species – with the exception of some tree-nesting jackdaws and swifts. In present-day Switzerland, some species are largely or even completely dependent on buildings for nesting: Common, Pallid and Alpine Swift, Barn Swallow, Northern House Martin, House Sparrow and Italian Sparrow. In the case of species like White Wagtail, Black Redstart, Spotted Flycatcher and Eurasian Jackdaw, a part of the population uses buildings for nesting. Goosander, Peregrine Falcon, Yellow-legged Gull and Eurasian Crag Martin are increasingly found to breed in buildings.

Colonisation of buildings: the trend continues

We do not know which species was the first to nest on buildings, or when this happened and where. The House Sparrow is assumed to have become a constant companion of humans in central Europe ever since the emergence of agriculture in early history[HVM]. The pigeon towers of the Middle East and nesting towers for swifts in Italy show that humans have encouraged the colonisation of settlements by cavity breeders for centuries or even millennia[7]. Humans quickly learned that birds could be attracted and used for culinary purposes.

The earliest documented colonisation of buildings in Switzerland relates to the Alpine Swift colonies in the minster and the Christoffel Tower in Bern in 1768/1769; historical records note that the chicks were considered a «delightful meal»[6]. The expansion of the Alpine Swift in Switzerland seems to have been quite slow, however. It was not until the demolition of the Christoffel Tower and construction work on the minster around 1890 prevented the birds from occupying their nests that a wave of expansion was triggered. Subsequently, the first broods were found in Lucerne in 1892, in Zurich in 1911 and in Schaffhausen in 1922[2]. The colonisation of buildings by the Alpine Swift has progressed since the early 20th century leading to the gradual occupation of about 70 towns.

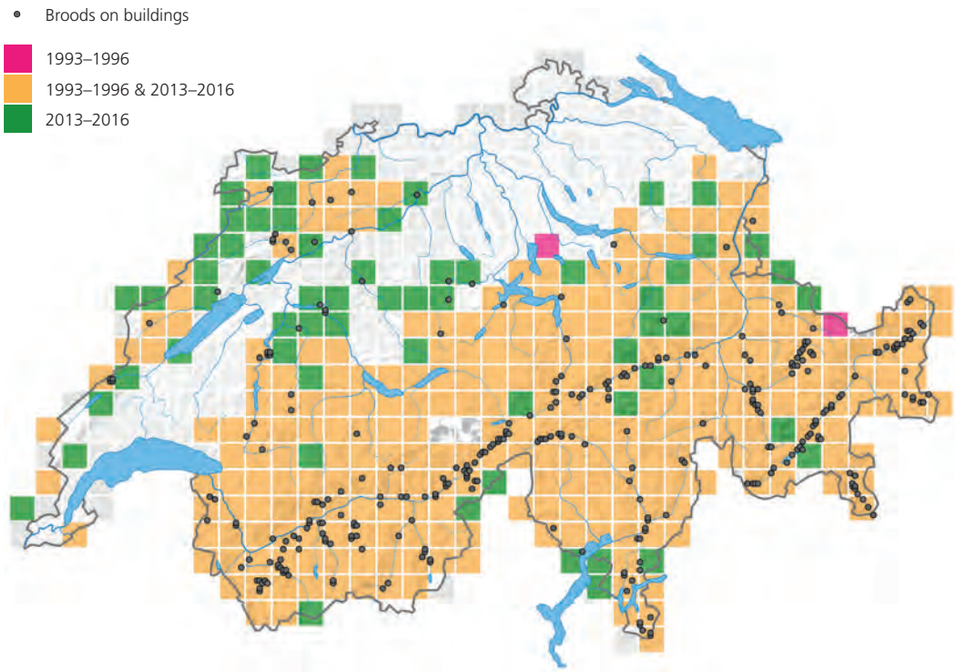
Crag Martins have been known to nest on buildings in the Canton of Valais since 1919, but such nests were an exception until 1970 and were still considered rare as late as 1982. They have become much more common since about 1994[8]. The Swiss population of the Crag Martin has grown by about 60 % since 2003. In Alpine valleys, pairs nesting in cliffs as well as those using buildings appear to be increasing. Buildings are probably used in an opportunistic manner as «artificial cliffs», mostly in proximity to existing breeding sites[9]. The Crag Martin is increasingly colonising the Central Plateau, where it nests on high-rises as well as in cliffs and on bridges[4, 10]. On the whole, however, new colonies outside of the Alpine range remain a marginal phenomenon.

Marcel Burkhardt

The Eurasian Jackdaw nests in cavities of old trees, rock faces and buildings. It relies on conservation measures to preserve nest sites on buildings and bird-friendly renovations.

Sandra Schweizer

Renovations offer opportunities, too: temporary nesting facilities help to preserve swift colonies. Ideally, more and better nest sites are available when the renovation is complete.



Eurasian Crag Martins that nest on buildings (grey dots) occur mainly in the traditional breeding grounds in the Alps. Beyond these areas, they are much less common.

Other species did not attempt to nest on buildings in Switzerland until the 1990s, such as Peregrine Falcon in 1991 [AtCH2] and Yellow-legged Gull in 1994 [1].

Modern building design is a problem

Architectural styles and building materials differ widely between regions. Houses with stone-slab roofs like they are common in Ticino or Engadine GR provide numerous nesting sites for Common Swifts. In central Switzerland, on the other hand, building structure is much less favourable, and offers few opportunities for Northern House Martins to build their nests. Also, the open barn design that has become popular in recent years is much less suitable for the Barn Swallow.

Alpine Swifts have the advantage of mostly nesting in colonies on prominent buildings and enjoying a certain popularity among the public. As a result, the impact of building renovations on Alpine Swifts is often recognised early on. In most cases, solutions can be found to protect and maintain the colony. The nest sites of the Common Swift in our towns and villages, on the other hand, are more numerous and spread out. Preserving them when buildings are renovated or creating enough new sites is an ongoing task [15]. Some municipalities have introduced swift inventories to keep track of nesting sites.

As a consequence of our modern «flawless» building design, few new nest holes are created for Common Swifts and other birds that nest on buildings. Due to high aesthetic standards, the use of certain construction materials, and potential problems with insulation, it can be difficult to create spaces for nesting birds.

Urbanisation and low acceptance put birds under pressure

The heightened construction activity throughout the country creates further difficulties for birds: as urban density grows, foraging sites for Common Kestrel, Eurasian Jackdaw, Common Redstart, Spotted Flycatcher, House Sparrow and others disappear. In urban habitats, food is scarce, often too low in protein, or has to be transported over long distances. As a result, the breeding success of Eurasian Jackdaws in urban areas is poor [3, 13, 14]. House Sparrow populations are also declining in many central European cities [HBW, HVM, 5]. Because most paths and forecourts are paved, the Northern House Martin has trouble finding sufficient nesting material. The use of large glass surfaces increases the risk of fatal collisions for many species.

In many areas, birds that rely on buildings for nesting face difficult conditions – not least due to a lack of acceptance from humans. The fact that these species' broods are protected by the federal act on hunting and for the protection of wild mammals and birds is too often overlooked.

Hans Schmid

[1] Albrecht (1996); [2] Arn-Willi (1960); [3] Biondo (1998); [4] Christen (2001); [5] De Laet & Summers-Smith (2007); [6] Engeler (1995); [7] Genton & Jacquat (2014); [8] Glutz von Blotzheim (2005); [9] Glutz von Blotzheim et al. (2012); [10] Hauri (2006); [11] Ineichen (1997); [12] Ineichen et al. (2012); [13] Kneubühl (1998); [14] Meyrier et al. (2017); [15] Scholl (2016a–b)

Species pages 120, 166, 168, 172, 226, 302, 306, 330, 388, 390, 394, 456, 468, 470, 494, 496, 518

Common Swift

Apus apus
Mauersegler
Martinet noir
Rondone comune
randurel pitschen

Daniele Occhiato

Red List Near Threatened (NT)
Population 40 000–60 000 pairs (2013–2016)

Focus pages 156, 170, 212, 308

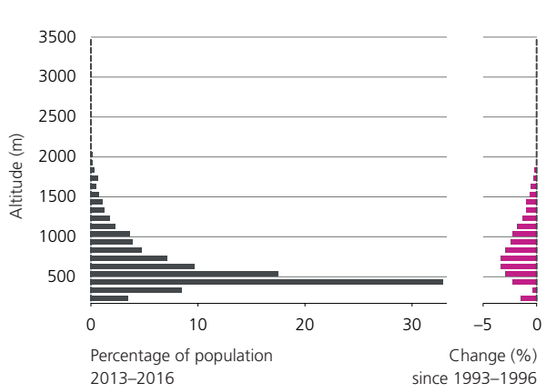
The Common Swift occurs throughout Switzerland, with the highest concentration below 700 m. The largest populations are found near urban centres. The Common Swift penetrates far into Alpine valleys (e.g. Juf/Avers GR at 2120 m) and also occupies isolated buildings. The highest nesting sites are on Furka Pass UR at 2430 m and Bernina Pass GR at 2310 m [AGR, AtCH2]. The 2013–2016 surveys led to the discovery of high-altitude cliff-nesting sites, on Augstmatthorn BE at 2000 m (M. Hammel), near the Glecksteinhütte/Grindelwald BE at about 2250 m (K. Jakob) and on Marscholhorn GR at about 2400 m (E. Bader). Nests in cliffs have been documented at lower altitudes before [1], but were previously unknown in the Alps. Many buildings accommodate 50–80 pairs [3]. Currently, the largest colonies are found on school buildings: Alte Kantonsschule Aarau AG, 159 pairs (2014; B. Zeller); Complexe scolaire du Belvédère in Lausanne VD, 104 pairs (2016; B. Genton); Morillonschulhaus in Wabern BE, 94 pairs (2016; A. Engeler, Stadt Grün Bern).

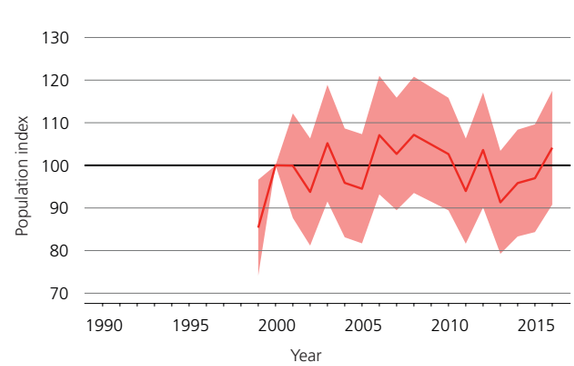
Inventories conducted in Aarau, Baden AG, Bremgarten AG, Lenzburg AG and Thalwil ZH (7500–20 000 inhabitants each) resulted in 50–590 pairs in 33–160 locations in each town; approx. 3–6 % of all buildings were occupied [7, 9]. Such surveys are challenging, however, as many colonies are inaccessible and breeding pairs can be secretive, while non-breeding birds 1–2 years old draw attention with their playful swoops and dives [2].

Although the population index (based mainly on well-monitored and managed colonies) suggests that numbers are stable, the comparison with 1993–1996 reveals gradual declines in rural areas especially. Similar declines were recorded around Lake Constance and in the Canton of Zurich [AtBo, AtZH]. While colonies also disappear in urban areas as a result of renovation and construction, these locations are more likely to benefit from conservation measures that provide alternative nest sites. In the face of decreasing densities, maintaining existing nest sites and creating new ones is an ongoing responsibility. Otherwise, we face the threat of population collapses like they occurred in the UK, where the population dropped by half in the course of 20 years [4]. Numbers are also declining in some neighbouring countries [AtD, 5, 8], though they appear to be stable in Italy [6].

Hans Schmid

[1] Beaud (2010); [2] Genton (2010); [3] Genton & Jacquat (2014); [4] Harris et al. (2017); [5] Jiguet (2017); [6] Nardelli et al. (2015); [7] Scholl (2015); [8] Teufelbauer & Seaman (2017); [9] B. Zeller, in litt.



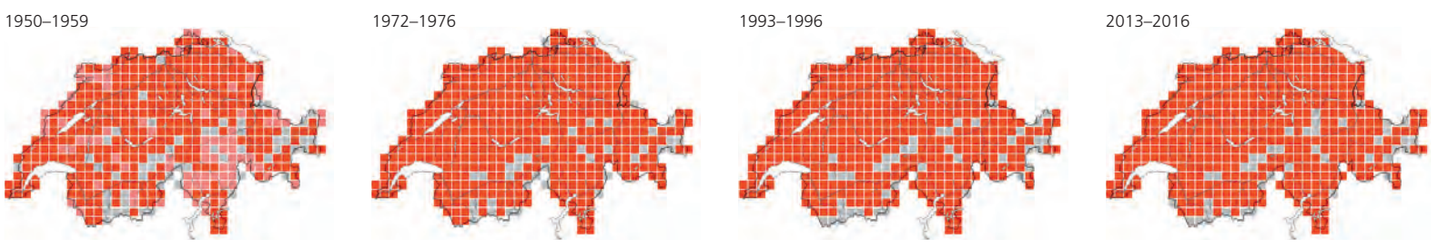


Density 2013–2016

Density change since 1993–1996

Sponsored by
Eric Adam
Bernard Genton
Elisabeth & Markus Graf-Meyer
Geneviève Loup

Langnauer Vogelschutz LVS



Common Cuckoo

Cuculus canorus
Kuckuck
Coucou gris
Cuculo
cucu

Daniele Occhiato

Red List Near Threatened (NT)
Population 15 000–25 000 males (2013–2016)

Focus pages 319, 362, 414, 506

The Common Cuckoo inhabits a diverse range of habitats in Switzerland, such as river valleys and wetlands, farmland, parks, scrubland and woodlands as well as Alpine pastures, making it one of our most widespread species. It is considered a good indicator of species diversity[3, 6]. White Wagtail, Water Pipit, Tree Pipit, Black Redstart, Common Reed-warbler and Spotted Flycatcher are among its most common host species in Switzerland[AtCH1, VdS]. While the Cuckoo has been observed at altitudes of up to 2700 m during the breeding season in the past[VdS], singing males have more recently been recorded up to 2500–2600 m, for example in eastern Grisons and valleys of the southern Valais. The highest confirmed breeding record comes from 2650 m near Lavin GR (S. Werner, H. Werner, K. Varga).

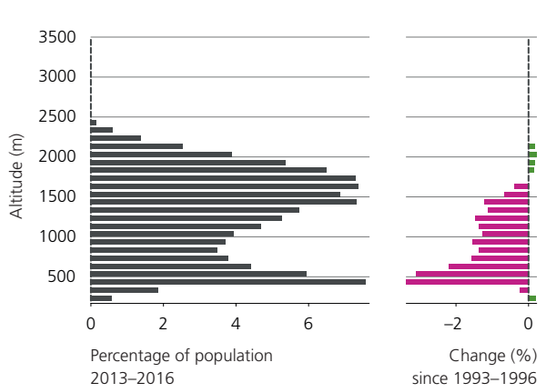
In the lowlands, distribution is now mostly limited to the major river valleys and wetlands. In large parts of the Central Plateau and the central and eastern Jura, the Common Cuckoo has become scarce and most of the formerly occupied woodland and farmland areas have been abandoned. In the Canton of Zurich, for example, numbers dropped by about 40 % between 1988 and 2008[AtZH]. The Cuckoo is somewhat more common in the western part of the Central Plateau and around Lake Constance, though there have been significant declines here as well[AtBo, AtGE]. The wetland population has remained stable since at least 1990.

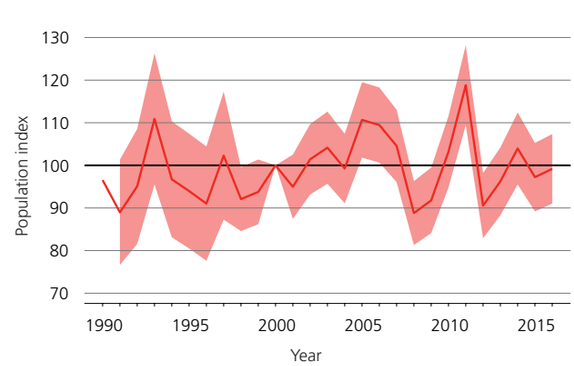
Today, the species is concentrated in the Pre-Alps and Alps, where distribution is almost continuous between 1000 and 2000 m, with fairly high densities. However, numbers are declining in some areas here as well, especially in the Upper Valais, central Grisons and the Alpstein massif. Despite significant fluctuations, the national index is stable, as the sample draws mainly from the more or less constant populations in the Pre-Alps and Alps.

Factors that have caused the population to thin out, especially in the lowlands, include the use of insecticides and habitat degradation through the removal of trees, hedges and other structures; both practices reduce the number of caterpillars, the Common Cuckoo's main food source[AtGE, VdS]. The decline of various long-distance migrants (host species) may serve to reinforce the negative trend. Numbers are decreasing in areas across the Swiss border[1, 2, 4, 5]. The same is true for the overall European population[EBCC].

Hans Schmid

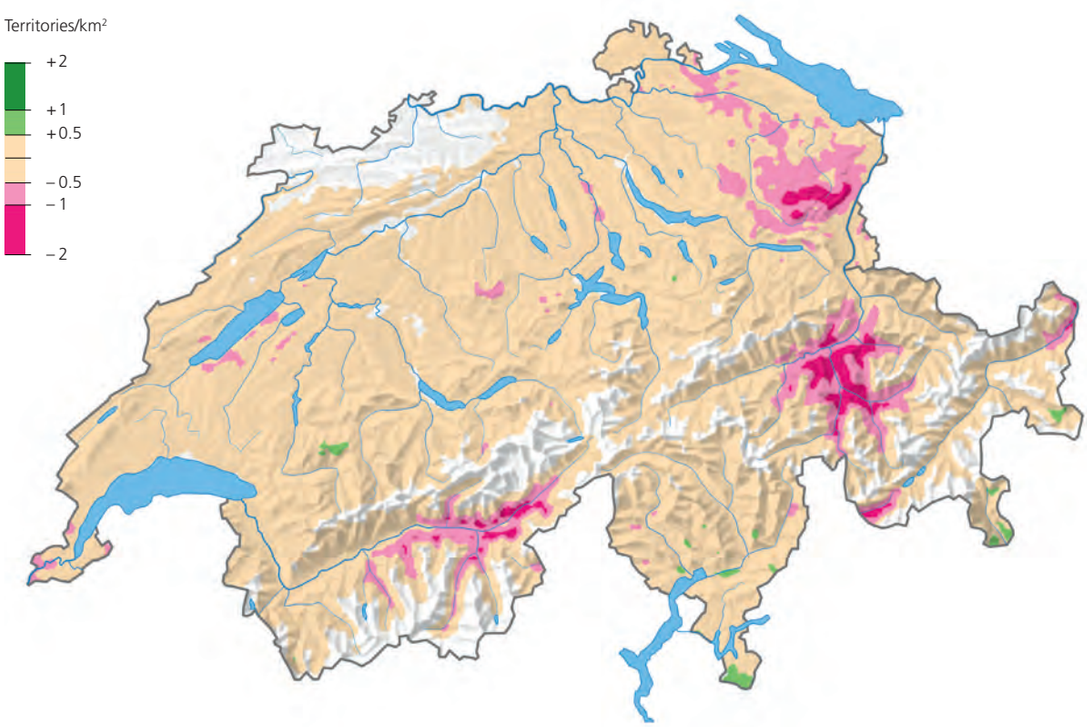
[1] Bauer et al. (2016a); [2] Jiguet (2017); [3] Morelli et al. (2017); [4] Nardelli et al. (2015); [5] Teufelbauer & Seaman (2017); [6] Tryjanowski & Morelli (2015)





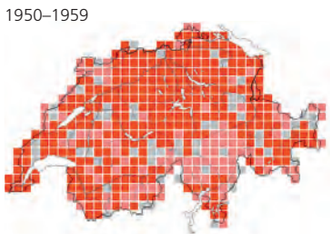
Density 2013–2016

Density change since 1993–1996

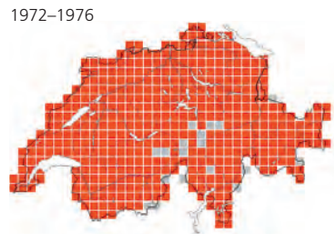


Sponsored by
Annette Huwyler-Van der Haegen
Peter Jucker

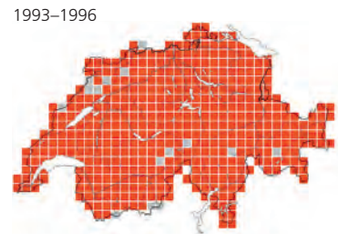
1950–1959



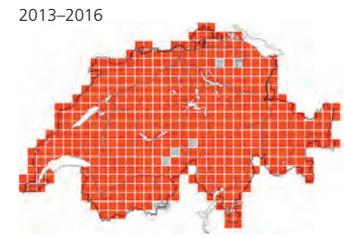
1972–1976



1993–1996



2013–2016



Western Water Rail

Rallus aquaticus
Râle d'eau
Porciglione
ralla da l'aua

Markus Varesvuo

Red List Least Concern (LC)
Population 500–800 pairs (2013–2016)

Focus page 380

In Switzerland, the Western Water Rail occurs in reed-dominated wetlands on the Central Plateau and Ticino, locally also in the Jura and the larger Alpine valleys below 800 m. As in earlier surveys [AtCH2], the highest breeding sites were found on Lac de Joux VD at 1005 m (Y. Menétrey, E. Bernardi) [1]. Observations during the breeding season were recorded near Samedan GR and Bever GR at 1690–1700 m (C. Foletti, D. Jenny; earlier records exist [AEn, AGR]), on Lag Grond/Laax GR at 1020 m (S. Dubach) and in 2011, on Geschinersee VS at 1340 m (U. Marti, P. Huguenin et al.) [6]. In prime habitats like the Grande Cariçaie nature reserve, densities can reach up to 25 territories/10 ha in a good year, as was the case in 2016 near Chevroux VD [2].

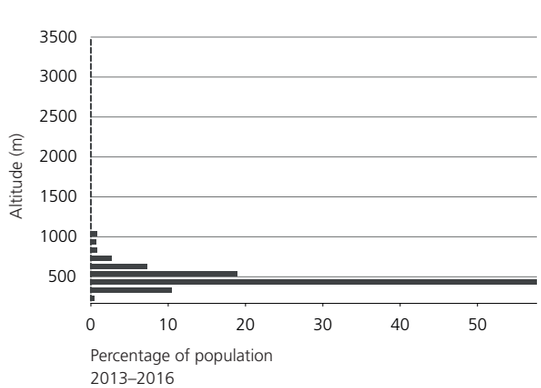
Since 1993–1996, several new atlas squares have been occupied mainly in the Jura and northeastern Switzerland. It is unclear whether these sites have in fact been newly colonised, or whether a sporadic presence of the Water Rail was detected thanks to increased observer effort. By contrast, we lack records from a number of peripheral atlas squares.

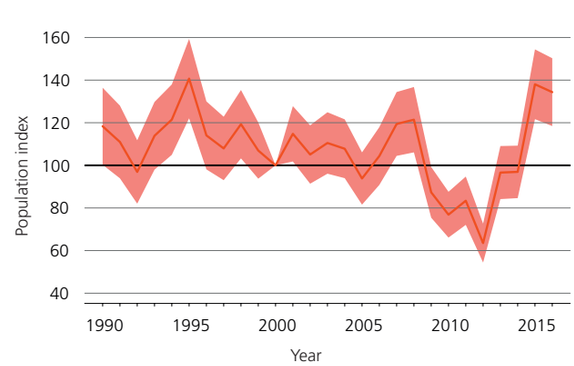
The population is fairly stable, although fluctuations can be caused by variations in the water level. The steep decline between 2008 and 2012 is thought to have been caused in part by cold winters with lots of snow [2]. Subsequently, the population recovered quickly. Some regional surveys revealed heavy losses; this was the case on Lake Constance between 1980 and 2010 (numbers dropped by half) [AtBo] and in the Canton of Zurich between 1988 and 2008 (25 % decline) [AtZH]. In Europe, the population is considered largely stable [RLEU], though France and Germany reported a long-term decline [AtD, AtF].

Besides high mortality in harsh winters, declines are caused by degradation and loss of habitat [ABW]. The Water Rail benefits from management measures in reedy wetlands to create pools of open water [5, 7], but also from the restoration of drained marshes. Annual large-scale reed cuts should be avoided, as the Water Rail colonises reed stands in particularly high densities only in the second to fourth year after cutting [3, 4].

Martin Spiess

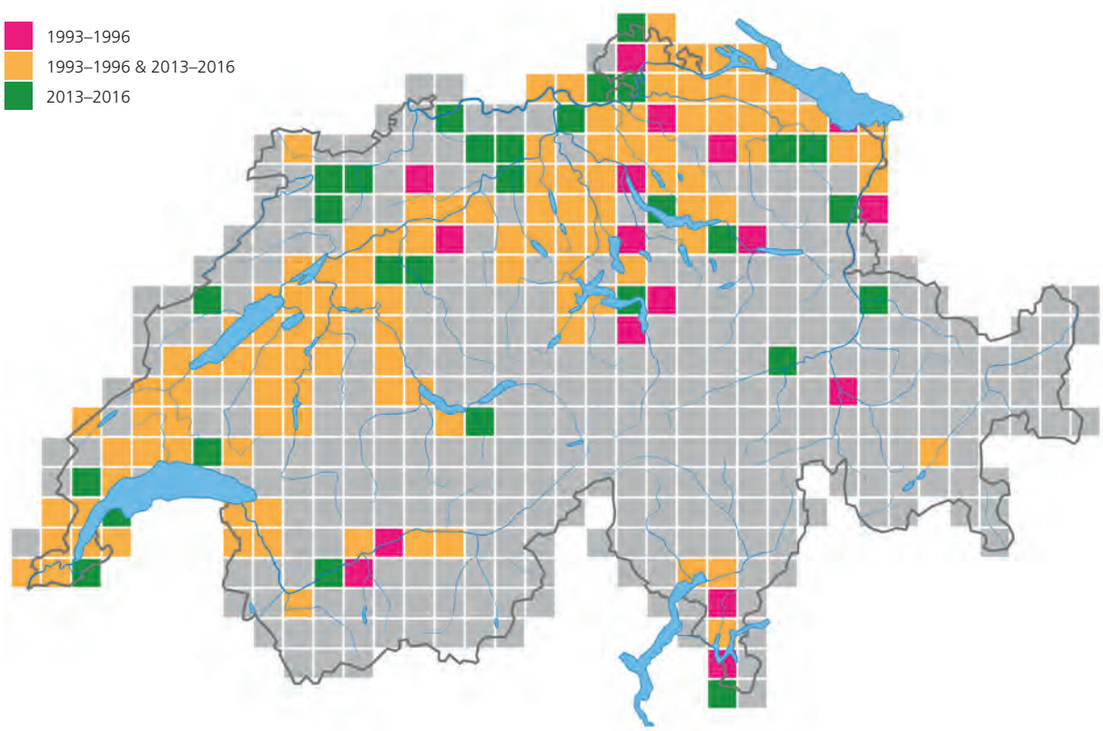
[1] Antoniazza (2016b); [2] Antoniazza (2018); [3] Antoniazza & Maillefer (2001); [4] Antoniazza et al. (2018); [5] Graf (2014); [6] Posse (2012); [7] Weggler et al. (2004)





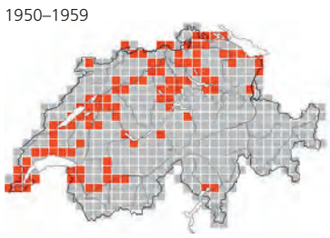
Occurrence 2013–2016

Distribution change since 1993–1996

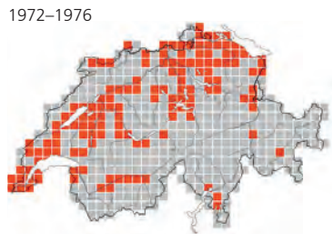


Sponsored by
Manfred Steffen

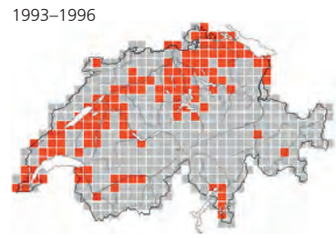
1950–1959



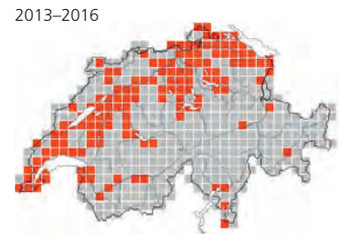
1972–1976



1993–1996



2013–2016



Corncrake

Crex crex
Wachtelkönig
Râle des genêts
Re di quaglie
quaglia

Bence Máté

Red List	Critically Endangered (CR)
Population	15–40 males (2013–2016)

Focus pages 212, 478

Until the early 20th century, the Corncrake was widespread in Switzerland, especially in the lowlands[VdS]. A marked decline started in the 1930s, reaching its low point in 1980[12]. In 2013–2016, calling males were observed mainly in Grisons, but also in other places in the Alps, the western Jura and on the Central Plateau. The map presents an optimistic picture for this highly mobile species, even though only birds recorded at least five nights in a row were included. The intensified survey effort is also reflected in the results, however, and some areas were only occupied in a single year.

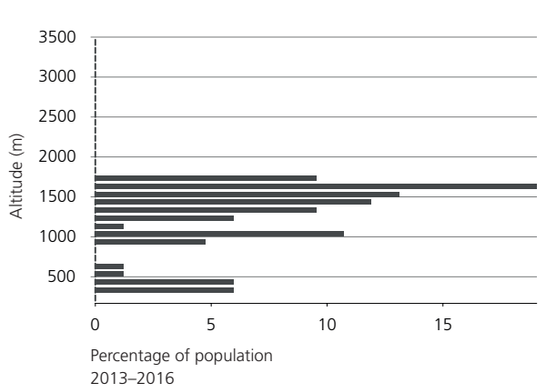
Calling males were observed in Lower Engadine GR at altitudes of up to 2000 m (Ftan, 1990 m, G. Andry; Samnaun, 1970 m, M. Kern) and at more than 1900 m on the northern slopes of the Alps (Hahnenmoos BE, 1940 m, R. Luder). The highest recent broods were recorded near Tujetsch GR (1830 m, M. Cavegn) and Silvaplana GR (1800 m, T. Giovanoli, R. Roganti).

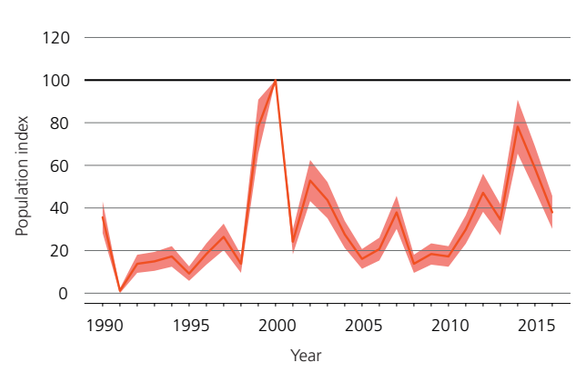
From the lowlands to the Alpine zone, the Corncrake mainly inhabits wet meadows with tall grass. These provide cover from above but are less dense on the ground, and accommodate an abundance of insects, snails, worms and seeds[3]. Depending on when the Corncrakes arrive, the meadows must not be cut before early or even mid-August.

The global threat to the Corncrake is considered much less serious today than in 2000, as the large populations of Russia and Kazakhstan appear to have stabilised since then[2]. However, the situation remains critical in some European countries, and various national action plans have been initiated[1, 4, 5, 10, 11]. BirdLife Switzerland launched a species recovery programme in 1996[9]. The main goal is to locate broods and – through agreements with farmers – save them from being destroyed during mowing. Despite these conservation measures, the Corncrake faces a difficult situation in Switzerland[7, 8]. In the lowlands, there is a lack of large sanctuaries with extensive wet meadows, and at higher altitudes, the trend towards intensified management of meadows and early mowing continues[6]. So although breeding currently occurs almost every year, there is not a single site so far where the species nests annually.

Hans Schmid & Eva Inderwildi

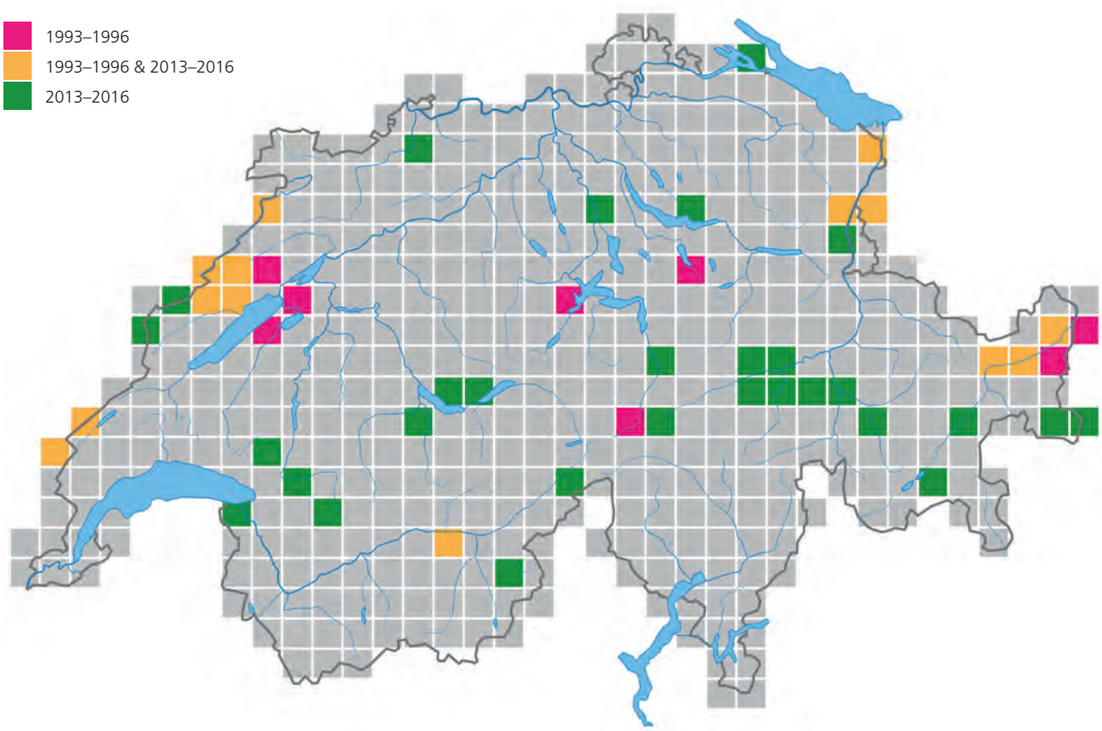
[1] Bellebaum et al. (2016); [2] BirdLife International (2016a); [3] Borgo (2010); [4] Deceuninck (2011); [5] Frühauf (2016); [6] Graf et al. (2014c); [7] Inderwildi (2016); [8] Inderwildi & Müller (2015); [9] Inderwildi et al. (2017a–b); [10] Koffijberg et al. (2016); [11] Pedrini et al. (2016); [12] Schmid & Maumary (1996)





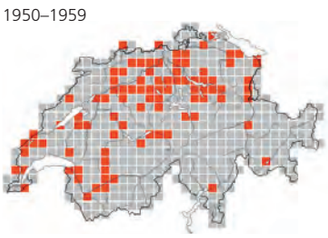
Territories 2013–2016

Distribution change since 1993–1996

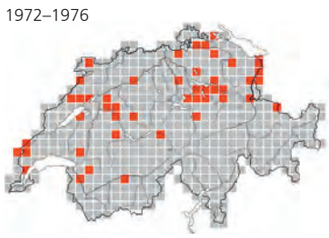


Sponsored by
Christoph Klopfenstein

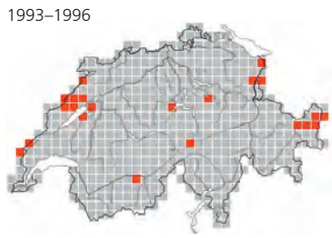
1950–1959



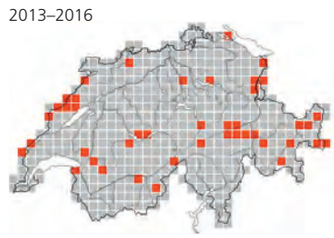
1972–1976



1993–1996



2013–2016



Spotted Crake

Porzana porzana
Tüpfelsumpfhuhn
Marouette ponctuée
Voltolino
pulsauna da palì

Jonas Landolt

Red List Vulnerable (VU)
Population 10–20 pairs (2013–2016)

Focus pages 181, 319

The distribution of the Spotted Crake in central, western and southern Europe is patchy. In 2013–2016, 13–17 territories were found per year in Switzerland, mainly in large wetlands in the lowlands. Only the Grande Cariçaie nature reserve and Neeracherried ZH were occupied every year. The highest observations during the breeding season were recorded at about 1700 m in Upper Engadine GR (most recently in 2001 near Bever) [AEn, VdS].

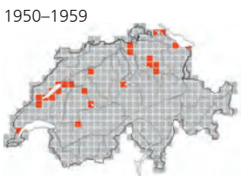
The Spotted Crake requires sedge and reed marshes with consistently low water levels [1, 2, 4]. The water levels in potential breeding habitats largely determine whether an area is colonised or not. As a result, the number of singing males can vary greatly from one year to the next. In 2013 in Wollmatinger Ried D, when water levels were ideal, 14 territories were recorded (S. Werner, H. Mehrgott, K. Schäfer) [5]; in 2014, however, there was not a single record. Similarly, numbers peaked in Neeracherried in 2013 with 6 territories (W. Müller, D. Marques) [3]; in 2014–2016, only 1–2 territories were counted.

The slightly higher number of occupied atlas squares is probably due to increased observer effort. All in all, the population trend has fluctuated in Switzerland since 1990. The same is true for most countries in Europe. The overall European trend is considered stable [AtD, AtF, RLEU].

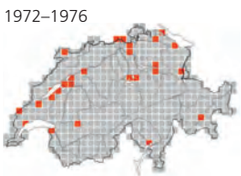
Roman Graf

[1] Antoniazza (in prep.); [2] Müller (1977); [3] Müller & Volet (2014); [4] Schäffer (1999); [5] Trösch et al. (2013c)

1950–1959



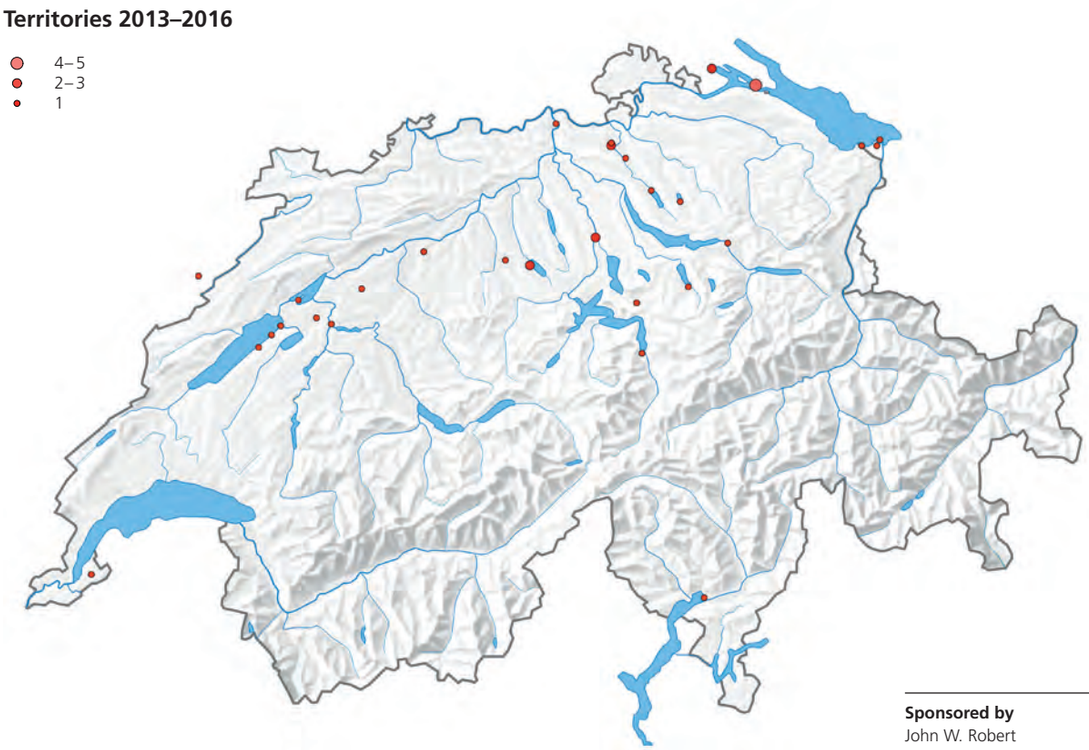
1972–1976



1993–1996

2013–2016

Territories 2013–2016



Sponsored by
John W. Robert

Rails: secretive life between water and land

Rails are found in the shallow-water zones of wetlands. They tend to inhabit dense vegetation, so acoustic communication plays a vital role. The three small rail species that occur in Switzerland are rare. Their nocturnal song and secretive behaviour make surveys difficult.

The three small rail species Spotted Crake, Little Crake and Baillon's Crake are patchily distributed in central Europe, their core ranges lying further to the east. Their habitat – wetlands such as marshes, flooded sedge meadows, and silted-up areas – has been drained and reduced in size in the past 200 years. Mires lost 82 % of surface area in Switzerland between 1900 and 2010, alluvial plains 36 %[3]. The remaining wetlands are scattered and exposed to a number of adverse influences[1]. Still today, low water levels during the breeding season due to ditches and other drainage measures lead to the degradation of many potential breeding sites in Switzerland. Suitable habitats do not necessarily have to be large in size, as all three species can colonise wetlands of less than 1 ha if conditions are favourable.

Singing activity in suitable habitats is generally an indication of individuals looking for a mate, as rails rarely sing during migration. In 2013–2016, 9–13 Spotted Crake territories and 1–2 Little Crake territories were recorded annually in Switzerland. As for the Baillon's Crake, only one territory was found in 2012 and in 2017; in 2016, there was a single observation during the breeding season. How many territories might have been overlooked?

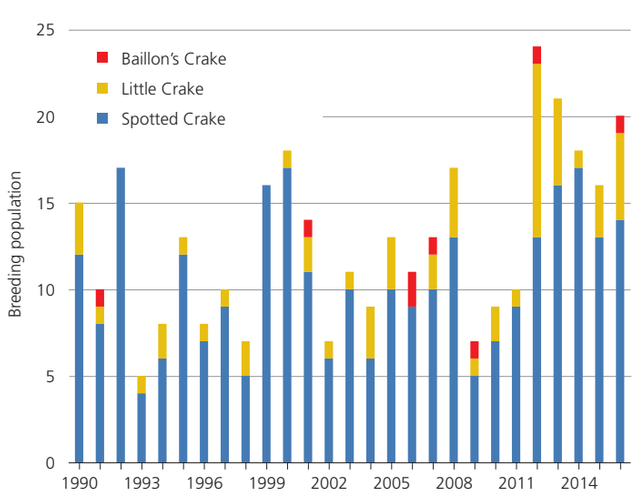
On the one hand, these secretive marsh birds are rare and irregular visitors; on the other hand, recording them by visual or acoustic means is a challenge. Visual observations mainly take place during migration, when all three species use the edges of reedbeds as stopover sites. During the breeding season, they generally remain well hidden in dense vegetation. Singing activity mostly takes place at dusk and during the night[HBW, HVM]. In some larger wetlands where the birds are regularly recorded, observers annually conduct 1–2 evening surveys beginning at dusk. But in the rest of the 90 wetlands that are systematically monitored and at other potential breeding sites, there are no such special surveys. Monitoring is further complicated by the fact that males only sing regularly until they have found a mate or the eggs have been laid[2, 4, 5].

The current methods probably only enable us to detect a part of the actual territories. More intensive monitoring, for instance by means of standardised nocturnal surveys or using acoustic recording devices, would improve our understanding of the extent to which these species occur.

Claudia Müller & Martin Schuck

Martin Schuck

Typical rail habitat with dense vegetation dominated by sedges and water about 40 cm deep. Almost the entire habitat is covered by water.



Number of territories recorded annually from 1990 to 2016 for Spotted Crake, Little Crake and Baillon's Crake in Switzerland.

[1] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [2] Fox et al. (2014); [3] Lachat et al. (2010–2011); [4] Schäffer (1999); [5] Taylor & van Perlo (1998)

Species pages 180, 182, 183

Little Crake

Zapornia parva
Kleines Sumpfhuhn
Marouette poussin
Schiribilla
pulsauna pitschna

Markus Varesvuo

Red List Vulnerable (VU)
Population 1–5 pairs (2013–2016)

Focus page 181

The Little Crake is patchily distributed in Europe. Only five broods have been recorded in Switzerland (most recently in 1971)[2]. Still, the secretive species may have bred regularly on the southern shore of Lake Neuchâtel up until the 1980s[VdS].

In 1972–1976, 14 atlas squares were occupied, but only five in 1993–1996. There were 25 observations during the breeding season between 1997 and 2012. Nine of them occurred in 2012, including four territories with probable breeding in Bolle di Magadino TI (R. Lardelli)[3]. In 2013–2016, singing males were recorded in ten locations; in most of them, the males were only observed in one or two years. Only Bolle di Magadino and Wollmatinger Ried D were occupied in three years; in the latter area, targeted surveys conducted when water levels were ideal counted five territories in 2013 (S. Werner, H. Mehrgott, K. Schäfer)[5]. Flooded expanses of mature reeds, mostly on large lowland lakes, are the species' preferred breeding habitat.

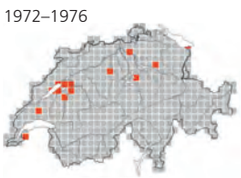
The overall European trend is increasing again thanks to the situation in the main area of distribution in Russia[RLEU], although the population on Neusiedlersee has declined sharply[1]. In Germany, the trend is positive once morefollowing a period of sustained decline[AtD], while France and Italy report downward trends[AtF, 4].

Stefan Werner & Claudia Müller

[1] Dvorak et al. (2016); [2] Glayre & Magnenat (1977); [3] Müller & Volet (2013); [4] Nardelli et al. (2015); [5] Trösch et al. (2013c)

1950–1959

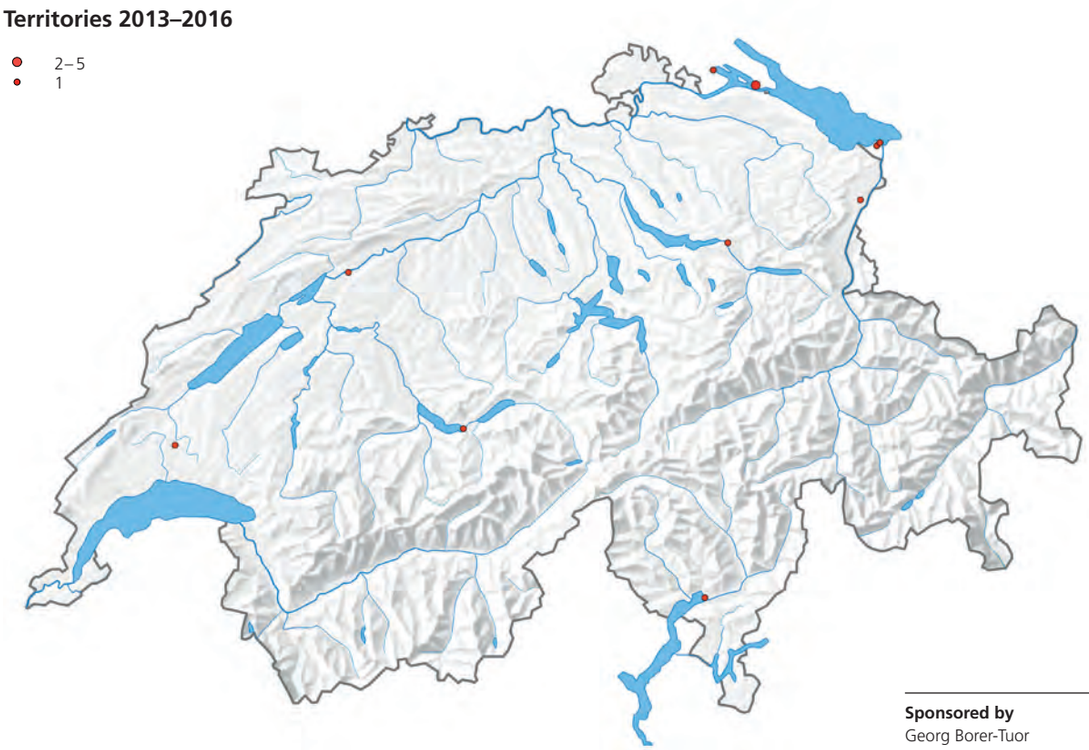
1972–1976



1993–1996

2013–2016

Territories 2013–2016



Sponsored by
Georg Borer-Tuor

Baillon's Crake

Zapornia pusilla
Zwergsumpfhuhn
Marouette de Baillon
Schiribilla grigiata
pulsauna nanina

Christoph Meier-Zwicky

Red List Endangered (EN)
Population 0–1 pairs (2013–2016)

Focus page 181

Baillon's Crake has a patchy distribution in Europe and breeds very rarely in central Europe. In Switzerland, we have 15 mainly historic breeding records; the most recent date from 1970–1971 and 1982 [AtCH2, VdS]. The species' secretive behaviour and its barely audible song that resembles the call of frogs make monitoring extremely difficult. While no breeding evidence was found in 1993–1996, a total of six singing males were recorded between 1997 and 2012: in Neeracherried ZH (2001, two in 2006, 2007), on Greifensee (2009) and in the Reuss Valley AG (2012) [1, 2, 4, 6, 7]. In 2016, one observation during the breeding season was made near Gwatt BE (M. Gerber) [3]. In addition, a singing male was recorded in Auried/Kleinbösingen FR in 2017 (M. Schweizer et al.).

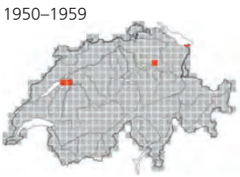
The favourite breeding habitats of Baillon's Crake are in the lowlands and consist of shallowly flooded wetlands dominated by sedges, rushes and occasionally bulrushes, often on the shores of large lakes.

Despite better information and greater observer effort, the number of records has decreased significantly in Switzerland since 1950 [VdS]. The overall European population was long considered to be in decline [EBBA1]. However, numbers appear to be increasing in Russia [RLEU]. In Germany, there were no broods after 1983 until 2006, when breeding evidence was again recorded following extensive restoration measures [AtD, 5].

Stefan Werner & Claudia Müller

[1] Marques et al. (2013a–b); [2] Maumary & Gysel (2002)/Maumary (2002); [3] Maumary & Mosimann-Kampe (2017)/Maumary (2017); [4] Schweizer (2007)/Schweizer & Vallotton (2007); [5] Stübing & Sacher (2012); [6] Vallotton et al. (2008)/Vallotton & Piot (2008); [7] Vallotton et al. (2010)/Vallotton & Piot (2010)

1950–1959



1972–1976

1993–1996

2013–2016

Territories 2013–2016

Sponsored by
Daniel Zimmerli, Schönbühl

Common Moorhen

Gallinula chloropus
Teichhuhn
Gallinule poule-d'eau
Gallinella d'acqua
pulsauna da l'aua

Frédéric Demeuse

Red List Least Concern (LC)
Population 1000–2000 pairs (2013–2016)

Focus –

In Switzerland, the Common Moorhen is a widespread but often local breeder. It is found mainly on the Central Plateau below 700 m in areas with many waterbodies. The Moorhen has populated the Alpine region along the river valleys, though it is confined to lower altitudes. Breeding records are rare above 1000 m, with the exception of the Upper Engadine GR, where the Common Moorhen breeds up to 1800 m [AEn, ID]. The highest record outside of the Engadine was at 1530 m in Selva/Tujetsch GR, where a bird was observed on a golf course for an extended period in 2016 (J. Savioz). Also in 2016, the Common Moorhen bred successfully at 1340 m on the Geschinersee VS (T. Wirthner, U. Marti). In the Jura, the highest breeding records are at 1000 m [ID, VdS]. The Common Moorhen breeds on ponds, lakes and slow-flowing or dammed rivers with dense waterside vegetation and also populates small artificial waterbodies (e.g. ponds on golf courses).

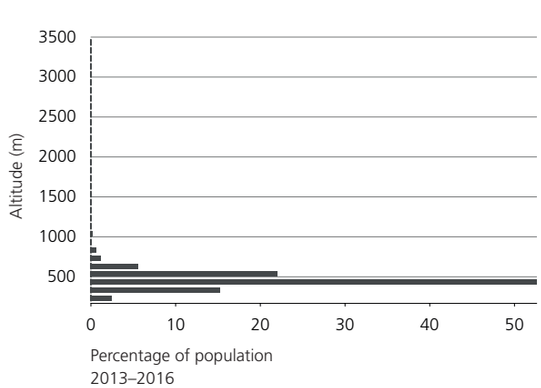
The trend towards nesting in urban areas, noted in 1993–1996, appears to have intensified. The species' increasing tolerance of humans allows it to populate new sites and also makes it easier to record breeding activity. Monitoring is more difficult in the reedbeds of large lakes that often include large sanctuaries where access is restricted.

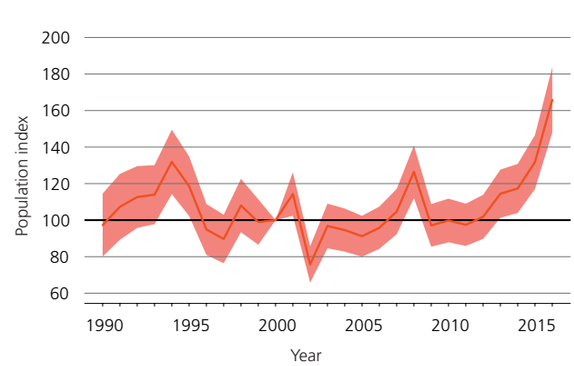
The population trend fluctuates heavily, as populations can collapse following cold winters. In several wetlands on the Central Plateau, the population declined from 1976 to 2003 [3], and also in the Canton of Zurich between 1988 and 2008 [AtZH]. The overall trend for Switzerland has seen a marked increase in the past years. The population index is strongly influenced by trends in a few large wetlands: in Bolle di Magadino TI, the population grew from 2–8 to 18–28 territories between 2008–2010 and 2014–2016, probably thanks to habitat restorations. In the Grande Cariçaie, too, the Common Moorhen increased slightly from 2000 to 2016 [1].

In Germany and France, populations also fluctuate widely, with a modest upward trend that is attributed to the creation of new waterbodies [AtD, AtF]. In Italy, the trend is negative [2], but the overall European trend remains stable [EBCC].

Verena Keller

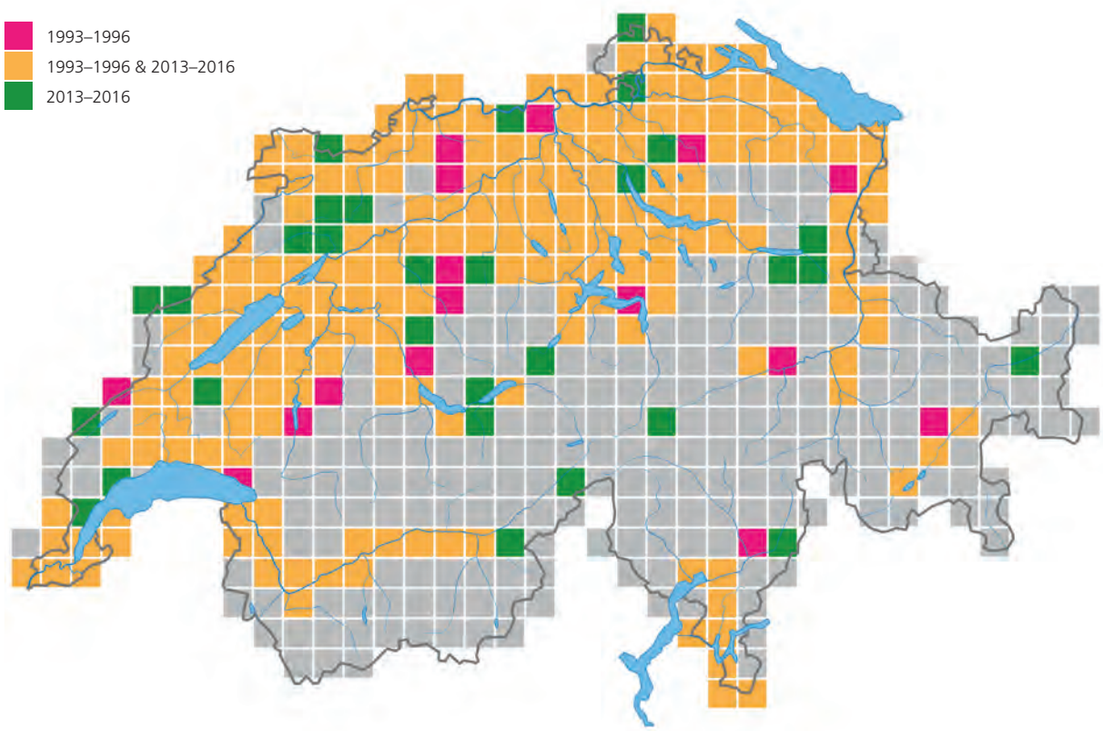
[1] Antoniazza (2018); [2] Rete Rurale Nazionale & Lipu (2015); [3] Weggler (2005)





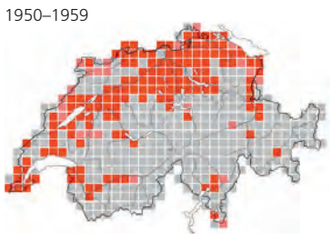
Occurrence 2013–2016

Distribution change since 1993–1996

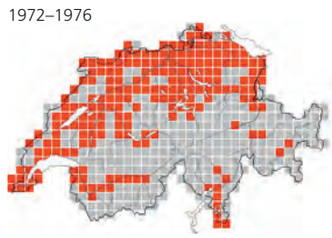


Sponsored by
Anselmo Fandino

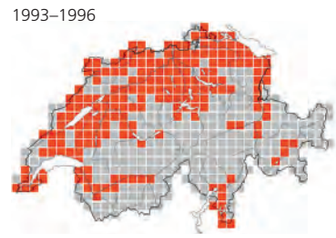
1950–1959



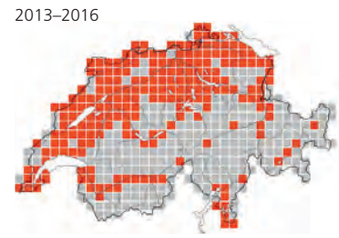
1972–1976



1993–1996



2013–2016



Common Coot

Fulica atra
Blässhuhn
Foulque macroule
Folaga
fulca

Sandra Schweizer

Red List Least Concern (LC)
Population 5000–8000 pairs (2013–2016)

Focus –

The Common Coot is widespread in Switzerland, populating mainly the Central Plateau below 700 m in regions with many waterbodies. It is undemanding, both with regard to food and choice of nesting sites. During the breeding season, it does not rely as heavily on waterbodies with abundant submerged vegetation or zebra mussels as it does in winter, often foraging on adjacent grassland. Accordingly, it inhabits many small bodies of water and slow-moving or dammed rivers as well as the larger lakes. Along shores lacking suitable nest sites, however, it breeds only rarely (e.g. on Lake Geneva).

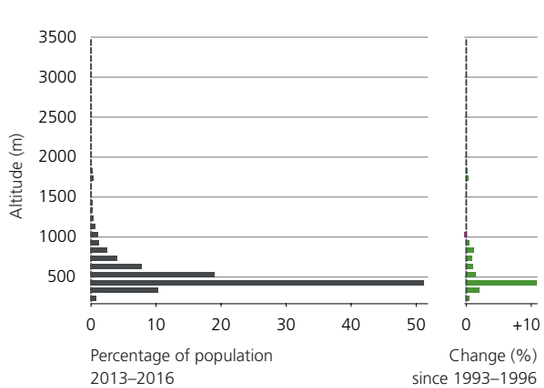
Since 1993–1996, the Coot has increasingly populated waterbodies above 1000 m. Observations in newly occupied atlas squares were mostly of single pairs on mountain lakes, new golf course ponds or other small artificial waterbodies. On the Upper Engadine Lakes GR at 1700–1800 m, the Coot has been a regular breeder for about 50 years [AEn]. More recently, however, the highest breeding sites are Lai da Vons/Andeer GR at 1990 m (occupied since 2004) [AGR, ID] and Lai da Palpuegna/Preda GR at 1920 m (since 2008; V. Oswald). Earlier thaws may have made it easier for the Common Coot to populate waterbodies at higher altitudes [3].

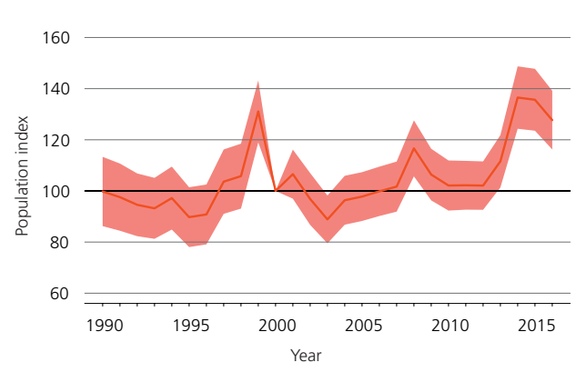
The overall Swiss breeding population has increased by about 50 % since the year 2000, possibly due to the large number of waterbodies with small populations. On the southern shore of Lake Neuchâtel, the number of family parties has increased [1, 2], although the waterbird counts in May have barely changed. In the Canton of Zurich, the population remained stable between 1988 and 2008 with some fluctuations [AtZH], while there was a slight increase on Lake Constance of 13 % between 1980 and 2010 [AtBo].

In France, the population has shown an upward trend since 1990; in Germany, there are considerable fluctuations, but also regional increases. In both countries, the increases are attributed in part to the creation of new waterbodies [AtD, AtF]. In Italy, the Common Coot population is declining [4].

Verena Keller

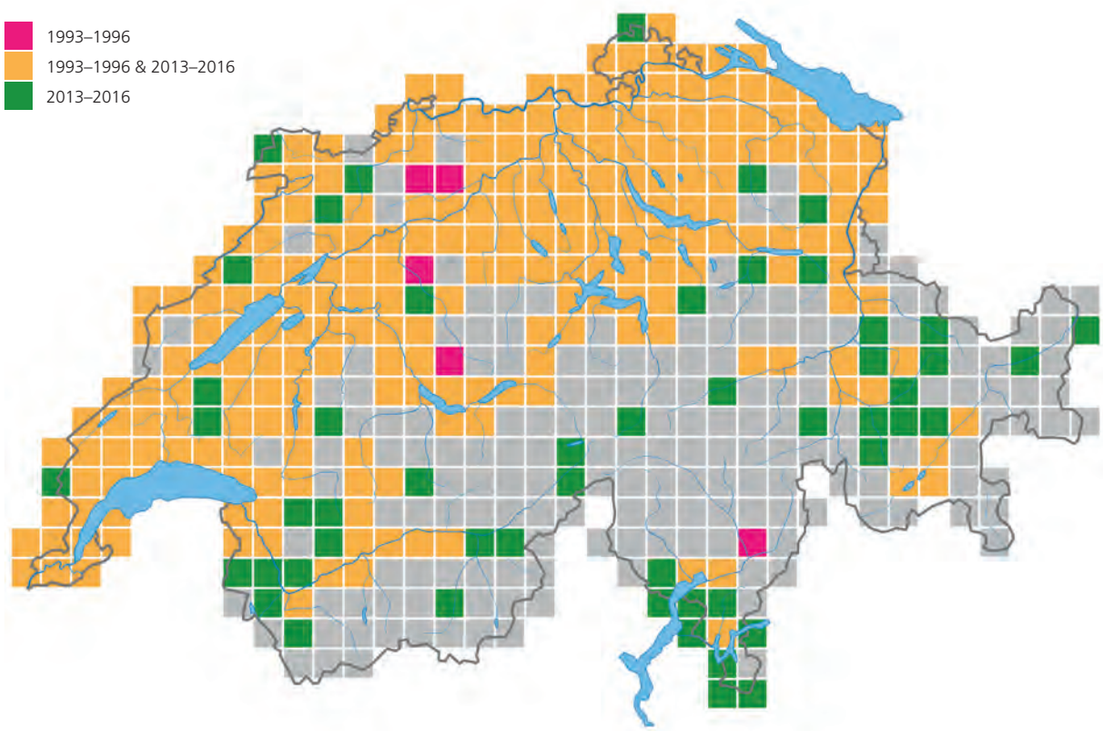
[1] Antoniazza (2016a); [2] Antoniazza (2018); [3] Bundesamt für Umwelt (2017b)/Office fédéral de l'environnement (2017a); [4] Campedelli et al. (2012)





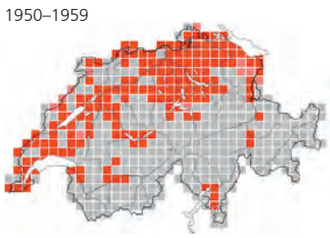
Density 2013–2016

Distribution change since 1993–1996

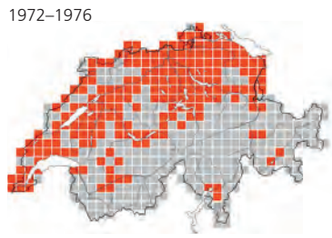


Sponsored by
Angelika Wiedersheim

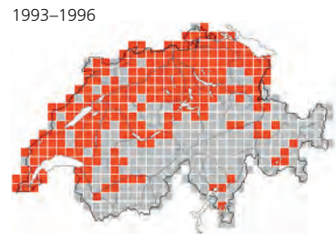
1950–1959



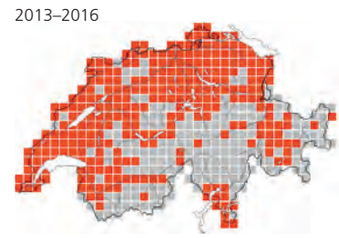
1972–1976



1993–1996



2013–2016



White Stork

Ciconia ciconia
Weissstorch
Cigogne blanche
Cicogna bianca
cicogna alva

Mathias Schäf

Red List Vulnerable (VU)
Population 370–460 pairs (2013–2016)

Focus pages 212, 240, 392

In Switzerland, the White Stork occurs mainly in the central and eastern parts of the Central Plateau and in the lower regions of the Jura. The highest broods were found at 620 m in Watterdingen/Tengen D (H.-P. Bieri) and at 610 m in the Zurich zoo (A. Weiss, M. Zumbühl) and in Kleindietwil BE [AtCH2]. The White Stork inhabits floodplains and farmland with adjacent wet habitats where it finds an ample supply of food (e.g. small mammals, amphibians, insects, earthworms). It nests on tall structures such as trees, rooftops or pylons. The highest densities are found near former captive-breeding stations. In 2016, the largest colonies were recorded in Altreu SO (42 pairs), Murimoos AG (41 pairs) and Uznach SG (35 pairs).

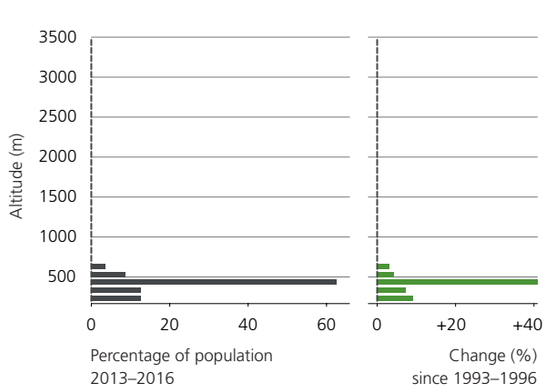
The last pair of White Storks bred in Switzerland in 1949. A year earlier, in 1948, Max Bloesch had already begun a reintroduction programme in Altreu SO. The first pair of free-flying White Storks bred again in 1960. The population has grown steadily from then on, with a particularly marked increase in wild breeding pairs between 1980 and 1990 [2]. This is mainly thanks to the high survival rate of adult birds [7], even though overhead power lines cause frequent deaths [5, 6]. Since 1993–1996, new sites have been colonised by birds dispersing from traditional colonies [4]. Today, the distribution increasingly resembles the pattern around 1900 [BCH]. In 2016, a total of 456 pairs bred in Switzerland [8], which is almost three times the population size of 1996.

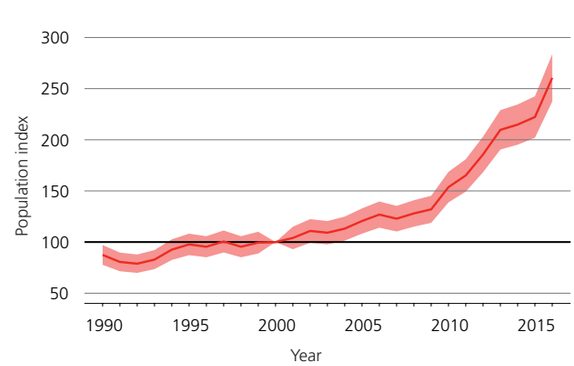
In other countries of western and central Europe, the increase was just as pronounced. The International White Stork Census of 2004–2005 found an increase of 105 % on the Iberian Peninsula and a remarkable 210 % increase in France since 1994–1995 [9].

Besides reintroduction schemes and the winter feeding associated with them, shorter migration routes are also responsible for the positive trends in western and central Europe [1, 3]. More and more White Storks winter on the Iberian Peninsula instead of in West Africa, taking advantage of American crawfish in the rice fields and the food supply in open landfills [3].

Stephanie Michler

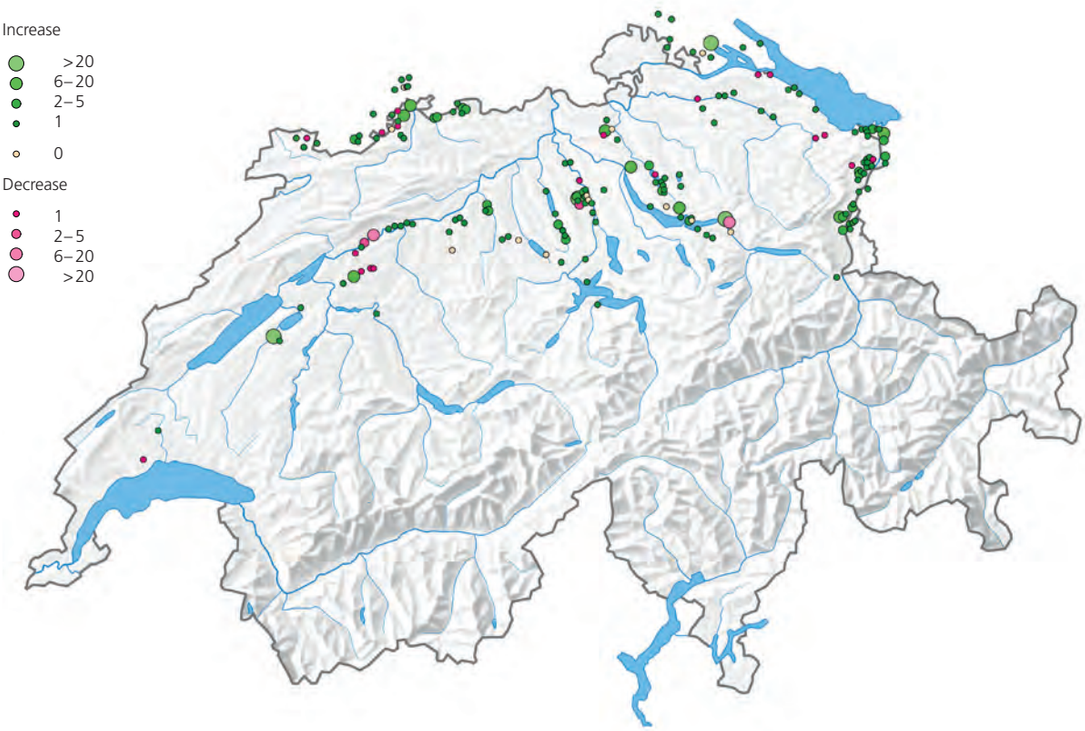
[1] Aebischer & Fasel (2010); [2] Biber et al. (2003); [3] Kaatz et al. (2017); [4] Kestenholz et al. (2010a–b); [5] Moritzi et al. (2001); [6] Schaub & Pradel (2004); [7] Schaub et al. (2004); [8] Storch Schweiz/Cigogne Suisse (2017); [9] Thomsen (2013)





Breeding pairs 2013–2016

Change in the number of breeding pairs since 1993–1996



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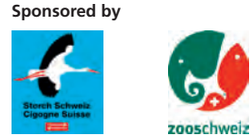
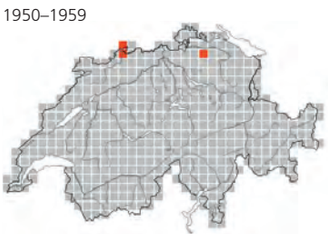
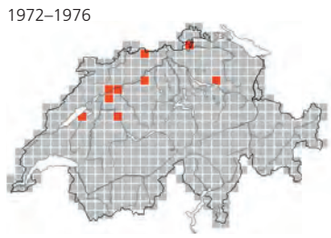


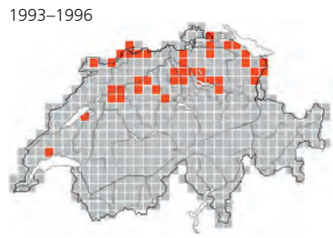
1950–1959



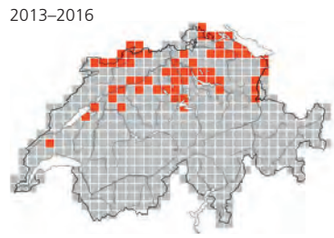
1972–1976



1993–1996



2013–2016



Breeding birds on our doorstep

Several species of birds are expanding their breeding range in central Europe. Some of them have almost reached Switzerland. For new arrivals or former breeders to find a home here, it is critical that their habitats be sufficiently protected.

Today, it is hard to imagine that the Rook did not breed in Switzerland until 1963, and that the Eurasian Collared-dove became a native breeding bird as late as the 1950s [VdS]. A species' overall distribution reflects the dynamics of its regional populations, which can be subject to major changes through time for reasons that are not always known. Some new arrivals to Switzerland benefit from an improved food supply owing to habitat changes. Similarly, climate change can impact a species' population size and distribution. In a handful of cases, international species recovery programmes involving public-awareness campaigns and measures for habitat management have initiated or at least supported phases of expansion. In other cases, the relevant factors remain in the dark.

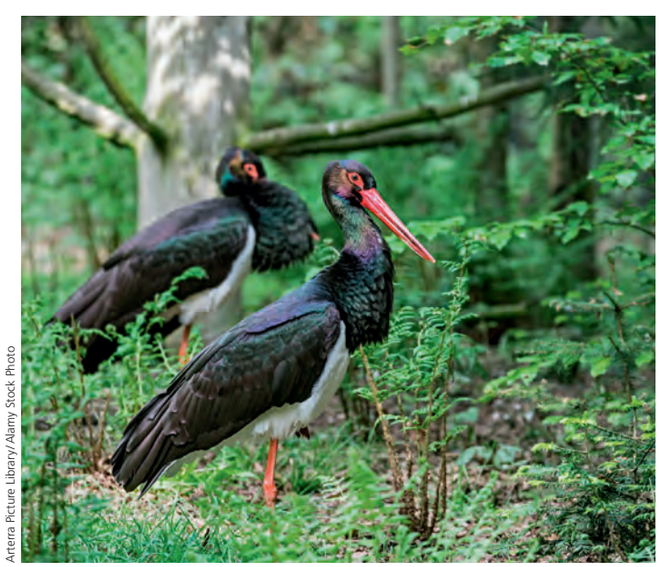
The newest additions to Swiss avifauna

Often, there are signs that a species is about to establish itself as a breeding bird, such as a growing number of migrants or expansions in neighbouring areas. At the end of the 1993–1996 atlas period, several species were gaining ground just beyond our borders, including the White-backed Woodpecker and the Red-breasted Flycatcher; both species subsequently bred in the Prättigau GR in 1999 and 2003, respectively [VdS]. More spectacular than these hesitant advances was the arrival of the Great Cormorant from 2001 onwards: 15 years after it had first bred in the Fanel BE/NE and after a strong expansion phase, 11 colonies with as many as 2099 breeding pairs were counted in Switzerland [12]. The Short-toed Snake-eagle is another recent addition to the list of breeding birds in Switzerland, presumably as a result of population increases in the Mediterranean [10, 13].

Will these species breed (again) in Switzerland?

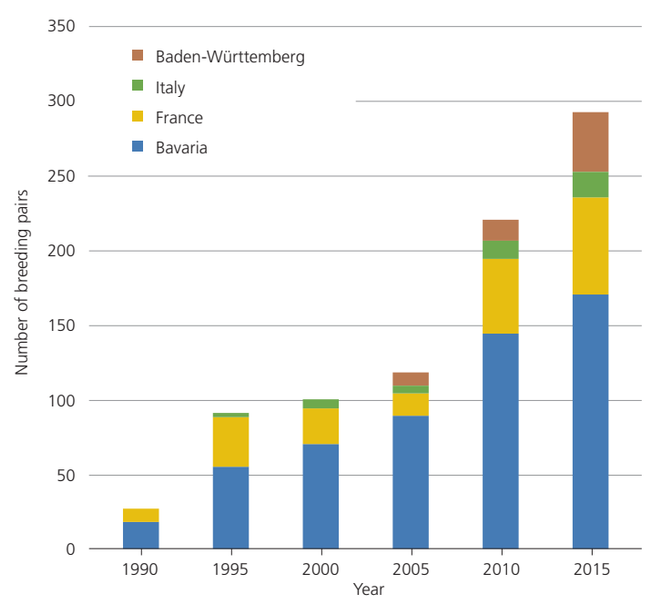
After disappearing almost completely from central Europe, due mainly to persecution and intensified forest management, Black Stork populations recovered well throughout the continent in the second half of the 20th century, especially in the east [VdS]. Waning hunting pressure and various conservation programmes, including protection of nest sites in the sub-Saharan wintering grounds, made recovery possible [5, 6]. The closest nest sites in Germany, occupied since 2003, are only about 20 km from Lake Constance [16]. Although there are few areas of vast, undisturbed forest on the Central Plateau, recent summer observations suggest that the Black Stork may breed here in the near future. Support could come from spatial planning measures, such as restricting the construction of forest roads.

The Common Crane has extended its breeding range to the southwest since the 1960s, benefiting from the creation of sanctuaries and from public-awareness campaigns. Since the 19th century, and perhaps even earlier, the species has suffered the loss of its breeding grounds as large European plains were drained and turned into farmland [VdS]. The Common Crane has bred again in France (Lorraine) since 1995, in Bavaria since 2002 and in Baden-Württemberg since 2016, only 45 km from Lake Constance [AtF, 1, 7, 11]. Occasional summering birds have been observed

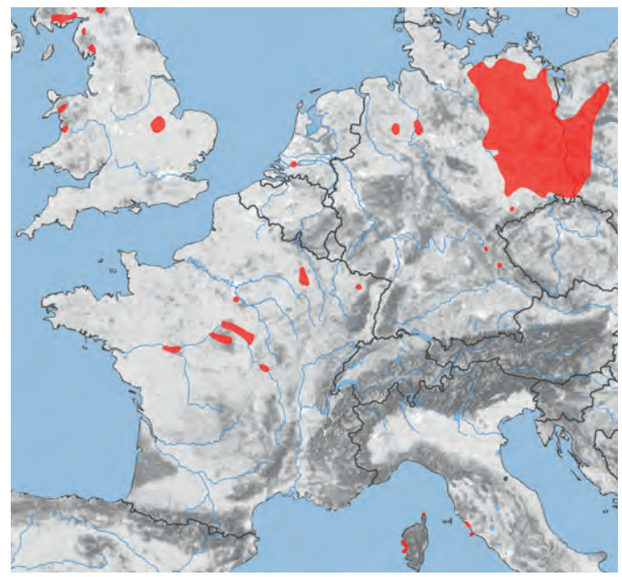


Arterra Picture Library/Alamy Stock Photo

During the breeding season, the Black Stork requires vast, undisturbed deciduous and mixed forests with scattered clearances and waterbodies.



Population trend of the Black Stork in neighbouring regions and countries.



Distribution of the Osprey in central Europe. Background map: Natural Earth, Stamen Design & OpenStreetMap.

in Switzerland, but colonisation of the Swiss side of the Rhine is limited by the lack of large wetlands, mires and swampy forests.

We may also see the return of the Osprey, which bred in Switzerland until 1911. Since the 1970s, persecution has diminished, and the species now benefits from newly created nature reserves, the targeted protection of its nests, the supply of nesting platforms, and reintroduction schemes in several European countries [14]. It is slowly gaining ground in Bavaria and in France, where it breeds in Lorraine just 140 km from the Swiss border. A number of summer sightings have been reported in recent years. A reintroduction project is underway in the Seeland BE/FR with juveniles from Scotland, Germany and Norway [14, 15]. Time will tell whether these efforts, combined with natural population dynamics, will allow the Osprey to resettle permanently in Switzerland.

Finally, Little Egrets and Cattle Egrets may also join the ranks of Swiss breeding birds in the near future. Both species have expanded their range in neighbouring areas of France and Italy [AtF, 8], and a breeding attempt by the Little Egret took place near Zug in 2014 [9].

Rich birdlife depends on high-quality habitats

It is hard to predict which species will be the next new addition to the Swiss avifauna. The following (incomplete) list names further candidates along with the closest breeding site that was occupied at least once during 2013–2016: Purple Swamphen (Dombes, 75 km), Griffon Vulture (Vercors, 160 km), White-tailed Sea-eagle (department of Moselle, 150 km), Sardinian Warbler (Aosta Valley, less than 20 km away), and Black-headed Bunting (Lombardy, 110 km) [AtD, AtF, 2, 3, 4]. If and when these species breed in Switzerland depends on the habitat quality we are able to offer. Keeping natural environments intact and preserving their diversity is critical. On a larger scale, conservation of breeding sites, migration routes and wintering grounds has first priority. These efforts must be sustained and intensified so that European breeding birds can continue to spread and claim new habitats.

Jérémy Savioz

Markus Varesvuo

Cranes rely on undisturbed wetlands, mires and swampy forests to raise their young.

[1] Arbeitsgruppe Seltene Brutvögel Baden-Württemberg (2017); [2] Bocca & Maffei (2010); [3] Brambilla (2015); [4] Crouzier (2017); [5] Diagana et al. (2006); [6] Gendre et al. (2016); [7] Hansbauer (2010); [8] Nardelli et al. (2015); [9] Martinez & Maumary (2016a–b); [10] Maumary et al. (2013); [11] Mewes (2010); [12] Müller (2017); [13] Rampazzi & Pagano (2017); [14] Strahm & Landenbergue (2013); [15] Strahm & Landenbergue (2018); [16] Trösch et al. (2013b)

Species pages 160, 201, 202, 258, 296, 332, 572, 576

Common Little Bittern

Ixobrychus minutus
Zwergdommel
Blongios nain
Tarabusino
tarbegl pitschen

Marcel Burkhardt

Red List Endangered (EN)
Population 90–120 pairs (2013–2016)

Focus page 380

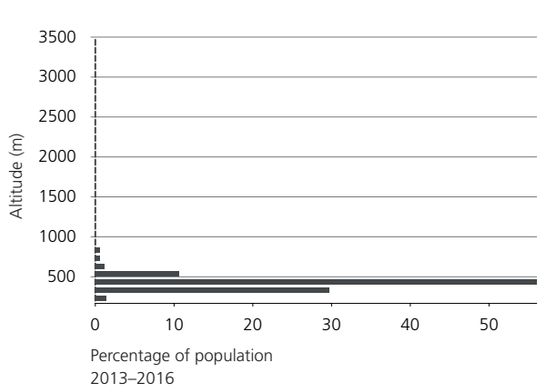
In Europe, the Common Little Bittern is concentrated in the east; its distribution in central and western Europe is scattered. In Switzerland, it breeds in lowland reedbeds, normally below 600 m. It inhabits the margins of lakes and ponds as well as oxbow lakes and river mouths on the Central Plateau, in Valais and in Ticino. The most significant populations are found on the southern shore of Lake Neuchâtel (16–23 territories in 2013–2016)[ID, 2, 3] and in other large wetlands of the Central Plateau. In the central Alps, the Little Bittern only inhabits the Rhone Valley VS (up to Leuk). The highest breeding record was in 2016 on Lac de Bret VD at 675 m (G. Rochat), where the species had bred once before in 1997[VdS]. Also, calling males were heard in Villaraboud VD at 760 m (G. Schaub) and in La Rogivue VD at 840 m (J. Trüb)[6].

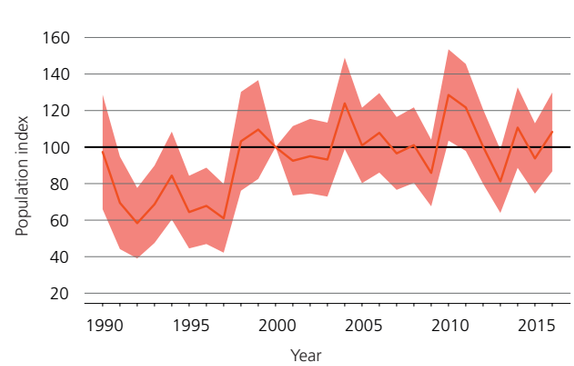
Compared to 1993–1996, the recent survey reveals several abandoned atlas squares in western and northeastern Switzerland. On the other hand, the Little Bittern has also been recorded in a number of new squares. This is most likely due to a slight expansion and colonisation of small or newly created wetlands. Thanks to greater observer effort, some sites may also have been detected that are only occupied sporadically. Surveys also show regional increases, for instance in the Canton of Zurich between 1988 and 2008 (tripling of the population)[AtZH] and on Lake Constance between 1980 and 2010 (increase by more than 150 %)[AtBo]. In the Grande Cariçaie, the population has remained stable since 2000[2, 3]. The Little Bittern has shown a marked decline in France and Italy[AtF, 4]. In Germany and other central European countries, however, there have been positive trends since about 2000[AtD, RLEU, 1].

The increases and newly colonised areas are probably a result of improved conservation laws (e.g. in the Canton of Zurich)[7] as well as maintenance and restoration measures (e.g. Chrümmi/Kerzers FR, Marais d'Ardon VS). Modelled maps suggest that the Little Bittern will extend its range to the north due to climate change[ClimAt]. At the same time, periods of drought[5] and habitat changes in Africa pose a latent threat to the Common Little Bittern.

Peter Knaus

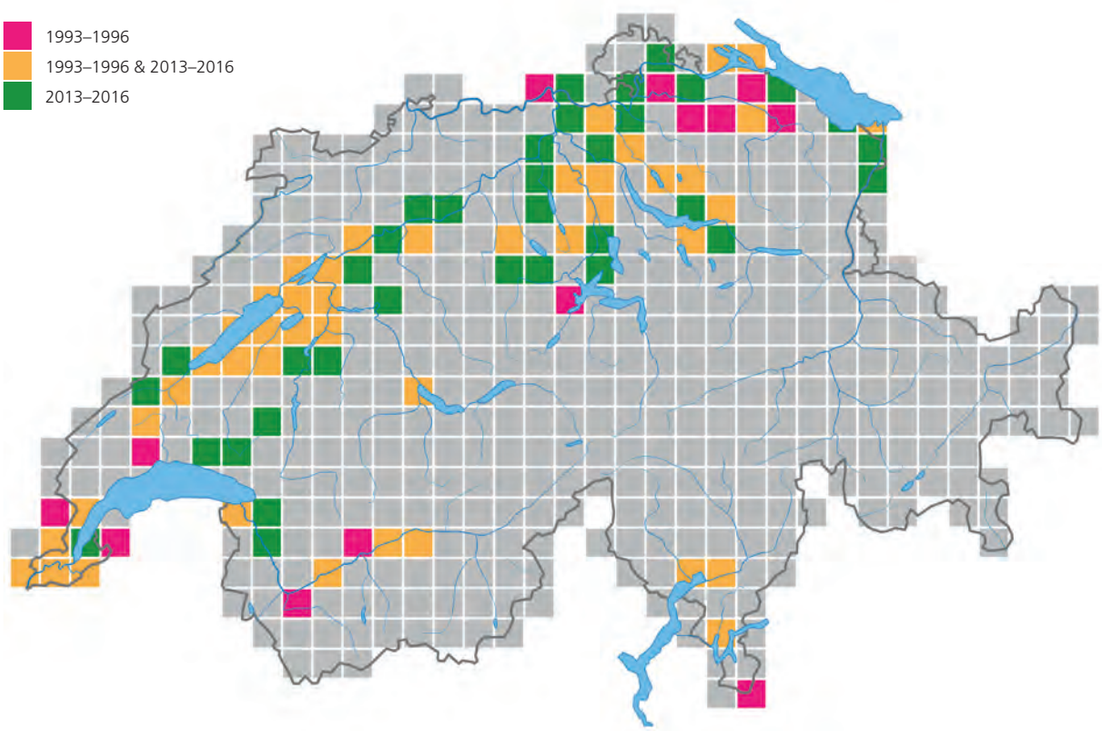
[1] Albegger et al. (2015); [2] Antoniazza (2016a); [3] Antoniazza (2018); [4] Campedelli et al. (2012); [5] Marion et al. (2006); [6] Posse (2014); [7] Weggler et al. (2011)





Territories 2013–2016

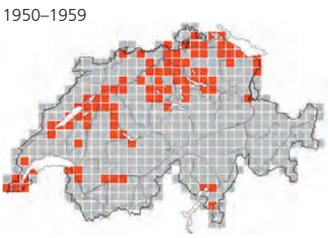
Distribution change since 1993–1996



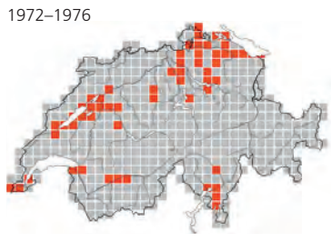
Sponsored by
Family Häller-Völgi

Natur- und Vogelschutzverein Etziken

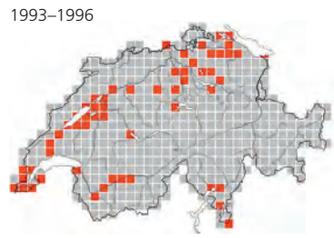
1950–1959



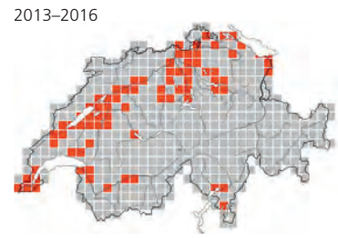
1972–1976



1993–1996



2013–2016



Black-crowned Night-heron

Nycticorax nycticorax
Nachtreiher
Bihoreau gris
Nitticora
irun stgarvunà

Marcel Burkhardt

Red List Endangered (EN)
Population 0–1 pairs (2013–2016)

Focus page 195

Despite its recent expansion to the north, the Black-crowned Night-heron only breeds sporadically in Switzerland. In 2013–2016, the only breeding records were just beyond the Swiss border in neighbouring countries: in the Rhine delta A in 2013 (D. Bruderer)[6] and at Étang de Veyrier/Étrembières F in 2014–2015 (G. Dändliker, J.-P. Matérac). In all cases, newly fledged young were observed following a series of sightings during the breeding season. Juveniles that are already able to fly, often with down feathers still on their heads, can arrive here from abroad as early as June. This is regularly taken as an indication of probable breeding. However, such sightings are only counted as breeding evidence if they meet additional criteria.

In 2011–2012 (J. Jeanmonod, F. Schneider, P. Rapin, J.-N. Pradervand)[4, 5] the Night-heron nested near Payerne VD. The last probable breeding before that was in 1994 near Estavayer-le-Lac FR. From 1967 to 1970, 2–8 pairs bred in Häftli BE and in 1971, three breeding pairs were observed near Avenches VD[AtCH1, VdS]. The Night-heron likes to nest with other heron species in mixed colonies and favours undisturbed river and pond landscapes at low altitude.

In France, the population rose steeply from 1974 and has been declining again slightly since 2000[AtF, 3]. In other regions such as Italy, the Netherlands and Germany, it is increasing[AtD, 1, 2].

Peter Knaus

[1] Boele et al. (2015); [2] Campedelli et al. (2012); [3] Marion (2009); [4] Müller & Volet (2012); [5] Müller & Volet (2013); [6] Trösch et al. (2013c)

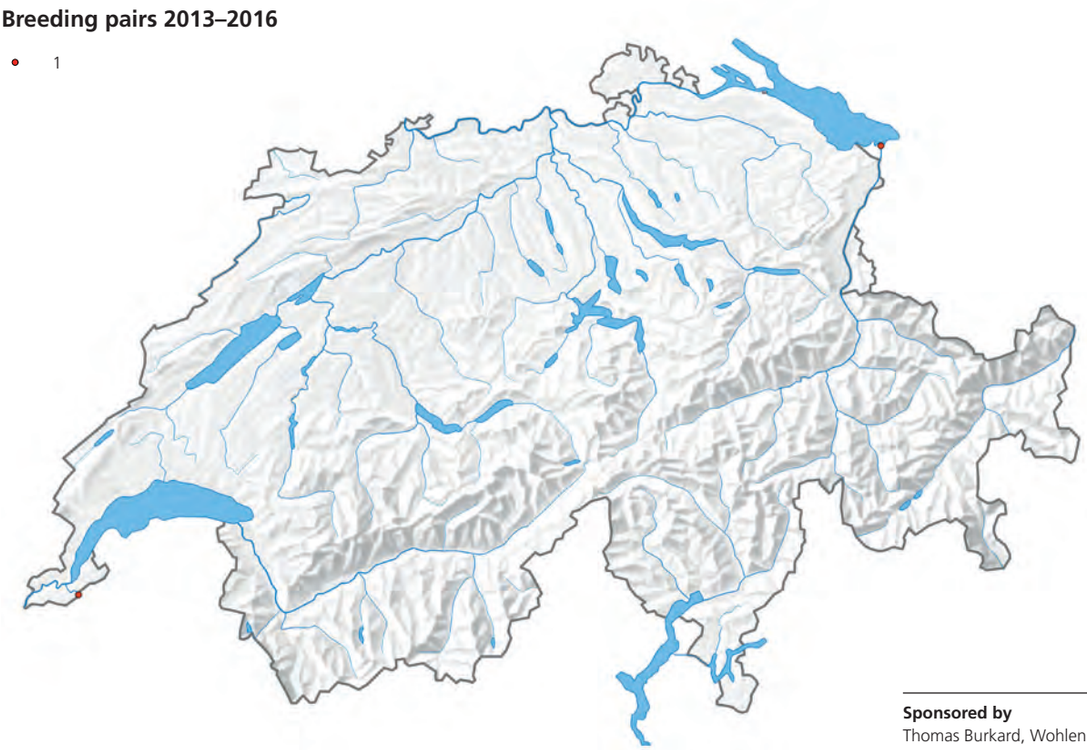
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Thomas Burkard, Wohlen AG

Focus

Herons and egrets make a comeback

The 2013–2016 atlas not only documents the increase of the Grey Heron population, but also the recovery of the Purple Heron, the first brood of Great White Egrets, and the first breeding attempt by the Little Egret in Switzerland. These events would have been unthinkable just a few years ago and reflect a positive Europe-wide trend.

Until the mid-20th century, the European populations of many heron and egret species suffered massive losses as wetlands were drained and the birds were persecuted for their plumage. In several of our neighbouring countries, the negative trend was halted when feathers went out of fashion and hunting pressure decreased (herons and egrets were placed under protection in France in 1975) [AtF]. Newly designated, largely undisturbed sanctuaries with vast reedbeds facilitated the recovery of local species and the colonisation by new ones. The development of rice farming in the Camargue and the Po Valley created shallow, inundated areas rich in invertebrates and amphibians, improving the breeding success of herons and egrets and raising the number of wintering birds [4, 11]. The Cattle Egret, for example, has bred in France since 1969 and numbers are growing rapidly. France and Italy together supported more than 20 000 breeding pairs in 2014 [AtF, 3, 10]. The Squacco Heron is also expanding its area of distribution. The Eurasian Spoonbill has bred in France since 1981, and the Glossy Ibis has been a regular breeder since 2006 [AtF]. Somewhat less encouraging are the fluctuating European populations of the Purple Heron and the Black-crowned Night-heron. However, despite the negative long-term prospects, there have been some positive local trends since 2000 [AtF, EBAA1, 1, 5].

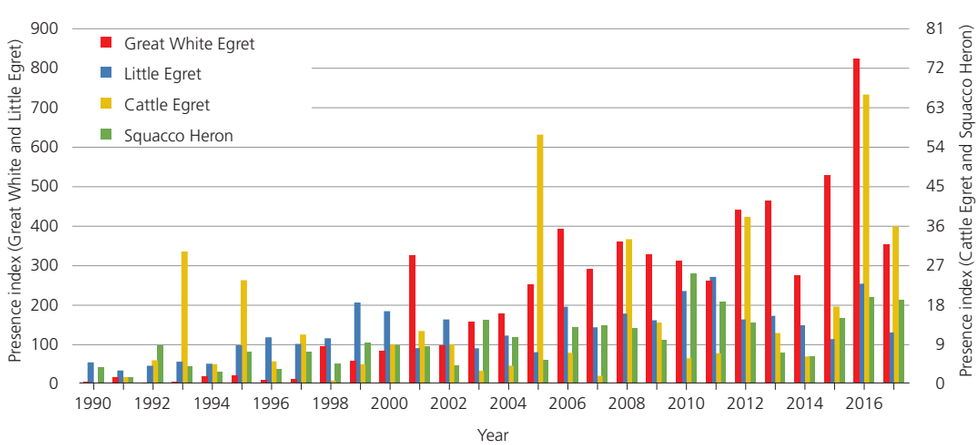
The situation in Switzerland is not comparable with France, as Great White Egret and Black-crowned Night-heron have only bred here occasionally in the past few years, and the Little Egret made a single breeding attempt near Zug in 2014 that was unsuccessful [7]. Apart from the Grey Heron, only the Purple Heron has increased in number in Switzerland, reaching 17 breeding pairs in 2016, the highest level since 1965 [9]. Switzerland is not well suited to accommodate large colonies of herons or egrets due to the lack of vast and undisturbed wetlands. The increases in neighbouring countries are therefore primarily reflected in higher numbers of passage migrants and wintering birds. Such is the case of the Great White Egret, a species native to the plains of central and eastern Europe that only began to winter entirely in Switzerland on a regular basis in 1994/1995 [12]. The Little Egret is gaining ground as well, and has bred in several areas close to the Swiss border in France and in the province of Varese since 2009 [2, 6, 8]. The Cattle Egret is also gradually approaching our borders.

The history of herons and egrets in Europe is closely associated with large-scale conservation efforts and a positive change in public awareness. There are two ways in which the growing populations in neighbouring countries could have a positive impact in Switzerland: on the one hand, scarce species such as Great White Egret, Little Egret and Black-crowned Night-heron could become regular breeders; on the other hand, new species might breed here for the first time. The long-term conservation of herons and egrets, and all other waterbirds, depends crucially on the maintenance of a dense network of undisturbed wetlands extending across Europe.

Jérémy Savioz

[1] BirdLife International (2017a); [2] Culat (2009); [3] Dubois et al. (2017); [4] Fasola & Cardarelli (2015); [5] Fasola et al. (2010); [6] R. Lardelli, pers. comm.; [7] Martinez & Maumary (2016a–b); [8] Muller et al. (2017); [9] Müller (2017); [10] Nardelli et al. (2015); [11] Pernollet et al. (2018); [12] Sattler et al. (2017e–h)

Species pages 194, 196, 198, 200, 201



Trend of the presence index in spring (15 March – 30 June) for four species with the strongest increase in Switzerland: Great White Egret (red) and Little Egret (blue; both left axis), Cattle Egret (yellow) and Squacco Heron (green; both right axis).

Grey Heron

Ardea cinerea
Graureiher
Héron cendré
Airone cenerino
irun grisch

Mathias Schäf

Red List Least Concern (LC)
Population 1600–1800 pairs (2013–2016)

Focus pages 142, 147, 195

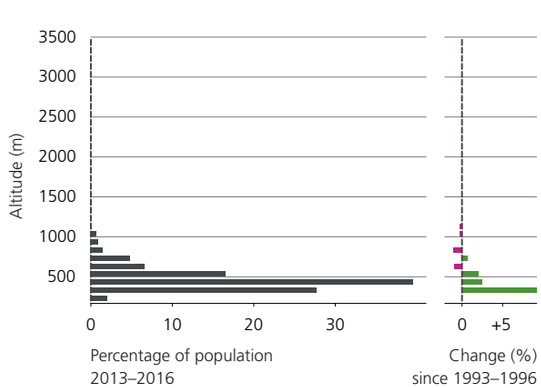
In Switzerland, the Grey Heron is found mainly on the Central Plateau and in the Jura at altitudes below 600 m, where it breeds close to water and sometimes near settlements. It is also regularly seen foraging on farmland. Since 1993–1996, there has been a slight expansion in the Alpine valleys and southern Ticino. Remarkably, breeding was recorded for the first time in Engadine GR in Scuol in 2016 (C. Müller, C. Florineth, M. Ernst, N. Pua)[6]. The Grey Heron was also more frequently observed in areas of the Valais upstream from Lake Geneva[6]. The population in Ticino may have benefited from increases in northern Italy[3]. Following the species' expansion to higher altitudes, the highest breeding site is now in Sigriswil BE at 1370 m (M. Hammel).

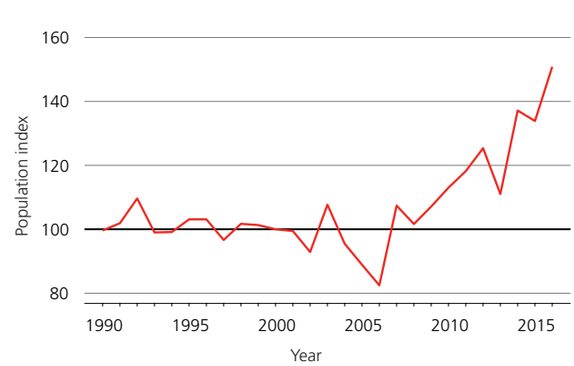
The Grey Heron population has grown by about 30 % since 1993–1996 (especially since 2008), according to the index, as has the number of colonies, increasing from 275 to about 340. While some colonies are occupied for decades, others show a more dynamic pattern, with many new colonies being formed while others are abandoned[2]. Heavy storms can cause heronries to be abandoned locally and re-established elsewhere, as was observed in the wake of storm «Lothar» at the end of 1999[7]. The Grey Heron is sensitive to longer periods of frost as well as forestry interventions near its nest and benefits from rising winter temperatures[VdS, 3, 5]. However, population numbers are most strongly influenced by direct persecution by humans[5].

Since the Grey Heron was placed under protection and hunting was restricted in the mid-20th century, the population has been on the rise again in Europe overall[EBCC] and in most of our neighbouring countries[AtD, AtF, RLEU, 3]. In recent years, however, a slight decline has been observed in Europe[EBCC]. In Austria, the Grey Heron population decreased by almost 40 % between 1998 and 2016[8]. At least in certain areas, the decline is being caused by shooting and the destruction of breeding colonies[1, 4]. The impact of increased shooting and disturbance on the colonies in Austria suggests that weakening protection in Switzerland could also lead to a decline in numbers.

Livio Rey

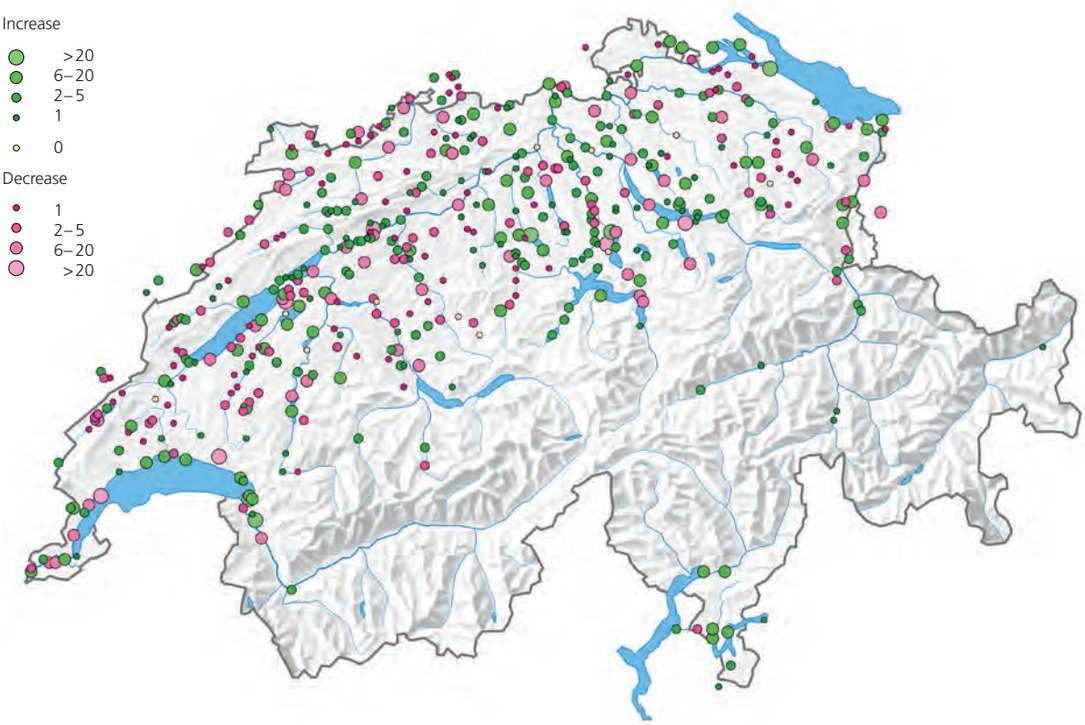
[1] Albegger et al. (2015); [2] Christen (2017a); [3] Fasola et al. (2010); [4] Feldner et al. (2006); [5] Kushlan & Hancock (2005); [6] Müller (2017); [7] Schmid et al. (2004a); [8] Teufelbauer & Seaman (2017)





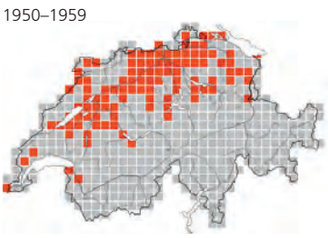
Breeding pairs 2013–2016

Change in the number of breeding pairs since 1993–1996

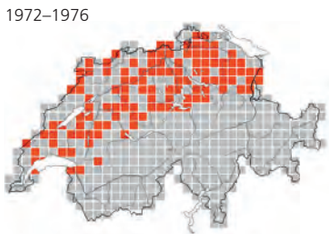


Sponsored by
Christoph Ledermann
Barbara Sigrist

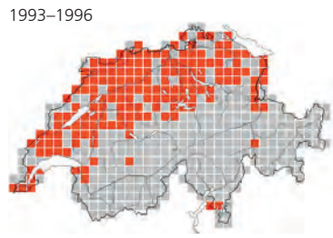
1950–1959



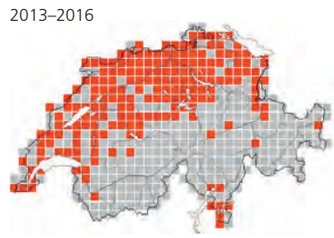
1972–1976



1993–1996



2013–2016



Purple Heron

Ardea purpurea
Purpurreiher
Héron pourpré
Airone rosso
irun cotschen

Mathias Schäf

Red List Critically Endangered (CR)
Population 6–17 pairs (2013–2016)

Focus pages 195, 319, 380

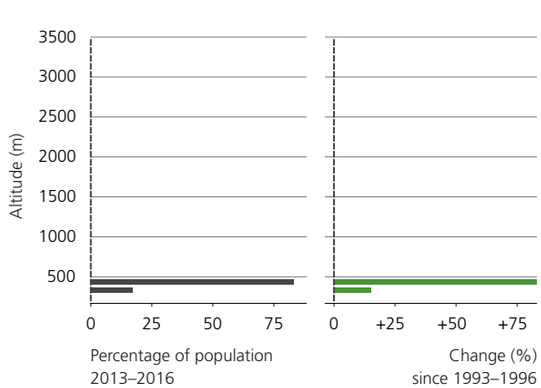
Switzerland lies at the northwestern edge of the Purple Heron's range. In this country, the species most frequently nests in the Grande Cariçaie, where 4–11 breeding pairs were observed in 2013–2016 [1, 2, 6]. During the same period, the wetland near Chavornay VD was also regularly occupied with 2–4 pairs. In addition, in 2016, there was a breeding pair in the Canton of Geneva (P. Marti, A. Barbalat, P. Albrecht) [6] as well as a record of probable breeding at Meieriedloch BE [3, 6]. Occupied areas in neighbouring countries near the Swiss border included the Rhine delta A (1–3 pairs in 2013–2015) and the Hegnebucht D (1 pair in 2013–2015). The Purple Heron requires large, flooded reedbeds. It lives in undisturbed wetlands and on shallow lake shores with broad reed belts, small ponds and quiet coves. Water levels should remain relatively constant throughout the breeding season.

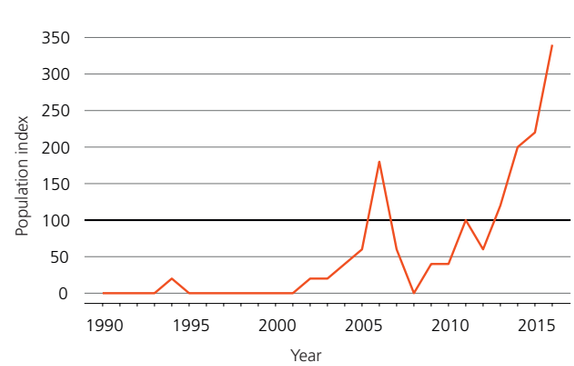
The first breeding evidence of Purple Herons in Switzerland dates back to 1941. From 1949, several colonies formed in the Grande Cariçaie; the breeding population peaked in 1955 with 54 pairs and in 1961 with 40–45 pairs [AtCH1, VdS]. Breeding subsequently occurred at sites other than Lake Neuchâtel. However, the population quickly declined again as a result of the second Jura river regulation and periods of drought in the Sahel, and there were no breeding records in 1980–1983. After 1987, there was only occasional evidence of probable breeding [1]. Since 2002, breeding has again been observed annually (except in 2008). Since then, the number of broods has significantly increased as well, and 6–17 pairs were recorded in Switzerland in 2013–2016.

Reasons for the repopulation of the southern shore of Lake Neuchâtel presumably include the designation of nature reserves, boating restrictions and other conservation and habitat management measures. Overall, these reduced disturbance in shore areas, where the Purple Heron likes to forage [2]. The positive trend in other European countries may also be partly responsible for the increase in Switzerland. The population is increasing in western Europe in particular, including northern Italy, France, Germany and the Netherlands [AtD, RLEU, 4, 5]. Moreover, climate change could cause the Purple Heron to shift its range further north [ClimAt].

Peter Knaus

[1] Antoniazza (2018); [2] Antoniazza (in prep.); [3] Christen (2017b); [4] Fasola et al. (2010); [5] Jiguet (2017); [6] Müller (2017)





Breeding pairs 2013–2016

6–20
2–5
1

Certain dots on the maps have been moved to protect this sensitive species

Change in the number of breeding pairs since 1993–1996

Increase

6–20
2–5
1

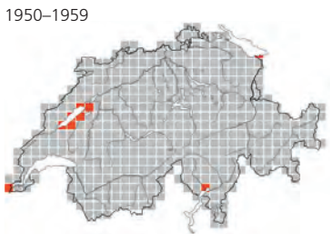
0

Decrease

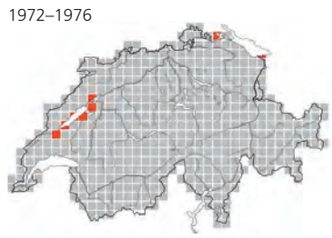
1
2–5
6–20

Sponsored by
Claudia Bauer

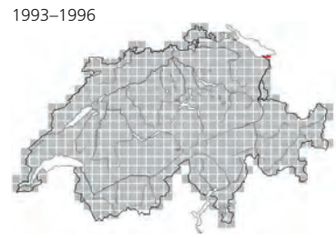
1950–1959



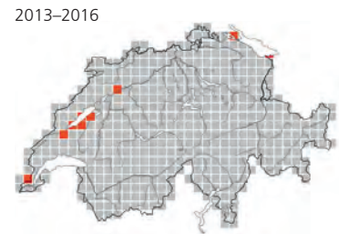
1972–1976



1993–1996



2013–2016



Great White Egret

Ardea alba
Silberreiher
Grande Aigrette
Airone bianco maggiore
irun alv

Daniele Occhiato

Red List –
Population 0–1 pairs (2013–2016)

Focus page 195

The Great White Egret occurs mainly in the eastern part of Europe, with only scattered breeding records further west. In Switzerland, the number of migrating and wintering birds has seen a marked increase since 1995[9]. In 2013, breeding was confirmed for the first time near Chevroux VD[5, 10]. In the following year, nesting activity was again observed there (P. Rapin)[7] and in Chavornay VD (D. Cosandier)[1]. In 2015, a pair was again seen engaging in breeding activity at a nest near Chevroux (M. Zimmerli, P. Rapin)[2, 8]. No signs of breeding were detected in 2016. During the breeding season, the Great White Egret favours sheltered and shallow shore areas surrounded by a broad reed belt.

From 1980, the breeding and wintering populations increased massively in Europe. Since then, the Great White Egret has extended its range to the west and north and bred in 14 countries for the first time[6]. The first breeding record was reported in France in 1994; in 2016, there were almost 500 pairs[3]. The Great White Egret has increased significantly on Neusiedlersee A as well[4]. Reasons for this trend include better protection, ample food supply due to eutrophication, changes in fisheries management, increased rice farming, and a shift of foraging activity to farmland in autumn and winter (small mammals)[6].

Peter Knaus

[1] Antoniazza (2015); [2] Antoniazza (2016b); [3] Dubois et al. (2017); [4] Dvorak et al. (2016); [5] Jeanmonod & Rapin (2014); [6] Ławicki (2014); [7] Müller (2015); [8] Müller (2016); [9] Sattler et al. (2017e–h); [10] Vallotton et al. (2014a–b)

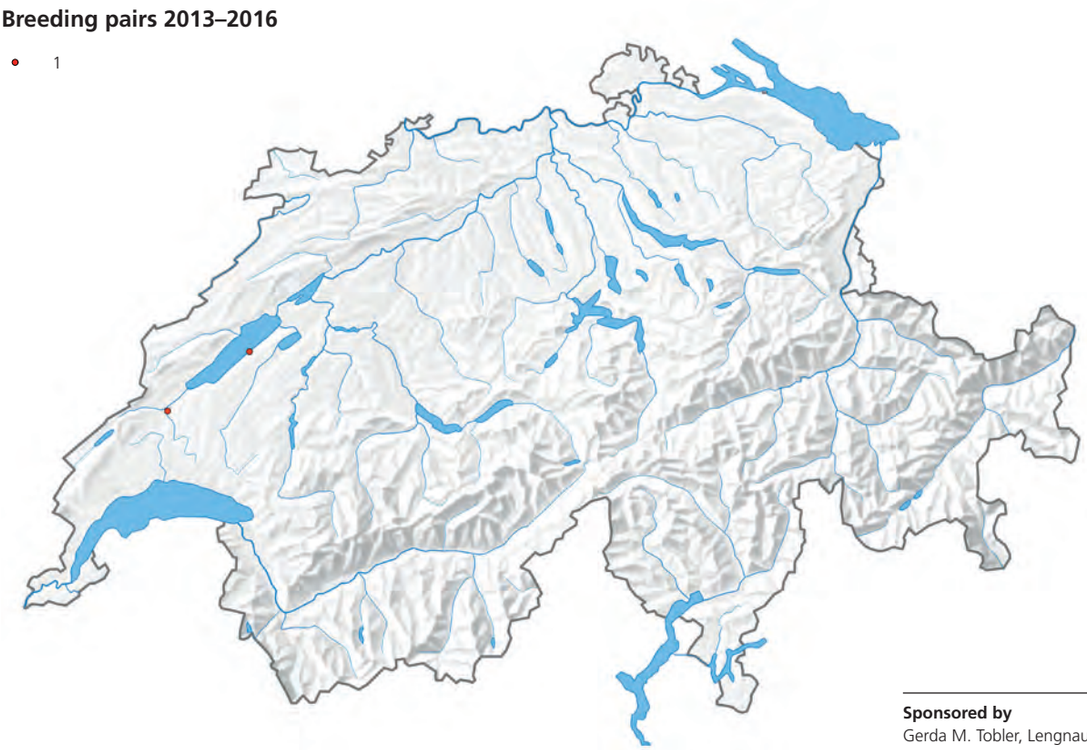
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Gerda M. Tobler, Lengnau AG

Little Egret

Egretta garzetta
Seidenreiher
Aigrette garzette
Garzetta
irun da saida

Mathias Schäf

Red List –
Population 0–1 pairs (2013–2016)

Focus pages 190, 195

In Europe, the Little Egret predominantly inhabits the regions of the Mediterranean, Black and Caspian Seas. Its numbers in Switzerland fluctuate widely. Since 1990, records have become more frequent, however, with an increase in sightings during the breeding season and in autumn as well as with first wintering records[10]. The first breeding attempt occurred in 2014 in a Grey Heron colony near Zug: on 27 April, a bird was observed carrying nesting material, and from 10 May to 7 June, a pair occupied a nest in a location which was poorly visible (D. & J. Kronauer, A. Huber, C. Monigatti, B. Walser)[8, 9].

The Little Egret has increased significantly in France in the past 50 years and extended its range to the north as well as inland (e.g. along the Loire River)[AtF]. In Alsace, breeding was first recorded in 2005; since then, 4–9 pairs have been breeding annually just a few kilometres north of Basel[4, 7]. In northern Italy, too, the population has increased significantly[6]. Since 1998, the Little Egret also breeds in Austria[1, 5]. In the Netherlands, breeding occurred for the first time in 1978, followed by a steep rise in the 1990s; cold winters have, however, recently caused a renewed decline[2, 3]. Further breeding attempts are to be expected in Switzerland in the short and medium term.

Peter Knaus

[1] Billinger (2004); [2] Boele et al. (2011); [3] Boele et al. (2015); [4] Dronneau & les observateurs de la LPO Alsace (2016); [5] Dvorak et al. (2016); [6] Fasola et al. (2010); [7] Leuzinger (2011); [8] Martinez & Maumary (2016a–b); [9] Müller (2015); [10] Sattler et al. (2017e–h)

1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016

Great Cormorant

Phalacrocorax carbo
Kormoran
Grand Cormoran
Cormorano
cormoran

Christoph Meier-Zwicky

Red List Least Concern (LC)
Population 1200–2100 pairs (2013–2016)

Focus pages 142, 147, 190, 319

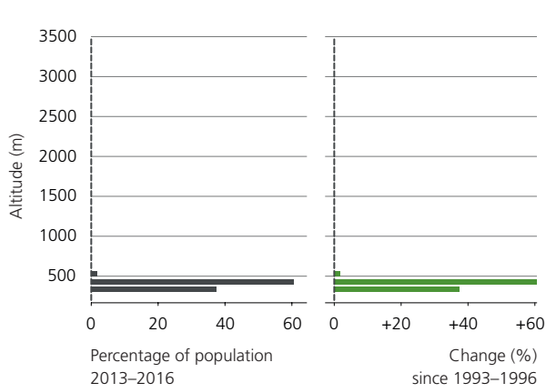
Great Cormorants in Switzerland belong to the inland-breeding subspecies sinensis. These fish-eating birds were once considered pests and persecuted, but the European breeding population has made a strong recovery since the mid-20th century thanks to protection measures. At the same time, the Great Cormorant has extended its range further south [1].

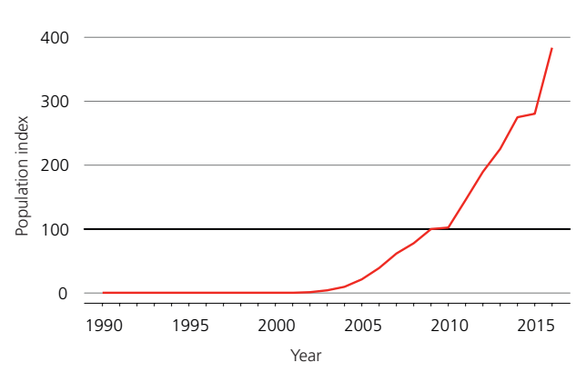
The population increase in Denmark and the Netherlands especially caused a steep rise in the Swiss wintering population in the 1980s [5]. In 2001, the first breeding pairs occupied the islands in the Fanel nature reserve BE/NE [4]. New colonies in lake-side trees rapidly formed and exist to this day: on Lake Zug and in Bolle di Magadino TI in 2005, and on Greifensee as well as a second colony on Lake Neuchâtel at Champ-Pittet VD in 2007 [3]. Since then, the trend has been more dynamic. The colony on Baldeggersee only lasted from 2007 to 2013. On Lake Sempach (occupied since 2010) and Lake Zurich (since 2011), nesting sites were relocated or irregularly occupied. There were also several site changes on Lake Geneva. The first colony was in Bursinel VD and existed from 2011 to 2015. Besides the colony formed in 2012 in the nature reserve Les Grangettes VD, there were smaller nesting sites on the north side of the lake [2]. The Great Cormorant has also settled in areas just beyond the Swiss border, on Lake Constance in particular (since 1997) [AtBo, AtD].

From 2013 to 2016, 11–13 of 19 nesting sites were occupied each year. All Great Cormorants now nest in trees. By 2016, the population had grown to 2099 pairs. Half of the population (1171 pairs) bred in colonies on Lake Neuchâtel; 463 pairs nested on Lake Geneva. The growth rate has dropped significantly, however. The greatest potential for further growth is probably on the large lakes in areas where waterside access is restricted for humans and protected zones keep boats away [2]. Declining food supply due to the decrease in nutrient levels in Swiss lakes as well as the availability of undisturbed nesting sites will likely limit the number of breeding pairs. In Europe, the subspecies sinensis is continuing to spread in central and southern parts. Overall, however, population numbers hardly changed from 2006 to 2012 [1].

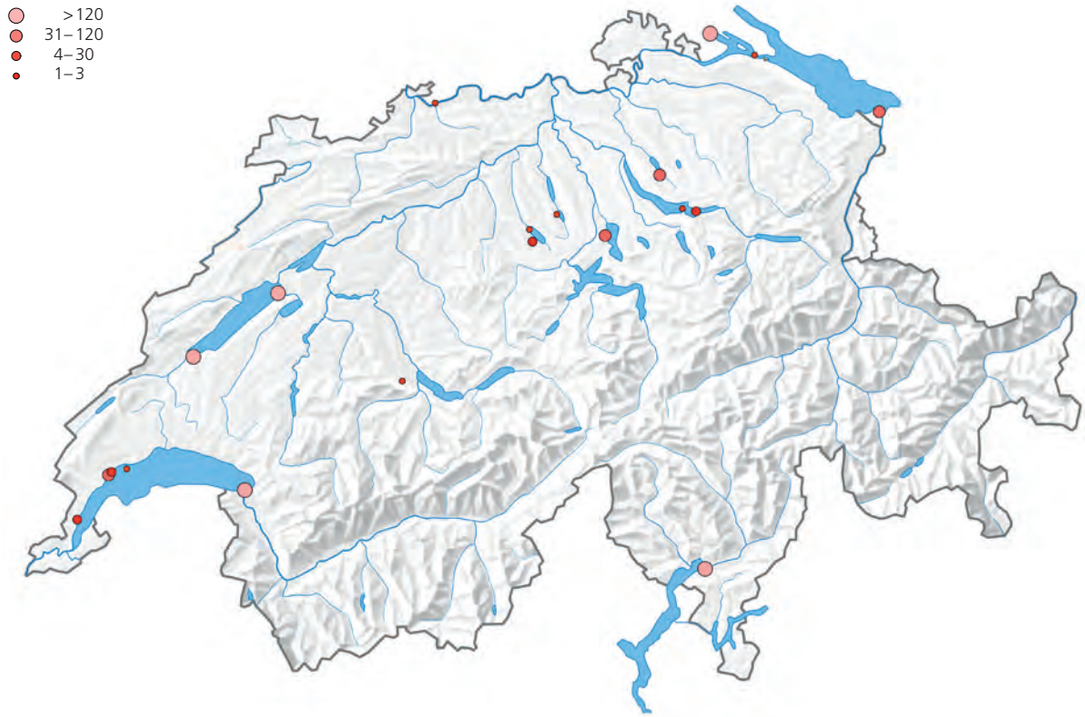
Verena Keller

[1] Bregnballe et al. (2014); [2] Keller & Müller (2015); [3] Keller et al. (2012); [4] Rapin (2003); [5] Schifferli et al. (2005)

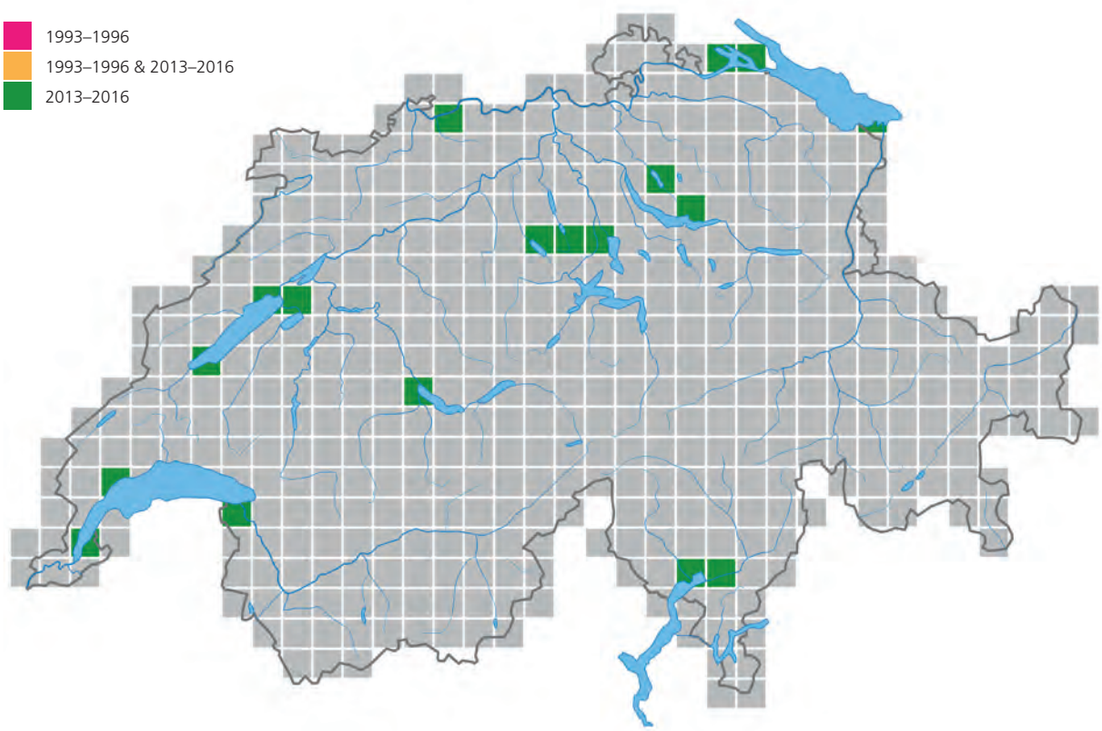




Breeding pairs 2013–2016

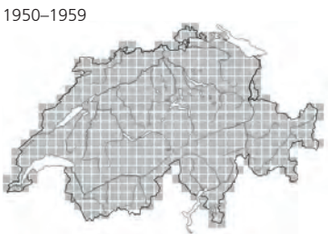


Distribution change since 1993–1996

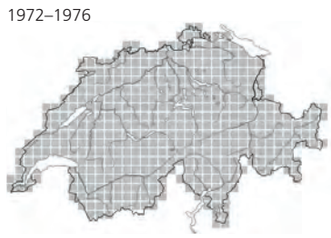


Sponsored by
Jürg Rohner, Reinach BL

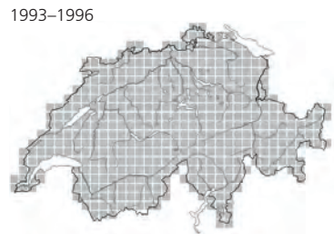
1950–1959



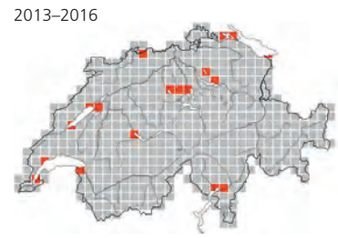
1972–1976



1993–1996



2013–2016



Black-winged Stilt

Himantopus himantopus
Stelzenläufer
Échasse blanche
Cavaliere d'Italia
gambun pitschen

Mathias Schäf

Red List –
Population 0–1 pairs (2013–2016)

Focus page 369

In Europe, the Black-winged Stilt occurs predominantly in the south. The first breeding record in Switzerland dates from 2013: from 15 May, two pairs were seen displaying on Flachsee Unterlunkhofen AG, and on 30 May, an egg belonging to one of the pairs was found in a nest on an island. The very next day, the nest was flooded by high water (M. Hüsler, A. Storensten, P. Roth et al.)[4, 6]. A similar breeding attempt had occurred back in 1965 in the Fanel nature reserve BE/NE. The nest was also lost due to a sudden rise in the water level, though in this case, no egg had been produced[5], so this attempt was not counted as a confirmed breeding record.

The Black-winged Stilt is an opportunistic breeder and can temporarily occupy other suitable habitats (e.g. densely vegetated shallow-water areas) when conditions in its traditional breeding sites are not favourable[3]. It has recently extended its breeding range in western and central Europe, becoming a regular breeder in Austria and the Netherlands[1, 2]. In France, the population has more than doubled since 2000, and pairs are increasingly settling in inland areas[AtF]. If the positive trend in neighbouring countries continues, future breeding attempts in Switzerland are to be expected.

Peter Knaus

[1] Boele (2012); [2] Dvorak et al. (2016); [3] Figuerola (2007); [4] Müller & Volet (2014); [5] Thönen & Haueter (1969); [6] Vallotton et al. (2014a–b)

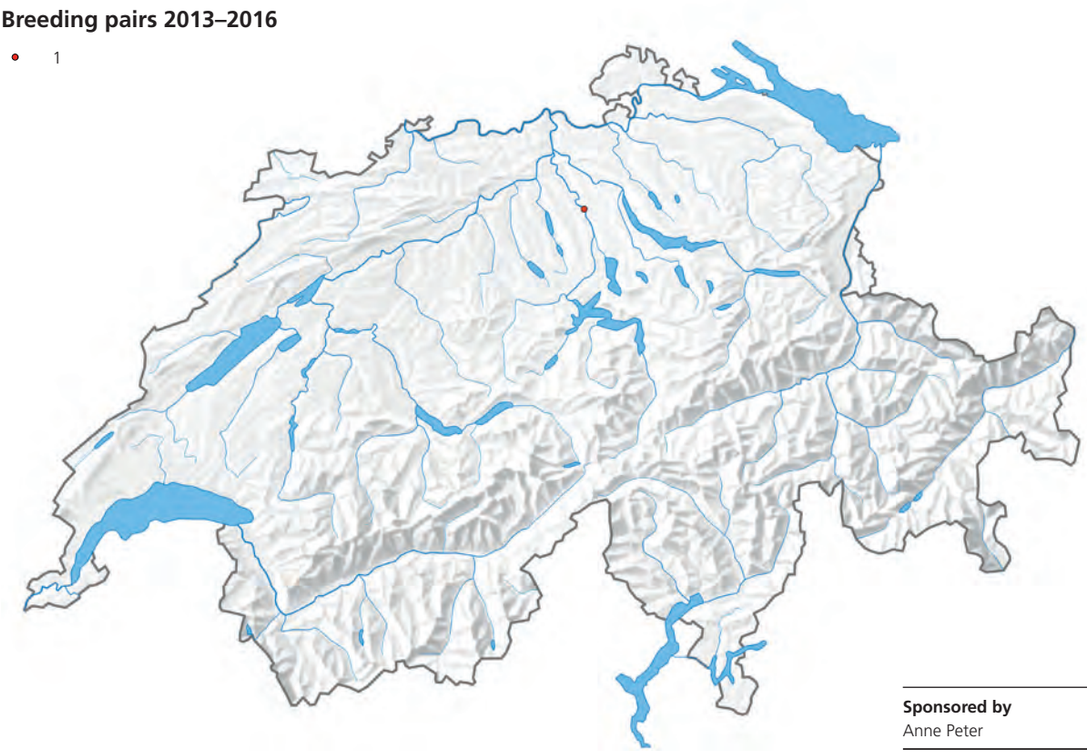
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Anne Peter

Eurasian Dotterel

Eudromias morinellus
Mornellregenpfeifer
Pluvier guignard
Piviere tortolino
gravarel brin

Markus Varesvuo

Red List –
Population 1–3 males (2013–2016)

Focus page 369

The Eurasian Dotterel is an inhabitant of the tundra region. In small numbers, it also breeds in central and southern European mountain ranges [11]. Breeding has been recorded nine times in Switzerland up until 2017, always in the Canton of Grisons. The first two records date from 1965 on the Fil de Cassons [3] and from 1998 near S-chanf [6]. Breeding has been recorded annually since 2012: in the Flims region and the Lower Engadine in 2012 [10]; in the border region between Lower Engadine and Austria: 1 family in 2013, 3–4 families in 2014 (on the Austrian side) and 1 family in 2015 [5, 7, 8]; on the border between Upper Engadine and Italy: 1 family in 2014 (on the Italian side), 1 family in 2015, 2–3 families in 2016 (1–2 on the Italian side) and 1 family in 2017 [2, 7, 8, 9]. There were also signs of possible breeding in the Swiss National Park GR in 2015 (M. Hammel) [8].

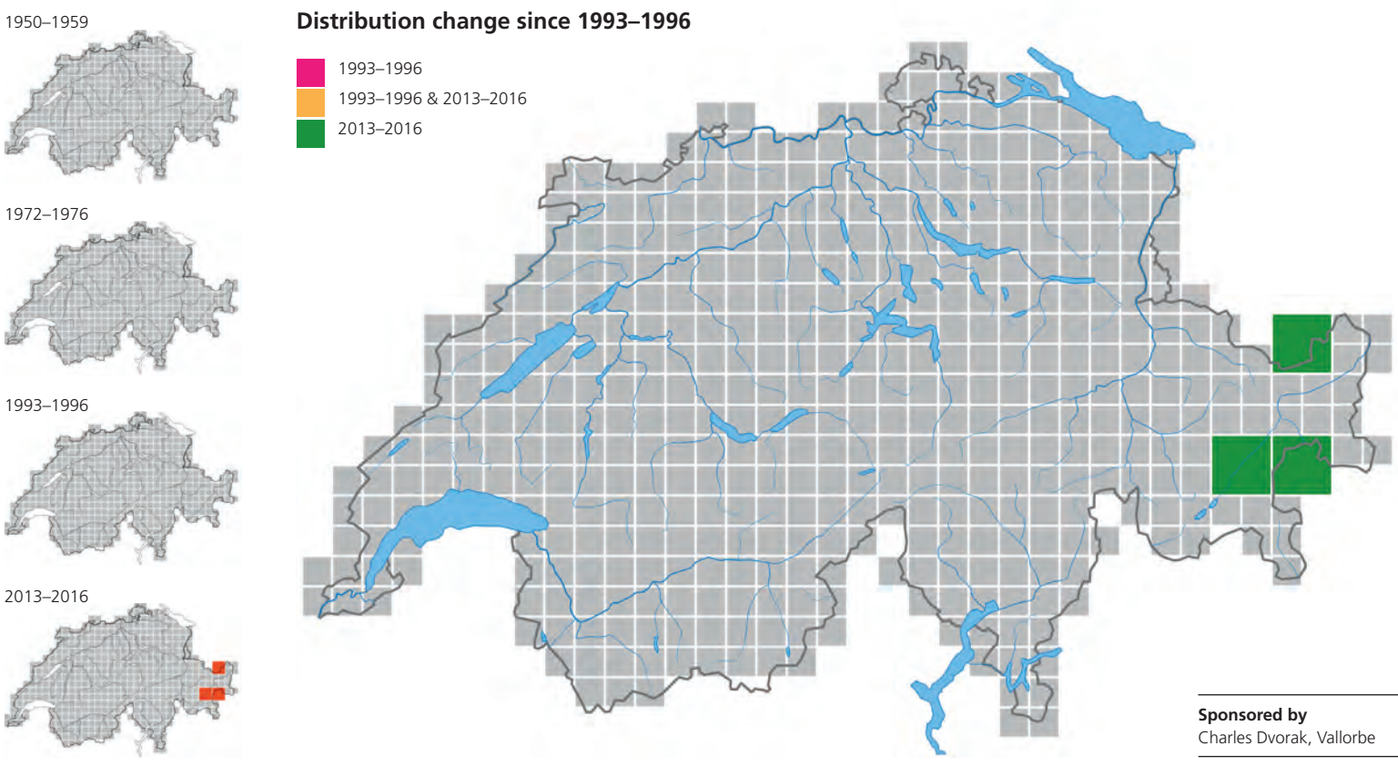
Breeding sites lie at altitudes between 2600 and 2900 m, on broad rocky ridges or plateaus with patches of vegetation such as Alpine grass, cushion plants and lichen. Given the remoteness of breeding sites and the species' secretive behaviour, some broods may have gone unrecorded [1].

The European population is in slight decline, possibly because of persecution in the species' North African wintering grounds [RLEU]. Climate change may also have a negative effect [RLEU, 4].

Claudia Müller

[1] Albegger et al. (2015); [2] Bassi et al. (2014); [3] Burnier (1965); [4] Hayhow et al. (2015); [5] Lentner (2016); [6] Meier-Zwicky (1999); [7] Müller (2015); [8] Müller (2016); [9] Müller (2017); [10] Müller-Derungs et al. (2014); [11] Valle & Scarton (1999)

Distribution change since 1993–1996



Sponsored by
Charles Dvorak, Vallorbe

Little Ringed Plover

Charadrius dubius
Flussregenpfeifer
Petit Gravelot
Corriere piccolo
gravarel pitschen

Marcel Burkhardt

Red List Endangered (EN)
Population 90–120 pairs (2013–2016)

Focus pages 110, 208, 276

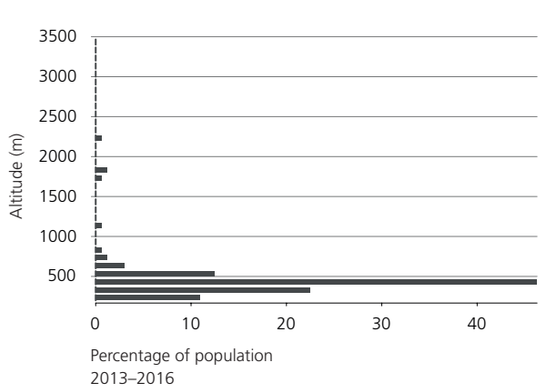
In Switzerland, the Little Ringed Plover originally inhabits floodplains, though it is also found locally on deltas and lakes, and requires sparsely vegetated shores and islands of shingle, sand and silt. The Little Ringed Plover is a pioneer species that also breeds in man-made sites with rough surfaces such as gravel pits, quarries, rubbish dumps, military training grounds, building sites, wet farmland and occasionally flat roofs [VdS, 5, 7]. Due to the abrupt changes that affect these habitats, there are often significant short-term fluctuations in the occurrence of breeding pairs. The number of suitable gravel pits and the overall surface area of the pits have decreased since 1993–1996. This instability is reflected in the comparison map. Currently, about half the population breeds along rivers and one third in gravel pits. Most breeding occurs below 600 m. Switzerland probably has the highest breeding sites in Europe for this species. For a long time, Ova da Bernina above Pontresina GR at 1860 m was considered the highest breeding site [VdS]. However, it has since been replaced by Lago Bianco GR at 2240 m, where there have been several breeding records since 2007 [ID, 6].

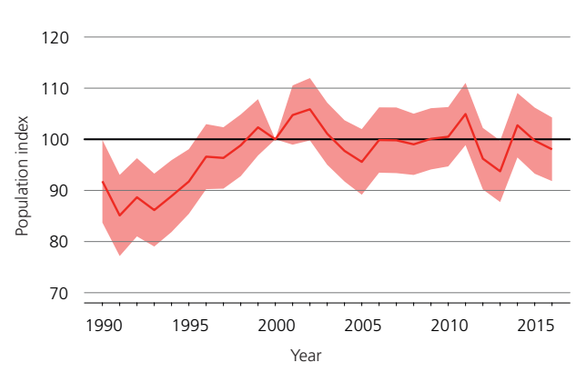
The largest population lives on a 30 km stretch of the Alpine Rhine between Trübbach SG and Rüthi SG. In good years, it numbers up to 30 pairs. Since the river flows through a canal, most gravel banks are easily accessible from the shore. Frequent floods cause water levels to rise rapidly, and the gravel banks are flooded more often than they would be in a natural environment. Disturbance from leisure activities, predation and flooding lead to massive fluctuations in the population and a high rate of brood loss [2].

Thanks to the species' adaptability, the population is expected to remain stable in the future, but protected zones and conservation measures are needed locally to offset the intense visitor pressure. Besides frequent flooding, the added threats of shorter turnaround times in gravel pits, insufficient maintenance of nature reserves, and loss of natural dynamics in rivers due to barrages and canals make the overall situation difficult. For rivers to be populated by the Little Ringed Plover in the long term, large-scale revitalisation projects are necessary [1, 3, 4].

Hans Schmid

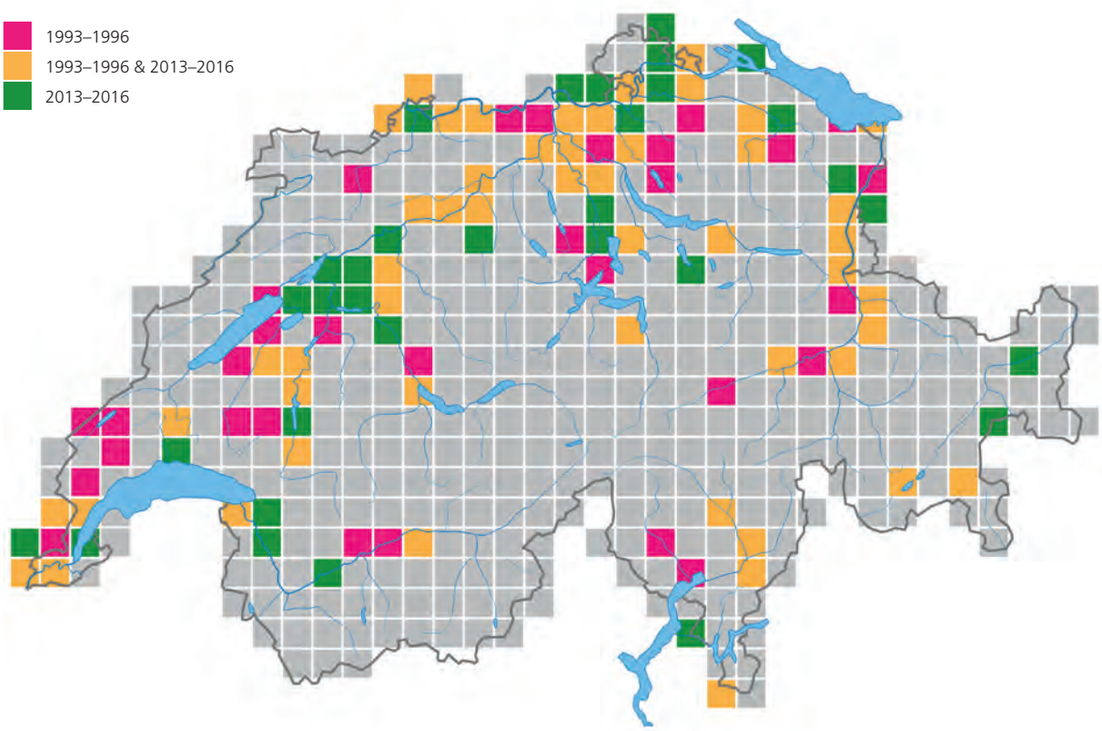
[1] Arlettaz et al. (2011); [2] Baiker (2015); [3] Baumann (2003); [4] Baumann (2005); [5] Savioz (2013); [6] Suter & Suter (2008); [7] Weber (2002)





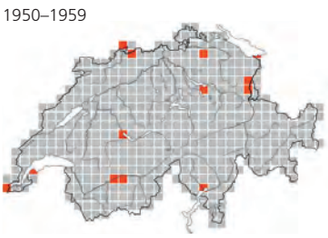
Territories 2013–2016

Distribution change since 1993–1996

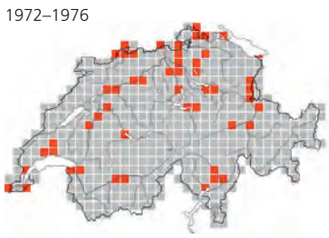


Sponsored by
André Schenker-Nay, Münchenstein

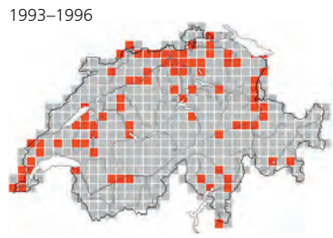
1950–1959



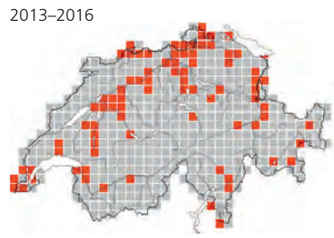
1972–1976



1993–1996



2013–2016



Gravel-nesting birds under threat

Little Ringed Plover and Common Sandpiper, both typical species of floodplains, are not faring well in Switzerland. Human interventions have tamed rivers and decreased their value as a habitat for these two wader species. Restorations alone do not guarantee success, as flooding and disturbance from recreational activities often cause breeding failure.

Little Ringed Plover and Common Sandpiper nest on the large gravel banks of our rivers. The Common Sandpiper relies on extensive, undisturbed and semi-natural floodplains. On slow-flowing stretches of river, fine sediment such as gravel, sand or silt is deposited; the pioneer vegetation that grows there provides cover for the Common Sandpiper to hide its nest. Because the state of rivers today mostly fails to meet the species' needs, the population can barely survive. All breeding sites on the Central Plateau were abandoned long ago.

The Little Ringed Plover, on the other hand, is a pioneer species that can colonise temporary sites with gravel and little or no vegetation; it can also revert to habitats connected with human activity (e.g. gravel pits, military training grounds, building sites), though it originally relied on natural, free-flowing rivers as well. Human intervention has caused the majority of suitable gravel areas to disappear. As a result, only about half the Swiss population of Little Ringed Plovers now breeds on rivers. In Bavaria, this figure has dropped to less than 10 %; the rest of the population breeds in alternative habitats[4, 7]. In part because of their small numbers, both species are classified as «Endangered» on the Swiss Red List[RLCH].

Massive loss of habitat

In Switzerland, typical floodplain species face difficult conditions on rivers and at river mouths on lakes. The floodplains are mostly small due to the topography of the region, and high flow velocity causes fine sediment to be swept along rather than deposited. Heavy rainfall typical for June storms in the mountains is often exacerbated by the snow melt. This happens at a time that is crucial for the breeding success of gravel-nesting birds.

Increasing human interventions since the first river regulations in the 18th century add to the difficulties of the natural landscape: river canalisation, construction of power stations and infrastructure, weirs, gravel extraction, and altered sediment deposition[5, 8]. Interventions on the riverbed are aggravated by the effects of hydropeaking[10]. These sudden, massive changes in the water level caused by hydropower plants pose an additional threat to breeding waders. Other dangers include flushing to remove trapped sediment from the channel and predation pressure (e.g. by crows and foxes). Finally, gravel-nesting birds face frequent disturbance from human recreation.

The Rhine – a haven for the Little Ringed Plover?

The situation on a stretch of the Rhine between Chur GR and Lake Constance exemplifies the problem. Once notorious for frequent flooding, the Rhine was straightened and confined in several stages from 1861. Today, the entire length of the river is canalised. Meanwhile, a number of peninsulas have formed between Sargans SG and Rüthi SG. While the Common Sandpiper may at best make an exceptional breeding attempt on these gravel bars that lack a protective cover of vegetation, the areas are attractive for the Little Ringed Plover. When water levels are favourable, about 30 breeding pairs gather here in April[2]. But a canalised river has downsides for the Little Ringed Plover as well. Because the riverbed has been narrowed, the water rises more rapidly, and at the onset of snow melt, the first gravel banks are soon flooded. Also, islands that would provide better protection from human disturbance and land predators are unable to form. The only advantage for the Little Ringed Plover is that frequent high water and torrential floods keep the gravel banks largely free of vegetation. Population surveys conducted since 1989 by H. Aemisegger suggest that in many years, the birds cannot produce enough offspring to compensate for natural losses.

Paul Hürlimann

Breeding sites on mountain rivers are particularly at risk of flooding. This Little Ringed Plover in the Kander delta BE protected its clutch for as long as possible, but eventually lost it.

Hans Schmid

The gravel bars of the heavily channelled Rhine between Trübbach SG and Rüthi SG accommodate the largest breeding population of Little Ringed Plovers in Switzerland. As the gravel bars are mostly accessible from the riverbank, recreation pressure is particularly high. They are also frequently flooded due to large variations in the water level.

Restoration can have a positive impact

Since the start of the millennium, many stretches of river have been restored in Switzerland, mainly for the purpose of flood protection. In the coming decades, rivers are to be given back at least some of the space they have been deprived of. This is required by the Federal Act on the Protection of Waters, revised in 2011. Gravel-nesting birds have already been able to benefit from some such restoration projects[1, 3]: The Common Sandpiper quickly reappeared on the revitalised sections of the Inn in Upper Engadine GR. Other revitalised stretches of river where the Common Sandpiper has bred in at least some years include the Moesa GR, the Rhine near Felsberg GR, the Kander BE and the Rhone VS (Pfynwald). In the Reuss delta UR and Kander delta BE, the species has also benefited from restorations. However, the efforts made so far have been insufficient to encourage the return of the species to the Central Plateau. Factors that have limited the success of restoration projects include the failure to provide large-enough surface areas, and poor management of visitor flow. In places where recolonisation by the Little Ringed Plover has been successful, for example on the Thur River, continuing effort is required to protect breeding sites from human disturbance[6]. Also, some breeding islands became unsuitable after only a few years because vegetation grew too rapidly due to poor maintenance and reduced river dynamics[9]. Extra effort must be put into future restoration projects so that gravel-nesting birds and other typical floodplain species can truly benefit and raise their young without disturbance.

Hans Schmid

Verena Dobelin

The Kander River near Heustrich BE used to have a wider floodplain. Embankments were built but severely damaged during a flood in 2005. In Winter 2010/2011, the river was revitalised in an extensive restoration project. The Common Sandpiper bred here successfully in 2017.

[1] Ayé et al. (2017); [2] Baiker (2015); [3] Baumann (2003); [4] Bezzel et al. (2005); [5] Fischer et al. (2015b–c); [6] Jaquier & Meyer (2013); [7] Ranftl (1994); [8] Schmid et al. (2010a–b); [9] Schmid et al. (2016); [10] Tonolla et al. (2017a–c)

Species pages 206, 218

Northern Lapwing

Vanellus vanellus
Kiebitz
Vanneau huppé
Pavoncella
vanel

Marcel Burkhardt

Red List Critically Endangered (CR)
Population 140–180 pairs (2013–2016)

Focus pages 212, 240, 284, 428

In Switzerland, the Northern Lapwing inhabits open landscapes with few trees. Originally it occurred in wetland habitats such as sedge marshes, wet meadows or raised bogs. Today, it is also found in agricultural areas, especially on arable land [3]. For breeding, it typically requires areas of low, patchy vegetation.

The Northern Lapwing occurs locally in the lowlands of the Central Plateau. It reaches the Alpine region in the lower Rhone Valley VD/VS and the Rhine Valley, where the populations are in Vorarlberg A [2, 7, 8] and Liechtenstein [AtFL].

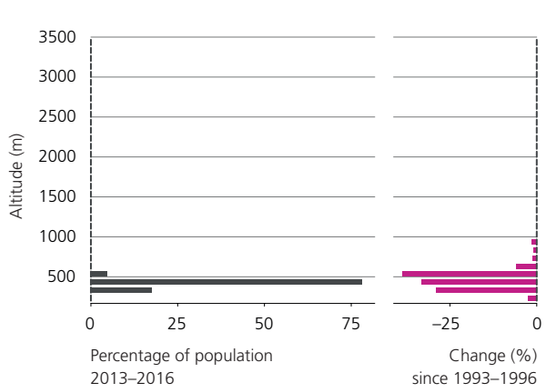
Two thirds of the atlas squares occupied in 1993–1996 are now abandoned. While broods have been observed up to 1690 m [AEn], the highest breeding sites are currently at 560 m in the Ostergau region LU and near Rubigen BE. The population was estimated to number at least 1000 pairs in 1972–1976 [1] and about 450 pairs in 1993–1996 [AtCH2]. It reached its lowest level in 2005 with 83 pairs [15]. The population subsequently increased again thanks to conservation measures, reaching 175–180 pairs in 2015–2016 [11, 12]. Today, the population is concentrated on arable land and in vegetable growing regions (Wauwiler Ebene LU, Nuolener Ried SZ, Zurich Oberland, Grosses Moos BE/FR, Rhone Valley), in ecologically restored areas (Bernese Mittelland, Reuss Valley AG) and some wetlands (Neeracherried ZH, Frauenwinkel SZ). Some pairs nest on flat roofs [13, 15, 18].

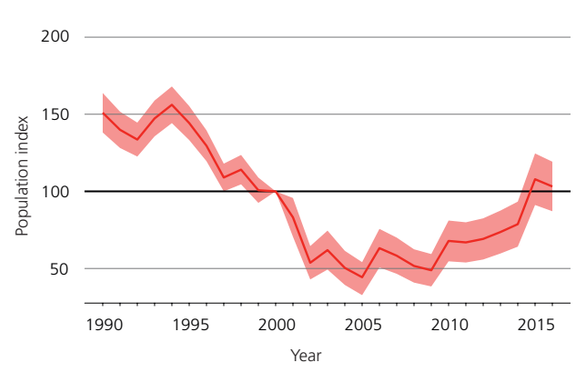
Regional surveys in the Canton of Zurich (1988–2008) [AtZH] and on Lake Constance (1980–2010) [AtBo] also report declines of 70–85 %. The negative trend in large parts of central Europe [AtD, AtF, 17] is due mainly to the fact that productivity is insufficient to maintain populations [5, 8, 14]. On grassland and arable land, many clutches and chicks are lost because of intensive farming practices. Predation also causes significant losses [16].

Today, the Northern Lapwing population in Switzerland is dependent on conservation measures [4, 6, 9, 10, 12]. The species can only successfully breed on farmland if nests and chicks are protected from ground predators and from destruction by farming operations. In wetlands, where high nutrient input and climatic conditions lead to rapid and dense plant growth, colonisation by the Northern Lapwing is only possible if measures are taken to restrict vegetation growth.

Petra Horch

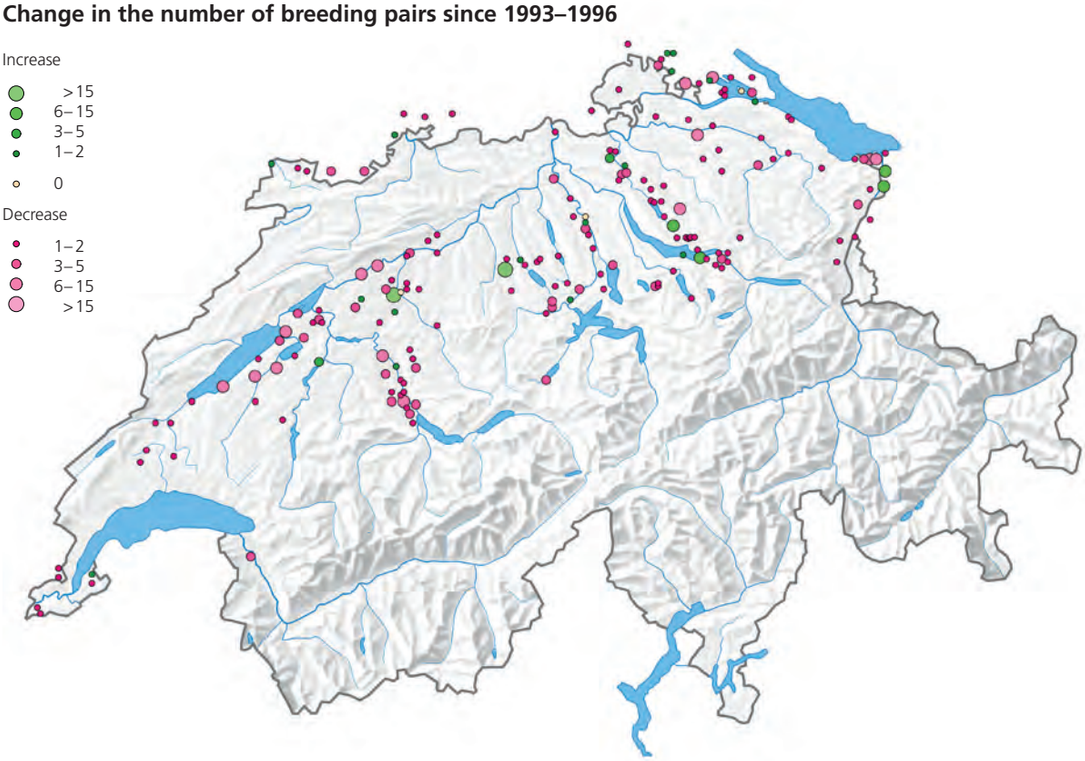
[1] Birrer & Schmid (1989); [2] Burtscher et al. (2017); [3] Glutz von Blotzheim (1959); [4] Horch et al. (2017); [5] Matter (1982); [6] Müller et al. (2009); [7] Puchta et al. (2009); [8] Puchta et al. (2011); [9] Puchta et al. (2012); [10] Rehsteiner & Spaar (2009); [11] Ritschard (2015b); [12] Ritschard (2017); [13] Ritschard & Villiger (2017); [14] Roodbergen et al. (2012); [15] Sattler et al. (2009); [16] Schifferli et al. (2009); [17] Teufelbauer & Seaman (2017); [18] Weggler (2009)





Breeding pairs 2013–2016

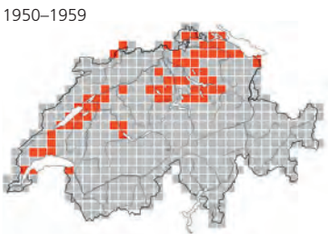
Change in the number of breeding pairs since 1993–1996



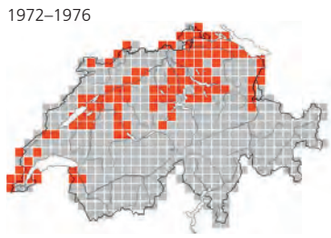
Sponsored by
Karin & Stefan Feller-Eichholzer
Steffen Gysel
Geneviève Loup

Ala
Schweizerische Gesellschaft für Vogelkunde und Vogelschutz

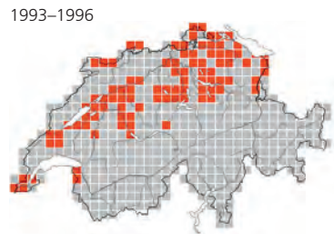
1950–1959



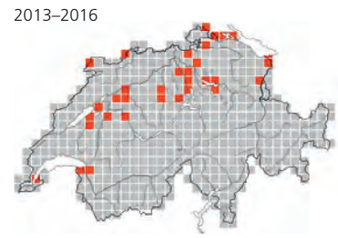
1972–1976



1993–1996



2013–2016



Species conservation is necessary and worth the effort

A whole range of endangered species can only be preserved by means of specific measures and projects customised to meet their ecological requirements. Since 2003, the Swiss Species Recovery Programme for Birds has provided added support for the protection of selected bird species. The results show that the efforts have paid off!

There has been a growing recognition that successful nature conservation must involve three levels:

1. «Habitats» involves the large-scale conservation of habitat, for example through nature-friendly forest management or biodiversity promotion areas on farmland.
2. «Sites» concerns areas with a special protection status, such as the traditional nature reserves or protected floodplains.
3. «Species conservation» enters the picture when habitat conservation and special sites are not enough to secure a species' survival[20].

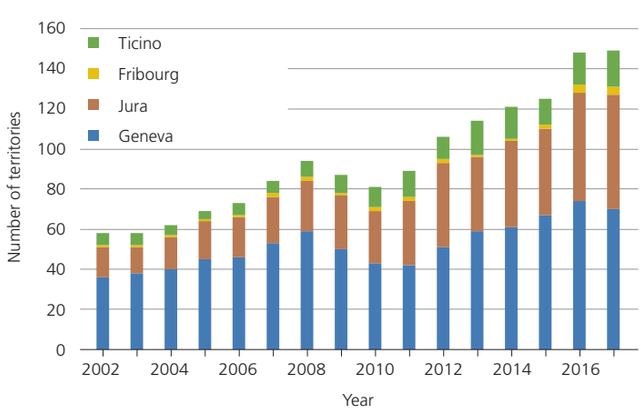
Species recovery programmes involve species-specific measures to eliminate the factors limiting a species' population size. Many species that rely on recovery programmes now only occur in small, often isolated populations. Measures are needed to preserve populations and boost numbers if possible. Aims may also include helping the species to recolonise potential habitat.

50 of our regular breeding birds are dependent on recovery measures[21]. The Swiss Species Recovery Programme for Birds, launched in 2003 by BirdLife Switzerland and the Swiss Ornithological Institute in collaboration with the Federal Office for the Environment FOEN, develops the conservation measures for so-called priority species and supports their implementation together with several partners[19].

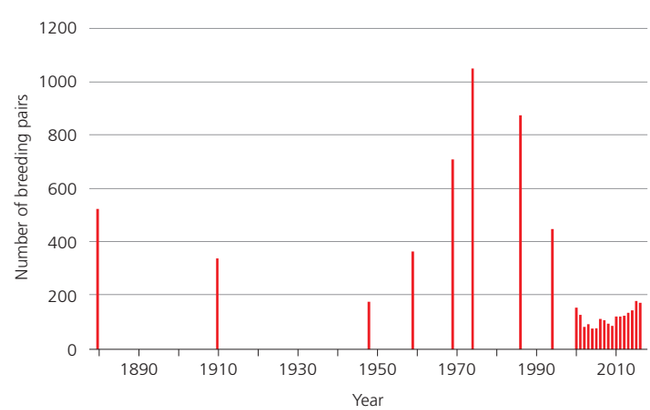
Species conservation is more than providing nest boxes

The traditional and simplest conservation measure involves increasing and maintaining the availability of suitable nest sites. This is an effective measure where sufficient habitat exists but nest sites are few. Nest boxes are provided for Common Barn-owl, Common Hoopoe, Common Swift, Northern House Martin, Eurasian Jackdaw, and others[1, 9, 10, 18, 22]. Rafts, platforms and gravel islands benefit Common Tern and Black-headed Gull[2, 15]. And many places provide nest platforms for the White Stork[6].

However, habitat quality is often inadequate. Targeted measures are necessary to improve the habitats of many priority species. To protect the Whinchat, for example, large flower meadows cut late in the season need to be preserved. In collaboration with the cantons of Valais and Grisons, core areas have been designated as special protection sites for ground nesters[4, 5]. The Northern Lapwing lacks suitable breeding sites in farmland, and predation and intensive farming practices reduce breeding success. Thanks to targeted measures in various areas, the Lapwing population has been recovering since 2009[14]. For typical orchard birds such as Little Owl, Eurasian Wryneck and Common Redstart, the problem is often not a lack of trees but of low-nutrient, insect-rich grassland between trees with small habitat structures and a small-scale vegetation mosaic that includes bare ground for foraging[8, 17]. Several projects exist to promote these types of habitat. The Western Capercaillie requires open, undisturbed mountain forests with dwarf shrubs, while the Middle Spotted Woodpecker relies on forests with large oak trees and other trees with furrowed bark as well as standing deadwood. Action plans for these two species involve forestry interventions and the designation of

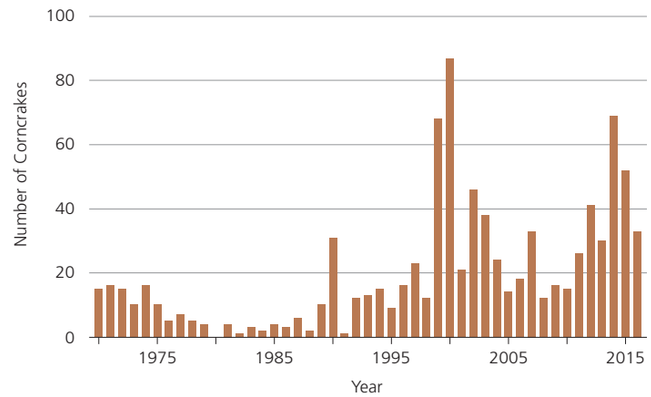


Population trend of the Little Owl in various regions of Switzerland in 2002–2017. Measures succeeded in halting the decline at the turn of the millennium. Thanks to intensive recovery efforts and favourable climate conditions, the Little Owl population has since increased significantly, albeit at a low level.



The population trend of the Northern Lapwing in Switzerland from 1880 to 2016 illustrates the species' turbulent history. Numbers declined massively from the mid-seventies, but recovery efforts have succeeded in reversing the trend.

Oliver Richter



Number of Corncrakes observed in Switzerland during the breeding season from 1970 to 2016. Thanks to the recovery programme initiated in 1996, the Corncrake now breeds successfully again in Switzerland. The increase is, however, also related to other factors such as improved observer effort and the species' overall situation in Europe.

Species like the Eurasian Wryneck require bare ground to forage for insects. Several recovery programmes have therefore created areas of patchy vegetation.

special forest reserves to promote suitable habitat in priority areas [11, 12]. Refuge zones for Capercaillie protect the species from disturbance, at least in winter.

Partnerships are crucial

Species conservation has become an established part of nature conservation policy in Switzerland. The cantons have defined cantonal priorities based on the national strategies. Valais and Ticino have developed cantonal species recovery schemes together with the Swiss Ornithological Institute and BirdLife Switzerland [13, 16]. Other cantons have implemented species-specific cantonal action plans [7, 23, 24].

A central pillar of species conservation are the many volunteers and local organisations that dedicate their resources and expertise to nature conservation and species recovery. The regional integration of recovery projects via people, institutions and authorities is a key success factor.

Future challenges

To date, seven national action plans have been published in the context of the Swiss species recovery programme. Hopefully, these action plans will reinforce the commitment to species conservation on the part of the cantons and other partners.

The results of the 2013–2016 atlas clearly show that species conservation will continue to play an important role in nature conservation in Switzerland. Birds that breed in farmland and on natural rivers have experienced especially steep declines. Despite important achievements in the recovery of Western Capercaillie, Northern Lapwing, Little Owl, Common Hoopoe and other species, their populations remain vulnerable. To secure their survival in the long term, conservation efforts must continue. In future, other birds will have to be included in the species recovery programme, as they meet the inclusion criteria following substantial population declines. Species conservation is specified as an important immediate measure in the «Action Plan for the Swiss Biodiversity Strategy» [3]. Besides the necessary funds, meeting these urgent challenges requires mutual understanding and close collaboration between authorities, conservationists, land owners and land users. Successful species conservation takes time and resources, so recovery programmes must be planned carefully and include strategies for monitoring success.

Reto Spaar & Raffael Ayé

[1] Arlettaz et al. (2010c); [2] Beaud (2017); [3] Bundesamt für Umwelt (2017a)/Office fédéral de l'environnement (2017b)/Ufficio federale dell'ambiente (2017)/Federal Office for the Environment (2017); [4] Graf et al. (2014d); [5] Horch et al. (2015); [6] Kestenholz et al. (2010a–b); [7] Martinez (2016); [8] Meisser et al. (2016a–b); [9] Michler et al. (2015a–b); [10] Michler et al. (2016a–b); [11] Mollet et al. (2008a–b); [12] Pasinelli et al. (2008b–c); [13] Posse et al. (2011); [14] Ritschard (2017); [15] Robin (2014); [16] Scandolara & Lardelli (2007); [17] Schaub et al. (2010b); [18] Scholl (2016a–b); [19] Spaar & Ayé (2016a); [20] Spaar & Ayé (2016b–c); [21] Spaar et al. (2012a–b); [22] Strebel et al. (2012a–b); [23] Weggler (2004a); [24] Weggler (2004b)

Species pages 108, 172, 178, 188, 210, 220, 230, 232, 238, 272, 280, 292, 330, 388, 470, 476

Eurasian Curlew

Numenius arquata
Grosser Brachvogel
Courlis cendré
Chiurlo maggiore
fliaun grond

Ralf Kistowski

Red List Critically Endangered (CR)
Population 0 pairs (2013–2016)

Focus pages 240, 319, 380

Switzerland lies at the southwestern edge of the Eurasian Curlew's breeding range. Its population was estimated at just under 40 pairs in 1960–1962 [HVM]. In 1993–1996, only 3–4 pairs remained [AtCH2]. The last breeding record occurred in 2006 at the southern end of Sihlsee SZ [2]. While there are regular sightings during the breeding season, there have been no breeding attempts. A small population still exists in the Rhine Valley in Vorarlberg A, with 2–3 pairs breeding every year within the atlas perimeter in 2013–2016 [1]. But numbers are declining here, too [1]: in 2016, only 8 of 13 pairs were found to breed [4].

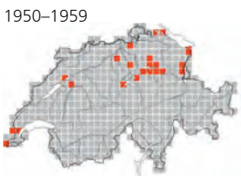
The Eurasian Curlew favours open sedge marshes and wet meadows with pools in large lowland wetlands. Although some larger marshes remain in Switzerland, they often have a dense network of trails that causes frequent disturbance. In addition, predation pressure may have been too high, as was the case for the Northern Lapwing [1, 3]. This has resulted in very low breeding success in recent years, but high life expectancy and breeding site fidelity have delayed the abandonment of breeding sites.

The Eurasian Curlew's range in central and western Europe has become very patchy. In many places, populations have declined dramatically since 1950 [RLEU].

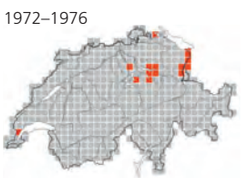
Peter Knaus

[1] Burtscher et al. (2017); [2] Glutz von Blotzheim (2007a); [3] Horch et al. (2016); [4] Knaus et al. (2016a)

1950–1959



1972–1976



1993–1996

2013–2016

Territories 2013–2016

Sponsored by
Ursula Jappert
Stephan Trösch, Schaffhausen

Common Snipe

Gallinago gallinago
Bekassine
Bécassine des marais
Beccaccino
becassina da palì

Marcel Burkhardt

Red List Critically Endangered (CR)
Population 0–1 pairs (2013–2016)

Focus pages 240, 380

Switzerland lies at the southern edge of the Common Snipe's range. Around 1960, the population probably still numbered at least 80 pairs [AtCH0]. Its decline accelerated after 1987 [7]. The population on Lake Constance has collapsed since 1980 as well, declining by 98 % [AtBo].

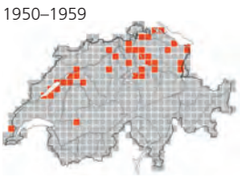
Since 1993–1996, the Common Snipe has occupied territories in Switzerland irregularly at 0–3 sites every year. In 2013–2016, only two territories were found: one at the Chablais de Cudrefin VD in 2013 (P. Walser, P. Mosimann-Kampe, P. Lustenberger, F. Müller, M. Bowman) [6] and one on Pfäffikersee ZH in 2014 (W. Hunkeler) [5]. Winnowing Snipes were observed just beyond the Swiss border in Wollmatinger Ried D (I. Stützle) [4], the Rhine delta A (gone since 2015) and the Rhine Valley in Vorarlberg A [2].

The Common Snipe breeds in large wetlands dominated by sedges with plenty of hollows, creeks and pools. In most remaining sedge marshes in Switzerland, the water level is too low, nutrient input has changed the vegetation and dense networks of trails cause frequent disturbance [1, 3]. Since populations in neighbouring countries [AtD, AtF] and many other countries in Europe [RLEU] are also declining, there is little hope that the Common Snipe will continue to breed in Switzerland.

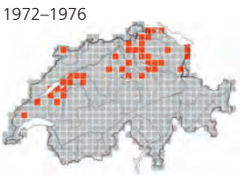
Peter Knaus

[1] BirdLife Schweiz & Stiftung Landschaftsschutz Schweiz SL (2017); [2] Burtscher et al. (2017); [3] Klaus (2007a–b); [4] Knaus et al. (2014); [5] Müller (2015); [6] Müller & Volet (2014); [7] Sattler et al. (2017e–h)

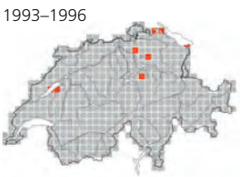
1950–1959



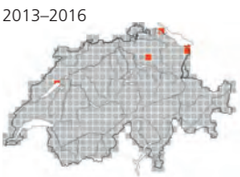
1972–1976



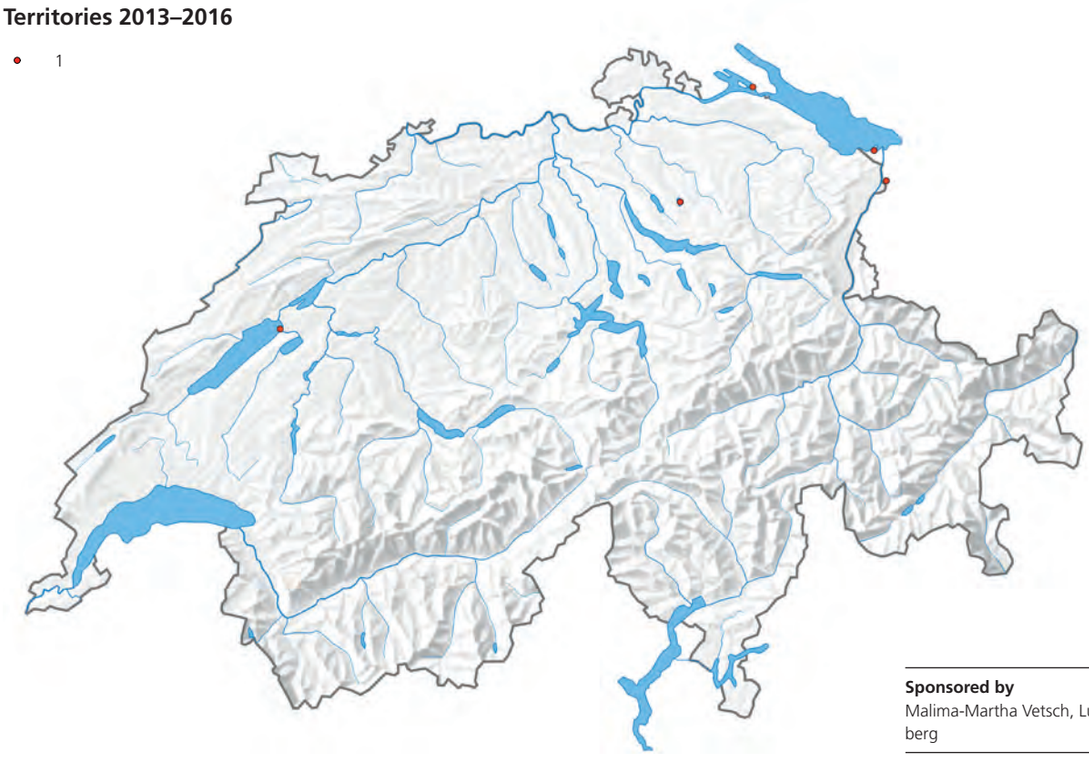
1993–1996



2013–2016



Territories 2013–2016



Sponsored by
Malima-Martha Vetsch, Lutzenberg

Eurasian Woodcock

Scolopax rusticola
Waldschnepfe
Bécasse des bois
Beccaccia
becassa

Jean-Lou Zimmermann

Red List Vulnerable (VU)
Population 1000–4000 males (2013–2016)

Focus page 142

Switzerland lies at the southern edge of the Eurasian Woodcock's range. The species inhabits the central and western Jura, the northern rim of the Alps, Grisons, and also the western ranges of the central and southern Alps, though distribution is patchier in these areas. Displaying males were observed from low altitudes of about 500 m near Niederbipp BE (M. Hammel) up to 2230 m near Zernez GR (J. von Hirschheydt). The highest confirmed breeding was recorded near Ennenda GL at 1780 m (J. Marti).

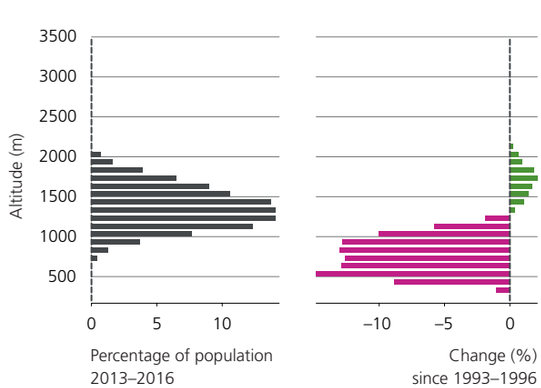
The Eurasian Woodcock inhabits extensive forests, favouring stands with an open canopy but well-developed shrub layer [1]. The species appears to prefer humid forests, often on north-facing slopes [AtNE]. So far, these findings are based solely on the habitat preferences of males, however.

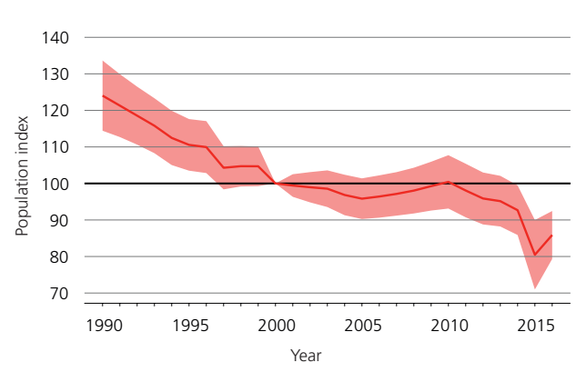
Since 1993–1996, the Eurasian Woodcock has almost completely disappeared from woods below 900 m, especially on the Central Plateau [7], but also in the eastern and northern Jura [3]. In contrast, the Woodcock was recorded in some new atlas squares in the central and southern Alps. These new records are probably due to a species-specific search conducted during the atlas period rather than a range expansion [6].

A detailed study in the Neuchâtel Jura in 1998–2000 estimated the number of displaying males in the Canton of Neuchâtel at 33–77 [4]. In the same area, a negative trend was reported from 2000 to 2010; several display sites had been abandoned [5]. Numbers appear to be stable in France and Germany [AtD, AtF], while they are in marked decline in the UK [2]. In Baden-Württemberg, the trend is similar to that in Switzerland, with significant declines observed in lowland woods, but stable numbers at higher altitudes, especially in the Black Forest [ABW]. The reasons for this marked decline in the lowlands, which has been documented at least since the 1970s, are largely unknown. Possible causes include adverse changes in woodlands (e.g. rising tree density as the growing stock increases), frequent disturbance by humans, natural predation, additive mortality from hunting, and reduced food supply (earthworms) due to soil acidification caused by acid rain [3].

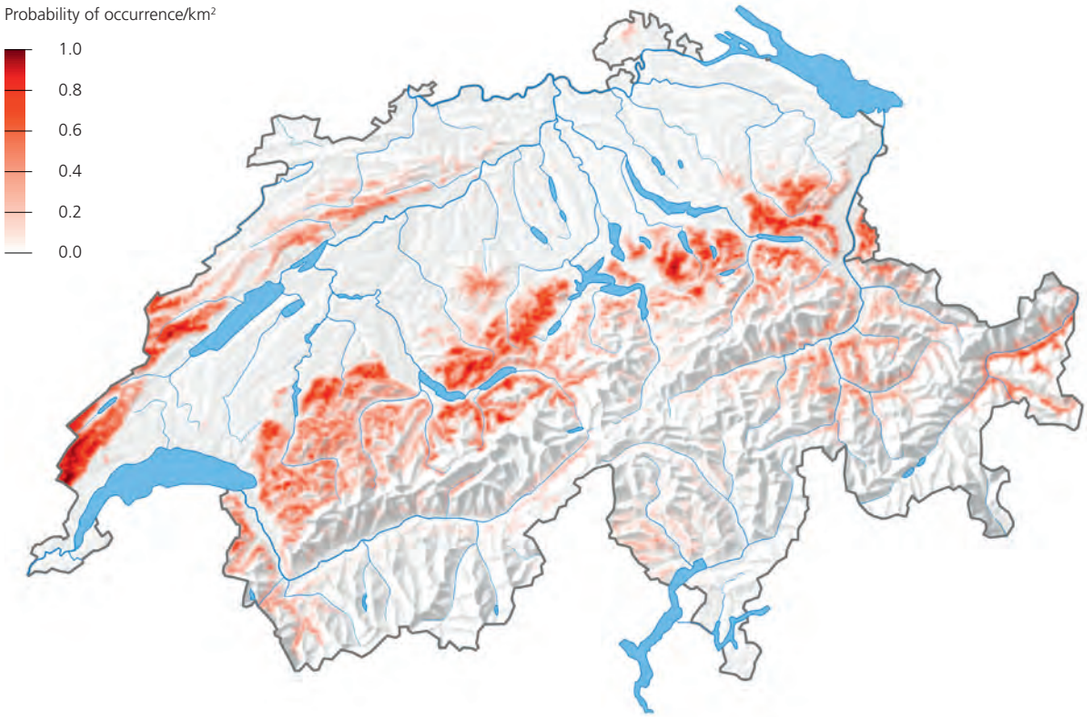
Pierre Mollet

[1] Brüngger & Estoppey (2008); [2] Heward et al. (2015); [3] Mollet (2015); [4] Mulhauser (2001); [5] Mulhauser & Zimmermann (2015); [6] Sattler & Strebel (2016); [7] Thiel (2013)

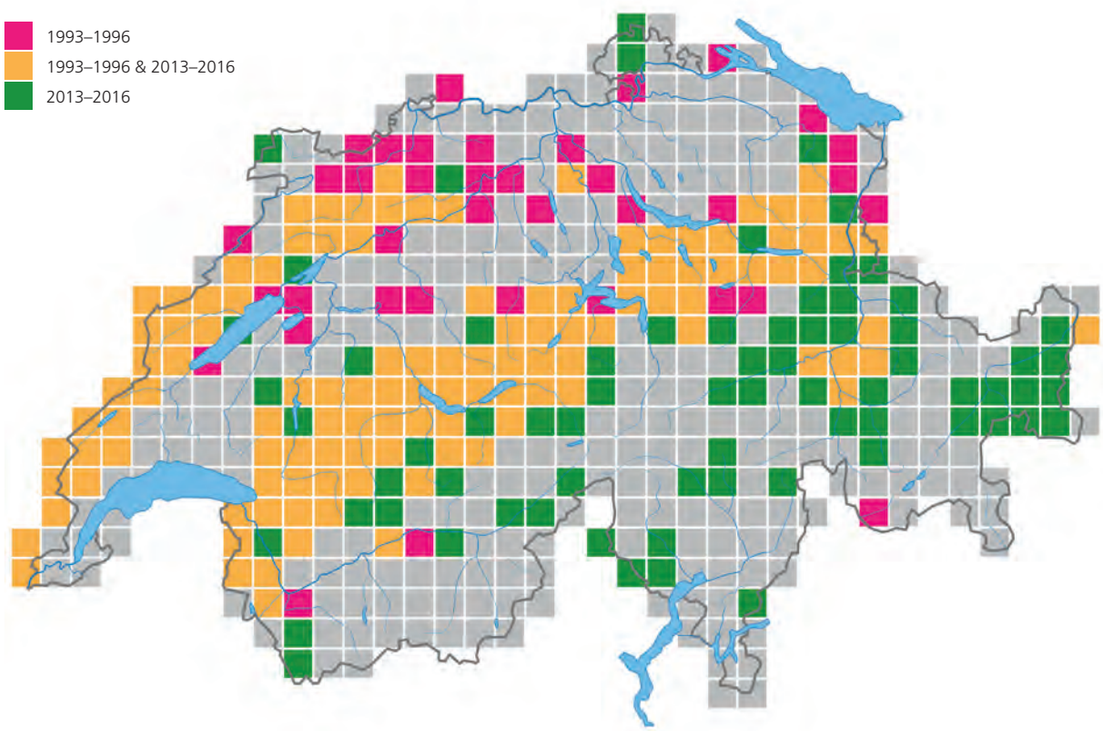




Occurrence 2013–2016

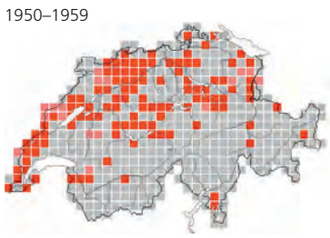


Distribution change since 1993–1996

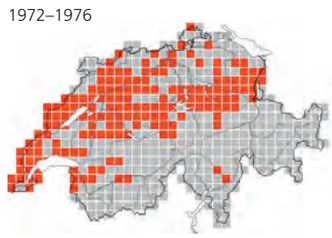


Sponsored by
Werner Schwaller, Olten

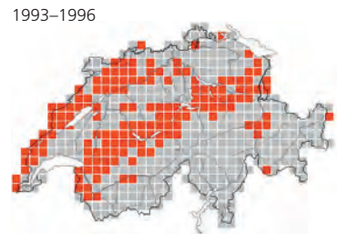
1950–1959



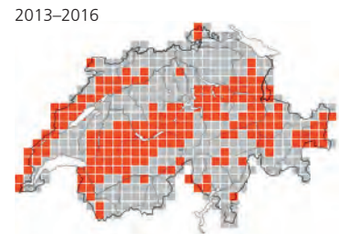
1972–1976



1993–1996



2013–2016



Common Sandpiper

Actitis hypoleucos
Flussuferläufer
Chevalier guignette
Piro piro piccolo
rivaun cumin

Beat Rüegger

Red List Endangered (EN)
Population 70–90 pairs (2013–2016)

Focus pages 110, 208, 319

The Common Sandpiper's distribution in Europe is concentrated in the northern part of the continent. Until the 1970s, it inhabited vast floodplains on the Central Plateau and in the Alps. Since then, it has disappeared from the Plateau as a breeding species, and the Alpine population is declining as well [5, 7].

Although the Common Sandpiper was confirmed in most of the best regions compared to 1993–1996, declines were recorded on the less suitable floodplains. These results must be qualified, however, as early flooding may have prevented breeding in 2015 and 2016 as well as impeding the field surveys. More than half the population is currently found in the Canton of Grisons.

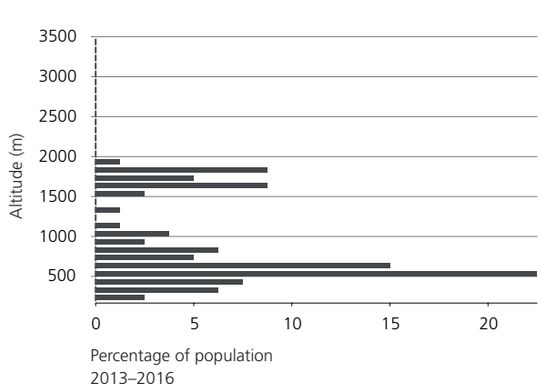
The highest regularly occupied site is the Ova da Bernina River GR at about 1860 m. The highest confirmed breeding was recorded on the Bernina Pass GR at 2090 m [AEn, VdS]. Outside of the Engadine GR and its tributary valleys, the Common Sandpiper rarely nests above 1200 m; only in the Goms region VS and on the Furkareuss River UR does it regularly nest at altitudes of 1300 m and 1500 m, respectively.

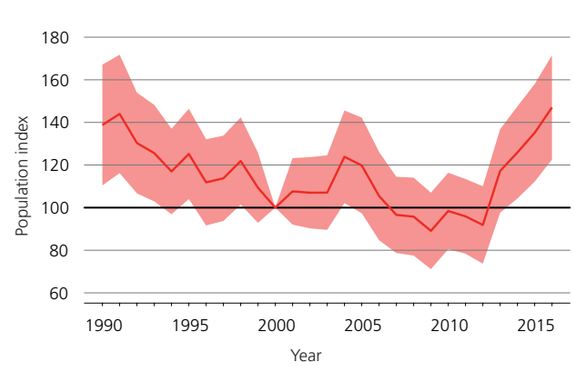
The Common Sandpiper requires broad floodplains with relatively slow-flowing river arms. This is where gravel, sand and silt banks made largely of fine sediment are deposited, allowing pioneer vegetation to develop, which in turn provides nest sites and cover for the chicks. On suitable river stretches, breeding density is about one pair/km, with a maximum of about 2.5 pairs/km. At particularly suitable sites, several pairs may breed in close proximity, forming a kind of colony [4].

Natural threats such as flooding and predation as well as problems caused by humans like recreation pressure, canalisation, hydropeaking from power plants and gravel extraction interfere with the breeding of the Common Sandpiper [5]. Restoration projects on larger rivers offer a glimmer of hope, provided that visitor flow is well managed and enough undisturbed spaces are created. Several examples on the rivers Kander BE, Rhone VS, Reuss UR, Rhine GR, Moesa GR and Inn GR show that the Common Sandpiper is quick to colonise such restored stretches of river and can breed there successfully [AGR, 1, 2, 3, 6].

Hans Schmid

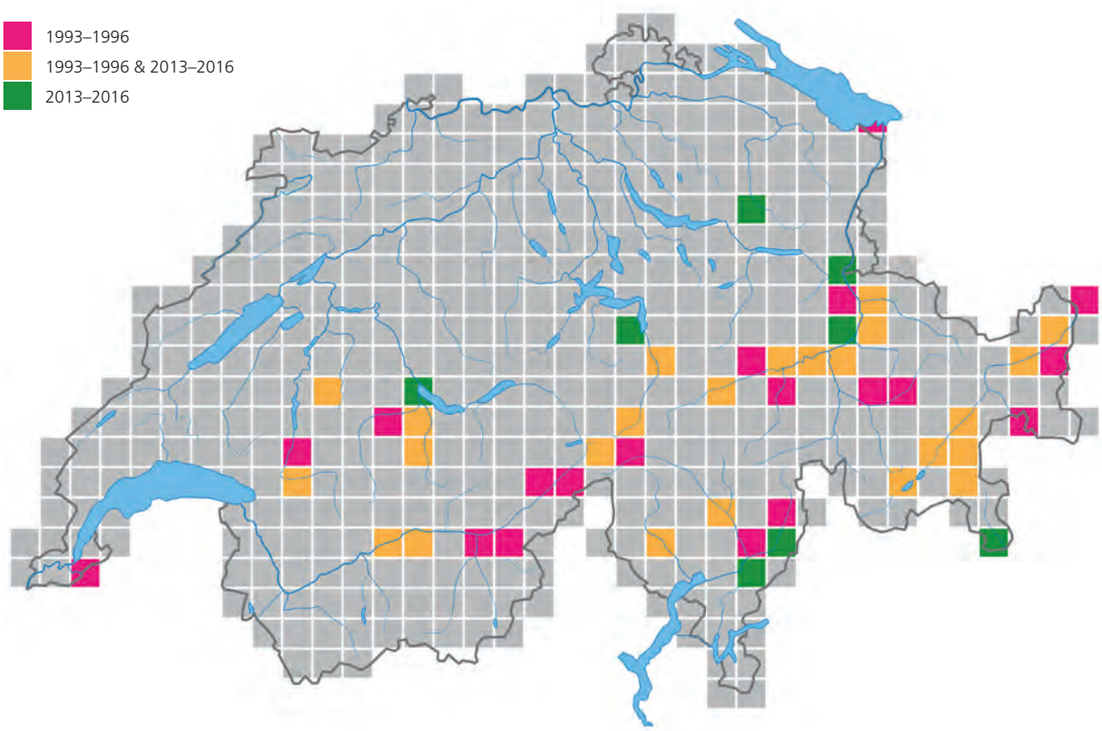
[1] Arlettaz et al. (2011); [2] Ayé et al. (2017); [3] Baumann (2003); [4] Müller (1975); [5] Schmid et al. (2010a–b); [6] Schmid et al. (2016); [7] Zanini et al. (2009)





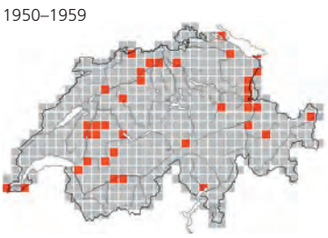
Territories 2013–2016

Distribution change since 1993–1996

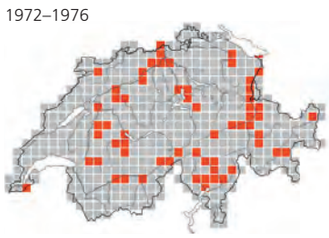


Sponsored by
Malima-Martha Vetsch, Lutzenberg

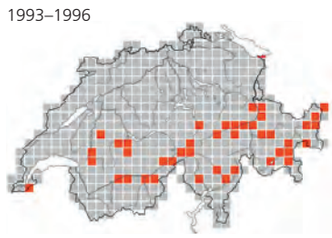
1950–1959



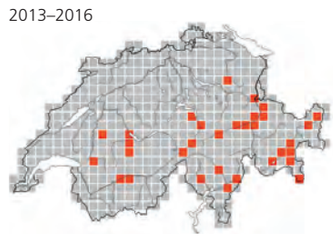
1972–1976



1993–1996



2013–2016



Black-headed Gull

Larus ridibundus
Lachmöwe
Mouette rieuse
Gabbiano comune
muetta rienta

Markus Varesvuo

Red List Endangered (EN)
Population 560–800 pairs (2013–2016)

Focus pages 212, 229, 380

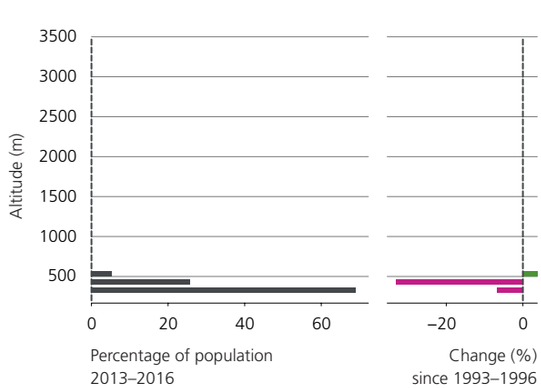
In Switzerland, the Black-headed Gull breeds on a small number of lakes and wetlands on the Central Plateau. Current nest sites are on rafts and platforms, but also artificial islands, piers, dams and, rarely, flooded sedge meadows. In 2013–2016, the population numbered 563–800 pairs per year in 14–16 colonies[8, 9]. The largest colonies in 2013–2016 were on Greifensee ZH, in Les Grangettes VD, near Cheseaux-Noréaz VD and near Rapperswil SG. Colonies in the Rhine delta A totalled 930–1450 pairs (D. Bruderer)[6]. Most breeding sites are located below 500 m. A remarkable breeding attempt took place in 1999 on Lac de Joux VD at 1005 m[VdS].

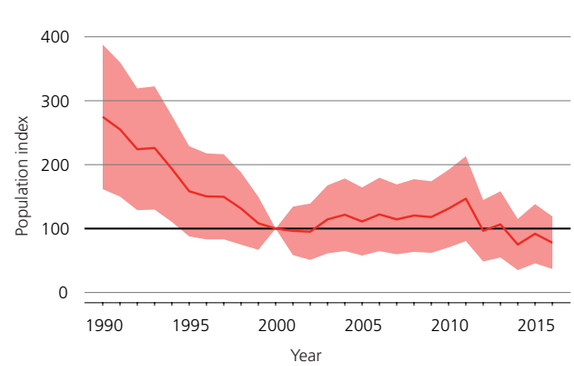
The population in Switzerland increased throughout the 20th century, peaking at 3800 pairs in 1980[HVM]. It subsequently decreased again, numbering 1300–1800 pairs in 1993–1996[AtCH2] and stabilising at about 800 pairs from the year 2000 onwards[9]. Part of the largest colony recorded in 1993–1996 in the Fanel BE/NE relocated first to the breakwaters near Cheseaux-Noréaz (maximum of 270 pairs in 2004) and then to the gravel islands near Vaumarcus NE (maximum of 536 pairs in 2011). In eastern Switzerland, the breeding site in Kaltbrunner Riet SG was abandoned in 2010, but the gravel island near Rapperswil (maximum of 285 pairs in 2007) and the rafts on the Greifensee (maximum of 194 pairs in 2013) were occupied. On Lake Constance, numbers halved from 1980 to 2010[AtBo]. The European population increased significantly until about 1990, but has since dropped again by about 50 %[AtD, AtF, EBCC, RLEU, 3].

A dynamic population trend characterised by the abandonment and relocation of colonies and the establishment of new ones is typical for the Black-headed Gull[AtD, HVM, 4]. Nest-site competition with Yellow-legged Gulls appears to affect populations locally[1, 2, 5, 7, 10, 11]. In the past 20 years, breeding sites have increasingly moved from gravel islands to platforms and rafts, where breeding success tends to be greater. This means that the Black-headed Gull in Switzerland is increasingly reliant on artificial nest sites that require regular maintenance. The Europe-wide decline since the 1980s, which may also affect the Swiss population, is associated with a lack of fledgling food due to intensified agriculture[3, 4].

Claudia Müller

[1] Antoniazza (in prep.); [2] Beaud (2017); [3] Bellebaum (2002); [4] Francesiaz et al. (2017); [5] Keller & Zbinden (1998); [6] Knaus et al. (2016a); [7] Monnier (1998); [8] Müller (2017); [9] Sattler et al. (2015a–d); [10] Skórka et al. (2012); [11] Spiess et al. (2008)



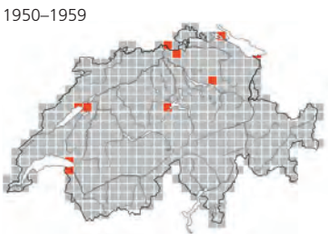


Breeding pairs 2013–2016

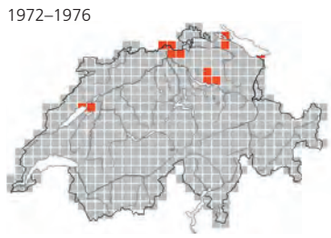
Change in the number of breeding pairs since 1993–1996

Sponsored by

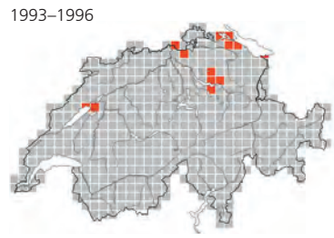
1950–1959



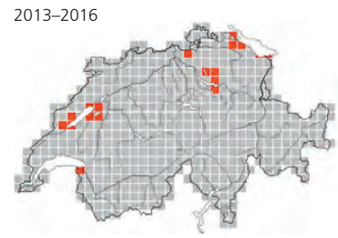
1972–1976



1993–1996



2013–2016



Mediterranean Gull

Larus melanocephalus
Schwarzkopfmöwe
Mouette mélanocéphale
Gabbiano corallino
muetta dal chau nair

Markus Varesvuo

Red List Vulnerable (VU)
Population 0–5 pairs (2013–2016)

Focus page 319

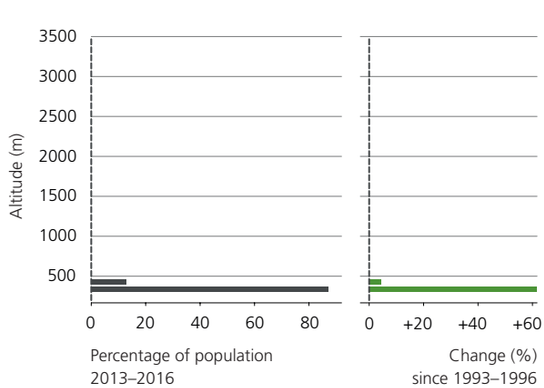
The distribution of the Mediterranean Gull is concentrated around the Black Sea and the Sea of Azov, with scattered pockets throughout Europe as far north as the North Sea and Baltic Sea coasts. During a range expansion beginning in the 1950s to the north and west[2, 12], the species colonised Switzerland in 1969, with the first confirmed brood in Kaltbrunner Riet SG[1]. Further breeding records followed and became quite regular after 1993, always in or on the margins of Black-headed Gull colonies. Between 1973 and 2008, breeding was recorded in 11 years, with 1–3 pairs nesting in the Fanel BE/NE each time; from 2003 to 2012 (except 2011), 1–4 pairs bred annually in Rapperswil SG, and 2–4 pairs were recorded in Vaumarcus NE in 2007 and 2009[AtCH2, VdS, 8, 9, 13].

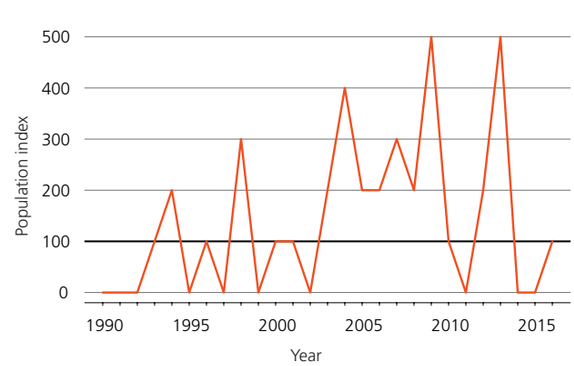
In the 2013–2016 survey period, 2 pairs nested in the Fanel (P. Mosimann-Kampe, J. Hassler)[10] and 3 in Cheseaux-Noréaz VD (M. Antoniazza)[10] in 2013, and 1 pair on Greifensee ZH in 2016 (H. Hächler, P. J. Brändli, H.-U. Dössegger)[7]. Two pairs were suspected to breed in Les Grangettes VD in 2014 (M. Peterz, D. Landenbergue, W. Strahm). In 2017, 1 pair bred in Vaumarcus (H. Joly, M. Antoniazza). In the Lake Constance area, breeding was confirmed for the first time in 1988 on the gravel bars in the Rhine delta A[ABo3]. Subsequently, 1–8 broods were recorded here every year except in 2001, 2010 and 2012. One pair bred in 2013, 7 in 2014, 11 in 2015, as many as 24 in 2016, and 14 in 2017 (D. Bruderer)[4, 5, 11]. Breeding has occurred twice so far on the German side of Lake Constance: in Wollmatinger Ried in 1988[ABo3] and at Radolfzeller Aachmündung in 2001 (S. Schuster)[3].

The future population trend will probably depend on that of the Black-headed Gull. The European trend of the Mediterranean Gull has been negative since 2000. The downturn is a result of declines in Ukraine, which supported almost 90 % of the European population in 2000, as well as in other countries in the East (Russia, Belarus, Greece)[RLEU]. In central and western Europe, the comparatively small populations have been increasing, sometimes significantly, since 1980[AtD, AtF, AtGB, RLEU, 6]. The continued presence of the species will depend on the availability of nesting sites, the protection of gull colonies from disturbance and predators such as rats and foxes, and the food supply near the colonies, especially in grassland.

Claudia Müller

[1] Anderegg (1969); [2] Boschert (2002); [3] Jacoby et al. (2001); [4] Knaus et al. (2015); [5] Knaus et al. (2017); [6] Laber et al. (2016); [7] Müller (2017); [8] Müller & Volet (2010); [9] Müller & Volet (2013); [10] Müller & Volet (2014); [11] Trösch et al. (2013c); [12] van Impe (2005); [13] Volet & Gerber (2009)



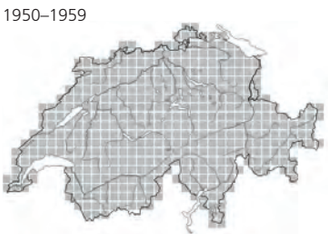


Breeding pairs 2013–2016

Change in the number of breeding pairs since 1993–1996

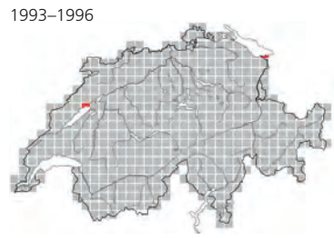
Sponsored by
Daniel Bruderer, Egnach

1950–1959

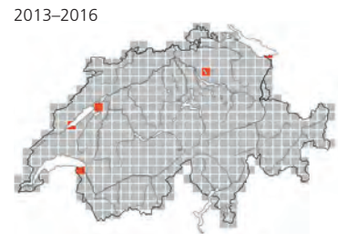


1972–1976

1993–1996



2013–2016



Mew Gull

Larus canus
Sturmmöwe
Goéland cendré
Gavina
muetta da tschendra

Mathias Schäf

Red List Endangered (EN)
Population 0–3 pairs (2013–2016)

Focus –

Following the population increase in northern Europe in the 20th century, the Mew Gull extended its range to central Europe, with pockets of distribution forming in inland wetlands[HVM, VdS]. Breeding was first confirmed in Switzerland in the Fanel BE/NE in 1966[10]. Subsequently, 1–5 pairs bred there every year until 1996 (except 1988) and again in 2000; counts in 1971–1987 recorded 3–7 pairs per year[AtCH2, 4]. In 2007–2011, 1–3 pairs nested near Vaumarcus NE, and 1–2 pairs in 2013–2014 (H. Joly)[5, 8]. In 2012–2013, a breeding pair was observed near Cheseaux-Noréaz VD (M. Antoniazza)[7, 8]. A further pair nested near Steinach SG on Lake Constance in 2011 (F. Portala, C. Thielen, R. Jenni)[6]. No breeding has been recorded since 2015. The wintering population in Switzerland is also in decline[9].

In the Lake Constance area, 1–4 breeding pairs were regularly observed in the Rhine delta A[ABo3, VdS] following the first confirmed breeding in 1959[AtCH1]. Four pairs bred in this area in 2013, and one pair per year in 2015–2017 (D. Bruderer)[2, 3, 11]. In Germany, numbers increased up until 2000 and have been constant since then[AtD]. The small French population has been stable in the past decades. Since 1966, the Mew Gull has bred in small numbers at the Dranse river mouth F on Lake Geneva[AtF, 1]. In Europe as a whole, the declining trends appear to predominate[RLEU].

Claudia Müller

[1] Camberlein (2010); [2] Knaus et al. (2015); [3] Knaus et al. (2017); [4] Monnier (1998); [5] Müller (2015); [6] Müller & Volet (2012); [7] Müller & Volet (2013); [8] Müller & Volet (2014); [9] Sattler et al. (2015a–d); [10] Thönen & Roux (1967)/Roux & Thönen (1967); [11] Trösch et al. (2013c)

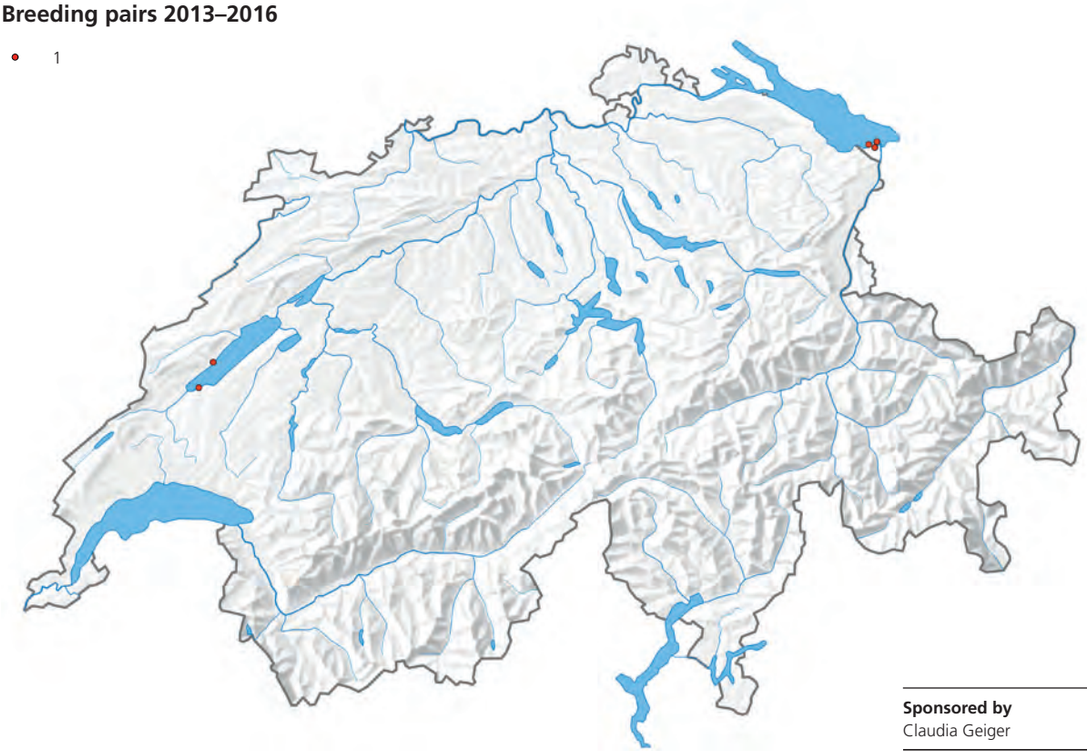
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Claudia Geiger

Lesser Black-backed Gull

Larus fuscus
Heringsmöwe
Goéland brun
Zafferano
muetta fustga

Mathias Schäf

Red List –
Population 0 pairs (2013–2016)

Focus –

The Lesser Black-backed Gull mainly breeds on the European coasts from Portugal and Iceland to the Kola Peninsula. In Switzerland, it has so far only formed mixed pairs with the Yellow-legged Gull, with the exception of a pair of Lesser Black-backed Gulls that built a nest but produced no eggs in the Fanel nature reserve BE/NE in 1985 [10]. Mixed broods first occurred in 2006–2007 and 2009–2010 in the Yellow-legged Gull colony in the Fanel (P. Rapin, B. Monnier, M. Antoniazza) [5, 6, 14, 15]. In 2012, a mixed brood was recorded in the Yellow-legged Gull colony in the Reuss delta UR (H. Schmid) [7]; in 2013–2015, there was only indication of a single case of mixed breeding (H. Schmid, B. Volet) [3, 4, 8]. On Lake Constance, mixed broods were recorded in 2010 and 2012–2015 near Bad Schachen/Bodholz D, first on a floating swim platform, then on a buoy [2, 9, 11, 13]. Similarly, mixed pairs bred on a buoy near Lindau D in 2011 and 2016 [9, 12].

Owing to the population increase on the Dutch and German North Sea coast, the Lesser Black-backed Gull extended its range to inland areas in Germany in the 1990s [AtD]. Mixed broods occurred at the expansion front, but disappeared again as the gulls became more abundant [AtD]. In France, the Lesser Black-backed Gull has also colonised some inland areas in the past 30 years [AtF, 1]. The global population trend has been positive in recent years [RLEU].

Claudia Müller

[1] Dubois et al. (2017); [2] Knaus et al. (2014); [3] Müller (2015); [4] Müller (2016); [5] Müller & Volet (2010); [6] Müller & Volet (2011); [7] Müller & Volet (2013); [8] Müller & Volet (2014); [9] A. Puchta, in litt.; [10] Thönen (1986); [11] Trösch et al. (2010); [12] Trösch et al. (2011); [13] Trösch et al. (2012); [14] Volet & Gerber (2008); [15] Volet et al. (2007)

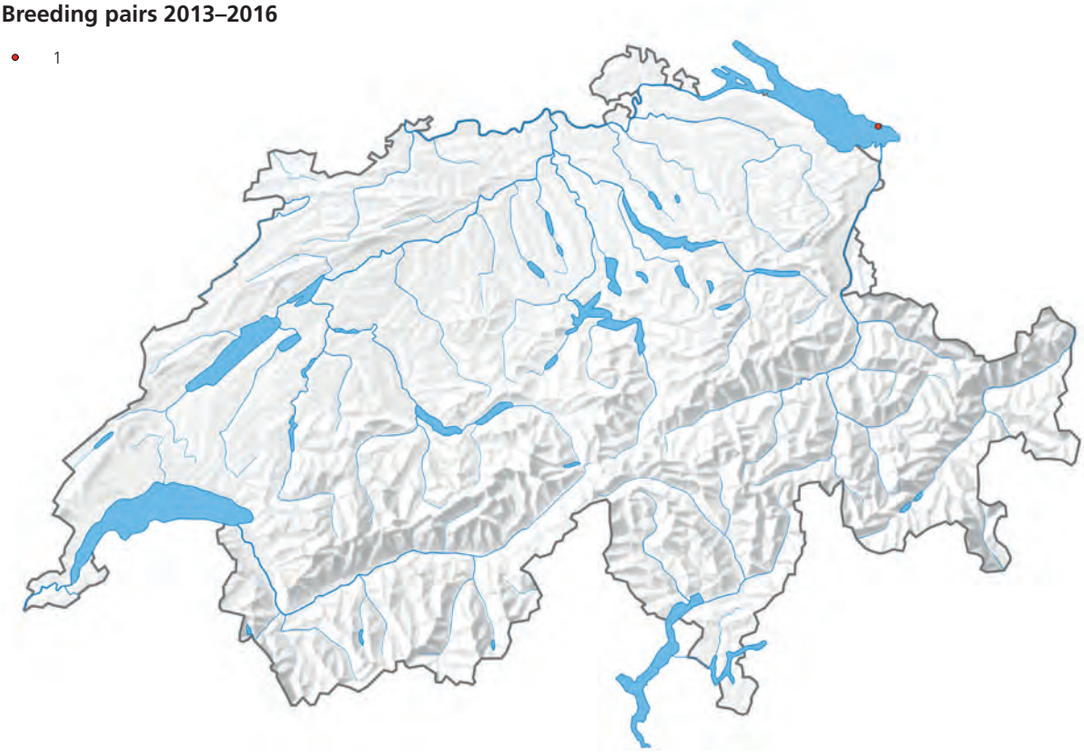
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Yellow-legged Gull

Larus michahellis
Mittelmeermöwe
Goéland leucophée
Gabbiano reale
muetta d'argient mediterrana

Daniele Occhiato

Red List Least Concern (LC)
Population 1240–1430 pairs (2013–2016)

Focus pages 156, 170, 229, 284, 319

The range of the Yellow-legged Gull mainly covers northwestern Africa and the Mediterranean, though it increasingly occurs in inland regions of western, central and southern Europe. In Switzerland, the Yellow-legged Gull now breeds on almost all larger lowland lakes and rivers. In 2013–2016, the population numbered 1243–1431 pairs at 49–77 locations[4, 9]. Lake Neuchâtel is the most important breeding site, accommodating 80 % of the population, including about 660 pairs in the Fanel BE/NE and about 350 pairs near Cheseaux-Noréaz VD. Other large colonies are found in the Reuss delta UR (about 90 pairs) and on Flachsee Unterlunkhofen AG (about 55 pairs). Since 2005, the highest breeding site has been on Lac de la Gruyère FR at 670 m (M. Beaud)[10].

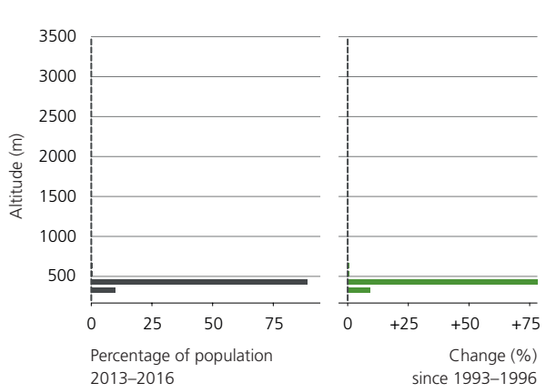
The Yellow-legged Gull is a flexible breeder, nesting on islands, platforms, rafts and piers, more rarely on posts, diving towers, buoys and boats as well as, more recently, in cliffs (G. Banderet, M. Beaud)[7] and trees (H. du Plessix)[5]. Two pairs were recorded nesting on rooftops for the first time near Versoix GE in 1994[1]. Roof nesting has increased considerably in recent years, from 37 nests on 25 buildings in 2013 to 104 nests on 66 buildings in 2016[4]. These were mostly single nests on flat, gravel-covered roofs (sometimes vegetated), although 36 pairs were counted on a roof near Allamann VD in 2016 (D. Morel, J. Duplain)[4].

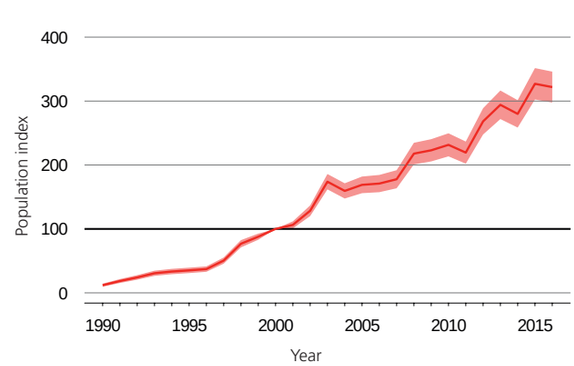
Switzerland was colonised via the Rhone Valley following a marked population increase in the Mediterranean region. Breeding was confirmed for the first time in the Fanel in 1968[3, 8]. Up until 1993–1996, the species mainly occupied the western part of Lake Geneva and the Rhone. The expansion has since continued, reaching Lago Maggiore in 1997, Lake Lucerne in 2000, Greifensee and Lake Zug in 2003[VdS], Lake Thun in 2004, Lake Brienz and Pfäffikersee in 2005, Walensee in 2010, Lake Zurich in 2011 and Lake Sempach in 2016. The breeding population in 2016 was almost ten times that of 1993–1996.

The European population is also increasing[RLEU]. In France, the species has spread inland since 1985, while numbers decreased on the Mediterranean coast in particular in 2001–2012[AtF]. In Germany and Austria, populations are increasing and expanding their range, though they are still quite small[AtD, 2]. Italy also reports a positive long-term trend[6].

Claudia Müller

[1] Albrecht (1996); [2] Dvorak et al. (2017); [3] Géroudet (1968); [4] Müller (2017); [5] Müller & Volet (2013); [6] Nardelli et al. (2015); [7] Posse (2014); [8] Roux & Thönen (1968); [9] Sattler et al. (2015a–d); [10] Volet & Burkhardt (2006)



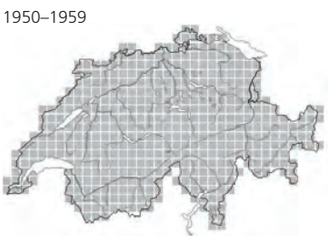


Breeding pairs 2013–2016

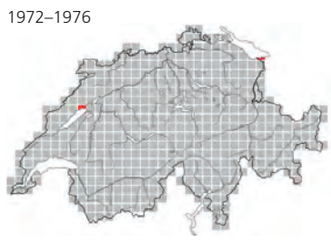
Change in the number of breeding pairs since 1993–1996

Sponsored by

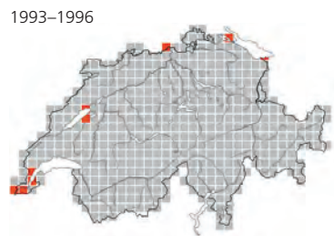
1950–1959



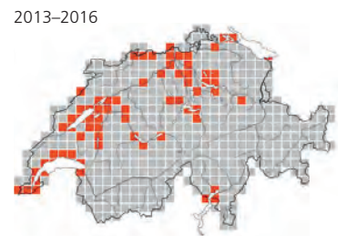
1972–1976



1993–1996



2013–2016



Arctic Tern

Sterna paradisaea
Küstenseeschwalbe
Sterne arctique
Sterna codalunga
pestgarel arctic

Marcel Burkhardt

Red List –
Population 0–1 pairs (2013–2016)

Focus page 369

The Arctic Tern's breeding range is in the northern hemisphere. In Europe, it includes the British Isles, the North Sea and Baltic coasts, and Fennoscandia. In 1988, up to three adult Arctic Terns and two first-year birds summered in the Rhine delta A[5]. In 1992, the first mixed brood with a Common Tern in an inland region of central Europe was observed on the Ammersee D[2]. Mixed pairs were also found in the Rhine delta in 2011–2013. Following a failed attempt in 2011, breeding was successful in 2012 and 2013[1]. In 2014 and 2015, a pair of Arctic Terns nested for the first time in Switzerland in the nature reserves Chablais de Cudrefin VD and Fanel BE: three failed attempts took place in 2014; in 2015, two nestlings only survived for about ten days (C. Jaberg, P. Mosimann-Kampe et al.)[3, 4]. A mixed Arctic Tern and Common Tern pair bred successfully in the same area in 2017 (C. Jaberg et al.).

The German population numbered 4000–4900 pairs in 2005–2009 and has been declining since 1985[AtD]. Breeding attempts have become irregular in France[AtF]. The global and European trends are negative, while populations in northern Europe are mostly stable or increasing[RLEU]. Threats include a decreasing food supply, presumably due to overfishing and global warming; locally, populations are also threatened by increased predation and disturbance[AtD, HBW, 6].

Claudia Müller

[1] Bruderer (2014); [2] Deutsche Seltenheitenkommission (1994); [3] Marques & Thoma (2015)/ Marques et al. (2015); [4] Martinez & Maumary (2016a–b); [5] Ranner et al. (1995); [6] Vigfusdottir et al. (2013)

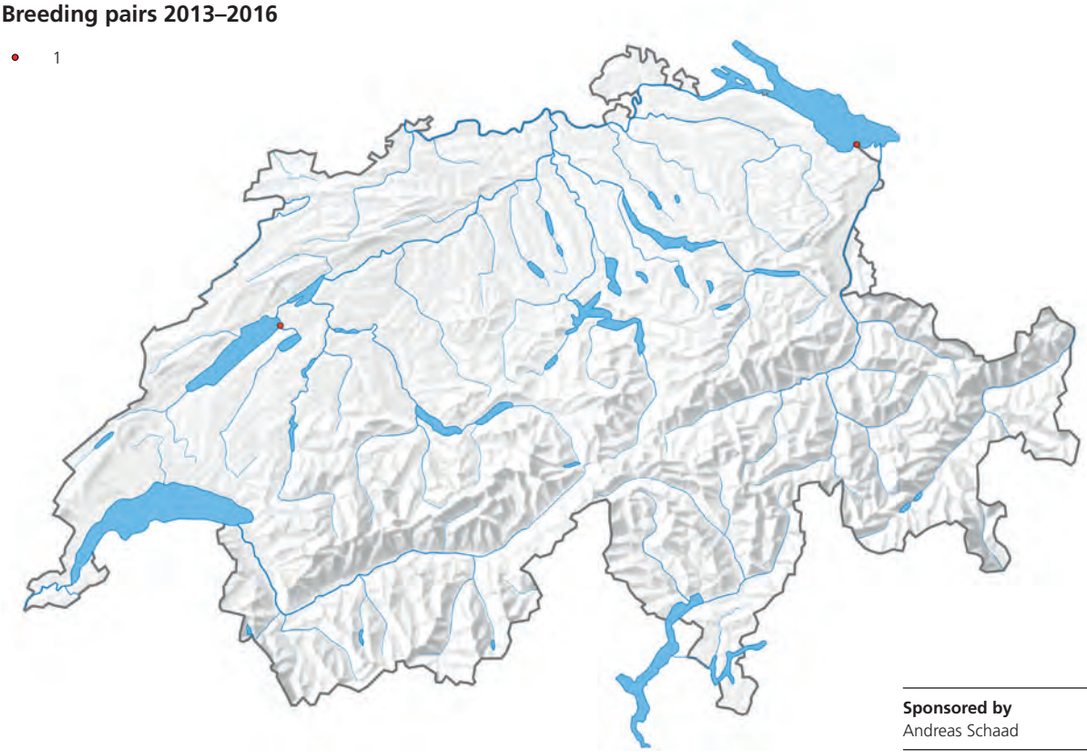
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Andreas Schaad

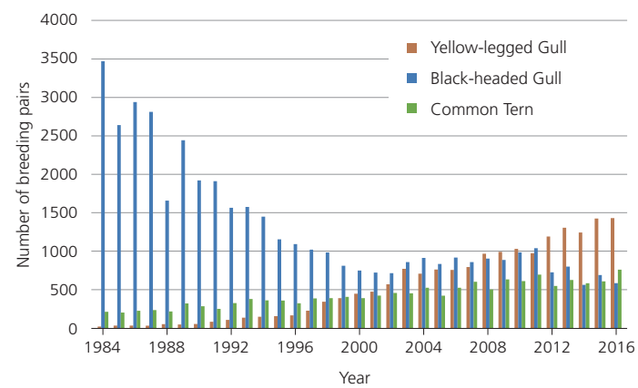
Nesting sites for gulls and terns

Gulls and terns breed in the transition zone between land and water. Breeding in colonies on islands allows them to defend collectively against predators from the air or protect the site against competitors. Today, most gulls and terns depend on artificial nesting sites.

In the past centuries, river engineering works have massively altered the shores of rivers and lakes in Switzerland. The Common Tern bred on gravel bars in over 30 sites in the early 20th century, but these breeding sites were subsequently lost. The population reached its low point in 1952, when only a single colony remained in the Fanel BE/NE [BCH, 4]. With the construction of artificial gravel islands (from 1929 in the Fanel) and the provision of nesting rafts and platforms (from the 1970s in all parts of the Central Plateau), a growing number of alternative breeding sites were made available [3]. The population subsequently increased from 47 pairs in 1948 [4] to 218 pairs in 1976. As further nesting sites were provided from 1990 onwards, numbers grew to the current level of 600–700 pairs [3, 5, 6]. In 2015, nesting by Common Terns was encouraged on a flat roof by Lake Zurich and resulted in breeding success [8].

The first Swiss colony of Black-headed Gulls was discovered in 1865 in the Kaltbrunner Riet SG, where the gulls nested on tufts of sedges [VdS, 7]. Other natural wetlands in northeastern Switzerland and in the Fanel were colonised between 1925 and 1974. After 1965, the colonies gradually moved to the newly created gravel islands. The population increased significantly, reaching a maximum of 3800 pairs in 1980 [HVM]. In a pattern similar to neighbouring areas across the border, it then decreased again, stabilising at about 500–1000 pairs from the year 2000.

The Yellow-legged Gull colonised Switzerland from 1968, and numbers remained low for a long time before increasing steadily after 1997 to currently about 1400 pairs. The species has spread across the entire Central Plateau. In 1994, the first two Swiss records of roof nesting by Yellow-legged Gulls were confirmed near Lake Geneva [1]. Roof nesting was recorded in other places as well from 2002 onwards. While most records relate to a single pair per building, a colony on a flat roof near Allaman VD grew to 45 pairs by 2017 (J. Duplain), and nests were found on 35 different buildings in Neuchâtel in 2016 (M. Zimmerli) [5].



Today, Black-headed Gull, Common Tern and Yellow-legged Gull nest almost exclusively on artificial structures, but their population trends since 1984 vary greatly.

Today, all gulls and terns nest on artificial structures, either roofs or specially provided nest sites. Several measures exist to reduce nest-site competition between different species. For example, the Yellow-legged Gull, a dominant species and early breeder, can be prevented from occupying a site by waiting for the arrival of Black-headed Gulls and Common Terns before launching rafts and gradually removing winter covers from platforms [2].

The species are adapted to changing habitats and are flexible in their choice of nesting sites. So that all species can breed side by side and spill over to alternative sites if predation pressure is great, a large enough network of nesting sites is required, similar to the natural sites that used to exist on rivers.

Claudia Müller

Pascal Rapin

Platform near Salavaux VD on Lake Murten with nesting Black-headed Gulls (and one Common Tern).

[1] Albrecht (1996); [2] Beaud (2017); [3] Bruderer & Schmid (1988); [4] Knopfli (1955–1956); [5] Müller (2017); [6] Müller & Volet (2012); [7] Noll-Tobler (1909); [8] Ritschard (2015a)

Species pages 220, 226, 230

Common Tern

Sterna hirundo
Flussseeschwalbe
Sterne pierregarin
Sterna comune
pestgarel da flum

Marco Savoldelli

Red List Near Threatened (NT)
Population 580–760 pairs (2013–2016)

Focus pages 212, 229, 380

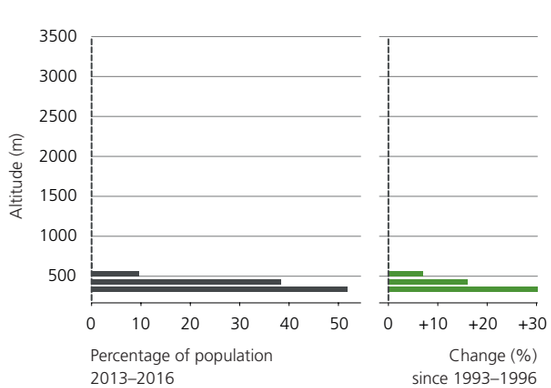
The Common Tern breeds on lakes and dammed rivers on the Central Plateau. Today, it nests almost exclusively on artificial gravel islands, platforms and nesting rafts, rarely at river mouths, on poles and, since 2015, on gravel-covered roofs. In 2013–2016, the population numbered 583–760 breeding pairs in 17–21 colonies[9, 13]. The largest colonies were in the Fanel nature reserve BE/NE, on Lengwiler Weiher TG and on Lake Murten. Around Lake Constance, there were large colonies in the Rhine delta A with 257–319 pairs per year (D. Bruderer)[6, 7] and in Wollmatinger Ried D with 56–67 pairs (H. Jacoby, S. Werner)[6, 7]. Since 1996, the highest breeding site has been on Lac de la Gruyère at 670 m[VdS, 1].

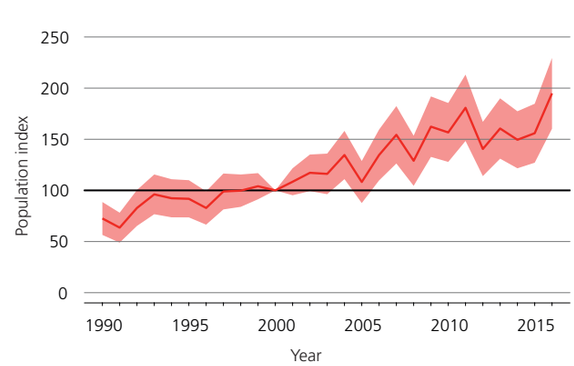
More than 30 colonies on gravel bars were known in the early 20th century, but they disappeared in the 1930s and 1940s[AtCH0]. In 1952, the only remaining colony in Switzerland was in the Fanel; it survived thanks to an artificial island created in 1929[BCH]. Since then numbers have increased again: in 1976, there were 218 pairs in three colonies, and in 1993–1996, 340–380 pairs formed 10–15 colonies[AtCH2]. The population subsequently doubled thanks to the provision of further platforms and rafts, and new sites were colonised on lakes Geneva, Neuchâtel, Murten, Greifensee and Pfäffikersee as well as in Neeracherried ZH[10]. In Horgen ZH (since 2015) and Zollikon ZH (2016) breeding occurred for the first time on flat roofs[12]. Only five sites have been abandoned since 1993–1996. The population on Lake Constance more than tripled between 1990 and 2010[AtBo]. The past two decades have also seen positive trends in France, Austria and Europe as a whole[AtF, RLEU, 4]. Numbers have remained stable in Germany[AtD] while decreasing in Italy[11].

The collapse of the population up until the 1950s was a consequence of the loss of natural breeding sites due to river engineering works. Alternative nest sites were made available with the provision of artificial gravel islands from 1929 and gravel-covered platforms and nesting rafts from the 1970s[AtCH0, 3]. Today, Common Terns in Switzerland rely on an adequate supply of artificial, undisturbed nest sites that are regularly maintained and allow colonies to relocate when predation pressure or competition for nest sites is high[2, 5, 8, 14].

Claudia Müller

[1] Beaud (2001); [2] Beaud (2017); [3] Bruderer & Schmid (1988); [4] Dvorak et al. (2017); [5] Keller & Zbinden (1998); [6] Knaus et al. (2014); [7] Knaus et al. (2016a); [8] Monnier (1998); [9] Müller (2017); [10] Müller & Volet (2012); [11] Nardelli et al. (2015); [12] Ritschard (2015a); [13] Sattler et al. (2015a–d); [14] Zintl & Gehrold (2016)



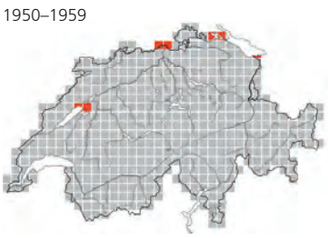


Breeding pairs 2013–2016

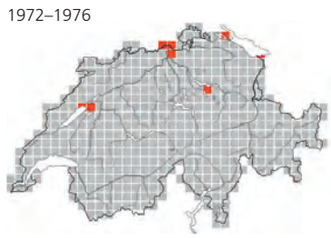
Change in the number of breeding pairs since 1993–1996

Sponsored by
Family Kobel-Wehinger, Bolligen
Anonymous donor

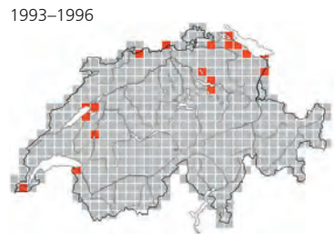
1950–1959



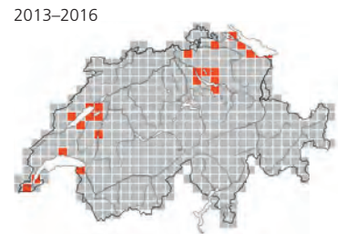
1972–1976



1993–1996



2013–2016



Common Barn-owl

Tyto alba
Schleiereule
Effraie des clochers
Barbagianni
tschuetta velada

Mathias Schäf

Red List Near Threatened (NT)
Population 200–1000 pairs (2013–2016)

Focus pages 212, 264

In Switzerland, the Common Barn-owl is found mainly on the Central Plateau, in the Ajoie region JU and in the northeastern Jura. It occurs in open farmland where it lives in close proximity to humans. Most of the population occurs below 600 m. While broods have been observed at altitudes of up to 1020 m [VdS], the highest current breeding sites were recorded at 800 m near Steinenbrünnen/Schwarzenburg BE (S. Scherz) and Müswangen LU (M. Koller) as well as at 790 m near Lignerolle VD (Y. Menétrey). As it feeds mainly on small mammals, the Common Barn-owl favours highly structured landscapes with hedges, orchards and shrub belts. It nests in nest boxes or in buildings [1].

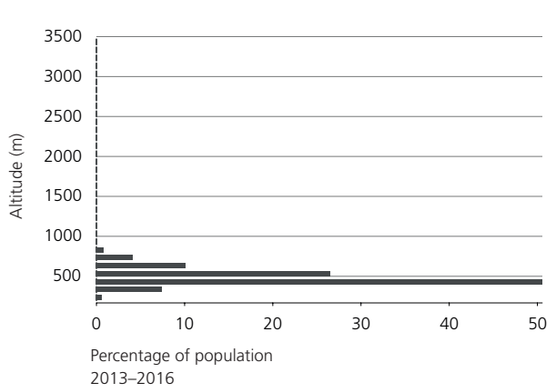
The species' population density depends heavily on winter weather and the availability of small mammals. In cold winters with lots of snow, numbers can decline sharply [3, 7]. Near Payerne VD, 131 broods were found in 2012, and only 12 the year after that; the population then steadily recovered (143 broods in 2016; A. Roulin). The highest densities are found in the western Lake Geneva region, the Broye Valley and the Ajoie JU. High breeding success helps populations recover rapidly from previous declines. In years when small mammals are abundant, 14 % of males and 50 % of females raise two broods [6].

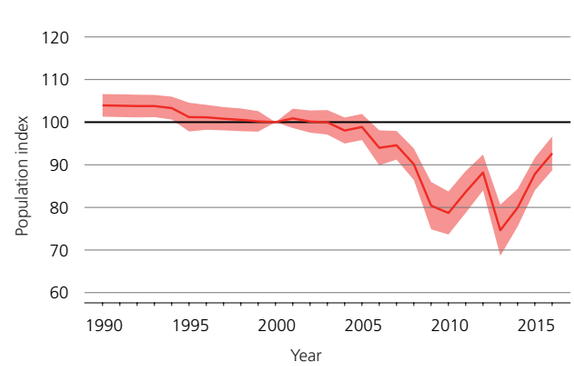
The overall Swiss population seems to be fairly stable since the 1990s, apart from short-term fluctuations [2, 3, 7, 8]. France and Germany report similar trends [AtD, AtF]. Harsh winters can cause local Barn-owl populations to disappear temporarily, as the comparison with 1993–1996 illustrates: in the current survey, the species was absent from some locations, especially at higher altitudes (Pre-Alps, Jura). It has also disappeared from the Rhone Valley VS. Across Europe, the harsh winters in 2009 and 2013 had a negative impact on the population size in subsequent years [AtD, AtF, 7, 8]. Abandoned areas can be recolonised through migration and interaction with less affected populations [2].

The Common Barn-owl benefits from nest boxes and from the creation of wildflower strips, herb fringes and hedges [4, 5], which improve the year-round availability of food.

Bettina Almasi

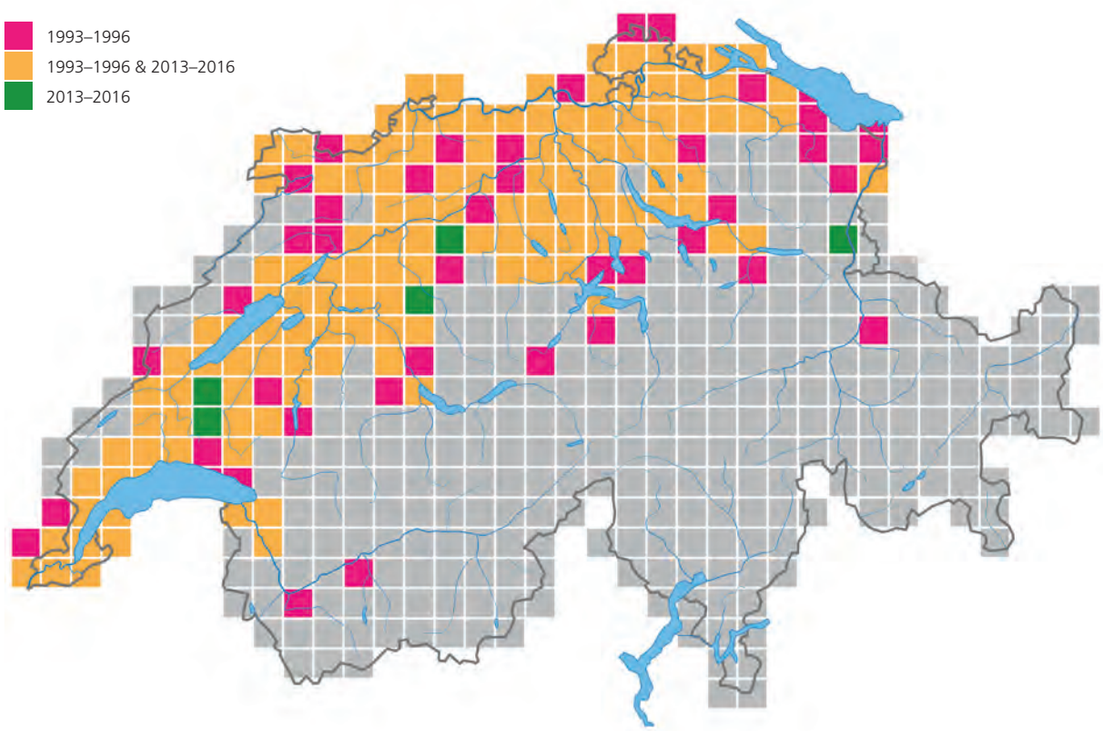
[1] Almasi et al. (2015); [2] Altwegg et al. (2003); [3] Altwegg et al. (2006); [4] Arlettaz et al. (2010a); [5] Aschwanden et al. (2007); [6] Béziers & Roulin (2016); [7] Chausson et al. (2014); [8] Michler et al. (2016a–b)





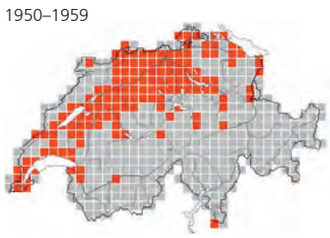
Occurrence 2013–2016

Distribution change since 1993–1996

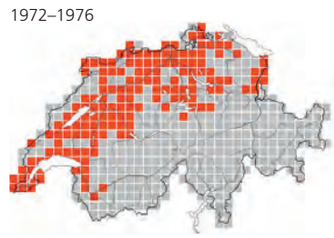


Sponsored by
Verena Buser, Wädenswil
Erich & Claudia Voggensperger, Schönenbuch

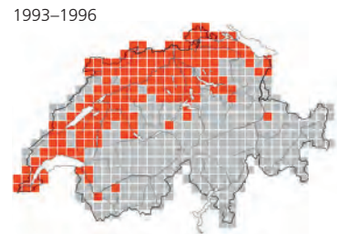
1950–1959



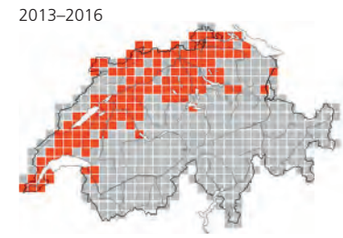
1972–1976



1993–1996



2013–2016



Agriculture has a responsibility for bird conservation

The federal government has defined target and characteristic species that merit special conservation efforts in agricultural environments. Despite the government objectives, these species have undergone a marked decline. The available instruments such as biodiversity promotion areas and habitat connectivity projects are suitable, but need to be implemented much more rigorously.

Like in most European countries, the pressure on biodiversity in Switzerland is particularly intense in agricultural habitats. Many species have declined significantly since the 1950s, and so the number of farmland breeding birds on the Red List is particularly high [RLCH]. Great Grey Shrike and Woodchat Shrike, two typical farmland species, have gone completely, and Grey Partridge and Ortolan Bunting are on the verge of disappearing.

Biodiversity promotion areas

In the past decades, the federal government has made several instruments available to stop the decline and pave the way for positive trends. Since the 1990s, farmers have received direct payments only if they adhere to certain ecological requirements. These regulations require farmers to allocate at least 7 % of farmland to biodiversity promotion areas (for special crops such as wine or vegetable growing the requirement is only 3.5 %). These are areas managed at low intensity to promote species diversity. They most frequently consist of low-intensity meadows (no fertiliser, late mowing), traditional orchards, and hedgerows. Biodiversity promotion areas are classified into two quality levels determined either by the occurrence of certain indicator plants (e.g. in the case of low-intensity meadows) or by habitat structures (e.g. in the case of traditional orchards and hedgerows). Farmers receive direct payments for designating biodiversity promotion areas. Since 2000, they can earn additional subsidies if they establish these areas according to a regional concept. These habitat connectivity projects define quantitative targets regarding the number and quality of the various types of biodiversity areas. In 2016, farmers on average registered 17.6 % of their farmland as biodiversity promotion areas [7]. On the Central Plateau, this corresponds to 20 000 ha of high-quality sites (quality level II plus wildflower plots and rotational fallows). However, back in 1995, the Swiss Landscape Concept declared a target of 65 000 ha of high-quality habitats on the Central Plateau [8]. That means that two thirds of the desired high-quality areas are still missing today.

Typical farmland species under pressure

The objective of biodiversity promotion areas is to enhance species diversity. The farmland species selected for special protection are listed in the federal government's «Environmental Objectives in Agriculture» (EOA) [2]. Among breeding birds, 29 species are classified as target species and 18 as characteristic species. Target species populations are to be conserved and promoted in their natural area of distribution – the efforts thus focus on direct conservation measures. The populations of characteristic species are to be supported by providing sufficiently large and well-distributed areas of suitable, high-quality habitat [2]. Characteristic species are thus considered representatives of an ecological community.

Distribution in 2013–2016 of 47 breeding bird species included in the «Environmental Objectives in Agriculture» (EOA). The map combines all species maps.

The combined distribution map of all EOA species in 2013–2016 shows that the largest number of species are found in the western part of the Central Plateau, especially in the Champagne genevoise and the Seeland BE/FR. Biodiversity promotion areas have repeatedly been proven to have a positive impact on local biodiversity [11, 13, 17]. Birds also benefit, especially from high-quality areas [1, 2, 4, 14, 15, 16, 19, 20]. While certain species such as Red Kite, Eurasian Green Woodpecker, Common Kestrel and Common Stonechat have increased in large parts of the country since 1990, there has been an overall decline of EOA species since 1993–1996, as the map illustrating occurrence change since 1993–1996 shows. Gains have only been recorded in certain locations, such as the Orbe plain VD and the Ajoie JU. Interestingly, positive changes have also been reported in farmland areas that have undergone extensive ecological restorations in the past decades, such as the Geneva region [3, 12], the Seeland [5, 6] and the Klettgau SH [16]. Species that benefit from such measures include Common Whitethroat, Stonechat, Red-backed Shrike and Yellowhammer. In contrast, the occurrence change maps show that ecologically enhanced grassland areas (e.g. Wauwiler Ebene LU [9, 10] or the Rhine Valley in the Canton of St. Gallen [18]) do only slightly better than the surrounding areas.

Lukas Pfiffner

Wildflower plots are especially effective biodiversity promotion areas when it comes to the conservation of birds. The picture shows a four-year-old, richly structured area in the foreground. The tall stems serve as song perches for the Common Stonechat. Further in the background, poppies dominate the patchier, one-year-old plant growth.

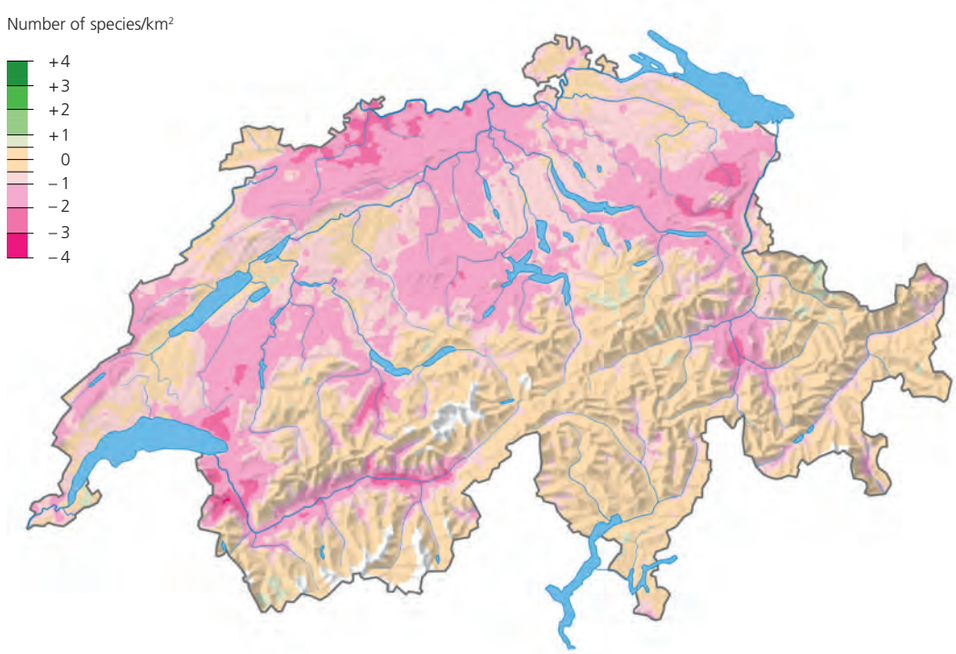
Further efforts are necessary

Overall, the decline of farmland birds has continued throughout the country. We are a long way from achieving the federal conservation goal for EOA species. Nevertheless, several positive examples demonstrate that the conservation of EOA species is achievable using the available instruments (biodiversity promotion areas, habitat connectivity projects etc.). We have failed to do so in large parts of the country because the importance of reaching quality level II on biodiversity promotion areas has been underestimated, and because the connectivity projects are insufficiently oriented towards the needs of target species.

Simon Birrer

[1] Aschwanden et al. (2005); [2] BAFU & BLW (2008)/OFEV & OFAG (2008); [3] Birrer & Oppermann (2012); [4] Birrer et al. (2013a); [5] Birrer et al. (2013b); [6] Birrer et al. (2016); [7] BLW (2016)/OFAG (2016)/UFAG (2016); [8] BUWAL (1995); [9] Graf (2016); [10] Graf (2017); [11] Herzog et al. (2005); [12] Jenny et al. (2002a–b); [13] Kampmann et al. (2012); [14] Martinez & Birrer (2017); [15] Martinez et al. (2017); [16] Meichtry-Stier et al. (2014); [17] Roth et al. (2008); [18] Rudin et al. (2010); [19] Zellweger-Fischer et al. (2018); [20] Zollinger (2017); [21] Zollinger et al. (2013)

Species pages 102, 266, 286, 302, 312, 317, 318, 426, 480, 554, 558



In Switzerland, farmland birds are among the most vulnerable species: distribution change since 1993–1996 of EOA species. The map is a combination of distribution change maps for 35 species (not including Corncrake, Eurasian Curlew, Common Snipe, Common Barn-owl, Eurasian Scops-owl, Northern Long-eared Owl, Common Hoopoe, Woodchat Shrike, Marsh Warbler, Collared Flycatcher, Western Yellow Wagtail and Ortolan Bunting, for which no maps are available).

Eurasian Pygmy-owl

Glaucidium passerinum
Sperlingskauz
Chevêchette d'Europe
Civetta nana
tschuetta nanina

Marcel Burkhardt

Red List Least Concern (LC)
Population 800–2000 pairs (2013–2016)

Focus pages 264, 542

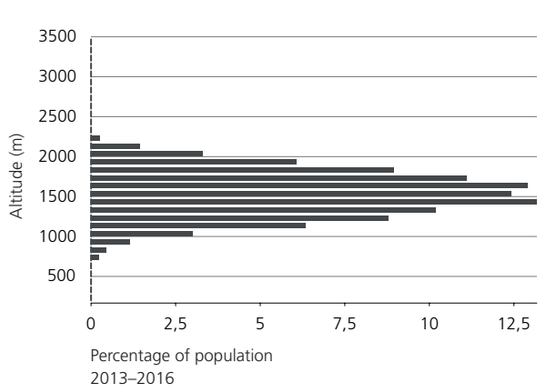
The Eurasian Pygmy-owl inhabits the coniferous forest belt of Eurasia and is found in many of Europe's mountain ranges. In Germany and in Alsace, populations are found in the lowlands as well [AtD, AtF]. In Switzerland, its breeding range used to be limited to the Alps and western Jura. Since 1993–1996, a significant expansion has taken place. The expansion is visible in the northwestern Jura in particular, and is not due to increased survey effort. There were also some new records in the Zurich Unterland and Canton of Schaffhausen. These are located in between the Alpine and Black Forest populations [AtD]. A range expansion was recorded in neighbouring countries as well [1]. In the French Jura, for example, locations to the northeast of the known range are now occupied [4]. In the Alps, Pygmy-owls were also found in many more atlas squares than in 1993–1996, though this is probably due to increased observer effort.

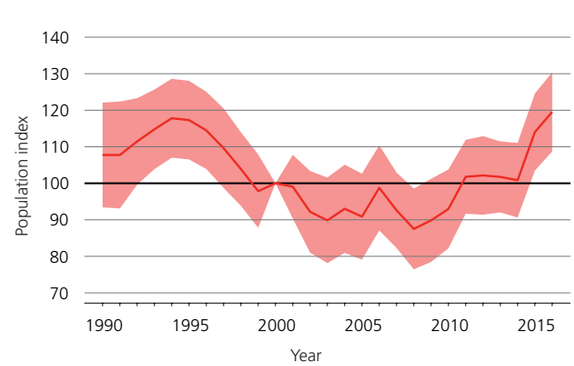
In Switzerland, most pairs breed at altitudes between 1100 and 2000 m in high-montane and subalpine coniferous forests. The highest breeding site was recorded at 2180 m near S-charl GR in 2016 (M. Ernst). The lowest breeding site was found at 560 m near Winterthur ZH in 2013 (H. von Rohr, A. Weiss, R. Furrer, L. Morf, L. Hübscher et al.) [9], and the lowest territories were detected at 370 m near Rheinau ZH in 2014–2015 (S. Baumann, H.-U. Dössegger, P. Mächler, P. Nietlisbach, B. Vögeli) [7, 8]. The range expansion in the French Jura coincided with the colonisation of lower altitudes there as well; singing males were heard at 520 m [4]. The Vosges mountains accommodate a small population with 60–120 territories [5]. In this area, the Eurasian Pygmy-owl also breeds in mixed oak forests at 245–280 m [6]. In Switzerland, however, richly structured coniferous forests are its main habitat [2].

Density is subject to large annual fluctuations. On a surface area of 126 km² in the Vaud Jura, including 85 km² of woodland, between 1 and 53 singing males were found every year. At a smaller scale, a maximum of four pairs was found on 3.8 km² [3]. The national population index shows no trend. Maintaining large areas of richly structured forest managed at low intensity and containing old-growth stands is an important conservation measure for the Eurasian Pygmy-owl.

Simon Birrer

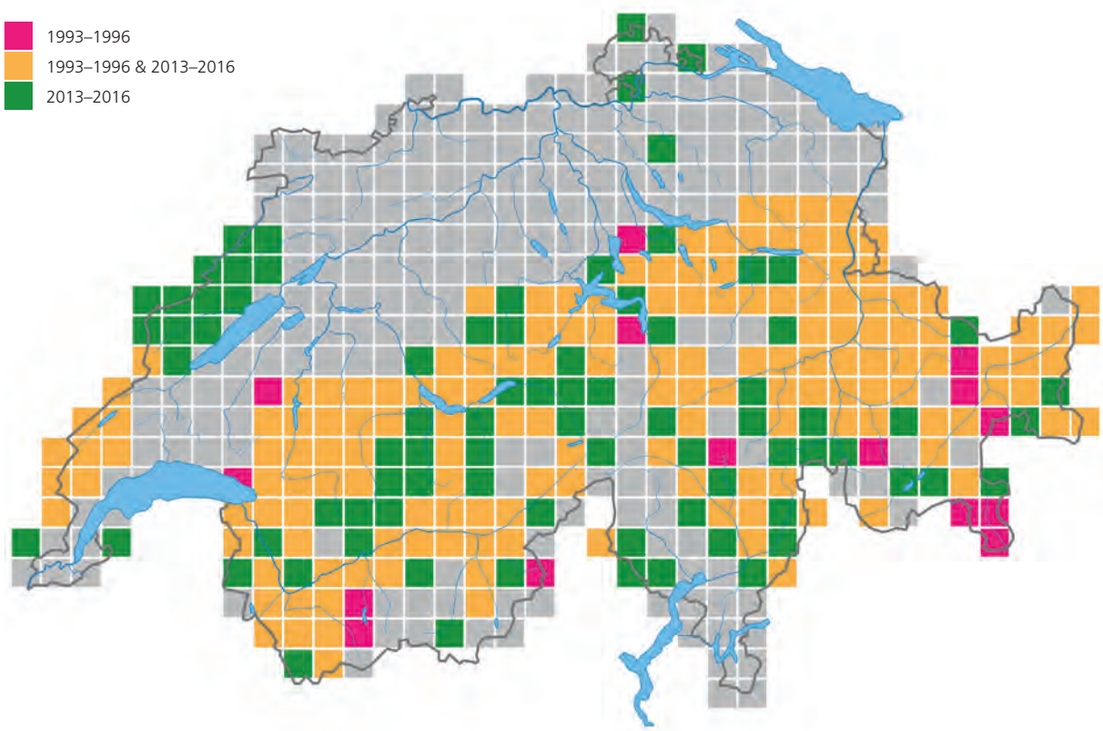
[1] Bauer et al. (2016a); [2] Henrioux et al. (2003); [3] Henrioux et al. (2016); [4] Michelat & Gauthier-Clerc (2016); [5] Muller (2011a); [6] Muller (2014b); [7] Müller (2015); [8] Müller (2016); [9] Müller & Volet (2014)





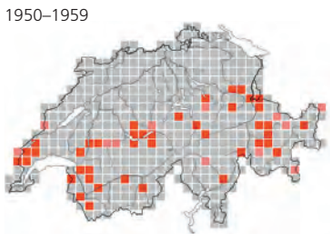
Occurrence 2013–2016

Distribution change since 1993–1996

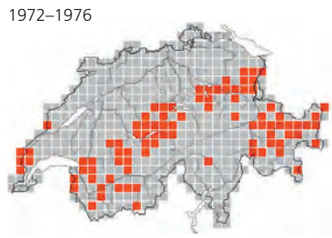


Sponsored by
Peter Wittker, Unterägeri

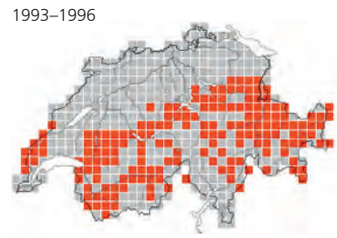
1950–1959



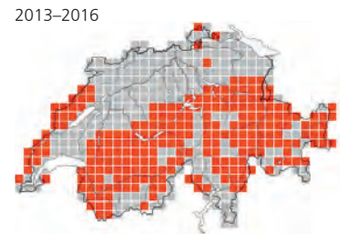
1972–1976



1993–1996



2013–2016



Little Owl

Athene noctua
Steinkauz
Chevêche d'Athéna
Civetta
tschuetta da la mort

Ralf Kistowski

Red List Endangered (EN)
Population 115–150 pairs (2013–2016)

Focus pages 212, 240, 264, 319, 560

In Europe, the core range of the Little Owl lies in the Mediterranean region. In Switzerland, four breeding populations are currently known: in 2013–2016, there were 59–78 territories in the Canton of Geneva, 37–54 in the Ajoie region JU, 13–17 in Ticino, and 1–4 territories in Seeland BE/FR[9, 12]. Of these, the first three are connected with populations across the Swiss border[18]. Other Little Owl populations occur just beyond the German-Swiss border near Basel. While we have earlier records of broods up to 1260 m[BCH], the current distribution lies below 600 m.

Following a steep decline between 1950 and 2000, numbers have increased again significantly in the past 15 years[9], from about 60 to 115–150 territories. This is due mainly to the increase in the Ajoie region and the Canton of Geneva. However, numbers remain very small. The new population in Seeland was established by a Little Owl that had previously bred in the Canton of Geneva. The highest densities are reached in the Canton of Geneva and the Ajoie (4–6 territories/km^2)[3, 8].

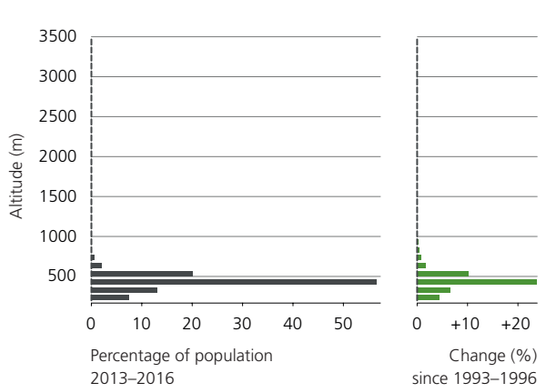
The Little Owl thrives in open, richly structured agricultural landscapes managed at low intensity and often dominated by grassland; today, such habitats occur only patchily in our intensively cultivated environment[1, 11, 16, 20, 21]. The Little Owl nests at some distance from the forest edge[10], mostly in orchards, tree-lined avenues or little-used buildings.

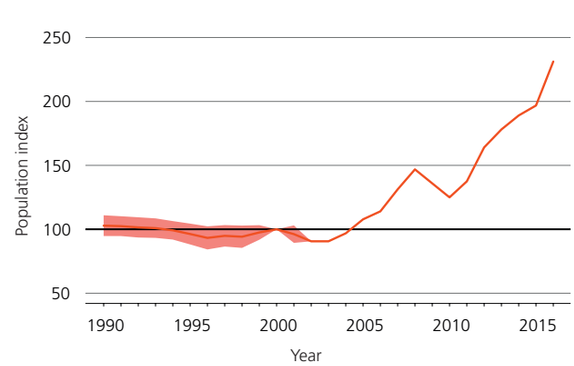
Several reasons are responsible for the increase in Switzerland. The Little Owl has benefited from conservation measures that include installing and maintaining nest sites as well as habitat management[2, 5, 7, 9]. Additional factors are reduced snow cover in winter in the lowlands[6] and immigrants from populations across the border. In France and Germany, numbers have stabilised[AtD, AtF] and are increasing rapidly in areas with nest box schemes[4, 17]. The population in Italy is declining, however[13].

Despite successful conservation measures, agricultural intensification and the expansion of settlements still pose a serious threat to the Little Owl in Switzerland. Nest cavities have become scarcer and the food supply has continued to decline[14, 15, 19] throughout the country in the past 20 years.

Martin Grüebler & Nadine Apolloni

[1] Apolloni et al. (2018b); [2] Brahier et al. (2012); [3] D. Crelier, pers. comm.; [4] Grüebler & Naef-Daenzer (2014); [5] Lardelli & Scandolara (2014); [6] Marty (2008); [7] Meisser (2017); [8] C. Meisser, in litt.; [9] Meisser et al. (2016a–b); [10] Michel et al. (2016); [11] Michel et al. (2017); [12] Müller (2017); [13] Nardelli et al. (2015); [14] Perrig et al. (2014); [15] Perrig et al. (2017); [16] Šálek et al. (2016); [17] Scaar (2017); [18] Schaub et al. (2006); [19] Staggenborg et al. (2017); [20] Sunde et al. (2014); [21] van Nieuwenhuyse et al. (2008)





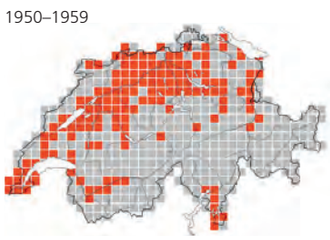
Occurrence 2013–2016

Occurrence change since 1993–1996

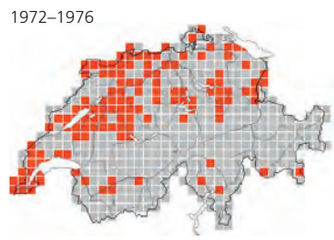
Sponsored by
Elsbeth Zurcher

Ornithologischer Verein Olten (OVO)

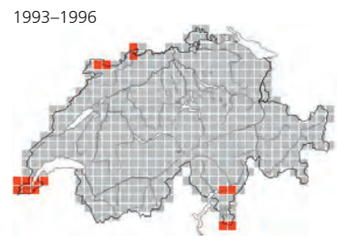
1950–1959



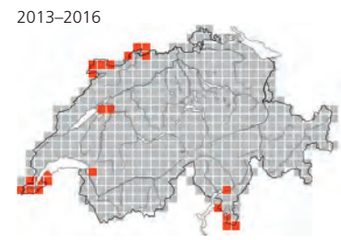
1972–1976



1993–1996



2013–2016



Continued decline of Red List species

Threatened species on the Red List are most frequently found in the Jura, the inner-Alpine valleys and the wetlands of the Central Plateau. Only very few threatened species still breed in areas of intensively cultivated farmland. Since 1993–1996, the species on the Red List have become rarer in most parts of Switzerland, highlighting the urgent need for additional, species-specific protection.

Red Lists assess a species' risk of extinction in a given region based on criteria defined by the International Union for Conservation of Nature (IUCN)[1]. They have proven an important tool in nature conservation and are published for Switzerland by the Federal Office for the Environment (FOEN). The Red List of threatened breeding birds in Switzerland includes 78 species following its last revision in 2010[RLCH]. 41 species are classified as «Vulnerable» (VU) and 21 as «Endangered» (EN), while nine species are considered «Critically Endangered» (CR). The Red List also includes seven former breeders – species that have not bred in Switzerland for more than 20 years (category «Regionally Extinct», RE). Birds in the categories «Near Threatened» (NT, 32 species) and «Least Concern» (LC, 89 species) are not considered Red List species.

In the 2010 revision, 12 species were removed from the 2001 Red List[2]. Of these, Red-crested Pochard, Peregrine Falcon, Middle Spotted Woodpecker, Cirl Bunting and others show significant gains compared to 1993–1996. Some species that have remained on the Red List also exhibit positive trends, including White Stork, Bearded Vulture, Eurasian Scops-owl, Little Owl and Common Hoopoe. Across large areas, however, the negative trends dominate. Not surprisingly, therefore, ten new species had to be added to the Red List in 2010[RLCH]. Woodchat Shrike and Eurasian Curlew, once widespread, disappeared completely as breeding species before the 2013–2016 survey period. In the case of Grey Partridge, Common Snipe and Ortolan Bunting, only individual territories remain, and these species are expected to disappear from Switzerland in the foreseeable future.

On the Central Plateau, only wetlands still support several threatened species

Superimposing the distribution maps of all species on the 2010 Red List allows us to identify regional hotspots. Today, the Jura and the Alps still hold rather significant numbers of Red List species. In terms of their potential range, many more species should occur on the Central Plateau than in the mountains. In reality, however, only very few threatened species were found on the Central Plateau, where land is intensively cultivated. Notable exceptions are the few remaining larger wetlands like Les Grangettes VD, the southern shore of Lake Neuchâtel, parts of the Grosses Moos BE/FR, and the wetlands in the Reuss Valley in the Canton of Aargau, where a comparatively large number of Red List species still occur today. Smaller wetlands such as Chavornay VD, Wauwilermoos LU, Neeracherried ZH, Greifensee and Pfäffikersee, Kaltbrunner Riet SG or Bolle di Magadino TI also show up on the map with a somewhat higher number of threatened species.

Distribution in 2013–2016 of 77 species on the current Red List. The map combines all species maps.

Steep declines at low and medium altitudes

Combining the distribution change maps for all Red List species reveals a significant decline since 1993–1996. Species from both the 2010 [RLCH] and the 2001 version [2] of the Red List were included in this comparison. Significant losses even occurred on the Central Plateau, even though the number of Red List species recorded there in 1993–1996 was already very low. Substantial losses were also apparent in the Jura and the northern Pre-Alps, whereas Ticino and large parts of Grisons showed little change. Gains were only noted locally, for example in the Geneva area and the Ajoie JU, where populations of Little Owl, Middle Spotted Woodpecker and Common Whitethroat have increased. Moreover, Wood Warbler and Fieldfare are not declining in these areas, in contrast to most parts of Switzerland.

Many threatened species in wetlands and in farmland

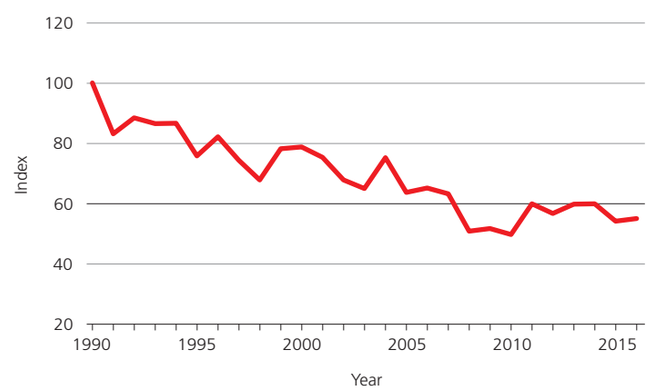
Red List species breed in all types of habitats. Wetland birds and waterbirds are most strongly represented, with 36 species on the Red List. For most of these species, the breeding area was already quite small in 1993–1996, being largely restricted to the remaining wetlands. Among the more widespread species, only the Red-crested Pochard has increased significantly.

Farmland birds are the second largest group, with 19 species on the Red List. Of these, White Stork and Little Owl populations have shown substantial gains since 1993–1996. On the other hand, four species have suffered marked losses (Northern Lapwing, Whinchat, Fieldfare and Corn Bunting). Only nine woodland birds are on the Red List. Nevertheless, five of these exhibited substantial changes in population size. Only the Middle Spotted Woodpecker has shown an increase, while Hazel Grouse, Ring Ouzel, Wood Warbler and Willow Warbler have suffered losses, some of them substantial.

Urgent effort needed to protect threatened species

The Red Lists confirm that the situation of farmland and wetland birds is especially serious. The threatened species are in urgent need of extra protection. Recovery measures must be species-specific, as each species has different needs and habitat requirements. On an encouraging note: many of the Red List species that have shown positive trends are species currently benefiting from recovery programmes, such as Little Owl, Common Hoopoe and Northern Lapwing.

Simon Birrer



Following a prolonged decline that has continued unabated since 1990, the SBI® sub-index for species on the current Red List appears to have stabilised at a low value of 55 %.

[1] IUCN (2003); [2] Keller et al. (2001a–c)

Species pages 102, 104, 128, 188, 210, 214, 215, 238, 244, 254, 272, 292, 306, 318, 400, 404, 426, 452, 454, 476, 548, 554, 556

Distribution change since 1993–1996 of Red List species. The map combines the distribution change maps of 27 species; these are species that appear either on the 2010 or the 2001 Red List and for which we had sufficient data to model the occurrence probability for both atlas periods (most of the remaining 50 species are extremely rare).

Boreal Owl

Aegolius funereus
Raufusskauz
Chouette de Tengmalm
Civetta capogrosso
tschuetta dal pe pailus

Marcel Burkhardt

Red List Least Concern (LC)
Population 1000–3000 pairs (2013–2016)

Focus pages 264, 542

In central Europe, the Boreal Owl occurs mainly in mountainous regions. In Switzerland, its range is confined to the Jura, Pre-Alps and Alps. The varying probabilities of occurrence shown here are probably due to differences in observation methods. The Boreal Owl actually reaches significant densities in the Engadine GR[AGR]. It inhabits montane and subalpine beech, mixed and coniferous forests. Its nests in the Jura are mainly in old stands of common beech[5], and in coniferous trees in the Pre-Alps and Alps, reflecting the availability of cavities made by the Black Woodpecker. As the Boreal Owl readily accepts nest boxes, it is found in other types of forest as well, and even on wooded pastures[VdS]. More than 90 % of possible broods were recorded between 1000 and 2000 m. The highest breeding sites were found at 2140 m near Arolla VS (P. Nijman) and at 2070 m near S-chanf GR[AEn].

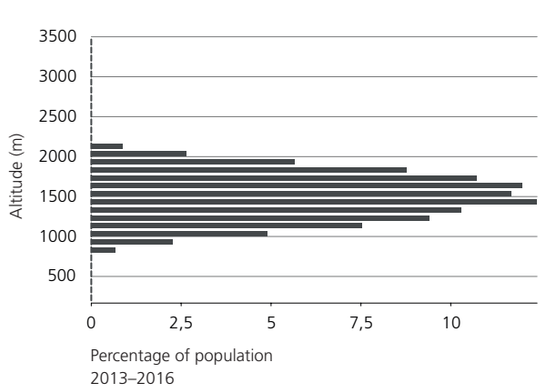
Since 1993–1996, many atlas squares have seen a change in status, with newly occupied squares slightly more numerous than those in which breeding was not confirmed. This suggests that survey intensity has improved but is still insufficient. A new breeding site was found in 2015 near Bargen SH at 770 m (M. Widmer, F. Schär), which can be considered an outpost of the population in the nearby Black Forest. The lowest breeding sites were recorded at 700 m near Burg in Leimental BL in 1975[AtCH1] and at 660 m near Beringen SH in 2000[VdS].

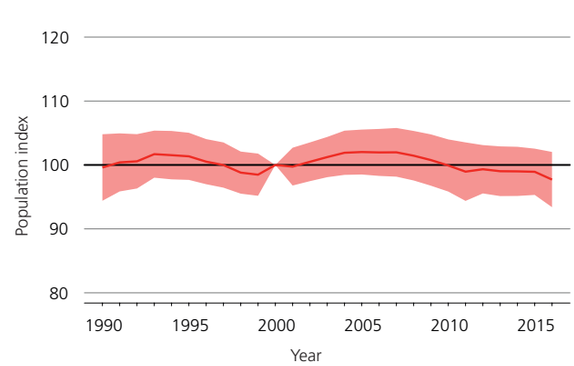
Local populations fluctuate widely from one year to the next due to the changing supply of small mammals[6, 7]. In the long term, we expect a marked decline in the Jura, especially on the southern slopes between 1000 and 1200 m[2, 6, 8]. Few data are available on population trends in the Alps. In the Vosges mountains, numbers also declined between 2007 and 2013, with large fluctuations[3, 4]. In contrast, the population has increased in Germany, where the Boreal Owl has colonised new areas[AtD, 1].

Forestry interventions can affect Boreal Owl populations when trees with cavities or old stands are felled[6, 8]. Conversely, providing nest boxes can lead to significant increases in local populations. In the medium to long term, it is important to preserve old-growth stands and trees with cavities.

Simon Birrer

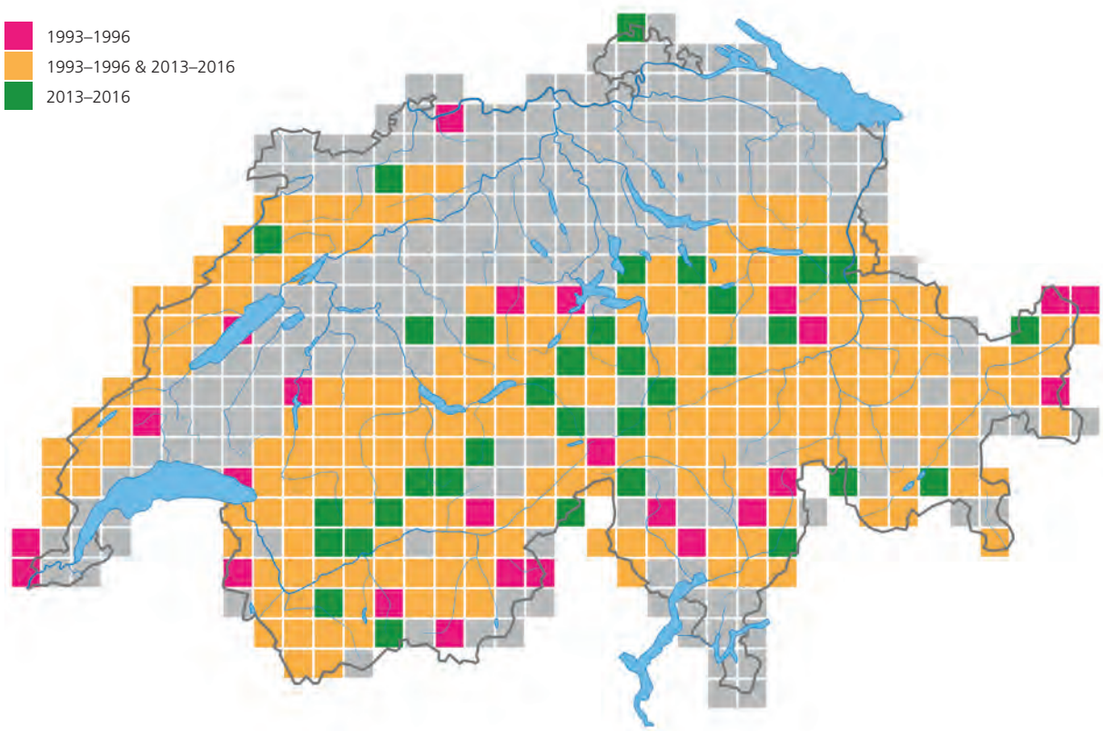
[1] Bauer et al. (2016a); [2] Henrioux (2017); [3] Muller (2011b); [4] Muller (2014a); [5] Ravussin et al. (1994); [6] Ravussin et al. (2015); [7] Ravussin et al. (2016); [8] Ravussin et al. (2017)





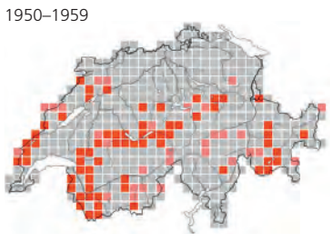
Occurrence 2013–2016

Distribution change since 1993–1996

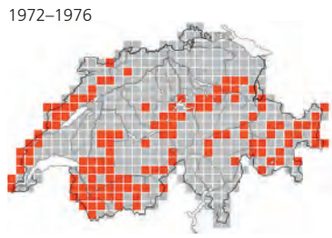


Sponsored by
Christian Bachmann, Mittelhäusern
Lea Berni

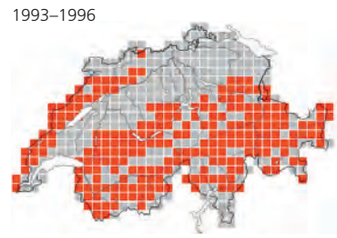
1950–1959



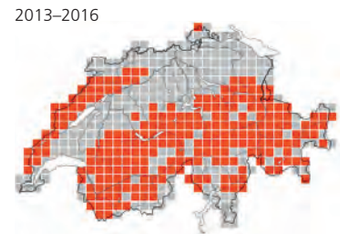
1972–1976



1993–1996



2013–2016



Eurasian Scops-owl

Otus scops
Zwergohreule
Petit-duc scops
Assiolo
piv nanin

Marcel Ruppen

Red List Endangered (EN)
Population 30–40 pairs (2013–2016)

Focus pages 240, 264, 284, 425

The Swiss and Austrian Alps form the northern range limit of the Eurasian Scops-owl in central Europe [AtD, 3]. Further north, breeding occurs sporadically in the Alsace, Burgundy and Germany [AtD, AtF, 2, 4].

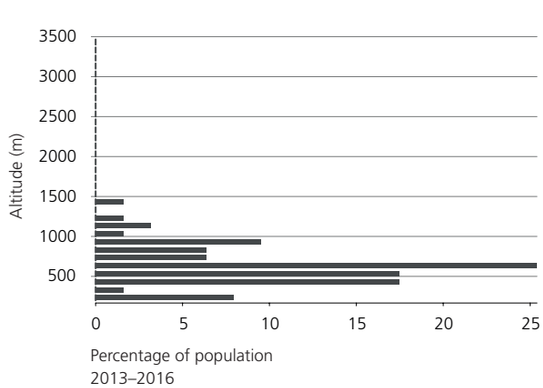
In Switzerland, the Eurasian Scops-owl only breeds regularly in Valais and Ticino between 200 and 1500 m. While singing males are regularly observed in the Geneva area, the Ajoie JU and some valleys in Grisons, breeding is rare north of the Alps; broods were recorded near Meinier GE in 2012 [5] and near Kleinlützel SO in 2012–2013 [6, 7]. In 2013–2016, Valais supported the largest population with about 20 territories on average, followed by Ticino (seven territories) and other areas (five territories). In favourable years like 2015 [10], singing males appear in large numbers, often on their own and beyond the habitual sites. With their persistent song, these highly mobile and active individuals can cause numbers to be overestimated.

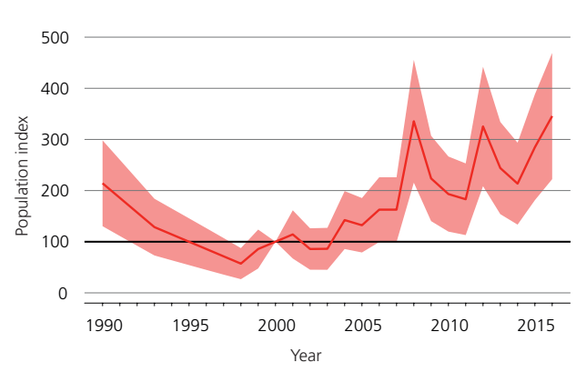
Like many other species that rely on low-intensity agriculture, the Eurasian Scops-owl declined in Europe up until the 1990s [AtF, RLEU, 8]. The decline in Switzerland was massive: while the species was common in many parts of the country before the 1950s, only about 20 singing males were counted in the 1970s, and at the beginning of this century, a single pair and a few unpaired singing males remained [1, 11].

The decline of the Eurasian Scops-owl is related to uniform agricultural landscapes, the expansion of vineyards and arable land, and urban sprawl. Breeding can also occur at the edge of settlements, however, as was the case in Martigny VS [10] and Sion VS. As agricultural intensification continues, low-intensity meadows and areas with scattered trees and bushes have disappeared from valley bottoms and from slopes up to 1500 m. These are the habitats that hold abundant quantities of the species' main food source, the Great Green Bush-cricket [3, 11, 12]. The Eurasian Scops-owl remains a vulnerable and localised species, despite the current positive trend, for which the reasons are not clear. Climate change favours prey abundance [9], and may play a key role in the recovery of the Swiss population, together with immigration from large populations in Italy or France [AtF, 8].

Jean-Nicolas Pradervand

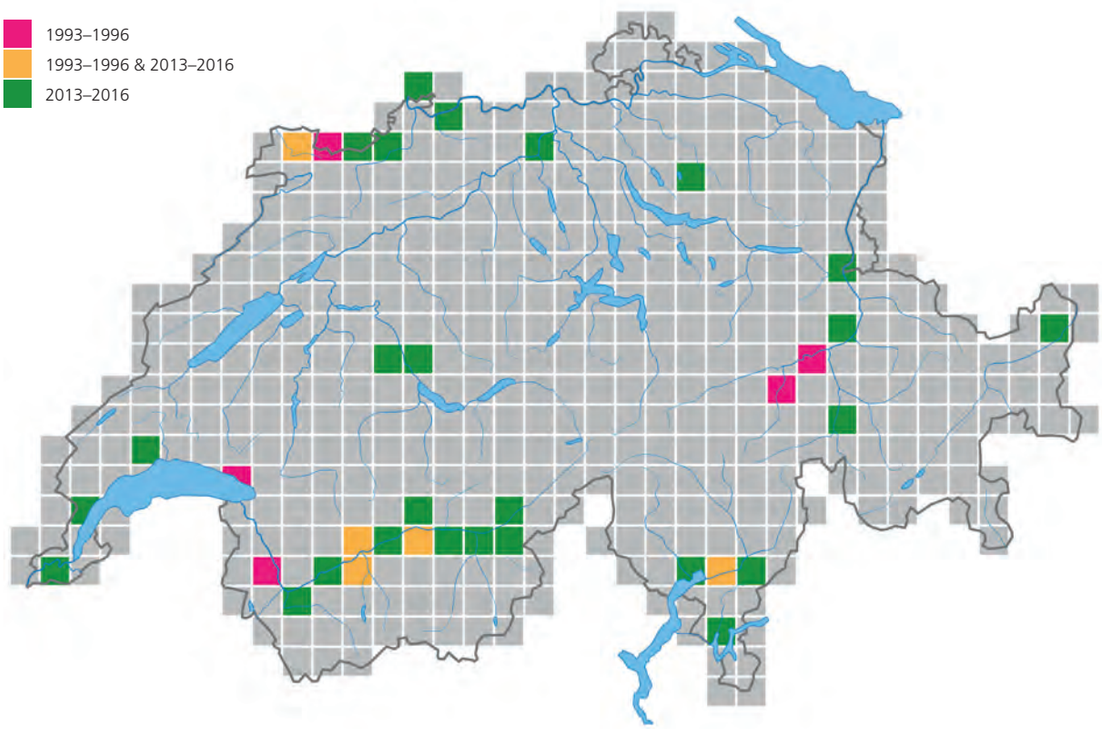
[1] Arlettaz (1990); [2] Dronneau & les observateurs de la LPO Alsace (2016); [3] Malle & Probst (2015); [4] Mebs & Nicklaus (2014); [5] Meisser et al. (2013); [6] Müller & Volet (2013); [7] Müller & Volet (2014); [8] Nardelli et al. (2015); [9] Netherer & Schopf (2010); [10] Pradervand & Posse (2016); [11] Sierro & Arlettaz (2013); [12] Šotnár et al. (2008)





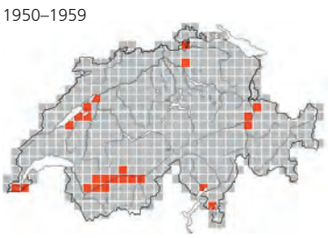
Territories 2013–2016

Distribution change since 1993–1996

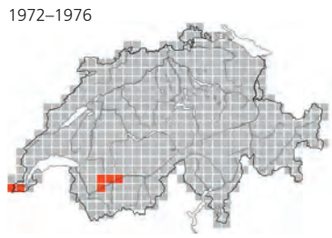


Sponsored by
Martina Thürig Arnold &
Peter Arnold

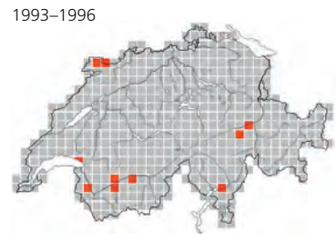
1950–1959



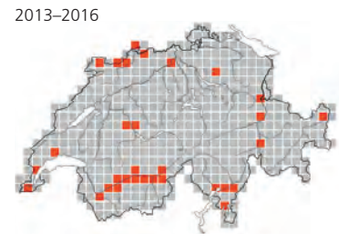
1972–1976



1993–1996



2013–2016



Northern Long-eared Owl

Asio otus
Waldohreule
Hibou moyen-duc
Gufo comune
piv mesaun

Patrick Donini

Red List Near Threatened (NT)
Population 2000–3000 pairs (2013–2016)

Focus –

The Northern Long-eared Owl occurs throughout Switzerland in widely varying densities. The Jura, Central Plateau, northern Pre-Alps and large Alpine valleys (Rhone Valley VS, Vorderrhein Valley GR, Engadine GR) are extensively colonised. In other regions of the Alps, distribution is patchy. The population is most concentrated in areas below 1100 m. At higher altitudes, densities are lower. When small mammals are abundant, Long-eared Owls are regularly found up to the tree line. The highest breeding sites were recorded near St-Martin VS at 2180 m [VdS] and near Arolla VS at 2160 m (P. Nijman).

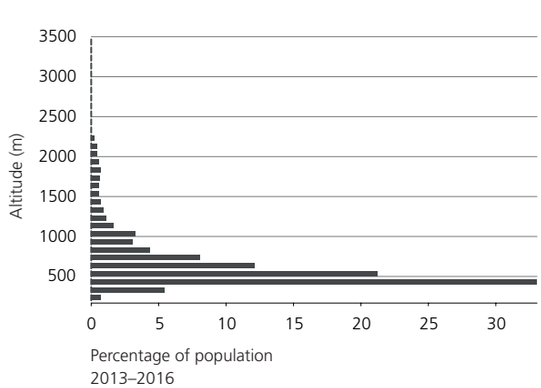
The Long-eared Owl favours flat or slightly hilly, semi-open landscapes, hunting on grassland and fields and raising its young in hedgerows or on forest edges. The highest densities are reached in the large river valleys on the Central Plateau. In the area around Wauwiler Ebene LU, 1.8–8.2 territories/10 km² were occupied every year [3, 4]; 4.0 territories/10 km² were occupied in the Reuss Valley AG [2], 1.4–2.8 territories/10 km² in the Payerne region VD [7] and 0.2–1.0 territories/10 km² in the western Lake Geneva region [6].

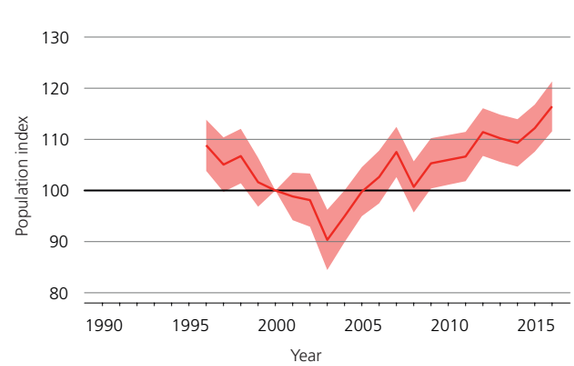
Since 1993–1996, almost all distribution gaps at low and medium altitudes have been filled. The only remaining gap is in the eastern part of the Central Plateau. In the central and southern ranges of the Alps, the number of occupied squares has also slightly increased, which in some places may be due to greater observer effort.

The population of Long-eared Owls has presumably increased somewhat in Switzerland, although the trend is obscured by heavy annual fluctuations related to the availability of small mammals. A slight but continuous decline between 1980 and 2010 was reported for the Lake Constance region [AtBo], however, and also in Vorarlberg [AtV]. In Germany, the population is considered stable [AtD]. The Long-eared Owl benefits from wildflower plots in agricultural areas, which increase the food supply [1]. Maintaining diverse meadow landscapes with interspersed copses and hedgerows also has a positive impact. Declines are attributed mainly to intensified agricultural practices [AtV, 5, 8].

Simon Birrer

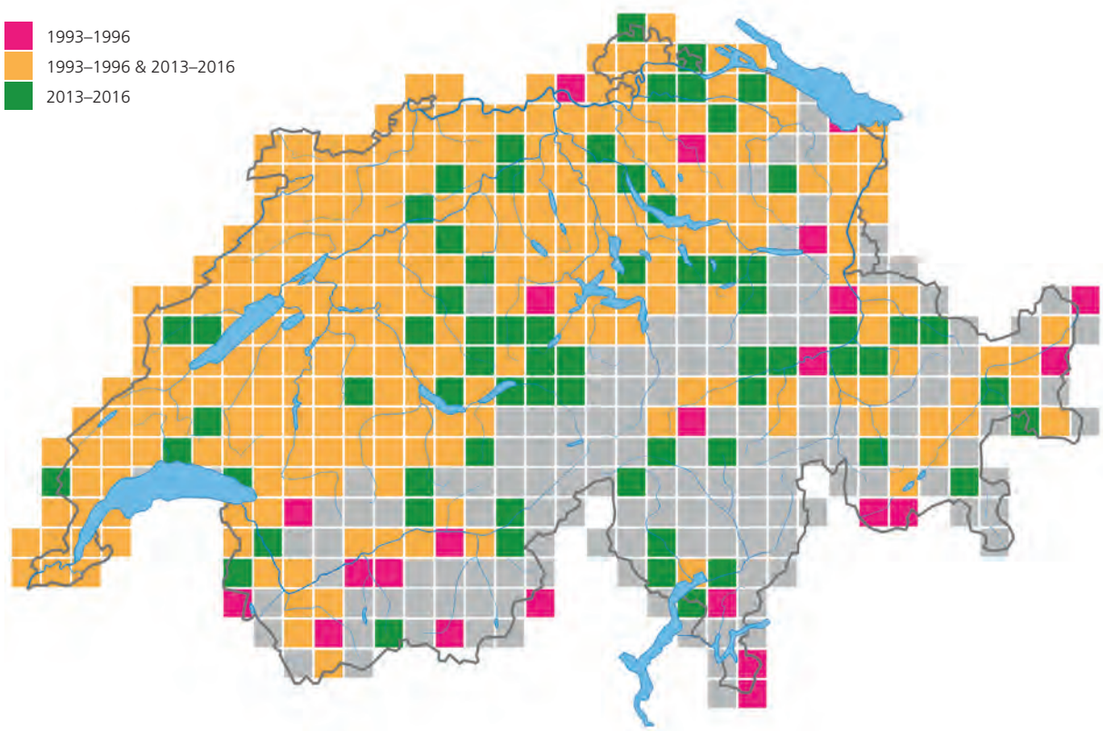
[1] Aschwanden et al. (2005); [2] Birrer (2001); [3] Birrer (2014); [4] S. Birrer, unpubl.; [5] Feldner et al. (2006); [6] Henrioux (1999); [7] Henrioux & Henrioux (1995); [8] Mebs & Scherzinger (2008)





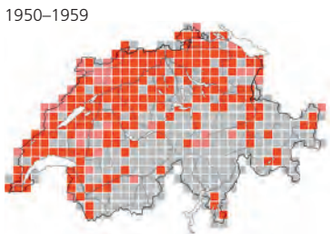
Occurrence 2013–2016

Distribution change since 1993–1996

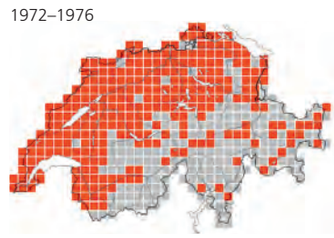


Sponsored by
Gieri Battaglia, Rorschach
Sabine Herzog
Martina Thürig Arnold &
Peter Arnold

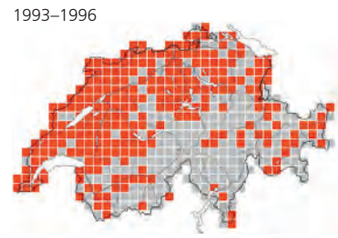
1950–1959



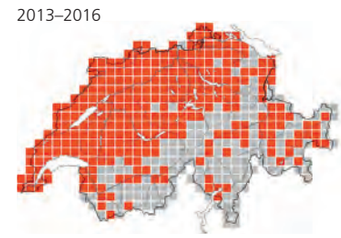
1972–1976



1993–1996



2013–2016



Tawny Owl

Strix aluco
Waldkauz
Chouette hulotte
Allocco
tschuetta (da guaud)

Denis Girard

Red List Least Concern (LC)
Population 6000–8000 pairs (2013–2016)

Focus pages 264, 314

The Tawny Owl is widespread in Switzerland, with gaps in distribution occurring at high altitudes, especially in the Valais Alps and Engadine GR. The species inhabits woodlands of all kinds, mainly below 1500 m, but can also be found in wooded areas in towns and villages. The highest densities are reached in open deciduous and mixed forests, as long as there are enough trees with cavities or nest boxes. The Tawny Owl does not normally occupy small copses on farmland, but in good years, calling birds or even broods can be found in these habitats as well.

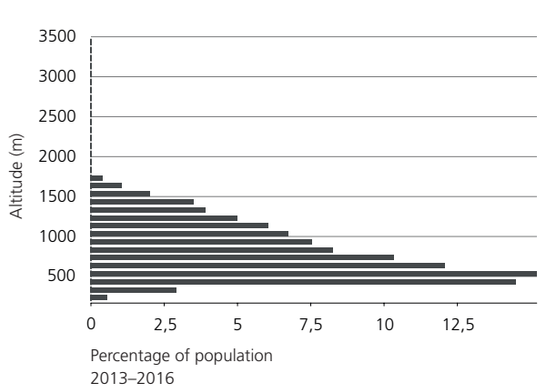
The highest breeding sites were recorded at 1940 m in Valais [VdS], at 1900 m in Engadine GR (M. Hammel) and at 1740 m in the northern Alps (J. Erard). The highest recent observation during the breeding season was recorded at 2060 m near Soglio GR (R. Roganti); during the previous atlas survey, a family with fledged young was seen at 2080 m near Zermatt VS [AtCH2].

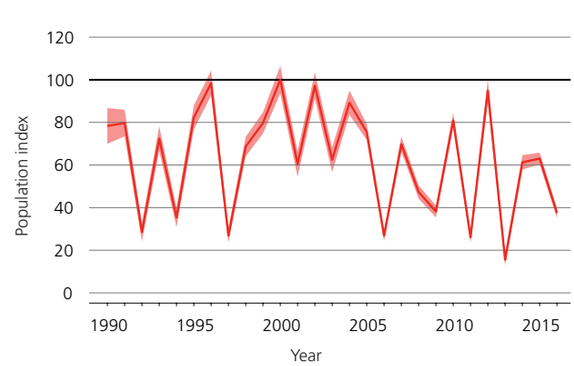
Compared to 1993–1996, the Tawny Owl has been recorded in some new atlas squares, probably thanks to increased observer effort. In the short term, the population fluctuates widely with peaks every two to four years. The fluctuations are a result of the changing food supply. When food is scarce, many pairs do not display or breed [4, 6] and are therefore hard to detect. The long-term trend is stable. Regional surveys also report fluctuating numbers: in a wooded area of 28 km² in the Zurich Weinland, 5–21 pairs occupied nest boxes between 2007 and 2017 [7, 8], and in an area of 107 km² near Morges VD, 9–30 pairs were found between 2006 and 2017 [2, 3]. Trends in neighbouring regions do not show any long-term changes in population size either [AtD, AtF, AtV, RLEU].

Installing nest boxes in forests where tree cavities are scarce can help local populations. However, such measures are not appropriate in areas where smaller owl species occur [1], as they avoid the Tawny Owl. Efforts to preserve old-growth stands and hollow trees in forests should be increased, and would benefit other species as well.

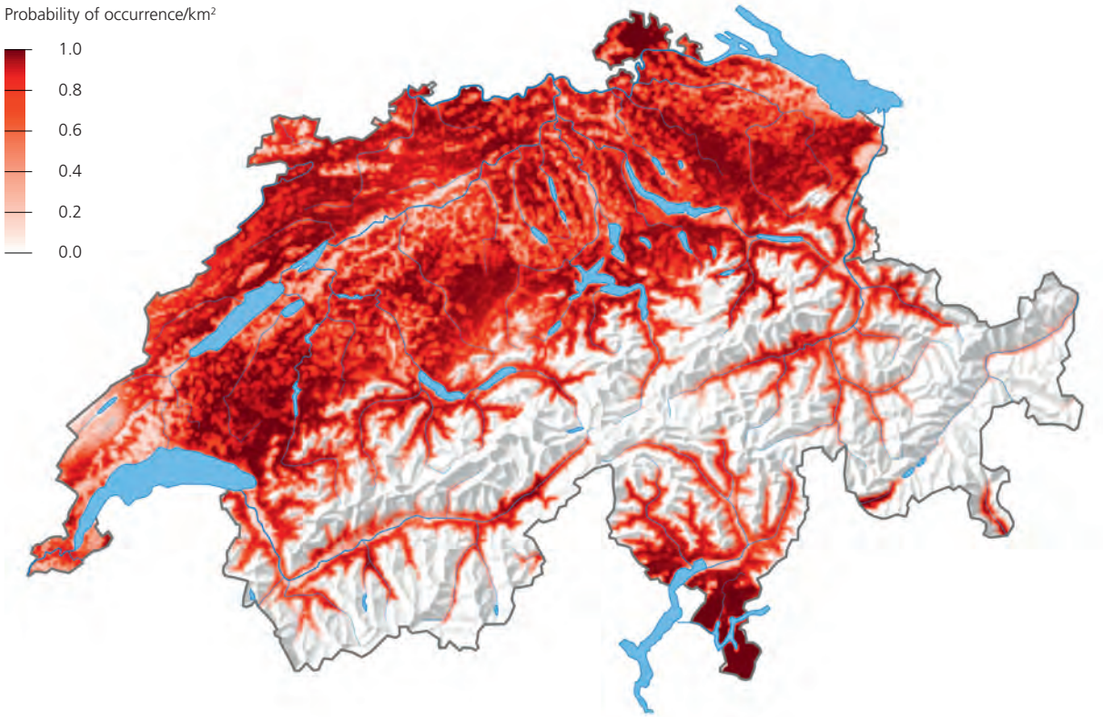
Simon Birrer

[1] AG Eulen (2017); [2] Cretegny et al. (2017); [3] Henry (2016); [4] Mebs & Scherzinger (2008); [5] Michel et al. (2016); [6] Roulin et al. (2009); [7] Studler (2014); [8] D. Studler, in litt.

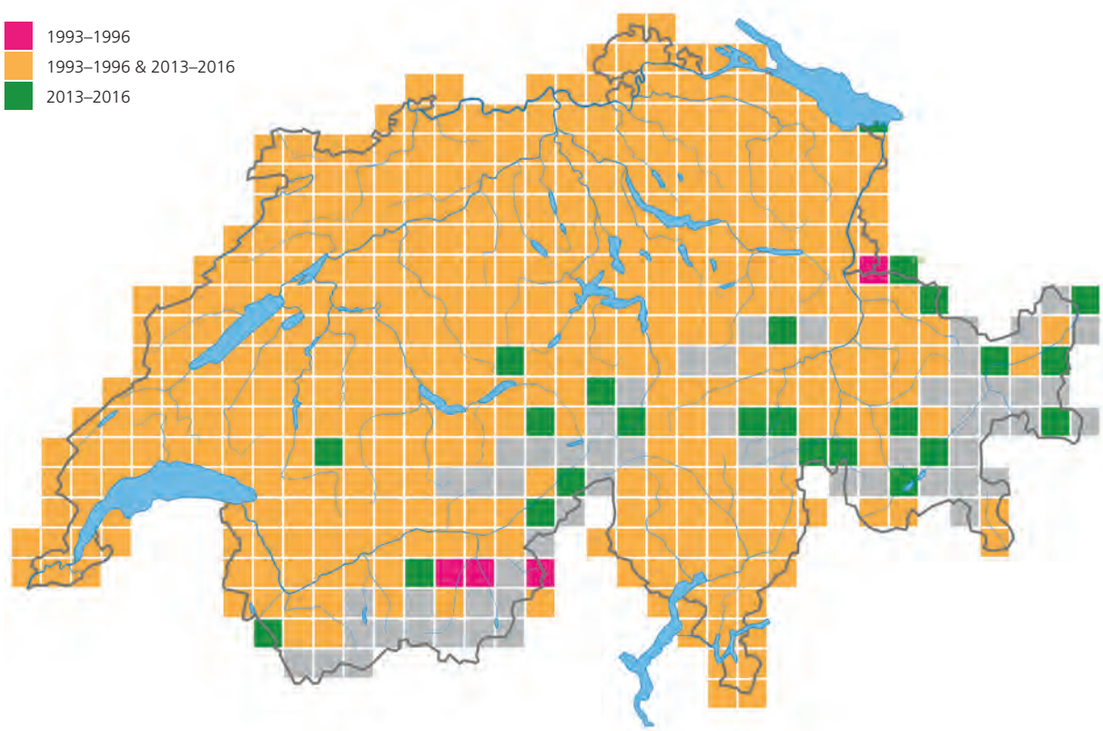




Occurrence 2013–2016

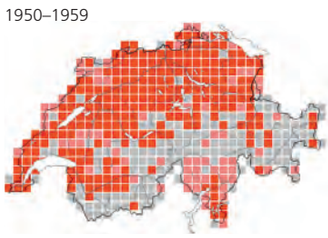


Distribution change since 1993–1996

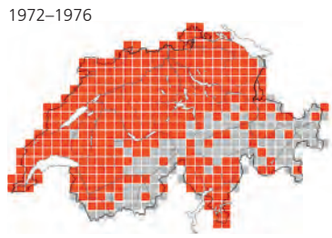


Sponsored by
Bernhard & Rosmarie Stähli, Ostermundigen
Anonymous donor

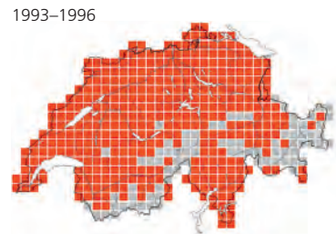
1950–1959



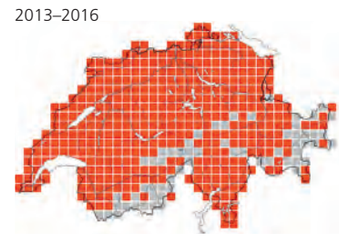
1972–1976



1993–1996



2013–2016



Eurasian Eagle-owl

Bubo bubo
Uhu
Grand-duc d'Europe
Gufo reale
piv (grond)

Ralf Kistowski

Red List Endangered (EN)
Population 200–230 pairs (2013–2016)

Focus pages 110, 142, 264, 308

In Switzerland, the Eurasian Eagle-owl inhabits the Alps, the Jura and parts of the Central Plateau. It favours richly structured landscapes with lots of open terrain for hunting mammals or medium-sized birds. Nests are often in inconspicuous cliffs, usually next to farmland and sometimes water. In Switzerland, most pairs nest below 1000 m. While breeding sites have been recorded up to 2020 m [AGR], the highest current site was found at 1900 m near Silvaplana GR [4]. Some Eagle-owls inhabit the Alpine zone, though these are generally not breeding birds.

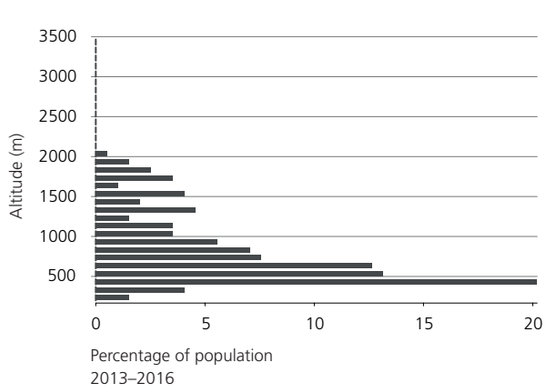
In the Jura and on the Central Plateau, the number of occupied territories has increased significantly in some areas since 1993–1996, while the Alpine population has stayed constant or declined [3, 4, 6, 9]. Besides regions with solid populations like Engadine GR or the Rhine Valley near Chur GR, unoccupied or abandoned areas remain, especially in the mountains of Grisons and Ticino. An increase in numbers that has its origin in France and Germany can be observed as far as the northern ranges of the Alps. Besides the unobtrusive behaviour of many Eagle-owl pairs, the species' habit of alternating between territories and its irregular breeding activity also make monitoring difficult. Temporary breeding sites or sites used only once exist alongside territories that are occupied regularly for many years [4].

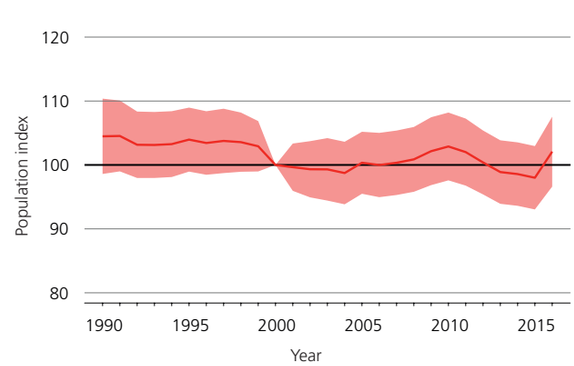
The different population trends in Switzerland may be related to differences in immigration pressure from the north and southwest. In the past, Eurasian Eagle-owls have at times been released in large numbers, especially in neighbouring regions across the Swiss border [ABW, 2, 8]. In addition, the high rate of mortality from collisions that affects Eagle-owls throughout Europe [1, 5, 7, 9] may be a particular threat in narrow Alpine valleys where traffic and power lines are more tightly channelled compared to flat or hilly country.

The weakening populations in the Alps highlight the need for conservation measures. These include mitigating the threat of dangerous power lines (medium-voltage poles, masts of overhead railway lines) [5] as well as monitoring breeding sites and protecting them from disturbance (e.g. rock climbing, photography, woodcutting, fireworks) [10].

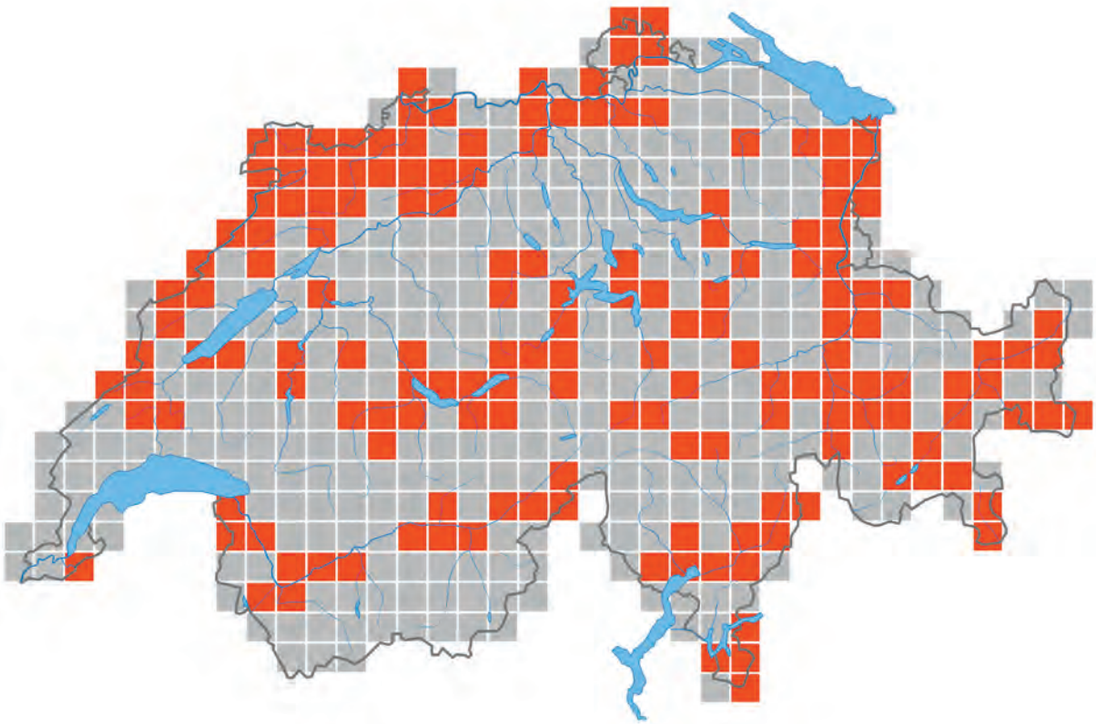
David Jenny

[1] Aebischer et al. (2005); [2] Förstel (1990); [3] Haller (1978); [4] Jenny (2011a); [5] Jenny (2017); [6] Lardelli & Zbinden (2017); [7] Martinèz et al. (2006); [8] Rau (2015); [9] Schaub et al. (2010a); [10] Werner et al. (2018); [11] Willenegger (2017)

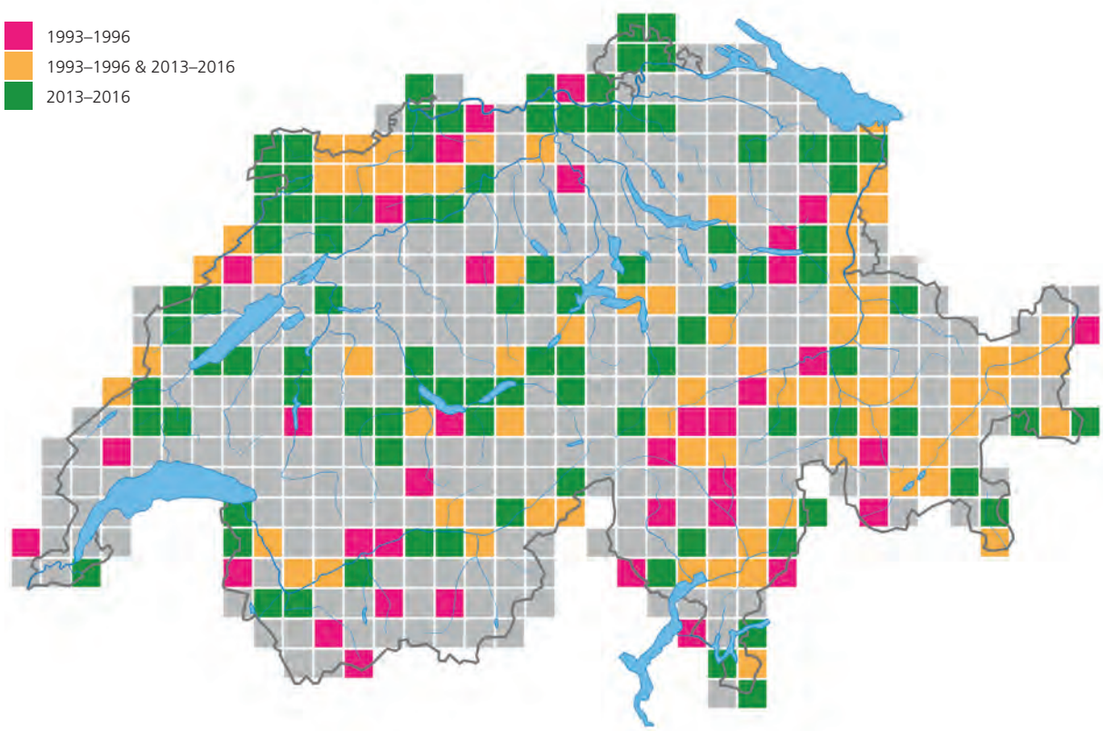




Distribution 2013–2016

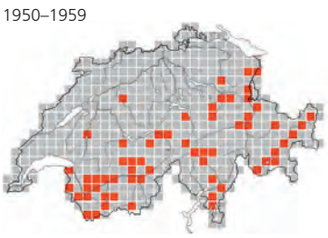


Distribution change since 1993–1996

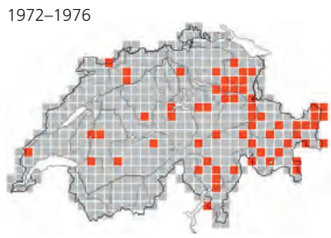


Sponsored by
Sandy Bonzon
Eduard Schnider

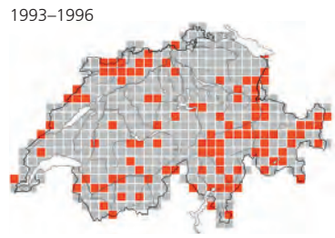
1950–1959



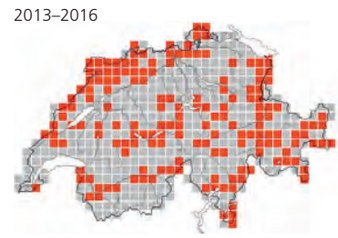
1972–1976



1993–1996



2013–2016



European Honey-buzzard

Pernis apivorus
Wespenbussard
Bondrée apivore
Falco pecchiaiolo
girun apivor

Daniele Occhiato

Red List Near Threatened (NT)
Population 500–1000 pairs (2013–2016)

Focus page 264

The main distribution of the European Honey-buzzard in Switzerland is below 1200 m, but foraging and courtship flights can take it to areas above the tree line. Broods have been recorded in altitudes up to 1500 m [VdS]. Observations in Valais and Grisons indicate isolated breeding attempts at higher altitudes, but there are no confirmed breeding records, nor are there any recent studies on population density. The species' secretive behaviour and large, overlapping territories are a methodological challenge [5].

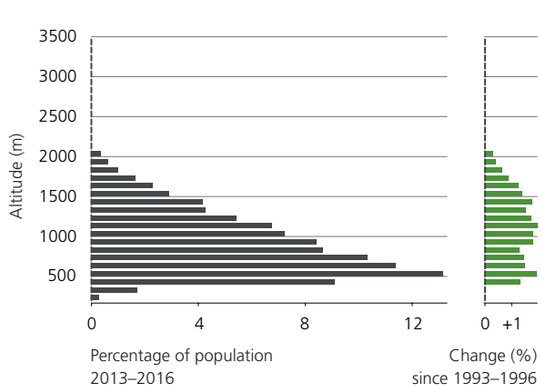
Ideal habitats consist of large, semi-natural and little-used woods, sunlit clearings, hedgerows and large expanses of dry meadows interspersed with wet habitats that provide an abundant supply of insects, small birds and frogs. The lowland distribution of the European Honey-buzzard is almost continuous, which shows that it copes well in «normal landscapes», too. The highest densities are reached in the Jura, the Napf region, Valais, Ticino and parts of Grisons.

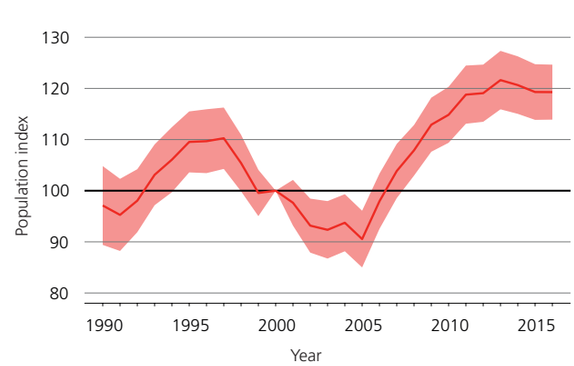
There has been no major change in the species' breeding range since 1993–1996. While a few atlas squares were without records this time round, a series of squares on the Central Plateau, in Valais and in northern Ticino appear to be newly occupied. These are sites with relatively low population density. The differences are therefore probably due to improved knowledge and survey effort.

While the impact of shooting in the Mediterranean region has been reduced for the populations migrating westward, it remains unclear to what extent the deforestation of rainforests affects wintering conditions in Africa. Threats in the breeding range include housing developments, nitrogen deposition in meadows, intensive agriculture, disturbance (e.g. by forestry activities in the summer months) and the construction of wind farms [4]. On the other hand, abandonment of marginal land, natural reforestation, windthrow and small-scale clear-cutting are likely to benefit the European Honey-buzzard. Changes in different habitats could explain why regional trends vary across central Europe, while the overall situation is considered fairly stable [AtD, AtF, AtV, 1, 2, 3].

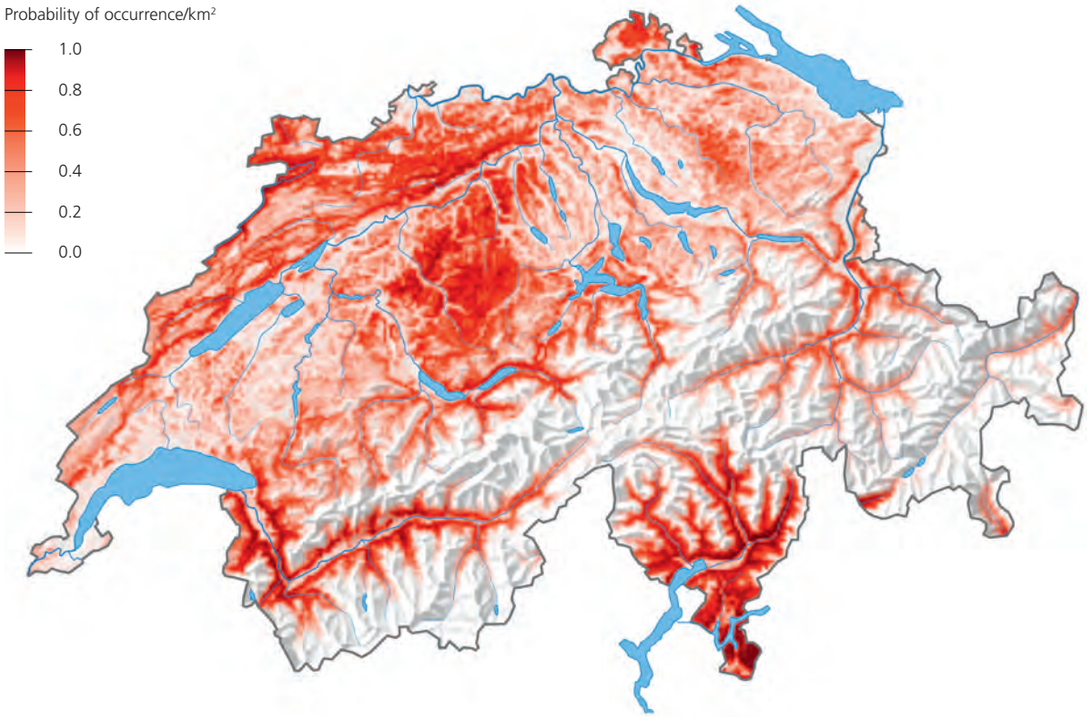
Hans Schmid

[1] Albegger et al. (2015); [2] Bezzel et al. (2005); [3] Martín et al. (2016); [4] Werner et al. (2018); [5] Ziesemer & Meyburg (2015)





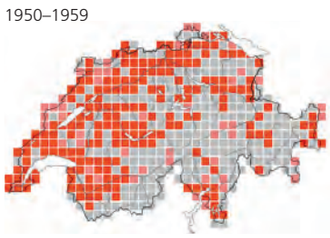
Occurrence 2013–2016



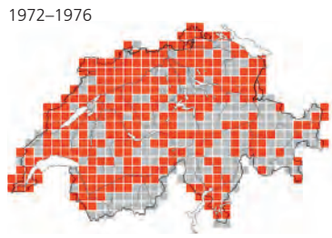
Occurrence change since 1993–1996

Sponsored by
Claudine Burkhard

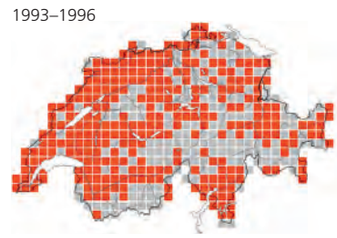
1950–1959



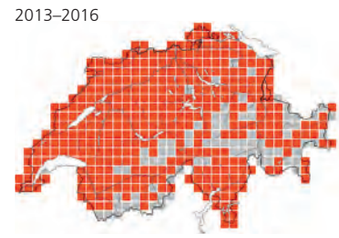
1972–1976



1993–1996



2013–2016



Bearded Vulture

Gypaetus barbatus
Bartgeier
Gypaète barbu
Gipeto
tschess barbet

Marcel Burkhardt

Red List	Critically Endangered (CR)
Population	9–15 pairs (2013–2016)

Focus pages 110, 142, 240, 255, 264, 319

The return of the Bearded Vulture to the Alps is the result of a large-scale reintroduction scheme[8, 9]. The first successful breeding attempts in Switzerland occurred in 2007 in the Ofenpass region GR[4] and at Derborence in Valais[2]. Dispersing from the release sites in the Swiss National Park GR and in Haute-Savoie F, the birds formed small populations in Engadine GR and Valais. The population grew steadily, reaching 17 breeding pairs in 2017 (12 in Grisons and 5 in Valais). In its core range in the National Park, it has reached a density of 1.9 pairs/100 km²[7].

The Bearded Vulture, a carrion eater specialised in digesting bones, mainly inhabits Alpine regions with large populations of ungulates (ibex, chamois, red deer, sheep). Breeding sites in Switzerland lie between 1250 m (Ardon VS; S. Denis) and 2560 m (Val Mora GR; D. Jenny). The high reproductive rate of 0.7 chicks per pair per year (2007–2016)[1, 5] confirms that ample resources are available. Besides food supply, these include suitable, inaccessible rock faces for nesting. Threats to the small and still fragile population[10] include (lead) poisoning[3, 6], illegal hunting, collisions with power lines and wind turbines as well as disturbance at the nest.

David Jenny

[1] Biollaz & Schaad (2017a–b); [2] Biollaz et al. (2011); [3] Jenni et al. (2015); [4] Jenny (2007); [5] Jenny (2016a); [6] Jenny et al. (2016); [7] Jenny et al. (in prep.); [8] Robin et al. (2003); [9] Robin et al. (2004); [10] Schaub et al. (2009)

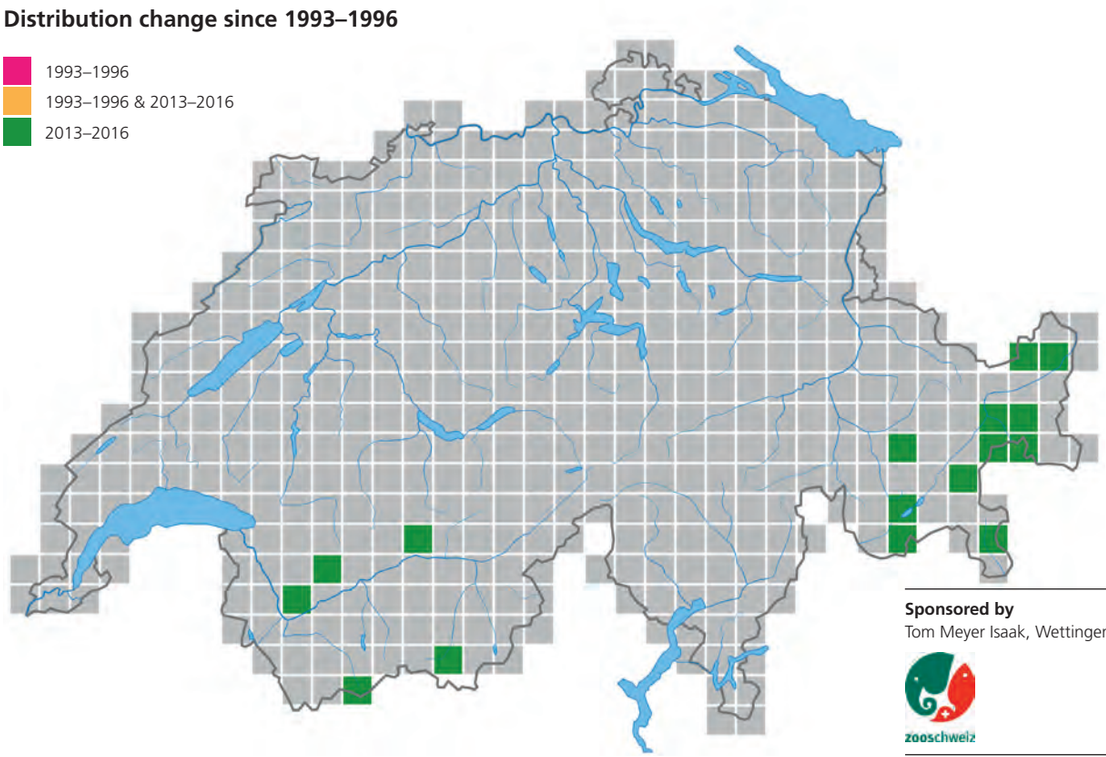
1950–1959

1972–1976

1993–1996

2013–2016

Distribution change since 1993–1996



Sponsored by
Tom Meyer Isaak, Wettingen
zooschweiz

The return of the Bearded Vulture

Once extirpated in the entire Alpine range, the Bearded Vulture now inhabits large parts of the Alps in the Valais and Grisons again. The successful reintroduction of Switzerland's largest bird of prey is a fine example of cross-border collaboration in raptor conservation.

The situation of vultures worldwide is alarming [2]. The return of the Bearded Vulture to the Alps, however, is a success story, making it a positive exception among vultures.

As late as 1850, the Bearded Vulture was widespread in large parts of the Alps. Due to direct persecution encouraged by bounties, the population rapidly declined and became extinct towards the end of the 19th century. Breeding was last recorded in Switzerland in 1886 near Vrin GR [HVM]. Today, the Bearded Vulture has returned to the Alps thanks to an international reintroduction scheme.

The reintroduction of extinct species is a last resort in nature conservation [8] and governed by strict guidelines. The following conditions were met in the case of the Bearded Vulture in the Alps: the causes for extinction are known (direct persecution) and have been resolved, habitat quality is adequate (food supply, nesting sites) and natural recolonisation is unlikely.

In 1986, the first Bearded Vultures from a European breeding programme were released in Hohe Tauern A, followed by annual releases in Haute-Savoie F, the Maritime Alps F/I and the Swiss National Park GR (1991–2007). In Switzerland, reintroductions are coordinated by the foundation Pro Bartgeier. By 2017, a total of 45 fledglings from the breeding programme had been released at three different sites.

The first wild-born broods were recorded in Haute-Savoie in 1997 [4], in Bormio I in the central Alps in 1998 [5] and in Switzerland in 2007, when three pairs bred successfully [1, 6]. Since then, there have been 1–2 new pairs every year. Intensive monitoring of breeding pairs by the foundation Pro Bartgeier provides the basis for further conservation measures. In 2017, the Swiss birds made up about 40 % of the Alpine population. Despite the positive trend, the small population remains fragile [7]. Illegal shooting has become rare, but still occurs occasionally (in Crans-Montana VS in 1997 [VdS], in Samnaun GR in 2008 [3]).

New breeding pairs usually nest close to their place of origin (release or nest site). Due to their distance from the core ranges, other Alpine regions such as central Switzerland and Ticino have not yet been populated. Release sites in the eastern (Calfeisental SG, 2010–2014) and central Swiss Alps (Melchsee-Frutt OW, from 2015) will hopefully lead to new populations in these areas. The reintroduction scheme aims for the Bearded Vulture to colonise the entire Alpine range, and for the Alpine population to connect with the vigorous population in the Pyrenees, but also with the unstable populations in Corsica and Crete.

David Jenny

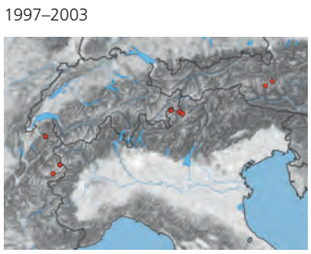
This juvenile Bearded Vulture is from a nest in the Upper Engadine GR.

David Jenny

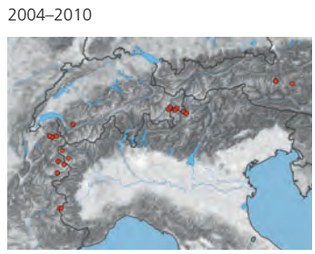
[1] Biollaz et al. (2011); [2] Buechley & Şekercioğlu (2016); [3] Hegglin & Müller (2009); [4] Heuret & Rouillon (1998); [5] Jenny (1999); [6] Jenny (2007); [7] Schaub et al. (2009); [8] Seddon et al. (2007)

Species page 254

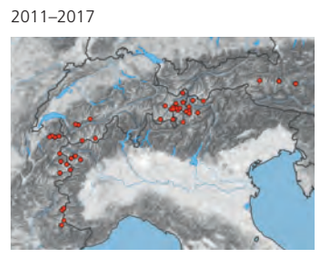
1997–2003



2004–2010



2011–2017



Switzerland, located at the heart of the Alpine region, plays a particularly important role in the reintroduction of the Bearded Vulture, as illustrated by the breeding sites recorded in 1997–2003, 2004–2010 and 2011–2017. Source: International Bearded Vulture Monitoring, Background map: Natural Earth, Stamen Design & OpenStreetMap.

Golden Eagle

Aquila chrysaetos
Steinadler
Aigle royal
Aquila reale
evla (da la pizza)

Patrick Donini

Red List Vulnerable (VU)
Population 350–360 pairs (2013–2016)

Focus pages 110, 142, 264, 308

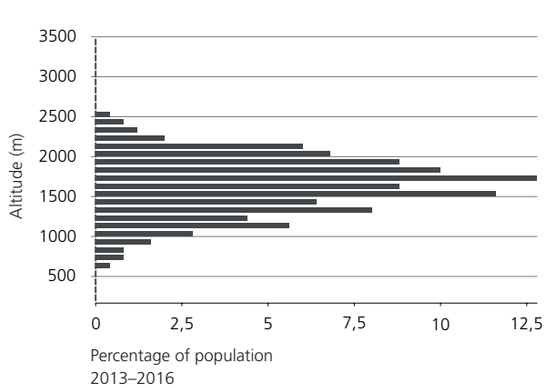
In Switzerland, the Golden Eagle is considered a typical bird of the high mountains. It does also populate lower-lying areas, however, as long as there is semi-open terrain managed at low intensity[1]. The Swiss Alps are occupied to capacity. Since 1993–1996, there have been almost 50 new territories, so that the population today numbers 350–360 breeding pairs. This includes four territories at the edge of the Central Plateau (cantons of Bern and St. Gallen) and two in the Jura, where the Golden Eagle bred for the first time in the Canton of Solothurn in 2009 after an absence of almost 200 years[8]. There has also been a breeding site in the Bernese Jura since 2014[7]. Further pairs can be expected to settle there as well as in the western Jura in the future. In the French Jura, the Golden Eagle has been breeding regularly again since 1994[VdS]. Since 1993–1996, only a single territory has been abandoned (Buchholterberg BE, from 2004).

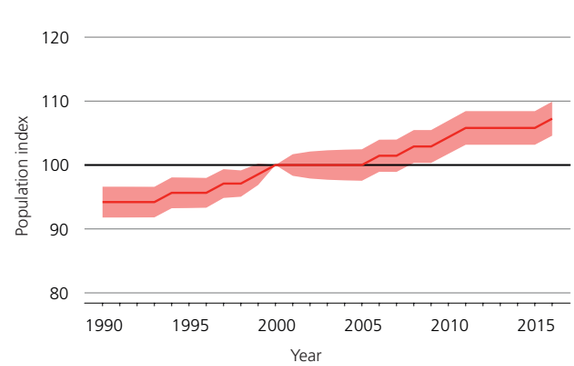
Golden Eagle pairs generally occupy territories of 20–80 km². Today, high densities of up to 2.5 pairs/100 km² can be observed. Overall, the pairs have a fairly even distribution, due partly to the plentiful food supply throughout the entire range. Breeding sites are mostly located at 1100 to 2200 m in rock faces, more rarely in trees. Successful breeding records span an altitudinal range that reaches from 2630 m in the Julier region GR (1991; H. Haller) to 670 m in Avegno TI (2017; L. Pagano).

The current Alpine population is subject to a marked regulation of density[2, 4]. Intraspecific competition reduces the reproduction rate and increases mortality by way of territorial disputes that can be quite fierce. Reproductive rates vary, the current average being about 0.3 chicks per pair and year in the Engadine GR and the Alps of western Switzerland (D. Jenny, G. Banderet); in the western part of Valais, they are even lower (S. Denis). Human influence, such as disturbance at the nest or poisoning, also increasingly affects the population. In several cantons, high concentrations of toxic lead were found in the bones of Golden Eagles, stemming mainly from hunting ammunition[3, 5, 6]. Switzerland, which is home to a quarter of the Alpine Golden Eagle population, has a particular responsibility for the conservation of this species.

David Jenny, Serge Denis & Gaby Banderet

[1] Haller (1994); [2] Haller (1996); [3] Jenni et al. (2015); [4] Jenny (1992); [5] Jenny et al. (2016); [6] Madry et al. (2015); [7] Müller (2015); [8] Müller & Volet (2010)





Breeding pairs 2013–2016

1

Certain dots on the maps have been moved to protect this sensitive species

Change in the number of breeding pairs since 1993–1996

Increase

1

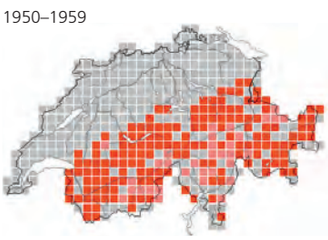
0

Decrease

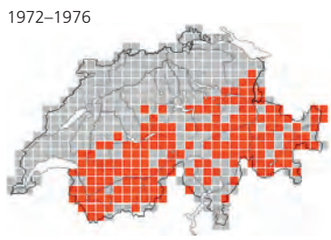
1

Sponsored by
Claudia Kamber
Erich & Claudia Voggensperger, Schönenbuch

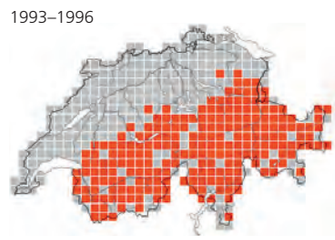
1950–1959



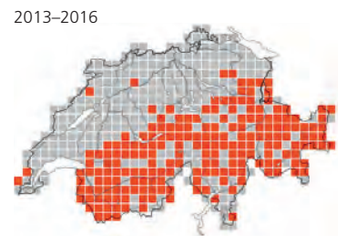
1972–1976



1993–1996



2013–2016



Short-toed Snake-eagle

Circaetus gallicus
Schlangenadler
Circaète Jean-le-Blanc
Biancone
evla alva

Daniele Occhiato

Red List –
Population 3–5 pairs (2013–2016)

Focus pages 190, 264, 425

The Short-toed Snake-eagle's preference for snakes restricts its breeding range to the Mediterranean and the Black Sea regions. In western Russia, however, it extends as far as the Baltic Sea[3]. In western Europe, the Alps limit the species' range in the north, and it regularly breeds in northern Italy[1] as well as in the French departments of Haute-Savoie, Ain and Jura[AtF].

Although the Short-toed Snake-eagle is suspected to have bred in Switzerland earlier[AtCH1, VdS], breeding was not recorded until 2012 near Leuk VS[2]. After a two-year interval, the same pair bred again in 2015 and 2016 in two different atlas squares in the Upper Valais (J. Cloutier, L. Maumary)[4, 5]. The first brood south of the Alps was recorded in central Ticino in 2016[7]. A thorough search in 2017 resulted in the discovery of two additional breeding pairs in Valais (R. Arlettaz, L. Maumary) and one in Ticino (L. Pagano, F. Rampazzi, M. & N. Spinelli).

The Short-toed Snake-eagle's colonisation of Switzerland was preceded by a marked increase in sightings since 1991[VdS, 2, 7]. Populations in France and Italy are also on the rise[AtF, 6].

Lionel Maumary

[1] Campora & Cattaneo (2006); [2] Maumary et al. (2013); [3] Mebs & Schmidt (2014); [4] Müller (2016); [5] Müller (2017); [6] Premuda et al. (2015); [7] Rampazzi & Pagano (2017)

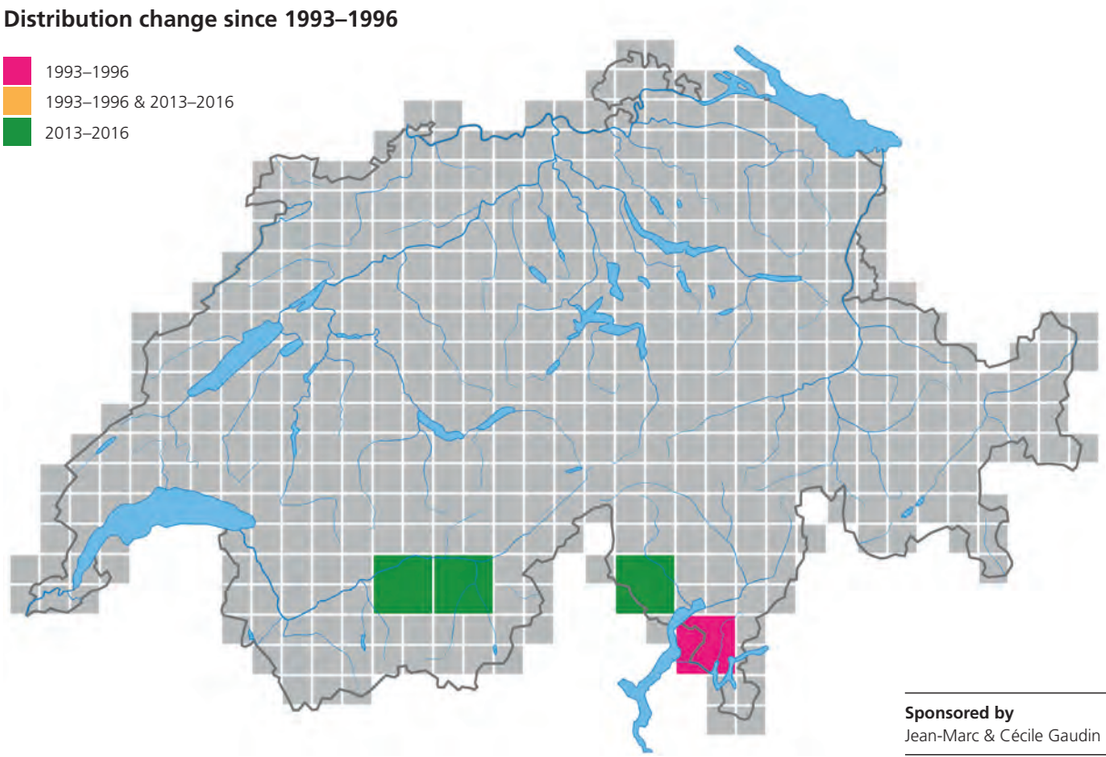
1950–1959

1972–1976

1993–1996

2013–2016

Distribution change since 1993–1996



Sponsored by
Jean-Marc & Cécile Gaudin

Western Marsh-harrier

Circus aeruginosus
Rohrweihe
Busard des roseaux
Falco di palude
melv da channa

Mathias Schäf

Red List Vulnerable (VU)
Population 0–3 pairs (2013–2016)

Focus –

Although the Western Marsh-harrier has been found to breed in relatively small wetlands in neighbouring countries, breeding attempts in Switzerland are exceptional. There are only seven confirmed breeding records in the 20th century[VdS]. Since 1980, the Western Marsh-harrier has nested regularly in Wollmatinger Ried D on Lake Constance (up to three pairs)[ABo3]; one pair per year bred here in 2014–2016 (H. Jacoby, S. Werner, J. Urban et al.). In addition, probable breeding was recorded in 2014 at Radolfzeller Aachmündung D (C. Stauch, A. Brall)[6].

In Switzerland, breeding attempts were observed in Neeracherried ZH in 2007–2009 for the first time since 1975 (S. Heller et al.)[8, 11, 12]. Further breeding attempts occurred in the Grande Cariçaie on Lake Neuchâtel (2015–2016)[1, 2, 7], at Fräschelsweiher BE (2016; P. Tröndle)[7], in Meieriedloch BE (2016)[4, 7] and in Wengimoos BE (2017; D. Friedli, R. Bearda, A. Stähli). A female carrying nesting material was observed in 2013 in Chavornay VD (D. Landenbergue)[9]. As nesting activity can be observed in unpaired birds as well[HVM], such activity is not necessarily evidence of breeding.

The overall European population has been stable since 1995[EBCC]. However, trends in Switzerland's neighbouring countries vary[AtD, AtF, RLEU, 3, 5, 10].

Hans Schmid

[1] Antoniazza (2016a); [2] Antoniazza (2016b); [3] Bauer et al. (2016a); [4] Christen (2017b); [5] Dronneau & les observateurs de la LPO Alsace (2016); [6] Knaus et al. (2014); [7] Müller (2017); [8] Müller & Volet (2010); [9] Posse (2014); [10] Rödl et al. (2012); [11] Volet & Gerber (2008); [12] Volet & Gerber (2009)

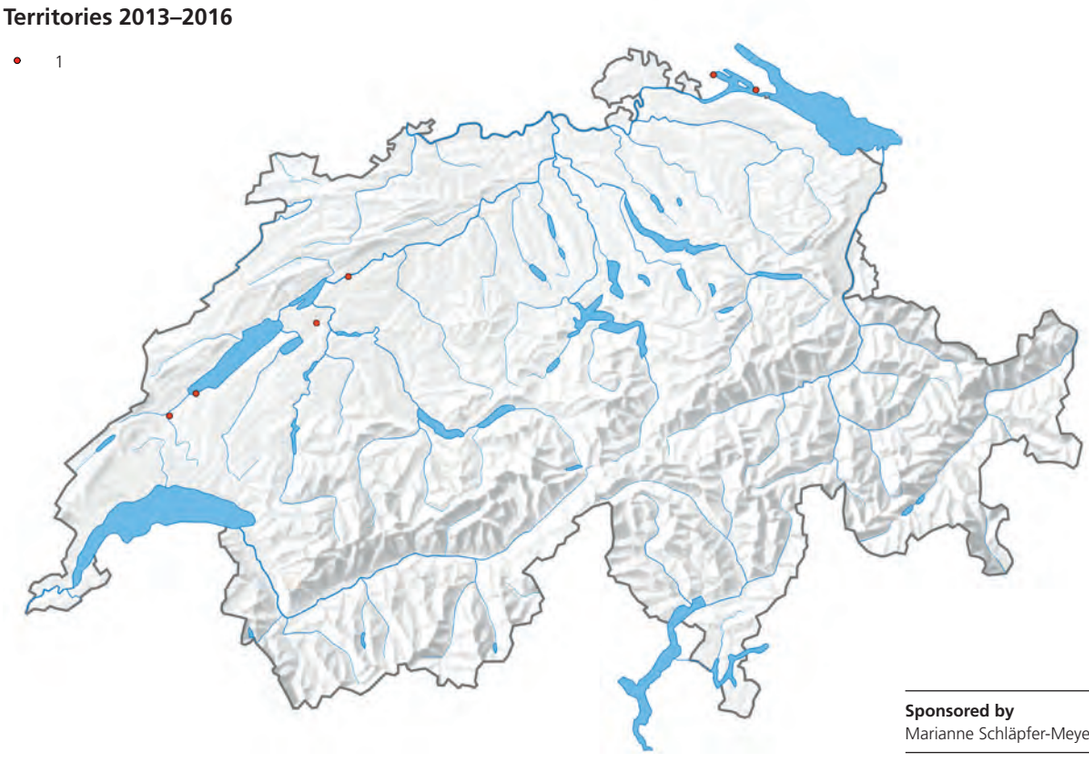
1950–1959

1972–1976

1993–1996

2013–2016

Territories 2013–2016



Sponsored by
Marianne Schläpfer-Meyer

Eurasian Sparrowhawk

Accipiter nisus
Sperber
Épervier d'Europe
Sparviere
sprer (pitschen)

Markus Varesvuo

Red List Least Concern (LC)
Population 3500–6000 pairs (2013–2016)

Focus page 264

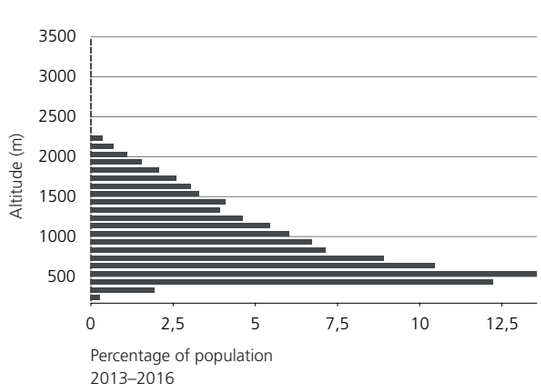
In Switzerland, the Eurasian Sparrowhawk occurs from the lowlands up to the tree line. It is concentrated in coniferous and mixed forests at altitudes of 400–800 m. The greatest densities are reached in the heavily wooded areas where the Central Plateau joins the Pre-Alps as well as in the Jura. When foraging during the breeding season, the Eurasian Sparrowhawk can be found around or even above the tree line. Although breeding has been observed in locations up to 1950 m [AtCH2, VdS], the highest current confirmed breeding was recorded in the Swiss National Park GR at 1920 m (R. Wüst-Graf).

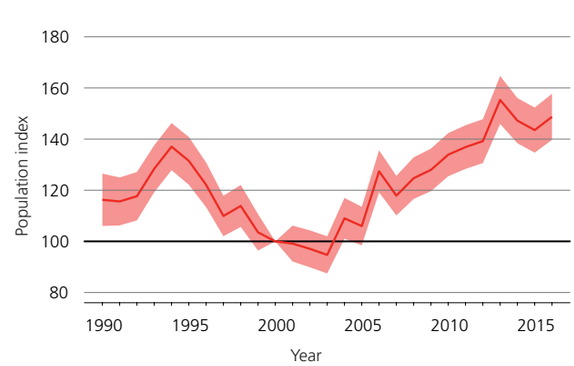
Since 1993–1996, the Sparrowhawk has been recorded in some new atlas squares in the Alpine region, which may be due to increased survey effort. The species' altitudinal distribution appears to have remained unchanged since 1993–1996. The Swiss breeding population has been increasing again since about 1975. Regional surveys also show signs of recovery, such as in the Canton of Zurich between 1988 and 2008 (where the population doubled) [AtZH] and at Lake Constance between 1980 and 2010 (fourfold increase in the population and the number of occupied squares) [AtBo]. In France, too, numbers saw a sustained increase; however, they have been declining again somewhat since 2000 [AtF, 5]. In Germany, the population was stable for a long time, but is currently also decreasing slightly [AtD, 4]. In Italy, the population is considered stable [6]. The overall European trend is negative [EBCC].

The increases were probably mainly caused by the ban on chlorinated hydrocarbons (such as DDT) and mercury compounds that had heavily contaminated Eurasian Sparrowhawk populations. Contamination with toxic substances continued to reduce the species' breeding success in Switzerland at least until 1994 [3]. To determine the current level of contamination, the studies conducted by Bühler [3] would have to be repeated. Increasing forestry operations and recreational activities during the breeding season may affect breeding success by causing disruption or nest loss [1, 2, 4]. Collisions (e.g. with window panes, vehicles) are the most common known cause of death [7]. Given the slight decline in neighbouring countries, improved monitoring of individual populations is called for.

Stefan Werner & Hans Schmid

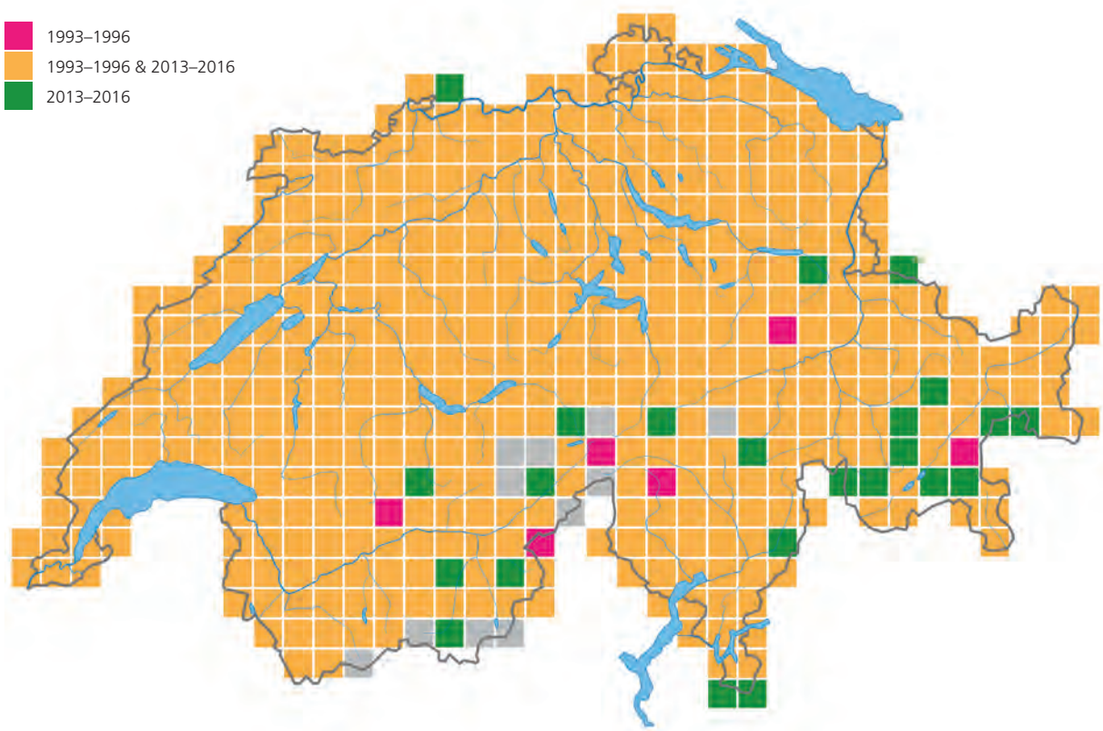
[1] L. Broch, in litt.; [2] Broch et al. (2017b); [3] Bühler (2000); [4] Interessengemeinschaft Sperber (2008); [5] Jiguet (2017); [6] Rete Rurale Nazionale & Lipu (2015); [7] Werner et al. (2018)



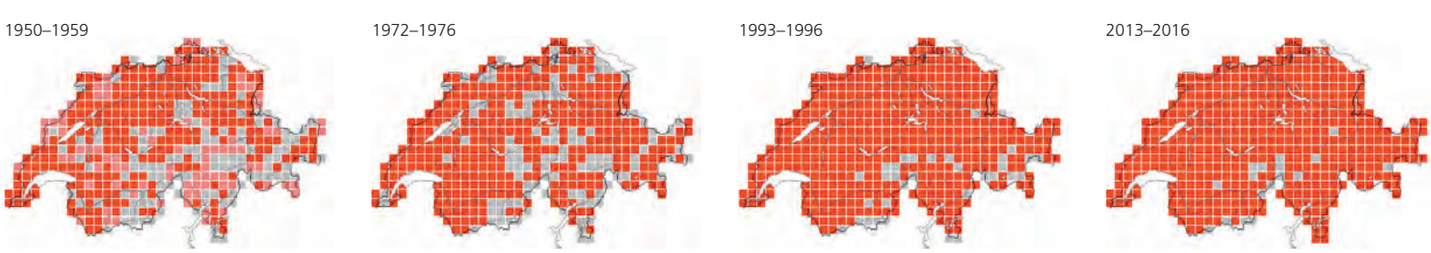


Occurrence 2013–2016

Distribution change since 1993–1996



Sponsored by
Forrer & Abderhalden GmbH, Unterwasser



Northern Goshawk

Accipiter gentilis
Habicht
Autour des palombes
Astore
sprer grond

Reto Ricci

Red List Least Concern (LC)
Population 1300–1700 pairs (2013–2016)

Focus pages 142, 264, 314

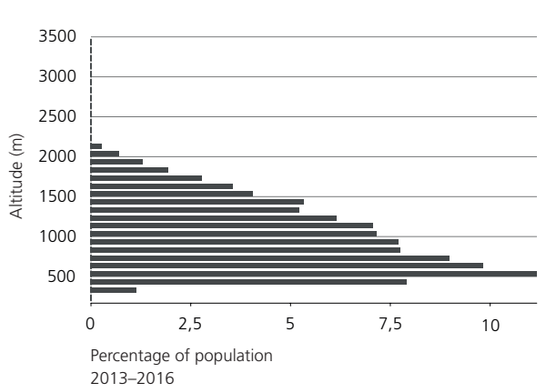
In Switzerland, the Northern Goshawk favours woodland habitats between 400 and 1500 m. However, it hunts up to and even above the tree line, also during the breeding season. The highest breeding site in Switzerland used to be in Zermatt VS at 2040 m [AtCH2]. More recently, the highest confirmed breeding was recorded at 1830 m near Stazersee GR (T. Wehrli, P. Walser Schwyzer). Altitudinal distribution does not appear to have changed since 1993–1996.

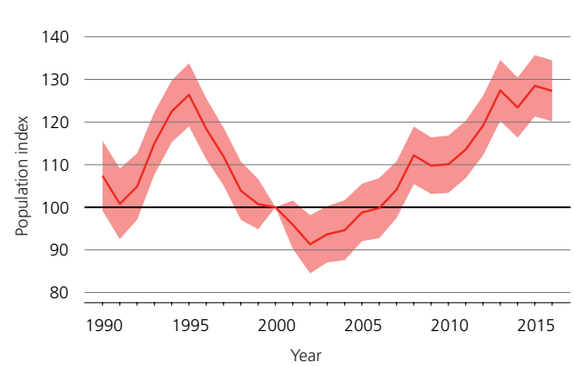
After 1972–1976, the Swiss population recovered, and the Northern Goshawk recolonised many sites on the Central Plateau and in the Jura that had been occupied earlier in 1950–1959 [AtCH0]. Since 1993–1996, the population appears to have remained more or less constant. The peaks during the two atlas periods are striking, and are most likely due to increased observer effort. In an area of 1121 km^2 in northeastern Switzerland, the upward trend lasted until 1985. After that, numbers were stable until 1999 [7]. The current trend is negative, at least in parts of the country [1, 3]. Breeding success is poor in some populations [3, 8]. In fact, many pairs do not even attempt to breed [8]. In the Lake Constance region, numbers declined by about 20 % between 2000 and 2010 [AtBo]. In neighbouring countries, the populations initially showed a long-term increase [AtD, AtF]. The population has been considered stable in France since 2000 [AtF], while it is declining in Germany and parts of Austria, probably due to direct persecution since 1998 [AtD, 2]. In most European countries where the trend is known, numbers are declining [RLEU].

The increase in the years following 1972–1976 was probably due primarily to the ban on persistent biocides, which had previously had severe adverse effects [VdS, 4]. The extent of illegal persecution through shooting and trapping is difficult to estimate [6]. Pigeons coated in poison harm not only the Peregrine Falcon, but also the Northern Goshawk [5, 9]. In addition, forestry work during the breeding season is increasingly causing brood loss [7]. To prevent yet another decline, these threats must be addressed, and old-growth stands need to be preserved and shielded from disturbance.

Stefan Werner

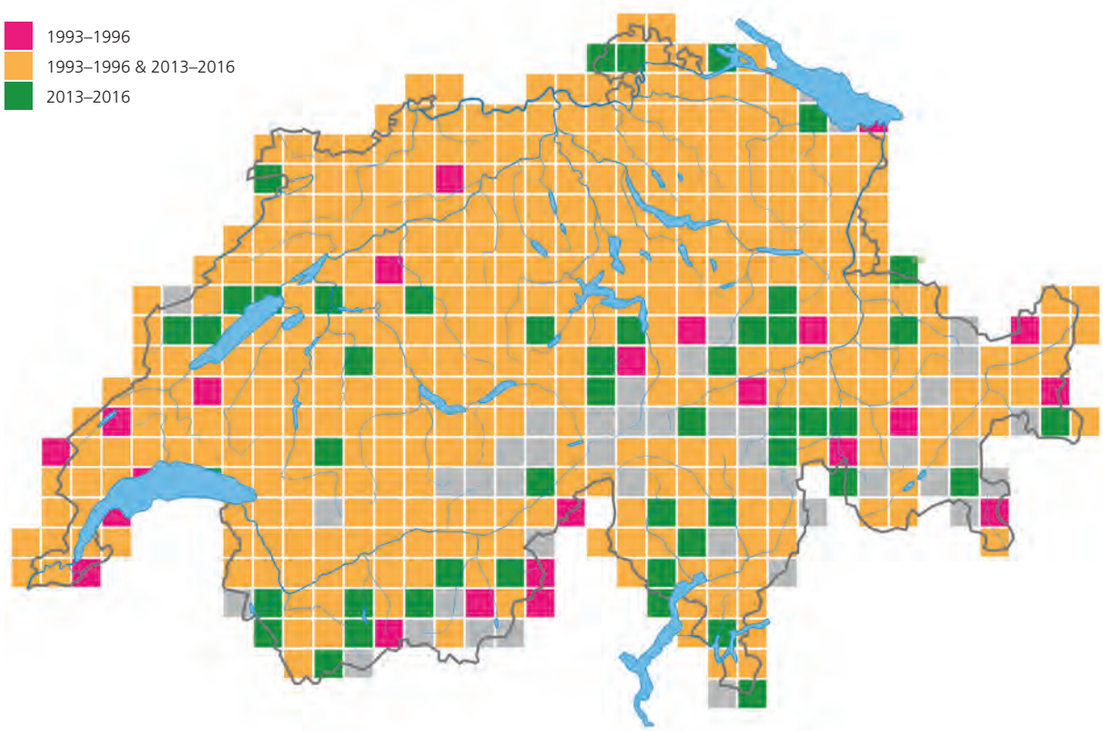
[1] A. Aebischer & M. Kéry, pers. comm.; [2] Albegger et al. (2015); [3] Broch et al. (2017a); [4] Bühler & Oggier (1987); [5] Inderwildi et al. (2016a–b); [6] Mebs & Schmidt (2014); [7] Schlosser & Bühler (2010); [8] Schlosser & Schlosser (2013); [9] Werner et al. (2018)





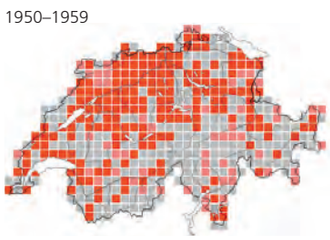
Occurrence 2013–2016

Distribution change since 1993–1996

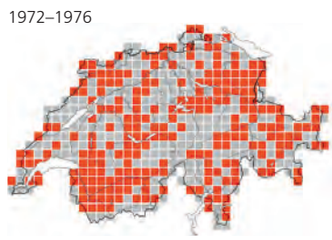


Sponsored by
Simon Müller, Möriken
Odile Niederhauser

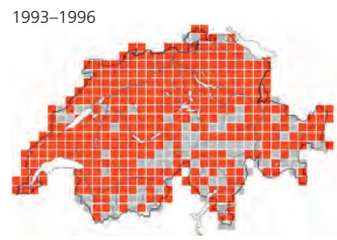
1950–1959



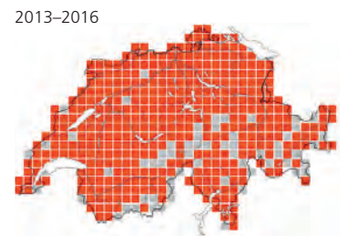
1972–1976



1993–1996



2013–2016



A golden age for raptors and owls?

For centuries, birds of prey and owls suffered persecution. While most species were protected by law from 1926, environmental toxins severely affected the slowly recovering populations in the 1960s and 70s especially. Thanks to a range of conservation measures, there has since been an encouraging upturn, but some threats remain.

For centuries, raptors and owls were directly persecuted by humans. The last Bearded Vulture in the Alps was shot in 1913, and the last Osprey pair bred in Switzerland in 1911. Red Kite and Eurasian Eagle-owl were on the brink of extinction. Golden Eagle numbers were also greatly diminished [VdS]. Despite the ban on hunting introduced for several species in 1926, many raptor and owl populations were slow to recover. Golden Eagle, Eurasian Hobby and Peregrine Falcon were not protected until 1953, Northern Goshawk and Eurasian Sparrowhawk not until 1963 [10, 19].

Fatal pesticides

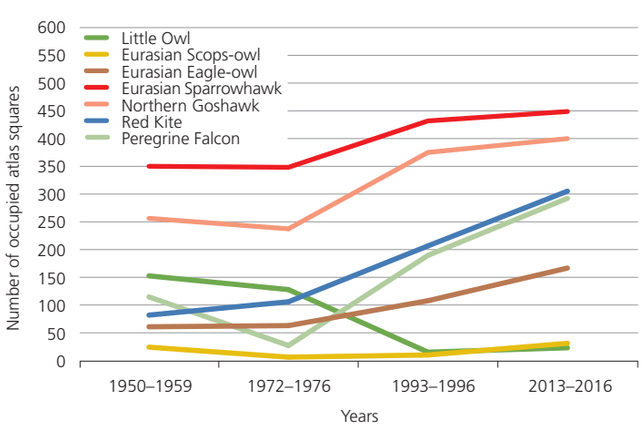
Besides illegal persecution, which still occurs in isolated cases today, the use of pesticides such as DDT, put to large-scale use from 1940, was a severe threat. It accumulates at the top of the food chain, which is why birds of prey were hit particularly hard, producing eggs with thin shells. As a result, only a single Peregrine Falcon pair bred successfully in Switzerland outside of the Alps in 1971 [AtCH1]. Following a ban on persistent chlorinated hydrocarbons (including DDT and PCB) in the 1970s in Switzerland and most western countries, the affected species started to recover. But poisoning by carbofuran, only banned in Switzerland in 2013, continued to occur regularly in farmland areas well into the 1990s, affecting the Eurasian Buzzard and Red and Black Kite [6]. Apart from these previously unknown effects of environmental toxins, the deliberate decimation of insects also had serious consequences. The reduced food supply has affected many species, including raptors and owls, the final links in the food chain, which either hunt insects themselves or prey on small, insectivorous mammals like the shrew.

In many European countries, birds of prey and owls were not protected until the 1970s [12]. Until then, migrating raptors were still exposed to direct persecution. Other human influences had a positive effect on certain species: intensively managed grassland, where grass is mowed several times a year, appears to benefit less specialised species (e.g. Red and Black Kite, Eurasian Buzzard). Targeted conservation measures have helped some birds of prey and owls to recover [13, 17]. Habitats are being improved and additional nest sites provided for Common Kestrel, Common Barn-owl, Eurasian Scops-owl and Little Owl. In recent years, climate change has led to warmer spring and summer months, which appears to benefit Mediterranean species such as Short-toed Snake-eagle and Eurasian Scops-owl.

Today, the populations of almost all birds of prey and owls are comparatively large – in some species, such as the Red Kite, numbers are probably higher than ever before.

Knowledge gaps and current threats

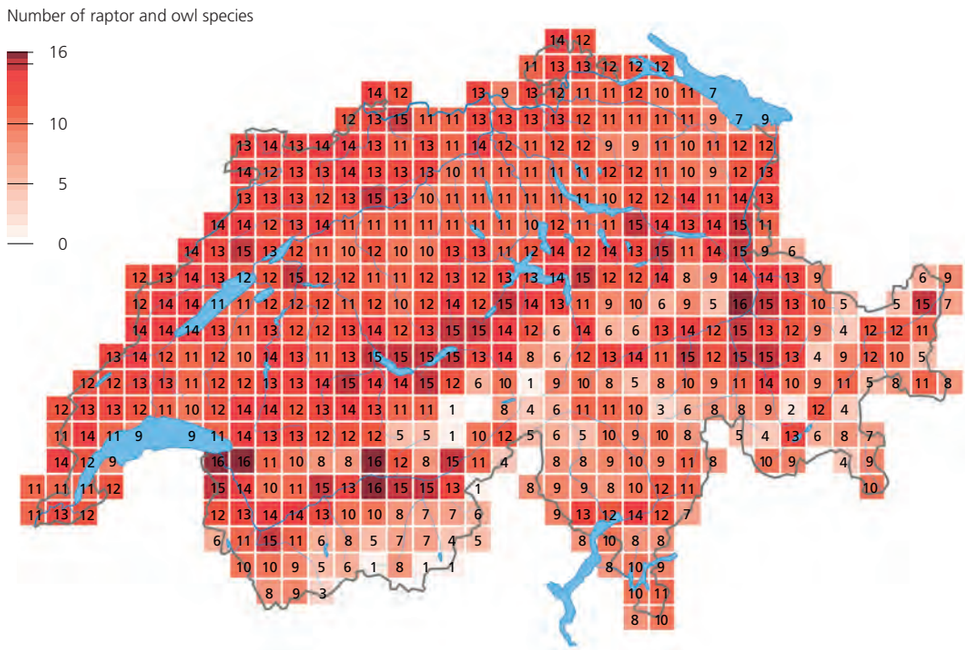
Despite a range of monitoring programmes, we still have incomplete knowledge of population trends, especially for Northern Goshawk and European Honey-buzzard, both secretive forest dwellers. Persistent pesticides are thought to have affected the reproductive rate of the Eurasian Sparrowhawk until at least the mid-1990s [3]. Whether these effects continue to influence the breeding success of our birds of prey is unknown. Our knowledge of cavity-nesting «woodland owls» such as Boreal Owl, Eurasian Pygmy-owl and Tawny Owl comes from areas where dedicated volunteers install and monitor nest boxes. We know too little about populations



The change in the number of atlas squares (10 × 10 km) occupied by various raptor and owl species illustrates their turbulent history in Switzerland. Increased observer effort from one atlas to the next has also influenced the results.

Adrian Aebischer

Birds of prey and owls often perch on electricity pylons. Medium-voltage poles are particularly dangerous, and can cause death by electrocution. The large number of deaths has put some Eurasian Eagle-owl populations at risk. Urgent action needs to be taken to replace these dangerous pylons throughout Switzerland.



Number of raptor and owl species per atlas square (10 × 10 km) in 2013–2016. Diversity is highest in the Jura, on the northern slopes of the Alps and in large Alpine valleys.

and trends in woodlands where no nest boxes exist. Finally, our understanding of how man-made structures and means of transport affect mortality is limited as well.

While most raptor and owl species in Switzerland currently show positive trends, some are declining. Critical cases include the Peregrine Falcon (due in part to illegal persecution)[5], and in some areas the Eurasian Eagle-owl (electrocution on electricity pylons and railway power lines, collisions, traffic casualties)[7, 8, 15]. The Little Owl remains vulnerable, too, despite signs of recovery; in intensively farmed areas, it finds barely enough food to feed its young[14].

Most raptors and some owls are long-lived, reach sexual maturity late and have a low reproductive rate. Therefore, even a small increase in mortality can affect the population trend. Current threats include habitat loss, increasing disturbance, electrocution on power pylons, collisions with overhead power lines, vehicles, trains and windows, pesticide contamination, lead poisoning from fragments of ammunition in the carcasses of game animals (which affects carrion eaters), and finally, direct illegal persecution[11, 16].

Farmland birds (e.g. Little Owl, Common Barn-owl) not only face direct habitat loss through building developments, but also struggle with food shortages as a result of intensive farming practices. Human recreation (e.g. rock climbing, paragliding, nest photography) also increasingly affects breeding success in several species[2, 9, 16]. The growth of wind energy will lead to losses of breeding birds in conflict areas. Wind farms are most likely already causing declines in Red Kite and Eurasian Buzzard populations in some areas of Germany[1, 4]. Migrating raptors are affected as well as a result of collisions with wind turbines in their southern migration and wintering grounds.

Required action

Many threats are hard to address. In our country, these include intensive farming, heavy use of fertilisers and pesticides, extensive networks of trails etc. The problems faced by migrant species are even more complex. They reach from direct persecution to drought and rainforest deforestation. However, the replacement of dangerous power pylons in Switzerland is feasible and long overdue. We could also improve the protection of nest sites for sensitive cliff breeders. Timber should be harvested outside of the breeding season (i.e. September to February). To protect migrating birds, important migration routes such as mountain passes and ridges should remain unobstructed by infrastructure. Other desirable measures include monitoring of breeding populations and breeding success, especially for secretive woodland species[18].

Stefan Werner

[1] Bellebaum et al. (2013); [2] Brambilla et al. (2004); [3] Bühler (2000); [4] Grünkorn et al. (2016); [5] Inderwildi et al. (2016a–b); [6] Jenni-Eiermann et al. (1996); [7] Jenny (2011a); [8] Jenny (2017); [9] Jenny & Schaad (2015a–b); [10] Lüps (2003); [11] Madry et al. (2015); [12] Mebs & Schmidt (2014); [13] Meisser et al. (2016a–b); [14] Perrig et al. (2017); [15] Schaub et al. (2010a); [16] Schmid (2009a–c); [17] Spaar & Ayé (2016a); [18] Werner et al. (2018); [19] Zbinden (1989)

Species pages 232, 236, 238, 242, 244, 248, 250, 252, 254, 256, 258, 260, 262, 266, 268, 270, 302, 304, 306, 572

Red Kite

Milvus milvus
Rotmilan
Milan royal
Nibbio reale
milan cotschen

Marcel Burkhardt

Red List Least Concern (LC)
Population 2800–3500 pairs (2013–2016)

Focus pages 142, 234, 264, 319, 392

The Red Kite occurs almost exclusively in the southern and temperate regions of Europe. Germany, Spain, France, Sweden and Switzerland are home to most of the world population of 25 000–33 000 pairs[4].

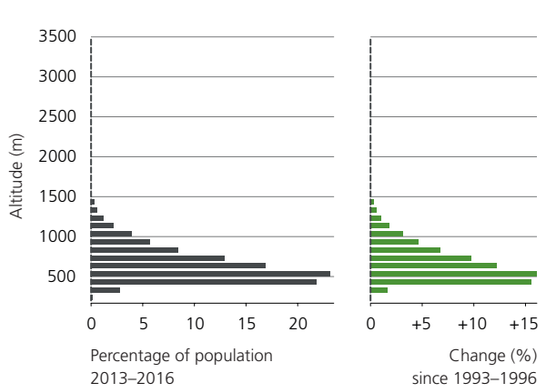
This bird of prey inhabits open, richly structured landscapes and is often seen in settlements, too. It nests in tall trees, preferably on forest edges, in clearings or in copses[1]. The Red Kite has continued to expand its range in Switzerland over the past decades. Since 1993–1996, it has penetrated the larger Alpine valleys and begun exploiting hunting grounds well into the Alpine zone. Today, Geneva and Ticino are the only cantons where it does not breed. The first breeding record in Grisons dates from 2008 in Maladers (F. Koch, C. Meier-Zwicky)[8]. Since then, the Red Kite has spread rapidly in that area, breeding for the first time in Davos at 1550 m in 2014 (H. Jacobs)[5]. In Valais, breeding was first recorded in 2012 in Val d'Illiez (G. Borrat-Besson, M. Chesaux)[6], followed by the Goms region in 2014 (S. Zurschmitten) and Bürchen in 2015 (R. Imstepf, P. Salzgeber)[3]. In 2013, breeding was observed for the first time in the Canton of Uri (B. Küng). The Red Kite continued to spread in Uri, merging its range with the existing range in the Canton of Glarus (where the species has bred since about 2005; J. Marti, R. Meier)[7].

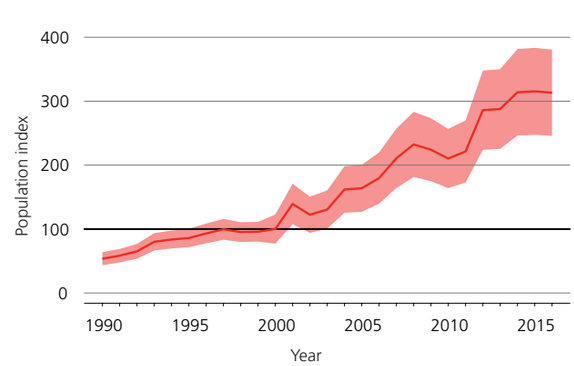
The expansion coincided with an increase in population density at altitudes of 400 to 900 m. Remarkable densities are found in these areas today, with 20 breeding pairs and at least 9 other pairs observed in an area of about 150 km² in the Seetal AG/LU in 2013 (R. Ristig). In large parts of the Canton of Fribourg, population density exceeds 20 pairs/100 km²[2]. In an area of 350 km² extending from Sensebezirk FR to Schwarzenburg BE, 124 pairs were recorded in 2017; in one square with a surface area of 6.25 km², as many as 11 broods were counted (P. Scherler).

The fragmented landscape in Switzerland is well-suited to the species' needs. The Red Kite takes a wide range of food and benefits from frequent mowing as well as from feeding and food sources in settlements. The wintering population has grown to more than 3000 individuals (A. Aebischer) and consists predominantly of adult birds, whose survival rates are probably higher when they winter in the breeding range rather than migrating.

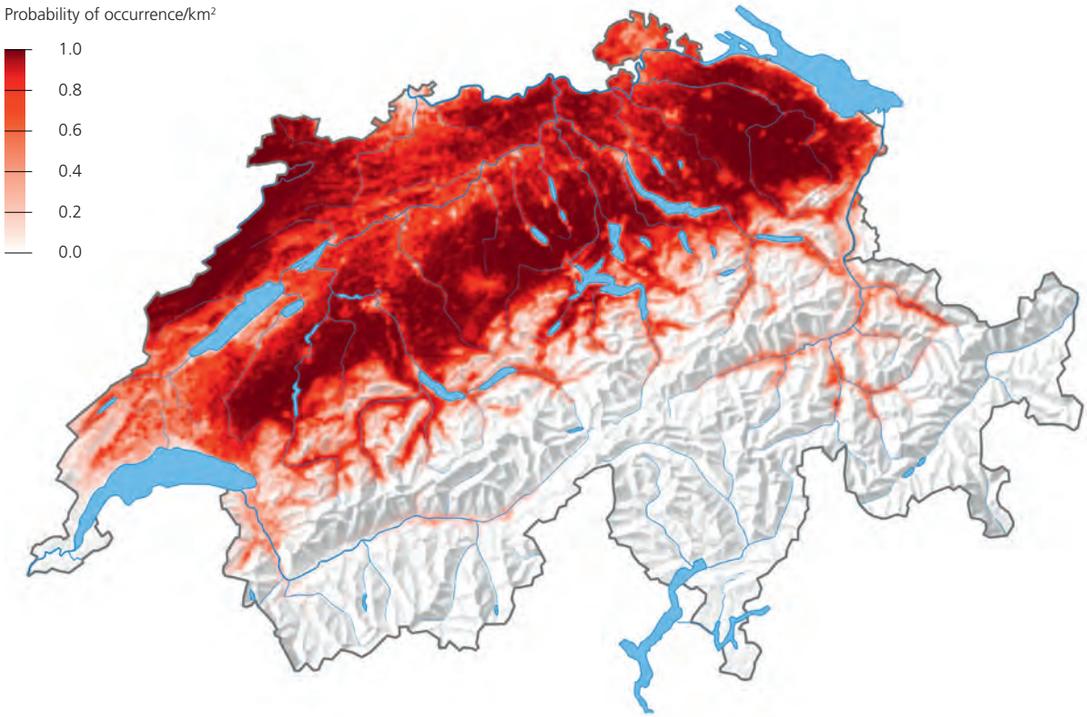
Hans Schmid, Patrick Scherler & Adrian Aebischer

[1] Aebischer (2009); [2] Aebischer & Broch (in prep.); [3] Antoniazza (2016b); [4] BirdLife International (2017a); [5] Müller (2015); [6] Posse (2013); [7] Schmid & Aebischer (in prep.); [8] Volet & Gerber (2009)

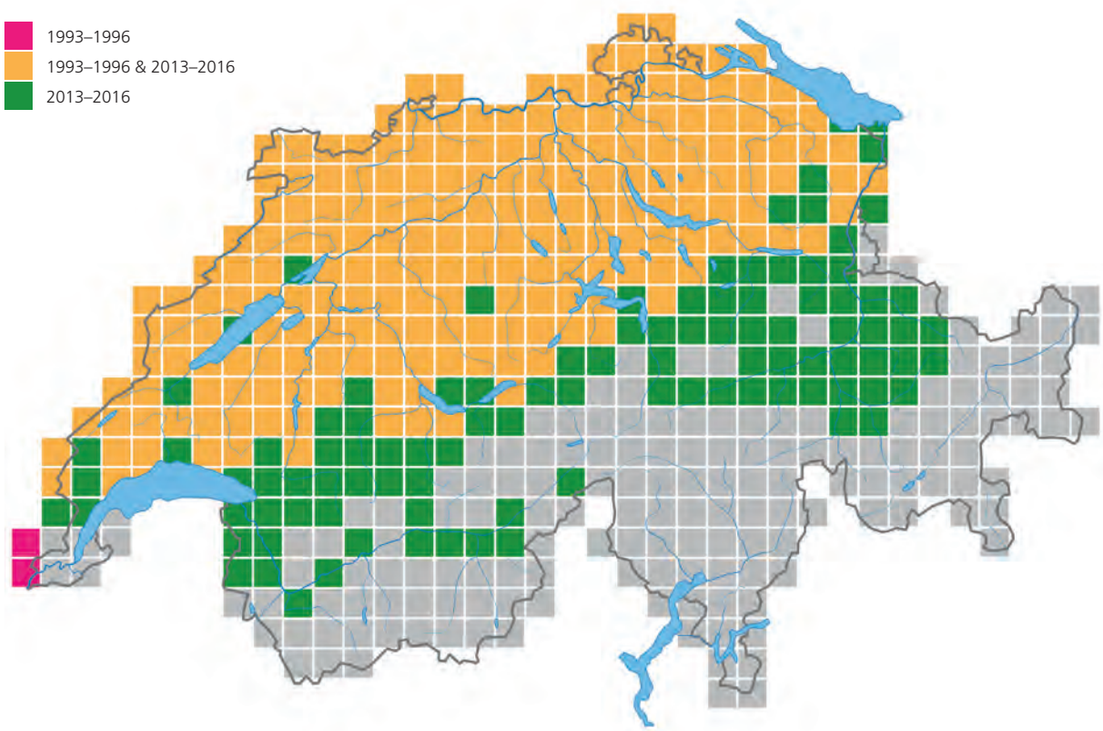




Occurrence 2013–2016



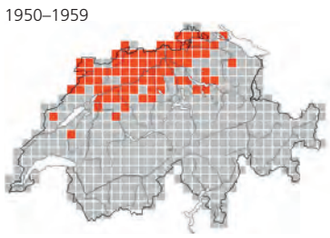
Distribution change since 1993–1996



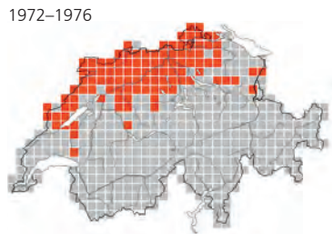
Sponsored by

BirdLife
BirdLife Aargau

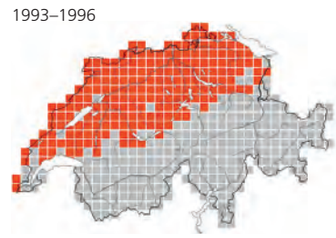
1950–1959



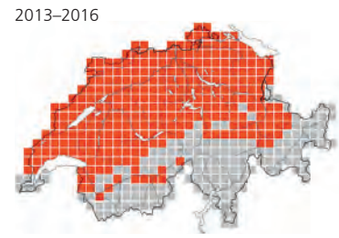
1972–1976



1993–1996



2013–2016



Black Kite

Milvus migrans
Schwarzmilan
Milan noir
Nibbio bruno
milan stgir

Pascal Engler

Red List Least Concern (LC)
Population 2000–3000 pairs (2013–2016)

Focus pages 264, 362

In Switzerland, the Black Kite is most common on the Central Plateau, especially near lakes and rivers. It also inhabits the Jura and parts of the Pre-Alps, Valais and Ticino. Some pairs penetrate the Alpine valleys, as demonstrated by breeding records in Waltensburg GR (880 m; M. Signorell), Filet VS (890 m; S. Zurschmitten), Zweisimmen BE (1130 m; D. Zeller), Gsteig BE (1150 m; M. Hammel) and Château-d'Œx VD (1210 m; V. & O. Rosselet)[1]. The highest breeding site was recorded near Ormont-Dessous VD at 1300 m, used in 2015 and 2017 (A. Meister).

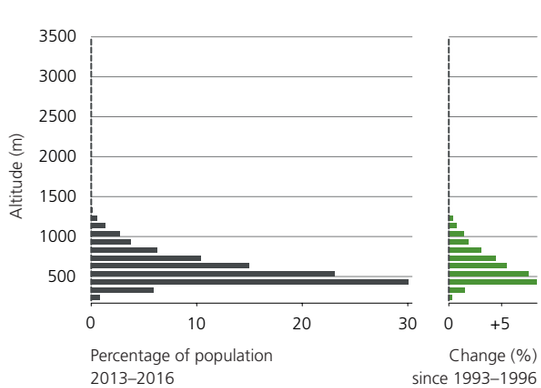
The Black Kite occurs in a range of habitats and is an opportunistic feeder. It likes to search lakes and rivers for dead fish, and meadows for earthworms and small mammals. Frequent mowing makes these easy prey. It nests in woods, groups of trees and waterside vegetation, sometimes also in high hedges or parks.

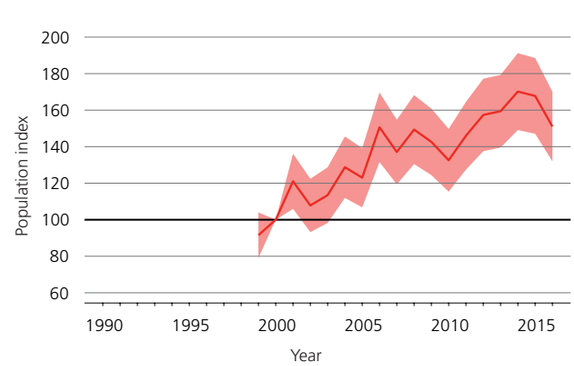
Since 1993–1996, new sites have been colonised in the Bernese Oberland and Grisons. Today, the Black Kite roams the Alpine valleys and enters the subalpine zone, although it does not breed there. In Grisons, breeding was recorded for the first time in 1998 in Domat/Ems[AGR]. Since then, the Black Kite has become a regular breeder in the lower part of the Vorderrhein Valley and in the Bündner Herrschaft[AGR]; it has also colonised the Domleschg area since 2002 (H. U. Tinner).

Currently, population density is highest in the western Lake Geneva basin. It is lower at the lakes at the foot of the Jura range, where numbers used to reach record highs compared to the European average[AN1]. The decline in that area is a result of lower nutrient levels in the lakes, which led to a massive drop in stocks of cyprinid fish, as well as the strong presence of the Yellow-legged Gull[2]. Despite these losses, the overall Swiss population is increasing, a trend confirmed by regional surveys[AtBo, AtZH]. In Germany, France and Italy, numbers are also increasing[AtD, AtF, 3]. As the Black Kite has shifted its foraging activity away from water and into farmland, its future distribution will depend on how small mammal populations develop. This change puts the Black Kite in a more specific niche, where it faces a range of competitors.

Hans Schmid

[1] Antoniazza (2015); [2] Antoniazza (2016a); [3] Campedelli et al. (2012)



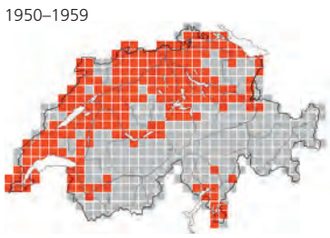


Occurrence 2013–2016

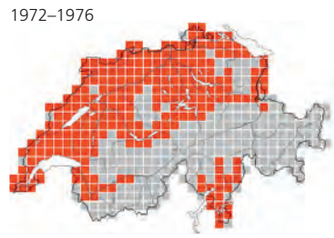
Occurrence change since 1993–1996

Sponsored by
Thomas Pfister, Sissach
Jean-Philippe Ruegger

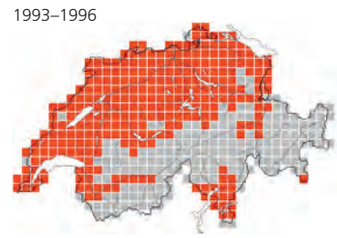
1950–1959



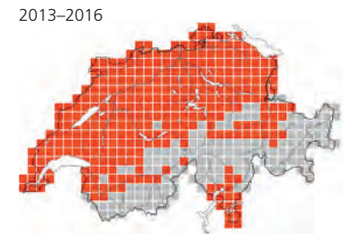
1972–1976



1993–1996



2013–2016



Eurasian Buzzard

Buteo buteo
Mäusebussard
Buse variable
Poiana
girun da mieurs

Patrick Donini

Red List Least Concern (LC)
Population 15 000–20 000 pairs (2013–2016)

Focus page 264

In Switzerland, the Eurasian Buzzard occurs from the lowlands to the subalpine zone. It is concentrated on the Central Plateau and in the Jura below 1000 m, where it finds its preferred habitat: a mosaic of fields, meadows and woods. The highest densities are reached in the central and eastern parts of the Central Plateau. Densities are low in Ticino and Valais. Although foraging birds can be found above the tree line, confirmed breeding records above 1500 m are rare. The highest breeding was recorded in Chamues-ch GR at 1850 m [AEn]. Begging young observed in recent years at about 1750 m could have come from a nest located elsewhere.

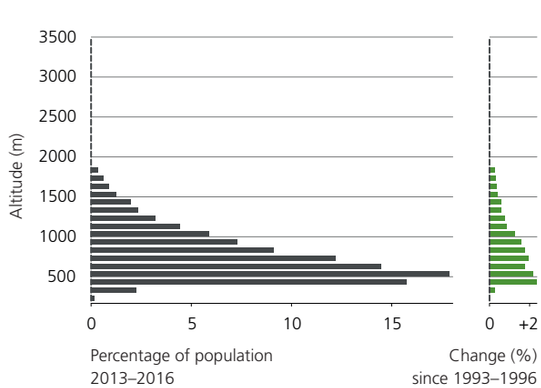
Compared to 1993–1996, the population has increased for unknown reasons in eastern Switzerland especially. Regional surveys also show an upward trend [AtBo, AtGE, AtZH]. Since 1993–1996, density has increased at all altitude levels where the species occurs, though the increase was somewhat greater at medium to high altitudes. The Eurasian Buzzard was recorded for the first time in a number of inner-Alpine atlas squares.

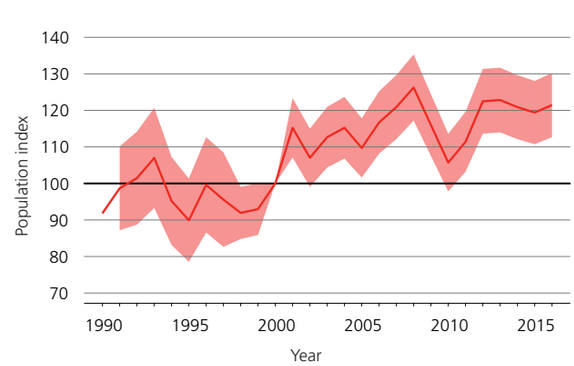
The steady increase is likely due to the ban on pesticides like carbofuran (2013), which had caused numerous deaths [2], as well as land use changes in grasslands. Like the Red and Black Kite, the Eurasian Buzzard benefits from frequent mowing, which makes it easier to prey on earthworms and small mammals. The population has been fairly constant in Switzerland since 2001. Cyclical outbreaks of mice can cause sharp fluctuations in the Eurasian Buzzard population [3], although these are less marked than they used to be [5]. This can be taken as an indication that the food supply is consistently high. The Eurasian Buzzard is expected to continue colonising new sites at higher altitude in the future.

In neighbouring countries, the population shows a sustained increase [AtD, AtF, 4] or is stable [6]. The overall European population is stable [EBCC]. Current declines in northern Germany are attributed to collisions with wind turbines due to the intensive use of wind power [1].

Stefan Werner & Hans Schmid

[1] Grünkorn et al. (2016); [2] Jenni-Eiermann et al. (1996); [3] Mebs (1964); [4] Rete Rurale Nazionale & Lipu (2015); [5] Schuster et al. (2012); [6] Teufelbauer & Seaman (2017)



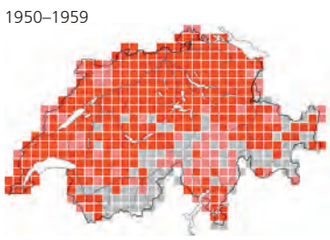


Occurrence 2013–2016

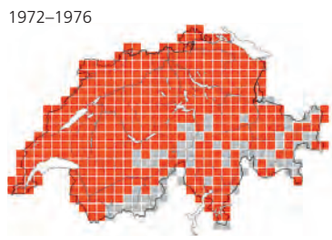
Occurrence change since 1993–1996

Sponsored by
Anonymous donor

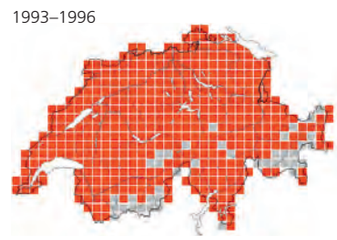
1950–1959



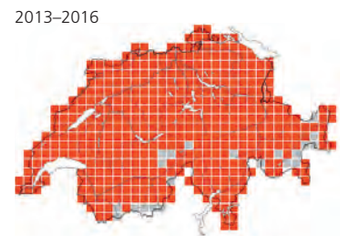
1972–1976



1993–1996



2013–2016



Common Hoopoe

Upupa epops
Wiedehopf
Huppe fasciée
Upupa
cot da matg

Daniele Occhiato

Red List Vulnerable (VU)
Population 180–260 pairs (2013–2016)

Focus pages 212, 240, 392, 532

Following the steep decline of the Common Hoopoe across Europe in the 20th century, Switzerland nearly constituted a gap in the species' central European breeding range. Currently, the Common Hoopoe inhabits the large Alpine valleys, the western Lake Geneva basin and a few sites on the southern slopes of the Jura and the Central Plateau. Outside of these areas, breeding is rare. More than 90 % of the population is found below 1000 m. The highest confirmed breeding record came from 2100 m near Samedan GR in 2013 (R. Vanscheidt, T. Wehrli).

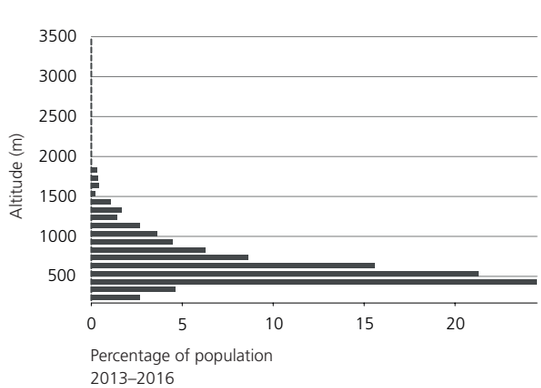
The Common Hoopoe feeds mainly on arthropods, foraging in low or patchy vegetation or on bare ground, for instance in orchards, vineyards and pastures with short grass [VdS, 1, 7, 14, 15]. Proximity to suitable nesting cavities is critical [2, 6]. Currently, half the Swiss population is found in the Valais, where density reaches about 80 pairs/64 km² in the Rhone Valley [8]. In other areas, density is lower and many nest sites are not occupied annually.

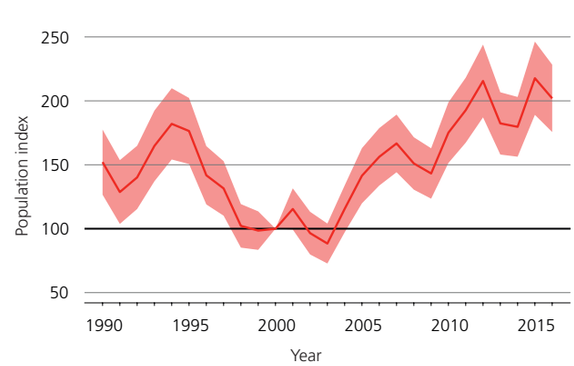
The Swiss population declined steeply between 1950 and 1980 [AtCH0], dropping to an alarming level before beginning to recover around the year 2000. Numbers have since doubled, increasing in Valais from 2002 onwards [2] – although they are currently in decline again there [13] – and in Grisons from 2004 [11]. From Grisons, the species colonised the Rhine Valley in St. Gallen after 2012. The Common Hoopoe re-established itself on the Central Plateau after 2006, first in the Canton of Geneva [12], later in the Canton of Vaud [4, 5]. In Ticino, numbers have been stable since at least 2006 [9]. France, Germany and Italy also report positive trends [AtD, AtF, 3].

The increase observed since the early 2000s is the result of conservation measures that began in Valais in 1998 [2] and were later implemented in other parts of Switzerland, supported by a national action plan [11]. Warmer summer temperatures due to climate change [10] have probably contributed to the success of the conservation measures [1], as have more sustainable cultivation practices, especially in the vineyards. The availability of large prey and suitable nesting cavities remains critical for the Common Hoopoe.

Jérôme Duplain

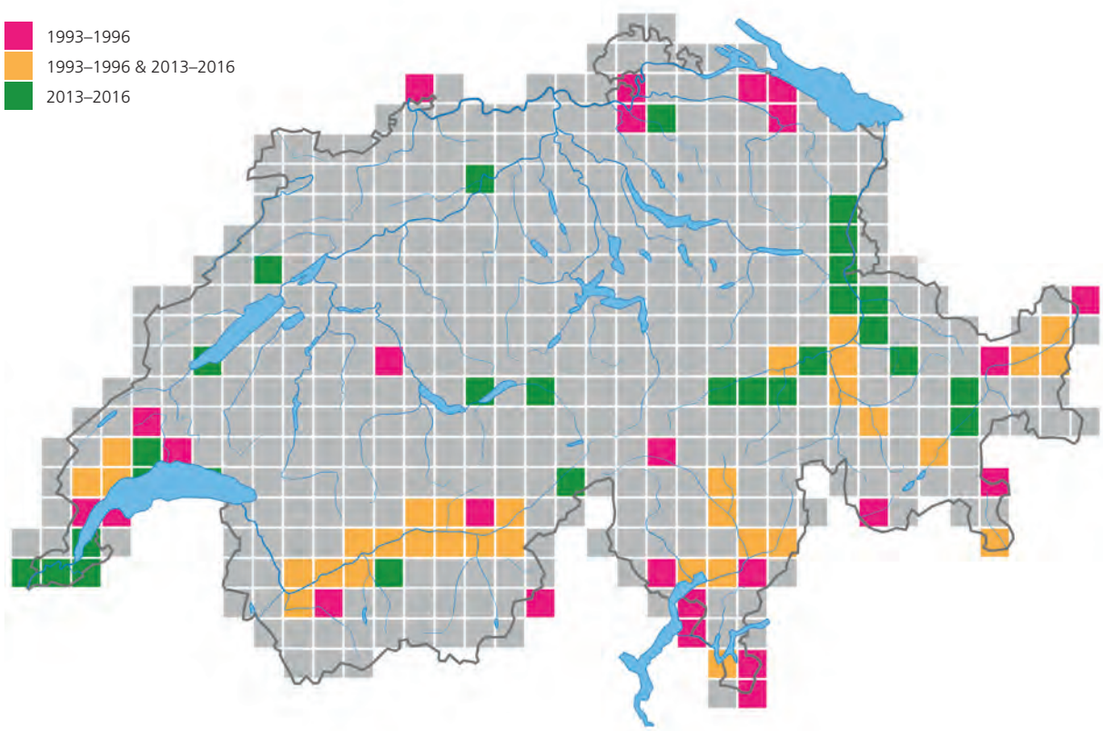
[1] Arlettaz et al. (2010b); [2] Arlettaz et al. (2010c); [3] Campedelli et al. (2012); [4] Daenzer et al. (2016); [5] Duplain et al. (2015); [6] Guillod et al. (2014a–b); [7] Guillod et al. (2016); [8] Hoffmann et al. (2015); [9] Lardelli & Scandolara (2014); [10] MeteoSchweiz (2017)/MétéoSuisse (2017)/MeteoSvizzera (2017); [11] Mühlethaler & Schaad (2010a–b); [12] Ruchet (2017); [13] Schaub & Arlettaz (2016); [14] Schaub et al. (2010b); [15] Tagmann-Ioset et al. (2012)





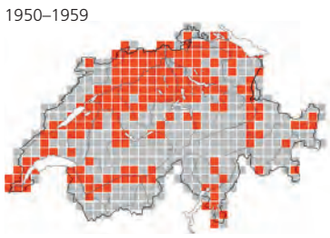
Occurrence 2013–2016

Distribution change since 1993–1996

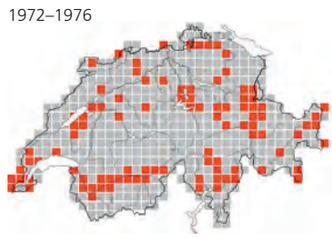


Sponsored by
Tassos & Marianne Chatzigeorgiou
Nathalie, Raúl & Lina Mil
Anonymous donor

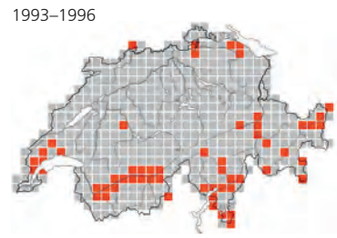
1950–1959



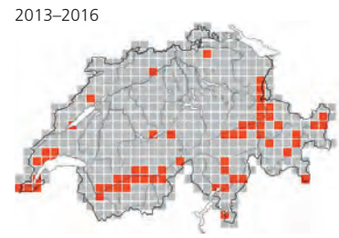
1972–1976



1993–1996



2013–2016



European Bee-eater

Merops apiaster
Bienenfresser
Guêpier d'Europe
Gruccione
maglia-avieuls

Beat Rüegger

Red List Endangered (EN)
Population 53–72 pairs (2013–2016)

Focus pages 276, 284, 319, 392, 425

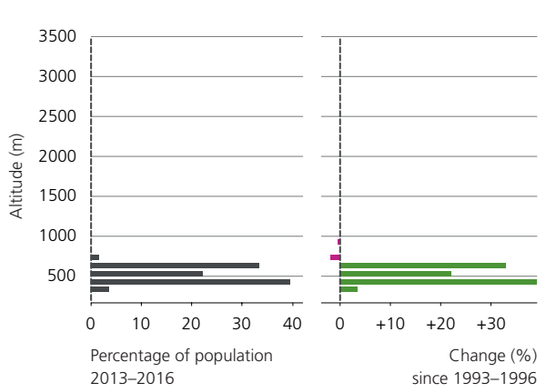
The breeding range of the European Bee-eater in western Europe is patchy and more or less confined to the Mediterranean region, though it extends further north in the east. The species bred in Switzerland for the first time in 1991 [AtCH2, 13] and rapidly became a regular breeder [5, 6]. It has modest habitat requirements, needing only small patches of bare earthen wall for nesting if it finds plenty of large flying insects such as butterflies, Hymenoptera or dragonflies nearby. The Bee-eater is a lowland species: the highest breeding sites were near Eriswil BE at 820 m in 1992 [AtCH2] and in Val de Ruz NE at 790 m in 2007 and 2015 (D. Gobbo, J.-M. Gobat, C. Sinz).

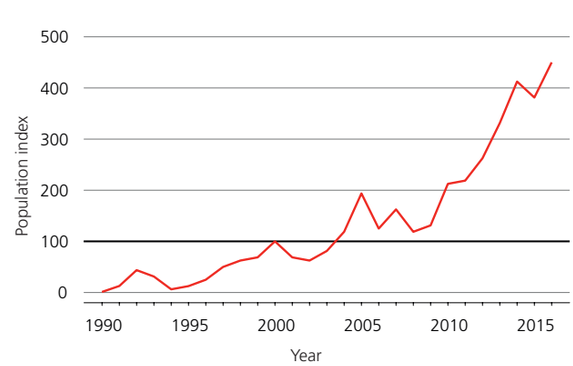
The European Bee-eater occurs mainly in western Switzerland, where it is still a rare and local breeder. But distribution and population size have increased since the unstable early years [5, 6]. The changes after 20 years are striking: 1–5 breeding pairs were counted in 2–3 sites in 1993–1996 [AtCH2]; in 2013, numbers had increased to 53 pairs in eight colonies [11], and in 2016, there were 72 pairs in 15 sites [10]. The increase has clearly accelerated in the past few years – perhaps because population growth is no longer dependent on colonies which form as a result of large-scale but unpredictable population increases, but is now also driven by regional «branches» established by birds from the two main breeding sites in Switzerland: the colony in Penthaz VD (from one pair in 1996 to a maximum of 26 in 2011) [8] and the colony in Leuk VS (from three pairs in 2010 to 35 in 2017) [7].

The rise of the European Bee-eater in Switzerland is expected to continue. It corresponds well with the predicted northward extension of the breeding range [ClimAt] also visible in neighbouring countries. The expansion has resulted in marked increases in Germany, Austria and Italy [AtD, RLEU, 2, 4, 12, 14], though these gains mask losses in the species' current strongholds in southern France [AtF] as well as uncertain trends at the European level [EBCC]. The rising spring and summer temperatures [9] and the increase in the food supply that will likely follow [1, 3, 6] are expected to influence the population trend in Switzerland in the future as well.

Bertrand Posse

[1] Arbeiter et al. (2016); [2] Bastian et al. (2013); [3] Bauer et al. (2005); [4] Brichetti & Fracasso (2007); [5] Gerber & Posse (2009); [6] Gerber et al. (2011); [7] Jacot & Posse (2018); [8] Maumary (2016); [9] MeteoSchweiz (2017)/Météo-Suisse (2017)/MeteoSvizzera (2017); [10] Müller (2017); [11] Müller & Volet (2014); [12] Rete Rurale Nazionale & Lipu (2015); [13] Schelbert (1992); [14] Teufelbauer (2014)





Territories 2013–2016

>20
6–20
2–5
1

Certain dots on the maps have been moved to protect this sensitive species

Change in the number of territories since 1993–1996

Increase

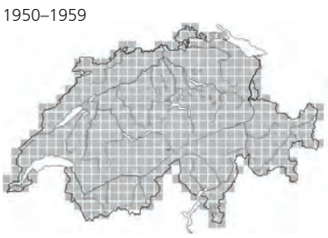
>20
6–20
2–5
1
0

Decrease

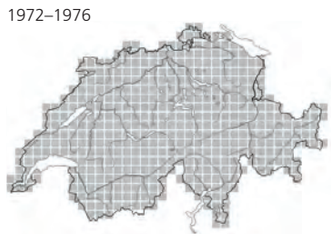
1
2–5
6–20
>20

Sponsored by
Dr Reto Dürler
Marianna & Eugen Schneider
Walter & Evelyn Thierstein-Calboli, Wettswil am Albis

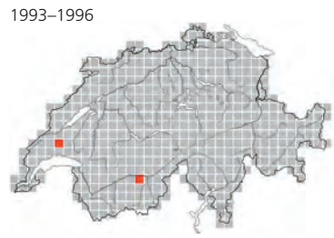
1950–1959



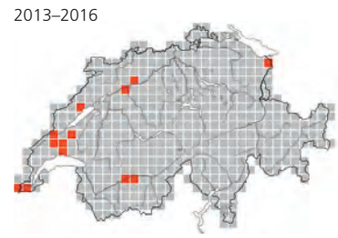
1972–1976



1993–1996



2013–2016



Gravel pits – refuges for displaced species

Gravel pits add to the diversity of agricultural landscapes and serve as pioneer habitats for birds. Due to the absence or loss of their natural habitats, Collared Sand Martin and Little Ringed Plover have become closely associated with these artificial environments, which are now also under threat.

Gravel pits emerged between the two world wars, when demand for concrete and construction material for roads increased, and reached the peak of their activity in the 1960s and 1970s [6]. They essentially expose a top layer of fine soil and a gravel layer beneath that is in contact with the fluctuating water table.

Bertrand Posse

The combination of bare gravel surfaces and open water creates a suitable alternative habitat for the Little Ringed Plover, despite the presence of construction machinery.

Bernard Lugrin

Gravel pit with open water and a sand bank accommodating a colony of Collared Sand Martins. Above it lies a steep slope with rough vegetation for pioneer species such as Common Stonechat or Common Whitethroat.

Havens of biodiversity

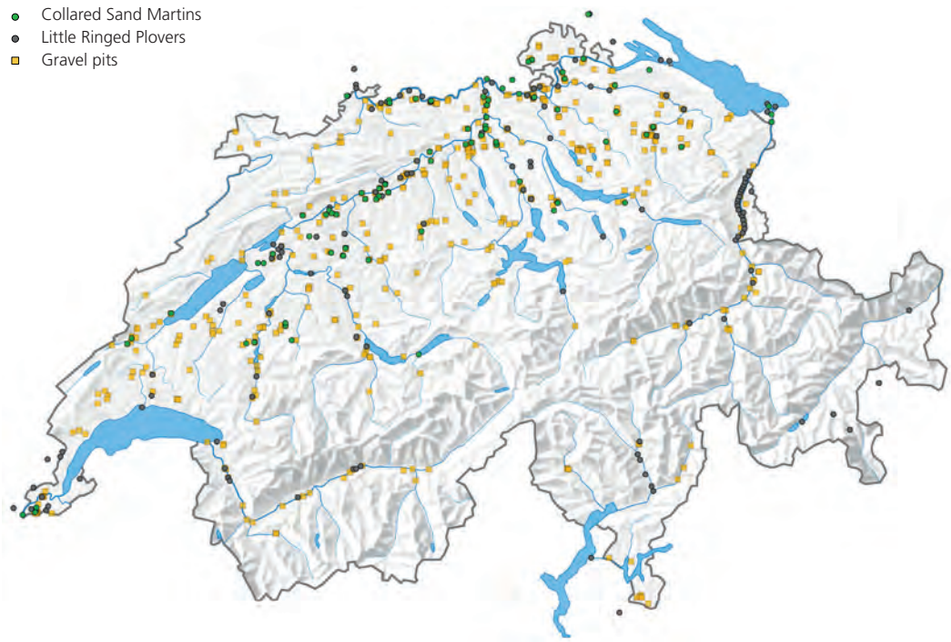
Many birds, amphibians, dragonflies, crickets and plants lost large expanses of alluvial and marsh habitats in the course of large-scale land-improvement schemes that were realised from the mid-19th to the mid-20th century. The artificial habitats created by gravel extraction were therefore of critical importance for these species. Machinery periodically digs up the ground and prevents the surfaces from being taken over by vegetation. The upper slopes made of gravel-free soil are left undisturbed. Within a few years, areas of rough land, shrubs and hedges with bushes or trees develop that add to the structural diversity and ecological value of the landscape on an area of several hectares. The contrast to the surrounding expanse of uniform farmland transforms gravel pits into havens for wildlife.

Significance for birds

These havens not only serve as stopover sites of regional importance for various migrants (especially waders) [4] but also offer alternative habitats for threatened breeding birds to raise their young. Because periodically flooded gravel banks have disappeared from our rivers, gravel pits now support one third of the breeding sites of the Little Ringed Plover [3]. The Collared Sand Martin breeds almost entirely in these alternative sites, because steep sandy cliffs no longer form on rivers that have lost their natural dynamics due to river engineering works. Several gravel pits even serve as breeding sites for the European Bee-eater, still rare in Switzerland, but spreading since it first bred here in 1991 [AtCH2], or for the Common Kingfisher. Depending on the region and on local conditions, the species spectrum may include shrubland birds of open landscapes, such as Common Stonechat, Common Whitethroat, Melodious Warbler, Red-backed Shrike or Common Linnet. For want of better alternatives, gravel pits have become substitute habitats for the pioneer species of floodplains and farmland.

Threats and conservation measures

Security is not part of the service that these retreats offer their guests. Firstly, excavation takes place year-round, and secondly, the heightened safety regulations introduced in the 1990s and increased economic pressure result in shorter concessions and earlier restoration of the original landscape. Without deliberate arrangements with the extraction companies and close monitoring on site, broods of Little Ringed Plover, Collared Sand Martin or European Bee-eater are at huge risk of being destroyed by machinery or the advancing edge of the pit. Negotiations with pit operators often pave the way for the protection or even creation of sand walls for Collared Sand Martin [1]. Little Ringed Plover nests are harder to protect because they are almost invisible in the gravel and are strongly disturbed by mining operations. Even if losses



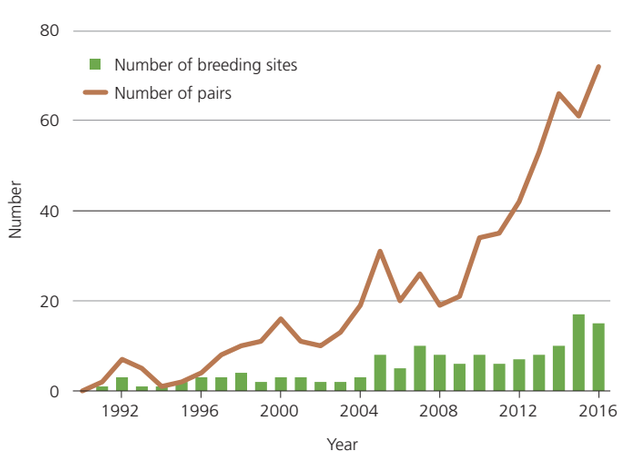
Only few of the many gravel pits (yellow) in Switzerland attract Little Ringed Plovers (black) or Collared Sand Martins (green). Of these two species, the Collared Sand Martin is most heavily dependent on gravel pits. The Little Ringed Plover also breeds in other habitats. Source: swisstopo.

can be prevented by establishing protection zones and informing the workers, the broods often fall prey to predators, especially on flat gravel surfaces. For these reasons, the breeding success of Little Ringed Plovers in gravel pits is probably low.

What does the future hold for these threatened refuges?
Conditions do not necessarily improve for birds when extraction ends. Gravel pits used to be abandoned, becoming overgrown and losing their value as habitat for pioneer species. Some gravel pits, however, continued to be maintained to preserve biodiversity or were designated as nature reserves. Today, they are systematically «restored» and returned to agricultural or silvicultural use. The pits are filled in and quickly lose their appeal. In the 1950s, there were about 2000 active gravel pits below 900 m in Switzerland; in 2016, that number had dropped to fewer than 500[2], at high cost to the Collared Sand Martin in particular.

The protection of species that depend on gravel pits, mainly the Collared Sand Martin, to a lesser extent the Little Ringed Plover, presents new challenges. Gravel pits that accommodate these species should not be refilled, or at most partially, making sure that enough suitable habitat remains. Further, continued maintenance that is geared towards the species' ecological requirements should be guaranteed. Finally, additional measures need to be put in place to reduce the dependence of these threatened species on gravel pits. Measures could involve customised breeding sites for the Collared Sand Martin, such as sand piles out of suitable material[1, 5], or river restoration projects, which would also benefit other threatened species.

Bertrand Posse



Change in the number of breeding sites (columns) and breeding pairs (lines) for the European Bee-eater in Switzerland from 1990 to 2016.

[1] Bachmann et al. (2008a–b); [2] Fachverband der Schweizerischen Kies- und Betonindustrie/Association suisse de l'industrie des graviers et du béton/Associazione Svizzera dell'industria degli Inerti e del Calcestruzzo, pers. comm.; [3] Rnjakovic (2014); [4] Schmid et al. (1992a–b); [5] Schmit (2016); [6] Sticher (1984a–b)

Species pages 206, 274, 278, 312, 370, 396, 426, 480, 530

Common Kingfisher

Alcedo atthis
Eisvogel
Martin-pêcheur d'Europe
Martin pescatore
pestgaderin

Olivier Born

Red List Vulnerable (VU)
Population 400–500 pairs (2013–2016)

Focus page 276

The Common Kingfisher inhabits slow-flowing rivers, large streams, lakes and large ponds with clear water allowing good visibility, perches, and an abundant supply of small fish. It relies on steep, eroded banks to excavate its tunnel with nesting chamber, but occasionally nests in the root plates of fallen trees and in artificial nests[8]. The most important breeding grounds in Switzerland include Lake Neuchâtel, the Saane River, the Aare downstream from Bern, the Reuss after Lucerne, the Thur downstream from Frauenfeld TG and the High Rhine. Only occasionally does the Kingfisher penetrate the Alps along the larger rivers. 95 % of territories lie below 620 m. The highest confirmed brood was recorded in 1976, at 990 m near Saanen BE[ABE]. More recently, the highest broods were found on the Doubs River near Montbenoît F at 780 m (V. Tardy) and on Lac des Brenets NE at 760 m (P. Aeby, D. Jeandupeux)[1].

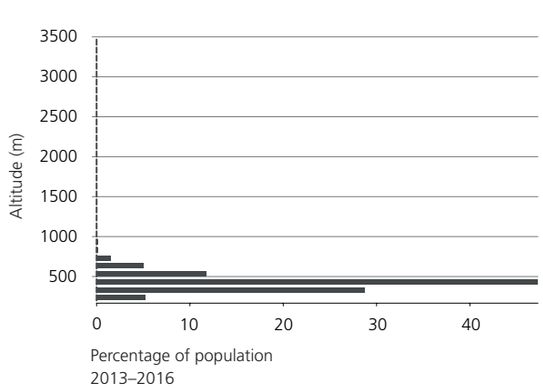
In 2002–2016, an average of 4.7 (1–9) pairs bred annually on the 18 km stretch of the Thur River in the Canton of Zurich, 6.0 (4–7) pairs on a 31 km stretch of the High Rhine between the Rhine Falls and Glattfelden ZH, and 8.2 (2–16) pairs in the Grande Cariçaie[2, 4, 5, 10]. In Bolle di Magadino TI, there were on average 6.5 (3–10) territories in 2008–2013[6]. Locally, the Common Kingfisher achieves much higher densities: four pairs nested on a 1 km stretch of the revitalised Thur River near Niederneunforn TG[4].

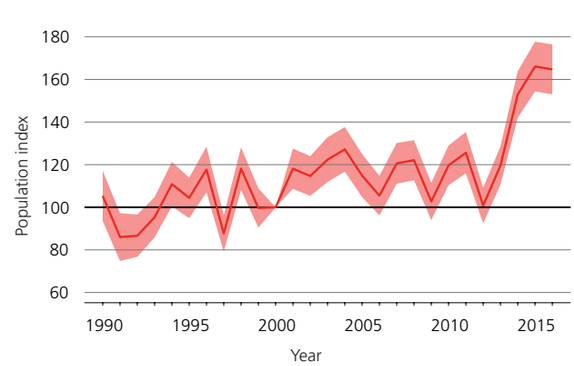
There have been no significant changes in distribution since 1993–1996. The Swiss population fluctuated until 2013, but strongly increased during 2014–2016; similar findings were recorded on the Thur River and in the Grande Cariçaie[2, 4]. In the Canton of Zurich and on Lake Constance, numbers have increased since 1990[AtBo, AtZH]. They have remained stable on the eastern section of the High Rhine since 2002[5, 10]. The trend is positive in Germany, stable in Italy and Austria and negative in France[AtD, AtF, RLEU]. The overall European trend has been stable in the past 20 years[EBCC].

Population collapses are mostly caused by cold winters as well as flooding during the breeding season[3]. The strong increase after 2013 is attributed to a combination of mild winters and high breeding success[4]; a cold spell in January 2017 again caused steep declines. Local Kingfisher populations benefit from lake and river restorations and species-specific conservation measures[4, 7, 9].

Samuel Wechsler

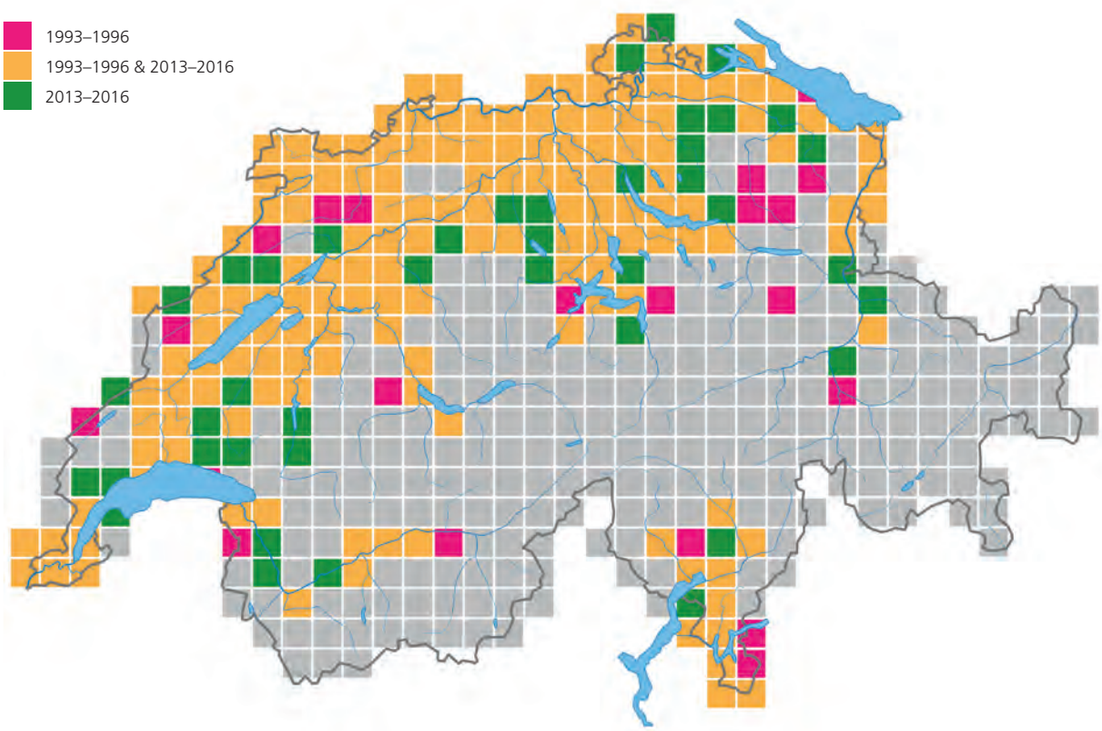
[1] Antoniazza (2015); [2] Antoniazza (2018); [3] Bauer et al. (2005); [4] Griesser (2016); [5] M. Müller, in litt.; [6] Scandolara et al. (2014); [7] Spaar et al. (2012a–b); [8] Boschert (2016); [9] Weggler (2004a); [10] Weggler et al. (2015)





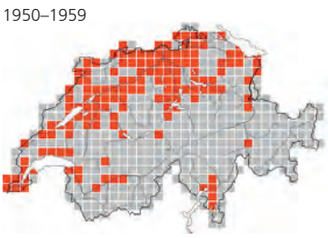
Territories 2013–2016

Distribution change since 1993–1996

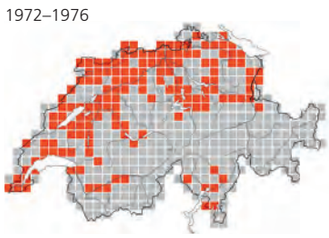


Sponsored by
Elsbeth Schmid, Forch
Pietro Teichert

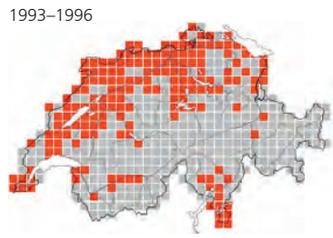
1950–1959



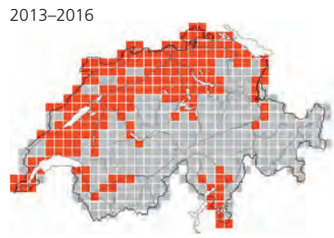
1972–1976



1993–1996



2013–2016



Eurasian Wryneck

Jynx torquilla
Wendehals
Torcol fourmilier
Torcicollo
volvachau

Markus Varesvuo

Red List Near Threatened (NT)
Population 1000–2500 pairs (2013–2016)

Focus pages 212, 362, 392, 402, 414, 532

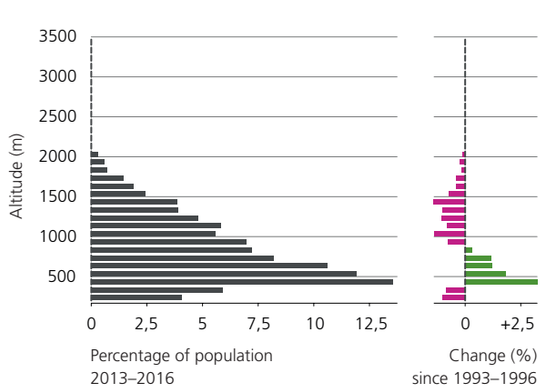
The Eurasian Wryneck is quite widespread in Switzerland, though many parts of the country only support low densities or single, irregularly occupied territories. The highest densities are reached in the larger Alpine valleys and the western part of the Lake Geneva basin. The wine-growing areas in Schaffhausen and along the southern foot of the western Jura also hold relatively high densities. 70 % of the population occurs below 1000 m. The highest singing males were recorded at 2300 m near Zermatt VS [VdS] and Tschierv GR (M. Hofer). Probable breeding was recorded at maximum altitudes of 2220 m near S-charl GR (R. Strimer) and 1980 m near La Punt GR and in the Val Fex GR [AEn]. In Switzerland, the Wryneck inhabits a range of semi-open landscapes, including traditional orchards, vineyards, open woodland, parks and even intensively managed orchards with dwarf-tree varieties. Characteristic habitat features are an abundance of ant nests, easily accessible thanks to low vegetation or sparse ground cover, and an ample supply of nesting cavities [2, 4, 8, 10, 13, 14]. The species favours locations with a mild climate, such as south-facing slopes.

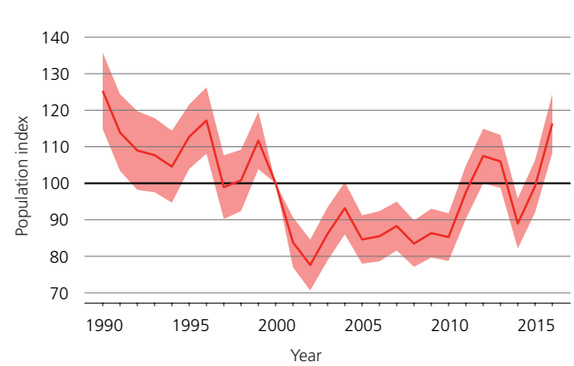
The Swiss population declined steeply until 2002. A period of stability followed, albeit at a low level, and numbers appear to be on the rise since 2010. Density has decreased significantly in parts of Valais and southern Ticino since 1993–1996, while increasing in the Lake Geneva basin. Negative trends were also recorded on the Central Plateau, in the Jura and in the Pre-Alps [AtBo, AtZH, 1, 6, 7]. There is a striking positive trend at medium altitude between 400 and 800 m. Trends in Europe are mixed. In general, numbers have been stable in eastern Europe, but have shown a long-term decline in western and northern Europe [RLEU]. Trends in neighbouring countries are also negative, though some populations have been stable in recent years [AtD, AtF, AtFL, 3, 5, 9].

The decline is mainly caused by intensified agricultural practices, which reduce the availability of ants and nest cavities. The Wryneck benefits from a combination of field copses with plenty of deadwood, ruderal habitats and overgrown fallows, the promotion of traditional orchards with patches of bare ground, and an improved supply of nest sites [10, 11, 12].

Michael Schaub

[1] Beaud & Beaud (2018); [2] Coudrain et al. (2010); [3] Dvorak et al. (2017); [4] Freitag (1996); [5] Jiguet (2017); [6] Lüthy & Weber (2005); [7] Martinez & Birrer (2017); [8] Mermod et al. (2009); [9] Rete Rurale Nazionale & Lipu (2015); [10] Schaub et al. (2010b); [11] Schuck & Lanz (2017); [12] Spaar et al. (2012a–b); [13] Weisshaupt et al. (2011); [14] Zingg et al. (2010)



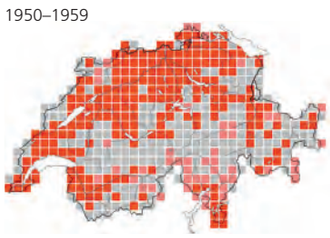


Density 2013–2016

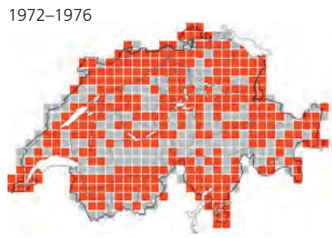
Density change since 1993–1996

Sponsored by
Irene Ribbe

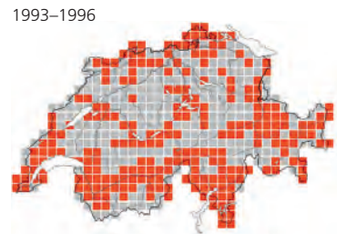
1950–1959



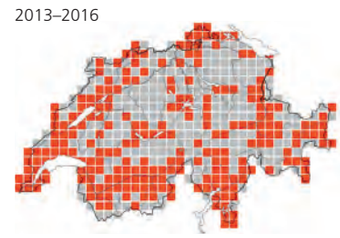
1972–1976



1993–1996



2013–2016



Grey-faced Woodpecker

Picus canus
Grauspecht
Pic cendré
Picchio cenerino
pitgalain grisch

Hendrik Fuchs

Red List Vulnerable (VU)
Population 300–700 pairs (2013–2016)

Focus page 284

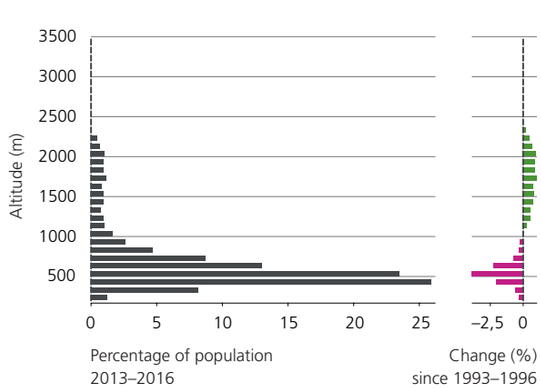
Switzerland lies at the western range margin of the Grey-faced Woodpecker. Its centre of distribution is in the north of the country, with somewhat smaller numbers in the Rhine Valley, Engadine GR and Val Müstair GR. About 80 % of the population is concentrated between 300 and 800 m. The Grey-faced Woodpecker inhabits highly structured, mixed deciduous woodland that is not too dense and has plenty of deadwood, e.g. old beech and oak woods and alluvial forest. It is sometimes found in semi-open farmland and at higher altitudes in open conifer forest dominated by larch and pine. The highest breeding records date from the 1950s at 1700 and 1880 m [BCH]. More recently, breeding has not been confirmed at these altitudes. However, in 2015, E. Sonnenschein observed two Grey-faced Woodpeckers giving alarm calls near Taufers in the Val Müstair I at 2140 m. The highest record of a calling male during the breeding season came from Tschierv GR at 2180 m (D. Muff).

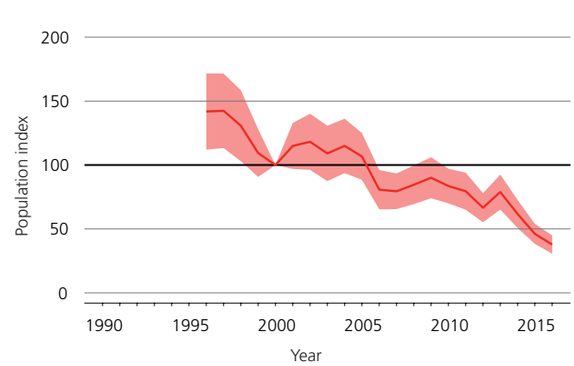
Since 1993–1996, the Grey-faced Woodpecker has been detected in some new atlas squares in eastern Switzerland, but has disappeared from several areas in the west of the country. It has become rarer between 400 and 600 m, while a small increase has been recorded above 1000 m, especially between 1500 and 2000 m. Overall, numbers have declined considerably. In the Canton of Zurich, the population dropped by almost half between 1988 and 2008 [AtZH]. Substantial losses were also recorded in the Grande Cariçaie and at the southern foot of the Jura near Solothurn [1, 3]. The population around Lake Constance remained stable between 1980 and 2010 [AtBo].

In Europe, populations are in decline in Belgium, France, Germany and Austria [AtD, AtF, RLEU, 7]. Stable populations or even (long-term) increases have been reported from Italy and several countries of eastern and northern Europe [RLEU, 6]. These developments match the climate models that predict a range shift to the northeast and declines in central Europe towards the end of the 21st century [ClimAt]. Other reasons for the declines may include habitat loss as the growing timber stock leads to fewer open forests, eutrophication of forest soil, and competition from the Eurasian Green Woodpecker, a species that has benefited from milder winters [2, 4, 5].

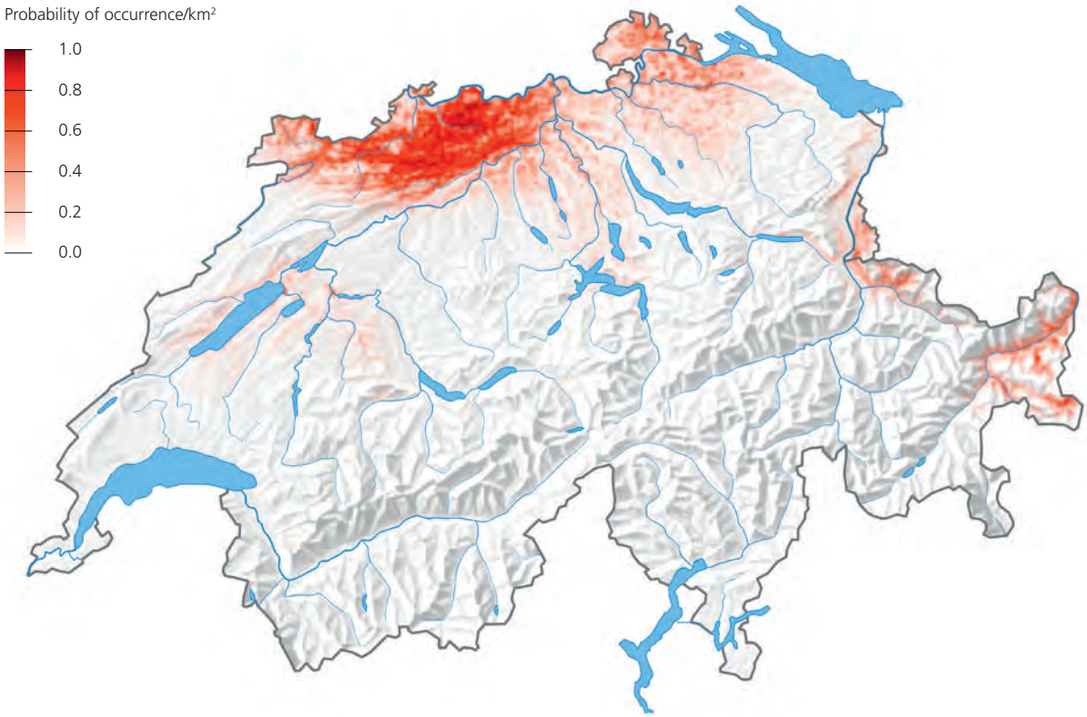
Gilberto Pasinelli

[1] Antoniazza (2018); [2] Bauer et al. (2016a); [3] Christen (2017b); [4] Liesen (2012); [5] Müller (2011); [6] Nardelli et al. (2015); [7] Teufelbauer & Seaman (2017)

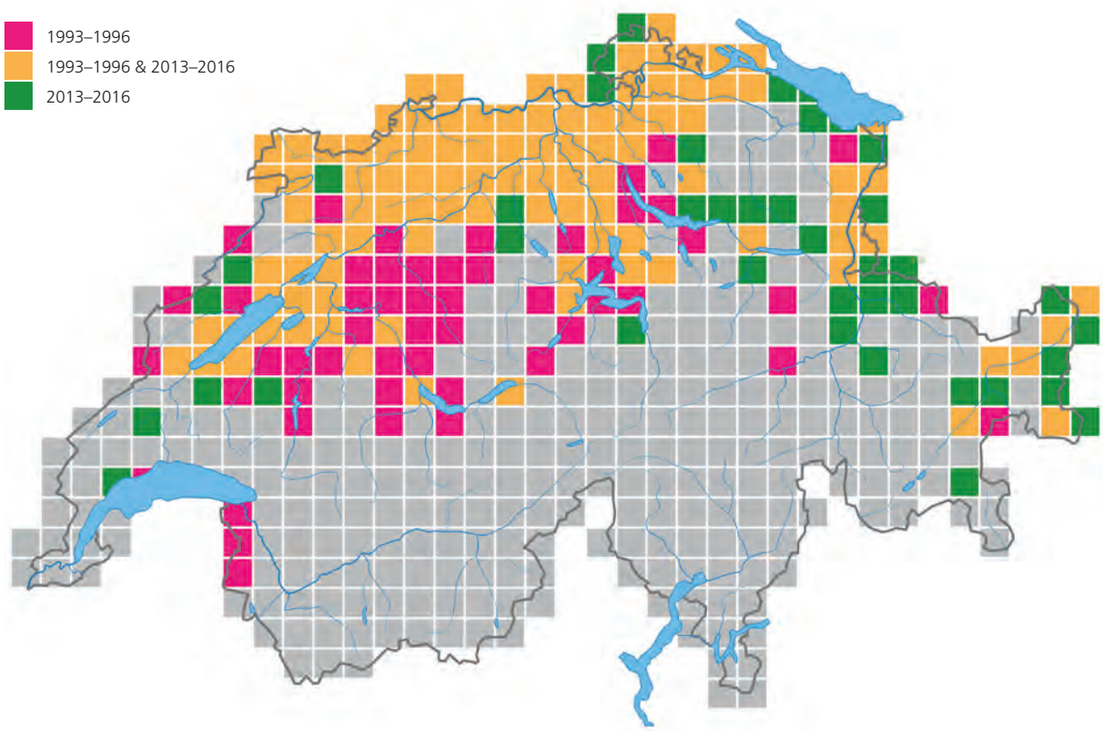




Occurrence 2013–2016

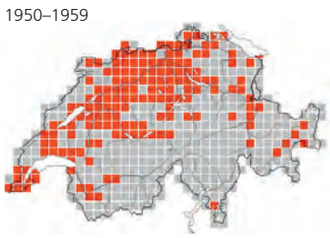


Distribution change since 1993–1996

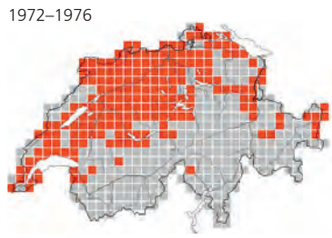


Sponsored by
André & Pia Müller, Münchenstein
Anonymous donor

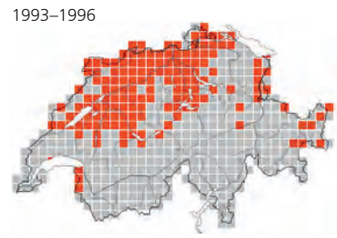
1950–1959



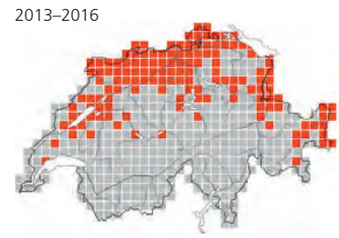
1972–1976



1993–1996



2013–2016



Southern species expand northwards

Mediterranean species that reach their northern distribution limit in Switzerland have increased and extended their ranges to the north since 1993–1996. In contrast, central and northern European species whose southern range limit lies in Switzerland appear to be decreasing. Climate change is presumably a driving force behind these trends.

The large-scale distribution of a species, also called its range, is often determined by the climate and therefore by types of vegetation that dominate large areas (e.g. deciduous forests, mountain ranges). Climate change has brought the range shifts of plants and animals to the attention of scientists[7, 9, 12, 18]. Models that account for climate change predict that the current ranges of many European birds will shift to the north or northeast[ClimAt].

Southern species on the rise in Switzerland

In order to verify whether range shifts have occurred in Switzerland using the atlas data, we selected 17 species whose European range limit runs through Switzerland. We only included species whose centre of distribution in Switzerland lies below 900 m. The sample includes nine «northern» species whose main European breeding ranges lie in central and northern Europe, and eight «southern» species with core ranges in southern Europe. For each species, we calculated the centre of distribution in Switzerland during 2013–2016, i.e. the mean geographical location of occupied atlas squares (10 × 10 km) and compared it with 1993–1996.

Results showed that all of the eight «southern» species had expanded their distribution in Switzerland between 1993–1996 and 2013–2016; in other words, they were found in a greater number of atlas squares than 20 years ago. In the case of six species, the centre of distribution shifted to the north or northeast. The average northward shift of the eight «southern» species was 9.4 km. Four of the nine «northern» species expanded their range in Switzerland; five species experienced a contraction. There was no clear pattern in terms of the direction of the shifts either. The ranges of Grey-faced Woodpecker and Icterine Warbler show a distinct northward shift, in accordance with the predictions; the range of Rook, a species that is increasing in number, moved to the southeast, that of White-backed Woodpecker to the southwest.

Only few «northern» species exhibited a substantial range contraction. This finding may be related to the fact that extinctions are a lengthy process, while it takes only a few individuals to colonise new territory.

Similar trends elsewhere

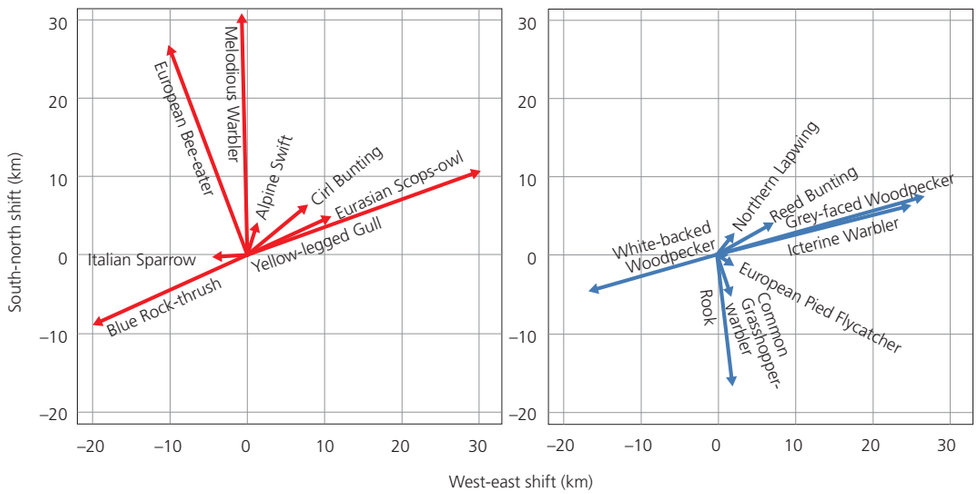
Due to its small size, Switzerland does not lend itself well to studies of large-scale range shifts. Moreover, the Alps produce a steep climate gradient independent of geographical location on the north-south axis, which may mask large-scale range shifts.

A distinct shift of southern species to the north, but no or only minor shifts of northern species to the north, has been observed

Change in the number of atlas squares occupied by eight «southern» and nine «northern» species between 1993–1996 and 2013–2016 and extent of the northward range shift. Population trends are shown as positive (+), negative (–) or no trend (=), «no trend» meaning that no statistically significant change was registered. For White-backed Woodpecker and Italian Sparrow, sample sizes were too small to determine a trend.

«Southern» species	Change in the number of atlas squares between 1993–1996 and 2013–2016	Northward shift (km)	Trend in Switzerland 1990–2016
Alpine Swift	+29	+4	+
Yellow-legged Gull	+61	+11	+
Eurasian Scops-owl	+21	+5	+
European Bee-eater	+11	+27	+
Blue Rock-thrush	+4	–9	=
Melodious Warbler	+29	+31	+
Italian Sparrow	+7	0	?
Cirl Bunting	+18	+7	+

«Northern» species	Change in the number of atlas squares between 1993–1996 and 2013–2016	Northward shift (km)	Trend in Switzerland 1990–2016
Northern Lapwing	–61	+3	–
Grey-faced Woodpecker	–11	+8	–
White-backed Woodpecker	+12	–4	?
Rook	+87	–17	+
Icterine Warbler	–25	+6	–
Common Grasshopper-warbler	+10	–5	=
Fieldfare	–3	0	–
European Pied Flycatcher	+15	–1	+
Reed Bunting	–29	+4	–



Shift in the centre of distribution of the eight «southern» (left) and nine «northern» species (right) between 1993–1996 and 2013–2016. The ranges of most «southern» species shifted to the north and northeast as expected, while the range shifts of «northern» species show no clear pattern.

elsewhere too[5, 6, 8, 10, 18]. In Finland, southern species are spreading northwards by about 1.2 km per year, while the distribution of northern species is shifting at half that pace[6]. In the UK, the range margins of southerly-distributed species have moved north by 18.9 km in 20 years, while no shift was observed in the case of northern species[18].

Is climate change the cause?

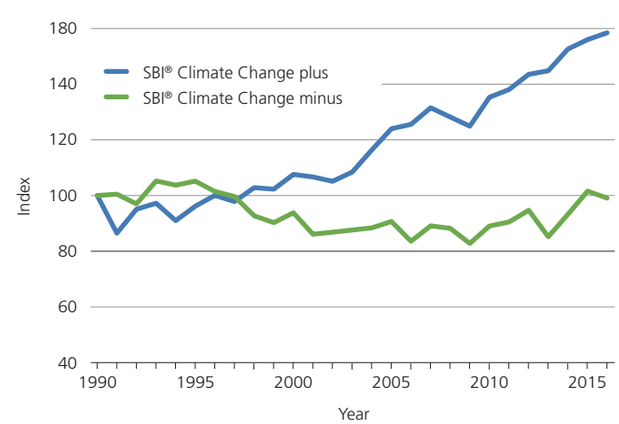
Many studies show that range shifts and changes in climate occur in parallel, suggesting that climate warming is a substantial contributor to range shifts. Accordingly, models based on climate factors predict considerable range contractions for several species in Switzerland[2, 4, 14, 19]. Studies have been able to show that bird populations evolve in accordance with climate-related predictions in Switzerland as well[11, 16, 20]. The Swiss Bird Index SBI® «Climate Change», for instance, summarises the population trends of 20 species that, according to predictions, will be most affected by climate warming. The climate index reveals a picture that resembles the observed changes in distribution: those species expected to benefit from the warming climate have indeed increased in number, while the suspected «losers» have not (yet) responded with declines[15, 20]. The results also show that range shifts can rarely be explained with climate change alone[1, 3, 11, 13, 17], but are influenced by other factors such as habitat changes or conservation measures.

Long-term prospects look bleak

Range shifts are expected to become more pronounced in the future. But they are hard to predict, because besides the rising temperatures, other factors play a role that can also be related to climate, such as rainfall during the chick-rearing period, extreme weather events, increasing aridity, the delayed effects of changes in vegetation (e.g. forests) and anthropogenic habitat changes.

In the long run, the birds most at risk in Switzerland are the «northern» species and cold-weather specialists as well as wetland birds[11]. At the European level, models predict an average range shift of 335 km for 409 species by 2050 due to climate change and land-use changes. Of these 409 species, 71 % are expected to experience range contractions[1].

Thomas Sattler



Trends of the Swiss Bird Index SBI® Climate Change sub-indices. While no clear trend is visible for the group of species expected to exhibit range contractions (green), the index of species with predicted expansions shows a marked increase (blue).

[1] Barbet-Massin et al. (2012); [2] Bollmann & Braunisch (2016a–b); [3] Bradshaw et al. (2014); [4] Braunisch et al. (2014); [5] Brommer & Møller (2010); [6] Brommer et al. (2012); [7] Chen et al. (2011); [8] Devictor et al. (2008); [9] Devictor et al. (2012); [10] Lehikoinen & Virkkala (2016); [11] Maggini et al. (2014); [12] Møller et al. (2010a); [13] Ram et al. (2017); [14] Revermann et al. (2012); [15] Sattler et al. (2017a–d); [16] Stephens et al. (2016); [17] Tayleur et al. (2015); [18] Thomas & Lennon (1999); [19] von dem Bussche et al. (2008); [20] Zbinden et al. (2012)

Species pages 166, 210, 226, 244, 274, 282, 296, 332, 370, 372, 386, 452, 464, 474, 496, 556, 562

Eurasian Green Woodpecker

Picus viridis
Grünspecht
Pic vert
Picchio verde
pitgalain verd

Beat Rüegger

Red List Least Concern (LC)
Population 10 000–17 000 pairs (2013–2016)

Focus pages 234, 298, 314, 414, 506

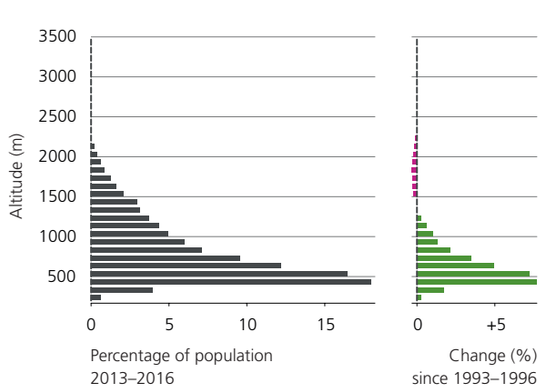
The Eurasian Green Woodpecker is widespread in Switzerland below 1500 m. It reaches the highest densities in the western part of the Lake Geneva basin, northern Switzerland, low-lying areas of Grisons and Valais, and southern Ticino. The highest confirmed breeding record came from Zermatt VS at 2240 m; in the same area, three recently fledged young were observed at 2300 m [VdS]. The Eurasian Green Woodpecker inhabits forest edges and highly structured, semi-open landscapes such as traditional orchards, fields interspersed with copses and tree hedges, and occasionally settlements with old trees and grassy areas. It is less dependent on woodland than the Grey-faced Woodpecker, but nevertheless often breeds in open deciduous, mixed and alluvial woods.

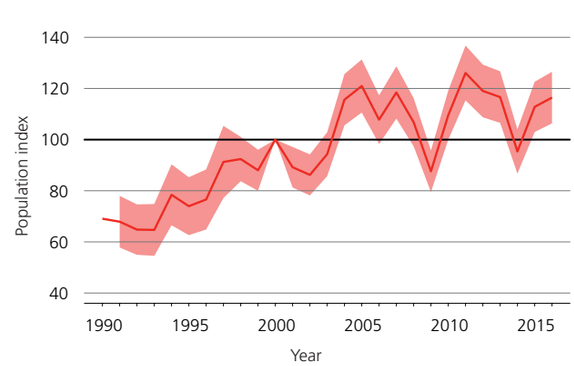
Since 1993–1996, the Green Woodpecker has become more abundant in large parts of the Central Plateau and especially in southern Ticino. Local declines occurred in the upper Valais, Domleschg GR and Lower Engadine GR. Interestingly, the population increased to about the same degree at all altitude levels up to 1200 m, but remained largely unchanged above that altitude. Numbers have increased by about 40 % since 1990 and have been stable since 2004 despite occasional large fluctuations. Regional surveys also reveal significant gains: the population increased almost fivefold in the Canton of Zurich between 1988 and 2008 [AtZH] and doubled in the Lake Constance area between 1980 and 2010 [AtBo]. In western Europe, increasing long-term trends and stable or fluctuating short-term trends dominate, whereas some countries in eastern and northern Europe report declining populations [AtD, AtF, RLEU, 5, 7]. The overall European trend is positive [EBCC].

The Green Woodpecker is vulnerable to cold, snowy winters [HVM], so the general trend towards milder winters may partly explain the gains in Switzerland. The increase in low-intensity farmland thanks to biodiversity promotion areas may also have played a part [2, 8] by providing foraging grounds for this ant-eating species [1, 6]. As in the case of Great and Middle Spotted Woodpecker, it is possible that the decline of the Common Starling population has reduced competition for nesting cavities. Finally, the general maturation of forests may also have had a positive impact [3, 4].

Gilberto Pasinelli

[1] Alder & Marsden (2010); [2] Birrer et al. (2007a); [3] Gatter (2000); [4] Mollet et al. (2009); [5] Rete Rurale Nazionale & Lipu (2015); [6] Rolstad et al. (2000); [7] Teufelbauer & Seaman (2017); [8] Weggler & Schwarzenbach (2011)



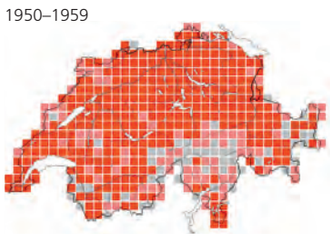


Density 2013–2016

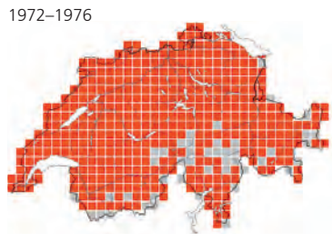
Density change since 1993–1996

Sponsored by
Thomas Vonwil, Zurich

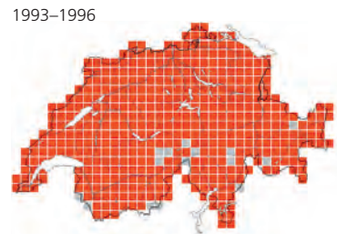
1950–1959



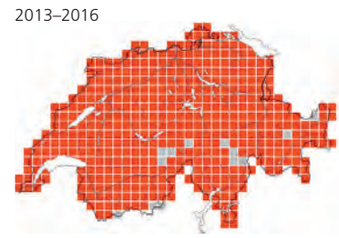
1972–1976



1993–1996



2013–2016



Black Woodpecker

Dryocopus martius
Schwarzspecht
Pic noir
Picchio nero
pitgalain nair

Gebhard Thibault

Red List Least Concern (LC)
Population 6000–9000 pairs (2013–2016)

Focus pages 298, 314

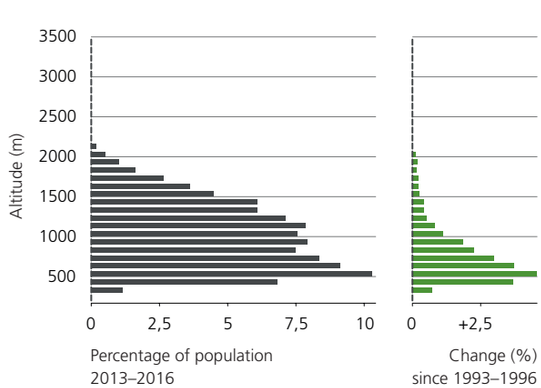
The Black Woodpecker is widespread in Switzerland between 400 and 1700 m, although high densities only occur between 900 and 1500 m. The species is most common in the Jura, along the Pre-Alps and in some Alpine valleys. The highest confirmed breeding record came from the Ofenpass region GR at 2200 m [HVM], while the highest breeding-season observation was recorded in Tschierv GR at 2260 m (M. Müller). The Black Woodpecker occurs in all types of forest with large trees (mainly beech) suitable for breeding and a sufficient supply of dead and dying trees as well as tree stumps for foraging [HVM]. It also forages in young stands with stumps [8].

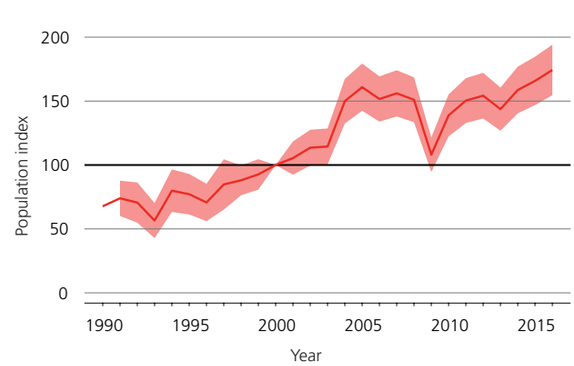
Since 1993–1996, the species has colonised the Mendrisiotto area TI and some parts of the Lake Geneva basin. Breeding was confirmed for the first time in the Canton of Geneva in 1996 [AtGE] and in the Mendrisiotto in 2003 [VdS]. The Swiss population of Black Woodpeckers has almost doubled since 1990. The increases occurred at all altitude levels, but were most pronounced between 400 and 1000 m. A doubling or even tripling of numbers was found in regional surveys conducted along the southern shore of Lake Neuchâtel between 2000 and 2016 [1], in the Canton of Zurich between 1988 and 2008 [AtZH] and around Lake Constance between 1980 and 2010 [AtBo]. The range expansion in the Mendrisiotto is presumably related to the current population increase and colonisation of new areas in northern Italy [6, 9]. Almost all European countries report stable or positive trends in the short and long term [AtD, AtF, RLEU, 10].

Possible reasons for the population gains in Europe since the late 19th century, and in Switzerland since about 1945, include the increased reforestation with conifers from the mid-19th century [2, 3]; over time, this may have led to an increase in ant species characteristic of coniferous forest, a preferred food source for the Black Woodpecker [11]. Currently, forest maturation [3] and the increase in old-growth stands and deadwood in Switzerland [5, 7] may have a positive impact on the population by improving habitat connectivity [4]. Harsh winters repeatedly cause significant losses (e.g. in 2009), so the warming climate could positively influence the species' winter mortality rate.

Gilberto Pasinelli

[1] Antoniazza (2018); [2] Bürgi (1998); [3] Gatter (2000); [4] Gil-Tena et al. (2013); [5] Mollet et al. (2009); [6] Nardelli et al. (2015); [7] Rigling & Schaffer (2015a–d); [8] Rolstad et al. (1998); [9] Saporetti et al. (2016); [10] Teufelbauer & Seaman (2017); [11] Wimmer & Zahner (2010)

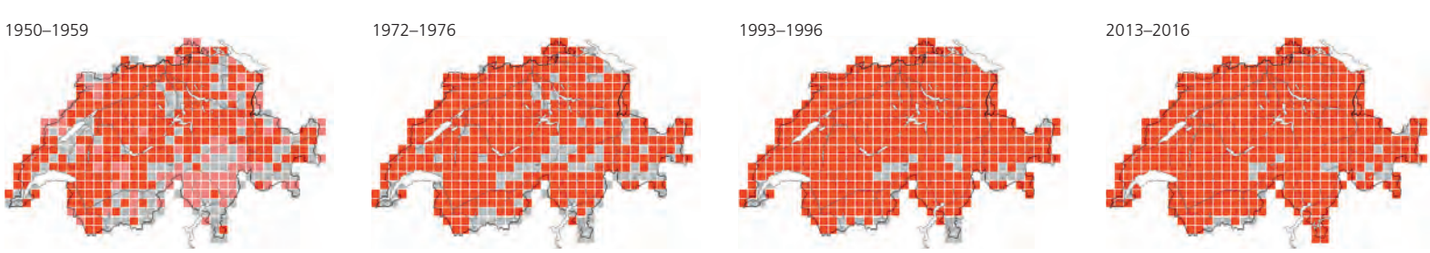




Occurrence 2013–2016

Occurrence change since 1993–1996

Sponsored by
Christoph Altermatt, Zurich



Three-toed Woodpecker

Picoides tridactylus
Dreizehenspecht
Pic tridactyle
Picchio tridattilo
pitgalain traidet

Christoph Meier-Zwicky

Red List Least Concern (LC)
Population 1000–2500 pairs (2013–2016)

Focus pages 298, 542

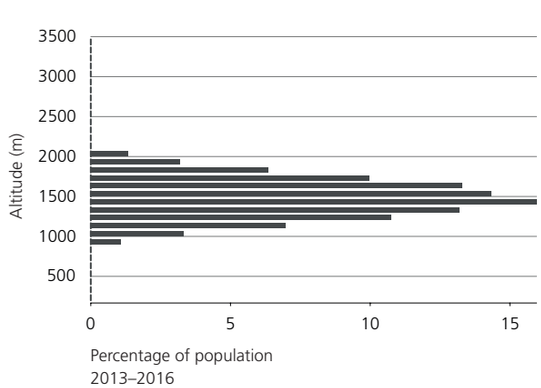
In central Europe, the breeding range of the Three-toed Woodpecker is confined to the Alps, Jura, Black Forest, Bohemian Forest and Carpathian Mountains. Its current distribution in Switzerland is practically continuous in the Pre-Alps and northern Alps. The highest densities are reached in the central ranges of the northern Alps and in Grisons. In our country, the Three-toed Woodpecker mainly inhabits old, sub-Alpine conifer forests dominated by spruce as well as mixed conifer and deciduous forests in the upper montane zone. It relies on an ample supply of standing deadwood and dying trees [4, 9]. The Three-toed Woodpecker is a diet specialist that feeds mainly on bark and longhorn beetles [10] and is known to contain beetle outbreaks [3, 6]. Breeding was rarely confirmed below 1000 m, with records near Bäretswil ZH at 780–890 m [ID, 14] and near Unterägeri ZG at 860 m [AtCH2, VdS]. The highest breeding records came from 2180 m near Valchava GR [VdS] and 2050 m near Guttet VS (B. Posse).

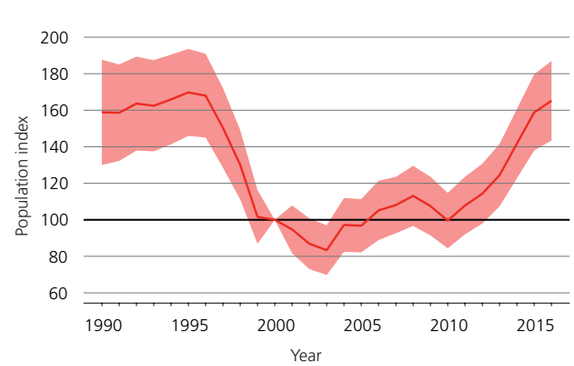
Since 1993–1996, the Three-toed Woodpecker has occupied new sites in Valais and the Valle Mesolcina GR. There are signs of a range expansion elsewhere, too, such as around Haut-Intyamon FR [2] and in the western Jura [11, 13]. Also, breeding was confirmed for the first time in the Zurich Oberland in 2005 [14], and there have been regular records ever since. It is unclear to what extent these new records are a result of increased observer effort.

A decline in the population trend from 1996 to 2002 for unknown reasons was followed by a trend reversal that continues until today. In France, Italy and Austria, numbers appear to be stable [AtF, RLEU, 5, 8]. The German population is increasing [AtD], though the recent trend in Baden-Württemberg [1] appears to be negative, likewise in Liechtenstein [AtFL]. To preserve Three-toed Woodpecker populations, standing deadwood should make up at least 5 % of trees and amount to more than 15 m^3/ha on at least 100 ha of woodland [3, 4]. Models predict that climate change may lead to an increase in the number of bark beetle generations per year at low altitudes [7] as well as an increase in forests affected by bark beetles [12]. It remains to be seen whether the Three-toed Woodpecker will benefit from these developments (if only in the short term).

Gilberto Pasinelli

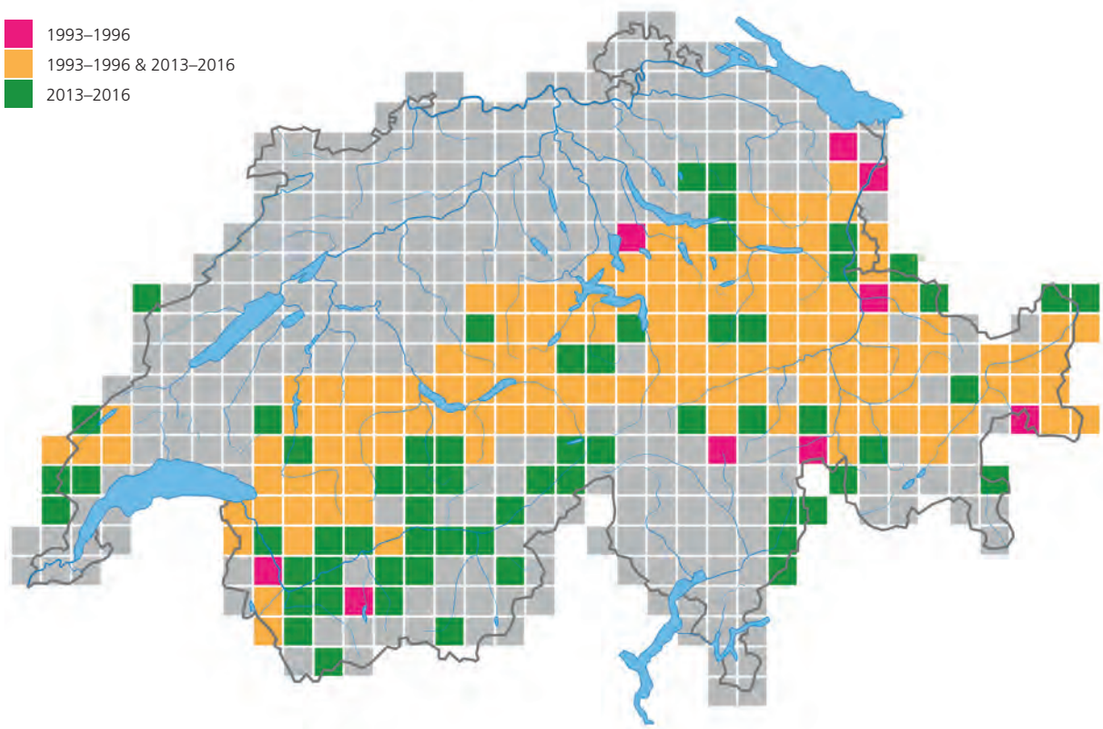
[1] Bauer et al. (2016a); [2] Beaud & Beaud (2018); [3] Bütler & Wermelinger (2014); [4] Bütler et al. (2004); [5] Dvorak et al. (2016); [6] Fayt et al. (2005); [7] Jakoby et al. (2016a–b); [8] Nardelli et al. (2015); [9] Pechacek (2004); [10] Pechacek & Kristin (2004); [11] Posse (2012); [12] Seidl et al. (2014); [13] Walder & Henrioux (2008); [14] Zollinger-Göpfert et al. (2006)





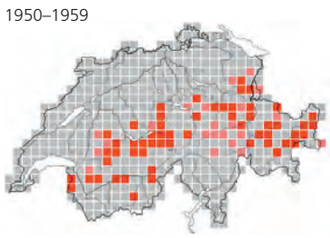
Occurrence 2013–2016

Distribution change since 1993–1996

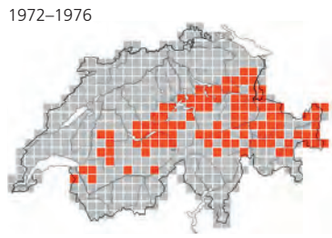


Sponsored by
Christine Hepperle, Bubikon

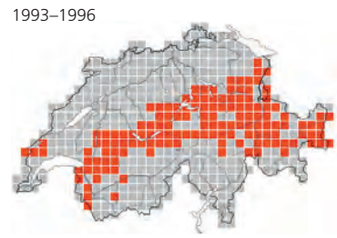
1950–1959



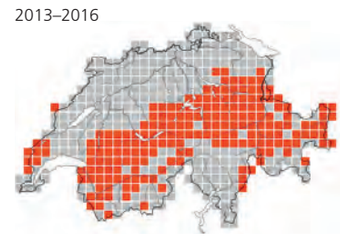
1972–1976



1993–1996



2013–2016



Middle Spotted Woodpecker

Leiopicus medius
Mittelspecht
Pic mar
Picchio rosso mezzano
pitgalain mesaun

Beat Rüegger

Red List Near Threatened (NT)
Population 1700–2100 pairs (2013–2016)

Focus pages 164, 212, 240, 298, 314

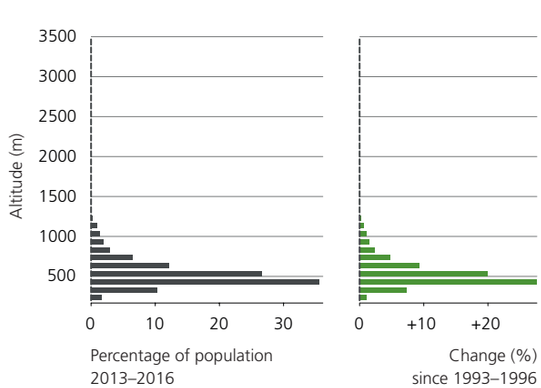
Switzerland lies at the western edge of the species' small, predominantly European breeding range. The Swiss population is concentrated in the cantons of Neuchâtel, Basel-Landschaft, Zurich and Thurgau between 300 and 600 m. In the past years, substantial populations have also been recorded in the cantons of Geneva, Vaud, Jura, Solothurn, Aargau and Schaffhausen. The Middle Spotted Woodpecker favours woodlands with a large proportion of old deciduous trees with furrowed bark, such as alluvial woodland and oak forests, and it will occasionally occupy traditional orchards with adjacent woodland. In other countries, the species also occurs in very old beech woods and in alder forests with lots of deadwood [10]. In 2013–2016, the highest confirmed breeding records came from the Forêt de Risoux VD at 1100 m (C. Fosserat) [12] and Col de Montvoie JU at 810 m (D. Berthold); all earlier breeding records were from areas below 800 m.

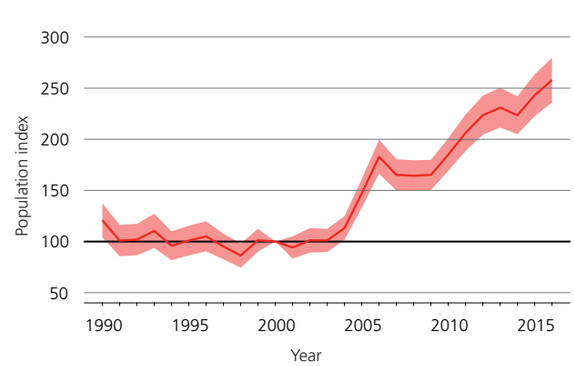
Following a constriction of the range in some places from the 1950s [AtCH0, 4], a renewed expansion has taken place since 1993–1996. Distribution gaps in northern Switzerland have been filled and areas along the southern range margin and in the Jura have been newly colonised [1, 5, 7, 8, 13, 15]. The gains occurred more or less in proportion to the population at all altitude levels, but were most pronounced between 400 and 600 m. The Swiss population trend has been positive since about 2004. Data from cantons that have surveyed Middle Spotted Woodpecker populations in 10-year intervals in the same areas and using the same method reveal increases of about 5 % (Neuchâtel), 57 % (Thurgau), 108 % (Zurich) and 950 % (Geneva) [13].

Numbers have increased in several other European countries as well (e.g. France, Germany, Austria) [AtD, AtF, RLEU, 6], with the rise mostly setting in towards the end of the 20th century [2]. Reasons for the positive trends could include lower winter mortality, greater breeding success and increased food supply due to climate change, the increase of deadwood and old oak trees thanks to oak conservation measures, and reduced competition for nesting cavities due to the decline of the Common Starling [3, 9, 11, 13, 14, 15]. Conserving oak forests is the most important measure for the protection of the Middle Spotted Woodpecker.

Gilberto Pasinelli

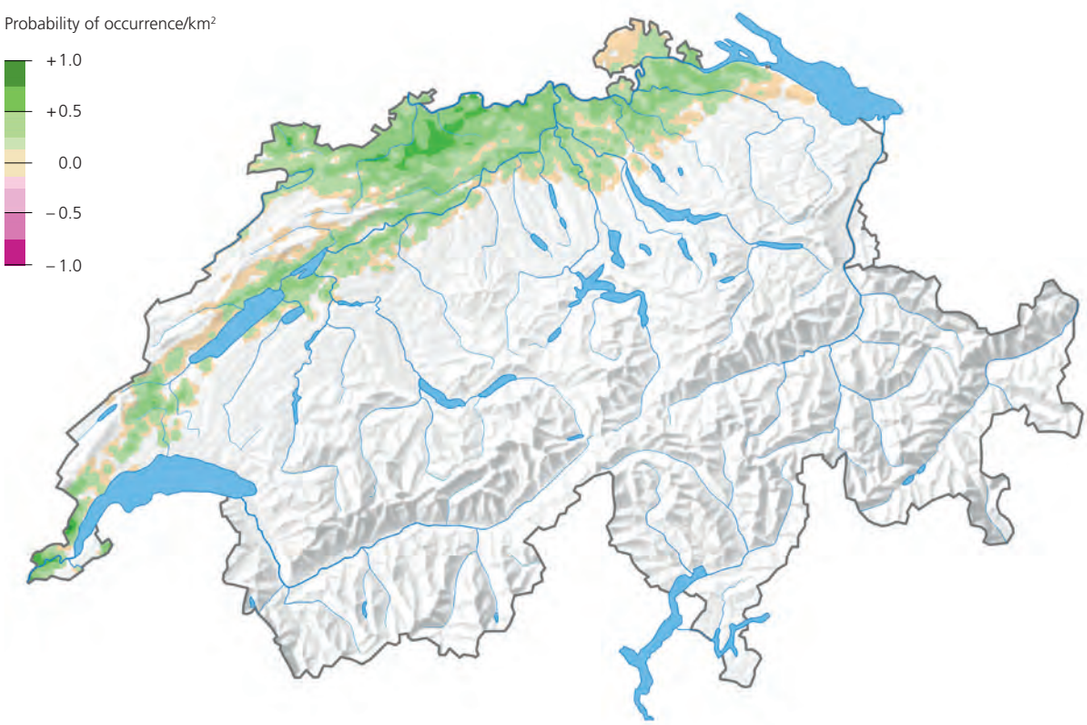
[1] Barbalat & Piot (2009); [2] Bauer et al. (2005); [3] Bühlmann (2016); [4] Bühlmann & Pasinelli (2012); [5] Bühlmann et al. (2018); [6] Dvorak et al. (2017); [7] Horisberger (2017); [8] Martinez et al. (2013); [9] Mattes & Gatter (2011); [10] Pasinelli (2003); [11] Pasinelli et al. (2008b–c); [12] Posse (2014); [13] Schuck et al. (2018); [14] Spühler et al. (2015); [15] Weggler et al. (2013)





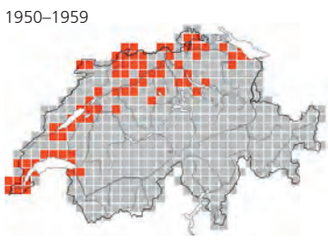
Occurrence 2013–2016

Occurrence change since 1993–1996

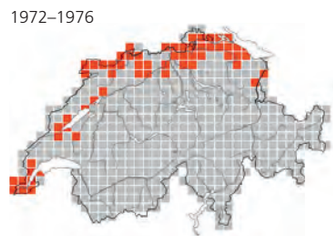


Sponsored by
Edith & Bernhard Herzog,
Villnachern

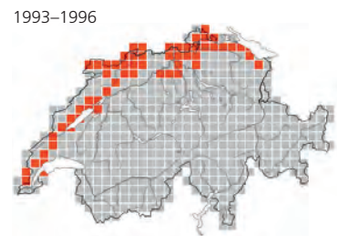
1950–1959



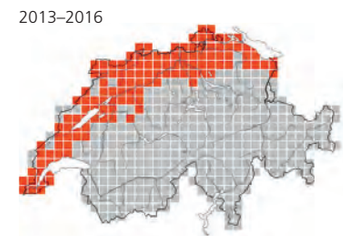
1972–1976



1993–1996



2013–2016



Lesser Spotted Woodpecker

Dryobates minor
Kleinspecht
Pic épeichette
Picchio rosso minore
pitgalain pitschen

Patrick Donini

Red List Least Concern (LC)
Population 1500–3000 pairs (2013–2016)

Focus page 298

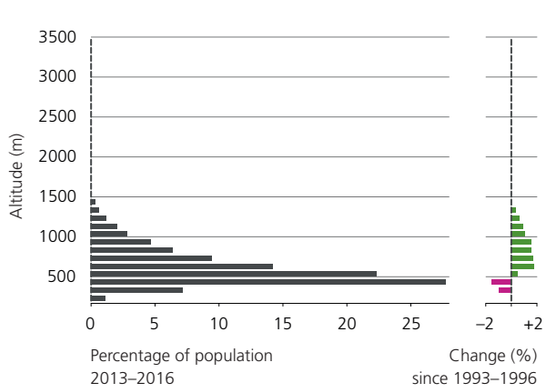
The Lesser Spotted Woodpecker is widespread in Switzerland below 1000 m, but it is not abundant anywhere due to its large home range[4, 10]. The eastern, central and southwestern parts of the Central Plateau, the banks of larger rivers such as the Rhone, Rhine and Maggia, and the southern shore of Lake Neuchâtel are well populated. The Lesser Spotted Woodpecker favours old, open deciduous forest with abundant softwoods and/or (thin) standing deadwood, such as alluvial and oak forests[VdS, 6]. It also breeds in traditional orchards, field copses, riparian woodland, alder carr and downy birch woods. The highest breeding record came from 1340 m near Fieschertal VS in the past[AtCH2], and more recently from 1320 m near Münster VS (D. Heldner). Wandering singing males were observed above 1900 m, e.g. near Mase VS at 2020 m (M. Thélin)[1] and near Dorénaz VS at 1940 m (P.-A. Pochon).

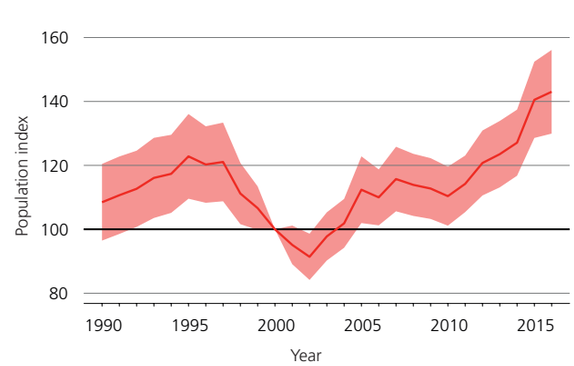
The Lesser Spotted Woodpecker has expanded its range somewhat since 1993–1996, especially in Ticino. Slight increases in density have occurred in eastern Switzerland, in the Vorderrhein Valley GR and around Lake Neuchâtel. In contrast, the species has become scarcer in the central parts of the Plateau and in the Basel area. Regional surveys show small increases on the southern shore of Lake Neuchâtel between 2000 and 2016[2] and a slight decline around Lake Constance between 1980 and 2010[AtBo]. In terms of altitudinal distribution, density has increased between 500 and 1200 m since 1993–1996, while decreasing slightly below 500 m. The Swiss population fluctuated widely up until 2002, but has steadily increased since then.

Populations of the Lesser Spotted Woodpecker are stable in several European countries[AtD, RLEU]. Others report eclines, (e.g. France)[AtF, 5], while the trend in Italy is positive[8]. Reasons for the declines are thought to include intensive forest management and the loss of traditional orchards; in England, declines have been attributed to low breeding success possibly caused by food shortage[3]. Whether the gains in Switzerland are related to ash dieback, which has increased the number of dead branches in the crowns of ash trees, or the build-up of deadwood more generally[7, 9] remains to be understood, as does the influence of climate change.

Gilberto Pasinelli

[1] Antoniazza (2016b); [2] Antoniazza (2018); [3] Charman et al. (2012); [4] Höntsch (2005); [5] Jiguet (2017); [6] Miranda & Pasinelli (2001); [7] Mollet et al. (2009); [8] Nardelli et al. (2015); [9] Rigling & Schaffer (2015a–d); [10] Wiktander et al. (2001)



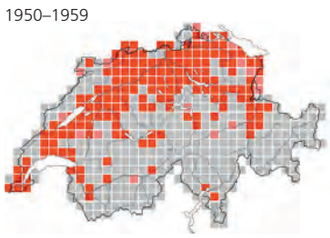


Occurrence 2013–2016

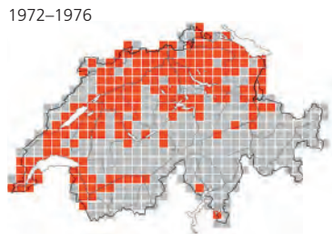
Occurrence change since 1993–1996

Sponsored by
Birgit Busch

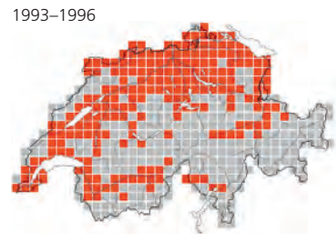
1950–1959



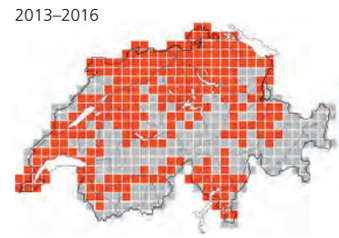
1972–1976



1993–1996



2013–2016



White-backed Woodpecker

Dendrocopos leucotos
Weissrückenspecht
Pic à dos blanc
Picchio dalmatino
pitgalain strivlà

Marcel Burkhardt

Red List Vulnerable (VU)
Population 20–30 pairs (2013–2016)

Focus pages 190, 284, 298, 420

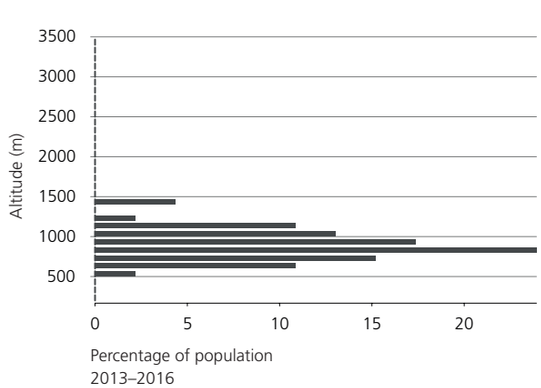
In Europe, the White-backed Woodpecker mainly occurs in the east, with outposts in the Pyrenees, Apennines and eastern Alps. Switzerland currently forms the western range limit in the Alpine region. The Swiss population is concentrated in the Prättigau GR and the Rhine Valley, where it numbers 15–20 pairs. In the Zurich Oberland and adjacent Toggenburg SG, where the White-backed Woodpecker has been observed since 2008, there are an estimated 3–5 pairs. Single territories, presumably irregularly occupied, have been found in the cantons of Glarus (where the species was first recorded in 2000) and Schwyz (first recorded in 2014). Noteworthy records include observations on the Brünig Pass BE (2002; R. Graf)[12], the Oberhalbstein GR (2014; P. & B. Giacometti)[7] and the Petite Camargue Alsacienne F north of Basel (2015)[9].

The White-backed Woodpecker favours mature deciduous and mixed forests (especially beech and beech-fir stands) with plenty of deadwood, chiefly between 600 and 1200 m. Occupied forests are typically rich in standing and fallen deadwood and old trees populated by insects that feed on decaying wood[2, 3, 4]. The highest observations during the breeding season came from the Schanfigg valley GR at 1650 m (1996)[6] and the Weisstannental SG at 1450 m (2014; A. Good)[7].

The presence of the White-backed Woodpecker in Switzerland was not documented with certainty until 1996 in the Schanfigg valley[6]. The first confirmed breeding record followed in 1999 in the Prättigau region[1]. The species has since spread westwards, although some new observations may be due to increased observer effort. New observations in southern Germany and in Liechtenstein also indicate a westward range expansion or a slight increase in numbers[AtD, AtFL, 11]. This trend runs contrary to the declines, some of them substantial, recorded in northern and eastern Europe[RLEU]. In Switzerland, the species benefits from low-intensity forest management in remote areas as well as the general increase in deadwood[8, 10]. To consolidate the population, creating connectivity between natural forest reserves, old-growth patches and habitat trees is crucial, as is increasing the volume of old trees and deadwood in general. These measures are included in the biodiversity scheme for Swiss forests[5]. The future of the White-backed Woodpecker will be one indicator of their success.

Michael Lanz & Ueli Bühler

[1] Bühler (2001); [2] Bühler (2008); [3] Bühler (2009); [4] Ettwein (2016); [5] Imesch et al. (2015a–b); [6] Knaus (1997); [7] Marques & Thoma (2015)/Marques et al. (2015); [8] Mollet et al. (2009); [9] Reeber et al. (2016); [10] Rigling & Schaffer (2015a–d); [11] Rödl et al. (2012); [12] Schweizer (2003)/Schweizer & Maumary (2003)



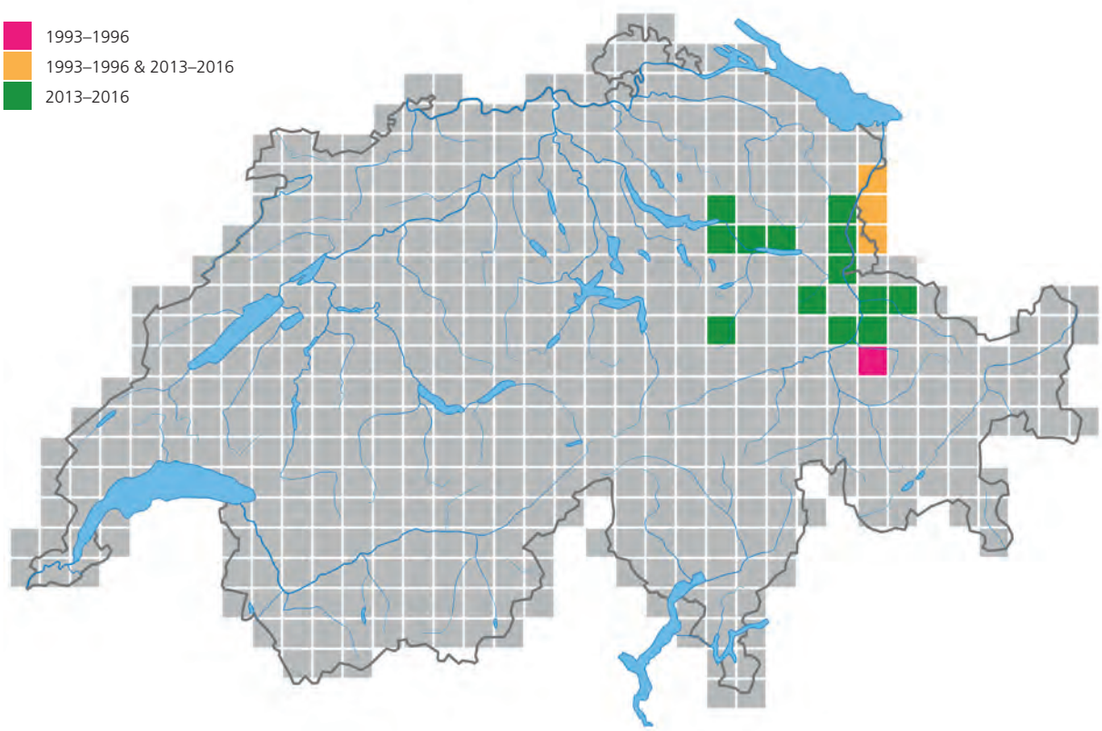
Territories 2013–2016

3
2
1

Certain dots on the map have been moved to protect this sensitive species

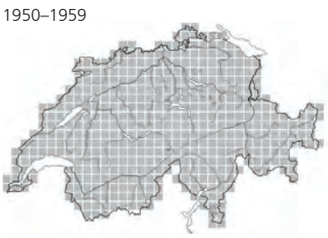
Distribution change since 1993–1996

1993–1996
1993–1996 & 2013–2016
2013–2016

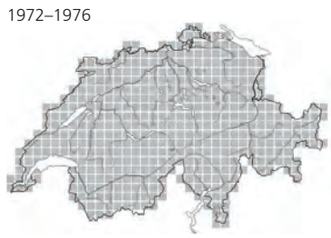


Sponsored by
Martin Spiess

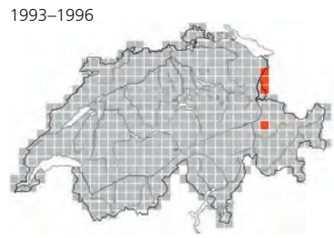
1950–1959



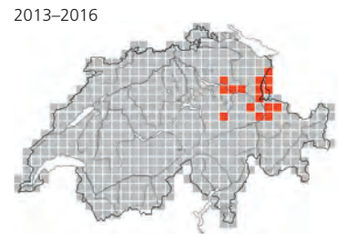
1972–1976



1993–1996



2013–2016



Deadwood and old-growth stands are essential for birds

Deadwood and old-growth stands are critical resources for a wide variety of species groups. Both have become more abundant in forests of marginal economic importance. Not surprisingly, birds that rely on deadwood and old growth show positive population trends. However, in lowland forests especially, there is a lack of deadwood and old-growth stands as well as forest reserves.

Deadwood refers to dead tree material in various forms: standing and lying trees or parts of trees, but also root plates or tree stumps [14]. The main processes that create deadwood are ageing, windthrow, fire, and fungal or insect infestations. In most forests, ageing is the driving force. Deadwood is therefore much more abundant in old-growth stands than in young forests. Veteran trees with thick trunks and branches and large crowns are another particularly valuable feature.

The decay of deadwood is caused mainly by fungi and insects: after the bark of a dead tree falls off, the hard wood gradually softens until it turns into humus. The speed of this process depends on the tree species, humidity, exposure to wind and sun, summer temperatures and contact with ground vegetation or the damp forest floor [14].

Habitat for numerous specialised organisms

Deadwood takes a variety of forms that change continuously throughout the process of decay, offering countless cavities that provide habitat for an equally large number of specialised organisms [7, 17]. About a quarter of our native woodland species need deadwood, including more than 1700 beetles and over 2700 species of macrofungi [8].

Without the influence of major events such as fire or storms, the creation of deadwood is a slow process [18], and large amounts take a long time to form. In cultivated forests, where timber is regularly removed, the quantity of deadwood amounts to a few m^3/ha and is thus much smaller than in unexploited forests, where the volume of deadwood can reach 200 m^3/ha and make up almost half a forest's total timber volume [2, 9, 15]. Because there are very few unmanaged forests in Europe following centuries of more or less intensive silviculture, many organisms that live in deadwood, especially insects, have become rare and are considered threatened [11, 16].

Important for many species of birds

Deadwood is also of great importance for several bird species. Dead trunks and large branches enable or facilitate the excavation of nesting cavities for woodpeckers, Crested Tit, Alpine and Willow Tit, and other cavity nesters. Natural cavities or cracks and hollows beneath dead, protruding pieces of bark are excellent nesting sites for species like the Eurasian Treecreeper. Dead and dying wood provides habitat for arthropods and their larvae, which several species of woodpecker feed on. The Black Woodpecker, for instance, likes to feed on carpenter ants, whose nests are close to the ground in spruce trees with rotting trunks. The Three-toed

Distribution change since 1993–1996 of eight common species that require deadwood and old-growth stands (Eurasian Green Woodpecker, Black Woodpecker, Great Spotted Woodpecker, Middle Spotted Woodpecker, Lesser Spotted Woodpecker, Crested Tit, Alpine and Willow Tit, Eurasian Treecreeper). The map combines the distribution change maps of all eight species.

Pierre Mollet

Lying deadwood is extremely important for regeneration, especially in mountain forests. Young trees emerge from this decaying spruce trunk, where the snow melts earlier in spring than on the surrounding ground.

Gilberto Pasinelli

Old forests rich in deadwood are necessary to support specialised species, but are absent in many parts of the country, especially in easily accessible areas of the Central Plateau and Jura.

Woodpecker is a specialist feeder with a preference for bark beetles and longhorn beetles[12]. The White-backed Woodpecker relies to a particular degree on large quantities of deadwood due to its preference for saproxylic insect larvae. Two typical habitats of the White-backed Woodpecker in northern Grisons contained 107 and 163 m^3 of deadwood per hectare, respectively[4].

The volume of deadwood in Swiss forests more than doubled between 1993–1995 and 2009–2013, increasing from 11 to 26 m^3/ha on average[1, 3], a development that at least partly explains the population increases of several bird species that rely on deadwood[10]. In the lower-lying, easily accessible woods of the Central Plateau and the Jura, however, the average volume of deadwood is still well below 20 m^3/ha. The need for improvements, such as the creation of natural forest reserves where interventions are kept to a minimum and the forest is left to natural succession, is all the more urgent in these areas[6].

Urgent need to promote deadwood and old growth

The shortage of old-growth stands and therefore dead and old wood is considered one of the greatest ecological deficits of managed forests. Accordingly, promoting deadwood and old-growth stands is an important federal objective, especially on the Central Plateau and in the Jura[8]. Natural forest reserves are at the forefront of this strategy and are to become core areas for deadwood-dependent species. However, due to the limited mobility of many saproxylic organisms, there would be little connectivity between populations in geographically dispersed forest reserves. Deadwood and old growth therefore need to be protected in the managed forests that lie between forest reserves by promoting old-growth patches and habitat trees, which are left standing until they decay[8].

The target values of 25 m^3/ha in the Pre-Alps and Alps and 20 m^3/ha on the Central Plateau, in the Jura and the southern Alps[8] will presumably benefit most species of birds that depend on old and decaying wood. For the Three-toed Woodpecker, for example, a threshold value of at least 15 m^3/ha on at least 100 ha of forest was calculated[5]. This value is already reached in most woodlands of the Pre-Alps and Alps today[8, 13]. The population of the Three-toed Woodpecker has indeed responded with increasing numbers in the past 15 years or so, and trends are equally positive for most other birds that depend on deadwood and old-growth stands. For the White-backed Woodpecker, however, these threshold values are insufficient. The species will only be able to spread in the long term if much larger areas of forest at low altitudes are left unmanaged for long periods of time, so that large quantities of deadwood and old growth can accumulate, or if old and dead trees are left much more frequently in managed forests. Many other specialists of deadwood stand to benefit from these measures as well.

Pierre Mollet & Gilberto Pasinelli

[1] Abegg et al. (2014a–d); [2] Albrecht et al. (1988); [3] Brändli et al. (2015a–d); [4] Bühler (2009); [5] Bütler et al. (2004); [6] Bütler et al. (2006); [7] Harmon et al. (1986); [8] Imesch et al. (2015a–b); [9] Mayer et al. (1979); [10] Mollet et al. (2009); [11] Monnerat et al. (2016a–c); [12] Pechacek & Kristin (2004); [13] Rigling & Schaffer (2015a–d); [14] Scherzinger (1996); [15] Siitonen et al. (2000); [16] Speight (1989); [17] Vallauri et al. (2003); [18] Vandekerkhove et al. (2009)

Species pages 286, 288, 290, 292, 294, 296, 300, 342, 346, 432

Great Spotted Woodpecker

Dendrocopos major
Buntspecht
Pic épeiche
Picchio rosso maggiore
pitgalain grond

Daniele Occhiato

Red List Least Concern (LC)
Population 70 000–90 000 pairs (2013–2016)

Focus pages 298, 362

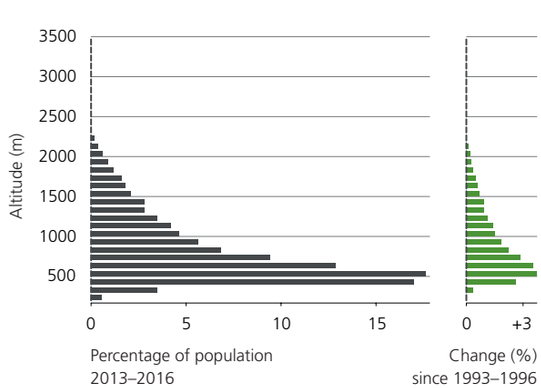
The Great Spotted Woodpecker is the most common woodpecker species in Switzerland. It reaches high densities on the Central Plateau, in parts of the Jura and in the lowlands of Valais and Engadine GR. About 75 % of the population occurs below 1000 m. The Great Spotted Woodpecker inhabits forests of all kinds as well as copses, hedgerows, orchards and settlements, as long as there are plenty of old trees. The highest densities are reached in alluvial forests, old oak and beech woods in the lowlands and old parks [5]. In suitable kilometre squares, it is not uncommon to count eight territories and more. In the past, the highest confirmed broods were found at 2290 m near Cinuos-chel GR [AEn] and at 2230 m near Zermatt VS [AtCH2], more recently at 2210 m near Nendaz VS (C. Morvan).

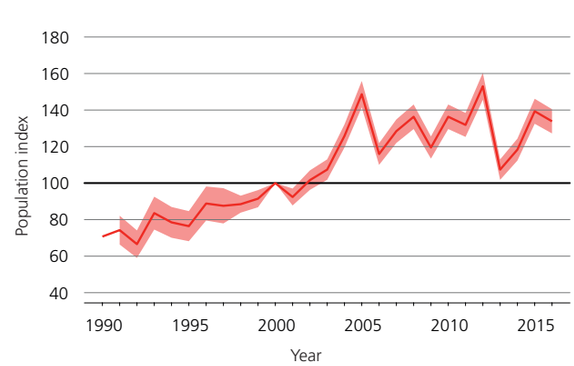
Since 1993–1996, numbers have increased throughout the country except in central parts of the Plateau. The Great Spotted Woodpecker has become more abundant at almost all altitude levels, but gains were somewhat smaller between 400 and 700 m. Regional surveys also show significant gains. The population increased by 20 % in the Canton of Zurich between 1988 and 2008 [AtZH] and by more than 80 % around Lake Constance between 1980 and 2010 [AtBo]. Analyses of data from 1988 and 1999 show that density has increased in settlements in the Canton of Zurich, while remaining largely unchanged in woodlands and farmland [16, 17, 18]. A similar trend was found in Germany [1].

Trends are also positive in our neighbouring countries [AtD, AtF, 3, 10, 14] and in Europe overall [EBCC]. Climate change, the maturation of woods, the increase of deadwood [6, 11] and reduced competition for breeding holes due to the decline of the Common Starling [4, 12] have been suggested as reasons for the widespread gains. There appears to be a positive relationship between the size of the breeding population and the seed production of beech, oak and/or spruce [1, 13], though this may not apply everywhere [19]. The increasing frequency of beech mast years in several European countries [8, 9, 15] and in Switzerland [7] as well as the higher seed production during mast years in beech and spruce [2] in the past decades could therefore be at least partly responsible for the population increase.

Gilberto Pasinelli

[1] Flade & Schwarz (2004b); [2] Gatter (2000); [3] Jiguet (2017); [4] Mattes & Gatter (2011); [5] Michalek & Miettinen (2003); [6] Mollet et al. (2009); [7] Nussbaumer et al. (2016); [8] Övergaard et al. (2007); [9] Paar et al. (2011); [10] Rete Rurale Nazionale & Lipu (2015); [11] Rigling & Schaffer (2015a–d); [12] Smith (2005); [13] Sokolov et al. (2013); [14] Teufelbauer & Seaman (2017); [15] Vetter et al. (2015); [16] Weggler & Widmer (2000a); [17] Weggler & Widmer (2000b); [18] Weggler & Widmer (2001); [19] Wesołowski & Tomiałojć (1997)



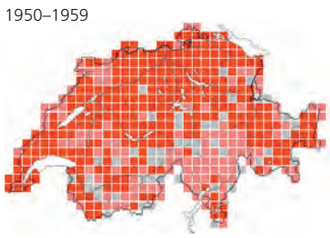


Density 2013–2016

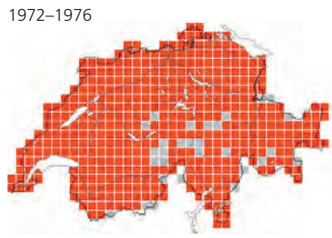
Density change since 1993–1996

Sponsored by
Anonymous donor

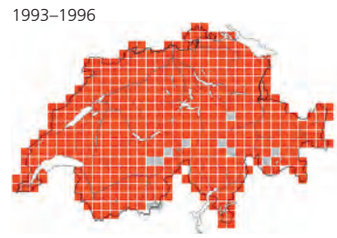
1950–1959



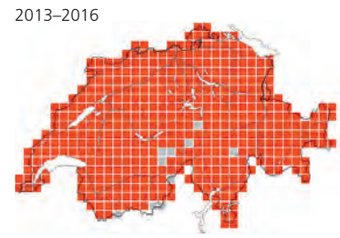
1972–1976



1993–1996



2013–2016



Common Kestrel

Falco tinnunculus
Turmfalke
Faucon crécerelle
Gheppio
crivel

Markus Varesvuo

Red List Near Threatened (NT)
Population 5000–7500 pairs (2013–2016)

Focus pages 170, 234, 264, 308, 362, 392

The Common Kestrel is found throughout Switzerland except in the highest reaches of the Alps and in urban centres. About half of the population occurs at altitudes below 800 m; between 1400 and 2400 m, population density is still fairly high. The highest nests were found in Grimentz VS at 2850 m [1] and in the Dischmatal GR at 2650 m [AGR].

The Common Kestrel is a typical inhabitant of open habitats such as farmland and Alpine meadows and pastures. Its preferred hunting grounds are mosaics of farm- and grassland managed at low intensity, where the supply and accessibility of prey are guaranteed [4]. It nests in crevices in rocks and buildings, crows' nests or nest boxes. In several areas, breeding in nest boxes has been monitored for many years [9, 13]. In 2014, these monitoring schemes found the highest densities in Moudon VD in the Broye Valley with 15 territories/10 km² (J. Jeanmonod), in the area of Kestenholz SO with 16 territories/10 km² (K. Stampfli, T. Aeschlimann) and near Altstätten SG in the Rhine Valley with 17 territories/10 km² (G. Gschwend, I. Moser).

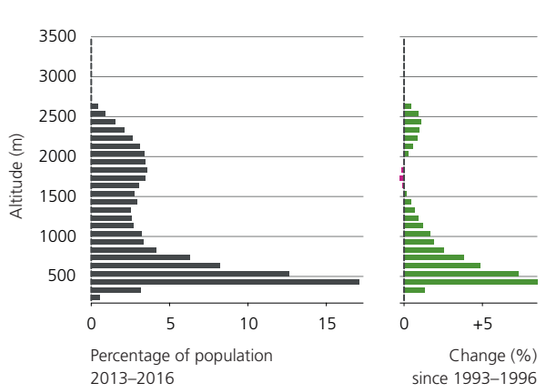
The Common Kestrel faced steep local declines in the 1970s and 1980s [11]. In the area around Rheinfelden AG only 3.1 territories/10 km² were recorded in 1989 [8]; in 2015, the number had risen to 13 territories/10 km² (M. Hohermuth).

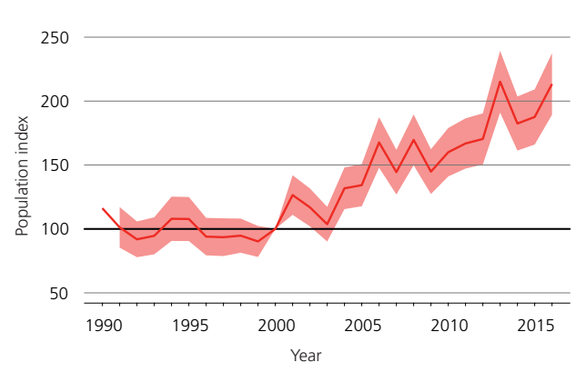
The Common Kestrel population has continued to increase after 1993–1996, especially in the central parts of the Plateau. At almost all altitude levels, density has increased in proportion to the population at that level. The trends in our neighbouring countries vary: In Germany and Austria, numbers are stable [AtD, 12], while there is a modest increase in Italy [10]. In France, the population declined by 10 % from 2000 to 2014 [5], possibly due to agricultural intensification [6]. The overall European population has shown a marked decline since 1990 [EBCC].

The positive trend in Switzerland was aided by local conservation groups providing nest boxes, as a lack of nesting sites can limit distribution [7]. In addition, designated biodiversity sites (especially wildflower plots) have improved the food supply [2, 3, 4].

Stephanie Michler

[1] Arlettaz (1993); [2] Aschwanden (2004); [3] Aschwanden & Buner (2006); [4] Aschwanden et al. (2005); [5] Bretagnolle & Pinaud (2016); [6] Butet et al. (2010); [7] Jeanmonod & Broch (2001); [8] Kaeser & Schmid (1989); [9] Michler et al. (2016a–b); [10] Rete Rurale Nazionale & Lipu (2015); [11] Schmid (1990); [12] Teufelbauer & Seaman (2017); [13] Zellweger-Fischer et al. (2011)





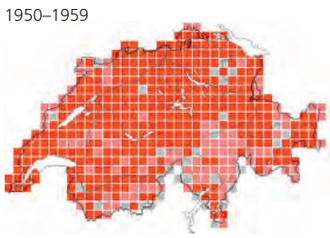
Occurrence 2013–2016

Occurrence change since 1993–1996

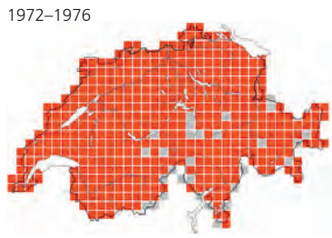
Sponsored by
Martin Schmid
Martina Thürig Arnold &
Peter Arnold

Natur- und Vogelschutzverein
Pfäffikon ZH

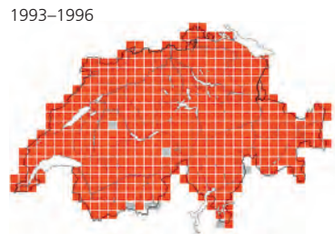
1950–1959



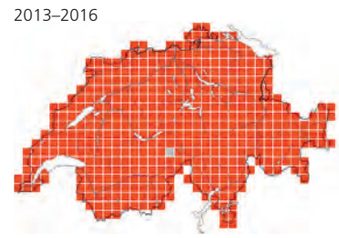
1972–1976



1993–1996



2013–2016



Eurasian Hobby

Falco subbuteo
Baumfalke
Faucon hobereau
Lodolaio
falcun da feglia

Beat Rüegger

Red List Near Threatened (NT)
Population 500–1000 pairs (2013–2016)

Focus page 264

In Switzerland, the Eurasian Hobby is regularly found at altitudes up to 800 m and ranges quite far into the Alps following the major valleys, especially the Rhone Valley VS, Vorderrhein Valley GR and Domleschg GR. Typical nesting habitats are patches of woodland with vertical forest edges or clearings with single tall trees, especially pines – often near water. Breeding can occur in large gardens in urban areas or in crows' nests on power pylons. The highest broods were recorded in Montévraz FR at 1200 m in 1994 [5] and in Tschlin GR at 1370 m in 2012 (B. Claude); the latter site was also occupied in 2015 (M. Müller).

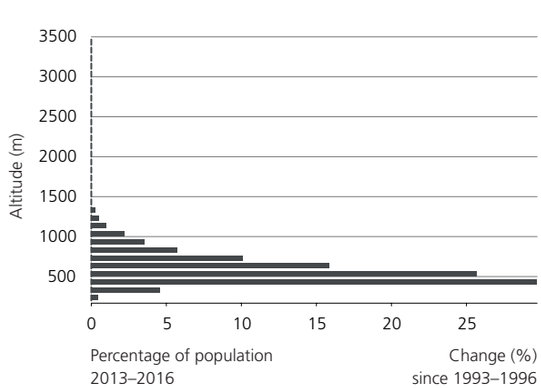
Little is known about the species' population density in Switzerland. In 1989–1998 in an area of 820 km² in the Canton of Fribourg on the Central Plateau, 10–26 pairs were counted in some years; the average was 19 pairs, which corresponds to 2.3 pairs/100 km² [5]. In the Canton of Geneva, 10.3 pairs/100 km² were recorded during 1998–2001 [AtGE].

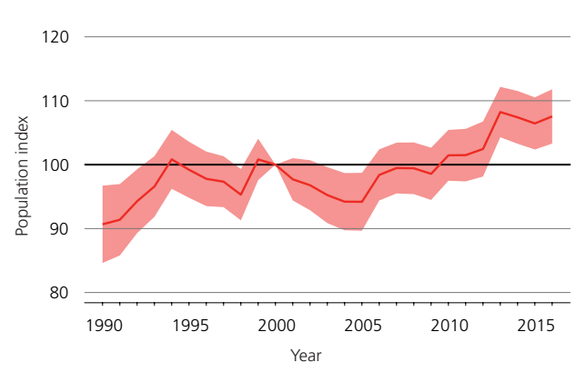
Compared to 1993–1996, the Eurasian Hobby was found in a number of new atlas squares. However, this is a secretive species, and some observations probably reflect increased observer effort rather than indicating newly colonised sites. Nevertheless, since 2002, broods or evidence of breeding have been detected for the first time in areas that were already well monitored in the past. First breeding records were obtained in 2002 in the Rhone Valley near Grône [VdS], in 2005 in Grisons near Landquart [AGR], in 2012 in Lower Engadine GR near Tschlin (B. Claude) and in 2015 in Ticino near Novazzano (G. Mangili). A slight range expansion is therefore probable. The population index also suggests a small increase, and regional surveys confirm this trend [AtBo, AtGE, AtZH].

In neighbouring countries, the species is recovering from earlier declines [AtD, AtF, 1]. Reasons for the recovery include a decrease in shooting, poisoning and pesticide contamination (e.g. DDT) [AtF] as well as colonisation of new habitats by the Eurasian Hobby (nests on power pylons) [AtD, AtF]. However, there are also regional declines, due in part to intensive forestry and diminishing numbers of important prey animals such as swallows and large insects [2, 3, 4]. The overall European trend is assumed to be stable [RLEU].

Marc Kéry

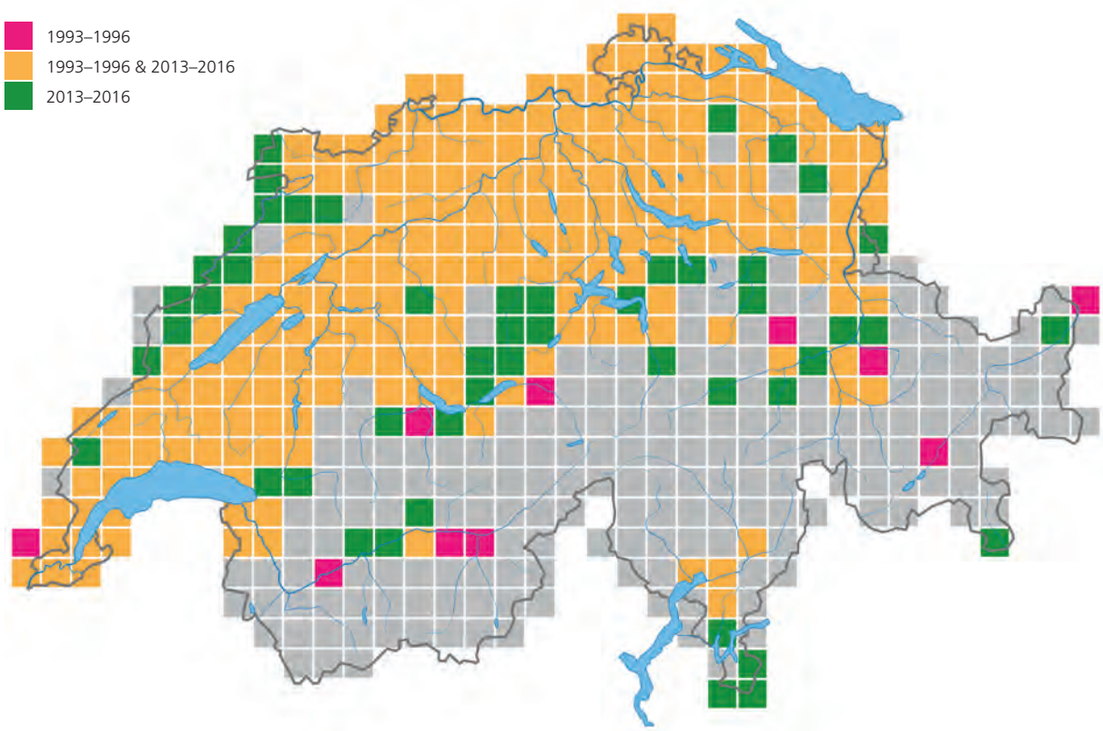
[1] Campedelli et al. (2012);
[2] Fiuczynski & Sömmer (2011);
[3] Mebs & Schmidt (2014);
[4] Probst (2013); [5] Vigneau & Duc (2001)



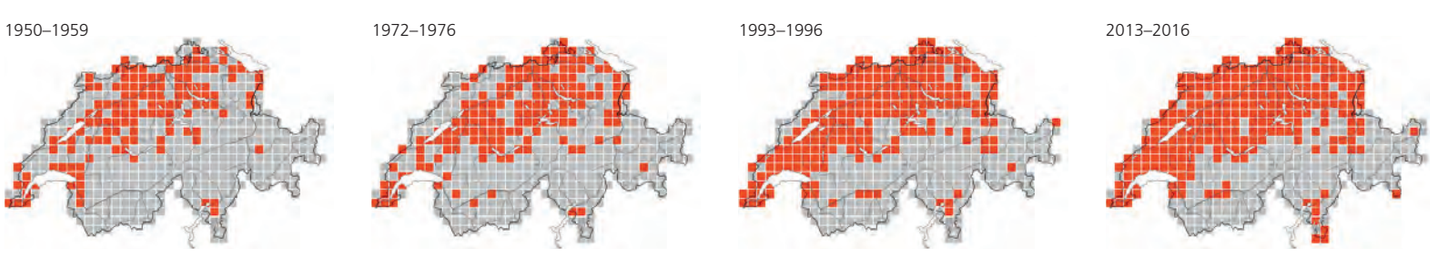


Occurrence 2013–2016

Distribution change since 1993–1996



Sponsored by
Erich & Claudia Voggensperger, Schönenbuch
Samuel Willener



Peregrine Falcon

Falco peregrinus
Wanderfalke
Faucon pèlerin
Falco pellegrino
falcun pelegrin

Ralf Kistowski

Red List Near Threatened (NT)
Population 260–320 pairs (2013–2016)

Focus pages 110, 170, 240, 264, 308

Switzerland lies within an area in central and western Europe that has a particularly high density of Peregrine Falcons. At low and medium altitudes, the Peregrine Falcon is a rare but widespread breeding bird as long as suitable nesting sites are available, such as unobstructed, vertical rock faces (including quarries) and high buildings. Most pairs nest below 1500 m, but nests at much higher altitude have been recorded. The highest confirmed broods were recorded in the Alps near Zernez GR at 2210 m (D. Jenny, A. Kofler) and Pontresina GR at 2180 m (D. Jenny) as well as in the Jura on Le Suchet mountain VD at 1520 m (P.-A. Ravussin)[1].

The species reaches its highest densities in rocky areas in the central Jura, the western part of the Central Plateau as well as at the northern rim of the Alps and in the large Alpine valleys, where population density can reach up to two territories/100 km². Density is lowest in the middle and eastern Central Plateau, where rocky habitats are much scarcer.

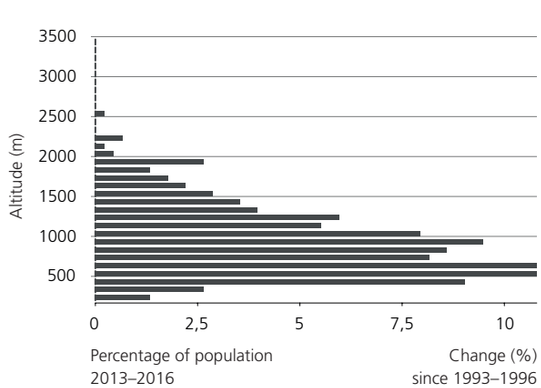
The Peregrine Falcon was widespread in Switzerland in 1950–1959[AtCH0]. Biocides then caused populations around the world to collapse, including in Switzerland[AtCH1, 9, 13]. The trend reversed starting in 1971[8, 10, 11]. In Switzerland, the population was estimated at more than 200 pairs in 1993–1996[AtCH2] and at 340 pairs in 2010 (M. Kéry). The recovery was reflected in breeding records at increasing altitudes, colonisation of cliffs only 10 m high, and a small increase in the number of nests on buildings[4].

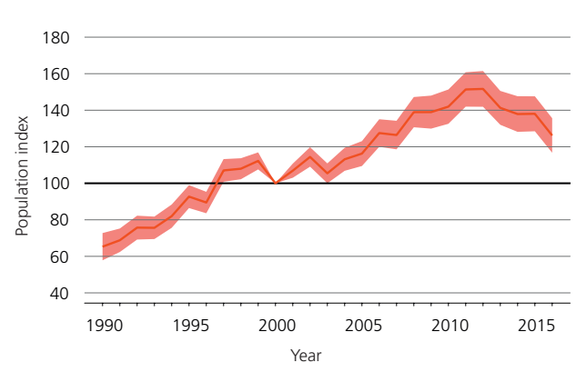
Since 2008, there have been marked regional declines: 33 % in southwestern Switzerland and as much as 43 % in the northern Jura[5]. Populations in neighbouring countries (Baden-Württemberg[10], French Jura[7]) decreased to a lesser extent during the same period. In 2013–2016, the Swiss population presumably numbered 260–320 pairs. The main causes of decline include predation by the growing population of Eurasian Eagle-owls[2, 6] as well as illegal persecution by pigeon fanciers[3, 12] and increasing disturbance from recreational sports[5].

Decisive legal action against poisoning and a reduction of disturbance at the nesting sites would help to reduce man-made threats.

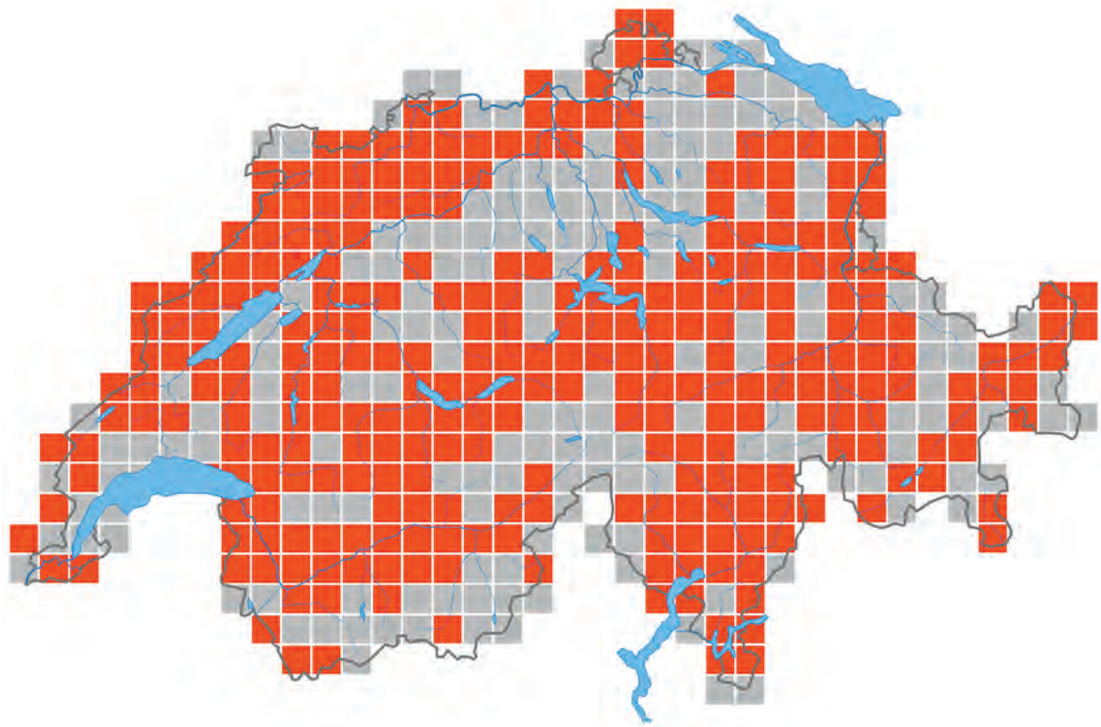
Marc Kéry

[1] Antoniazza (2015); [2] Brambilla et al. (2006a); [3] Inderwildi et al. (2016a–b); [4] Kéry et al. (2005); [5] Kéry et al. (2016); [6] Monneret (2010); [7] R.-J. Monneret, pers. comm.; [8] Monneret et al. (2015); [9] Ratcliffe (1993); [10] Rau et al. (2015); [11] Strenna (2013); [12] Vogler et al. (2015); [13] White et al. (2013)

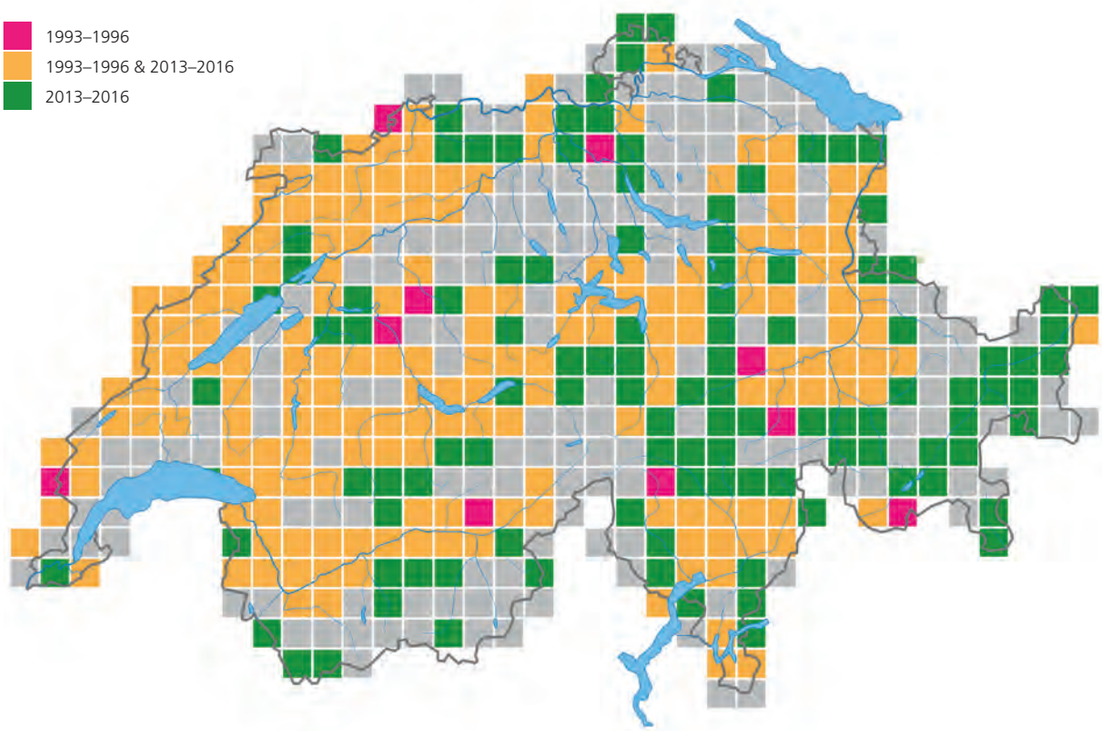




Distribution 2013–2016



Distribution change since 1993–1996



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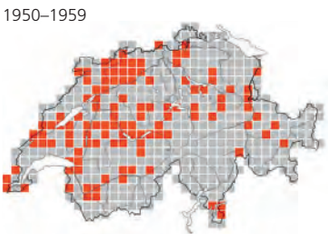
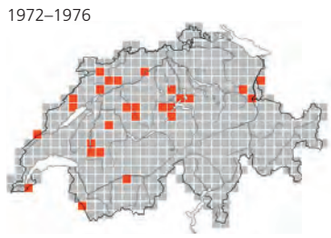
André Frei-Armstrong
Leibstadt Nuclear Power Plant

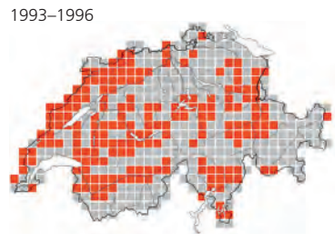
1950–1959



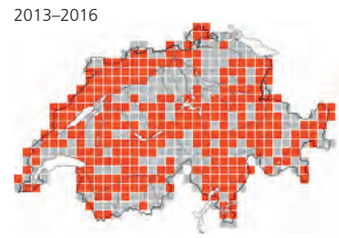
1972–1976



1993–1996



2013–2016



Rock faces – spectacular and valuable places of refuge

Rock faces are unique habitats where specialised birds find nest sites out of reach from predators. For a long time, these refuges were undisturbed. Today, with the growing popularity of leisure activities, preserving their ecological value has become a new challenge.

Rock faces, cirques and deep gorges in the Alps and Jura, molasse cliffs on the Central Plateau, or quarries made by humans – there are many forms of vertical, rocky terrain in Switzerland. They differ in terms of rock type, exposure, height, vegetation cover, and density of crevices and fissures. These factors influence the composition of the species communities inhabiting the rock formations. Geographical distribution also plays a role: rock faces are present almost everywhere in the Alps, somewhat scarcer in the Jura, and quite rare on the Central Plateau.

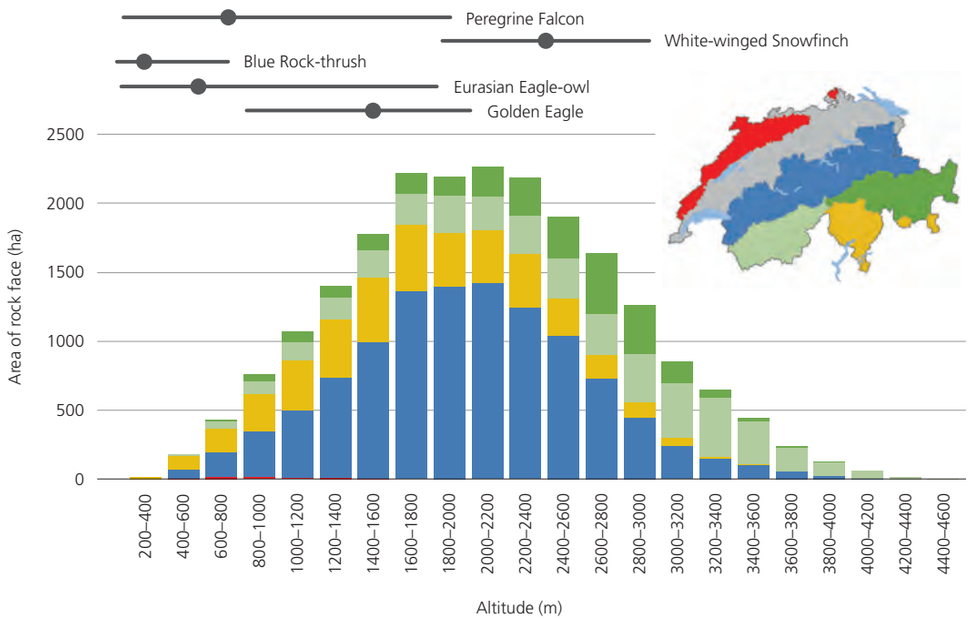
Specialised breeding birds

Highly specialised birds such as the Wallcreeper use rock faces as foraging grounds. But first and foremost, they offer safe nest sites, practically inaccessible to ground predators. Conflicts and predation do occur, however, between birds breeding side by side in the cliffs. This kind of predation can affect adults, chicks or eggs. Eurasian Eagle-owl, Peregrine Falcon and Common Raven have a particular reputation for such disputes: the more Eurasian Eagle-owls or Peregrine Falcons are disturbed at the nest, the greater the opportunity for Common Ravens to prey on chicks or eggs. The Eurasian Eagle-owl, in turn, is a direct threat to adult birds and chicks in nearby Peregrine Falcon or Raven nests [1, 2, 9, 10].

Some cliff-nesting birds have learnt to use artificial nest sites that resemble natural rock formations, such as arcades, bridges, church steeples or buildings. Among them are raptors and owls like Common Kestrel, Peregrine Falcon and Eurasian Eagle-owl, corvids such as Common Raven, Eurasian Jackdaw and Yellow-billed Chough, but also swallows and swifts. For certain species like the Eurasian Crag Martin, the trend to nest on buildings is still growing. Others have completed the shift: Northern House Martin colonies, for example, have become rare in cliffs and are now practically only found in settlements. Golden Eagle, Common Raven, Eurasian Jackdaw and, in rare cases, Common Swift can also nest in trees. Conversely, some woodland birds occasionally breed in rock faces, from Tawny Owl and Stock Dove to various species of tits [3].

Aurore Pradervand

The imposing limestone wall of Haut de Cry near Chamoson VS rises from 600 to 3000 m. It offers habitat for both Alpine and Mediterranean species, accommodating almost the entire spectrum of our native cliff-nesting birds, from the Red-billed Chough to the Blue Rock-thrush.



The frequency of rock faces (defined as stone surfaces with an inclination of more than 60°) differs depending on the biogeographical region (the colours correspond to those on the small map). The Alps dominate the graph, while the Jura and Central Plateau are practically absent. Rock faces at 800–1000 m, for example, are mainly found in the northern and southern Alps. The black lines represent the altitudinal distribution of five cliff-nesting birds, with the dot indicating the median.

From the lowlands to the Alpine zone, there are about 20 typical cliff-nesting birds in Switzerland. Most have healthy populations, but there are some exceptions: the situation of the Eurasian Eagle-owl, for example, is unstable and varies from region to region [5, 7, 11]. After increasing in number for many years, the Peregrine Falcon population also appears to be stagnating or even starting to decline [6]. Both species remind us that cliff-nesting birds in Switzerland are still in need of protection.

Impact of human activities

Nest sites in rock faces are well protected from ground predators. However, since the late 20th century, these sites have become increasingly attractive to humans pursuing leisure activities. Initially, disturbance mainly came from rock climbing and the installation of via ferratas; later on extreme sports such as base jumping gained in popularity. These leisure activities put additional pressure on populations, some of which are already weakened by other anthropogenic causes of death such as collisions, electrocutions, or even poisoning [4, 8, 11]. In addition, rock faces offer an impressive setting to perform sound and light shows for the benefit of tourists, which can cause breeding birds to abandon the site. The quarries in our country – there are approximately 200 – are a particularly striking example of the dynamic between human activity and birdlife: when excavation ends, these secondary habitats are often filled in with no consideration for the birds that nest there. In such cases, artificial walls need to be installed to provide alternative nest sites.

Customised conservation measures

Luckily, it is often possible for cliff-nesting birds and human activities to coexist without conflict. The nest sites of sensitive species or priority species (e.g. Eurasian Eagle-owl, Peregrine Falcon) are often known, so potential conflicts can be anticipated and recommendations made for measures that are adapted to the specific situation. For the protection of cliff-nesting birds to be successful, it is essential to involve the stakeholders when searching for solutions. Restricted access to certain areas or during certain periods is then more readily accepted, not least thanks to well-informed and cooperative partners on site.

Jean-Nicolas Pradervand & Emmanuel Revaz

Célestin Luisier

Conflict or coexistence? A characteristic bird of bare rock faces, the Wallcreeper is well known among rock climbers. This female carrying food stops right next to a bolt drilled into the rock to secure climbers.

[1] Brambilla et al. (2004); [2] Brambilla et al. (2006a); [3] Hauri (1988); [4] Inderwildi et al. (2016a–b); [5] Jenny (2011a); [6] Kéry et al. (2016); [7] Lardelli & Zbinden (2017); [8] Martinèz et al. (2006); [9] Monneret (2010); [10] Rau (2015); [11] Schaub et al. (2010a)

Species pages 172, 250, 256, 302, 306, 320, 322, 330, 334, 388, 394, 436, 474, 502

Eurasian Golden Oriole

Oriolus oriolus
Pirol
Loriot d'Europe
Rigogolo
pirol

Stefan Rieben

Red List Least Concern (LC)
Population 3000–4500 pairs (2013–2016)

Focus pages 357, 448

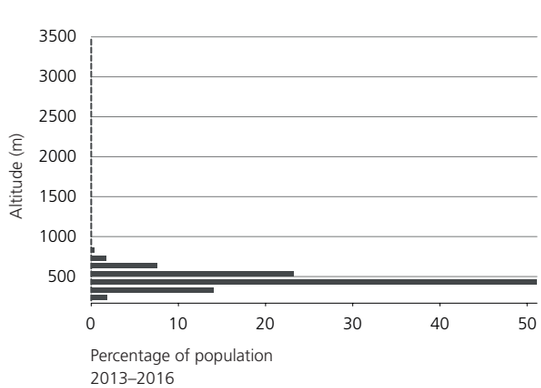
The Eurasian Golden Oriole breeds in highly structured, sparse tree stands with tall single trees. Suitable breeding grounds characterised by warm summer weather generally lie below 600 m. In Switzerland, the Golden Oriole is mainly found near water in alluvial forests dominated by deciduous trees, in carr, poplar stands, shelterbelts and forest edges [VdS]. The highest densities with more than three territories/km² are reached around Lake Geneva, at the southern foot of the Jura and along Switzerland's northern border from the Ajoie JU to Lake Constance. Locally the Golden Oriole can occur at higher altitudes. This is documented by breeding records near Lutry VD at 700 m (2014; M. Dvorak) and Chavannes-sous-Orsonnens FR at 650 m (2013 and 2015; M. Barbey), but also by singing males in suitable habitats near Mont-la-Ville VD at 950 m (16 June 2015; Y. Menétrey), Longirod VD at 930 m (16/25 May 2016; C. Venetz) and Filisur GR at 1180 m (24–25 June 2013; M. Ambühl, B. Ottmer). The species' ability to breed at these altitudes has been known since at least 1975, when breeding was confirmed at 1160 m near Osco TI [AtCH1].

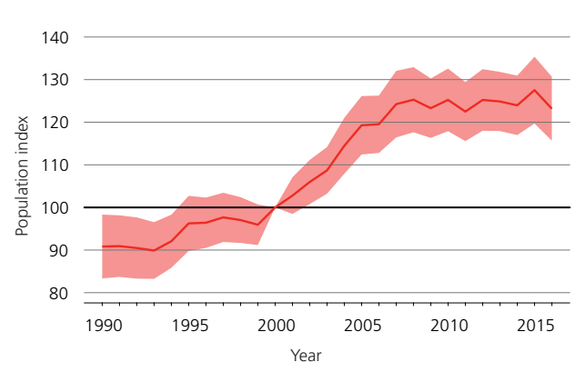
The Golden Oriole has expanded its range in Switzerland slightly since 1993–1996, especially at the periphery of areas already occupied. The population increased by about 30 % from 1993 to 2007 and has been stable since then. Regional surveys in Switzerland and results in neighbouring countries indicate small gains [2, 3] or stable trends [AtBo, AtZH, 1, 5, 9].

Along with climate change, forestry measures that promote deciduous trees are considered abroad to have a positive impact on the distribution and population dynamics of the Golden Oriole [AtF, AtGB, 4, 7]. This is probably true for Switzerland as well, as the proportion of woodland dominated by deciduous trees and providing suitable habitat for Golden Orioles on the Central Plateau, in the Jura and Pre-Alps has increased since the 1980s from 43 to 58 % below 700 m and from 23 to 34 % between 700 and 1200 m [10]. The population increase along the High Rhine in the Canton of Aargau, for example, is probably related to forest management following storm «Lothar» in late 1999, which favoured the regeneration of deciduous woods [6]. Intensified forestry interventions across large areas may have contributed to the marked decline in the Canton of Geneva. The medium-term prospects are considered favourable for the Golden Oriole in Switzerland [8].

Johann von Hirschheydt

[1] Antoniazza (2018); [2] Birrer et al. (2016); [3] Campedelli et al. (2012); [4] Gregory et al. (2009); [5] Jiguet (2017); [6] M. Kasper, pers. comm.; [7] Koop & Berndt (2014); [8] B. Lugrin, pers. comm.; [9] Teufelbauer & Seaman (2017); [10] WSL (2018)



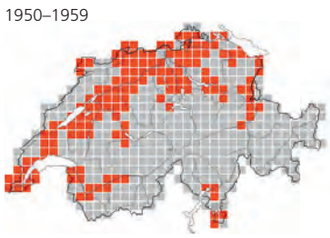


Density 2013–2016

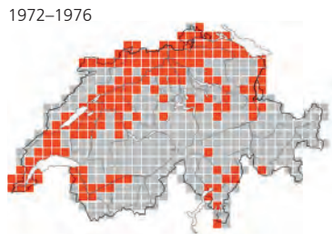
Density change since 1993–1996

Sponsored by
Beat Anner
Muriel Scherz, Bürglen

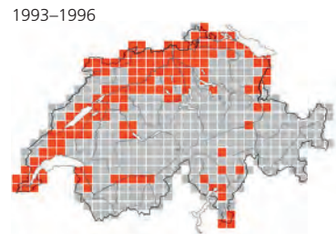
1950–1959



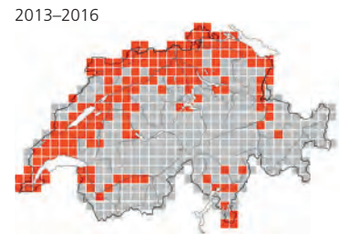
1972–1976



1993–1996



2013–2016



Red-backed Shrike

Lanius collurio
Neuntöter
Pie-grièche écorcheur
Averla piccola
pitgaspina brin

Markus Varesvuo

Red List Least Concern (LC)
Population 10 000–15 000 pairs (2013–2016)

Focus pages 234, 276, 314, 362, 392, 402, 414, 506, 532

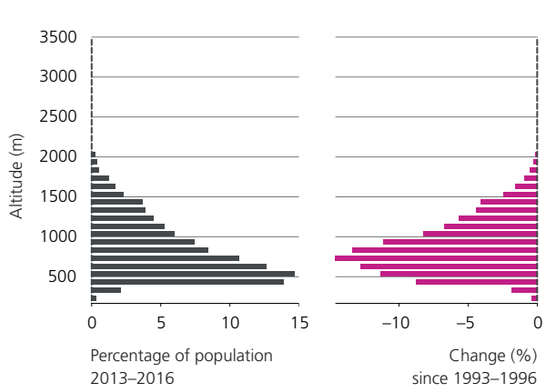
In Switzerland, the Red-backed Shrike reaches the highest densities in the dry inner-Alpine valleys (Valais, Lower Engadine GR, Val Müstair GR) and in the catchment area of Vorderrhein and Hinterrhein. High local densities are also found at the southern foot of the Jura, in the Klettgau SH and near Geneva. The Central Plateau is only thinly populated, especially in the east. 90 % of the population occurs below 1400 m. While breeding has been known to occur up to 2200 m [VdS], the highest record in 2013–2016 came from 1950 m near Zermatt VS (M. Rogg). The Red-backed Shrike inhabits semi-open, richly structured landscapes with hedgerows and scattered shrubs as well as an abundant supply of arthropods [13]. Prime habitat consists of thorny hedges with adjacent low-intensity meadows or pastures, but the species also occupies windthrow areas, traditional orchards, vineyards, tapered forest edges and shrubby fallows.

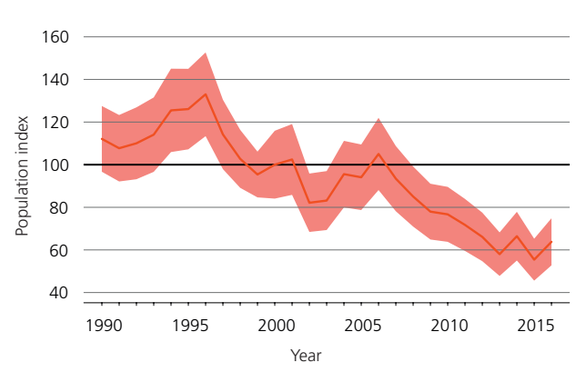
While distribution has remained largely unchanged since 1993–1996, density has decreased significantly in many places, particularly in the species' current core areas such as Valais and Domleschg GR. It is striking that the losses were more pronounced between 600 and 1100 m than at lower altitudes. Overall, the Swiss population has halved since 1993–1996. There are significant regional differences, however [AtBo, AtZH, 1, 2, 4, 5, 6, 8, 18]. Marked declines have also been recorded in Germany, Italy and Austria in the past 20 years [AtD, 9, 16]. In France and in Europe as a whole, numbers are considered stable [AtF, EBCC].

Large fluctuations in population size are not uncharacteristic of Red-backed Shrike populations [10, 12, 18]. Causes include weather conditions during the breeding season [15], habitat changes in the breeding grounds [7, 13] and drought in stopover and wintering areas [10, 11, 17]. The fact that losses were smaller below 600 m than at medium altitude may be due to the increase of hedges and wildflower plots on the Central Plateau but not in mountain areas (where these habitats are lost to shrub encroachment or intensified agricultural use) [3, 6, 7, 14]. Hedges that have been abandoned despite providing suitable habitat indicate that other factors besides habitat degradation have contributed to the declines since 1993–1996.

Michael Schaub

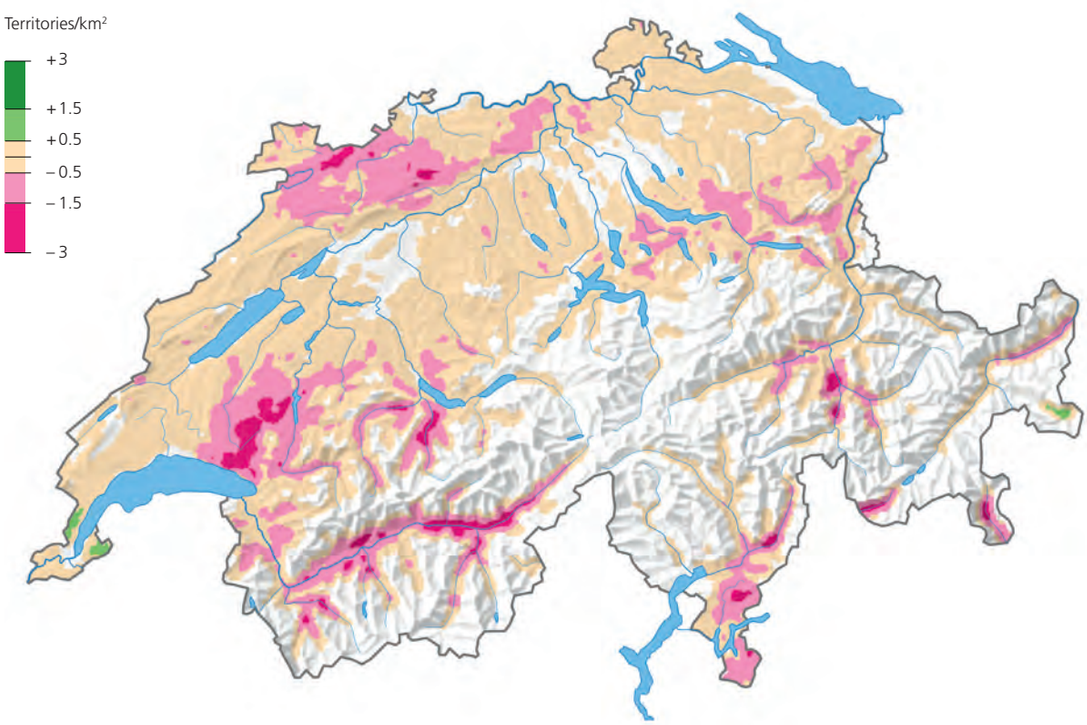
[1] Beaud & Beaud (2018); [2] Birrer et al. (2016); [3] Bundesamt für Umwelt (2007); [4] Christen (2017a); [5] Korner et al. (2017); [6] Martinez & Birrer (2017); [7] Martinez et al. (2017); [8] Morard (2014); [9] Nardelli et al. (2015); [10] Pasinelli et al. (2011); [11] Schaub et al. (2011); [12] Schaub et al. (2013b); [13] Schifferli et al. (1999); [14] Sierro et al. (2009); [15] Stauber & Ullrich (1970); [16] Teufelbauer & Seaman (2017); [17] Töttrup et al. (2012); [18] Zollinger (2014)





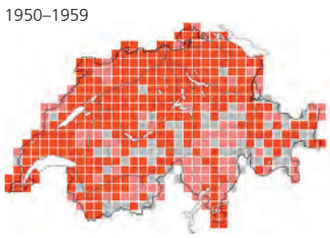
Density 2013–2016

Density change since 1993–1996

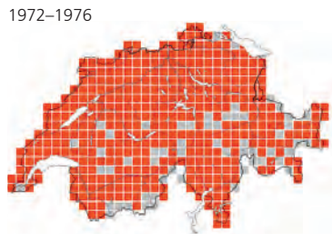


Sponsored by
Jean-Luc Brahier

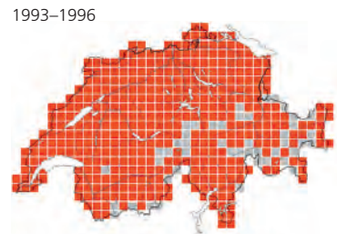
1950–1959



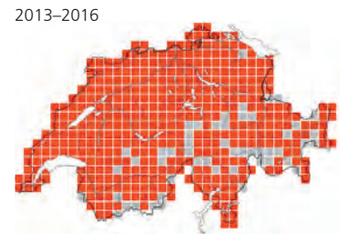
1972–1976



1993–1996



2013–2016



Hedgerows and forest edges – valuable structures in farmland

In otherwise open country, hedges provide shelter, nest sites and hunting perches. Forest edges, like all transition zones between different habitats, are especially rich in species. But most hedgerows and forest edges do not offer the habitat quality that breeding birds require. The need for ecological restoration is great.

Hedges and copses increase habitat connectivity and have a positive effect on species richness in farmland, including breeding birds [16]. Tapered forest edges with dense shrubs and a species-rich herb fringe have a similar function [1, 6, 12].

Until about 1950, the landscapes of the Central Plateau were dominated by a mosaic of small, hedged plots [5]. Following large-scale land consolidation, many hedges were cleared, a process that continued until about 1990. Since then, the number of hedges has increased again due to shrub encroachment on embankments (e.g. in terraced fields) and intentional replanting. Between 1989 and 2003, hedges in Switzerland increased by 62 km annually, reaching a total length of 10 334 km in 2003 [3].

Woodland species are typical inhabitants of hedgerows and forest edges

The birds that inhabit hedgerows and forest edges are originally woodland species. Some live in the forest's shrub layer, others inhabit large windthrow areas, while still others occupy areas where woodland growth is hampered by unfavourable conditions, giving way to semi-open scrubland. Red-backed Shrike, Common Whitethroat, Tree Pipit and Yellowhammer fall into these categories [HVM].

35 bird species regularly occupy hedgerows [9]. While numerous publications exist on «common hedgerow birds» such as Garden Warbler, Common Whitethroat, Red-backed Shrike or Yellowhammer [8, 10, 13, 15], surprisingly little has been published on the composition of breeding-bird communities in hedgerows and forest edges. In particular, the composition of bird communities in typical hedgerow landscapes in different regions and altitude zones in Switzerland is not well understood. One of the few studies to give a comprehensive description of breeding birds in a hedgerow landscape in Switzerland comes from the inner-Alpine Albula Valley GR. On 400 ha of land between 880 and 1180 m, the most common hedge-nesting birds were, in order of abundance, Eurasian Blackcap, Yellowhammer, Red-backed Shrike, Eurasian Blackbird, Garden Warbler, Eurasian Magpie and Eurasian Green Woodpecker [14]. In 2009–2011, the project «Mit Vielfalt punkten/Scoring with biodiversity», initiated by the Swiss Ornithological Institute and the Research Institute of Organic Agriculture, studied the bird communities on 133 farms between Bern and Zurich. The species most attracted to hedgerows were Garden Warbler, Red-backed Shrike, Yellowhammer, Eurasian Magpie, European Goldfinch and Short-toed Treecreeper.

According to the territory mapping surveys in kilometre squares (1 × 1 km) in 2013–2016, 40 out of 50 woodland species with sufficient data favour forest edges. The preference is most pronounced in Common Nightingale, Lesser Whitethroat, Redpoll, Ring Ouzel, Black Grouse, Citril Finch and Western Bonelli's Warbler (in order of decreasing abundance). By contrast, only ten

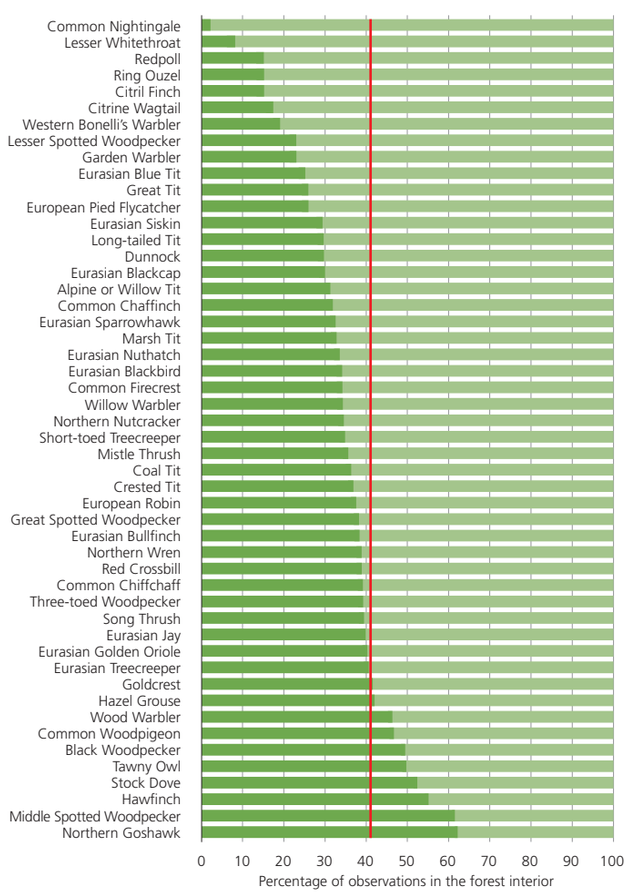
Roman Graf

In this hedge landscape near Filisur GR, the most common breeding birds are Eurasian Blackcap, Yellowhammer, Red-backed Shrike, Eurasian Blackbird, Garden Warbler, Eurasian Magpie and Eurasian Green Woodpecker.

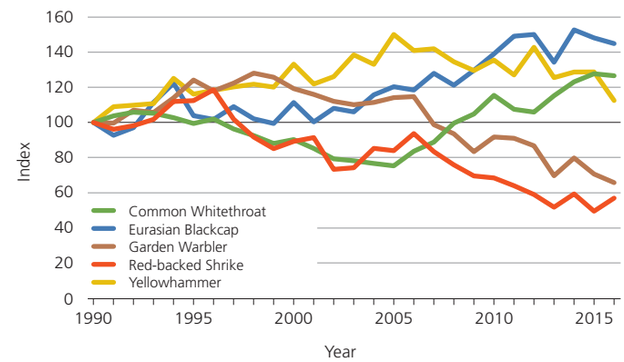
woodland birds were more abundant than expected in the forest interior. The species showing the strongest preference for the forest interior were (in this order): Northern Goshawk, Middle Spotted Woodpecker, Hawfinch, Stock Dove, Tawny Owl, Black Woodpecker and Common Woodpigeon.

Population trends of birds in hedgerows and forest edges

Eurasian Blackcap, Garden Warbler, Common Whitethroat, Red-backed Shrike and Yellowhammer, all typical hedge-nesting birds, have very different population trends. The trends of Red-backed Shrike and Garden Warbler were initially positive, but populations have collapsed since the late 1990s. The Yellowhammer shows small fluctuations over the long term. Following an initial decline, the Common Whitethroat population is showing signs of recovery. The Eurasian Blackcap, on the other hand, a species that also often nests in woodland, is increasing significantly. Apart from the quality or quantity of hedge habitat, other factors such as conditions in the wintering grounds and stopover sites, the changing food supply (especially insects) and the population trend of the woodland population appear to influence the «hedge nesters».



Preference for forest edge habitat of 50 species based on the territory mapping surveys in kilometre squares in 2013–2016. The chart shows the percentage of observations on the forest edge (the outermost 50 m of forest, light green) and in the forest interior (dark green). The red line marks the average area of forest interior in the surveyed kilometre squares (41.3 %).



Eurasian Blackcap, Garden Warbler, Common Whitethroat, Red-backed Shrike and Yellowhammer are all typical hedge birds, but their population trends (breeding bird index) differ greatly. To improve comparability between the species, the base year was set at 1990 with an index value of 100.

Urgent need for more thorny hedges

Hedgerows and forest edges can differ widely in terms of quality. Long, broad hedgerows and forest edges [7, 8] with a high proportion of thornbushes [8], a dense shrub layer, the presence of several woody species and plenty of old growth and deadwood are especially attractive for birds. Old hedgerows, where these structures are more common, are more frequently occupied by birds than young hedges [8]. The presence of a broad fringe managed at low intensity [4, 8] and additional hedges [8] or other near-natural structures has a positive impact on breeding birds. Some birds (e.g. Common Whitethroat, Red-backed Shrike) favour low-growing shrub hedges, but the presence of trees increases species richness [7].

Unfortunately, the quality of hedgerows in many areas of Switzerland is unsatisfactory [6, 9, 11]. It would take relatively little effort to enhance the ecological value of hedgerows and forest edges, as demonstrated by a hedge-improvement project («Aktion Dornröschen») initiated by BirdLife Lucerne and supported by the Canton of Lucerne. Within just a few years, the quality of 112 km of hedges was significantly improved [2].

Hedgerows and forest edges are among the most important habitat features for breeding birds in farmland. We need to focus on improving the ecological quality of hedges and increasing the stock by replanting hedges where they have been removed.

Roman Graf

[1] Berg & Pärt (1994); [2] Birrer & Kaufmann (2014); [3] Bundesamt für Umwelt (2007); [4] Christen (1988); [5] Ewald & Klaus (2009); [6] Flückiger et al. (2002); [7] Hinsley & Bellamy (2001); [8] Horch & Holzgang (2006); [9] Kohli & Birrer (2003a–b); [10] Korner et al. (2017); [11] Krüsi et al. (1997); [12] Laiolo & Rolando (2005); [13] Müller (1996); [14] Ott & Graf (2010); [15] Pfister et al. (1986); [16] Zellweger-Fischer et al. (2018)

Species pages 112, 152, 154, 248, 262, 286, 288, 292, 312, 326, 398, 412, 416, 422, 426, 430, 450, 454, 462, 504, 522, 534, 538, 540, 558

Lesser Grey Shrike

Lanius minor
Schwarzstirnwürger
Pie-grièche à poitrine rose
Averla cenerina
pitgaspina stgarvunà

Marcel Burkhardt

Red List Regionally Extinct (RE)
Population 0 pairs (2013–2016)

Focus page 319

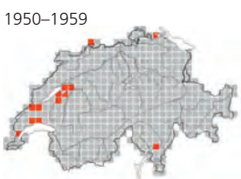
Switzerland lies at the northwestern edge of the Lesser Grey Shrike's range. In western Europe, only small pockets of distribution remain, while the range is more continuous in eastern Europe and beyond [HBW]. The Lesser Grey Shrike inhabits dry, warm and open steppes and farmland interspersed with shrubs, trees or tree rows. It bred in Switzerland in small numbers until 1964 [AtCH0]. During 1950–1959, there were never more than six broods per year [AVD]. Breeding was recorded for the last time near Missy VD in 1972 [AtCH1]. Signs of probable breeding were observed near Hombrechtikon ZH in 1987 [AtCH2], followed by breeding-season observations of a male in the same area in 1988–1990 [VdS]. Not until July 2017 was a pair again seen over a period of two weeks near Ried bei Kerzers FR (J. Hassler et al.).

In the late 19th century, the Lesser Grey Shrike, widespread at the time, began to retreat from western and central Europe [3]. Its disappearance has been linked to a series of wet and cold summers [AtCH0, HVM]. Agricultural intensification in breeding and wintering grounds (land consolidation, use of pesticides and fertilisers) has presumably contributed to the decline in the remaining populations in Spain, France, Italy and Austria [AtF, HVM, RLEU, 1, 2, 4, 5].

Michael Schaub

[1] Giralt & Valera (2007); [2] Lefranc (2017); [3] Lefranc & Worfolk (1997); [4] Nardelli et al. (2015); [5] Seymour & Dean (2010)

1950–1959

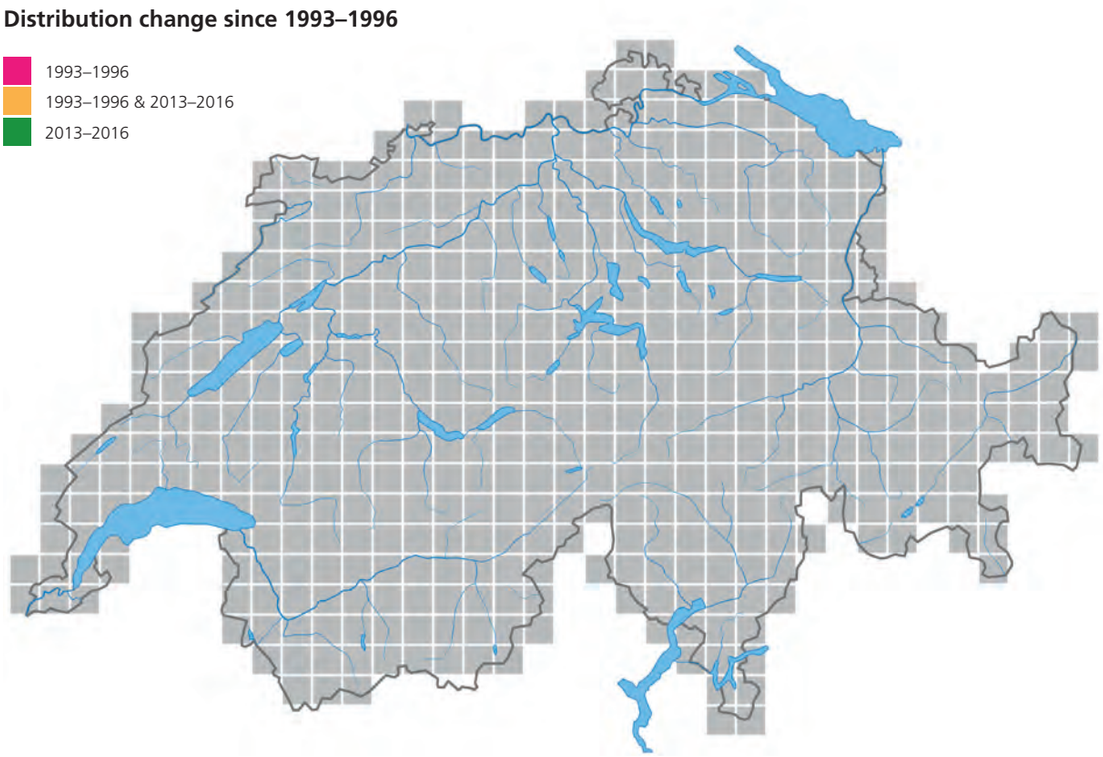


1972–1976

1993–1996

2013–2016

Distribution change since 1993–1996



Great Grey Shrike

Lanius excubitor
Raubwürger
Pie-grièche grise
Averla maggiore
pitgaspina grisch

Bernhard Herzog

Red List Regionally Extinct (RE)
Population 0 pairs (2013–2016)

Focus pages 234, 319

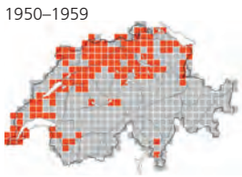
The Great Grey Shrike is a rare breeder in central Europe with a fragmented range. It inhabits various semi-open habitats, mainly grassland managed at low intensity, with lots of hedgerows, free-standing trees and copses. The Great Grey Shrike was still widespread in the lowlands of Switzerland in 1950–1959, when the population is thought to have numbered more than 750 pairs[AtCH0]. It subsequently declined steeply, and the last breeding pair was observed in the Ajoie JU in 1986[VdS]. Like everywhere in western and central Europe, the French, German and Austrian populations are in decline[AtD, AtF, 5, 6]. In northern and eastern Europe, on the other hand, numbers are stable or even increasing[RLEU].

Severe winters lead to major population crashes of the Great Grey Shrike[AtD, HVM, 6, 7]. However, the disappearance of the Great Grey Shrike from Switzerland and its decline in Europe are mainly attributed to agricultural intensification[HVM, VdS, 2, 4, 7]. Land improvements reduce the density of hedgerows, copses and orchards[HVM, RLEU, 3, 5]. Large insects, an important food source for the Great Grey Shrike, have become scarcer and less accessible due to pesticides and intensified grassland management[HVM, 1].

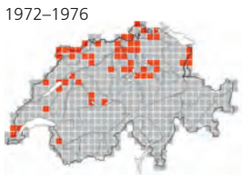
Michael Schaub

[1] Bassin et al. (1984); [2] Bauer et al. (2005); [3] Biber (1984); [4] Lefranc & Paul (2011); [5] Sachslehner (2008); [6] Sachslehner & Trauttmandorff (2014); [7] Sonnabend & Poltz (1978)

1950–1959



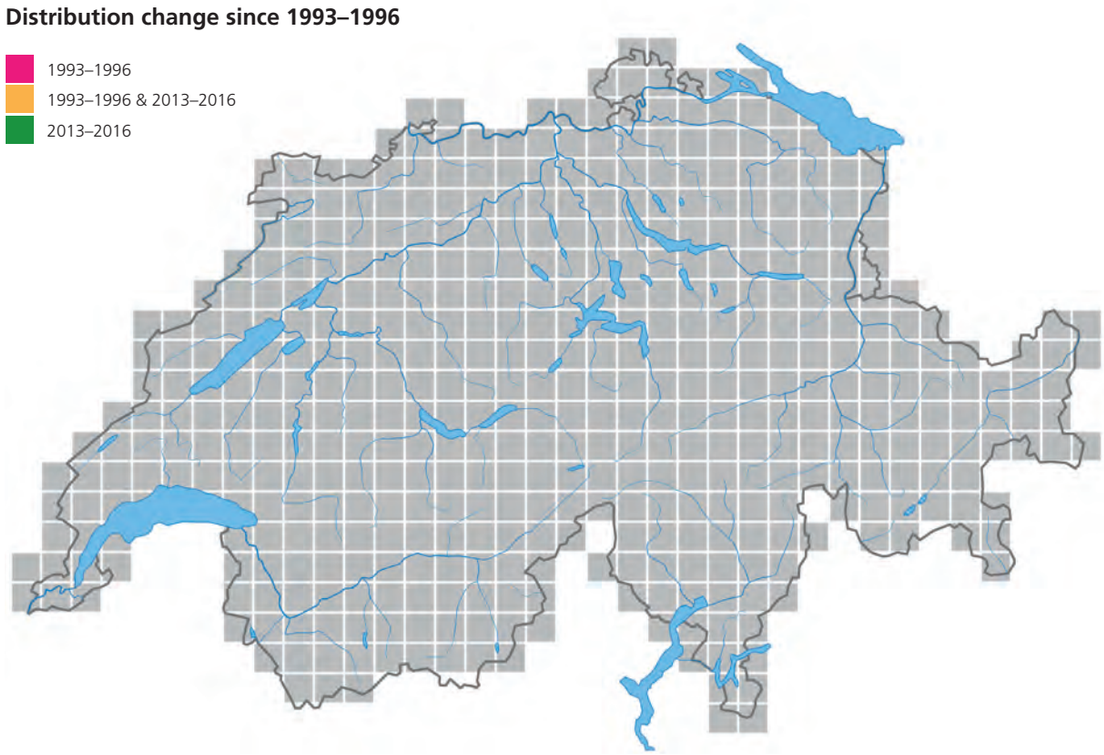
1972–1976



1993–1996

2013–2016

Distribution change since 1993–1996



Woodchat Shrike

Lanius senator
Rotkopfwürger
Pie-grièche à tête rousse
Averla capirossa
pitgaspina dal chau cotschen

Stefan Pfützke

Red List	Critically Endangered (CR)
Population	0 pairs (2013–2016)

Focus pages 234, 240, 319

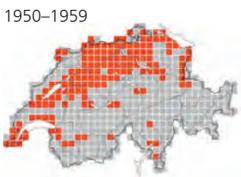
Switzerland lies at the northern edge of the Woodchat Shrike's breeding range. In our country, the species typically inhabited traditional orchards with grassland managed at low intensity and using a small-scale rotational mowing regime. In 1950–1959, the Woodchat Shrike was widespread in the lowlands, probably numbering more than 1000 pairs [AtCH0]. A rapid decline subsequently set in [AtCH1, 1]. In 1993–1996, distribution was limited to the Canton of Basel-Landschaft and the Fricktal AG [AtCH2], where populations continued to dwindle [3]. The last brood was recorded near Ormalingen BL in 2009 (M. Blattner-Jeanneret, U. Lanz) [5].

The Woodchat Shrike has become extinct in Austria too, and has practically disappeared from Germany. In France, Italy and Spain, numbers are decreasing fast [AtD, AtF, RLEU, 2]. In the Balkans and southeastern Europe, however, populations are stable [RLEU]. The extinction in Switzerland was caused by the decline of traditional orchards and the intensification of grassland management [6]. This has produced denser vegetation, reducing the accessibility of insects. Elsewhere, habitat loss due to intensified agriculture is considered the main cause of decline [HBW, RLEU, 4]. Given the lack of suitable habitats with an abundant food supply, it is unlikely that the Woodchat Shrike will re-establish itself in Switzerland anytime soon.

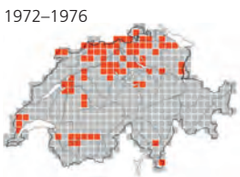
Michael Schaub

[1] Biber (1984); [2] Campedelli et al. (2012); [3] Horváth & Schaub (2007); [4] Isenmann & Fradet (1998); [5] Müller & Volet (2010); [6] Schaub (1996)

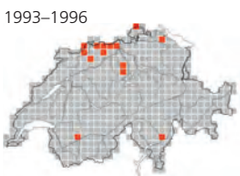
1950–1959



1972–1976

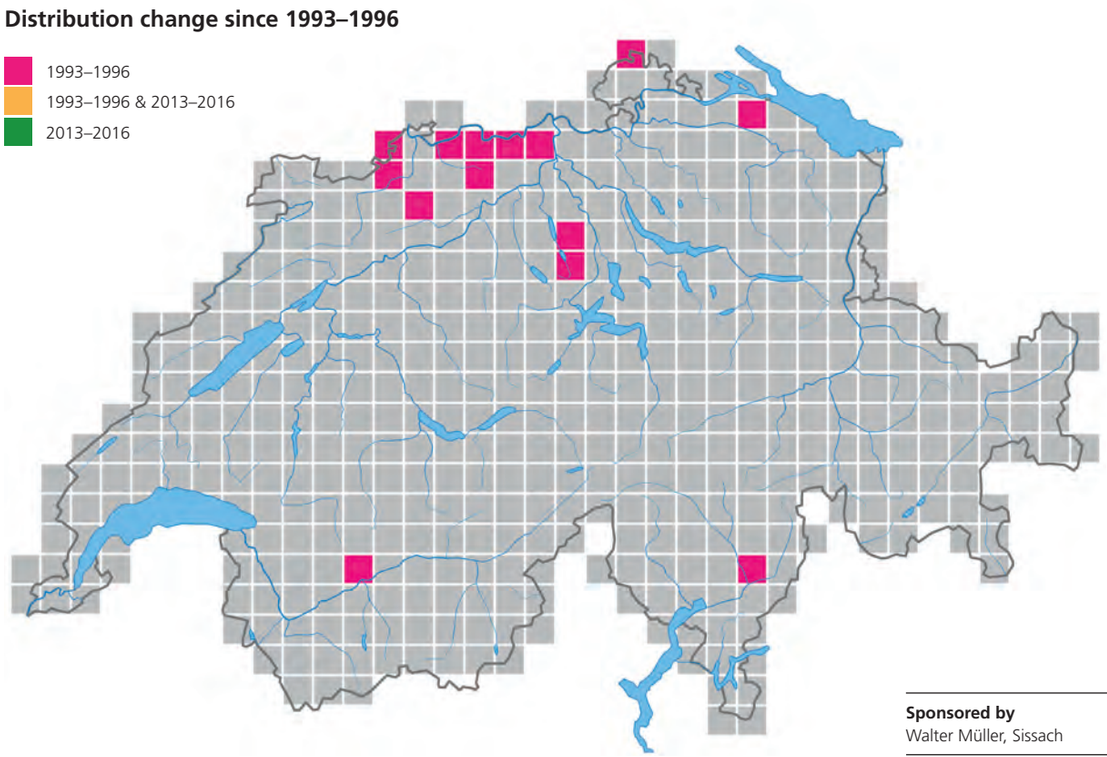


1993–1996



2013–2016

Distribution change since 1993–1996



Sponsored by
Walter Müller, Sissach

Swiss bird communities in constant change

The massive changes in the landscape on the one hand and the progress in species conservation on the other have also affected breeding birds. Wetlands and their inhabitants have suffered huge losses, the species composition in farmland has changed significantly, and birds that were once persecuted have recolonised Switzerland or expanded their range.

In the past 200 years, the Swiss landscape has changed faster than ever before. Between 1850 and 2010, more than 90 % of wetlands were lost[3]. Farmland has been transformed due to land consolidation, fertilisation and mechanisation. Population growth and infrastructure development have turned rural areas into urban agglomerations. Nutrient input has fertilised naturally nutrient-poor soils and led to the eutrophication of waterbodies. On the other hand, hunting bans now protect many species after centuries of persecution.

A look at the impact of these changes on bird communities reveals a mixed picture: between 1900 and 2010, 25 new species established themselves as breeding birds in Switzerland (including four non-native species), while nine disappeared. New additions like the Rook and the Great Cormorant have contributed to this positive overall balance; as colony breeders, they are particularly vulnerable to persecution and have directly benefited from improved international protection. On the other hand, some species have been able to sustain small local populations despite steep declines, often thanks to conservation measures (e.g. Little Owl). These declines therefore do not affect the overall Swiss record, and so a simple sum of losses and gains only partially reflects the important changes happening in the avifauna. Some wetland species have suffered particularly drastic declines. Eurasian Curlew and Common Redshank, for example, no longer breed in Switzerland. But other species too, such as Common Cuckoo, Spotted Crake or Common Sandpiper, have dwindled in number due to the massive loss of habitat. Moreover, once common farmland species such as Woodchat Shrike, Common Redstart or Tree Pipit have now vanished completely or at least sharply decreased. Suitable breeding conditions for these species have become hard to find. Insect numbers have taken a plunge[2], depriving the birds of an essential food source[1].

On the other hand, the past 30 years especially have seen an increase in species like Red Kite or Carrion Crow, which forage in farmland but raise their young elsewhere. This trend mostly concerns large species that can cover long distances while foraging and are therefore able to benefit from the food available in farmland. The increase of crows and raptors in turn leads to greater predation pressure on ground-breeding birds.

Humans are transforming their surroundings with far-reaching effects and at incredible speed. As a result, the composition of bird communities has been in constant flux throughout the past century. The avifauna as a whole is flexible enough to cope with an ever-changing environment. Species with special requirements, however, are often unable to adapt and eventually disappear as breeding birds.

Nicolas Strebel

Former breeders	Decade	New arrivals
Eurasian Curlew, Woodchat Shrike	2009 – 2000	Bearded Vulture, Great Cormorant
Western Orphean Warbler	1999 – 1990	European Bee-eater, Common Shelduck, White-backed Woodpecker
Great Grey Shrike	1989 – 1980	Common Eider, Pallid Swift, Red-spotted Bluethroat, Common Rosefinch
Lesser Grey Shrike, Crested Lark	1979 – 1970	Cetti's Warbler, Bearded Reedling
	1969 – 1960	Melodious Warbler, Rook, Mew Gull, Yellow-legged Gull, Mediterranean Gull
	1959 – 1950	Eurasian Collared-dove, Common Pochard, Barred Warbler, Savi's Warbler, Tawny Pipit, Tufted Duck, Gadwall
	1949 – 1940	Purple Heron, Black-necked Grebe, Western Yellow Wagtail
	1939 – 1930	
Common Redshank	1929 – 1920	Fieldfare, Red-crested Pochard
Osprey	1919 – 1910	
	1909 – 1900	

Species that arrived or disappeared as breeding birds in Switzerland between 1900 and 2010. The chart indicates the first or last decade in which breeding occurred in Switzerland. Species that did not breed here around 1900 but are now regular breeders are classified as new arrivals; the Bearded Vulture was reintroduced. Species that were once regular breeders, but whose breeding populations disappeared between 1900 and 2010, are listed as former breeders. Non-native species are not included.

[1] Hallmann et al. (2014); [2] Hallmann et al. (2017); [3] Stuber & Bürgi (2018)

Species pages 118, 126, 128, 132, 134, 138, 146, 160, 174, 180, 198, 202, 214, 218, 222, 226, 238, 254, 266, 274, 316, 317, 318, 332, 336, 364, 366, 370, 384, 421, 452, 470, 504, 514, 524, 571, 572

Red-billed Chough

Pyrrhocorax pyrrhocorax
Alpenkrähe
Crave à bec rouge
Gracchio corallino
corvagl

Markus Varesvuo

Red List Endangered (EN)
Population 70–80 pairs (2013–2016)

Focus page 308

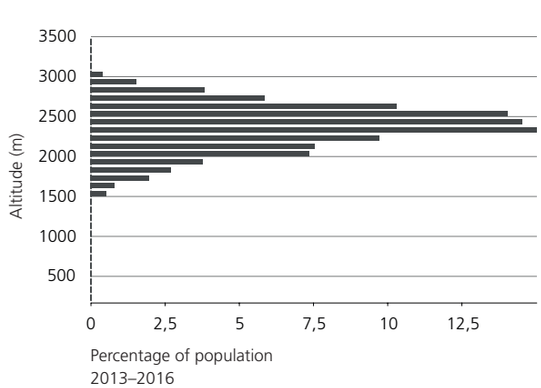
The Red-billed Chough inhabits the mountains of southern Europe and some coastal regions in western Europe as far as Scotland. Switzerland lies at the northern limit of its Alpine breeding range.

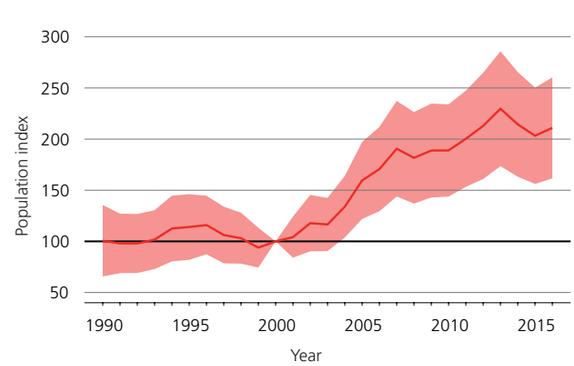
Today, the Red-billed Chough only breeds in the Valais and its immediate vicinity. During the breeding season, the species primarily occurs in the Alpine zone, where it finds suitable open habitat with short grassland to forage for arthropods and their larvae. Altitudinal distribution is concentrated between 2000 and 2800 m and has remained largely unchanged since 1993–1996. Breeding sites are found between 1500 m near Derborence VS (B. Posse) and 2900 m near Zermatt VS (E. Gunzinger). Breeding-season observations indicate a significant range expansion since 1993–1996 on the right-hand side of the Rhone, where breeding was confirmed near Anzeindaz/Bex VD in 2013 (J. Duplain). There have been scattered observations of individuals in Grisons and even in Glarus since 2012 [3, 5, 6, 7, 9], but no indications of breeding so far. These positive trends are reflected in the modelled distribution map and the population trend, though these are also influenced by the increased observer effort in recent years. Based on the monitoring of pairs, the population in Valais is estimated at 70–80 pairs, compared to 50 in 1993–1996. However, this increase is due mainly to the extension of the survey area (P.-A. Oggier). New pairs remained exceptional, with only 2–3 new pairs at the northwestern range limit.

The population trend of the Red-billed Chough in the Alps is largely unknown. In the French Alps, a range expansion has been described in recent years in Haute-Savoie, the Vercors Massif and the Diois region [AtF, 4]. In the Italian Alps, the population is fluctuating or slightly increasing, while declining in the Apennines [2, 8]. The European trend has recently been classified as declining [1]. In this context, the small Swiss population merits particular attention, not only because of climate models that predict the possible disappearance of the Red-billed Chough from the western Alps [ClimAt], but also because of increasing shrub encroachment in steppes and meadows at lower altitude, which serve as the species' wintering grounds.

Bertrand Posse & Pierre-Alain Oggier

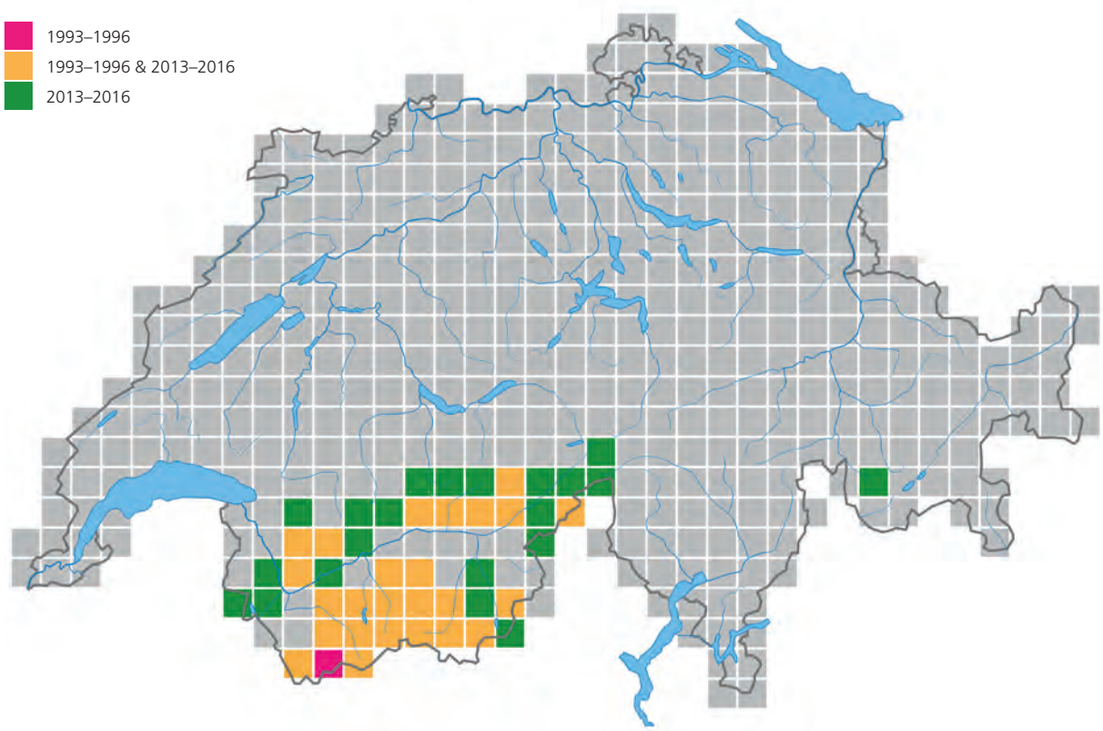
[1] BirdLife International (2017a); [2] Brichetti & Fracasso (2012); [3] Graf & Bitterlin (2015); [4] Lebrun & Sonnerat (2008); [5] Marques & Thoma (2015)/Marques et al. (2015); [6] Marques et al. (2013a–b); [7] Martinez & Maumary (2016a–b); [8] Nardelli et al. (2015); [9] Vallotton et al. (2014a–b)





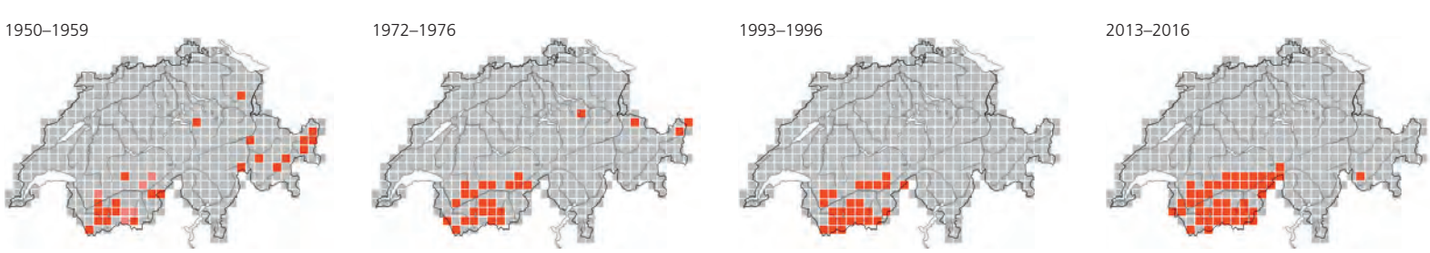
Occurrence 2013–2016

Distribution change since 1993–1996



Sponsored by
Kaspar Hitz, Männedorf

zooschweiz



Yellow-billed Chough

Pyrrhocorax graculus
Alpendohle
Chocard à bec jaune
Gracchio alpino
curnagl

Mathias Schäf

Red List Least Concern (LC)
Population 11 000–21 000 pairs (2013–2016)

Focus pages 308, 542

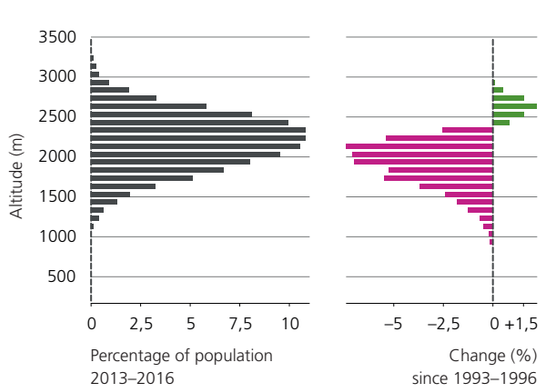
Switzerland lies in the west of the Yellow-billed Chough's vast range, which stretches from mountainous regions in northwestern Africa eastwards across the Cantabrian Mountains, Pyrenees, Alps, Apennines and the Balkans all the way to central Asia. In Switzerland, its range is confined to the Alps, with the highest densities found in the northern Alps.

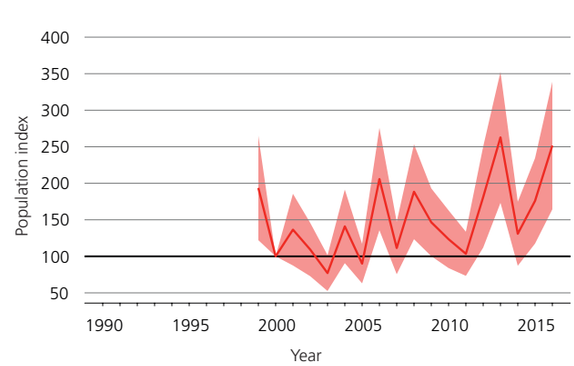
The Yellow-billed Chough forages at the edges of melting patches of snow as well as on Alpine pastures and meadows and may descend to lower altitudes due to snow cover [HVM]. Nest sites are almost exclusively in rock faces in the Alpine zone and are used year-round for roosting. The highest recorded nest of a Yellow-billed Chough in Switzerland was found at 3820 m in the cable car station on Klein Matterhorn above Zermatt VS [AtCH2]. In 2013–2016, breeding was confirmed at maximum altitudes of 3060 m in Val de Bagnes VS (B. Claude), 2960 m near Collonges VS (C. Luisier) and 2910 m near Pontresina GR (C. Müller). The Yellow-billed Chough is regularly seen in settlements and farmland in the valleys, occasionally breeding far below the tree line, for example in cliffs near Leuk VS at 900–1000 m [1, 4], in a mountain cabin in Haut-Intyamon FR at 1610 m [2] and in a cable car station near Adelboden BE at 1710 m (C. Vogel). Breeding at even lower altitudes has not been recorded in recent years: the nest site at the railway station in Thun BE at 560 m was occupied in 1970–1972, the site at the station of Sion VS at 490 m in 1993–1995 [VdS]. Overall, altitudinal distribution has seen a marked upward shift since 1993–1996.

The population fluctuates widely from year to year, though this may be related to methodological difficulties in the monitoring of this species. In most Alpine countries, trends fluctuate, but are stable overall [AtD, AtV, RLEU, 3], with the exception of France, where the Yellow-billed Chough has become much rarer [AtF]. Switzerland supports 14 % of the European breeding population, and therefore has an important responsibility in the conservation of this species [6]. Loss of habitat is mainly caused by changes to the terrain to establish tourism infrastructure. Flowery mountain meadows and berry-producing dwarf-shrub heath are converted into ski runs with low plant diversity, resulting in the loss of foraging areas for the Yellow-billed Chough [5].

Christoph Vogel-Baumann

[1] Antoniazza (2016b); [2] Beaud & Beaud (2018); [3] Nardelli et al. (2015); [4] Posse (2014); [5] Rolando & Patterson (1993); [6] Sattler et al. (2016a–d)



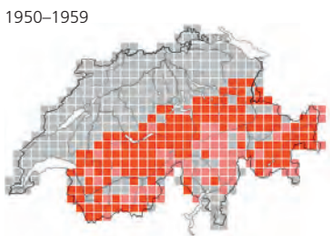


Density 2013–2016

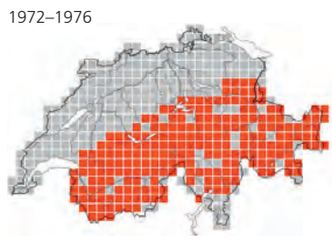
Density change since 1993–1996

Sponsored by
Andreas Boldt, Ferenbalm
Charlotte Müller, Altendorf

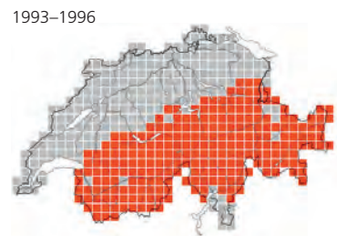
1950–1959



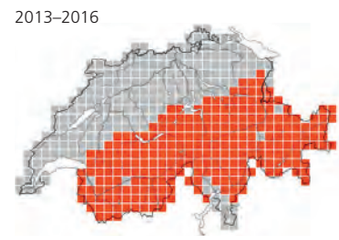
1972–1976



1993–1996



2013–2016



Eurasian Jay

Garrulus glandarius
Eichelhäher
Geai des chênes
Ghiandaia
sgragia

Mathias Schäf

Red List Least Concern (LC)
Population 60 000–75 000 pairs (2013–2016)

Focus –

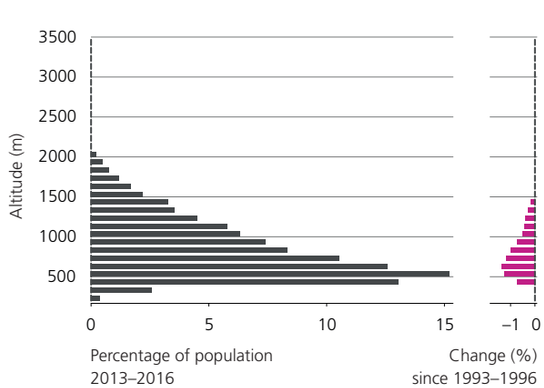
The Eurasian Jay is widespread in Switzerland. While it inhabits all kinds of woodland, its prime habitat are the deciduous and mixed forests of the lowlands with a high proportion of oak and a well-developed shrub layer. It occasionally inhabits copses and large traditional orchards as well as urban parks, cemeteries and residential areas with lots of trees[VdS, 3]. In Switzerland, the population is concentrated between 400 and 1200 m. Average densities of more than five territories/km^2 are reached between 600 and 1000 m. The highest densities were found in valleys of the Valais and Ticino. By far the highest confirmed brood was recorded at 2140 m near Zermatt VS (S. Stricker).

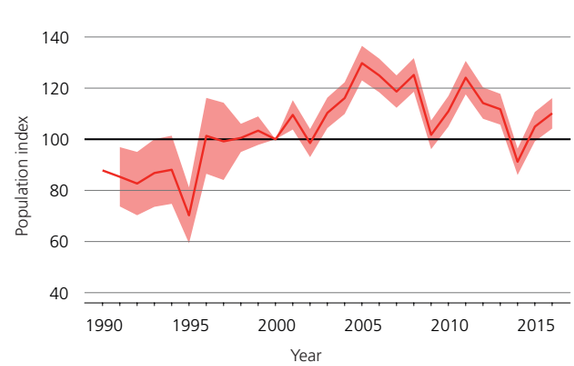
In Ticino, especially the Sottoceneri, Eurasian Jays have increased significantly since 1993–1996. In the Jura and on the Central Plateau, numbers remained unchanged in some areas while declining in others, mainly in Vaud, Aargau and eastern Switzerland. The Swiss population increased substantially after 1990, but dropped again after 2005. Regional surveys revealed an increase of slightly over 20 % in the Canton of Zurich between 1988 and 2008[AtZH]. The population in the Lake Constance area increased by just under 20 % between 1980 and 2000, but had dropped by 12 % again when surveyed in 2010[AtBo].

In our neighbouring countries, the trend is slightly positive in France and Italy[AtF, 2, 5], stable in Germany[AtD] and declining in Austria[6]. The overall European trend is positive[EBCC]. The increased density of Eurasian Jays in the Ticino may be linked to growing numbers in Italy as well as to the reversion of abandoned farmland and pastures to scrub and closed forest[1]. The reasons for the regional decline on the Central Plateau and in the Jura are not clear. Negative trends in other countries are partly associated with harsh winters and heavy hunting pressure. It is unlikely that either of those reasons applies to Switzerland. In Germany, no correlation was found between fluctuations in numbers and harsh winters, spring conditions or the fruit production of woodland trees[4].

Christoph Vogel-Baumann

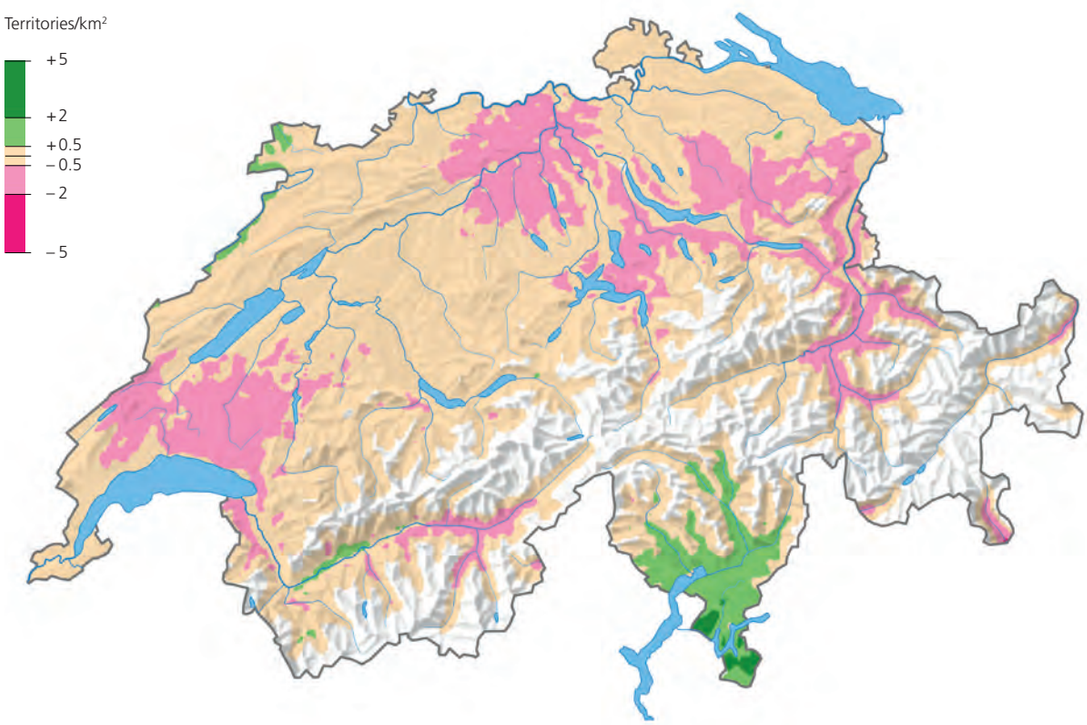
[1] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [2] Campedelli et al. (2012); [3] Epple (1997); [4] Flade & Schwarz (2004b); [5] Rete Rurale Nazionale & Lipu (2015); [6] Teufelbauer & Seaman (2017)





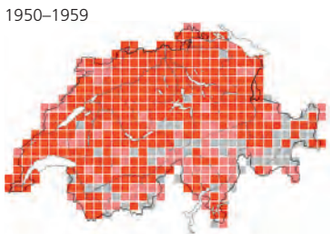
Density 2013–2016

Density change since 1993–1996

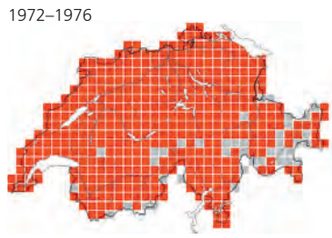


Sponsored by
Nils Dändliker, Effretikon
Morgan Risse
Yvar Wider, Schmitten

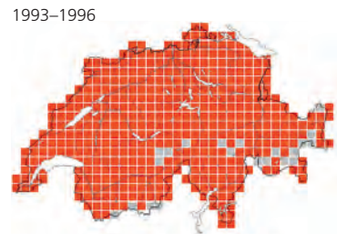
1950–1959



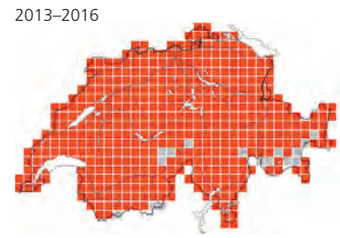
1972–1976



1993–1996



2013–2016



Eurasian Magpie

Pica pica
Elster
Pie bavarde
Gazza
giazla

Martin Demmel

Red List Least Concern (LC)
Population 35 000–40 000 pairs (2013–2016)

Focus pages 142, 156, 314, 414

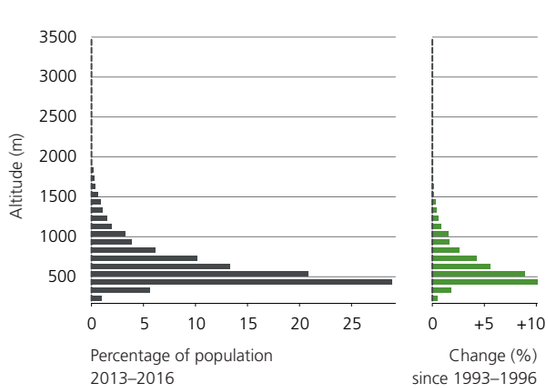
The Eurasian Magpie inhabits open farmland with hedgerows, bushes and copses as well as woodlands along water. It avoids arable land with little structural variation and is absent from the forest interior. The Magpie is also found in settlements with tree-lined avenues, parks and wooded gardens. The highest densities are reached locally on the Central Plateau, in the Jura and in Alpine valleys. About 90 % of the population occurs below 1000 m. While breeding is known to take place up to 2140 m and breeding-season observations have been recorded up to 2260 m [VdS], the highest recent breeding record comes from Riederalp VS at 2050 m (P. Bosshard) [8]. The highest recent signs of breeding were recorded at 2140 m near Langwies GR (P. Knaus) and Scuol GR (C. Müller).

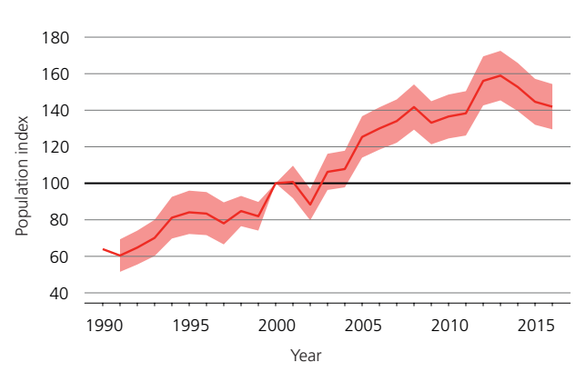
A marked range expansion in the Alps and in southern Switzerland has become visible since 1993–1996. The species became extinct in Ticino around 1915 [HVM] but has since returned and has spread northwards since 1993–1996. The Magpie has also recolonised valleys of southern Grisons, namely Valle Mesolcina (from 2012), Val Bregaglia and Val Poschiavo (both from 2013) [6]. Since 1993–1996, the Magpie has become more abundant at all altitude levels, with the largest gains occurring between 400 and 800 m. Density has increased in large parts of the Central Plateau as well as in some areas of the Jura, the Alpine valleys and the Sottoceneri TI. Losses only occurred in few places. In the Canton of Zurich, the Magpie population doubled between 1988 and 2008 [AtZH]. Around Lake Constance, gains were more moderate with an increase of 35 % between 1980 and 2010 [AtBo].

Numbers are decreasing slightly in Germany and Austria [AtD, 9]. In France, the trend was strongly negative until the turn of the century, but has been somewhat positive since then [AtF]. Numbers are growing in Italy [1, 2, 7], which matches the population increase recorded on the southern slopes of the Alps. The shift to urban habitats observed in the Magpie population since the 1950s is probably a consequence of agricultural intensification [HVM, 4] and has continued to progress [AN1, AtGE, AtZH, 3, 10]. In settlements, the Magpie faces no hunting pressure and benefits from reduced predation and a diverse food supply all year round. The increase of Magpies and Carrion Crows in settlements does not lead to a decline in songbirds [5].

Christoph Vogel-Baumann

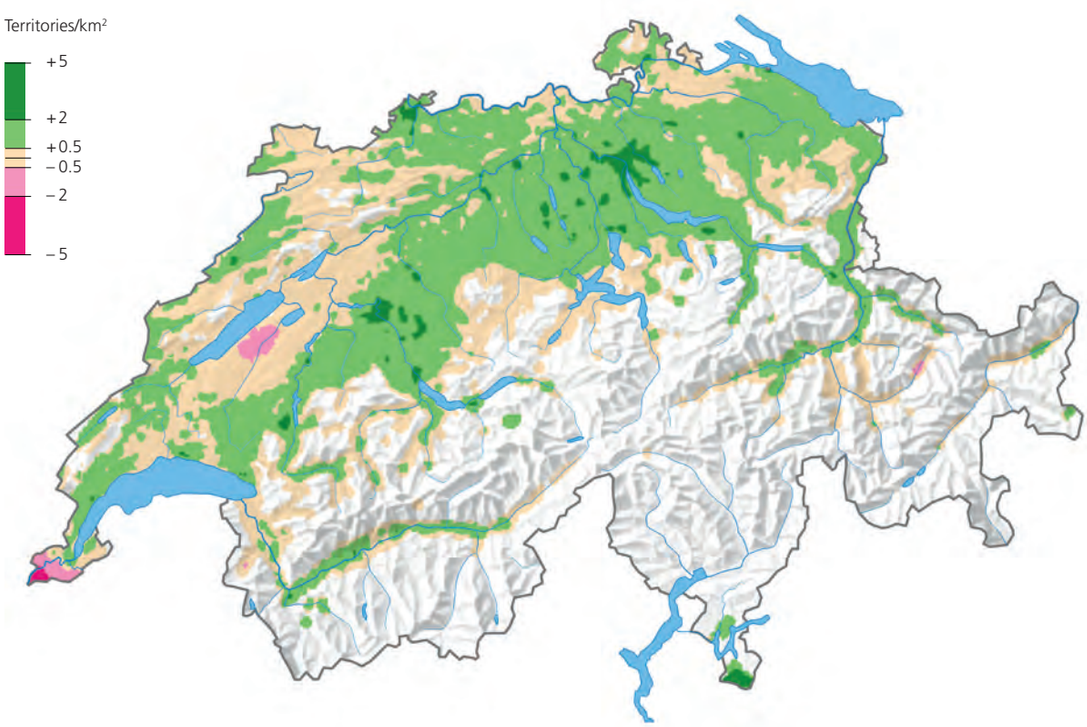
[1] Bani et al. (2014); [2] Campedelli et al. (2012); [3] Christen (2017b); [4] Epple (1997); [5] Madden et al. (2015); [6] Müller & Volet (2014); [7] Rete Rurale Nazionale & Lipu (2015); [8] Revaz (2000); [9] Teufelbauer & Seaman (2017); [10] Weggler & Widmer (2000b)





Density 2013–2016

Density change since 1993–1996



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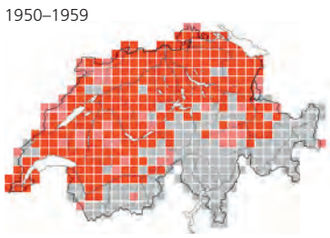
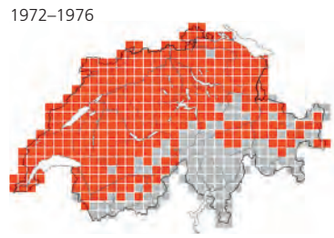
Christoph Altermatt, Zurich

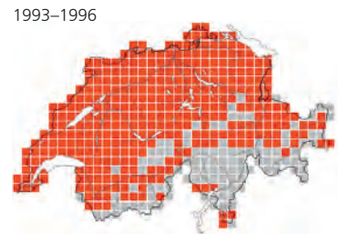
1950–1959



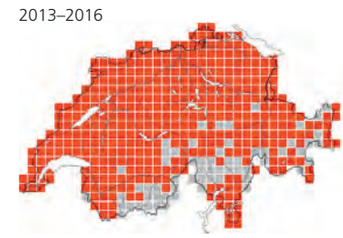
1972–1976



1993–1996



2013–2016



Northern Nutcracker

Nucifraga caryocatactes
Tannenhäher
Cassenoix moucheté
Nocciolaia
cratschla

Dennis Lorenz

Red List Least Concern (LC)
Population 20 000–25 000 pairs (2013–2016)

Focus page 542

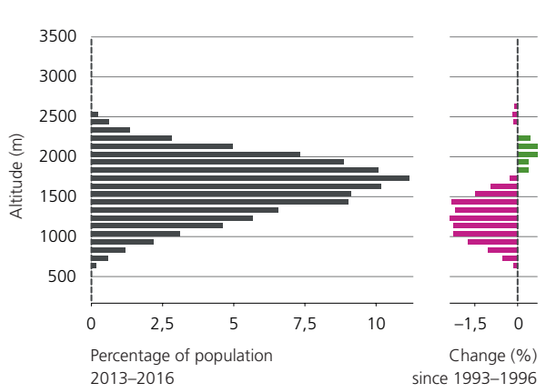
The Northern Nutcracker inhabits the boreal zone of Eurasia, its range reaching far into the mountain forests of central and southeastern Europe. Its breeding range in Switzerland is confined to the Alps and the western half of the Jura. Preferred habitats are conifer and mixed conifer forests. The species depends on sufficient availability of stone pine or hazel within a 15 km radius from the nest site[6]. Storing stone pine seeds and hazelnuts for use in winter is crucial for winter survival and reproduction[HVM, 4]. Walnuts, sweet chestnuts and acorns alone are insufficient sources of food. Comparing its range with that of stone pine[2] demonstrates the Nutcracker's dependence on this tree species: distribution and density of Nutcracker and stone pine correspond almost perfectly. The most densely populated areas are in southern and central Grisons and in the tributary valleys of the southern Valais. The highest territories were found at 2370 m near St-Luc VS (C. Angst) and at 2360 m near Pontresina GR (C. Rust).

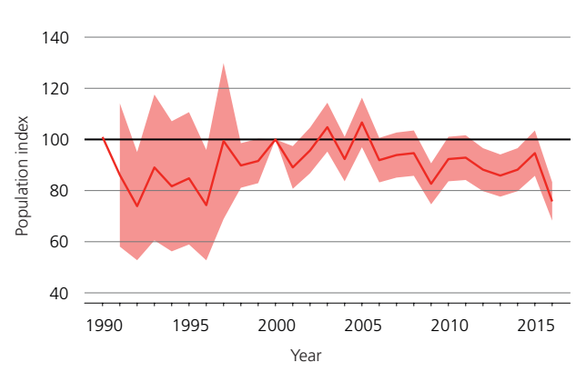
Some peripheral atlas squares have been abandoned since 1993–1996. Density has also declined in some places along the Pre-Alps and in the Jura and Valais. Increased densities were recorded in Lower Engadine GR and Val Müstair GR, however. The Nutcracker has become somewhat more common between 1800 and 2300 m, as the abandonment of Alpine pastures causes the tree line to rise. Significant declines occurred between 700 and 1700 m, a result that was confirmed in regional surveys[AtBo, AtZH, 1]. Probable causes include reduced fruit set in hazel bushes in shady hedges (the hazel is a light-loving species)[7], absence of shrub borders along forest edges and increase of closed-canopy forest area in the Alps[3] as well as climate change[9].

The Nutcracker population has stabilised at the level attained in the late 1990s. Annual fluctuations do not correspond with stone pine mast years, but are probably related to methodology: as the Nutcracker expands its home range in lean years, it is more frequently recorded than in mast years. A decline has been observed in Germany since at least the late 1990s[AtD]. The trend is negative in France as well[5], but largely stable in Italy and Austria[8, 10].

Christoph Vogel-Baumann & Hermann Mattes

[1] Beaud & Beaud (2018); [2] Brändli (2010a–b); [3] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [4] Glutz von Blotzheim (2008b); [5] Jiguet (2017); [6] Mattes (1982); [7] H. Mattes, unpubl.; [8] Rete Rurale Nazionale & Lipu (2015); [9] Scridel et al. (2017); [10] Teufelbauer & Seaman (2017)



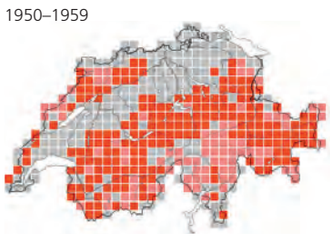


Density 2013–2016

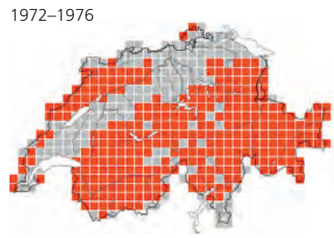
Density change since 1993–1996

Sponsored by
Rosmarie Hirter

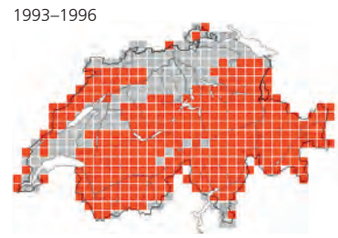
1950–1959



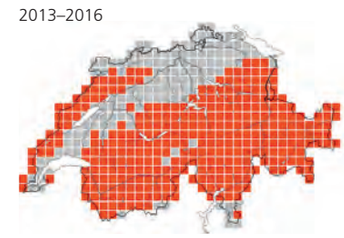
1972–1976



1993–1996



2013–2016



Eurasian Jackdaw

Corvus monedula
Dohle
Choucas des tours
Taccola
tulaun

Marcel Burkhardt

Red List Vulnerable (VU)
Population 1250–1500 pairs (2013–2016)

Focus pages 170, 212, 308

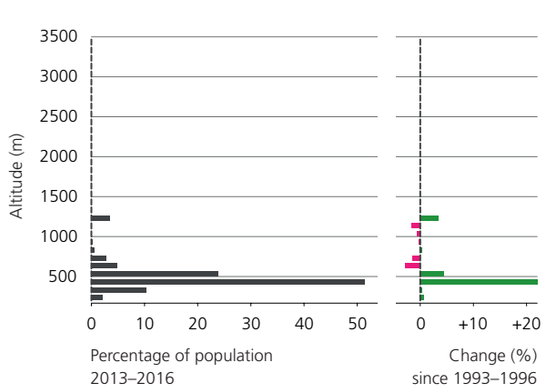
The Eurasian Jackdaw is widespread in Switzerland on the Central Plateau and in the Jura below 600 m. It inhabits the Alpine valleys as far as Riom GR and Brig VS. The Jackdaw relies on areas with short vegetation like pastures, meadows and arable fields for foraging. It nests on tall buildings and technical structures of all kinds, in tree cavities and in unobstructed molasse or limestone cliffs. The highest breeding site used to be in the Obergoms VS at 1460 m [HVM]; in 1978, there were even signs of probable breeding at about 2000 m [VdS]. Today, the highest colony is located in the castle of Riom GR at 1230 m (W. Bürkli, P. Giacometti), a site that has been occupied for decades [1]. In the Jura, cliff-nesting Jackdaws were found in a quarry in La Chaux-de-Fonds NE at 1000 m (M. Farine, V. Martin) [3, 4] and tree-nesting birds at 940 m in Diesse BE (A. Gerber). Like in 1993–1996, the largest colony was at Schloss Hallwyl/Seengen AG, where a maximum of 80 pairs were counted (R. Berner). The colony in Riom numbered more than 60 pairs (W. Bürkli, P. Giacometti). The largest cliff-nesting colonies in the Calanda range near Haldenstein GR (M. Scussel) and in a quarry in Porrentruy JU (M. Juillard) accommodated 30 pairs. Tree-nesting colonies are smaller, reaching a maximum of 20 pairs in Bern (A. Müller, C. Vogel-Baumann) and 14 pairs in Morges VD (J. Oberhaensli).

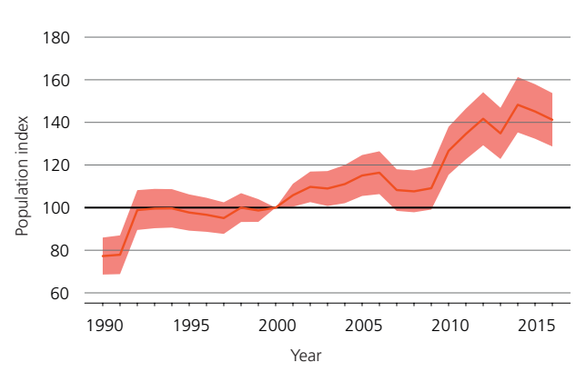
The species' breeding range has remained largely unchanged since 1993–1996. The recent surveys revealed higher densities in the Rhine Valley and southern Ticino. Since 1993–1996, a trend towards larger colonies has become apparent. This rise in density is most evident at the southern edge of the Jura and on the Central Plateau in the cantons of Bern, Solothurn, Aargau and Zurich. In part, the increase has occurred at the expense of small colonies and single birds in woodlands (C. Vogel-Baumann). Overall, the Swiss population has increased by about 40 % as a result of species-specific conservation projects [6, 7] and building renovations that are more sensitive to the needs of nesting Jackdaws. Installing nest boxes for Jackdaws is particularly effective in areas of low-intensity agriculture with suitable foraging sites close to the colonies [2].

Neighbouring countries also report positive trends in the short-term, with the exception of Germany [AtD, AtF, RLEU, 5, 8]. The European population is stable [EBCC].

Christoph Vogel-Baumann & Stephan Strebel

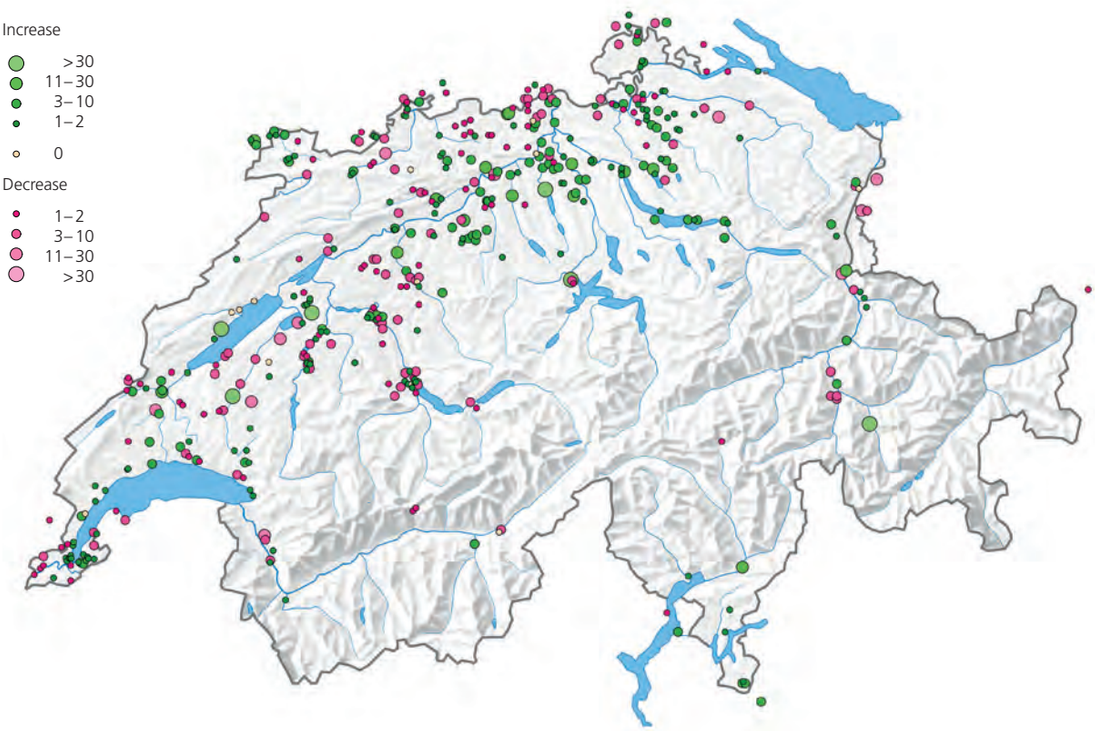
[1] Bürkli & Vanscheidt (2012); [2] Meyrier et al. (2017); [3] Posse (2013); [4] Posse (2014); [5] Rete Rurale Nazionale & Lipu (2015); [6] Spaar & Ayé (2016a); [7] Strebel et al. (2012a–b); [8] Teufelbauer & Seaman (2017)





Breeding pairs 2013–2016

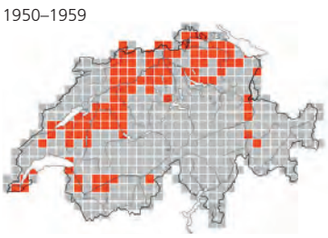
Change in the number of breeding pairs since 1993–1996



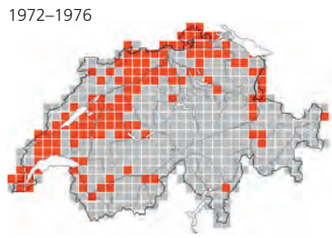
Sponsored by
Anonymous donor

Ornithologische Gesellschaft Basel

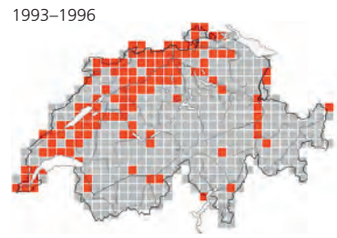
1950–1959



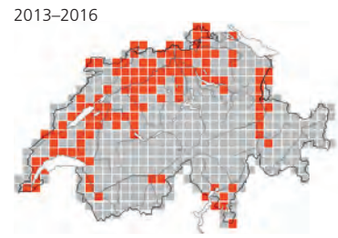
1972–1976



1993–1996



2013–2016



Rook

Corvus frugilegus
Saatkrähe
Corbeau freux
Corvo comune
corv champester

Mathias Schäf

Red List Least Concern (LC)
Population 5800–7300 pairs (2013–2016)

Focus pages 142, 190, 284, 319

Switzerland lies at the southwestern edge of the Rook's breeding range. Colonies are concentrated around the lakes at the foot of the Jura and in river plains. The occasional colony was found in the Schaffhausen area, the Ajoie JU and the Neuchâtel Jura. In the Rhone Valley VS, occupied since 2014 (B. Posse, A. Barras, B. Volet)[1], the Rook occurs as far as Sion.

Since 1993–1996, the Rook has spread from the Seeland region BE/FR into western Switzerland as far as Lake Geneva, and to Lake Constance in several phases, reaching Romanshorn TG in 2014 (D. Bruderer)[8] and Kesswil TG (D. Bruderer)[9] and Rorschach SG (S. Stricker, D. Hagist) in 2016[9]. During this dynamic expansion, the population grew from 700–800 pairs (1993–1996) to 5800–7300 pairs (2013–2016), thus multiplying its size almost tenfold.

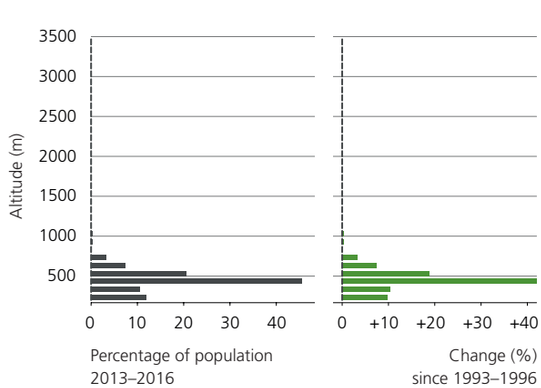
The Rook traditionally inhabits fertile lowlands and river valleys with high groundwater levels[6]. Today, it breeds mainly on cultivated land dominated by arable fields and livestock farming; in settlements, it nests in parks and tree-lined avenues[3, 5]. In 2009, about 40 % of pairs occurred in rural and about 60 % in urban areas[4].

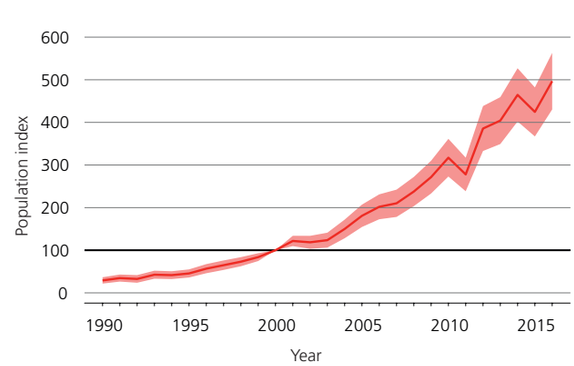
Distribution in Switzerland is concentrated between 400 and 600 m. The highest Rook colony is located at 1060 m in La Chaux-de-Fonds NE (since 2015; P. Aeby)[2]. The largest colony with 233 nests was recorded in Binningen BL (2013; M. Leuzinger), followed by colonies with 182 nests in Bern (2016; P. Frei) and 170 nests near Rüdtligen BE (A. von Ballmoos).

The Rook's expansion has been particularly pronounced in Switzerland and the Alsace[10] as a result of Germany's implementation in 1979 of the European Birds Directive[6], which stipulates the protection of all songbirds. Trends in neighbouring countries have been less dynamic: Germany and Austria report somewhat positive short-term trends, but the overall trend in France is negative[AtD, AtF, RLEU, 7]. The Rook suffers from direct persecution, disturbance at nest and roost sites and the intensification of agriculture. On the other hand, the species shows a great capacity to recover once the pressure eases and is able to adapt to urban habitats[HVM]. The ban on hunting Rooks was lifted in Switzerland in 2012, but they are protected during the breeding season.

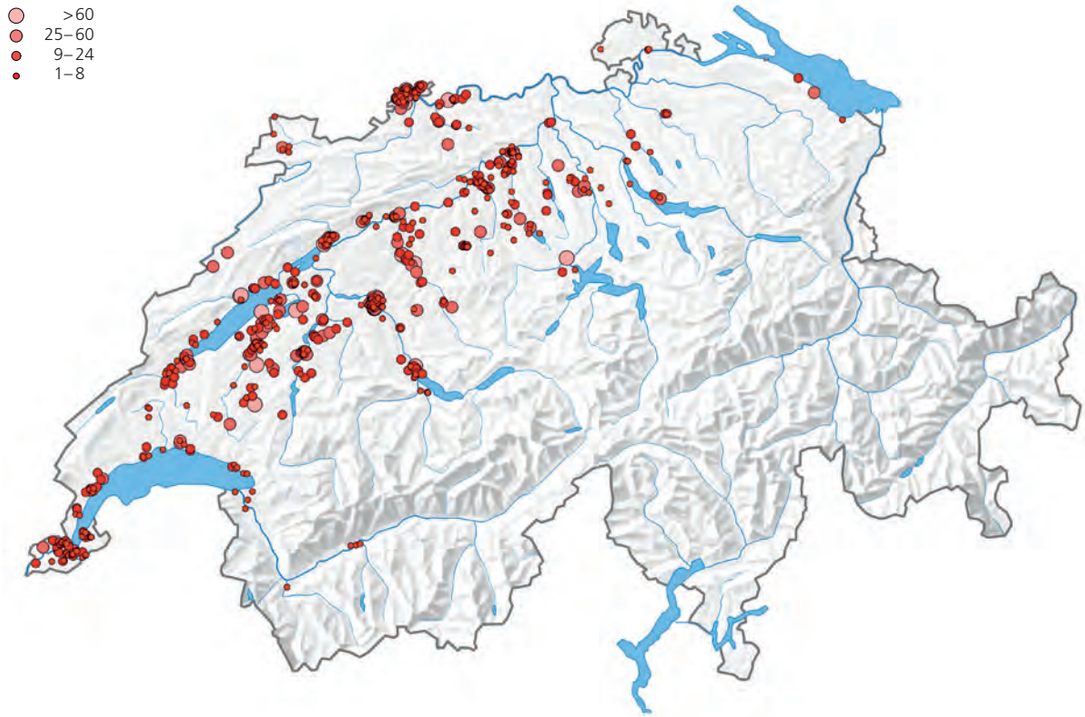
Christoph Vogel-Baumann

[1] Antoniazza (2015); [2] Antoniazza (2016b); [3] Barbalat (2013); [4] F. Borleis, in litt.; [5] Christen (2017a); [6] Epple (1997); [7] Jiguet (2017); [8] Knaus et al. (2014); [9] Knaus et al. (2016a); [10] Muller et al. (2017)





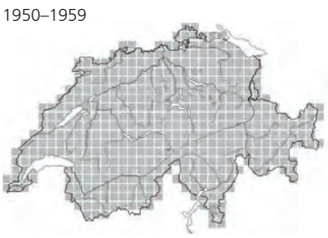
Breeding pairs 2013–2016



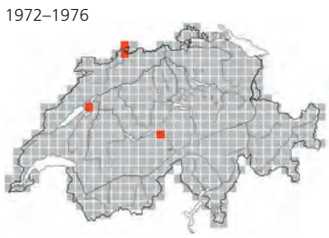
Change in the number of breeding pairs since 1993–1996

Sponsored by
Anonymous donor

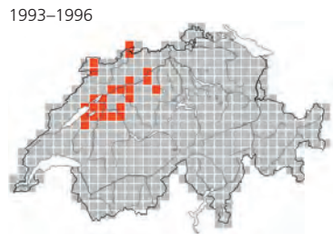
1950–1959



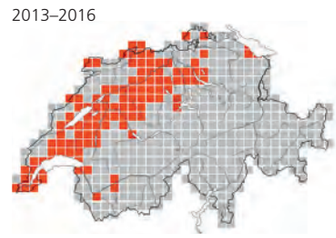
1972–1976



1993–1996



2013–2016



Common Raven

Corvus corax
Kolkrabe
Grand Corbeau
Corvo imperiale
corv grond

Markus Varesvuo

Red List Least Concern (LC)
Population 2000–3000 pairs (2013–2016)

Focus pages 142, 308

The Common Raven is widespread in Switzerland. The highest densities are found in Lower Engadine GR, Val Müstair GR and Val Poschiavo GR as well as in regions of the Central Plateau close to the Alps and in the Jura. The highest confirmed brood was recorded on the Ofenpass GR at 2520 m (H. Haller); the lowest nest site was found at 310 m on an electricity pylon near Eiken AG (M. Schumacher).

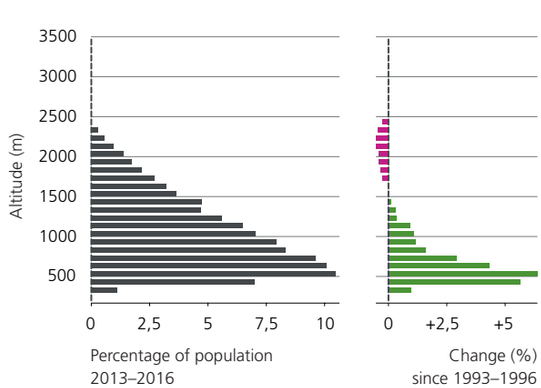
As a generalist, the Raven inhabits many types of landscapes where it finds undisturbed breeding sites in cliffs and tall trees, but also on buildings or technical structures [3]. It relies on an abundant supply of food all year round. The animal portion of its diet consists of small mammals and carrion such as gut piles left by hunters, predator kills, road kill and livestock carcasses [HVM].

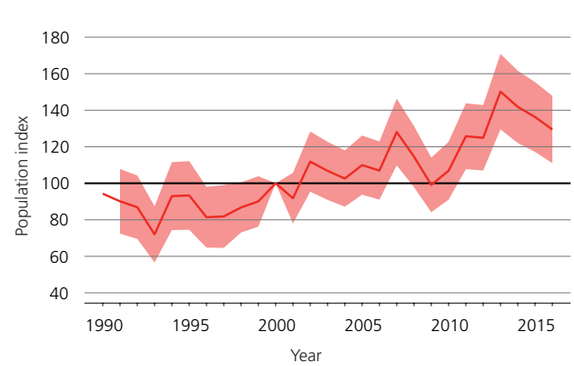
Gaps in the Common Raven's breeding range have been closed since the 1950s, and the species now occupies the whole of the Central Plateau. The greatest concentration is found at an altitude level of about 600 m, some 300 m lower than in 1993–1996. The Raven has become somewhat rarer above 1700 m, a decline that is offset by significant gains below 1500 m. The gains are evident in many parts of the country, but there have also been regional declines, such as in the Upper Valais and the southern part of the Canton of St. Gallen. Overall, the population has increased slightly since 1990. At the same time, flocks of non-breeding Ravens have become more prevalent [1]. The population increase was particularly pronounced in northwestern Switzerland, a region that was not fully colonised until after 1993–1996 [AtBo, AtZH]. However, a decline was recorded during the 2013–2016 surveys and confirmed in 2017. Whether this means that the population has reached capacity remains to be seen. In western Switzerland, competition from the Eurasian Eagle-owl is thought to be a possible reason for the decline [1].

The Common Raven largely disappeared from central Europe between 1870 and about 1950 due to severe persecution. Small populations survived in the Alps and other areas. When persecution stopped, the Raven started to spread again from about 1940 [AtCH0, 4]. It is in this context that the positive trend here and in our neighbouring countries must be understood [AtD, AtF, 5]. The population increase has slowed in Italy and Austria like it has in Switzerland, and numbers are again taking a downward turn [2, 6, 7].

Christoph Vogel-Baumann

[1] M. Beaud, in litt.; [2] Campedelli et al. (2012); [3] Epple (1997); [4] Glandt (2008); [5] Jiguet (2017); [6] Rete Rurale Nazionale & Lipu (2015); [7] Teufelbauer & Seaman (2017)



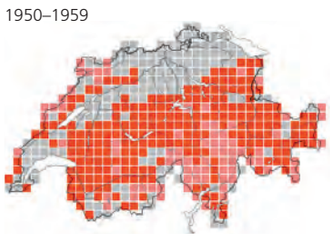


Occurrence 2013–2016

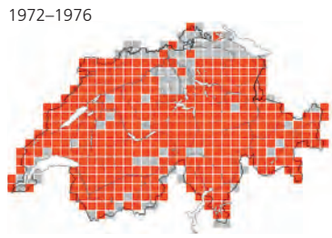
Occurrence change since 1993–1996

Sponsored by
Anonymous donor

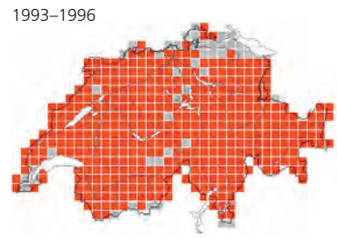
1950–1959



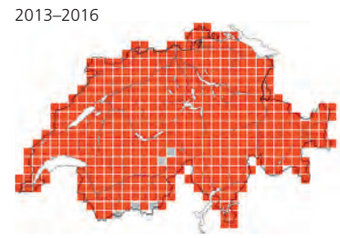
1972–1976



1993–1996



2013–2016



Carrion Crow

Corvus corone corone
Rabenkrähe
Corneille noire
Cornacchia nera
corv nair

Mathias Schäf

Red List Least Concern (LC)
Population 80 000–120 000 pairs (2013–2016)

Focus pages 142, 319, 498

The breeding range of the *corone* subspecies of the Carrion Crow, also called Carrion Crow, extends from the UK eastwards to the Elbe River and from Austria along the southern slopes of the Alps across the Maritime Alps to the Iberian Peninsula[3]. The highly adaptable Carrion Crow inhabits open farmland, industrial areas, villages and cities, as long as there are trees or tall shrubs as well as open areas offering good views of the surroundings. Density is highest in the eastern and central parts of the Plateau and around Basel. South of the Alps, the Carrion Crow is gradually replaced by the Hooded Crow. Almost 70 % of the breeding population occurs between 400 and 800 m. The highest confirmed breeding records came from 2430 m near Samnaun GR (G. Hauser, J. Savioz) and from 2100 m in the Val d'Hérens VS[AtCH1]. Observations during the breeding season were recorded up to more than 2500 m.

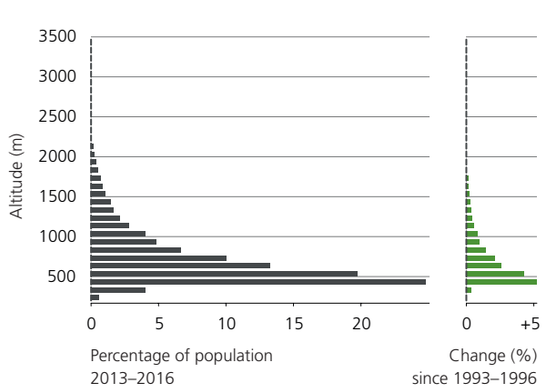
The population increased significantly between 1990 and 2004 and has since been stable with annual fluctuations. Gains since 1993–1996 were recorded in large parts of the Central Plateau, Jura and Pre-Alps. Only few areas charted small losses. At almost all altitude levels, density has increased in proportion to the population at that level. Regional surveys also show significant gains: the population increased by 50 % in the Canton of Zurich between 1988 and 2008[AtZH] and by more than 70 % around Lake Constance between 1980 and 2010[AtBo].

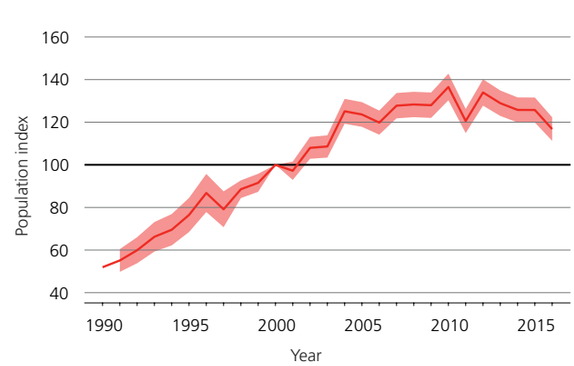
In Germany and France, the long-term trends are positive[AtD, AtF], and populations in Italy and Austria have been stable since 2000[2, 4].

Less persecution by humans, urbanisation and an improved food supply (regular mowing, small mammals killed or injured by farm machinery, open compost heaps, stretches of grass with easy accessibility to food) are among the reasons for the increase[1]. The Carrion Crow may have reached the limits of growth achieved by expanding into settlements. Whether the population size is limited by the abundance or quality of nestling food or by competition from non-breeding flocks remains to be investigated.

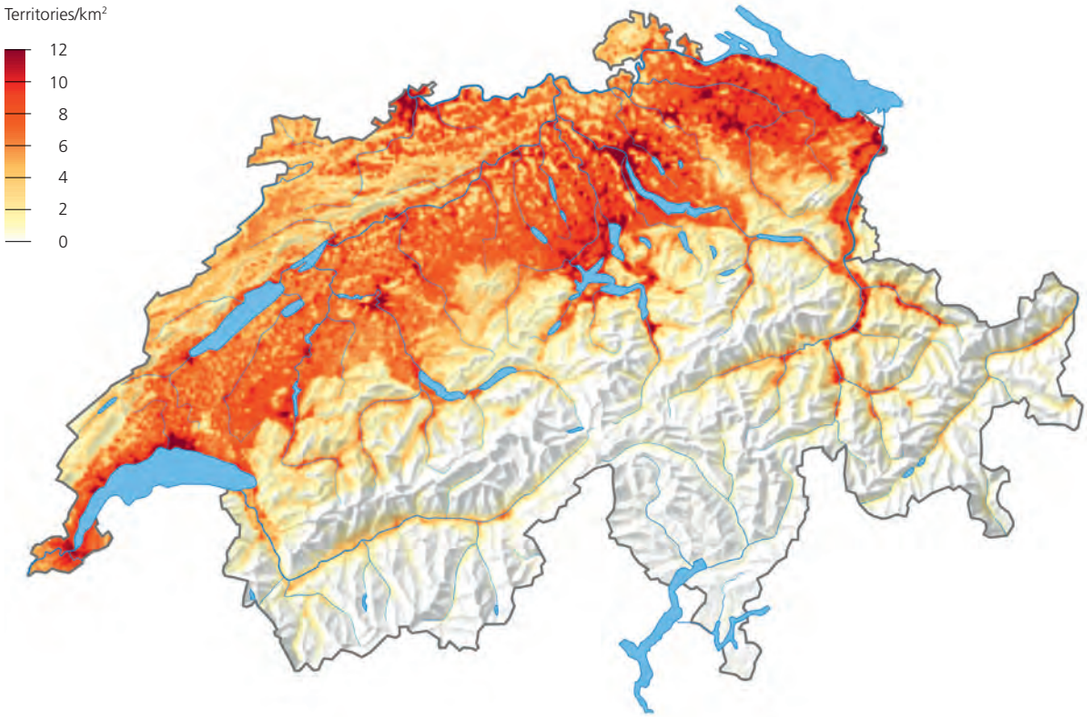
Christoph Vogel-Baumann

[1] Bauer et al. (2005); [2] Campedelli et al. (2012); [3] Epple (1997); [4] Teufelbauer & Seaman (2017)

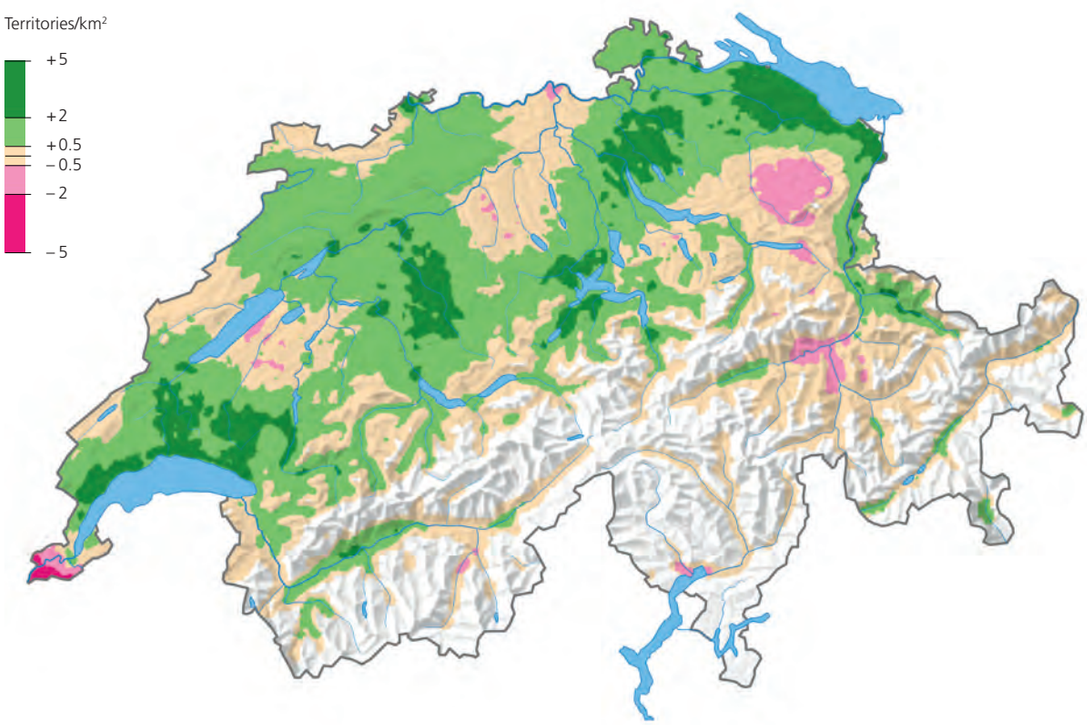




Density 2013–2016

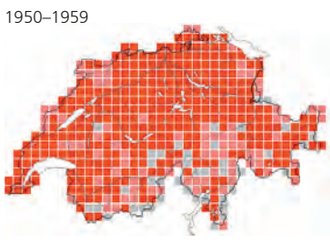


Density change since 1993–1996

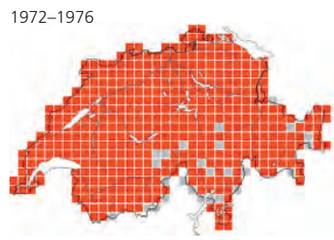


Sponsored by
Markus Hofmann, Zurich

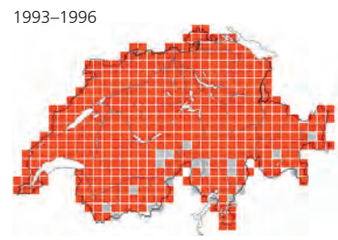
1950–1959



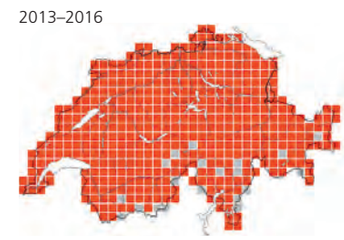
1972–1976



1993–1996



2013–2016



Hooded Crow

Corvus corone cornix
Nebelkrähe
Corneille mantelée
Cornacchia grigia
corv grisch

Beat Rüegger

Red List –
Population 2000–3000 pairs (2013–2016)

Focus pages 414, 498

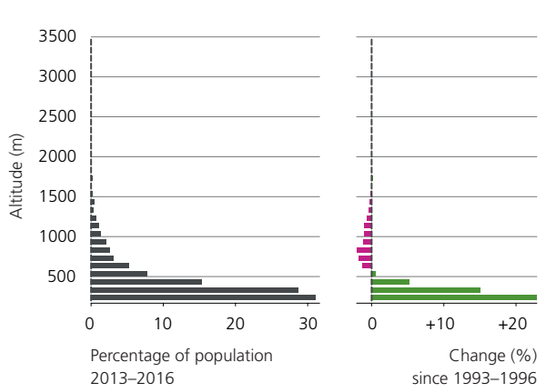
The Hooded Crow's breeding range borders on that of the Carrion Crow in the north, east and south. The European ranges of the two subspecies overlap in a zone that is 2100 km long and 50–150 km wide, extending from Scotland across Denmark, eastern Germany, the Czech Republic, Austria and the southern Alps to the Mediterranean [HVM]. In Switzerland, the Hooded Crow's breeding range is limited to the cantons of Ticino, Grisons and Valais. Hooded Crows have been observed far from the contact zone in the range of the Carrion Crow, where they have occasionally been found to pair with Carrion Crows. The Hooded Crow reaches the highest densities in Ticino and the lower Valle Mesolcina GR, especially in the Magadino Plain TI and the Sottoceneri TI. Density reaches 1.8 nests/km² in the Magadino Plain and 1.2 nests/km² in the adjoining Riviera TI to the north [4]. The highest observations during the breeding season were recorded in the Val di Campo TI (M. Gandini) and near S-chanf GR (M. Ernst) at 2100 m. The highest record of probable breeding came from Cröt/Avers GR at 1940 m (C. Venetz), while the highest confirmed brood (mixed pair with Carrion Crow) was found near Davos GR at 1560 m (C. Koch).

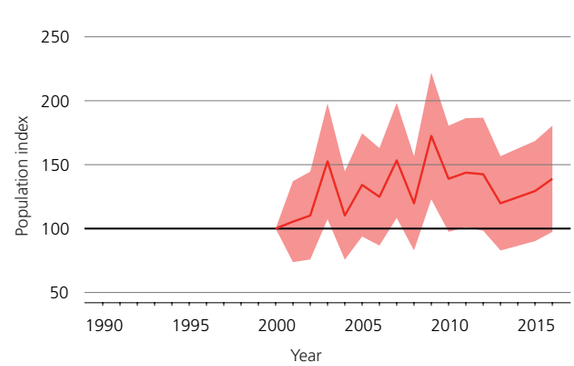
Like the Carrion Crow, the Hooded Crow inhabits farmland with scattered trees, copses and wooded riverbanks as well as parks and gardens [4]. Studies conducted in the narrow contact zone found subtle differences in the use of foraging habitats. While the Carrion Crow favours meadows and maize fields at somewhat higher altitudes, especially in summer, the Hooded Crow prefers meadows in the valleys [2, 6, 7].

The population of the Hooded Crow in Switzerland has been stable since 2000 with some large fluctuations. The breeding range has stayed largely unchanged since 1993–1996. The Hooded Crow has become somewhat rarer above 600 m, which may be related to an increase in the more dominant Carrion Crow [8]. Below 500 m, Hooded Crows have increased significantly, probably in part due to the growing population in Italy [1, 3, 5], where the Hooded Crow has benefited from the improved food supply in farmland and is increasingly moving into urban areas [2]. Trends are also positive in Austria, where Carrion and Hooded Crows are about equally common [RLEU], and in eastern Germany [AtD].

Christoph Vogel-Baumann

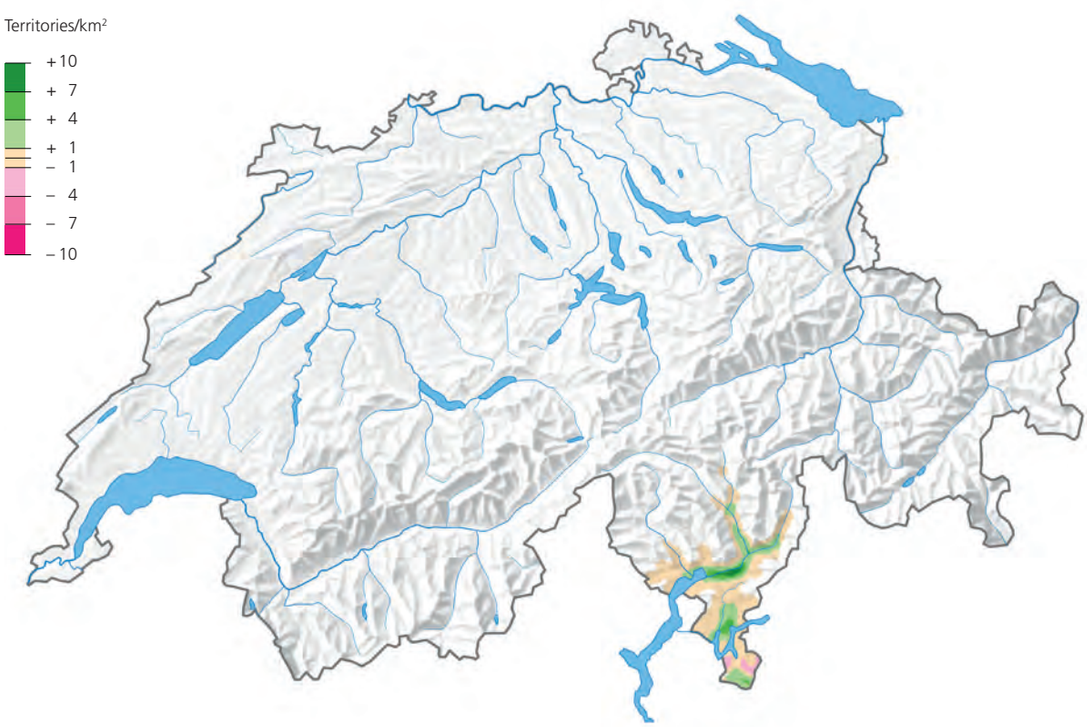
[1] Bani et al. (2014); [2] Brichetti & Fracasso (2013); [3] Campedelli et al. (2012); [4] Nidola (2009); [5] Rete Rurale Nazionale & Lipu (2015); [6] Rolando & Laiolo (1994); [7] Saino (1992); [8] Saino & Scatizzi (1991)





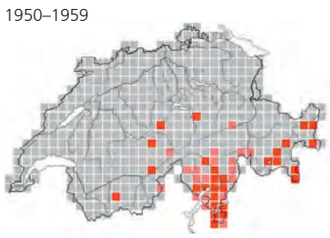
Density 2013–2016

Density change since 1993–1996

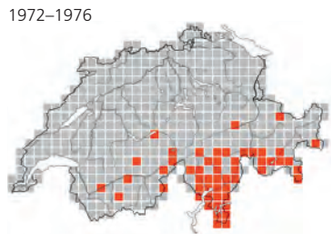


Sponsored by
Anonymous donor

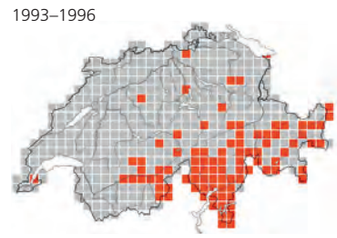
1950–1959



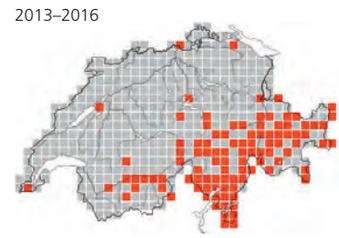
1972–1976



1993–1996



2013–2016



Coal Tit

Periparus ater
Tannenmeise
Mésange noire
Cincia mora
maset da guaud

Dennis Lorenz

Red List Least Concern (LC)
Population 400 000–600 000 pairs (2013–2016)

Focus page 542

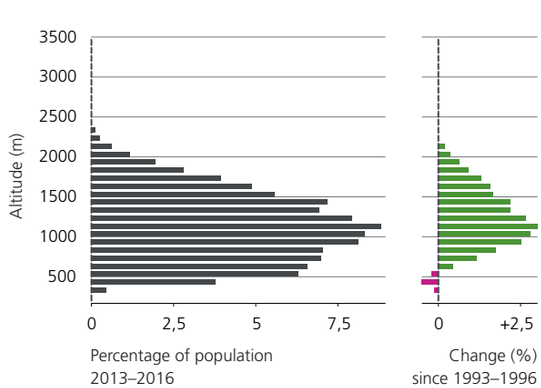
The Coal Tit is widespread in Switzerland, occupying all types of habitats with conifer trees. The highest densities are found in the Vaud Jura, the Alps of Valais and Grisons and parts of the Pre-Alps. In suitable kilometre squares, it is not uncommon to count 50 territories and more. About 80 % of the Swiss population occurs between 500 and 1700 m, with peak densities between 1000 and 1600 m. The highest evidence of breeding (adult carrying food) was recorded at about 2350 m near Zermatt VS (J. Duplain)[6].

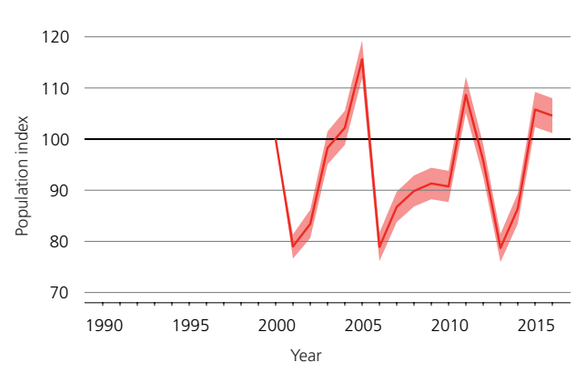
The population trend of the Coal Tit in Switzerland is characterised by large annual fluctuations related to harsh winters and spruce mast years[1]. These fluctuations make it difficult to identify long-term trends. Since 1993–1996, density has increased mainly in the Jura, along the Pre-Alps and in the Alps. The population has grown considerably at medium and higher altitude levels, but has remained stable or even declined at lower altitudes. Surveys in the Canton of Zurich in 1988 and 2008 revealed a slight decline of 20 %[AtZH]. Around Lake Constance, numbers were fairly constant from 1980 to 2000, but dropped by 40 % between then and 2010[AtBo, AtZH]. In Germany and Italy, the populations have remained unchanged in the past 20 years, while they are declining in France and Austria[AtD, AtF, 3, 8]. There has been a renewed increase in France since 2007, however[4]. The overall European trend is slightly negative, though it has remained largely constant since 2000[EBCC].

The declines in Europe are mainly attributed to the decrease in the proportion of conifer trees at lower altitudes[AtF, 5]. The proportion of spruce trees on the Central Plateau has dropped significantly since the 1990s due to intensified use, forestry measures that favour deciduous woods, and damage caused by storms and bark beetles. The situation is reversed in the Alps, where spruce forests are expanding[2, 7]. These changes in forest management are reflected in the distribution of the Coal Tit in Switzerland. In Germany, the Coal Tit has increased significantly in settlements since 1990[AtD] – a trend that has not (yet) been observed in Switzerland.

Samuel Wechsler

[1] Bauer et al. (2005); [2] Brändli (2010a–b); [3] Campedelli et al. (2012); [4] Jiguet (2017); [5] Marchadour (2014); [6] Posse (2012); [7] Rigling & Schaffer (2015a–d); [8] Teufelbauer & Seaman (2017)



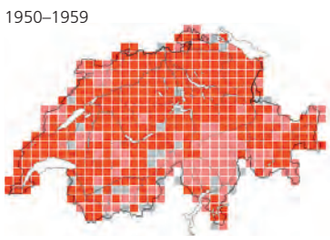


Density 2013–2016

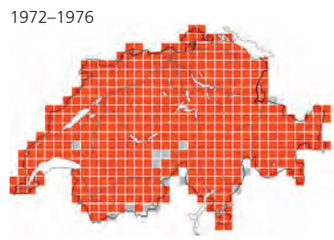
Density change since 1993–1996

Sponsored by
Laurence Wiedmer

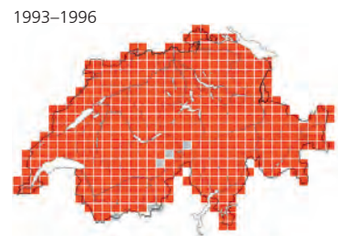
1950–1959



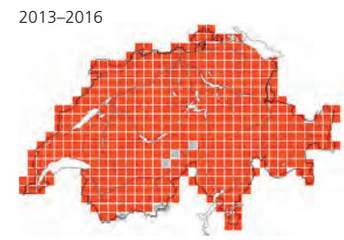
1972–1976



1993–1996



2013–2016



Crested Tit

Lophophanes cristatus
Haubenmeise
Mésange huppée
Cincia dal ciuffo
maset da la cresta

Markus Varesvuo

Red List Least Concern (LC)
Population 90 000–110 000 pairs (2013–2016)

Focus pages 298, 542

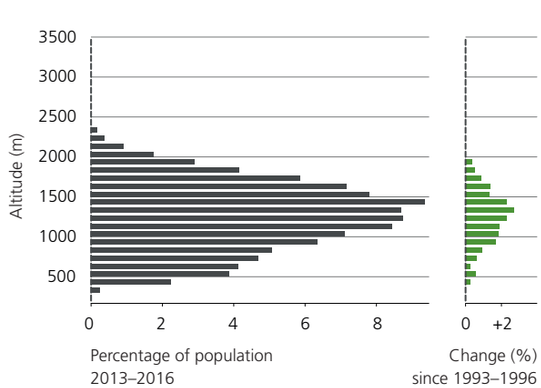
The Crested Tit occurs throughout Switzerland and favours coniferous woodland, especially spruce or spruce-fir as well as larch-stone pine forests, but also mixed forests dominated by conifers. It may occasionally breed in areas where conifers are absent (e.g. settlements)[6]. As with the Coal Tit, the highest densities occur in the Vaud Jura and in the Alps of Valais and Grisons. About 80 % of the population is concentrated between 700 and 1800 m, with peak densities between 1200 and 1700 m. In suitable kilometre squares, it is not uncommon to count 15 territories and more. In the past, breeding has been confirmed at maximum altitudes of 2300 m near Cinuos-chel GR[AEn] and 2240 m near Zermatt VS[AtCH2], more recently on the Ofenpass GR at 2200 m (D. Godly).

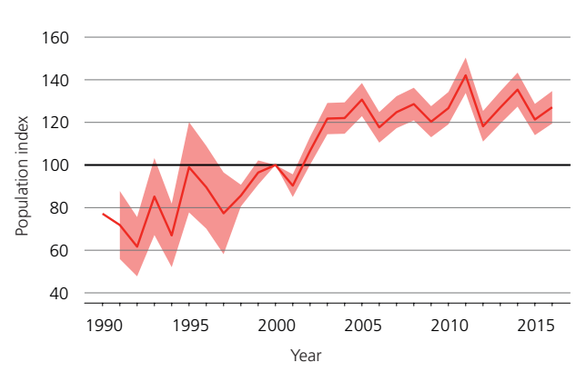
The Swiss population has increased by more than 40 % since 1993–1996. The gains occurred at all altitude levels in proportion to the population at that level. Increases in density were mainly recorded in parts of the Jura as well as in the Alps and Pre-Alps. There have also been local declines, however. In the Canton of Zurich, the population doubled between 1988 and 2008[AtZH]. Significant gains were recorded in the Lake Constance area too, where the population rose by more than half between 1980 and 2010, with the largest increase between 1990 and 2000[AtBo]. The trend in Switzerland has been more positive than in neighbouring countries, where numbers have remained constant or even declined[AtD, AtF, AtFL, 3, 4, 9]. The overall European trend is slightly negative as well[EBCC].

The reasons for these contradictory trends in Switzerland and Europe are unclear. As the Crested Tit is highly sedentary, local causes such as forestry practices (e.g. intensified use, afforestation, and measures that alter the proportion of conifers)[AtD, AtF, HBW, 5] and the species' increasing colonisation of habitats in settlements such as cemeteries and parks[AtD, 1] may be responsible for changes in the population size. In Switzerland, the expansion of forest area as well as the increase in growing stock and in old-growth elements and deadwood[2, 8] have probably had a positive impact on the Crested Tit population[7, 10].

Samuel Wechsler

[1] Barthélemy (2015); [2] Brändli (2010a–b); [3] Campedelli et al. (2012); [4] Jiguet (2017); [5] Lovaty (2014); [6] Martinez (2011); [7] Mollet et al. (2009); [8] Rigling & Schaffer (2015a–d); [9] Teufelbauer & Seaman (2017); [10] Weggler & Widmer (2001)



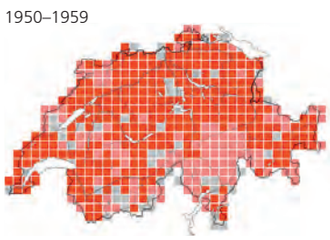


Density 2013–2016

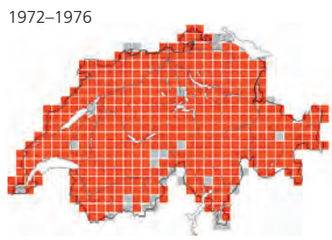
Density change since 1993–1996

Sponsored by
Franziska Hindermann Maillard, Ettingen
Anonymous donor from Spiez

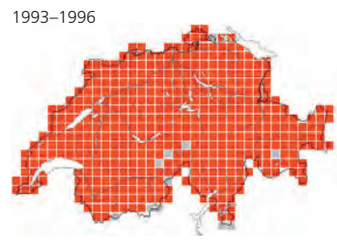
1950–1959



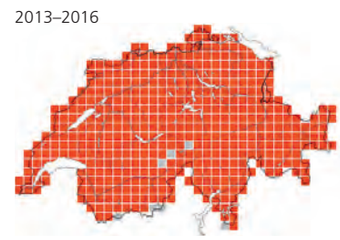
1972–1976



1993–1996



2013–2016



Marsh Tit

Poecile palustris
Sumpfmeise
Mésange nonnette
Cincia bigia
maset da palì

Pascal Pini

Red List Least Concern (LC)
Population 70 000–100 000 pairs (2013–2016)

Focus –

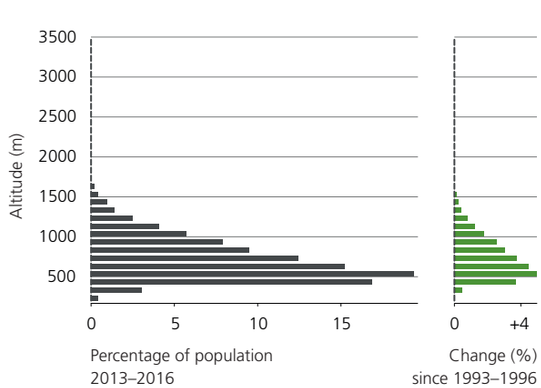
The Marsh Tit is widespread in the lowlands of Switzerland, reaching the highest densities in Ticino, the northern parts of the Central Plateau and Jura, and the Vorderrhein Valley GR. It occupies a range of richly structured woodland habitats, especially open deciduous or mixed woods, where maximum densities of up to 20 territories/km² have been recorded. While about 95 % of the population breed below 1200 m, with average densities peaking between 500 m and 1000 m, breeding has been confirmed up to 1450 m [AtCH1], and singing males have been observed up to 1930 m [AtCH2]. In 2013–2016, the highest record of probable breeding came from Evolène VS at 1530 m (M. Thélin); the highest singing male was recorded at 1860 m near Saanen BE (R. Wagner).

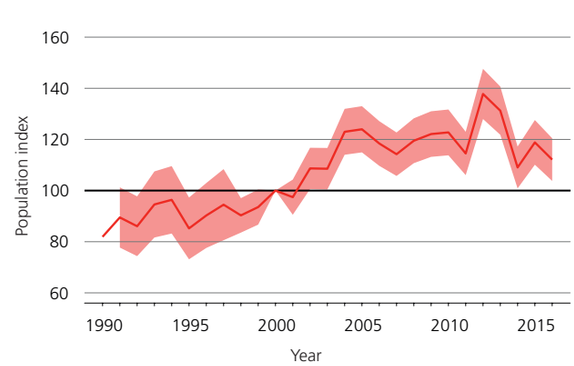
The Swiss population has increased by about 30 % since 1993–1996. The increase, apparent throughout the altitudinal gradient and across almost the entire range, was most pronounced in Ticino, the lower Rhone Valley and the Canton of Jura. In the past decades, growing numbers have also been recorded in the cantons of Geneva, Aargau and Zurich, the Lake Constance area, and around Haut-Intyamon FR [AtBo, AtGE, AtZH, 1, 6]. By contrast, the European population declined quite significantly between 1980 and 2000 [EBCC]. While the decline continues in the UK [2], the trend appears to have reversed or stabilised [11] elsewhere in Europe since 2000 [EBCC], at least in Switzerland's neighbouring countries [AtD, AtF, 9].

The declines recorded in Europe from 1980 to 2000 have been attributed to changes in forest structure, in particular the loss of undergrowth [2, 3, 4, 7, 10]. While the reasons for the recent increase in Switzerland are not clear, the Marsh Tit may have benefited from forestry practices that favour near-natural structures and from the decreasing proportion of conifers in the lowlands. The species' breeding period has advanced considerably, presumably in response to climate change [5, 8], but it is not clear whether this will contribute to a growth in population size.

Sylvain Antoniazza

[1] Beaud & Beaud (2018); [2] Broughton & Hinsley (2015); [3] Broughton et al. (2010); [4] Carpenter et al. (2010); [5] Dolenec (2006); [6] Draeger (2004); [7] Hinsley et al. (2007); [8] Källander et al. (2017); [9] Rete Rurale Nazionale & Lipu (2015); [10] Siriwardena (2006); [11] Teufelbauer & Seaman (2017)



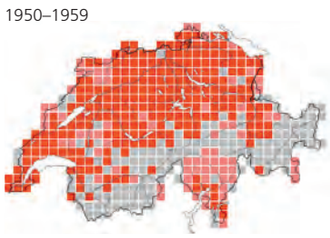


Density 2013–2016

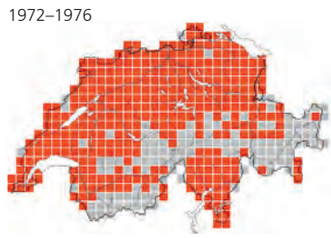
Density change since 1993–1996

Sponsored by
Daniel Schertenleib, Aarau

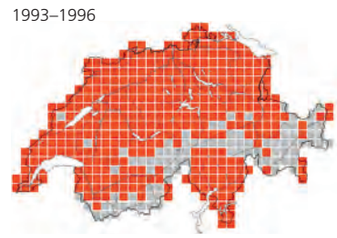
1950–1959



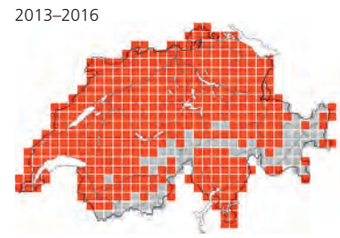
1972–1976



1993–1996



2013–2016



Alpine or Willow Tit

Poecile montanus
Mönchsmeise
Mésange boréale
Cincia alpestre o C. dei salici
maset da muntogna

Marcel Burkhardt

Red List Least Concern (LC)
Population 70 000–95 000 pairs (2013–2016)

Focus pages 298, 350

There are several subspecies of *Poecile montanus*, three of which occur in Switzerland: *P. m. salicarius* inhabits the Jura, while P. m. rhenanus occurs in the Pre-Alps and on the Central Plateau. These two subspecies are called Willow Tits and are distinguished by their song from the Alpine Tit *P. m. montanus*, which inhabits the Alps.

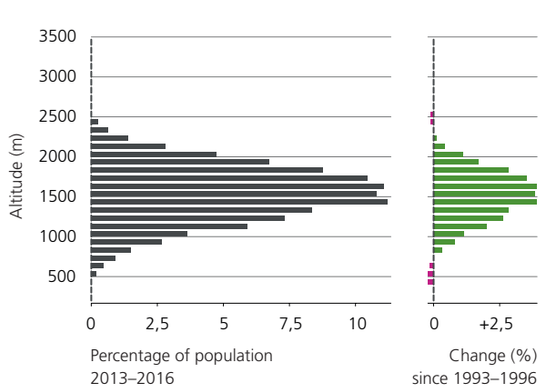
Alpine and Willow Tits rely primarily on an abundant supply of standing deadwood and decaying wood to excavate nesting cavities. Where this habitat feature is present, they occupy a variety of well-structured mixed and conifer forests, alluvial forests, mires with birch and pine stands as well as clearings and windthrow areas [HVM, 12, 13]. In Switzerland, Alpine and Willow Tits occur mainly in the Alps and the Jura; distribution on the Central Plateau is patchy. The highest densities are reached in Engadine GR, Val Müstair GR and Upper Valais and relate to the Alpine Tit. They are five times higher than the greatest densities of Willow Tit in the Jura and Pre-Alps. About 90 % of the population occurs between 1000 and 2100 m and is most concentrated between 1500 and 1900 m.

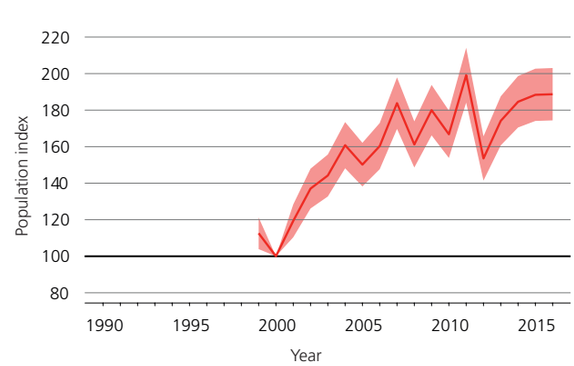
The overall trend of *P. montanus* is positive throughout the Alps above 800 m. As a result, the Swiss population has almost doubled since 2000. By contrast, several areas on the Central Plateau exhibit a negative trend [AtZH, 1, 5]. However, there are signs of a range expansion in the German-speaking regions of Switzerland including Lake Constance [AtBo], though these may be in part related to increased observer effort. The population trends of Alpine Tit and Willow Tit thus appear to be quite different. The European population of *P. montanus* has declined slightly since 1993–1996 [EBCC], for example in Germany, France, Belgium and the Netherlands (mainly concerns the Willow Tit) [AtD, AtF, RLEU, 2]. Italy and Austria, on the other hand, report stable numbers (mainly Alpine Tits) [8, 11].

The Alpine Tit presumably benefits from the increase in forest area and deadwood as well as from climate change [3, 6, 7, 9, 14]. Conversely, the Willow Tit may have suffered from clearings becoming overgrown and from increased competition for nesting cavities (e.g. from other tits) [HVM, 4, 5, 10, 12].

Sylvain Antoniazza

[1] Antoniazza (in prep.); [2] Bauer (2013); [3] Chamberlain et al. (2013); [4] Christen (1994); [5] Christen (2017b); [6] Klein et al. (2016); [7] Mollet et al. (2009); [8] Rete Rurale Nazionale & Lipu (2015); [9] Rigling & Schaffer (2015a–d); [10] Straub (2013); [11] Teufelbauer & Seaman (2017); [12] Thönen (1962); [13] Vatka et al. (2014); [14] Vitasse et al. (2018)



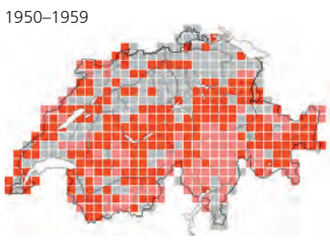


Density 2013–2016

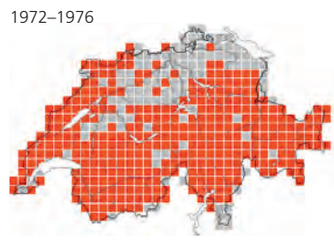
Density change since 1993–1996

Sponsored by
Fabienne Decker
Maya & Balz Merkli

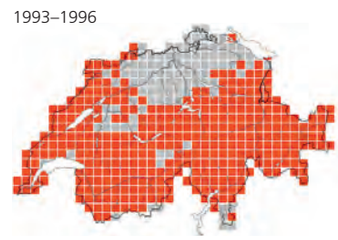
1950–1959



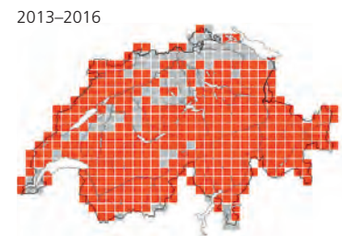
1972–1976



1993–1996



2013–2016



Alpine Tit

Poecile montanus montanus
Alpenmeise
Mésange alpestre
Cincia alpestre
maset alpin

Marcel Burkhardt

Red List –
Population 65 000–85 000 pairs (2013–2016)

Focus page 350

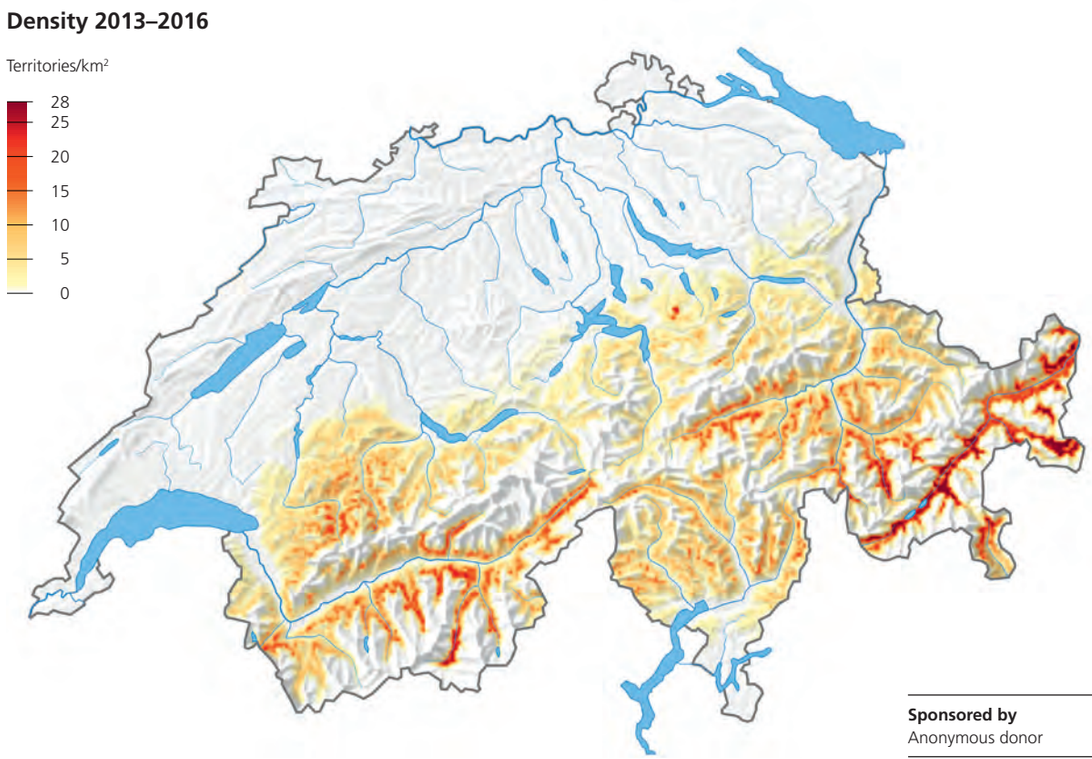
The Alpine Tit breeds throughout the Alps, mainly between 1300 and 2100 m. The highest densities are reached in Engadine GR, Val Müstair GR and Upper Valais. In the contact zones with the Willow Tit between Lake Lucerne and Lake Thun, the Alpine Tit is less abundant than the Willow Tit. Breeding has been confirmed up to 2280 m near Pontresina GR [AEn] and, during 2013–2016, up to 2260 m near Zermatt VS (J. Duplain). In the lowlands, singing males were heard in Les Grangettes VD at 370 m (Y. Schmidt, J.-M. Fivat) [1].

The distribution of the Alpine Tit has presumably remained largely unchanged since 1993–1996, but the population of the taxon *Poecile montanus*, including Alpine and Willow Tit, has increased significantly in the Alps, primarily as a result of the positive trend of the Alpine Tit. The Alpine Tit presumably benefits from the increase in forest area and deadwood [4, 5], and probably [2] also from earlier springs and warmer summer temperatures [3, 7]. Studies from northern Europe have shown that *P. montanus* can synchronise the hatching date of its young with the activity peak in caterpillars despite the influence of climate change [6].

Sylvain Antoniazza

[1] Antoniazza (2016b); [2] Chamberlain et al. (2013); [3] Klein et al. (2016); [4] Mollet et al. (2009); [5] Rigling & Schaffer (2015a–d); [6] Vatka et al. (2011); [7] Vitasse et al. (2018)

Density 2013–2016



2013–2016

Sponsored by
Anonymous donor

Willow Tit

Poecile montanus rhenanus/salicarius
Weidenmeise
Mésange des saules
Cincia dei salici
maset da salischs

Bernhard Herren

Red List –
Population 4000–8000 pairs (2013–2016)

Focus pages 350, 357

The Willow Tit inhabits the Jura and occurs locally on the Central Plateau, in the Pre-Alps and in the Alpine Rhine Valley. The species is most concentrated between 800 and 1500 m. Its largest populations occur in the western Jura and in the Pre-Alps of Bern and Lucerne, where it occupies habitats more typical of the Alpine Tit. The highest records of singing males came from 1590 m near Montricher VD in the Jura (Y. Menétrey) and from 1870 m near Iseltwald BE in the Pre-Alps (M. Roost, S. Trösch).

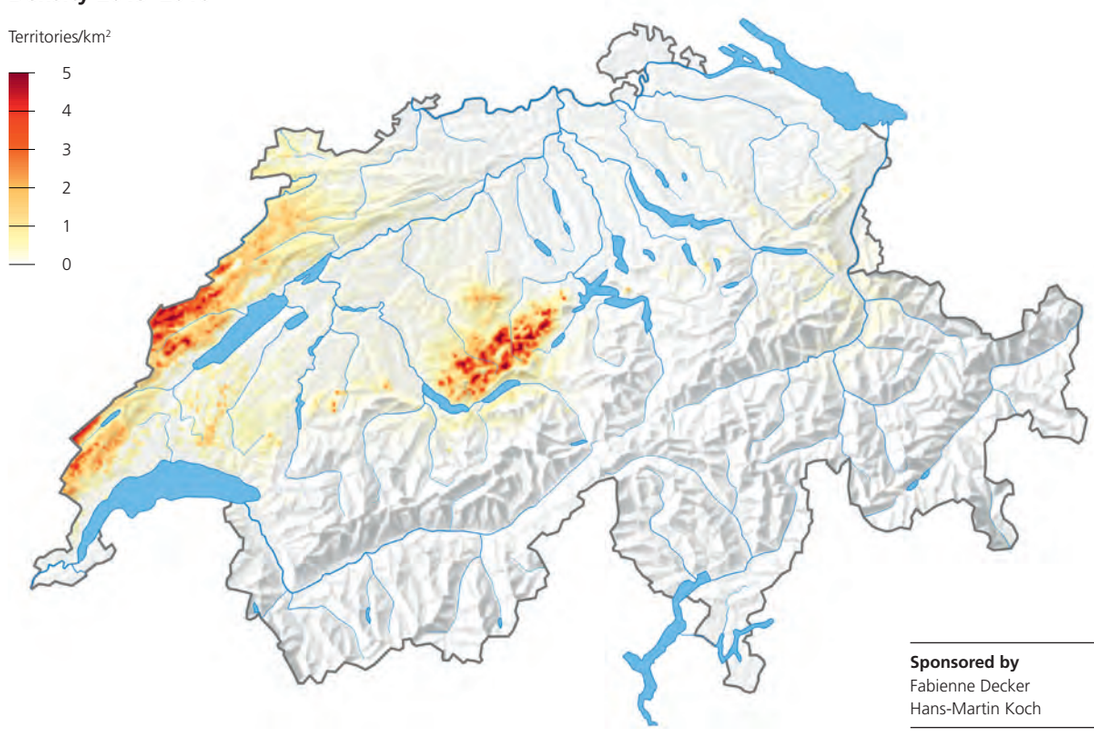
While declines have been noted in certain parts of the Central Plateau [AtZH, 1, 3], the Willow Tit was detected for the first time in several areas of German-speaking Switzerland, presumably in part due to greater observer effort. Numbers have increased in the Lake Constance area since 2000 [AtBo] and appear to be stable in the Jura [AtNe].

The Willow Tit is not very competitive, and benefits from felling and windthrow areas before these are colonised in large numbers by other tits [HVM, 2, 3, 6, 7]. Increases in more common tit species may have resulted in greater nest-site competition, leading to the decline of the Willow Tit. On the other hand, the increased amount of deadwood, especially in the wake of storm «Lothar» in late 1999, may have aided the colonisation of some areas [4, 5].

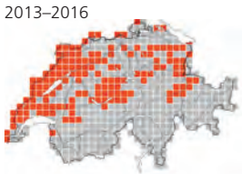
Sylvain Antoniazza

[1] Antoniazza (in prep.); [2] Christen (1994); [3] Christen (2017b); [4] Mollet et al. (2009); [5] Rigling & Schaffer (2015a–d); [6] Straub (2013); [7] Thönen (1962)

Density 2013–2016



2013–2016



Sponsored by
Fabienne Decker
Hans-Martin Koch

Alpine Tit and Willow Tit – an example of incipient speciation?

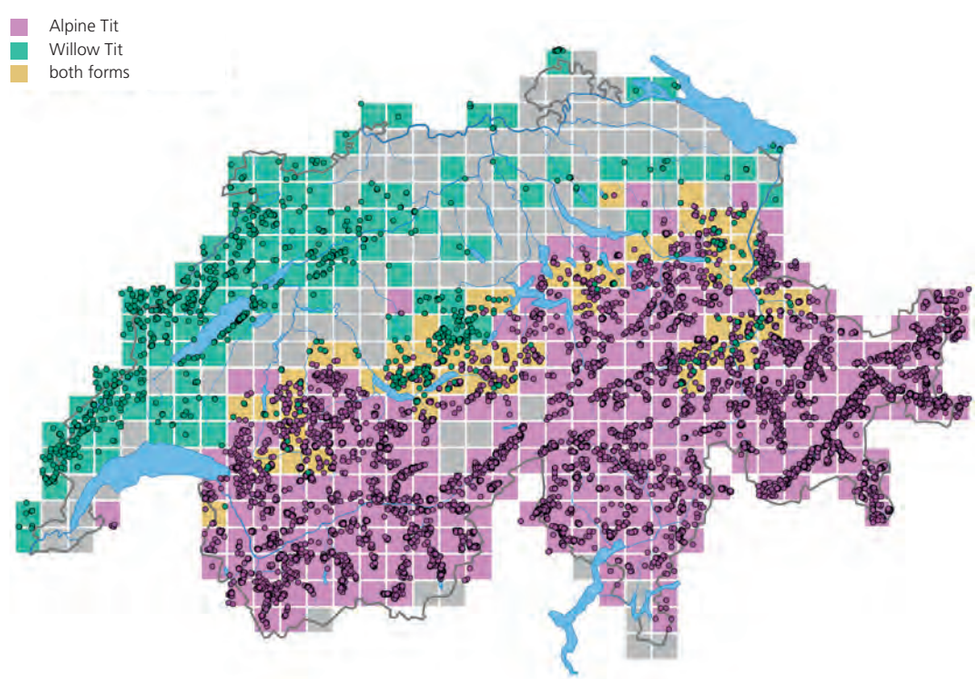
Two forms of *Poecile montanus* exist in Switzerland: the Willow Tit occurs in the Jura, the Pre-Alps and locally on the Central Plateau, while the Alpine Tit is confined to the Alps. The two forms have a distinct song as well as different ecological requirements, and could evolve into two species over time.

In many bird species, especially passerines, song plays an important role in mate selection[4], allowing females in particular to distinguish between males of their own species and those of closely related species. For example, Common Chiffchaff and Willow Warbler, two leaf warblers, look very similar, but have a completely different song. From this perspective, it appears likely that populations of a species that differ in song will eventually evolve into two or more distinct species in the medium to long term[9].

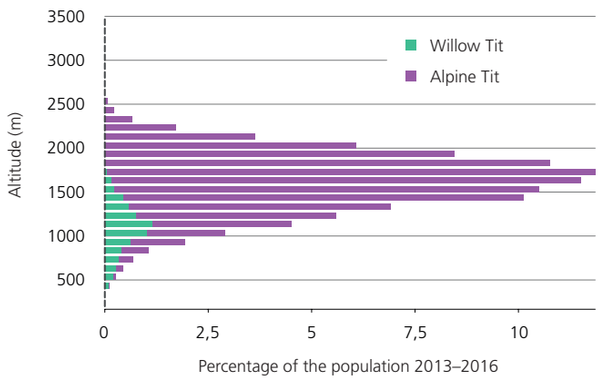
Alpine and Willow Tit, two forms of *Poecile montanus* that occur in Switzerland, could well be an example of this speciation process. The Willow Tit breeds in the Jura (*P. m. salicarius*), in the Pre-Alps, and locally on the Central Plateau (*P. m. rhenanus*), where it mainly inhabits deciduous woods, young woodland and alluvial forests between 800 and 1500 m. The Alpine Tit (*P. m. montanus*) occupies mixed and coniferous stands in the Alps, mostly between 1300 and 2100 m. Both forms rely on a sufficient amount of standing deadwood to excavate their nesting cavities. Apart from minor differences in diet and size[HVM, 2, 11], Alpine Tit and Willow Tit can only be identified by their song. The Willow Tit utters a series of long, descending notes («tyoo tyoo tyoo tyoo»), whereas the Alpine Tit's territorial song consists of short notes on an even pitch («dee dee dee dee dee»). The distribution of these two forms in Switzerland and the presence of two contact zones in this country and one in Bavaria were described as early as 1962[11]. Other contact zones were later discovered in the Pre-Alps of Fribourg, in Savoie, the Allgäu, the Austrian Alps[ABW, AtFR, HVM, 3, 5, 12] and the mountains of Bulgaria[12]. In Switzerland, the two forms have never been surveyed separately before. For the first time, the 2013–2016 atlas provides an overview of their distribution.

Overlapping ranges

Interestingly, the breeding ranges of Alpine and Willow Tit described by W. Thönen[11] have remained largely unchanged for more than half a century. They have now been precisely modelled and quantified for the first time. The Alpine Tit is closely confined to the Alps, reaching high densities in some areas. The Willow Tit occurs in much lower densities in the Jura, the Pre-Alps, and some parts of the Central Plateau and the Rhine Valley in St. Gallen and Grisons. Contact zones exist in the Pre-Alps of Fribourg, Bern, Obwalden and Lucerne, in the Alpstein massif, and in the Rhine Valley between Ilanz GR and Altstätten SG. The suspected presence of the Alpine Tit in the Jura[1, 11] could not be confirmed[12].



Distribution of Alpine Tit (purple) and Willow Tit (green) in Switzerland during 2013–2016. Atlas squares that accommodate both forms are shown in yellow.



Altitudinal distribution of P. montanus *in Switzerland during 2013–2016. The density of Willow Tit (green) is much lower than that of Alpine Tit (purple).*

Walter Christen

Nesting cavity (centre) excavated by Willow Tits in a beech trunk on the Central Plateau, Canton of Solothurn, that was girdled and eventually snapped.

Willow Tits in the Pre-Alps have two noteworthy features: they occupy similar habitats to the Alpine Tit, and they occur locally in fairly high densities, despite the distance to the core range in the Jura. How can this be explained? We suspect that the Alpine Tits in this region have adopted the song of the Willow Tit, either by learning or by gene flow (i.e. the exchange of genetic material between two populations). This is a bold hypothesis given the information available to us today, but one that nonetheless merits more detailed investigation.

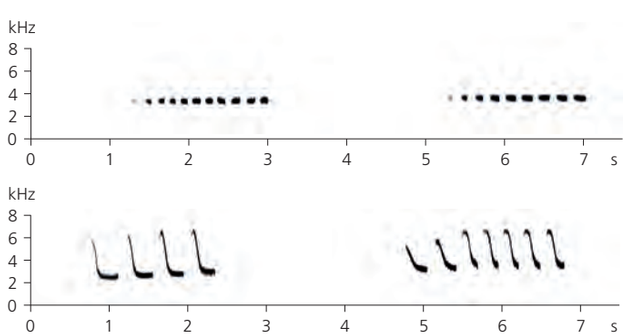
Further research needed

The data collected so far give us a fairly clear picture of the distribution and population size of Alpine and Willow Tit in Switzerland. Distinguishing between the two forms allows us to track the subpopulations separately. This is an interesting opportunity given the slightly negative trend of the Willow Tit, at least in the lowlands.

As most Alpine and Willow Tits do not appear to recognise each other as conspecifics by their song, there is reason to assume that they may be evolving into two distinct species, as Thönen suggested [11]. However, the occasional observation of mixed singers – Thönen himself notes five cases [11] – indicates that reproductive isolation (i.e. the interruption of gene flow between subpopulations of the same species) is far from complete. Because we now know the exact distribution of Alpine and Willow Tit, additional investigations into the status of the two forms could be pursued. For example, the degree of differentiation between the subspecies could be analysed in birds from the contact zones using a modern population-genetics approach. Preliminary studies in this direction have not been taken far enough to yield this kind of information [6, 7, 8, 10]. In a subsequent step, inheritance and acquisition of song could be examined in order to gain a better understanding of the dynamics that separate the two populations and how they might evolve in the future. Song appears to be largely innate [11], but additional experiments are necessary to provide support for this hypothesis.

The relationships between subforms of *P. montanus* provide one of the few opportunities in the Alpine region to study the process of speciation. Hopefully, the 2013–2016 atlas will serve as a basis for future research that will shed light on some of the many questions regarding the populations of Alpine Tit and Willow Tit in Switzerland.

Sylvain Antoniazza



The sonograms clearly show the differences in song between the two subspecies: above, the Alpine Tit's series of mostly short notes on an even pitch («dee dee dee dee dee»); below the somewhat slurred, longer and falling notes of the Willow Tit («tyoo tyoo tyoo tyoo»). Sonograms: A. Bossus, recordings: F. Charron.

[1] Amann (1954); [2] Bauer (2013); [3] Brader & Aubrecht (2003); [4] Catchpole & Slater (2008); [5] Feldner et al. (2006); [6] Kvist et al. (1998); [7] Kvist et al. (2001); [8] Pavlova et al. (2006); [9] Price (2008); [10] Salzburger et al. (2002); [11] Thönen (1962); [12] Thönen (1996)

Species pages 346, 348, 349

Eurasian Blue Tit

Cyanistes caeruleus
Blaumeise
Mésange bleue
Cinciarella
maset blau

Ruedi Aeschlimann

Red List Least Concern (LC)
Population 200 000–300 000 pairs (2013–2016)

Focus –

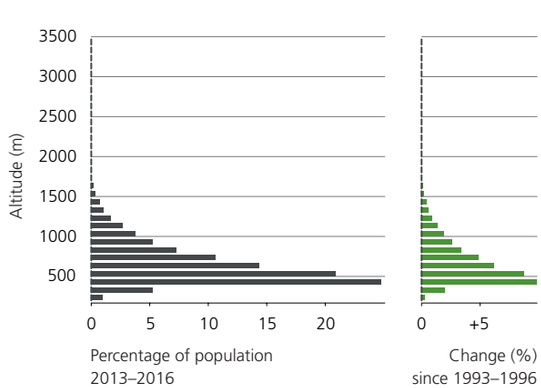
The Eurasian Blue Tit inhabits deciduous woods with few or no conifers, field copses, orchards, hedges, gardens and parks. High densities are reached in pure or mixed oak woods and alluvial forests [HVM], but also in settlements in the cantons of Zurich, Aargau, Basel and Basel-Landschaft, Ticino and the Lake Geneva region. The high densities in some Alpine valleys such as Valais or Maggia Valley TI are striking. In suitable kilometre squares, it is not uncommon to count 40 territories and more. Around 90 % of the population occurs below 1000 m. Average densities of more than 10 territories/km^2 are only found below 900 m. The highest breeding records came from 1740 m near Arosa GR (J. Jelen) and 1620 m near Fuldera GR (M. Hofer). The highest singing male was recorded near Binn VS at 2090 m (B. Abgottspon).

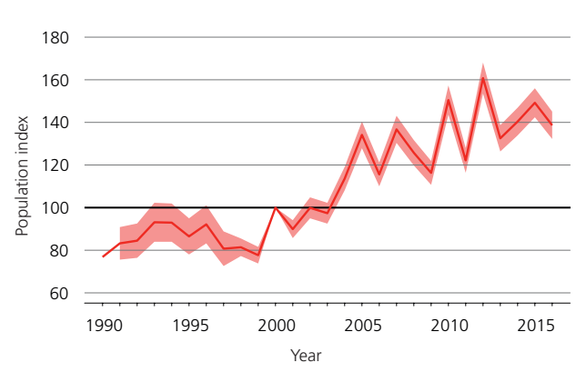
The Blue Tit population has increased by about 50 % since 1993–1996. The gains occurred throughout the range and were most pronounced in the cantons of Thurgau, Geneva, Valais and Ticino. Positive trends were also found in the Lake Constance area (25 % increase between 1980 and 2010) [AtBo] and in the Canton of Zurich (33 % increase between 1988 and 2008) [AtZH]. Analyses of data from 1988 and 1999 show that density in the Canton of Zurich has remained largely constant in forests while increasing by 30 % in settlements [11, 12]. The range expansion into Alpine regions that was evident in the 1993–1996 atlas has continued, with several newly occupied squares. Nevertheless, density increased to more or less the same extent at all altitude levels. While France and Italy report positive trends since 2000, numbers in Austria and Germany are stable or fluctuating [AtD, AtF, 6, 9]. The overall European population has increased by about 30 % since 1993–1996 [EBCC].

The reasons for the gains in Switzerland are unknown. Possible causes include climatic changes [AtF, 5, 10], the availability of food in winter [AtD, 1, 8], the abundant supply of nest boxes [AN1] and the spread of settlements [AtD, 2, 11]. It is unclear whether changes in woodlands (more deadwood, older trees, higher proportion of deciduous trees) have also played a part [3, 4, 7].

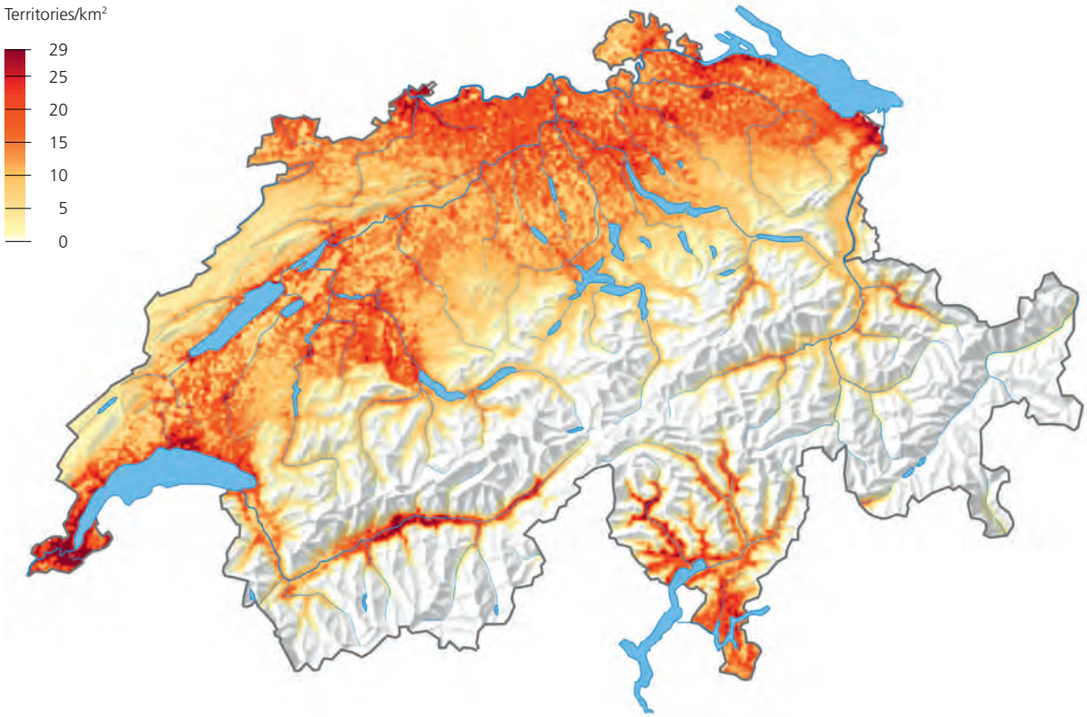
Beat Naef-Daenzer

[1] Bauer et al. (2005); [2] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [3] Carpenter et al. (2010); [4] Mollet et al. (2009); [5] Potti (2009); [6] Rete Rurale Nazionale & Lipu (2015); [7] Rigling & Schaffer (2015a–d); [8] Robb et al. (2008a); [9] Teufelbauer & Seaman (2017); [10] Visser et al. (2003); [11] Weggler & Widmer (2000b); [12] Weggler & Widmer (2001)

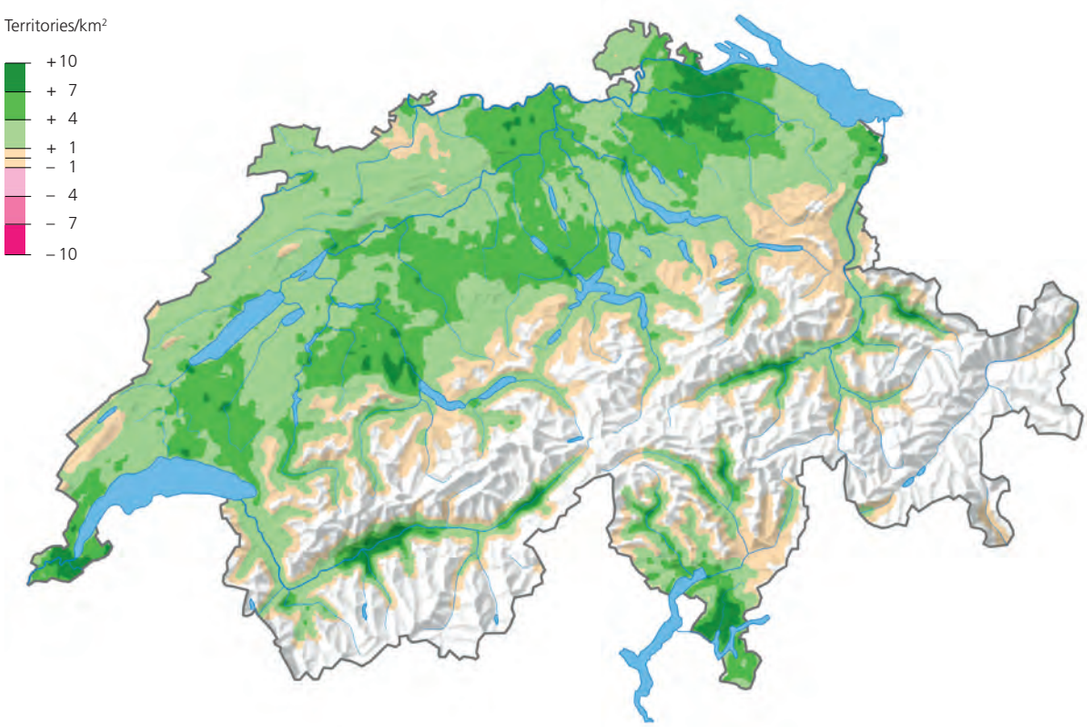




Density 2013–2016

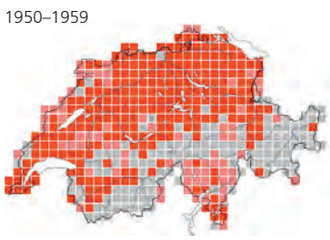


Density change since 1993–1996

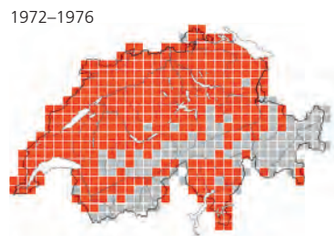


Sponsored by
Loredana & Aurelio Botta

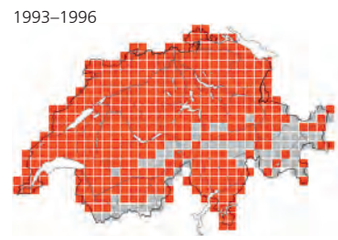
1950–1959



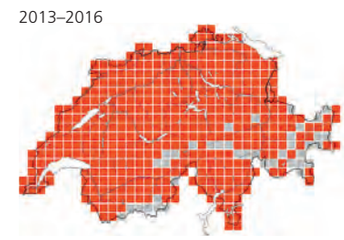
1972–1976



1993–1996



2013–2016



Great Tit

Parus major
Kohlmeise
Mésange charbonnière
Cinciallegra
maset grond

Adrian Wullschleger

Red List Least Concern (LC)
Population 400 000–550 000 pairs (2013–2016)

Focus

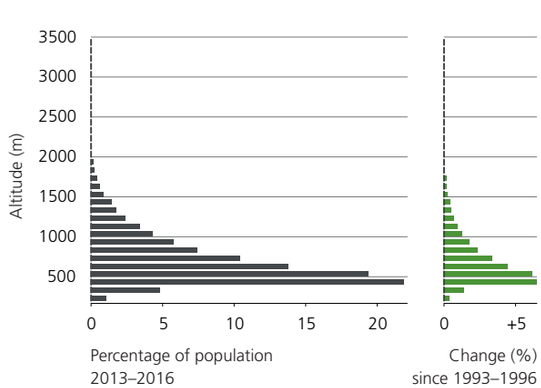
The Great Tit is one of Switzerland's most common birds. It inhabits all types of woodland, but favours deciduous and mixed woods. It is also found in gardens, hedges, orchards and parks. Around 90 % of the population occurs below 1100 m. The highest densities are reached in the large Alpine valleys of Valais, Ticino and Grisons. Densities are also very high around Geneva and Zurich and along the Seerücken range in Thurgau. In suitable kilometre squares, it is not uncommon to count 40 territories and more. Distribution is practically continuous, and the Great Tit was found in almost all surveyed kilometre squares in the lowlands. The highest breeding records came from 2240 m near Pontresina GR in 2003 (A. Bürkli) [AEn] and from 2210 m near Saas Fee VS in 2014 (E. Kalbermatten) [1]. The highest singing male was also recorded near Saas Fee at 2320 m (S. E. Armbruster) [7].

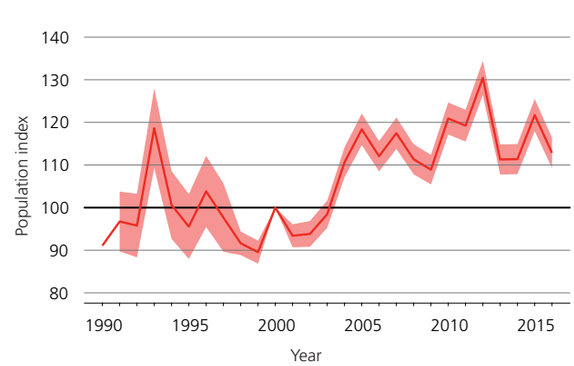
The Great Tit population has increased since 1993–1996. Gains are evident throughout the range, but are most pronounced in the northeastern part of the Central Plateau, in the central Valais and in parts of Ticino and Grisons. The increase occurred at all altitude levels in proportion to the population at that level. In Grisons, the Great Tit has gradually extended its range to higher altitudes since 1980 [AEn, AGR]. Regional surveys around Lake Constance between 1980 and 2010 and in the Canton of Zurich between 1988 and 2008 found no changes in population size [AtBo, AtZH]. While the German and French populations are considered stable, France and Italy have seen an increase since the 1990s [AtD, AtF, 6, 12]. The overall European population has increased by about 15 % since 1993–1996 [EBCC].

Surveys in the Canton of Zurich and in Germany found that numbers remained unchanged in settlements while decreasing in woodland habitats [AtD, 15, 16]. The reasons for this and for the population increase in Switzerland are unknown. The influence of supplementary feeding [2, 10, 11] on winter survival, the availability of nest boxes [2], the spread of settlements [4], the maturation of woods [3], but also climate change have been suggested as possible causes [5, 8, 9, 13, 14].

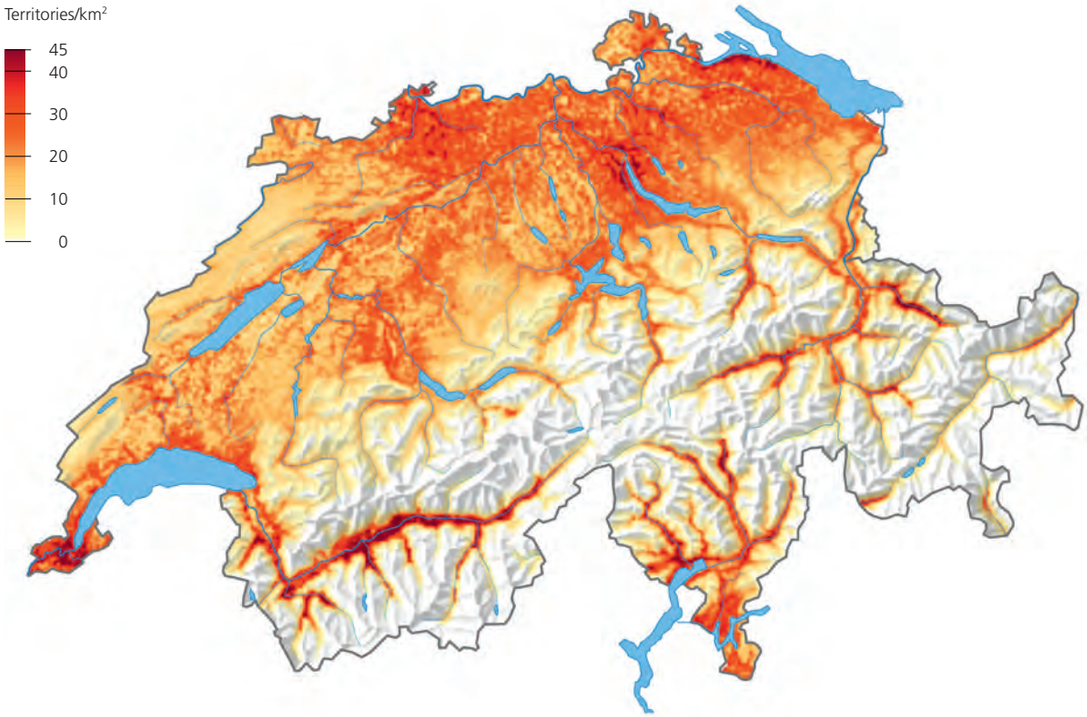
Beat Naef-Daenzer

[1] Antoniazza (2015); [2] Bauer et al. (2005); [3] Brändli (2010a–b); [4] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [5] Naef-Daenzer et al. (2012); [6] Nardelli et al. (2015); [7] Posse (2014); [8] Reed et al. (2013a); [9] Reed et al. (2013b); [10] Robb et al. (2008a); [11] Robb et al. (2008b); [12] Teufelbauer & Seaman (2017); [13] Visser et al. (1998); [14] Visser et al. (2003); [15] Weggler & Widmer (2000b); [16] Weggler & Widmer (2001)





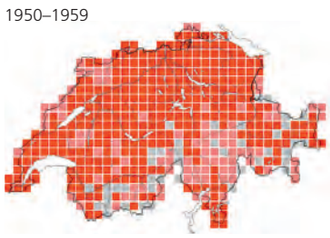
Density 2013–2016



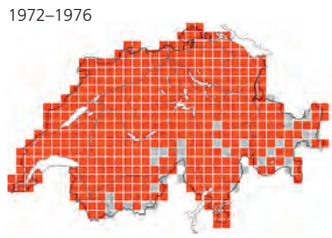
Density change since 1993–1996

Sponsored by
Anonymous donor from Spiez

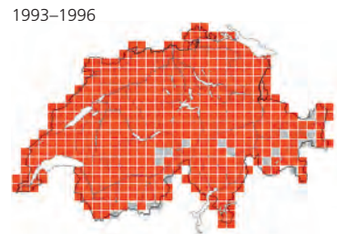
1950–1959



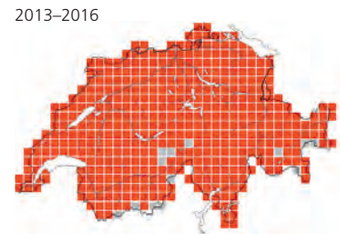
1972–1976



1993–1996



2013–2016



Eurasian Penduline-tit

Remiz pendulinus
Beutelmeise
Rémiz penduline
Pendolino
pendulina

Harry Kählin

Red List Vulnerable (VU)
Population 0–1 pairs (2013–2016)

Focus page 420

The Eurasian Penduline-tit was first recorded breeding in Switzerland in 1952 near Chavornay VD[3]. In the course of a range expansion to the west the species was occasionally found to breed in various lowland wetlands. Until 1979, 1–4 broods were recorded per decade; there were ten broods in 1980–1989 and as many as 13 in 1990–1999. The number of breeding attempts subsequently dropped: after the last two broods in 1999, the species was not suspected of breeding again until 2006 in the Bolle di Magadino TI (R. Lardelli, F. Schneider)[5]. Since then, there has been only one further record of probable breeding: in 2014 near Bürglen TG, a family party with two fledglings was observed calling loudly in a gravel pit with willows near the Thur River (M. Müller)[4]. The occupied habitats are often small and isolated, but always feature a loose vegetation cover of willows, reeds or bulrushes.

The Eurasian Penduline-tit has disappeared again from many areas in western Europe that it colonised in 1960–1990. The French population, for instance, dropped from 100–200 (1999) to 0–5 pairs (2012), and there have been no breeding records since 2009[AtF]. The trends in Germany, Austria and Italy have also been negative since the late 1990s[AtD, 1, 2]. The reasons for the decline are unclear.

Martin Spiess

[1] Brichetti & Grattini (2010a); [2] Dvorak et al. (2017); [3] Meylan (1952); [4] Müller (2015); [5] Volet et al. (2007)

1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016

Sponsored by
Malima-Martha Vetsch, Lutzenberg

Alluvial forests – a paradise for birds

Alluvial forests are shaped by the dynamics of rivers, making them the most species-rich forests in Europe. In the past 200 years, many alluvial forests have been destroyed or their natural dynamics interrupted. Only small areas remain in Switzerland today. Many alluvial forests urgently need to be restored to preserve their biodiversity.

Floodplains are hotspots of biodiversity[6, 7] thanks to the multitude of habitats created and constantly influenced by the flow of water. Floodplains are characterised by a dynamic transition zone between land and water, larger along rivers, narrower along lakes. They typically consist of a shore area with pioneer herbaceous vegetation, the adjoining softwood alluvial forest, which is regularly flooded, and hardwood alluvial forest, further away from the water and less frequently flooded[5].

Since 1850, about 70 % of floodplains in Switzerland have been destroyed, primarily because of river engineering works. Today, about 233 km² of floodplains still exist in Switzerland, fragmented into many small areas[6]. The remaining floodplains are often in poor condition due to the lack of a natural flow regime. Remedial action could come in the form of restoration projects, which have been implemented in various regions since the turn of the millennium[3, 4] and play an increasingly important role in flood protection (e.g. the floodplain near the Thur River mouth ZH).

The annual surveys of the wetland monitoring scheme, conducted in areas with a significant proportion of alluvial forest, provide data on the population trends since 2000 of five species typically associated with alluvial forest. European Turtle-dove, Willow Tit and Willow Warbler have become scarcer since 2000, while the Common Nightingale has increased. The population of Eurasian Golden Oriole remained stable despite some fluctuations. The population trends of these species in the five surveyed areas largely match the trends observed in Switzerland as a whole.

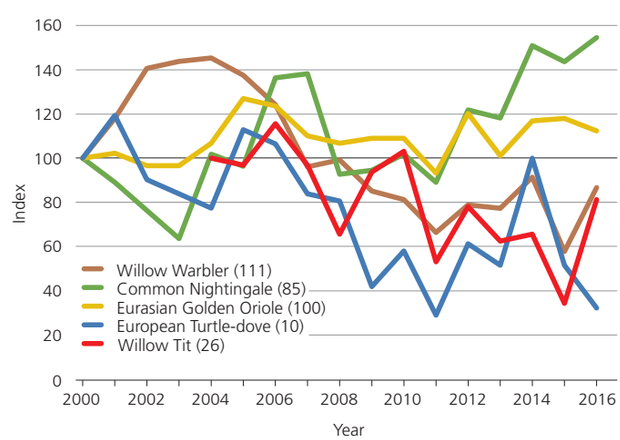
Despite having dwindled to a few small areas in Switzerland, alluvial forests nonetheless continue to be species-rich habitats. In the alluvial forest Aarau – Wildegg AG, for example, observers surveyed 270 ha (234 ha of land), recording 62 bird species with a total of 1633 territories in 2013 and 1871 territories in 2014. In the adjacent area Wildegg – Brugg AG, 315 ha (206 ha of land) accommodated 65 species with 2225 territories in 2015, and 66 species with 2510 territories in 2016[2]. Similarly high numbers of species and territories were found in German alluvial forests in the Naturpark Rheinland. In the same area, density (but not species richness) of birds was higher in hardwood alluvial forest than in other deciduous forests[9].

These examples demonstrate that the remaining alluvial forests still offer excellent conditions for birds. To enhance their potential as habitat, they should be restored to the dynamic systems they once were. Several exemplary projects already exist in Switzerland, such as the Thur River mouth ZH, Pfynwald VS and Auenschutzpark Aargau[1, 8]. Hopefully, many more will follow in the years to come. The 2011 revision of the Federal Act on the Protection of Waters has set the course; the policies must now be put into practice without delay.

Gilberto Pasinelli, Claudia Müller & Pierre Mollet

Claudia Müller

This alluvial forest in the Umiker Schachen AG boasts a rich diversity of habitats including eroded areas along the riverbanks, gravel bars, reed canary-grass, and soft- and hardwood alluvial forests.



2000–2016 population trends for five alluvial-forest birds in five areas with a significant proportion of alluvial forest: Bolle di Magadino TI, Chablais near Galmiz FR, the oxbow lakes of the Glatt River near Oberglatt ZH, Grande Cariçaie and Häftli BE. The base year is 2000 with an index value of 100; the number behind the species name indicates the total number of territories per species in 2016.

[1] Auenberatungsstelle Bern und Yverdon-les-Bains (2001–2008)/Service conseil Zones alluviales Berne et Yverdon-les-Bains (2001–2008); [2] Auenschutzpark Aargau, unpubl.; [3] Cosandey & Rast (2017); [4] Hanus et al. (2014); [5] Imboden (1976a–b); [6] Lachat et al. (2010–2011); [7] Rust-Dubié et al. (2006); [8] Schelbert (2015); [9] Zenker (1980)

Species pages 158, 310, 349, 404, 462

Woodlark

Lullula arborea
Heidelerche
Alouette lulu
Tottavilla
Iodola da pastgira

Dennis Lorenz

Red List Vulnerable (VU)
Population 250–300 pairs (2013–2016)

Focus pages 402, 484, 506, 532

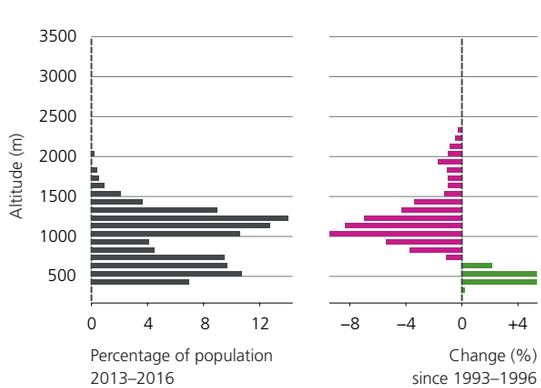
In Switzerland, the Woodlark breeds mainly in the Jura, in the Randen range SH, and on the southern slopes of central and Upper Valais. It occupies semi-open, richly structured and sunny habitats on dry or well-drained ground, often with a good view of the surroundings. Other habitat requirements include an ample supply of song perches, bare ground, and low or patchy vegetation[3, 7]. The Woodlark finds suitable habitat in shrubby steppes, vineyards and low-intensity pastures, where it breeds in low densities. Only on the military training grounds in Bure JU and in some vineyards in Valais and the Canton of Geneva does density reach 5–6 territories/km^2. The rest of the Swiss population occurs in the montane zone up to 1500 m, though singing males are occasionally observed up to 2300 m, often relatively late in the season, as was the case near St-Luc VS (B.-O. Demory). These observations may relate to second broods of birds which first bred at lower altitude[6].

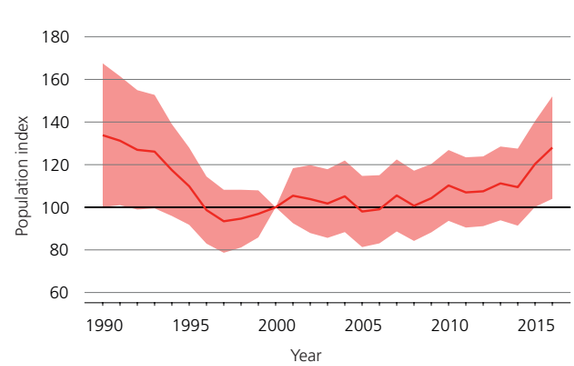
Following a population collapse that lasted until the late 1990s, the current trend is slightly positive. However, increases in the vineyards in central Valais, in the Canton of Geneva and in the Randen range are offset by declines in most of the Jura[2, 10]. Italy reports a slight upward trend[8], while trends in Austria[9], the mid-elevation ranges of Germany[AtD, 5] and several parts of northern France[AtF] are negative.

Since the mid-20th century, the Woodlark has increasingly faced habitat loss in Switzerland. Today, intensification of agriculture threatens its remaining strongholds at mid-elevation[1, 2, 10, 12]. Additional pressure comes from the construction of wind-power plants on the Jura ridges and the spread of settlements in the vineyards of the Valais. To secure the survival of the Woodlark in Switzerland, the loss of low-intensity pastures to intensified agriculture or forest encroachment must be halted. Further measures include habitat improvement by creating wildflower strips and patches of ground vegetation in vineyards[3, 4, 11].

Nadine Apolloni

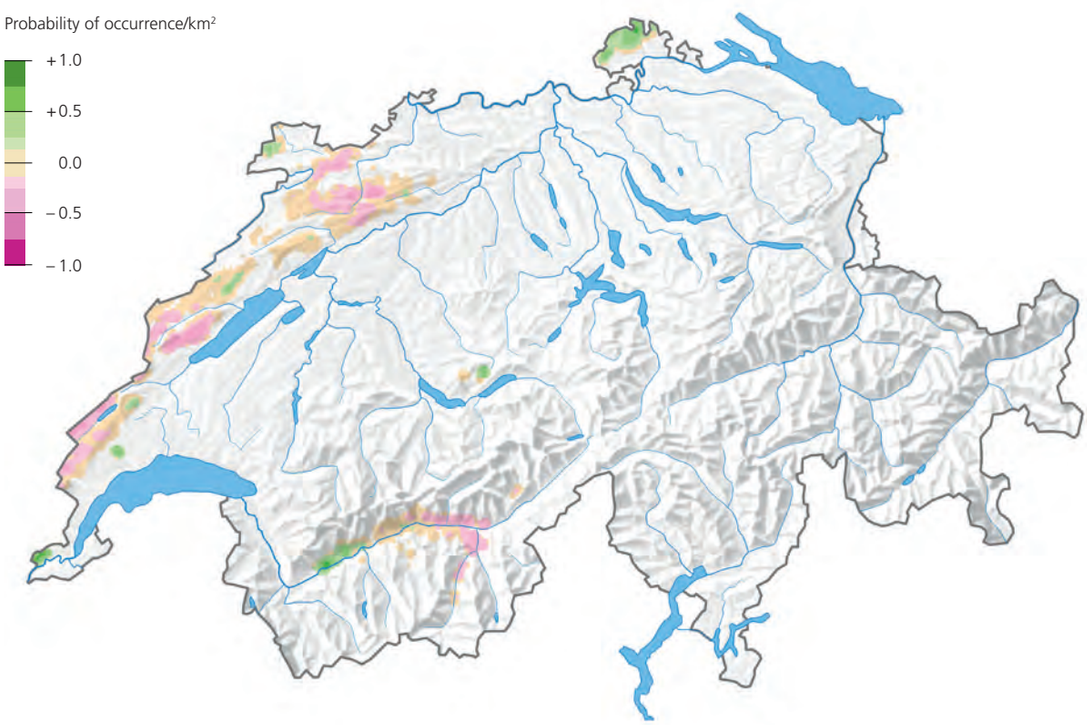
[1] Apolloni et al. (2017); [2] Apolloni et al. (2018a); [3] Arlettaz et al. (2012); [4] Barbalat & Juat (in prep.); [5] Bauer et al. (2016a); [6] Brambilla et al. (2012); [7] Bühler et al. (2017); [8] Campedelli et al. (2012); [9] Dvorak et al. (2017); [10] Gerber et al. (2006); [11] Schaub et al. (2010b); [12] Widmer (2000)





Occurrence 2013–2016

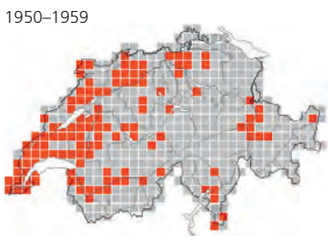
Occurrence change since 1993–1996



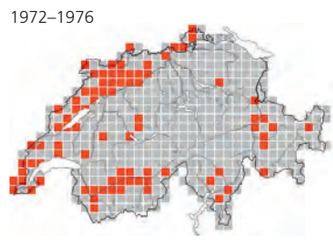
Sponsored by

Turdus Vogel- und Naturschutzverein, Schaffhausen

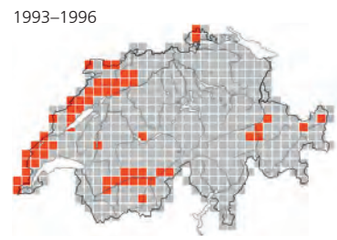
1950–1959



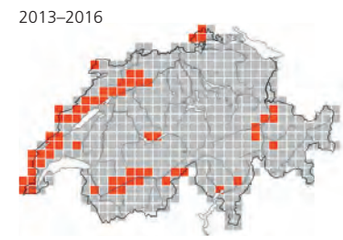
1972–1976



1993–1996



2013–2016



Eurasian Skylark

Alauda arvensis
Feldlerche
Alouette des champs
Allodola
Iodola da prada

Mathias Schäf

Red List Near Threatened (NT)
Population 25 000–30 000 pairs (2013–2016)

Focus pages 362, 402, 414, 428, 478, 484, 506

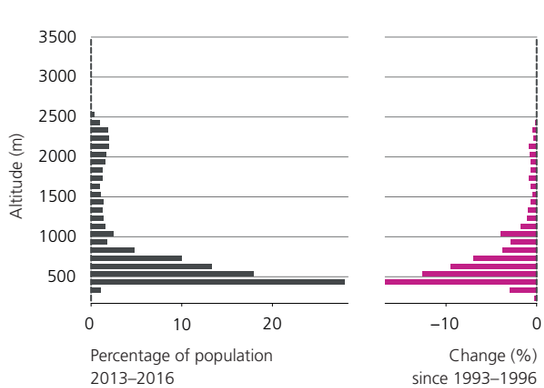
In Switzerland, the Eurasian Skylark now mainly breeds in dry cereal-growing areas in the western part of the Plateau, the Ajoie JU and the Klettgau SH at 400 to 800 m. It also inhabits Alpine regions. Remarkably high densities are reached on some plateaus at around 2000 m, for example on Schamserberg GR, where up to five territories/10 ha were recorded locally [1]. The highest breeding records came from 2460 m near Evolène VS (M. Thélin) and 2420 m near Albinen VS (S. Stöckli). The highest singing males were recorded at 2860 m near Zinal VS [VdS] and more recently at 2790 m near Zermatt VS (C. Huwiler). Originally a species of the steppes, the Skylark inhabits open, vast landscapes and avoids vertical structures (woods, settlements and overhead power lines). It favours relatively short and sparse vegetation, and birds in the valley bottoms breed almost exclusively on arable land. Intensive grassland management with frequent mowing makes it increasingly difficult for breeding to succeed even at higher altitudes [2, 9]. In Alpine areas, the Skylark favours vast meadows and open hilltops.

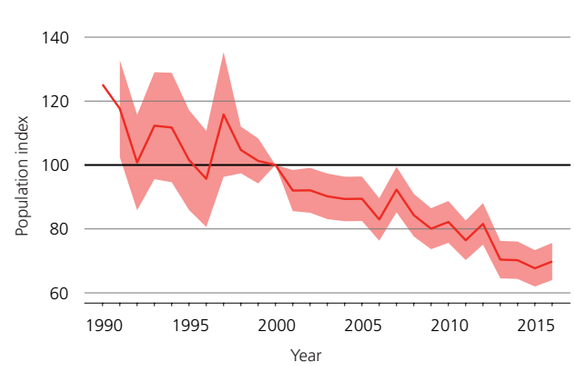
Since 1993–1996, the range of the Skylark has continued to contract, and density has decreased almost everywhere [AtBo, AtZH, 3, 6, 10, 11, 15]. On the Central Plateau, density is now about ten times lower than it was around 1990 [AtCH2, 13]. Numbers have dwindled at all altitude levels. Regional surveys revealed declines of 50 to 77 % since 1990 [10, 11]. In the Canton of Zurich, the population decreased by 54 % from 2008 to 2017 [12]. Losses have occurred at higher altitudes as well, as illustrated by the 44 % decline in the Engadine GR between 1988 and 2010 [9].

The main cause for the negative trend observed throughout Europe (decline of more than 50 % since 1980) [EBCC] is intensified land use associated with agriculture but also urbanisation [4]. Conservation measures for the Eurasian Skylark therefore need be designed with spatial planning considerations in mind. Remaining expanses of open farmland must be protected from building development and fragmentation. At the same time, there is an urgent need for large-scale conservation measures on arable land (e.g. creation of wildflower plots and rotational fallows, widely spaced crop rows, nurse crops etc.) [5, 8, 14]. Contracts with farmers to delay mowing can help to protect nests in meadows [7, 8].

Judith Zellweger-Fischer

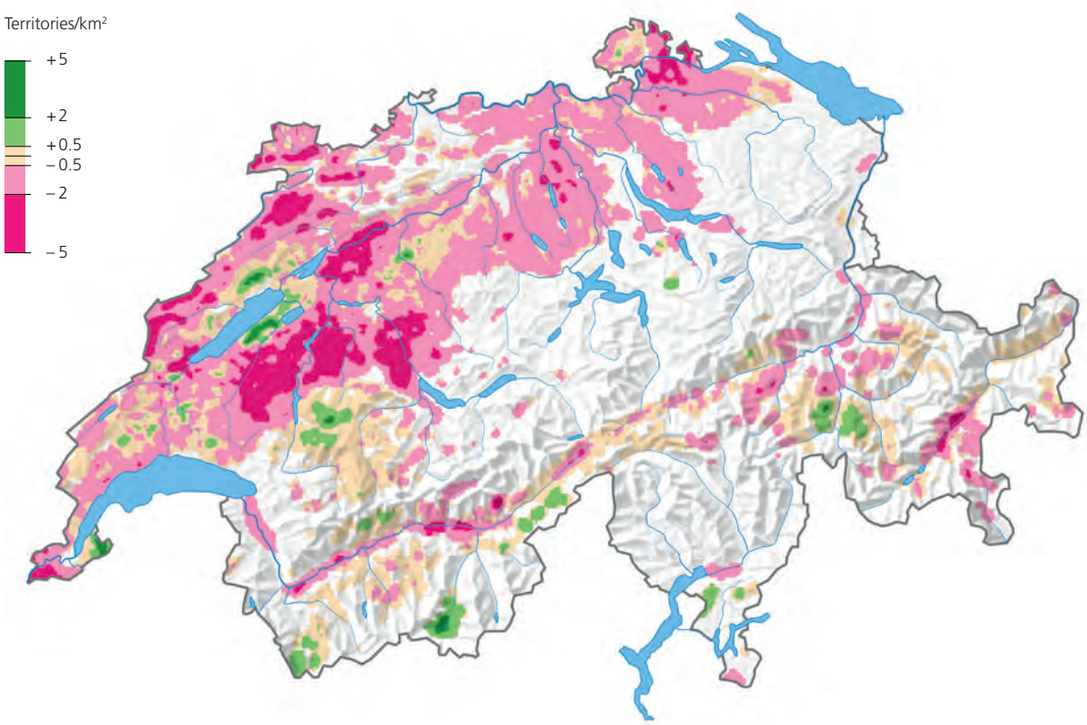
[1] Aelvoet et al. (2016); [2] Beaud & Beaud (2018); [3] Berger-Flückiger et al. (2008b); [4] Bundesamt für Raumentwicklung (2014); [5] Fischer et al. (2009); [6] Glutz von Blotzheim (2007a); [7] Graf et al. (2014d); [8] Jenny et al. (2014a–b); [9] Korner et al. (2017); [10] Martinez & Birrer (2017); [11] Müller & Ernst (2014); [12] Müller & Weggler (2018); [13] Schläpfer (1988); [14] Schmidt et al. (2017); [15] Sierro et al. (2009)





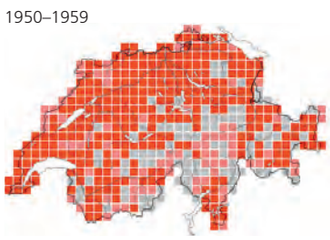
Density 2013–2016

Density change since 1993–1996

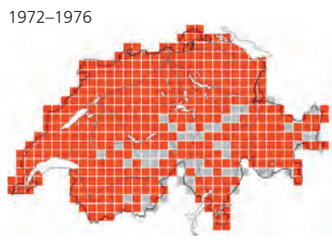


Sponsored by
Alex Schläpfer
Urs-Peter Stäuble

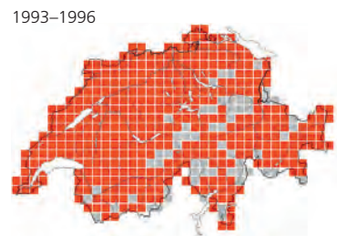
1950–1959



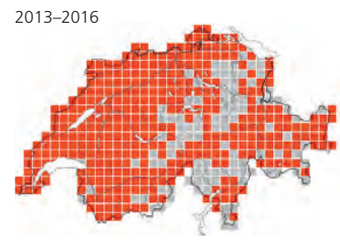
1972–1976



1993–1996



2013–2016



The spread of settlements has consequences for farmland birds

Settlements have continued to expand in Switzerland since the 1990s. Some birds cope well with this trend, finding suitable habitat in built-up areas. Others, especially farmland birds, have declined considerably as settlements have spread and the surrounding land has been put to intensive use.

Settlement area in Switzerland is steadily increasing, especially on the Central Plateau and easily accessible valley plains, growing by 0.8 % every year from 1997 to 2009[2]. Contrary to the declared political intent, construction regularly occurs outside of building zones, sometimes even in landscape conservation zones[7]. According to the 2004–2009 land-use statistics, almost 38 % of total settlement area lies outside of the building zones[6].

Expanding settlements, fragmented landscapes

89 % of new settlement areas were built on farmland, predominantly on meadows (32.8 %) and arable land (31.5 %). Orchards, vineyards and gardens (13.5 %) were also used. Woodland was less affected in comparison (9.1 %)[2], one reason being that forests benefit from better legal protection than farmland.

The growth of settlements goes hand in hand with the fragmentation of landscapes. The vast agricultural landscapes of the past are now interspersed with roads, buildings and industrial complexes, but also livestock-fattening units, greenhouses and covered crops, and have lost their open character. The spread of settlements accelerated between 1960 and 1980, before slowing down again between then and 2002. From 2002 to 2010, the annual increase in urban expansion accelerated again, reaching three times the rate of 1980–2002[8]. At the same time, cultivation of the remaining farmland has intensified. The practice of covering crops with plastic sheeting has also increased, and many dirt roads have been paved. Habitat loss is aggravated by disturbance, caused in particular by the increased presence of humans and a range of leisure activities that claim more and more space. All in all, these changes predominantly affect farmland birds.

Markus Jenny

The expansion of settlements often results in the loss of valuable habitats such as orchards or low-intensity pastures.

Habitat loss in and around settlements

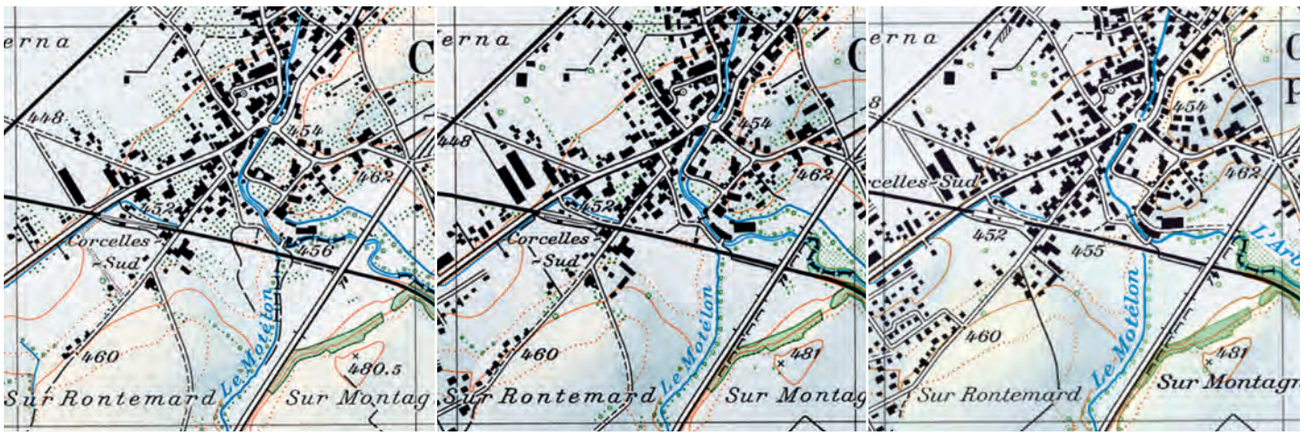
Many ecologically valuable habitats in the transition zones between settlements and farmland (e.g. orchard belts) have been lost to building development, leading to the decline of birds with a preference for this type of habitat (e.g. Eurasian Wryneck, Common Redstart, Spotted Flycatcher).

A spatial-planning strategy that counteracts fragmentation is greater building density. However, densification puts remaining semi-natural green spaces within settlements at risk, such as trees or old gardens. Nowadays, 60 % of surfaces in settlements are impervious, which is another reason why species richness (e.g. of vascular plants) in settlements has continued to decrease in the last ten years[1]. Nevertheless, species richness (e.g. birds, vascular plants and mosses) is often higher in settlements than in the adjacent farmland[1]. Still, in Switzerland as a whole, the dominant process of urbanisation is resulting in the homogenisation of biodiversity[5].

Expansion of settlements and decline of farmland birds: an example

Landscape change often happens gradually and locally[4, 6]. The effects on bird communities are serious, but not always evident based on the data from the kilometre squares (1 × 1 km) surveyed for the 1993–1996 and 2013–2016 atlases. Many agricultural areas were already farmed so intensively 20 years ago that several species were only found in low densities in large parts of the Central Plateau (e.g. Common Cuckoo, Eurasian Skylark, Common Redstart) or had disappeared completely (e.g. Grey Partridge, Whinchat). A general comparison of survey results from 1993–1996 and 2013–2016 therefore fails to reflect the seriousness of the situation. The following example helps to illustrate the development.

The two municipalities Corcelles-près-Payerne VD and Payerne VD have expanded considerably over the past 20 years and have now practically grown together. The population of the two towns increased by 39 % and 28 %, respectively, between 1995 and 2015[3]. In the surveyed kilometre square, a new residential area was built during this time period and many old trees, copses and hedges were lost. Between 1995 and 2015, several bird species that occupy such transitional habitats declined steeply or disappeared completely. Within 20 years, the overall number of species dropped from 48 to 31. Only three new species were recorded: Black Kite, Common Kestrel and Great Spotted Woodpecker.



Corcelles-près-Payerne VD in 1972 (left), 1996 (centre) and 2013 (right). In the lower left corner, a whole new neighbourhood was built, with construction mainly taking place between 1996 and 2013. The expansion of built-up area led to the loss of trees, copses and hedges. Reproduced with permission of swisstopo (BA180142).

The substantial loss of species can be explained by the disappearance of undeveloped space, but also by the intensified use of the remaining land (e.g. larger plots, fewer field margins). As a result, open areas consist almost exclusively of intensively managed farmland for forage crops and a few tall hedges. In addition, gardens in new housing developments are young and offer few near-natural structures, only attracting species with simple habitat requirements.

Species	Number of territories 1995	Number of territories 2015	Trend in Switzerland 1990–2016
Common Woodpigeon	1	5	+
Eurasian Collared-dove	4	16	+
Common Swift	8	5	=
Red-backed Shrike	2	0	–
Eurasian Jay	2	0	+
Carrion Crow	7	10	+
Eurasian Blue Tit	6	8	+
Eurasian Skylark	4	0	–
Marsh Warbler	4	0	=
Northern House Martin	8	18	–
Common Chiffchaff	5	0	+
Garden Warbler	6	0	–
Common Whitethroat	5	0	=
Short-toed Treecreeper	3	1	+
Fieldfare	7	0	–
Spotted Flycatcher	5	0	–
Common Nightingale	4	0	+
Black Redstart	10	16	=
White Wagtail	7	4	=
European Greenfinch	8	6	=
European Goldfinch	3	1	–
European Serin	4	2	=
Yellowhammer	10	1	+

Changes in the number of territories of selected breeding birds in the kilometre square of Corcelles-près-Payerne VD in 1995 and 2015 and the overall Swiss trend. The list includes species that either lost or gained at least two territories. Species in bold print also breed in the transition zone between farmland and settlements. Trends are shown as positive (+), negative (–) or no trend (=), «no trend» meaning that no statistically significant change was registered.

Future prospects?

Agricultural and natural landscapes urgently need to be protected and their ecological value restored, and they must at least partly remain untouched by human use. For some time now, there have been attempts to slow the expansion of settlements and prevent fragmentation by means of spatial-planning legislation, cantonal structure plans, and building and zoning codes. Municipalities have a particularly important responsibility in this respect.

Open spaces and areas of high ecological value in particular should be preserved in settlements, or replaced if they are used for construction. Useful measures include compiling an inventory of objects to be preserved, a practice that some municipalities have already adopted. Special attention should be given to construction outside of building zones, where building continues despite legal regulations that prohibit it.

Judith Zellweger-Fischer

[1] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [2] Bundesamt für Statistik (2013a)/Office fédéral de la statistique (2013a)/Ufficio federale di statistica (2013)/Swiss Federal Statistical Office (2013); [3] Bundesamt für Statistik (2018)/Office fédéral de la statistique (2018)/Ufficio federale di statistica (2018); [4] Ewald & Klaus (2009); [5] Knop (2016); [6] Rey et al. (2017a–b); [7] Schwick et al. (2011a–b); [8] Schwick et al. (2013)

Species pages 102, 174, 268, 280, 300, 302, 312, 360, 376, 416, 426, 456, 462, 470, 476, 558

Crested Lark

Galerida cristata
Haubenlerche
Cochevis huppé
Cappellaccia
Iodola da la cresta

Eduard Germann

Red List Regionally Extinct (RE)
Population 0 pairs (2013–2016)

Focus page 319

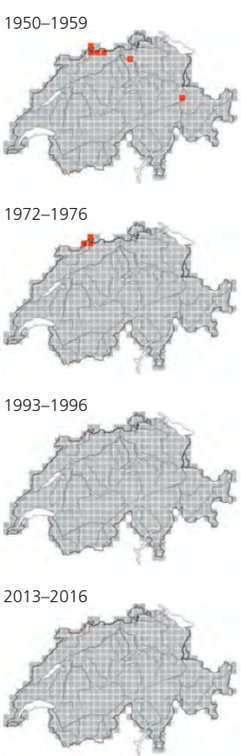
The range of the Crested Lark extends from western Africa to southern, central and eastern Europe and further to Asia. As a result of the Europe-wide population decline since the 1930s [EBBA1], the species no longer breeds in Switzerland. The last confirmed breeding record dates back to 1976 in Basel, where occasional observations continued until 1989 [VdS, 3]. The only more recent observation during the breeding season relates to a singing male in a vineyard in the Bündner Herrschaft in spring 2010 (R. Kunz et al.) [5].

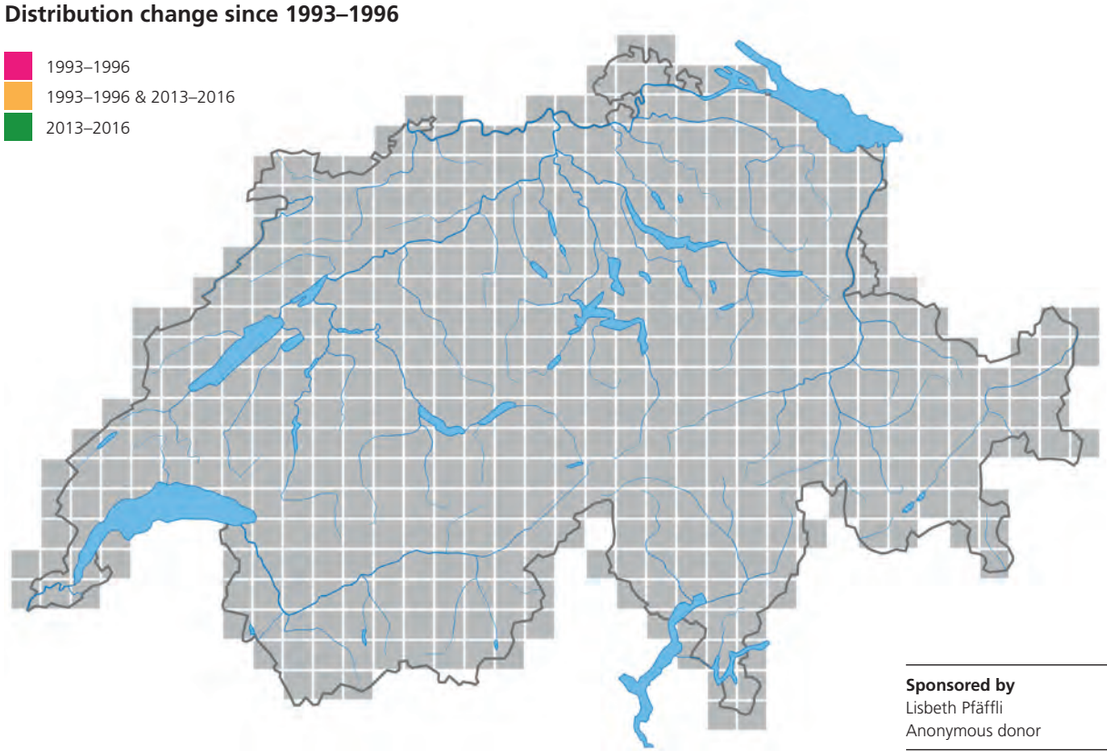
In Europe, the Crested Lark inhabits open landscapes with sparse vegetation, such as ruderal habitats or industrial wasteland. The species is thought to have become scarce due to the loss of these habitats to intensified agriculture and construction [RLEU]. This is true in Germany, for example, where declines have been accompanied by a range contraction; today, the species mainly breeds in the northeast of the country and in the Upper Rhine Valley [AtD]. In France, the population has been stable since 2001, following a decline in the second half of the 20th century [AtF]; in Alsace, by contrast, the population decreased by 50 % between 1996 and 2011 [4]. Numbers appear to be stable in Italy and Austria, at least in the short term [1, 2].

Bernard Volet

[1] Campedelli et al. (2012); [2] Dvorak et al. (2017); [3] Hegelbach et al. (2003); [4] Muller et al. (2017); [5] Wassmer & Haag (2011)/Wassmer et al. (2011)

Distribution change since 1993–1996





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Anonymous donor

Monitoring birds in Switzerland

In the 1980s, the Swiss Ornithological Institute launched a range of monitoring schemes that are carried out with the help of volunteers. The data serve to calculate breeding bird indices from 1990, which in turn allow us to assess long-term trends. Every 20 years, a breeding bird atlas describes the distribution of all breeding species.

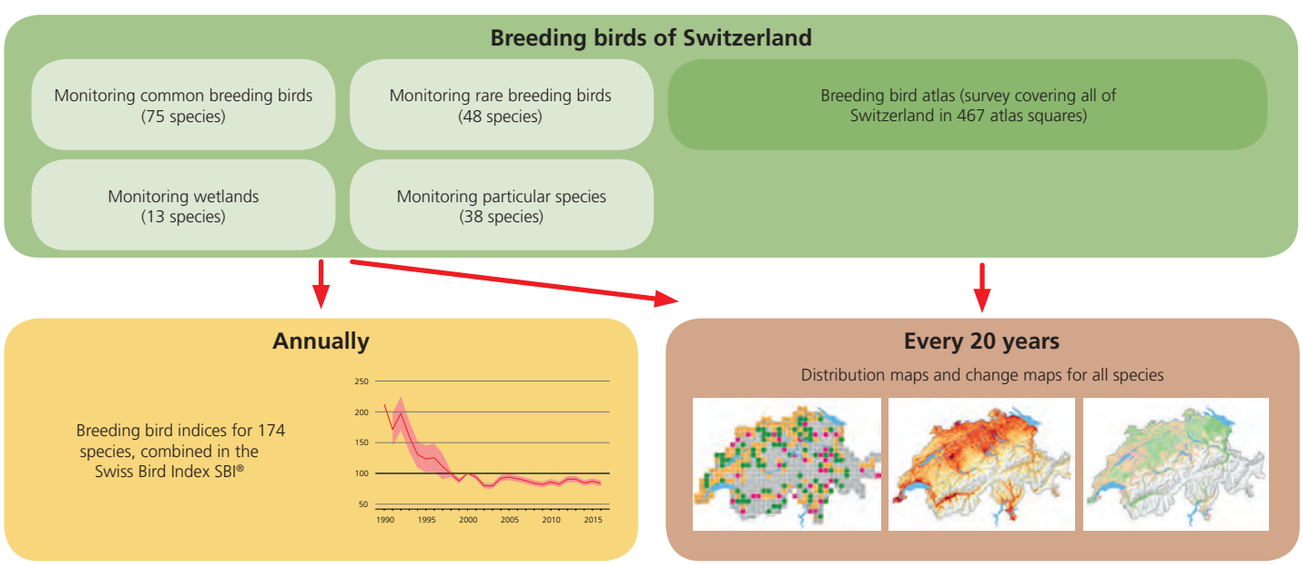
A species' population trend depends on many factors that take effect on different time scales. Short-term weather-related fluctuations, for example, determine increases and declines from one year to the next. Such annual variations can only be distinguished from actual, long-term trends with the help of long time series[3, 7]. The objective of the Swiss monitoring schemes is to distinguish these short-term fluctuations from actual changes in a population. Long-term population trends are often caused by human influences. Identifying such trends as early as possible is important so that remedial action can be taken when necessary. Most of the time, however, follow-up studies are needed to identify the reasons for population changes[5, 6].

To accomplish its monitoring objective, the Swiss Ornithological Institute documents the trends of native and regular breeding birds with surveys that are as representative as possible. Currently, we are able to calculate annual population indices for 174 species out of 177, not including introduced species (e.g. Mute Swan, Ruddy Shelduck)[4, 8]. The individual species indices are combined to produce the Swiss Bird Index SBI®, which documents the overall situation of breeding birds since 1990. The SBI® has been integrated into various national statistics[1, 2].

Moreover, a breeding bird atlas has been published every 20 years since 1972–1976. The atlas describes in detail the distribution of all breeding bird species in Switzerland. In addition to the regular breeding birds, irregular breeders and non-native species are surveyed as fully as possible in a grid of 467 squares measuring 10 × 10 km, so-called atlas squares. Territory mapping surveys in more than 2300 kilometre squares (1 × 1 km) allow us to generate detailed density or distribution maps for many species; change maps document the changes that have taken place since 1993–1996.

The combination of annual monitoring efforts and periodic atlas projects provides us with a wealth of information, unique in its kind, on the state of bird communities in Switzerland and their trends. This detailed body of knowledge can only be maintained thanks to the long-standing commitment of more than 2000 volunteers.

Thomas Sattler



174 regular breeding birds are currently monitored annually in Switzerland; at 20-year intervals, all breeding species are surveyed to produce the breeding bird atlas.

[1] BAFU & BLW (2016)/OFEV & OFAG (2016); [2] BFS et al. (2016)/OFS et al. (2016)/UST et al. (2016)/FSO et al. (2016); [3] Magurran et al. (2010); [4] Sattler et al. (2017e–h); [5] Spaar et al. (2012a–b); [6] Sutherland et al. (2004); [7] Turchin (2003); [8] Zbinden et al. (2005b)

Bearded Reedling

Panurus biarmicus
Bartmeise
Panure à moustaches
Basettino
maset barbet

Markus Varesvuo

Red List Vulnerable (VU)
Population 80–110 pairs (2013–2016)

Focus pages 319, 380

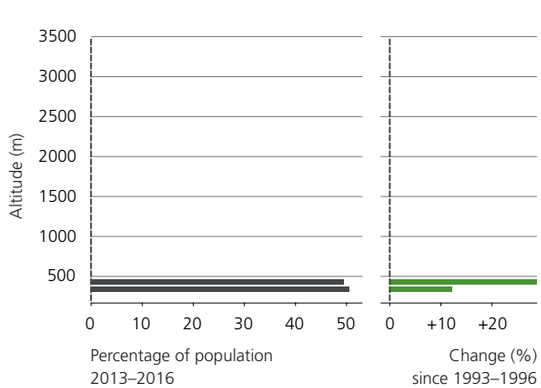
The fragmented breeding range of the Bearded Reedling in Europe is a result of the species' ability to rapidly colonise new areas. In Switzerland, too, where it mainly inhabits several large (at least 5 ha) and permanently flooded reedbeds on Lake Constance and Lake Neuchâtel, populations are characterised by a dynamic relationship between colonisation, winter survival rate and waves of emigration (e.g. due to flooding). Near Chevroux VD, the average density was 12 pairs/10 ha in 2010–2016[2].

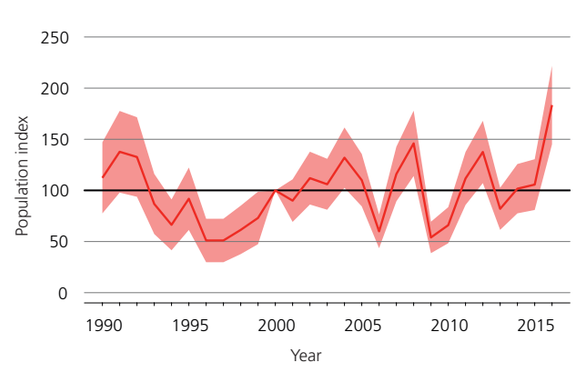
The Bearded Reedling is quite a recent breeder in Switzerland. Breeding was first confirmed in the Grande Cariçaie in 1976[3] following the substantial increase in the Dutch population from the 1950s[HVM, VdS]. In the subsequent expansion phase, which peaked in 1992, the Bearded Reedling colonised the entire southern shore of Lake Neuchâtel before numbers dropped to the lowest level since the late 1970s in 1996[AtCH2]. Since then, there has been a significant increase despite large fluctuations. On the southern shore of Lake Neuchâtel, 24–66 territories were counted annually from 2000 to 2016[2, 8]. In the Lake Constance area in 2013–2016, 41–80 territories were counted in Wollmatinger Ried D, 3–8 territories in the Rhine delta A, and 1–3 territories at Radolfzeller Aachmündung[6, 7]. The population that occupies the Heideweg BE on Lake Biel fluctuated between two and ten pairs after 2002[8] before increasing to 19 territories in 2015 and to 31 territories in 2016 (P. Mosimann-Kampe)[10]. Recently, the Bearded Reedling has colonised wetlands in areas other than the two large lakes: Neeracherried ZH (2014), Chavornay VD (2015), Klingnau reservoir AG (2015), and Greifensee ZH (2016)[8, 9, 10]. In 2015, these movements appear to have been produced by flooding on Lake Neuchâtel causing many birds to relocate.

Trends are also positive with large fluctuations in Germany and France[AtD, AtF], but negative in Austria and Italy[5, 11]. The Bearded Reedling is concentrated in just a few sites, and these should be managed at low intensity, as reedbeds are only colonised in high densities in the third to sixth year after cutting[4]. We may see fewer population collapses in the future due to milder winters.

Sylvain Antoniazza & Michel Antoniazza

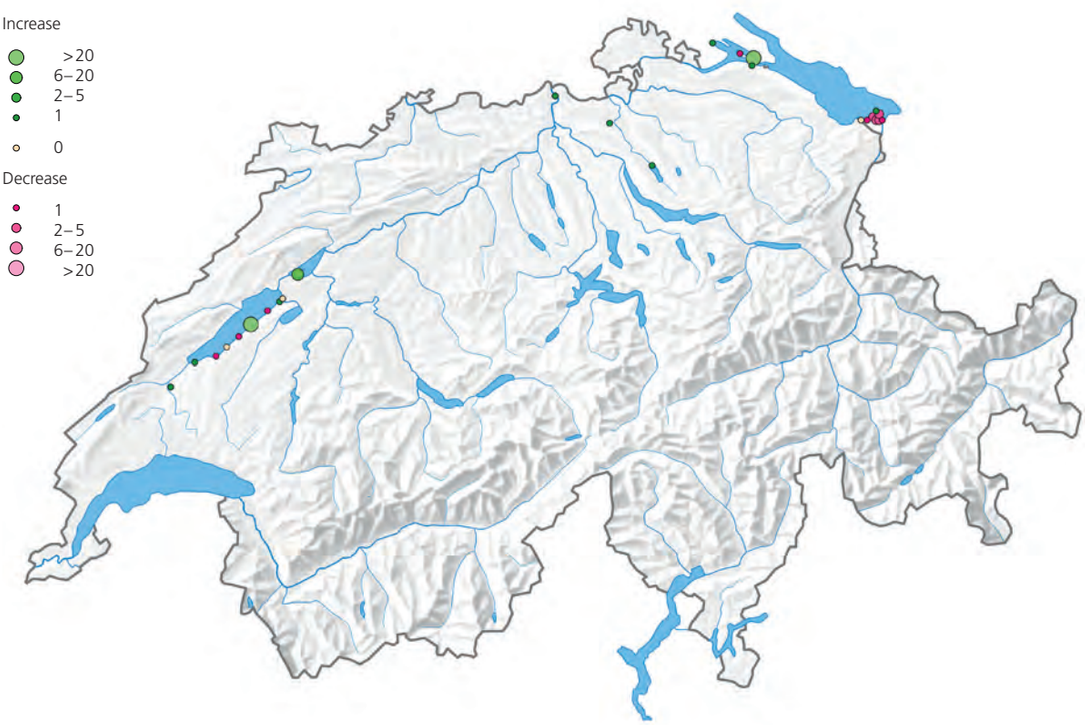
[1] Antoniazza (2016a); [2] Antoniazza (2018); [3] Antoniazza & Lévêque (1977); [4] Antoniazza et al. (2018); [5] Dvorak et al. (2016); [6] Knaus et al. (2014); [7] Knaus et al. (2016a); [8] Müller (2015); [9] Müller (2016); [10] Müller (2017); [11] Nardelli et al. (2015)





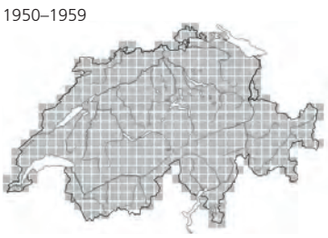
Territories 2013–2016

Change in the number of territories since 1993–1996

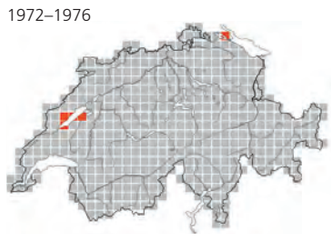


Sponsored by
Gabriela W.

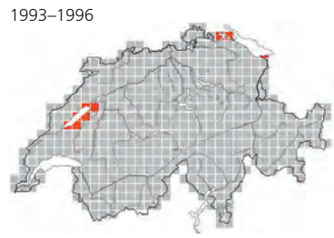
1950–1959



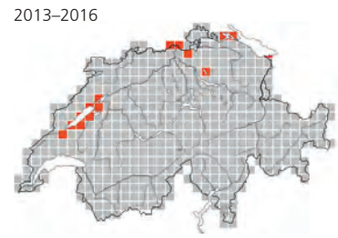
1972–1976



1993–1996



2013–2016



Zitting Cisticola

Cisticola juncidis
Zistensänger
Cisticole des joncs
Beccamoschino
channarel da la cua lada

Markus Varesvuo

Red List –
Population 0–2 pairs (2013–2016)

Focus page 425

The Zitting Cisticola occurs on several continents, in Europe mainly in the Mediterranean region. It makes irregular appearances in Switzerland in the course of range expansions, though these are constrained by harsh winters. In our country, the species inhabits open wetlands with tall grass. Breeding has been recorded three times: in Les Grangettes VD in 1975 and 2001, and in the Magadino Plain TI in 1975 [VdS].

Within the area covered for the atlas, the Zitting Cisticola successfully bred near Lustenau A in 2015, resulting in the first breeding record in Austria [5]. The record occurred in the context of influxes into Switzerland from 2014 onward, following a five-year absence. Singing males were observed in two places in 2014 [2], in one in 2015 [3], in three in 2016 [4] and in two in 2017. Like in the past [VdS], these were mainly summer and autumn sightings.

The European population trend fluctuates widely, but is considered constant [EBCC]. Numbers declined slightly in France in 2001–2012, mainly due to a series of cold spells [AtF]. In Italy, in contrast, the population increased by 48 % between 2000 and 2011 [1].

Bernard Volet

[1] Campedelli et al. (2012); [2] Marques & Thoma (2015)/Marques et al. (2015); [3] Martinez & Maumary (2016a–b); [4] Maumary & Mosimann-Kampe (2017)/Maumary (2017); [5] Ulmer (2017)

1950–1959

1972–1976

1993–1996

2013–2016

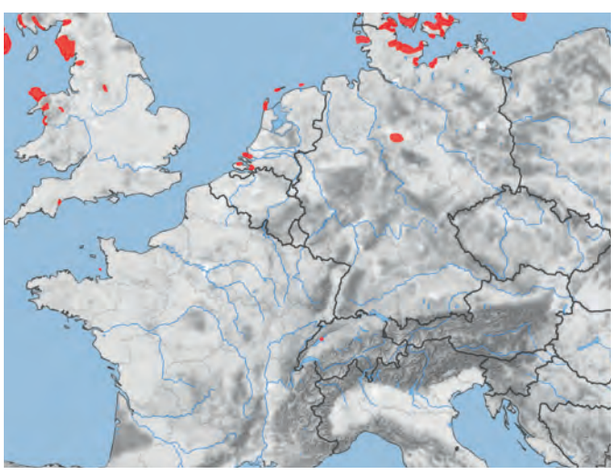
Territories 2013–2016

Sponsored by
Corinne Gianola, Dübendorf

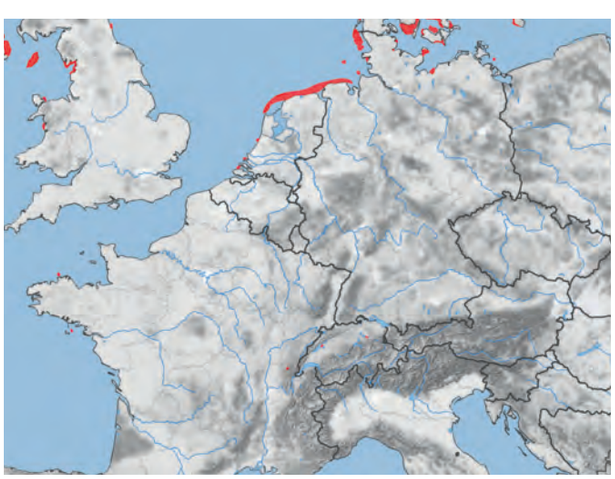
Unexpected breeders

The distribution of breeding birds is in constant flux. Occasionally, birds that normally breed far from Switzerland will temporarily or permanently settle in central Europe – a dynamic that never fails to surprise and fascinate birdwatchers and scientists alike.

Located at the heart of Europe and at the intersection of several biogeographical regions, Switzerland has a remarkably high species richness. This is especially true for ducks, some of which spend the summer here after wintering in Switzerland, or even breed here. Often, these species reach the periphery of their breeding range in Switzerland – Common Teal, Garganey, Northern Shoveler and Ferruginous Duck, for example. Such events are more spectacular when they involve typical maritime species. The Common Eider, a characteristic bird of northern European coasts, significantly increased its wintering population in Switzerland in the 1970s and 1980s. After several influxes, small groups began to spend the summer here. Breeding was confirmed for the first time in 1988 and occurred almost every year from 1992 onwards, albeit in small numbers, a situation that is unique in central Europe.



Distribution map for the Red-breasted Merganser: They normally occur on the coasts of northern Europe. Lake Neuchâtel is the species' southernmost breeding site in central Europe.



Distribution map for the Common Eider: Switzerland lies far from the species' habitual breeding and wintering grounds. Nevertheless, the Common Eider is a regular passage migrant and winter visitor, and has bred here almost every year since 1992.

Red-breasted Merganser and Arctic Tern are also native to the north. Nevertheless, they have bred irregularly in the Fanel nature reserve BE/NE since 1993 and 2014, respectively[7, 8]. For both species, it is their southernmost breeding site. A mixed pair of Arctic and Common Tern bred in the Rhine delta A in 2010–2013[1]. The Common Shelduck first bred in Switzerland in 1998[5] and has regularly bred on Lake Geneva since 2011, far away from the nearest larger populations.

Besides species that established themselves for longer periods, isolated cases of breeding occurred by birds whose colonisation process is known to be quite dynamic. Among them are Greater Short-toed Lark, Citrine Wagtail, Black-winged Stilt and Greenish Warbler[3, 4, 6, 9]. Some have only bred in Switzerland once, but others may attempt to breed again in the near future. Finally, Eurasian Dotterel and Red-spotted Bluethroat are special cases, forming small breeding populations in the central and eastern Alps, far from the northern European tundra[2, 10].

It is hardly possible to find a common denominator to explain the presence in Switzerland of species with such different population dynamics. But these cases illustrate that individual pioneers, possibly responding to environmental changes, play an important role in the colonisation of a region. Such events have certainly always occurred, but they are now easier to detect and investigate thanks to the increased popularity of field ornithology, improved tools to identify birds, and the much faster dissemination of reports. Birdwatchers can look forward to more thrilling surprises in the years to come.

Jérémy Savioz

[1] Bruderer (2014); [2] Cereda & Posse (2002); [3] Curchod et al. (1990); [4] Glutz von Blotzheim (1997); [5] Knaus (2000); [6] Maumary & Schneider (2018); [7] Monnier (1995); [8] Müller (2015); [9] Müller & Volet (2014); [10] Müller-Derungs et al. (2014)

Species

pages 118, 119, 126, 133, 136, 137, 139, 204, 205, 228, 408, 460, 513, 574

Melodious Warbler

Hippolais polyglotta
Orpheusspötter
Hypolaïs polyglotte
Canapino comune
beffarel poliglot

Mathias Schäf

Red List Near Threatened (NT)
Population 300–350 pairs (2013–2016)

Focus pages 276, 284, 319

The Melodious Warbler breeds in North Africa and Europe, south of a line extending from Belgium to Croatia. In Switzerland, at the periphery of its range, the species is concentrated in the low-lying areas of the cantons of Geneva, Vaud, Valais and Ticino. More than 90 % of the Swiss population occurs below 600 m, though singing males have been heard during the breeding season up to 1600 m near Bedretto TI[AtCH2], at 1490 m near Santa Maria Val Müstair GR (H. Gehler) and at 1460 m near Jeizinen VS (M. Freiburghaus).

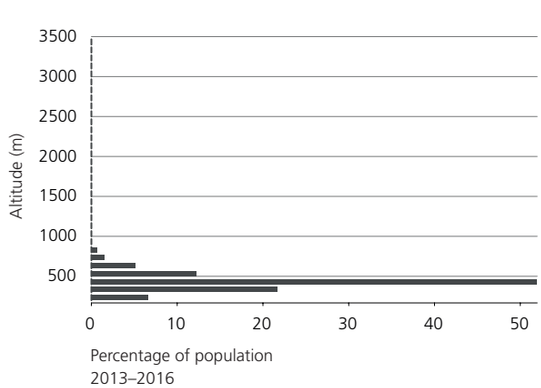
The Melodious Warbler favours open, shrubby habitats with a southern exposure. Breeding habitat consists of grassy slopes with scattered thickets, vineyards with low hedges, young plantations, or patches of fallow land with few shrubs. The highest densities are reached in the farming areas of the Champagne genevoise (maximum of 69 territories/6.13 km^2 2011; B. Lugrin)[6], where it benefits from a dense mosaic of older wildflower strips (5–10 years)[AtGE].

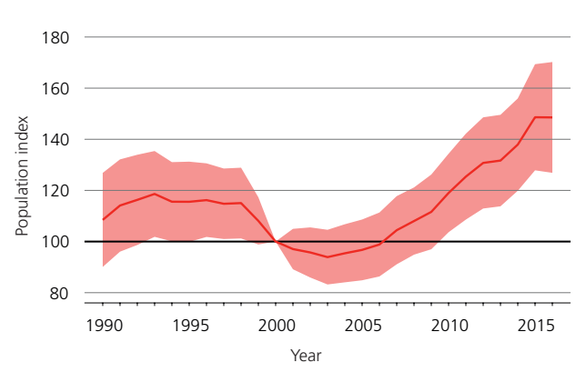
In the course of the past 20 years, the species has continued to spread to the northeast, an expansion that first became apparent in the late 1950s[AtCH0]. The Melodious Warbler has since become established in the Rhine Valley and increased its presence in the western parts of the Central Plateau and around Basel. It is even occasionally seen in the Jura. The expansion has resulted in an increase of almost 30 % since 1993–1996. After some initial variation in trends, the populations in France, Italy, Germany and the rest of Europe have all increased in the 21st century[AtD, AtF, EBCC, 7].

Although the observed expansion to the northeast corresponds with predictions based on climate models[ClimAt], the influence of climate change on this warmth-loving species is controversial[1, 2]. Rather, its success is attributed to habitat changes in the wintering sites or complex genetic and physiological interactions in the contact zones with the Icterine Warbler, which is losing ground[1, 2, 3, 4, 8]. Whatever the true causes may be, the Melodious Warbler appears to benefit from measures to promote biodiversity (wildflower strips, low hedgerows) that have been implemented in Switzerland since 1993[5, 9].

Bertrand Posse

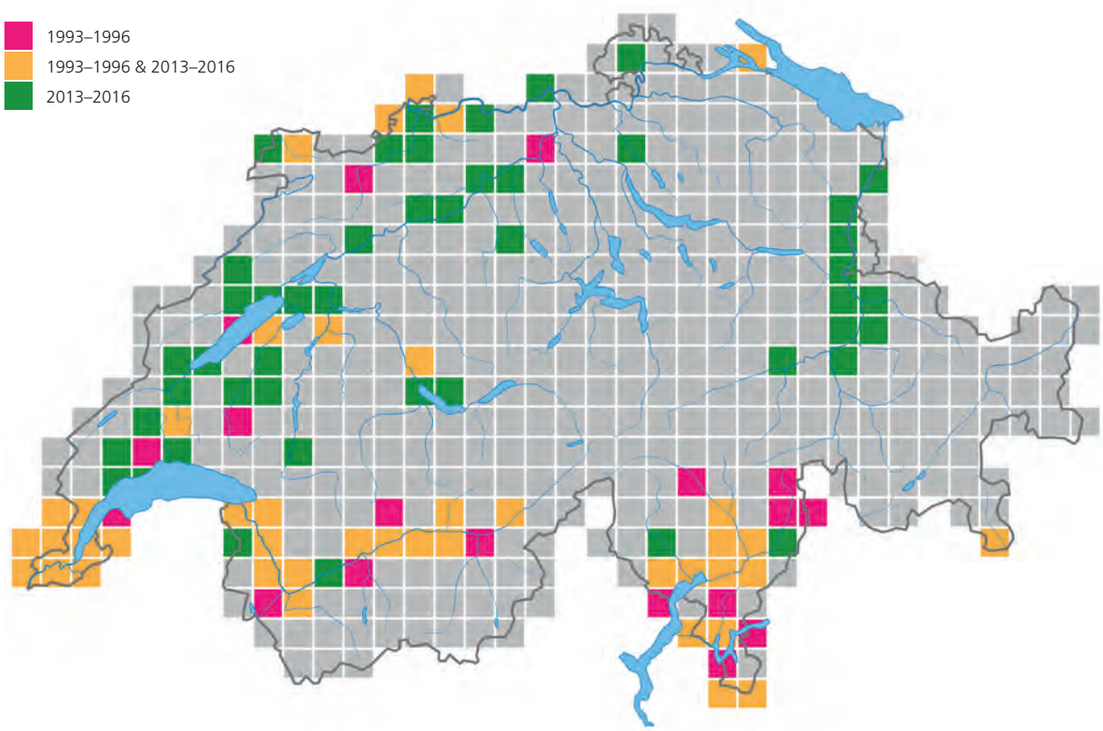
[1] Engler et al. (2013); [2] Engler et al. (2016); [3] Faivre & Secondi (2008); [4] Gatter (2016); [5] Jenny et al. (2002a–b); [6] Posse (2012); [7] Rete Rurale Nazionale & Lipu (2015); [8] Reullier et al. (2006); [9] Zollinger (2012)





Occurrence 2013–2016

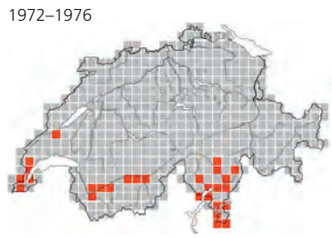
Distribution change since 1993–1996



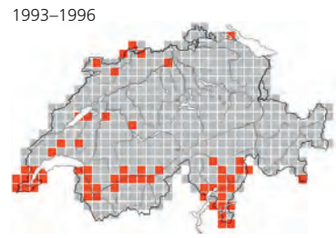
Sponsored by
Ursula Jappert
Orpheus Zürich Verein für Vogelkunde und Naturschutz

1950–1959

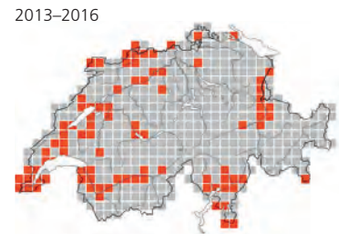
1972–1976



1993–1996



2013–2016



Icterine Warbler

Hippolais icterina
Gelbspötter
Hypolaïs ictérine
Canapino maggiore
beffarel da curtin

Markus Varesvuo

Red List Vulnerable (VU)
Population 100–150 pairs (2013–2016)

Focus page 284

Switzerland lies at the southwestern edge of the Icterine Warbler's range. Currently, distribution is concentrated between 400 and 600 m in the eastern part of the Central Plateau and in the Rhine Valley in the Canton of St. Gallen. In these regions, an average of 6.2 territories per 10 km of tree rows and shelterbelts were found and an average density of 0.36 territories/10 ha in nature reserves[4]. Occasional sightings during the breeding season in western Switzerland, Valais, the Bernese Oberland and Grisons probably represent unpaired males or wandering birds. However, breeding can occur sporadically in these areas as well, as it did in 2017 in the Weissenau nature reserve BE (M. Hammel). In 2013–2016 the highest territories were found at 800 m near Sagogn GR (E. Mühlethaler) and at 780 m near Rueun GR (M. Hammel, L. Sutter). In earlier years, the highest broods were recorded at 1260 m near Lauenen BE and at 1500 m in the Urseren Valley UR[BCH].

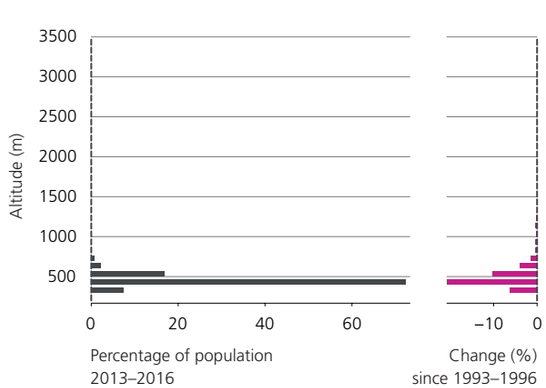
The Icterine Warbler inhabits semi-open landscapes and favours warm, damp places with tall shrubs and discontinuous tree cover. It breeds in riparian forests and damp mixed deciduous forests, riverside vegetation, parks and gardens with plenty of undergrowth, and field copses and hedgerows.

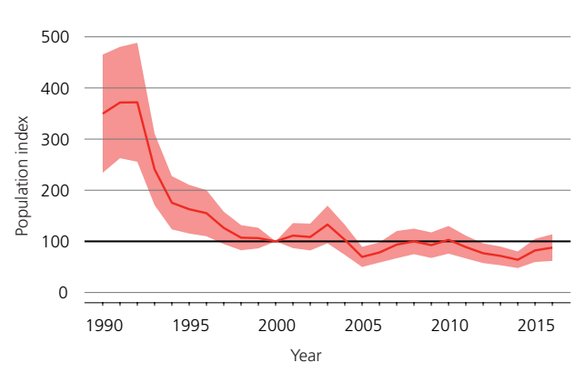
The Icterine Warbler was widespread on the Central Plateau until the mid-20th century[BCH], when its range contracted greatly. Since 1993–1996 the Icterine Warbler has disappeared from the region of the lakes at the foot of the Jura, and numbers have dropped significantly in the central and eastern parts of the Plateau. The overall population declined massively from 1990 to 2005, but has been fairly stable since then. Numbers dropped by 80 % in the Lake Constance area between 1980 and 2010[AtBo] and by more than 85 % in the Canton of Zurich between 1988 and 2008[AtZH].

In France, the population has been declining sharply since the 1990s[AtF]. The Icterine Warbler's range in Germany has been contracting, especially at the southwestern periphery[AtD]. The European trend is negative as well[EBCC]. The reasons are not known in detail. Along with structural changes and forestry interventions in stands occupied by the Icterine Warbler, climatic factors may also play a part[1, 2]. It is unlikely that the spread of the closely related Melodious Warbler from the southwest is a contributing cause[HVM, 3].

Michael Schaad

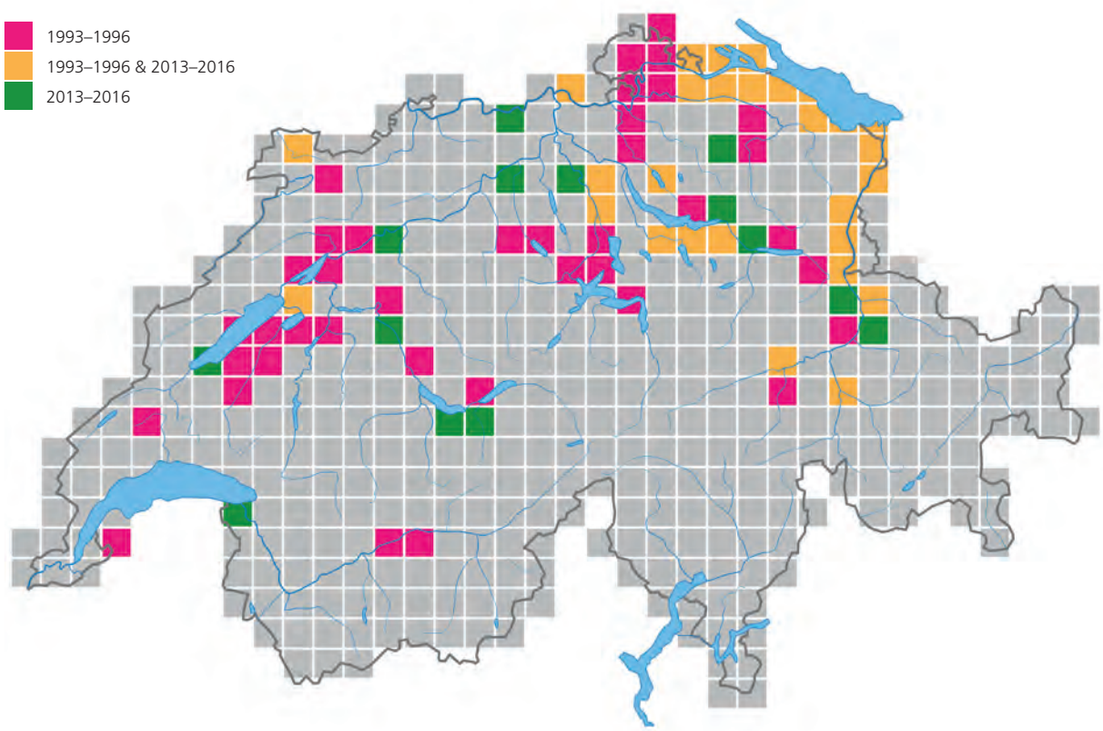
[1] Bauer et al. (2016a); [2] Engler et al. (2013); [3] Engler et al. (2016); [4] Rudin et al. (2010)





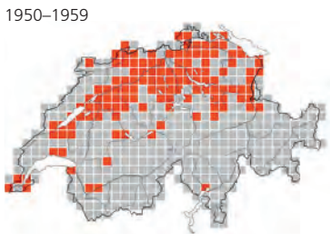
Occurrence 2013–2016

Distribution change since 1993–1996

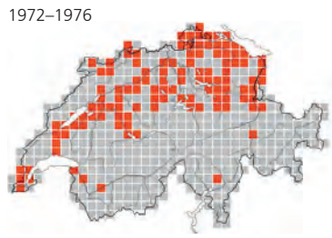


Sponsored by
Anselmo Fandino

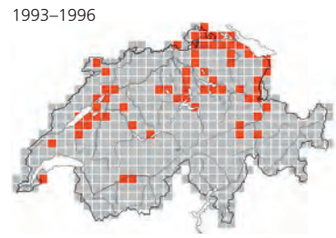
1950–1959



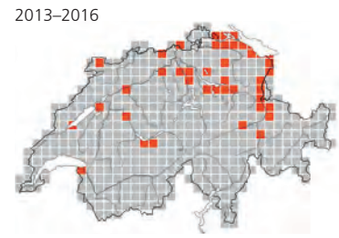
1972–1976



1993–1996



2013–2016



Moustached Warbler

Acrocephalus melanopogon
Mariskenrohrsänger
Lusciniole à moustaches
Forapaglie castagnolo
channarel barbet

Beat Rüegger

Red List Vulnerable (VU)
Population 0–1 pairs (2013–2016)

Focus page 425

In Europe, the Moustached Warbler breeds in the Mediterranean, on the Black Sea coasts and in the Pannonian Plain, mainly in the Danube delta and around Neusiedlersee. A bird of old, flooded reedbeds, the Moustached Warbler occupied the southern shore of Lake Neuchâtel from 1973–1991, where 3–4 singing males were regularly recorded between 1978 and 1985 [AtCH2]. Breeding was confirmed for the first time in 1981 (M. Antoniazza) [AtFR]. After a ten-year absence, the Moustached Warbler again appeared in the Grande Cariçaie from 2001 to 2006, breeding there in 2004 and 2005 [6, 7].

During 2013–2016, two singing males were observed, one from 31 March to 10 April 2014 in Neeracherried ZH (W. Müller et al.)[3], the other from 31 March to 7 April 2015 on Büsisee/Zurich (P. Walser Schwyzer et al.)[4]. In 2017, a singing male was heard at Niederried reservoir BE from 17 February to 3 March (S. Aubert et al.). These are the first records of birds present for prolonged periods since 2006 and the first beyond Lake Neuchâtel.

Populations of the Moustached Warbler in France, Italy and Austria are in decline [AtF 2, 5]. Causes are thought to include habitat degradation and fragmentation and the use of insecticides [AtF, 1].

Bernard Volet

[1] Brichetti & Fracasso (2010); [2] Dvorak et al. (2016); [3] Marques & Thoma (2015)/Marques et al. (2015); [4] Martinez & Maumary (2016a–b); [5] Nardelli et al. (2015); [6] Schweizer (2007)/Schweizer & Vallotton (2007); [7] Zimmerli (2006)

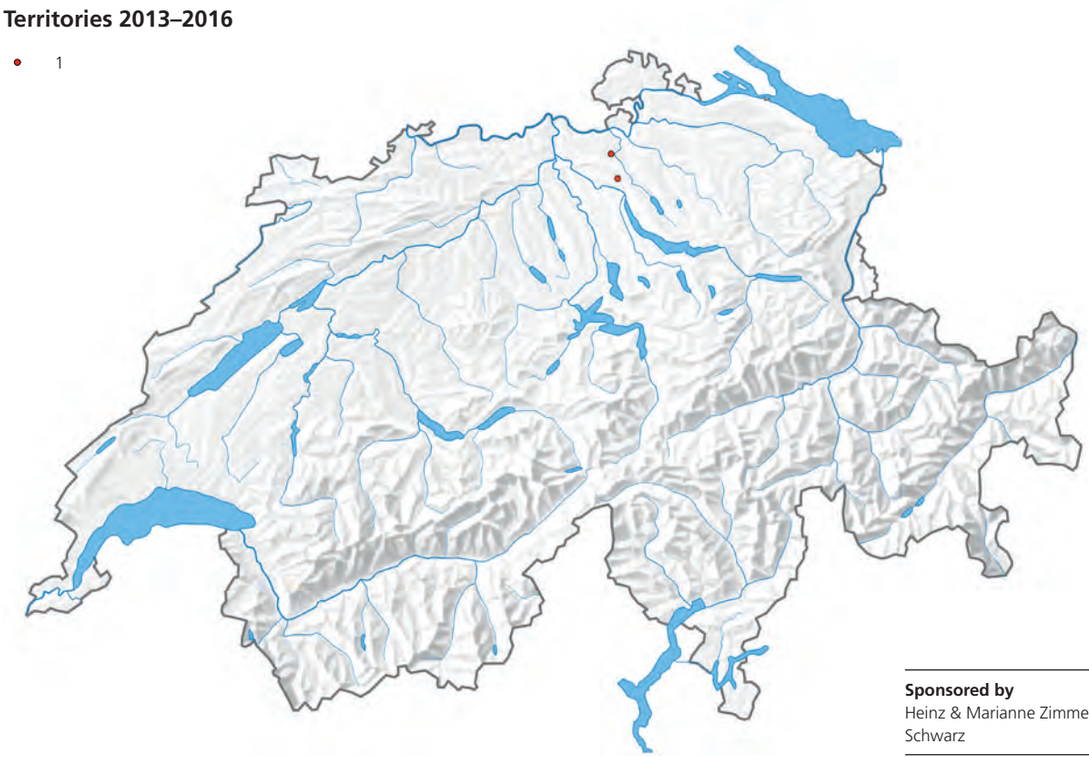
1950–1959

1972–1976

1993–1996

2013–2016

Territories 2013–2016



Sponsored by
Heinz & Marianne Zimmerli-Schwarz

Sedge Warbler

Acrocephalus schoenobaenus
Schilfrohrsänger
Phragmite des joncs
Forapaglie comune
channarel da channa

Mathias Schäf

Red List –
Population 0 pairs (2013–2016)

Focus –

Switzerland lies at the southern edge of the Sedge Warbler's breeding range. The species favours wetlands with dense stands of rushes, sedges or bulrushes. Singing males often stay until mid-June. Though breeding has been suspected several times, it has so far only been confirmed twice: in 1903 near Bellerive GE[BCH] and in 1972 near Loderio TI[6]. A few occupied territories are regularly recorded on Lake Constance in areas beyond the Swiss border[ABo3]. In the 2013–2016 period, the Sedge Warbler bred in the Rhine delta A in 2015 (J. Hohenegger, S. Werner)[4], following an earlier record here in 2011 (D. Bruderer)[7]. In Switzerland, singing males were present near Gletterens FR[1], in Neeracherried ZH (M. Ritschard) and in Nuolener Ried SZ (L. Hüppin et al.) in 2013, and on Flachsee Unterlunkhofen AG in 2015 (D. Kleiner et al.).

European populations saw steep declines between about 1970 and 1990[AtD, AtF, HBW, VdS, 2], probably caused by drought in the Sahel as well as habitat loss[AtD, 2, 3, 5]. Numbers have been stable since then[EBCC]. The French population increased after 1994 before stabilising around the turn of the millennium[AtF]. Northern Germany has seen a distinct positive trend since 1990 thanks to habitat improvements[AtD].

Bernard Volet

[1] Antoniazza (2014); [2] Bauer et al. (2005); [3] Foppen et al. (1999); [4] Knaus et al. (2015); [5] Peach et al. (1991); [6] Schifferli & D'Alessandri (1973); [7] Trösch et al. (2011)

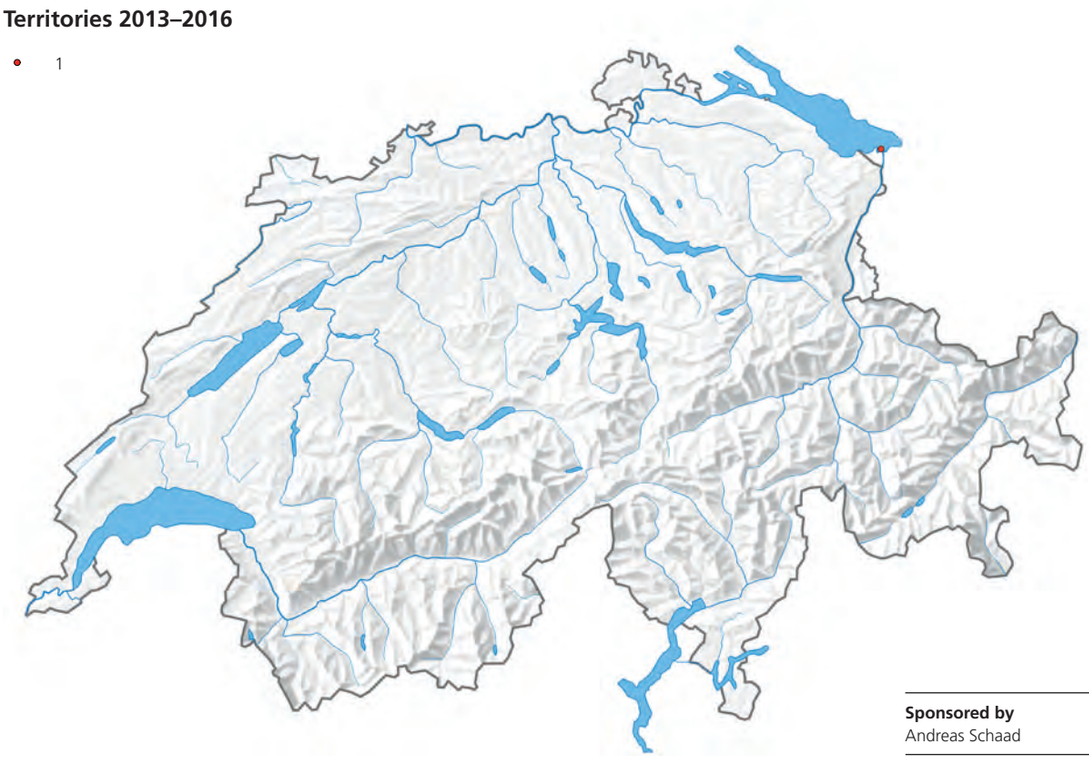
1950–1959

1972–1976

1993–1996

2013–2016

Territories 2013–2016



Sponsored by
Andreas Schaad

Marsh Warbler

Acrocephalus palustris
Sumpfrohrsänger
Rousserolle verderolle
Cannaiola verdognola
channarel da palì

Dennis Lorenz

Red List Least Concern (LC)
Population 3000–6000 pairs (2013–2016)

Focus page 362

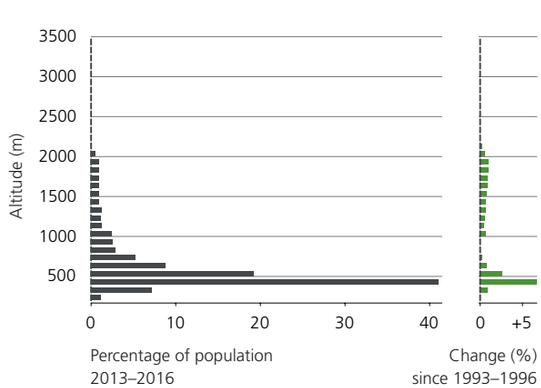
Switzerland lies at the southwestern edge of the Marsh Warbler's range. Although the population is smaller than that of the Common Reed-warbler, the Marsh Warbler is our most widespread reed-warbler, especially on the Central Plateau between 300 and 600 m. The population is concentrated in northeastern Switzerland. The species also occurs in the Jura, the Alps and Ticino. The highest confirmed broods were recorded in Val Ferret VS at 2040 m (J. Cloutier, C. Meisser)[11] and near Attinghausen UR at 1930 m (F. Bucher)[14]. During the last atlas period, singing males were heard at 2300 m near Bourg-St-Pierre VS[AtCH2].

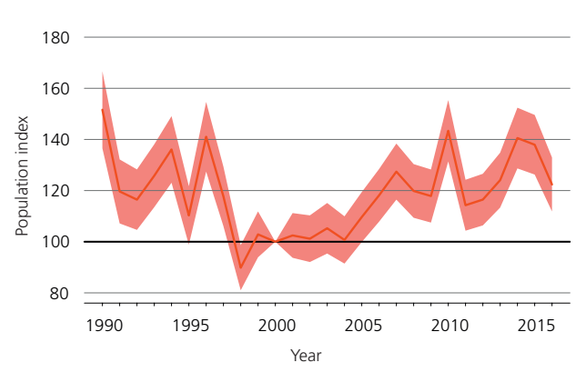
The Marsh Warbler breeds on rivers and lake shores, in wetlands, on the embankments of canals and ditches and on floodplains with alder and willow stands. In the Alps, it inhabits tall forb meadows with green alder shrubs. The species is also found in dry areas far from water. It requires tall, dense herbage consisting of plants with laterally protruding leaves. While the Marsh Warbler was once a common sight in cornfields, there are no recent records of breeding in cereal crops. The species does, however, occupy mature wildflower strips[8]. In the Aare Valley BE/SO, singing males are observed most years in June and July in rapeseed and potato fields with abundant herbage[4]. Locally, the Marsh Warbler can reach densities of more than 10 territories/10 ha[VdS].

Several distribution gaps have been filled since 1993–1996, although some new records may be due to increased observer effort. Following a period of decline, numbers began to grow again around the year 2000, albeit with considerable year-to-year fluctuations. Some regional surveys report significant losses[AtBo, AtZH, 3, 4, 13, 16], while others show more stable trends[AtFL, 6, 7, 14] or gains[1, 5, 10]. The trend in neighbouring countries is negative[AtD, 2, 9, 12, 15]. In Europe as a whole, the population appears to be stable[EBCC]. Factors that have a negative impact on Marsh Warbler numbers include the complete (rather than rotational) cutting of reedbeds and tall forb meadows alongside canals and ditches, even during the Marsh Warbler's late breeding season, and the disappearance of ditches with tall forbs as a result of property consolidation.

Michael Schaad

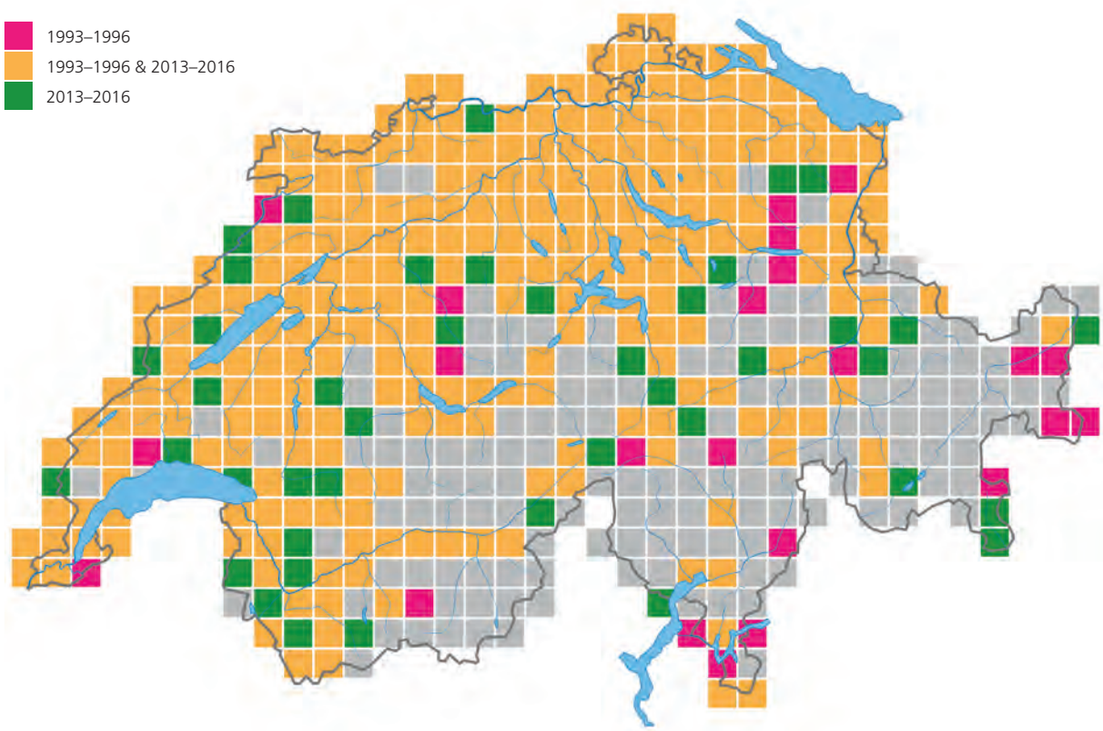
[1] Antoniazza (in prep.); [2] Bauer et al. (2016a); [3] Birrer et al. (2013b); [4] Christen (2017b); [5] Galliker et al. (2007); [6] Glutz von Blotzheim (2007a); [7] Graf (2016); [8] Jenny et al. (2002a–b); [9] Jiguet (2017); [10] Müller et al. (2010); [11] Posse (2013); [12] Rete Rurale Nazionale & Lipu (2015); [13] Rudin et al. (2010); [14] Schmid et al. (2016); [15] Teufelbauer & Seaman (2017); [16] Weggler & Schwarzenbach (2011)





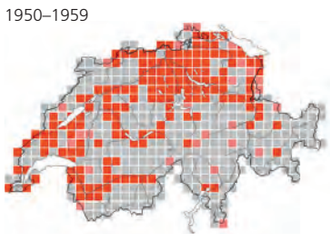
Occurrence 2013–2016

Distribution change since 1993–1996

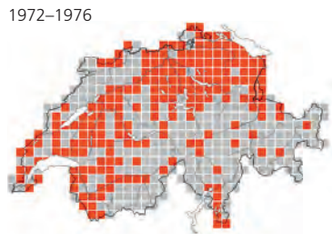


Sponsored by
Corinne Gianola

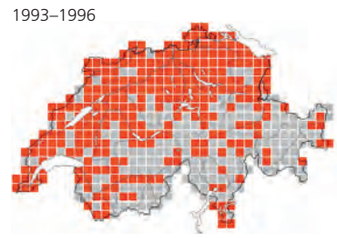
1950–1959



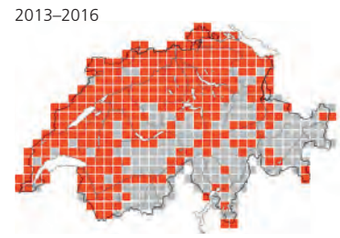
1972–1976



1993–1996



2013–2016



Common Reed-warbler

Acrocephalus scirpaceus
Teichrohrsänger
Rousserolle effarvatte
Cannaiola comune
channarel da puz

Mathias Schäf

Red List Least Concern (LC)
Population 9000–11 000 pairs (2013–2016)

Focus page 380

In Switzerland, the Common Reed-warbler mainly inhabits the wetlands of the Central Plateau. Inner-Alpine valleys and the Jura are only sparsely populated. About 90 % of the population occurs below 600 m. In recent years, the highest confirmed broods were recorded on Lac des Rousses F at 1060 m (P. Durlet) and Lac de Joux VD at 1000 m (C. Guex, C. Vaucher). Evidence of probable breeding was found on Geschinersee VS at 1340 m VS (R. Lupi) and Lenkerseeli BE at 1070 m (K. Rösti).

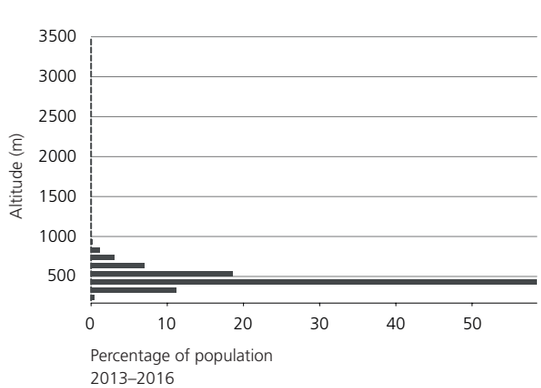
The Common Reed-warbler breeds in reedbeds of lakes, ditches and rivers. It can occupy reed stands as small as 20 m^2 provided the stems are dense and strong [HVM]. In prime habitats such as the Grande Cariçaie nature reserve, it locally reaches densities of more than 70 territories/10 ha [1].

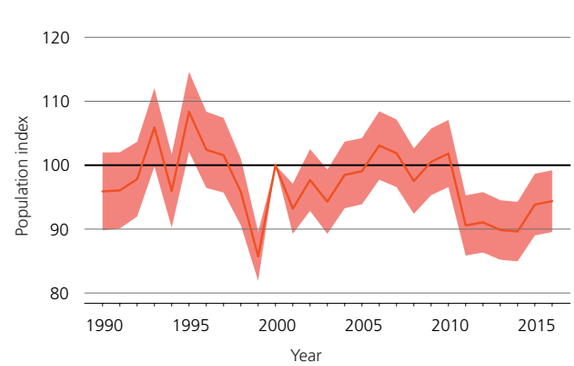
Population size and distribution have remained much the same since 1993–1996. Changes have occurred locally, however: The population on Lake Neuchâtel initially increased from the late 1980s, but declines have been recorded since 2010 [1]. In the Canton of Zurich, the Common Reed-warbler was the only long-distance migrant to show a positive trend between 1988 and 2008 [AtZH]. Around Lake Constance, losses occurred between 1980 and 2010, especially in areas at some distance from the water, while the population remained stable in core locations [AtBo]. Following long-term declines, numbers are increasing again in Germany and France [AtD, AtF]. However, there are signs of a renewed decline in Germany since the turn of the century [AtD]. Trends are also negative in Italy [5] and around Neusiedlersee [8]. The overall European population is stable [EBCC].

The Common Reed-warbler's spring arrival in Switzerland is advancing [6, 7], and breeding occurs earlier [4, 9, 10, 11], presumably as a result of climate change. The end of the breeding season has not shifted, however [10], which means that more breeding attempts can take place per season. This may explain why the Common Reed-warbler is one of the few long-distance migrants to have maintained its population. Reed stands are only colonised in high densities in the second to fourth year after cutting [2, 3]. Too frequent reed cutting in wetlands and along ditches can lead to local declines in Reed-warbler populations.

Stefan Werner

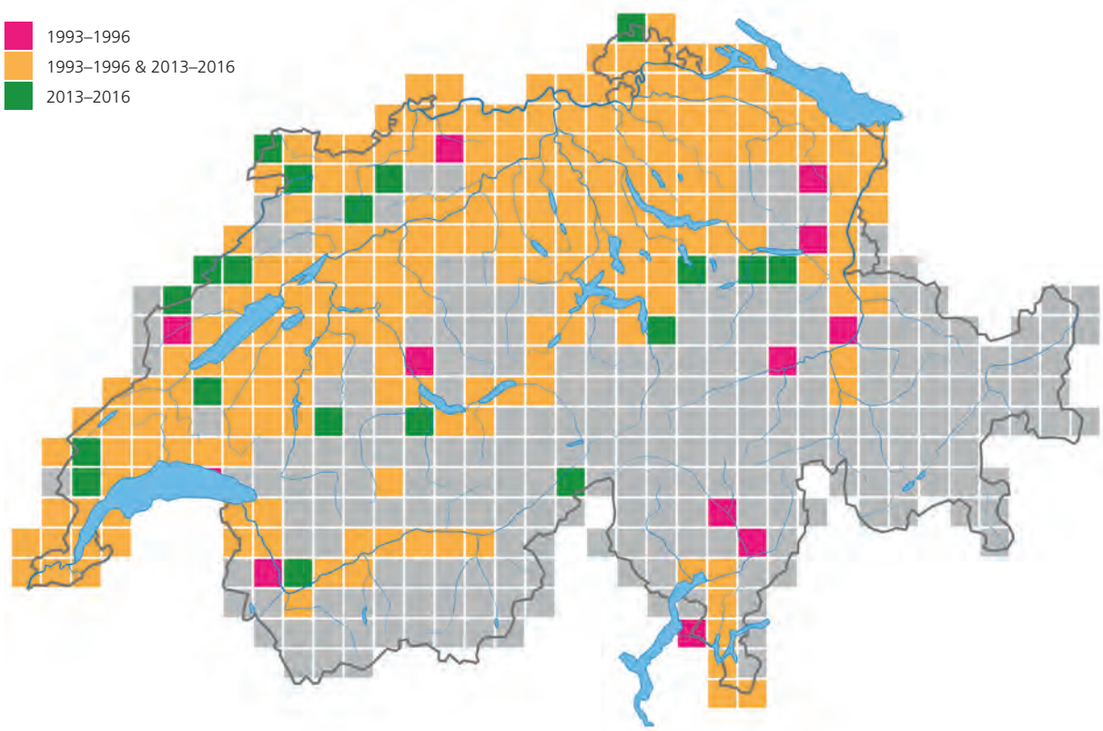
[1] Antoniazza (2018); [2] Antoniazza et al. (2018); [3] Antoniazza & Maillefer (2001); [4] Bergmann (1999); [5] Campedelli et al. (2012); [6] Christen (2007); [7] Christen (2017b); [8] Dvorak et al. (2016); [9] Halupka et al. (2008); [10] Schaefer et al. (2006); [11] Vafidis et al. (2016)





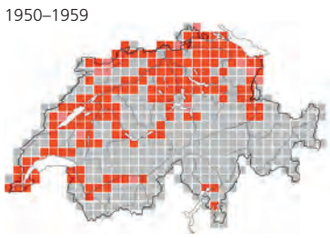
Density 2013–2016

Distribution change since 1993–1996

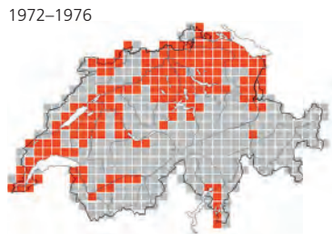


Sponsored by
Michael Götsch

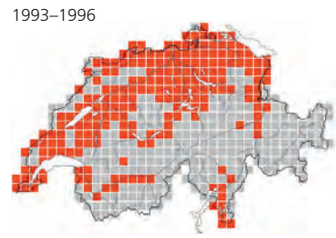
1950–1959



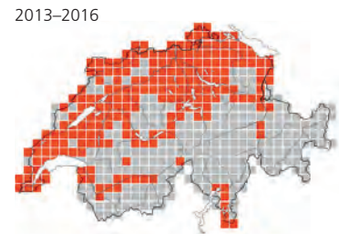
1972–1976



1993–1996



2013–2016



Switzerland needs large wetlands with plenty of water

While the populations of many wetland species have increased, they remain small and unable to compensate the losses that occurred in the past. Besides loss of area and isolation, the main problems are linked to the human influence on wetland hydrology through drainage and water-level regulation.

The large river regulation schemes and many smaller drainage projects have led to the loss of more than 90 % of mires since 1850 [5]. A detailed analysis of maps has shown that the greatest area loss occurred in the larger wetlands (at least 10 km² in size) [5]. Today, only few wetlands larger than one km² remain, e.g. Les Grangettes VD, Pfäffikersee ZH, Bolle di Magadino TI or Neeracherried ZH. Even our largest wetland, the Grande Cariçaie on the southern shore of Lake Neuchâtel that covers about 30 km², is small compared to wetlands elsewhere such as the Biebrza Marshes in Poland (approx. 1000 km²). The importance of the Grande Cariçaie is demonstrated by the fact that 41 of the 52 breeding bird species associated with wetlands in Switzerland were recorded there in 2013–2016. More than 50 % of Switzerland's Purple Herons, Savi's Warblers and Bearded Reedlings breed there, and more than 10 % of Red-crested Pochards, Great Crested Grebes, Common Little Bitterns, Western Water Rails, Black-headed Gulls, Common Terns, Great Reed-warblers and Reed Buntings.

Small size and isolation are a problem

The distribution maps for wetland species clearly demonstrate the importance of the bigger wetlands. The fact that large areas accommodate more species than small ones is hardly surprising. But large wetlands are also more regularly occupied, as a comparison of species counts for the areas surveyed annually in the wetland monitoring scheme shows. Data from the wetland monitoring scheme also reveal that many species breed in higher density in large wetlands than in small ones. The analysis counted the number of territories in the whole survey area, which may include expanses of water, woodland or small residential areas. Densities were higher in large wetlands for species that breed in reedbeds in particular, such as Western Water Rail, Common Reed-warbler, Savi's Warbler and Reed Bunting.

Along with size, the isolation of wetlands also plays a role. Small and isolated wetlands are less frequently occupied by the Reed Bunting than large ones [4]. The fragmentation of areas that used to be continuous could be one reason for the decline of this species that has led to its inclusion on the Red List [RLCH]. Common Snipe and Eurasian Curlew were among the last birds to disappear from the once vast expanses of wetlands in northeastern Switzerland [AtCH0, 5]. Today, these areas are too small and isolated even for these species.

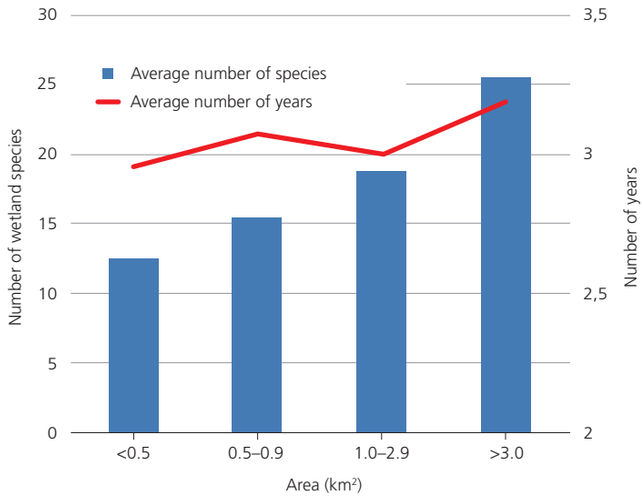
Poor habitat quality

The wetlands that remain today are not only much smaller, but also offer poorer quality habitat for many birds owing to nutrient input, inadequate water levels and increasing disturbance from human recreation. Many wetlands are drying up due to drainage of surrounding farmland and water-level regulation on lakes and rivers. With the exception of Lake Constance and Walensee, the outflow of all larger lakes in Switzerland is regulated to prevent damage through flooding.

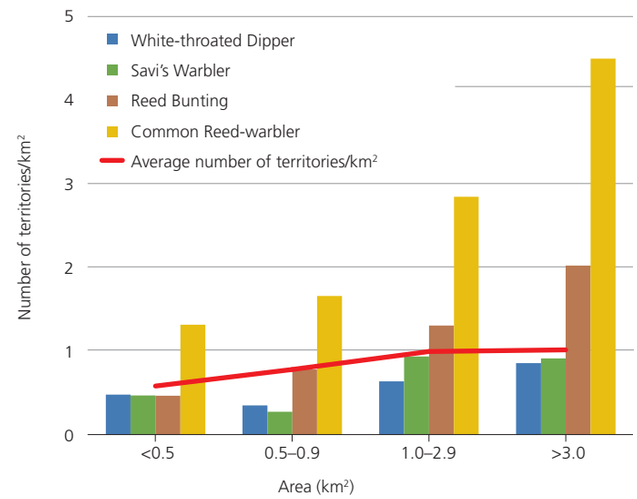
The example of the Purple Heron, a species that breeds almost exclusively in the Grande Cariçaie, illustrates the impact of water-level regulation. The second Jura river regulation project in 1962–1973 and the subsequent stabilisation of the water level

Verena Keller

The Grande Cariçaie is by far the most important wetland in Switzerland. It takes costly maintenance measures to mitigate the negative effects (siltation, shrub encroachment) of artificial water-level regulation.



In wetlands larger than 3 km² (total survey area) the number of typical wetland species is twice as high as in very small wetlands (columns, left axis), and the species bred there in more than three out of four years during the atlas period 2013–2016 (line, right axis). Comparing the 106 annually surveyed areas, breeding is less regular in smaller wetlands.



In large wetlands, many species occur in higher densities than in small ones. 18 relatively common species (no colony breeders or species that chiefly breed along rivers) in 89 annually surveyed wetlands were included in the analysis. Density pertains to the total area surveyed.

reduced the fluctuations that occur in the course of the year[3]. Following the second Jura river regulation, the Purple Heron population declined considerably[VdS]. Today, large parts of the reedbeds and sedge marshes are often not flooded at the start of the breeding season like they were before the 1970s. This is a problem both for amphibians and for fish that rely on shallow water as nursery grounds. Species like the Purple Heron, which forages in shallow water, or Savi's Warbler, which builds its nest above the water, often stay away completely. The peak water level is often not reached until late May or June, when the rising water destroys the nests of many species that selected their nesting site in accordance with the lower water level at the start of the breeding season[3]. Exceptional events like the spring high water in 2015 show that abandoned sedge marshes could be recolonised if the water content increased. In the Grande Cariçaie, Black-headed Gulls and Common Terns began to breed in the sedge marshes like they did in the past in wetlands like the Kaltbrunner Riet SG.

Verena Keller

Small and isolated wetlands are important stepping stones between larger areas, but they do not provide sufficient habitat to support large populations.

Thus, the high water could actually have had a positive impact, but the water level was lowered again so quickly that the colonies were abandoned, probably because they were no longer protected from predators such as foxes[1]. Wetland birds are adapted to fluctuations in the water level and losses caused by flooding are normal. However, the species are not adapted to artificial fluctuations that do not correspond with their phenology.

Protection and management are key

The populations of many wetland species have increased since 1993–1996. Wetlands are now under protection and management has improved in many areas. While management used to focus on preventing shrub encroachment by mowing large areas of reeds, more targeted and diverse measures are now used in an attempt to meet the requirements of various animals and plants[2, 3]. But the positive trends should not obscure the fact that populations remain very small and therefore vulnerable. The Eurasian Curlew has disappeared completely and the Common Snipe has become an irregular breeder, which clearly shows that our wetlands need to be restored at a large scale to give these and other species a chance.

Verena Keller

[1] Antoniazza (2016a); [2] Antoniazza et al. (2018); [3] Baudraz et al. (2014); [4] Pasinelli & Schiegg (2012); [5] Stuber & Bürgi (2018)

Species pages 128, 148, 176, 192, 198, 214, 215, 220, 230, 366, 378, 382, 384, 562

Great Reed-warbler

Acrocephalus arundinaceus
Drosselrohrsänger
Rousserolle turdoïde
Cannareccione
channarel grond

Mathias Schäf

Red List Near Threatened (NT)
Population 270–320 pairs (2013–2016)

Focus page 380

In Switzerland, the Great Reed-warbler mainly inhabits reedbeds on the Central Plateau and is also found locally in reed stands in Valais and Ticino. More than 95 % of the population breeds below 600 m. The highest confirmed breeding records came from Leuk VS at 620 m (G. & N. Delaloye, M. Hammel, B. Posse). The highest singing males, possibly late passage migrants, were recorded in late May and early June in 2007, 2014 and 2015 around Lac Brenet VD at 1005 m (C. Zollinger, M. Baudraz, Y. Menétrey, A. Croisier)[1, 2, 11].

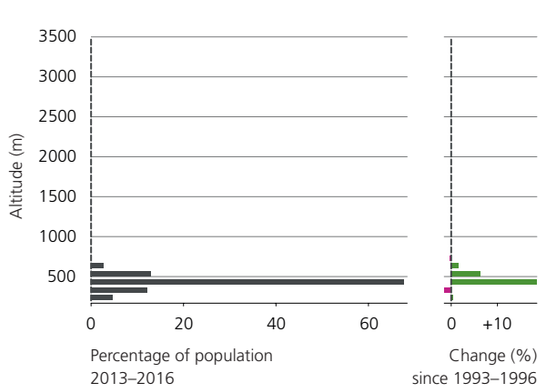
Great Reed-warblers favour older, dense and permanently flooded reed stands with strong stems[HVM]. They generally occupy extensive reedbeds, but are sometimes found in small stands and narrow strips of less than 0.1 ha[HVM, 5]. On the southern shore of Lake Neuchâtel, 89 territories were recorded on average in 2013–2016, which corresponds to almost a third of the Swiss population[3].

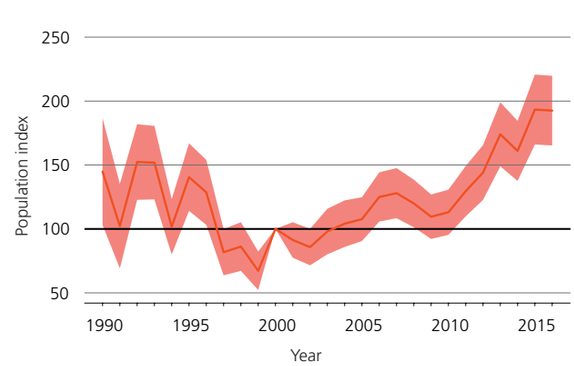
Following a steep decline in the 1970s in Switzerland and all of western Europe, the Swiss population stabilised at a low level from the late 1980s[AtCH0]. In several wetlands, populations have recovered since 1993–1996. The overall Swiss population has even increased by 30 % while expanding its range. On Lake Neuchâtel and Lake Constance, the number of territories has doubled in the past ten years[AtBo, 3]. On the other hand, some range losses have occurred in Ticino since 1993–1996, in accordance with the trend in Italy, where a steep decline has been observed since 1990[10]. Numbers are also in decline in France, while Germany and Austria report increases. The overall European trend has been negative since 1990[EBCC].

While the reasons for the positive trend in Switzerland are not well understood, they may involve the following two factors: first, due to the warming climate, the Great Reed-warbler can breed earlier in the season and benefit from the supply of insects that now peaks earlier in the year[8]; second, the increased vitality of reedbeds, thanks to better water quality and warmer spring and summer temperatures, may have a positive effect[AtD, 4, 6, 9, 12].

Sophie Jaquier

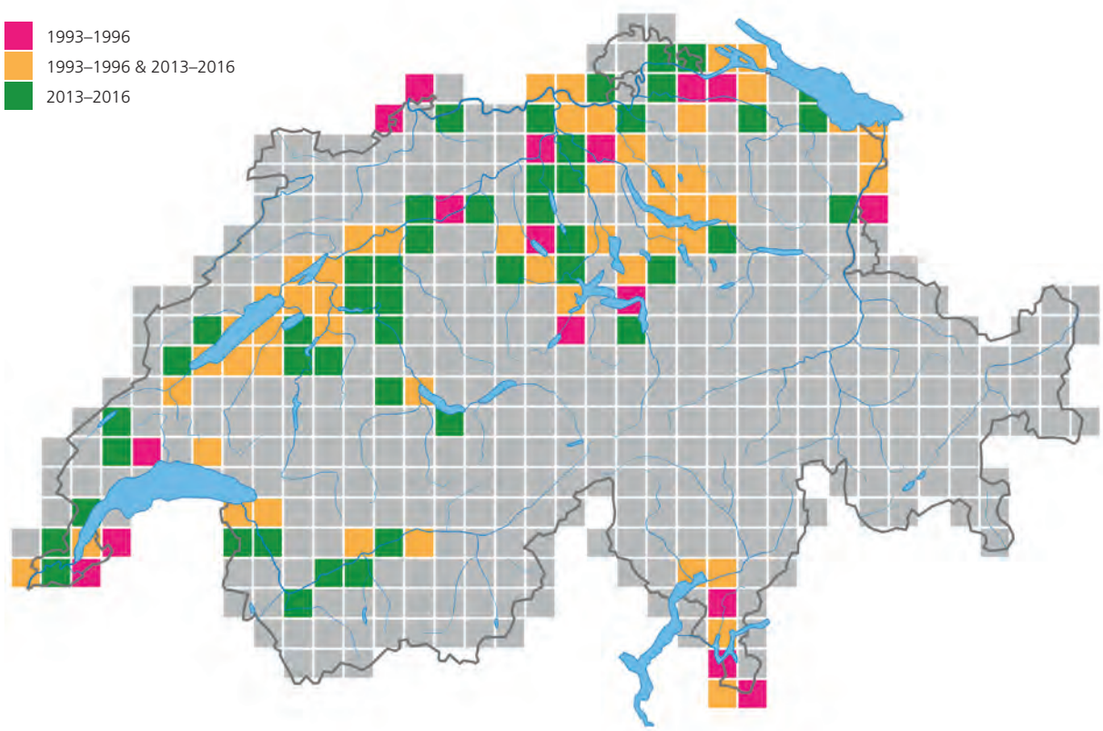
[1] Antoniazza (2015); [2] Antoniazza (2016b); [3] Antoniazza (2018); [4] Berndt & Struwe-Juhl (2004); [5] Boschert (2016); [6] Brauneis (2016); [7] Dvorak et al. (2016); [8] Dyrcz & Halupka (2009); [9] Méró et al. (2015); [10] Nardelli et al. (2015); [11] Posse (2008); [12] Schaefer et al. (2006)



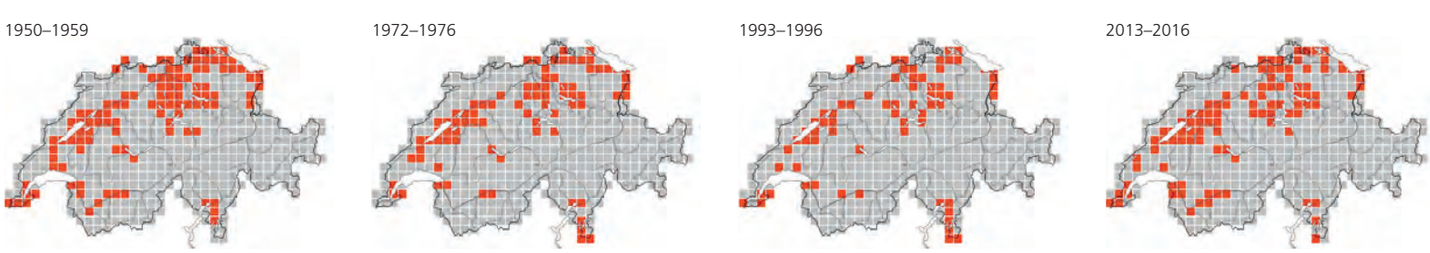


Occurrence 2013–2016

Distribution change since 1993–1996



Sponsored by
Malima-Martha Vetsch, Lutzenberg



Savi's Warbler

Locustella luscinioides
Rohrschwirl
Locustelle luscinioïde
Salciaiola
scroller da palì

Mathias Schäf

Red List Near Threatened (NT)
Population 280–310 pairs (2013–2016)

Focus pages 319, 380

In Switzerland, Savi's Warbler mainly inhabits the large reedbeds of the Central Plateau; currently, about two thirds of the population breed on the southern shore of Lake Neuchâtel. Flooded expanses of old reedbeds or sedge marshes interspersed with reeds are the species' preferred habitat. Population size fluctuates depending on the water level [1, 6]. Wetlands that have dried up do not meet the requirements of Savi's Warbler, as it normally builds its nest just above the water on broken reed stems or on clumps of sedges [HVM, 2, 3]. In the Grande Cariçaie nature reserve, up to 20 territories/10 ha are found in prime areas [6]. The highest observation during the breeding season involved a singing male on Lac de Seedorf/Noréaz FR at 610 m (2015; P. Desbiolles, Y. Rime) [5].

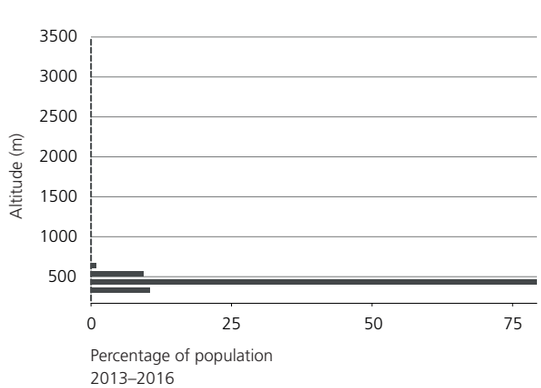
Savi's Warbler only started breeding in Switzerland in 1956 [12]. It gradually spread from Lake Neuchâtel [AtCH2], continuing to expand after 1993–1996, though new areas are often only irregularly occupied by single birds. The extreme high-water levels on Lakes Neuchâtel and Biel in early May 2015 presumably caused many Savi's Warblers to move to other sites [4, 5, 10].

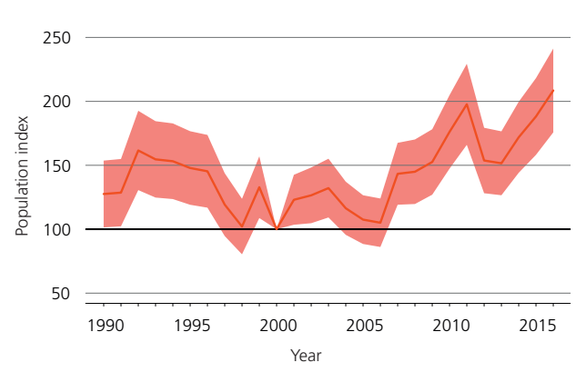
The Swiss population has increased by almost 25 % since 1993–1996. On Lake Neuchâtel, however, numbers have been stable since 1993–1996 with some fluctuations [6]. The population around Lake Constance more than doubled to about 56 territories between 1980 and 2010 [AtBo]; numbers also rose steadily in the Canton of Zurich from 1988 to 2008 [AtZH]. While populations in France and Italy are declining [AtF, 9], they appear to be stable in Germany and Austria [AtD, RLEU, 11].

The reasons for the positive trend are unclear. Savi's Warbler depends heavily on appropriate habitat management: reedbeds that are cut every year and have no old stands are as unsuitable as areas that become overgrown with scrub because they are rarely cut [6, 8]. Reedbeds are only colonised in high densities in the third to sixth year after cutting [7, 8]. On Lake Neuchâtel, Savi's Warbler may also have benefited from a period when flood-related brood loss was low [1, 6].

Stefan Werner

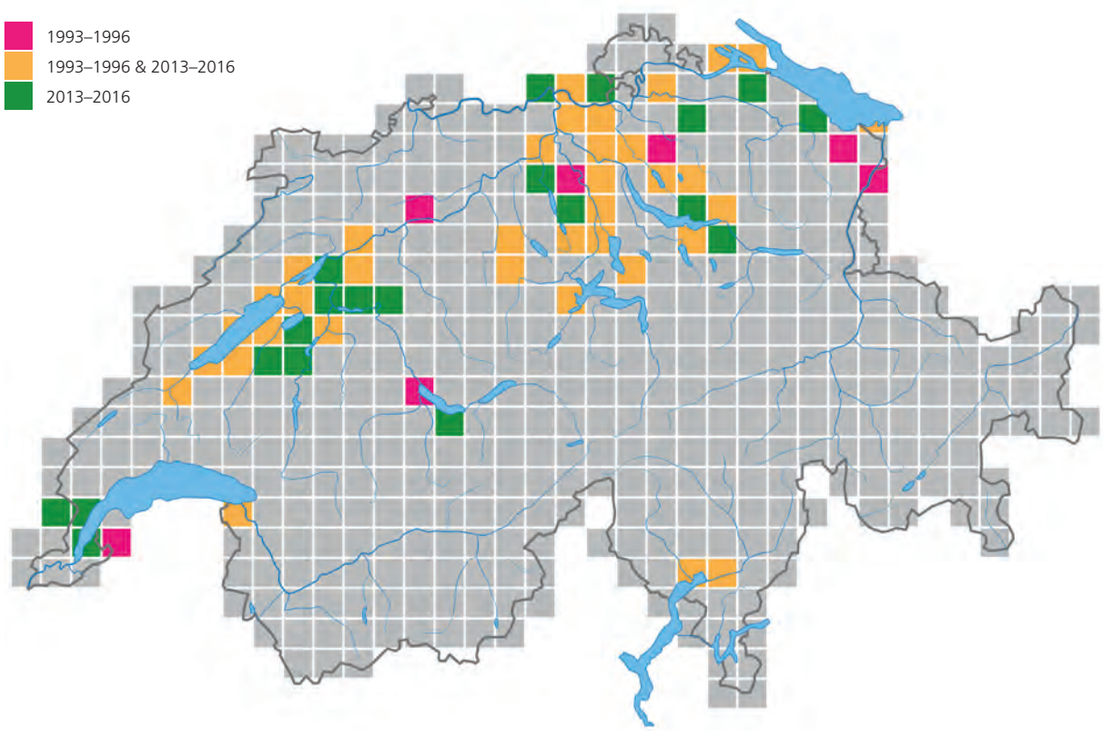
[1] Aebischer & Antoniazza (1995); [2] Aebischer & Meyer (1998); [3] Aebischer et al. (1996); [4] Antoniazza (2016a); [5] Antoniazza (2016b); [6] Antoniazza (2018); [7] Antoniazza & Maillefer (2001); [8] Antoniazza et al. (2018); [9] Brichetti & Grattini (2010b); [10] Christen (2017b); [11] Dvorak et al. (2016); [12] Gacond (1957)





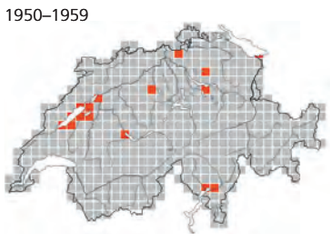
Occurrence 2013–2016

Distribution change since 1993–1996

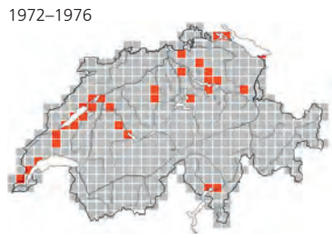


Sponsored by
Anonymous donor

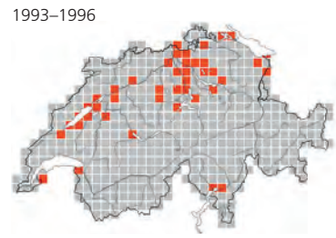
1950–1959



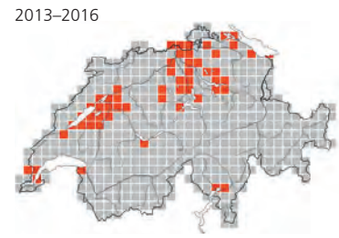
1972–1976



1993–1996



2013–2016



Common Grasshopper-warbler

Locustella naevia
Feldschwirl
Locustelle tachetée
Forapaglie macchiettato
scroller da chaglia

Markus Varesvuo

Red List Near Threatened (NT)
Population 150–250 pairs (2013–2016)

Focus page 284

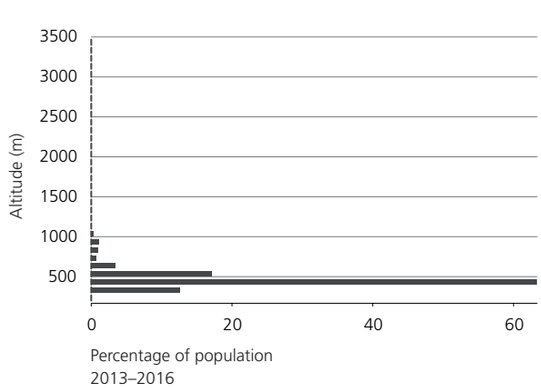
In Switzerland, the Common Grasshopper-warbler reaches the southern edge of its breeding range. Its distribution here is sparse and largely confined to the Central Plateau. The Grasshopper-warbler likes to breed on the edge of wetlands and in tall herb vegetation with scattered shrubs, but it is also found in drier habitats such as forest clearings. More than 90 % of the population occurs below 600 m. The highest probable breeding records relate to a bird feigning an injury near Hasliberg BE at 1580 m (2006) [VdS] and a pair giving warning calls near Poschiavo GR at 1440 m (2014; M. Müller).

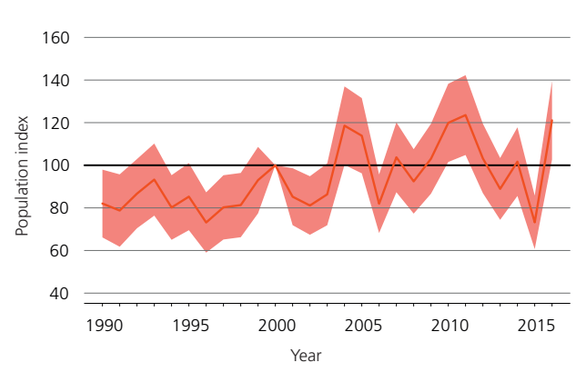
A steep decline in the Swiss population in the second half of the 20th century [AtCH2, VdS], has been followed by large fluctuations since the 1990s. The irregular occupation of several atlas squares compared to 1993–1996 reflects a species-specific preference for temporary habitats. The recent stabilisation has been confirmed in regional surveys. In the Grande Cariçaie, 200 territories were recorded in 1972–1976 (though the count may have included some passage migrants); by 2002, numbers had dropped to 15 territories. The population then slowly recovered, reaching an average of 23 territories in 2001–2008 and 30 territories in 2009–2016 [VdS, 1]. Around Lake Constance, numbers fell by 65 % between 1980 and 2000, followed by a more stable phase until 2010 [AtBo]. In the Canton of Zurich, numbers remained largely constant between 1975 and 2008 [AtZH, 6]. In Europe as a whole [EBBC] as well as in Germany and France [AtD, AtF], trends have been negative since the 1990s.

The decline in Europe is attributed to the destruction of habitats [3] and conditions in the stopover and wintering sites [3, 4, 5]. It could also be an early indication of the predicted northward shift of the breeding range due to climate change [ClimAt]. The future population trend in Switzerland will depend on the health of habitats on the edges of wetlands, where both a lack of maintenance or excessive interventions may prevent the Grasshopper-warbler from colonising the area. The species is most likely to colonise reedbeds in the third to fourth year after cutting [2].

Sophie Jaquier

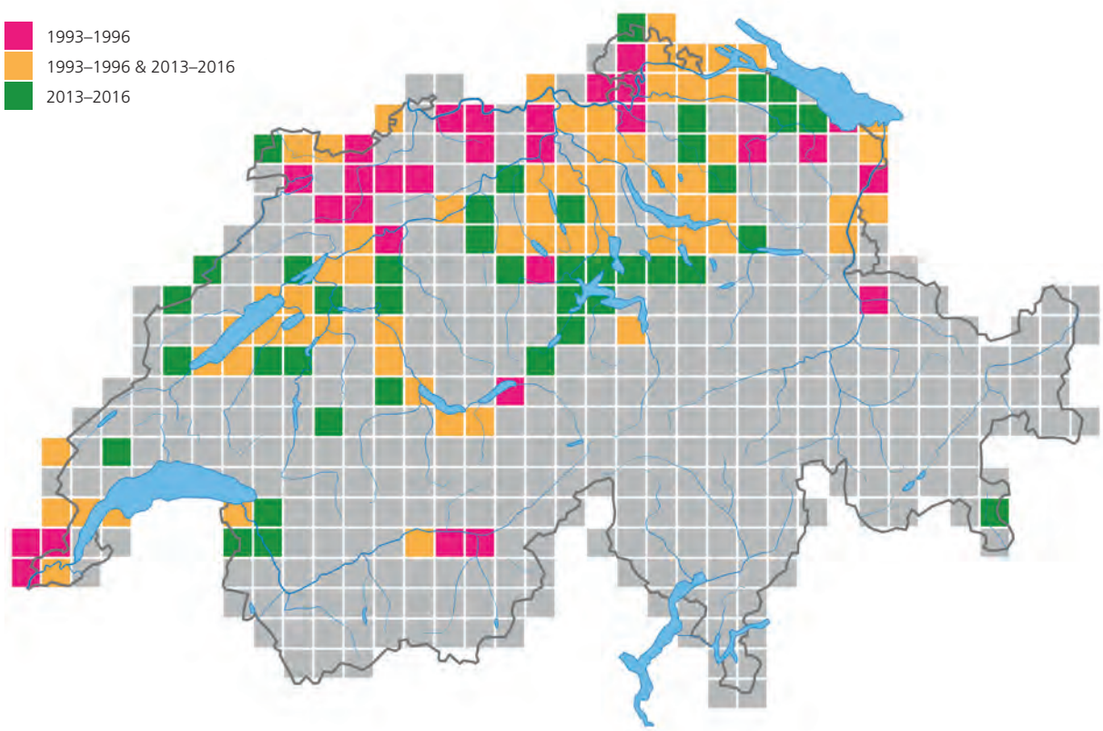
[1] Antoniazza (in prep.); [2] Antoniazza & Maillefer (2001); [3] Bauer et al. (2005); [4] Bayly et al. (2011); [5] Vickery et al. (2014); [6] Weggler et al. (2004)





Occurrence 2013–2016

Distribution change since 1993–1996



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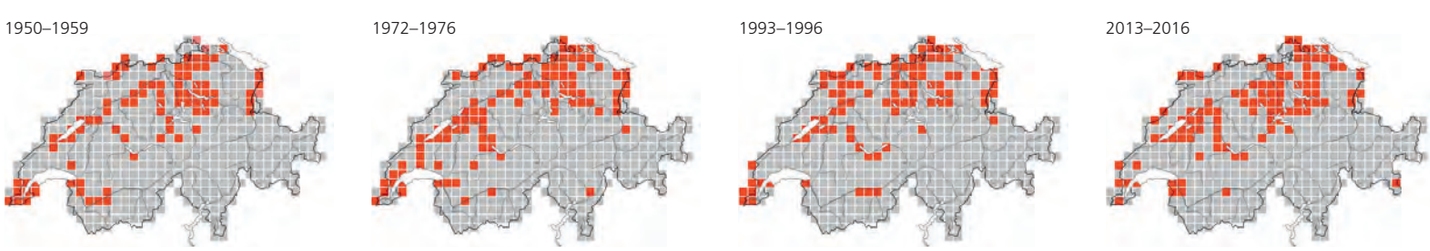
Gluing Technology



Northern House Martin

Delichon urbicum
Mehlschwalbe
Hirondelle de fenêtre
Balestruccio
randulina clera

Mathias Schäf

Red List Near Threatened (NT)
Population 70 000–90 000 pairs (2013–2016)

Focus pages 170, 212, 308

The Northern House Martin originally occupied rocky landscapes but today mainly nests on buildings and bridges. In Switzerland, it occurs mainly in villages, hamlets and individual farmhouses, where buildings have overhanging eaves as well as rough facades, and where nesting material or nest boxes are available. In the Alps, some small cliff-nesting colonies exist.

Most House Martins in Switzerland occur at altitudes of 400–700 m. The species penetrates far into the Alpine valleys, with small numbers inhabiting some of the highest settlements. There has been a colony on Furka Pass UR at 2430 m since at least the 1970s [VdS]. The highest nesting site was found on a restaurant near Zermatt VS at 2580 m [VdS].

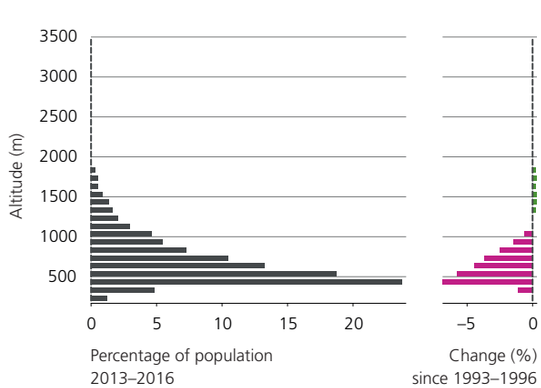
Colonies of 80 to more than 100 breeding pairs are found along Lakes Geneva and Neuchâtel, in the Jura, the Pre-Alps and the Magadino Plain TI [6]. At present, the largest colony in Switzerland with 222 pairs is located on the Terreni alla Maggia farm near Ascona TI (2014; P. Teichert). Eastern Switzerland is less densely occupied, and colonies rarely exceed 50 breeding pairs.

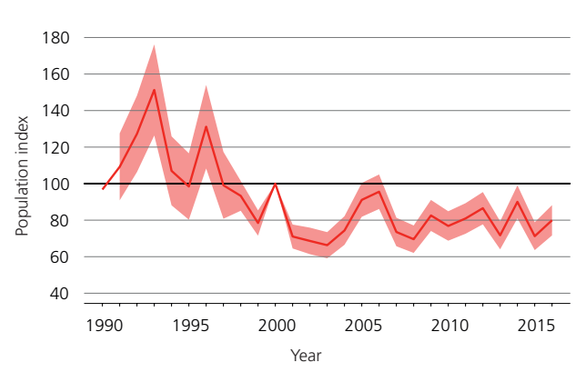
The Northern House Martin population peaked in Switzerland around 1993. Since then, numbers have declined significantly across the country and have fluctuated at a low level since 2001. The decline occurred mainly below 1000 m, particularly on the Central Plateau, and is reflected both in the number of colonies and in colony size. For example, the population dropped from 318 (1993) to 137 pairs (2016; R. Freuler) in Magden AG and from 152 (1994) to 84 pairs (2010) in Erschwil SO [5]. Regional surveys reveal similar losses [AtBo, AtZH, 1, 2, 10]. Other European countries also report a downward trend [AtD, EBCC, 4, 7, 9].

In locations that lack nesting material or suitable wall structures for nesting, conservation measures such as nest cups, nest platforms or patches of muddy ground can help [8, 11]. For local populations to persist, it is crucial that house owners and tenants accept their presence, as nests continue to be illegally removed or disappear during renovations. Semi-natural habitats are important as well, to guarantee a supply of insects even in bad weather.

Stephanie Michler

[1] Beaud & Beaud (2018); [2] Christen (2017b); [3] Hoffmann & Michler (2015); [4] Jiguet (2017); [5] Martinez et al. (2012); [6] Michler et al. (2015a–b); [7] Rete Rurale Nazionale & Lipu (2015); [8] Schwarzenbach et al. (2014a–b); [9] Teufelbauer & Seaman (2017); [10] Weggler & Widmer (2000b); [11] Willi et al. (2011)





Occurrence 2013–2016

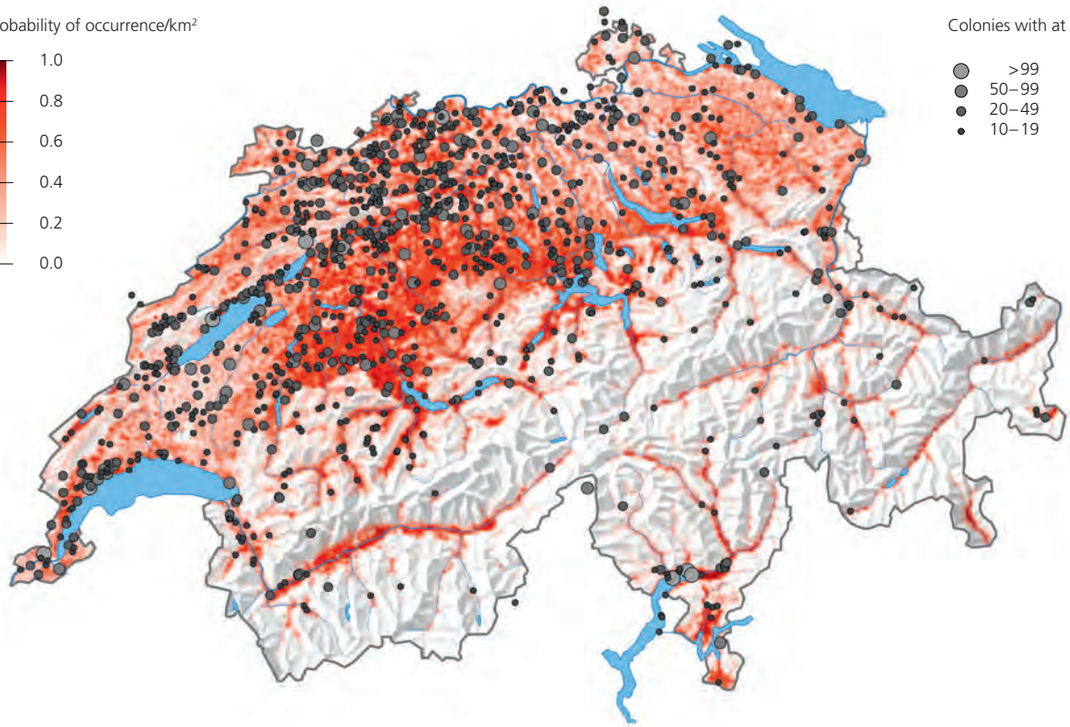
Probability of occurrence/km²

1.0
0.8
0.6
0.4
0.2
0.0

Pairs 2013–2016

Colonies with at least 10 pairs

>99
50–99
20–49
10–19



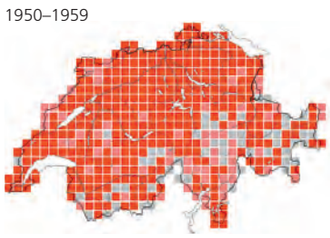
Occurrence change since 1993–1996

Probability of occurrence/km²

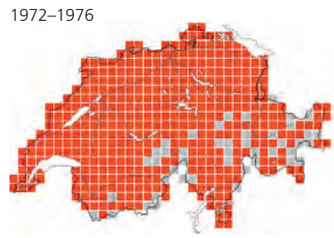
+1.0
+0.5
0.0
–0.5
–1.0

Sponsored by
Marianne und Benno Lüthi Stiftung

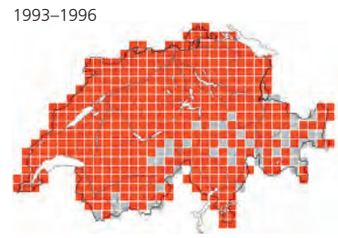
1950–1959



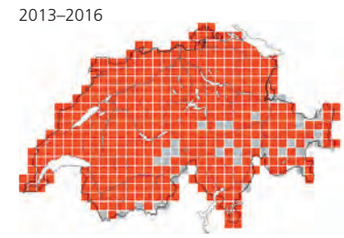
1972–1976



1993–1996



2013–2016



Barn Swallow

Hirundo rustica
Rauchschwalbe
Hirondelle rustique
Rondine
randulina stgira

Mathias Schaef

Red List Least Concern (LC)
Population 70 000–90 000 pairs (2013–2016)

Focus pages 170, 392, 448

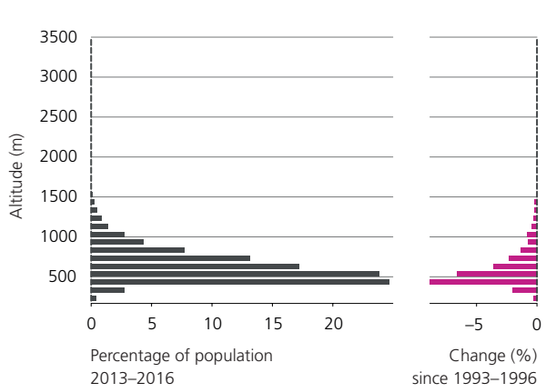
In Switzerland, the Barn Swallow is widespread up to altitudes of 1000 m. As in 1993–1996, the highest breeding site was found in Lü GR at 1920 m (C. Vaucher, M. Hofer, J. Denkinger). The Barn Swallow inhabits agricultural landscapes and breeds in or on buildings, mostly traditional barns for livestock [4], but occasionally other buildings as well. The Barn Swallow is a specialist feeder and as such, needs hunting grounds with an ample supply of flying insects even in bad weather (e.g. hedgerows, orchards, forest edges, waterbodies) [3, 12]. Bad weather is the main reason for the population fluctuations typical in this species. During the breeding season, such weather conditions affect breeding success across a large area [10]. During migration and in the wintering grounds, it is mainly drought that directly impacts the birds' survival rates [7].

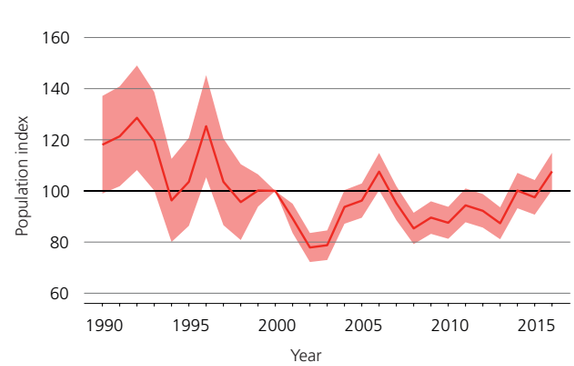
The distribution of the Barn Swallow in Switzerland has hardly changed in the past 40 years. The highest densities are found north of the Alps at altitudes of 400 to 800 m. In some of these areas, and in other regions at similar altitudes, numbers have declined considerably since 1993–1996. Several regional surveys confirm these results [AtBo, AtZH, 2, 5, 13]. Typically, the declines occurred in formerly rural areas near urban centres. Significant increases are confined to certain plains with intensive grassland and pasture farming. Today, the Barn Swallow population in Switzerland is thought to be about 10–20 % smaller than in 1993–1996. Reasons include the declining number of farms, the open construction design of modern barns with close-to-outdoor temperatures and draughts, and a reduced food supply near breeding sites. These changes are expected to affect further areas of the Central Plateau and, with some delay, the Pre-Alps and Alps.

Similar population trends are reported in neighbouring countries [AtD, AtF, 1, 6, 8, 11] and in Europe as a whole [EBCC, 9]. Conservation measures involve installing nest boxes on suitable buildings – stables play an increasingly important role – and preserving diverse landscapes with small plots of land where the Barn Swallow can find sufficient food even in bad weather.

Martin Grüebler & Johann von Hirschheydt

[1] Bani et al. (2014); [2] Christen (2017b); [3] Grüebler et al. (2008a); [4] Grüebler et al. (2010); [5] Hirschheydt et al. (2006); [6] Jiguet (2017); [7] Møller & Szép (2005); [8] Rete Rurale Nazionale & Lipu (2015); [9] Sanderson et al. (2006); [10] Schaub et al. (2015); [11] Teufelbauer & Seaman (2017); [12] Turner (2006); [13] Weggler & Widmer (2000b)



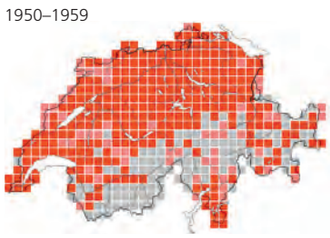


Density 2013–2016

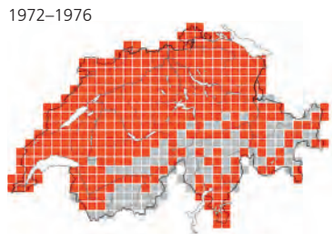
Density change since 1993–1996

Sponsored by
Jean-Luc Brahier
Sepp Muff

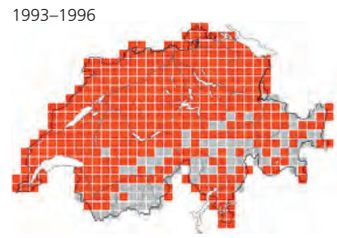
1950–1959



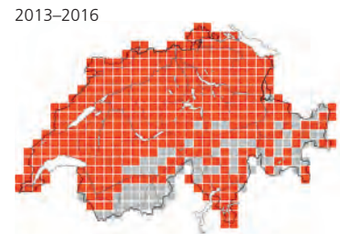
1972–1976



1993–1996



2013–2016



Decline of insectivorous birds

The steep decline of insects in farmland creates problems for insectivorous birds. The use of pesticides and modern land-use practices are among the main causes for the disappearance of insects. Insectivorous birds in farmland habitats in particular are declining sharply.

About 40 % of Swiss breeding bird species feed almost exclusively on insects. A further 25 % have a mixed diet, but rely mainly on insects to feed their young. The demand for suitable insects that are easy to catch is therefore great.

Although data are scarce, it is safe to say that fewer insects exist today than a few decades ago. This loss is documented for several areas in Germany, where insect biomass has decreased by 75 % in the past 27 years [10, 24]. There are very few data sets from Switzerland to document the decline of insect biomass. Georg Artmann-Graf found a marked reduction in grasshoppers around Olten SO in the past 30 years [1]. Moreover, older train drivers unanimously report having to remove a mass of dead insects from the windscreen after every run back in the 1960s, while much less frequent cleaning is necessary nowadays.

Roman Graf

Railway and road embankments can become hotspots for insects if they are appropriately managed. Instead of cutting and mulching the entire surface (like in the picture), a third of the area should remain uncut. Removing the cuttings prevents thatch and keeps the soil low in nutrients.

The main causes of insect decline

There are many different reasons for the drop in insect numbers: The loss of insect-rich habitats (semi-dry and dry grassland, wetlands, semi-natural waterbodies) is particularly significant. Various large insects such as grasshoppers, dragonflies and butterflies occurred in these environments. Many modern land-management practices also have a negative impact on insects [13]: Semi-natural road and railway embankments are often mowed during the peak flowering period. Plant material for the production of silage is packed and moved shortly after cutting, including the insects trapped inside. Meadows are cut up to six times a year. Often, this is done with mower-conditioners that crush the grass immediately after cutting to promote faster drying. Mower-conditioners result in a loss of honeybees that is seven times greater (up to 90 000 dead bees/ha) than mowing without a conditioner [5].

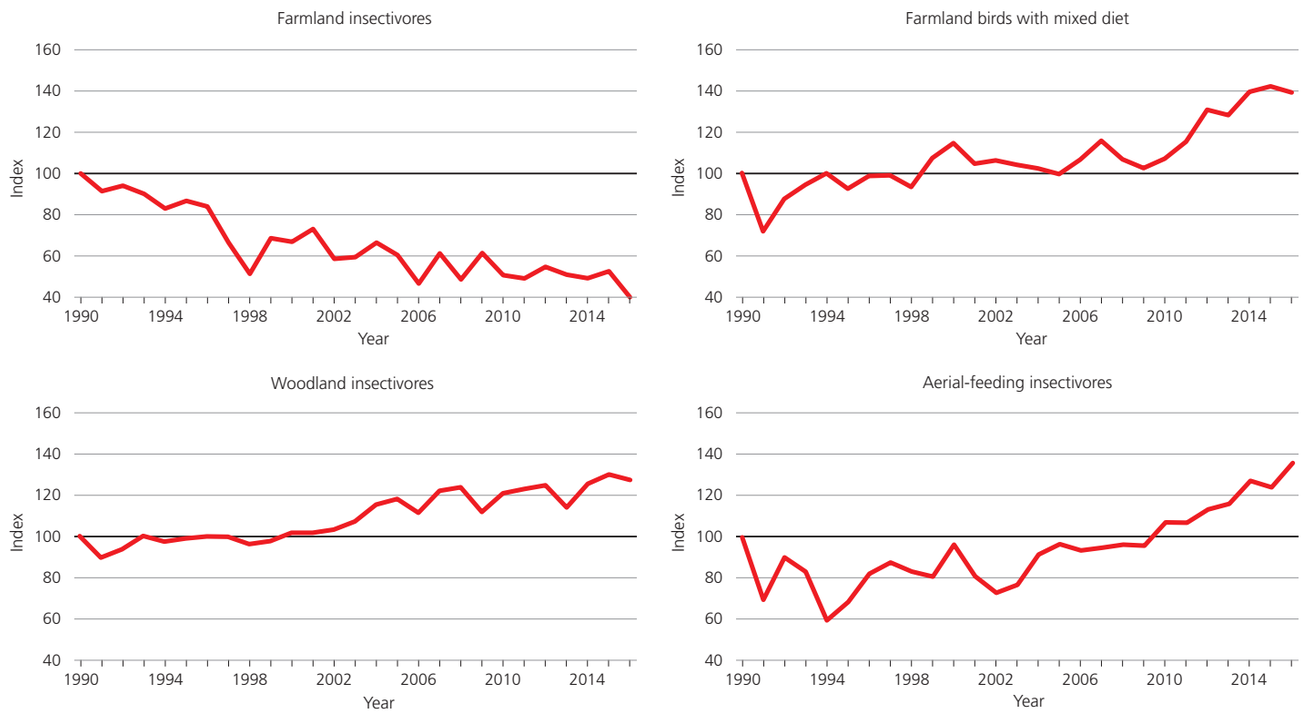
The use of pesticides reduces the diversity and abundance of arthropods [2, 6, 7, 11, 22, 26, 27]. Herbicides reduce the food supply of many insects. Insecticides not only decimate pests, but kill other insects as well. In addition, persistent insecticides enter the soil and sometimes the groundwater. In the 1970s, the fat-soluble insecticide DDT, which has since been banned in many places, accumulated in the food chain, leading to a dramatic worldwide decline in birds of prey. Today, persistent and water-soluble neonicotinoids are often applied as a preventive measure and have been found in waterbodies and biodiversity promotion areas in Switzerland [12]. Pesticides are also widely used in private gardens. In the Netherlands, insectivorous birds declined more steeply in areas where surface water was more heavily contaminated with neonicotinoids [9]. The dung and manure of livestock treated with medication to control parasites attracts significantly fewer insects, resulting in the loss of yet another source of insects [3, 16, 18]. The bacterium Bacillus thuringiensis var. israelensis, used against mosquito larvae, is also deployed in Swiss nature reserves. Destroying the mosquitoes reduces the overall abundance of insects, which negatively effects the breeding success of birds [14, 20, 21].

Marc Tschudin

A Barn Swallow pair feeds its young about one kilogramme of insects during the nestling period, which corresponds to the content of this plastic bag.

Remaining insects are poorly accessible

Many crops and meadows are much denser than they used to be, due mainly to increased fertilisation. Sparse, low-nutrient meadows, for instance, declined by 20 % in the Engadine GR in only 20 years, while the proportion of extremely dense meadows increased



The population trends of specialist insect eaters in three different habitats and of farmland birds with a mixed diet indicate that farmland insectivores are affected by a shortage of food.

considerably during the same period[8]. Cereal fields have become denser because of new crop varieties and fertilisation[4]. Dense vegetation in meadows and fields makes it hard for birds to prey on insects. Common Redstart and Eurasian Wryneck, for example, rely on sparse vegetation within their territory that allows them to easily catch insects[17, 23]. In the case of the Common Hoopoe, the accessibility of prey influences the choice of foraging sites even more strongly than prey abundance[25].

Hard times for farmland insectivores

For all the above reasons, it is not surprising that specialist insect feeders of farmland (e.g. larks, Tree Pipit, Red-backed Shrike, Common Whitethroat, Whinchat) are in marked decline. Farmland birds whose diet contains only a small portion of insects (e.g. White Stork, Red Kite, Common Kestrel, Fieldfare, Yellowhammer) are barely affected by their disappearance. Woodland insectivores (e.g. woodpeckers, tits, Eurasian Blackcap, European Robin) and aerial feeders (e.g. Alpine Swift, European Bee-eater) even show positive overall population trends. The alarming situation of insectivores in farmland is presumably a result of heavy pesticide use, modern land-use practices and land consolidation.

Possible solutions to the problem

The situation can be improved using simple measures: Leaving at least 10 % of surface area as refuges at each cutting must become standard procedure in low-intensity and litter meadows. These uncut refuges have been proven to have a positive effect on insects[19]. Pesticides must be severely restricted and should not be applied preventively, but only when damage has reached a certain threshold. Studies have shown that pesticides can be reduced by 42 % without loss of productivity[15]. Information campaigns are needed to raise consumers' willingness to buy food grown with minimal use of pesticides. The majority of green spaces in settlements are artificial and over-maintained, making them unattractive for insects. Garden experts and owners should be educated about insect-friendly and natural garden design.

The decline of food for insect-eating birds is alarming, and too little is known about the extent of the problem. A monitoring scheme for insect biomass in Switzerland is therefore needed.

Lukas Jenni & Roman Graf

[1] Artmann-Graf (2017a); [2] Bengtsson et al. (2005); [3] Floate et al. (2005); [4] Fossati & Brabant (2003); [5] Frick & Fluri (2001); [6] Fuller et al. (2005); [7] Geiger et al. (2010); [8] Graf et al. (2014c); [9] Hallmann et al. (2014); [10] Hallmann et al. (2017); [11] Hole et al. (2005); [12] Humann-Guilleminot et al. (in prep.); [13] Humbert et al. (2009); [14] Jakob & Poulin (2016); [15] Lechenet et al. (2017); [16] Mann et al. (2015); [17] Martinez et al. (2010); [18] McCracken (1993); [19] Meyer et al. (2017); [20] Poulin (2012); [21] Poulin et al. (2010); [22] Power et al. (2012); [23] Schaub et al. (2010b); [24] Sorg et al. (2013); [25] Tagmann-loset et al. (2012); [26] Tuck et al. (2014); [27] Winqvist et al. (2011)

Species pages 166, 188, 266, 272, 274, 280, 302, 312, 390, 412, 426, 452, 458, 470, 476, 504, 558

Eurasian Crag Martin

Ptyonoprogne rupestris
Felsenschwalbe
Hirondelle de rochers
Rondine montana
randulina da crap

Beat Rüegger

Red List Least Concern (LC)
Population 7000–9000 pairs (2013–2016)

Focus pages 170, 308

In Europe, the Eurasian Crag Martin breeds south of a line extending from central France to southern Germany, Hungary, and the Danube delta. Switzerland lies close to the northern limit of its range. The Eurasian Crag Martin is widespread in the Alps and in the southern and central Jura. It also occurs in a few locations on the Central Plateau, where it nests on bridges and high-rises[1, 5, 7]. The population is concentrated in areas between 900 and 1800 m. The highest densities are reached in the main and tributary valleys of the Alps. In suitable kilometre squares, it is not uncommon to count six territories and more. In the Jura, population density is much lower than in the Alps. Significant densities are found locally north of the Alps as well.

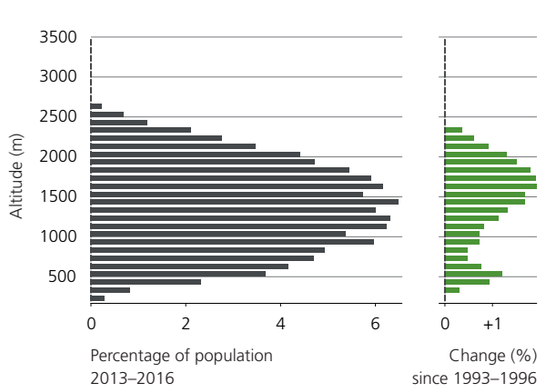
Nesting occurs under cliff overhangs on bare rock faces and increasingly on building structures, historical as well as new. In Ticino, the Crag Martin breeds at altitudes as low as 210 m as well as far above the tree line. While broods have been recorded up to 2620 m[AtCH2], the highest current breeding site was found near Zermatt VS at 2390 m (J.-L. Carlo).

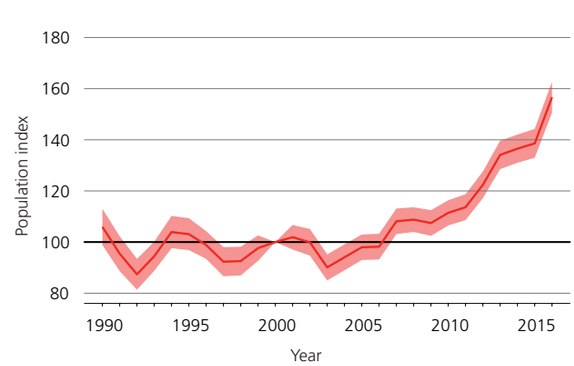
Between 1980 and 1991, the Crag Martin colonised two thirds of the length of the Jura range from the southwest[8]. Since 2003, numbers have increased by about 60 % in Switzerland. This is reflected in the species' geographically limited range expansion, but even more so in previous distribution gaps that have been filled in, a general increase in density, and a growing number of nests on buildings[3, 4, 6, 7, 10]. Interestingly, while the Eurasian Crag Martin has increasingly colonised smaller cliffs in the Jura (M. Kéry), it has not continued to expand its range there to the east since 1996. The increase in population density in the Alpine valleys, however, is ongoing. We can expect a continued growth in population size in the future, as well as a further increase in nests on buildings. These have probably been encouraged by the construction boom in the Alps, which has provided suitable «artificial cliffs» in areas that lack rocky habitats[6].

In Europe, populations are considered mostly stable[RLEU], although there have been significant increases at the northern edge of the range in France[AtF] and Germany[AtD, 2, 9], where the Black Forest was colonised after 2007[9].

Marc Kéry

[1] Christen (2001); [2] Fünfstück (2016); [3] Glutz von Blotzheim (2005); [4] Glutz von Blotzheim (2008a); [5] U. N. Glutz von Blotzheim, unpubl.; [6] Glutz von Blotzheim et al. (2012); [7] Hauri (2006); [8] Kéry (1991); [9] Kratzer (2015); [10] Signorell Häusler et al. (2012)

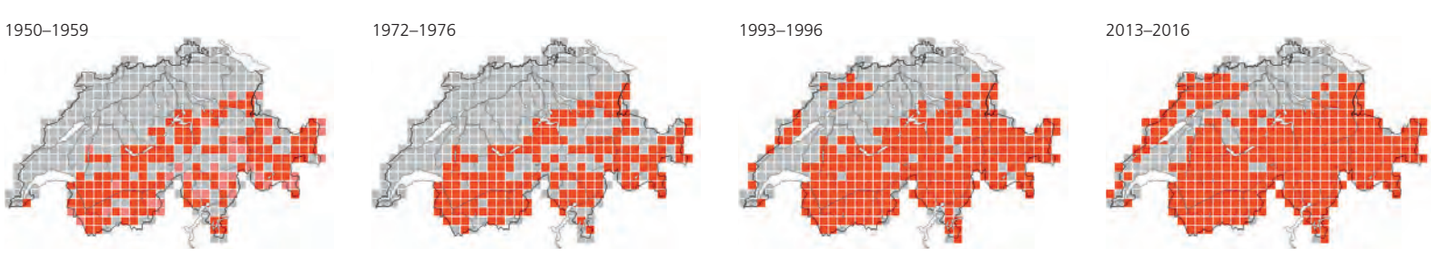




Occurrence 2013–2016

Occurrence change since 1993–1996

Sponsored by
Adrian Borgula, Lucerne



Collared Sand Martin

Riparia riparia
Uferschwalbe
Hirondelle de rivage
Topino
randulina da riva

Andreas Jaun

Red List Vulnerable (VU)
Population 2300–3000 pairs (2013–2016)

Focus pages 276, 448

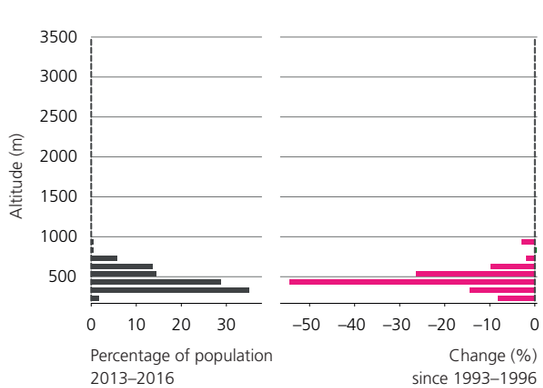
In Switzerland, the Collared Sand Martin occurs north of the Alps at altitudes of 300 to 700 m. The highest colony at 920 m in Oberschrot FR was occupied in 2012–2013 (P. Scherler, L. Broch, Y. Rime); a gravel pit in Jassbach BE located at 920 m was last occupied in 2007 (C. Dohrn). Currently, other high breeding sites include locations at 810 m in Menzingen ZG (D. Kronauer) and at 770 m in Degersheim SG (M. Stacher, M. Valentini). In Switzerland, the Sand Martin originally nested in steep banks on large rivers. The last colony in a natural breeding habitat was found in 2002 in Avenches VD (L. Broch) – until 2017, when two breeding pairs were discovered for the first time on the revitalised Thur River near Kleinandelfingen ZH (M. Griesser). In 2013–2016, most colonies were in gravel pits, some in sand deposits with fresh walls, and the occasional one in artificial sand banks built especially for Sand Martins[5].

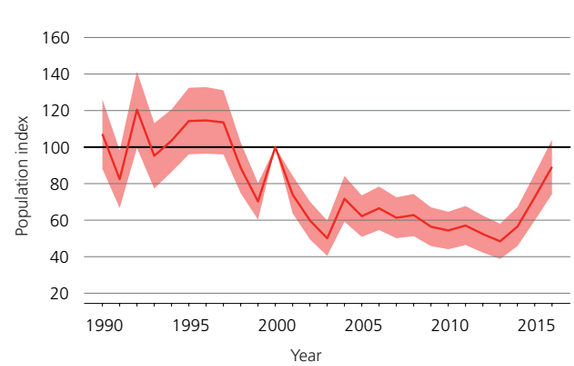
Since 1980, all gravel pits in a representative section of the Central Plateau have been checked for Sand Martins as part of a monitoring project (method according to Kuhnen[3]). The largest colonies numbered 874 burrows (277 pairs) in Raperswilen TG (P. Kaiser) and 823 burrows (263 pairs) in Stetten AG (M. Lüthy), both in 2016. The population has thinned out considerably since 1950–1959, especially in western Switzerland. There have been no breeding attempts in southern Switzerland since 1999. Since 1993–1996, the total number of colonies has dropped from 130 to 69, and colony size has shrunk by more than 20 %. The population reached a historical low in 2013. It is uncertain whether the trend reversal that has taken place since 2014 will persist.

In 2013–2016, about half the gravel pits surveyed in the monitoring project were unoccupied but contained the structures that Sand Martins rely on, such as steep faces and sand layers. The continuing trend towards more rapid extraction as well as legal requirements for reclamation will likely reduce the number of gravel pits, which in turn would limit the expansion of the Sand Martin population. Artificial walls for breeding can serve as a conservation measure in certain locations[1, 5]. So far, the Sand Martin has rarely been able to benefit from river restorations. Downward trends in neighbouring countries[AtD, AtF, RLEU, 2] have been attributed to drought in the species' wintering grounds in the Sahel region[4, 6, 7].

Christoph Vogel-Baumann

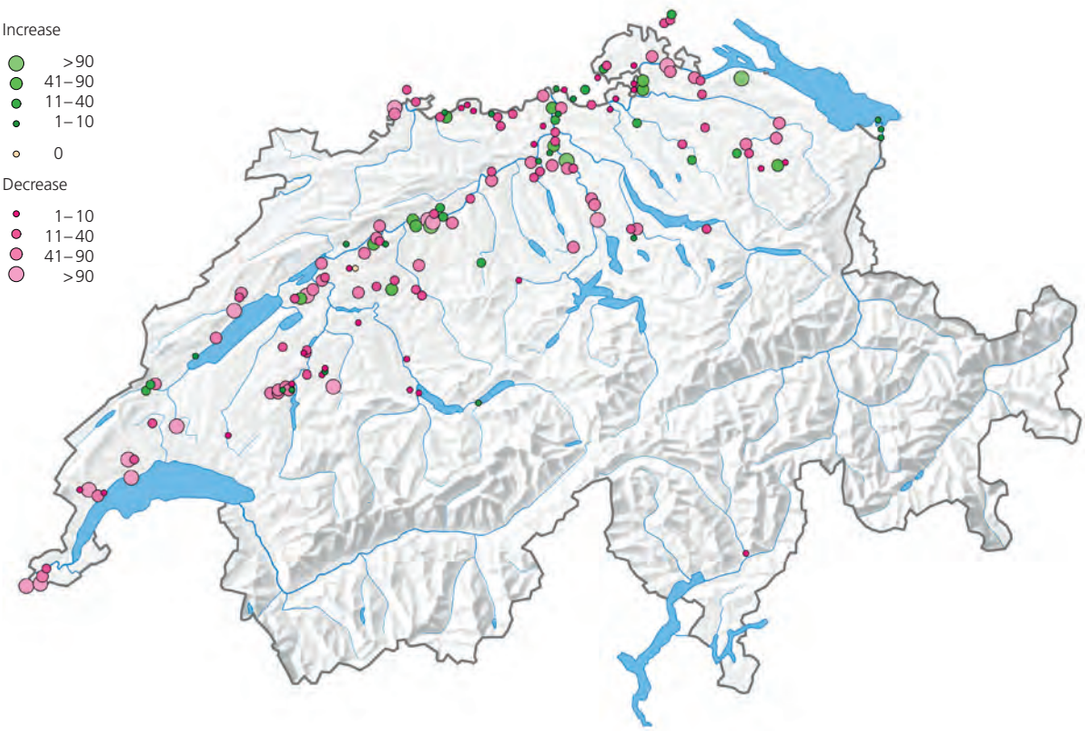
[1] Bachmann et al. (2008a–b); [2] Campedelli et al. (2012); [3] Kuhnen (1978); [4] Robinson et al. (2008); [5] Schmit (2016); [6] Szép (1995); [7] Zwarts et al. (2009)





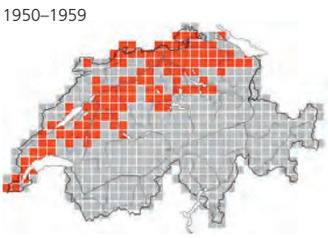
Breeding pairs 2013–2016

Change in the number of breeding pairs since 1993–1996

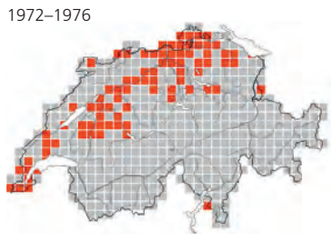


Sponsored by
Herbert Weidmann
kse bern Der Kantonale Kies- und Betonverband
Stiftung Landschaft und Kies
Im Dienste des Bauens und der Natur.

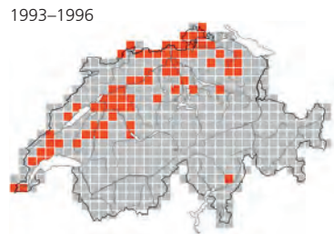
1950–1959



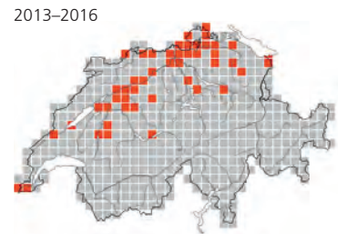
1972–1976



1993–1996



2013–2016



Western Bonelli's Warbler

Phylloscopus bonelli
Berglaubsänger
Pouillot de Bonelli
Luì bianco
fegliarel da muntogna

Dennis Lorenz

Red List Least Concern (LC)
Population 40 000–60 000 pairs (2013–2016)

Focus pages 164, 314, 402, 542, 552

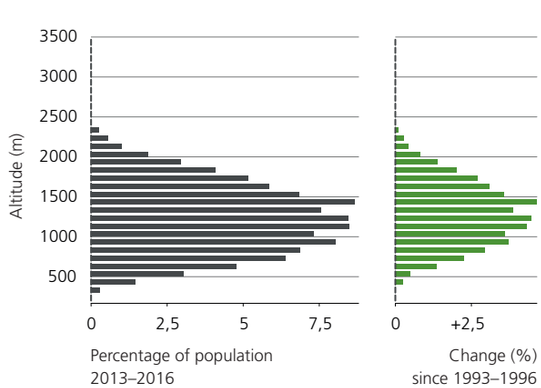
In Switzerland, the Western Bonelli's Warbler approaches the northeastern limit of its range, which extends from North Africa to northern France and eastwards as far as Slovenia. The Western Bonelli's Warbler mainly inhabits sunny, dry and warm slopes in Valais and Grisons as well as the southern slopes of the northern Jura, where it finds open woodland with sparse ground vegetation or rocky slopes with shrubs. In the Alps, the Western Bonelli's Warbler occurs in forests of spruce, larch and stone pine up to the tree line; in the Jura, it favours oak and birch woods [VdS]. Altitudinal distribution is concentrated between 700 and 1700 m. The highest singing males were observed near Nendaz VS at 2340 m (C. Luisier) and near Felsberg GR at 2330 m [AGR]. In prime habitat, Western Bonelli's Warbler can be the most abundant species, reaching densities of more than 20 territories/km². Territory mapping surveys found as many as 16 singing males/10 ha on a slope near the valley bottom between Näfels GL and Netstal GL [5] as well as 5.5 territories/10 ha in a larch forest in Upper Engadine GR [AEn].

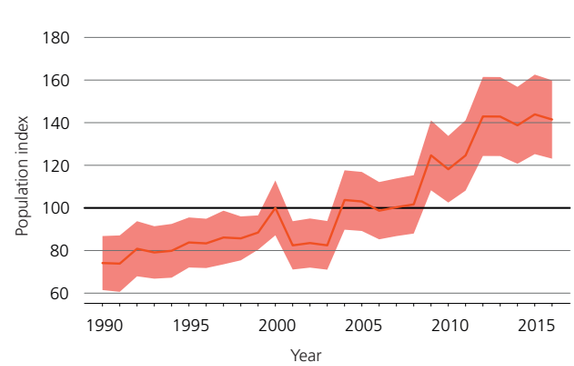
The overall Swiss population has increased by more than 50 % since 1993–1996. The Western Bonelli's Warbler was detected in several new atlas squares, filling in distribution gaps in the Alps and Pre-Alps. Density increased to the same extent at all altitude levels, especially in areas that were already well populated. Losses on the Central Plateau, in contrast, are greater than the change map implies. A long-term decline is in progress in the lowlands [AtCH1, AtZH], similar to trends observed in southern Germany [AtBo, AtD, 2, 8] and in Austria [9].

The positive population trends in Switzerland as well as in France [AtF] and Italy [1] may be related to the general tendency for warmer and drier summers, which allow the species to colonise new habitats at higher altitude. The decline in lower-lying areas can be expected to continue as forest dynamics cause clearings to become overgrown and shrubland to grow into forest [3, 4]. The European population of the Western Bonelli's Warbler declined until about 2000 and has since increased again [EBBC].

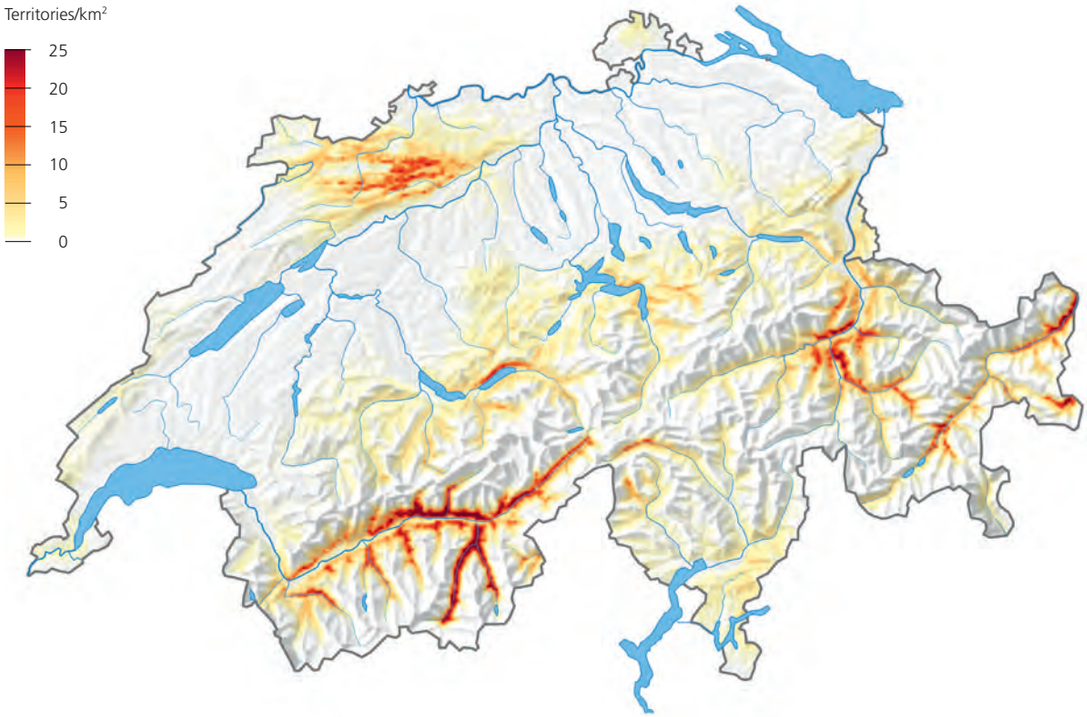
Jérémy Savioz

[1] Bani et al. (2014); [2] Bauer et al. (2016a); [3] Gatter (1997); [4] Gatter & Dallmann (2017); [5] Marti (2002); [6] MeteoSchweiz (2017)/MétéoSuisse (2017)/MeteoSvizzera (2017); [7] Rete Rurale Nazionale & Lipu (2015); [8] Rödl et al. (2012); [9] Teufelbauer & Seaman (2017)

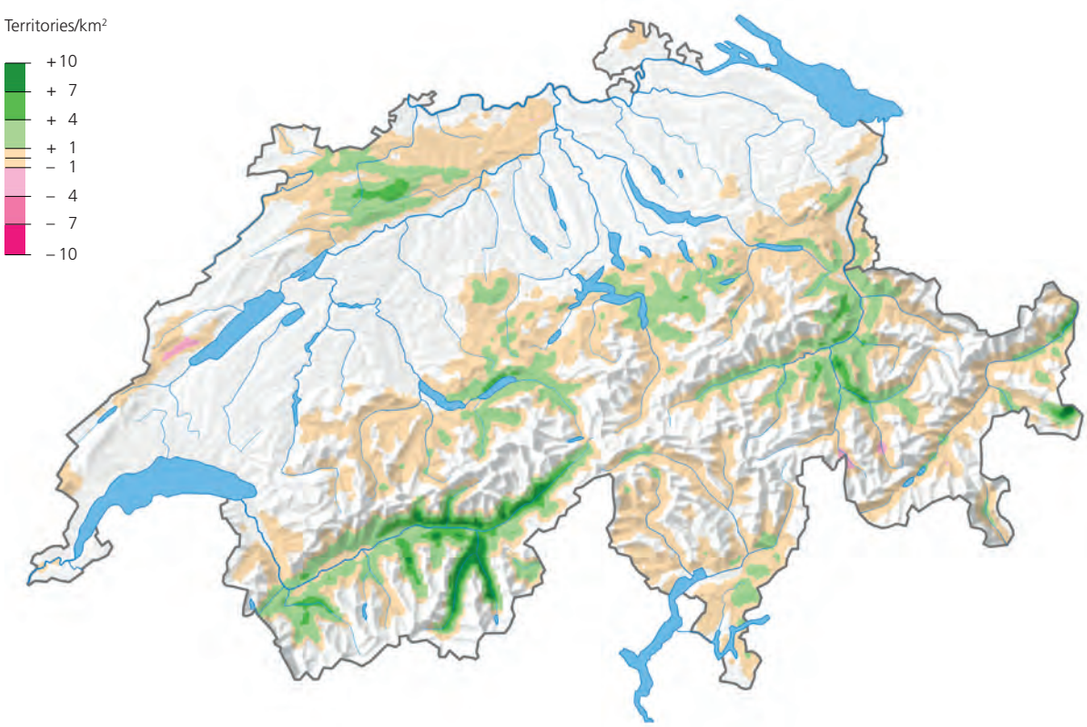




Density 2013–2016

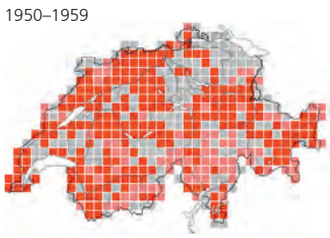


Density change since 1993–1996

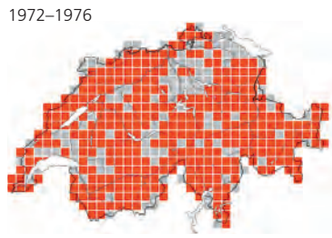


Sponsored by
Bruno Kaufmann & Sigrid Rogl

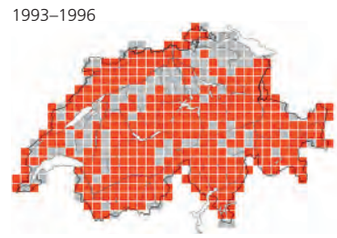
1950–1959



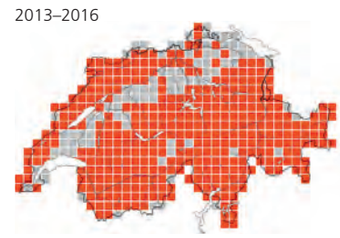
1972–1976



1993–1996



2013–2016



Wood Warbler

Phylloscopus sibilatrix
Waldlaubsänger
Pouillot siffleur
Luì verde
fegliarel da guaud

Markus Varesvuo

Red List Vulnerable (VU)
Population 5000–7500 pairs (2013–2016)

Focus pages 240, 402, 448

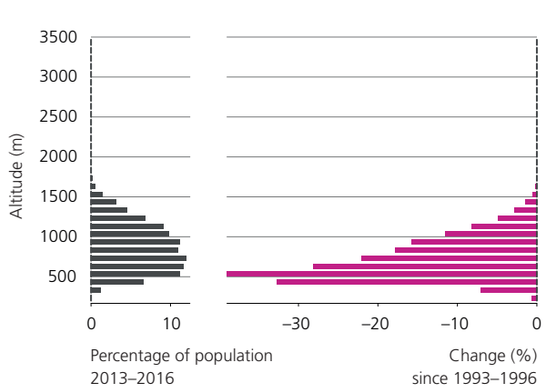
The Wood Warbler occurs throughout Switzerland, but population density is low in many parts of the Central Plateau. Most territories lie between 400 and 1200 m. While breeding has been recorded up to 1780 m [AEn], the highest recent record comes from 1490 m near Valchava GR (B. Wartmann). The highest singing males were recorded near Anzère VS at 2020 m (A. Barras) and in the Val Fex GR at 2000 m (R. Wigger). The species favours forests in medium stages of succession and inhabits large deciduous woods often dominated by beech and/or oak, but also coniferous forests with suitable forest structure. Key habitat features are a closed canopy, little vertical layering, few bushes and shrubs, thin to medium ground cover with grass-like vegetation, relatively high tree density, sloping terrain and nutrient-poor soils [HVM, 3, 4, 8, 9, 10]. In years when rodent numbers are high, suitable habitat is occupied to a much lesser degree to avoid brood loss through mammalian predators [2, 13].

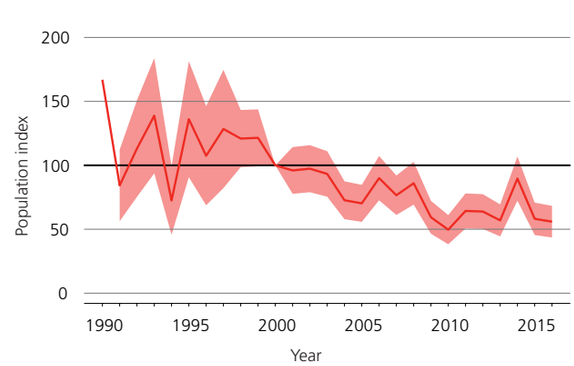
Significant gaps in distribution have appeared since 1993–1996. The Wood Warbler has become rarer or is completely absent from many parts of the Central Plateau, Jura and Pre-Alps, with the greatest losses occurring below 1000 m. The Swiss population has declined by about 50 % since 1993–1996, but appears to have stabilised at a low level since about 2010. Regional surveys reveal even more massive collapses, e.g. by more than 95 % in the Canton of Zurich between 1988 and 2008 [AtZH] and around Lake Constance between 1980 and 2010 [AtBo].

Steep declines have been recorded in the past 40 years in several countries of northern, western and central Europe; in some areas, populations have stabilised in the past 10–15 years [AtD, EBCC, RLEU, 5, 12]. In eastern Europe, numbers appear to be stable overall; some areas have even seen increases. Changes in the breeding habitats due to forestry interventions and atmospheric nitrogen deposition [9, 11] as well as habitat degradation in the species' African wintering grounds [1, 6, 7] have been suggested as possible causes of the decline. Forestry interventions should be avoided in woodlands occupied by the Wood Warbler.

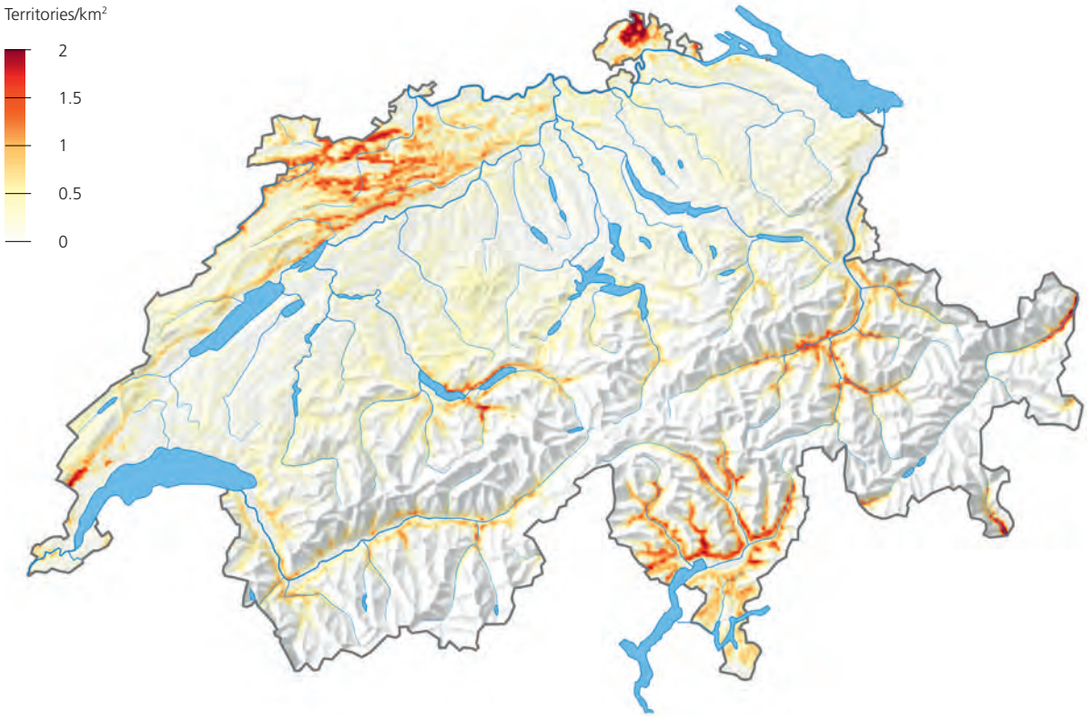
Gilberto Pasinelli & Alex Grendelmeier

[1] Awa II et al. (2018); [2] Grendelmeier et al. (in prep.); [3] Huber et al. (2016); [4] Huber et al. (2017); [5] Jiguet (2017); [6] Mallord et al. (2016); [7] Mallord et al. (2018); [8] Marti (2007); [9] Pasinelli et al. (2016); [10] Reinhardt & Bauer (2009); [11] Scheibler (2015); [12] Teufelbauer & Seaman (2017); [13] Wesołowski et al. (2009)

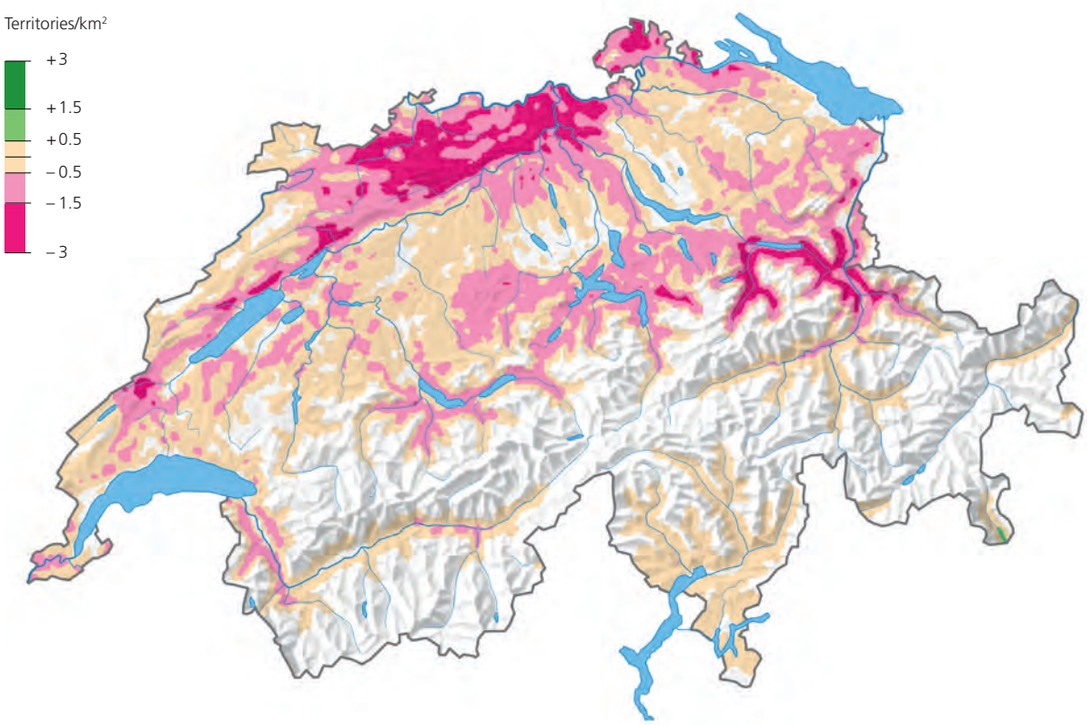




Density 2013–2016

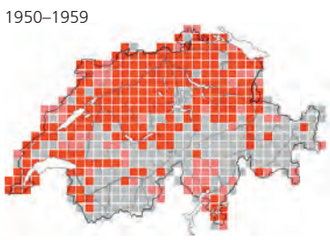


Density change since 1993–1996

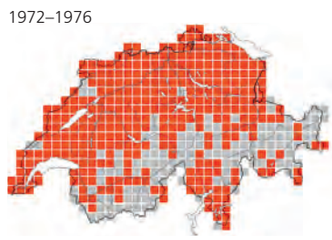


Sponsored by
Herbert Hächler

1950–1959



1972–1976



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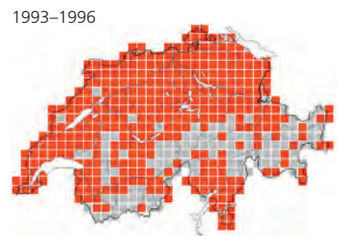
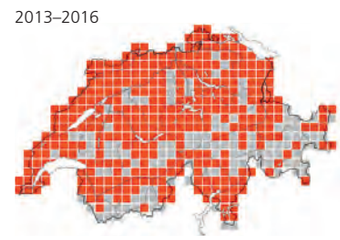


2013–2016



Lush and green – too much fertiliser harms birds

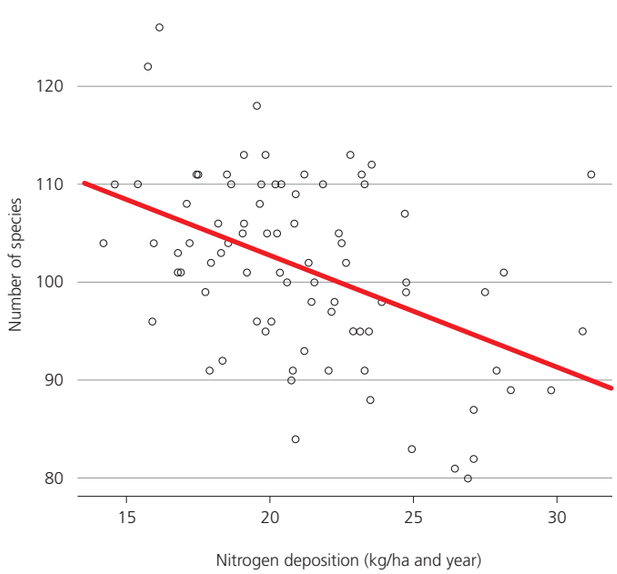
Switzerland is a country of verdant landscapes. Fields and meadows are richly fertilised, and mires and woodlands receive more nutrient input than is good for them. In consequence, the habitat of many bird species that depend on low, patchy vegetation for foraging or nesting is degraded.

Fertiliser is applied to increase crop yields. But plants do not absorb the entire amount. A considerable quantity of nitrogen diffuses into the air: in 2005, 65 % of nitrogen emissions into the air came from agriculture, 22 % from traffic, 10 % from trade and industry, and 3 % from private households [7]. Most airborne nitrogen returns to the soil, fertilising surfaces where no such treatment is desired. Today, these immissions often exceed by far the so-called critical load of 5–25 kg of nitrogen/ha and year that is considered acceptable for most ecosystems [1, 14]. An annual nitrogen surplus of 190 000 t was calculated in 1994; the figure is expected to drop to 145 000 t per year in 2020 (if the present trend continues). So-called nitrogen efficiency will have increased from 22 to 30 % [8]. Nevertheless, despite these signs of progress, the nitrogen surplus in Switzerland is huge.

Swiss lowlands most affected by excessive fertilisation

Levels of nitrogen deposition differ from region to region [17]. They are highest in the eastern parts of the Plateau and in the colline zone of the Pre-Alps, but high values are recorded in the remaining lowland areas too.

While the critical loads of nitrogen differ depending on the habitat, they are exceeded almost everywhere in Switzerland: 100 % of raised bogs, 90 % of forests, 84 % of fens and 42 % of dry grassland contain harmful levels of nitrogen [2].



Comparison of the number of species per atlas square (10 × 10 km, below 600 m on the Central Plateau and in the Jura) with average annual nitrogen deposition from the air (in kg/ha and year). The number of species decreases as nitrogen input increases.

Substantial impact on birds

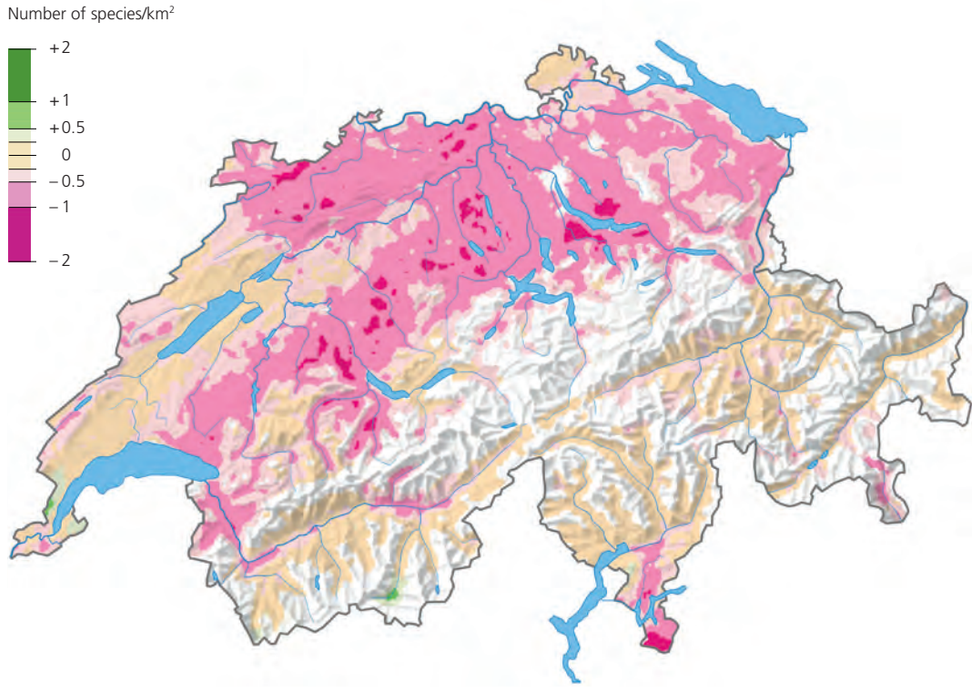
The surplus quantities of nitrogen that are released into the environment are considered one of the main causes for the decline in biodiversity in central Europe [20]. They have serious consequences for species composition and vegetation structure, and have an indirect impact on breeding birds, as illustrated by the following two examples:

1. Where woodruff or wood-rush once formed patchy ground vegetation, undergrowth in «over-fertilised woods» is now dominated by species that tolerate high nutrient levels, such as brambles and nettles [3]. The Wood Warbler avoids this type of vegetation when establishing its territory [11, 13]. The increase in nutrients may also have a negative impact on the Western Bonelli's Warbler, a species that occupies nutrient-poor woodland [6].
2. Where nitrogen deposition from the air is high, plant diversity is smaller than at other, comparable sites [15]. This is because the number of competitive species increases, crowding out smaller plants that are specialists of nutrient-poor soils. Insect abundance is lower in nutrient-rich, species-poor meadows, affecting many farmland birds. In addition, dense vegetation growth makes it difficult for ground-foraging birds to access insects. Several species with declining populations, such as Eurasian Wryneck, Eurasian Skylark, Woodlark, Red-backed Shrike and Common Redstart rely on low, patchy vegetation for foraging [12, 16, 18, 19].

At the landscape scale, excessive fertilisation leads to the homogenisation of flora [5]. Analyses of atlas data indicate a similar effect on bird communities. We selected all atlas squares (10 × 10 km) below 600 m on the Central Plateau and the Jura and compared the average nitrogen deposition from the air per hectare [14, 17] with the recorded number of species. Over-fertilised atlas squares supported fewer breeding bird species than squares with low nitrogen input: the number of species declined by 11 species per 10 kg/ha of additional nitrogen.

Positive effect of nutrient reduction in lakes

Lakes and rivers present a different situation than grassland and forests. The limiting nutrient in freshwater lakes is not nitrogen but phosphorus. Just a few decades ago, many Swiss lakes were so loaded with phosphorus from wastewater and agriculture that ecosystems were close to collapse. The situation has since greatly improved thanks to the expanded sewage treatment system, the ban on phosphates in detergents, and the introduction of buffer zones [10]. As a result, reedbeds and especially submerged vegetation such as pondweed and stoneworts have recovered. Birds that breed in reedbeds have benefited, as has the Red-crested Pochard, which feeds predominantly on



Distribution change since 1993–1996 of five species that require patches of bare ground for foraging (Eurasian Wryneck, Eurasian Skylark, Woodlark, Red-backed Shrike and Common Redstart). The map combines the distribution change maps of all five species.

stoneworts. Its wintering population has increased considerably in recent years. The species has become a more common breeder as well[9], increasing its numbers fivefold from 1993–1996 to 2013–2016.

Thus, targeted measures have succeeded in significantly improving the situation in Swiss lakes and streams. When it comes to nitrogen loss on land, we are still far from achieving a sustainable solution. If we are committed to preserving species that require low, patchy vegetation in a landscape that is not excessively fertilised, we need to act with determination and without delay.

Roman Graf

[1] BAFU & BLW (2008)/OFEV & OFAG (2008); [2] BAFU & BLW (2016)/OFEV & OFAG (2016); [3] Braun et al. (2012); [4] Britschgi et al. (2006); [5] Bühler & Roth (2011); [6] Gatter (1997); [7] Heldstab et al. (2010); [8] Heldstab et al. (2013); [9] Keller (2014); [10] Liechti (1994); [11] Marti (2007); [12] Martinez et al. (2010); [13] Pasinelli et al. (2016); [14] Rihm & Achermann (2016); [15] Roth et al. (2013); [16] Schaub et al. (2010b); [17] Seitler et al. (2014); [18] Sutton et al. (2011); [19] Tagmann-Ioset et al. (2012); [20] WallisDeVries & Bobbink (2017)

Species pages 128, 280, 312, 358, 360, 398, 400, 470

Alex Grendelmeier

Jael Hoffmann

Wood Warblers favour woods with sparse to moderate grassy ground cover (left). Due to fertilisation with nitrogen from the air, the undergrowth is dominated by species that thrive in nutrient-rich soil, such as brambles (right); the Wood Warbler avoids this type of environment.

Willow Warbler

Phylloscopus trochilus
Fitis
Pouillot fitis
Luì grosso
fegliarel musicant

Ruedi Aeschlimann

Red List Vulnerable (VU)
Population 4000–5000 pairs (2013–2016)

Focus pages 240, 357, 414, 448

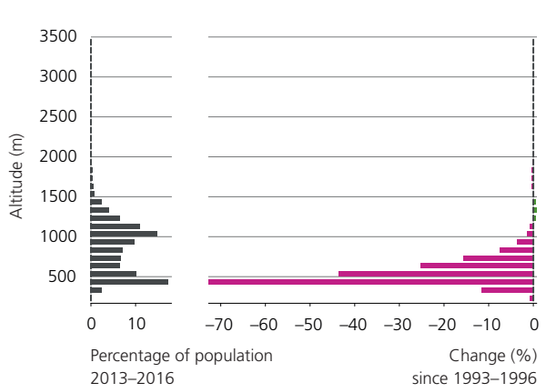
Switzerland lies at the southern edge of the Willow Warbler's breeding range. The species occurs throughout the country, but is rare and dispersed in the Alpine region and south of the Alps. The highest densities are reached in the raised bogs of the Jura and central Switzerland, in bushy sedge marshes, alluvial forests and carr, and in open woodlands on the Central Plateau [VdS]. The populations in the Neuchâtel Jura and the Franches-Montagnes JU are so large that they influence the altitudinal distribution pattern between 900 and 1200 m. The highest records of confirmed breeding relate to adults carrying food near Villars-sur-Ollon VD at 1710 m (J.-P. Reitz) and near Habkern BE at 1640 m (M. Hammel). Singing males have been recorded all the way up to the tree line, for example near Lü GR at 2240 m (M. Hofer) and near Törbel VS at 2200 m (A. Barras). Passage migrants or wandering birds are sometimes seen in atypical habitats.

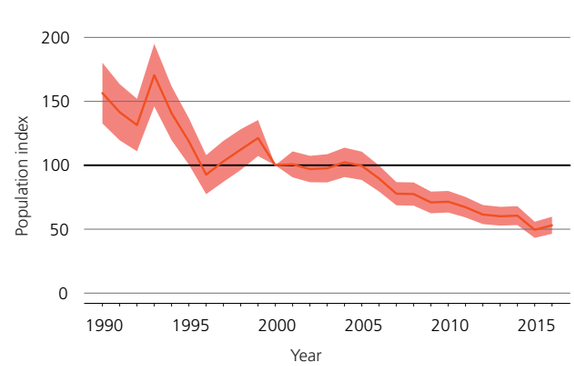
The population has dropped by half since 1993–1996, the decline being most pronounced on the Central Plateau, where distribution has become extremely sparse. The population has also thinned out around Geneva. In the Grande Cariçaie, the average number of territories dropped from 146 (2002–2006) to 78 (2012–2016) [1]. The population decreased by more than 60 % in the Canton of Zurich between 1988 and 2008 [AtZH] and by almost 85 % in the Lake Constance area between 1980 and 2010 [AtBo]. Numbers appear to be stable in areas above 1100 m. The apparent range expansion in the central and southern Alps does not in fact reflect newly occupied sites, but results from a different treatment of records of singing males during the breeding season than in 1993–1996. In France, Germany and Austria, numbers have also halved since the 1990s [AtD, AtF, 6]. The overall European population has declined by 20 % since 1993–1996 [EBCC].

The decline of the Willow Warbler is mainly attributed to the loss of suitable habitat when woody thickets are cleared or forest stands grow denser [3, 5]. Other reasons include higher mortality during migration and in the wintering grounds due to changes in climate and habitat in the Sahel [2, 3, 4, 7, 8, 9]. Finally, the decline could also indicate a northward shift of the Willow Warbler's breeding range in response to climate change [ClimAt].

Jacques Laesser

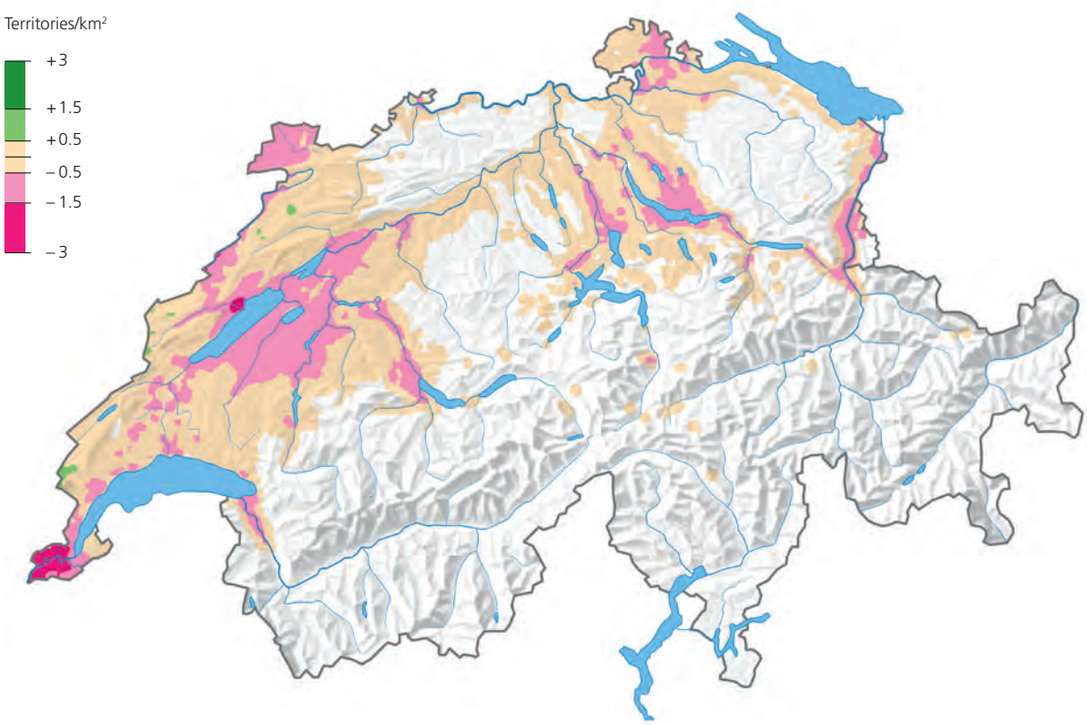
[1] Antoniazza (in prep.); [2] Morrison et al. (2013a); [3] Morrison et al. (2013b); [4] Peach et al. (1995a); [5] Spaar et al. (2012a–b); [6] Teufelbauer & Seaman (2017); [7] Thingstad et al. (2015); [8] Vickery et al. (2014); [9] Zwarts et al. (2009)





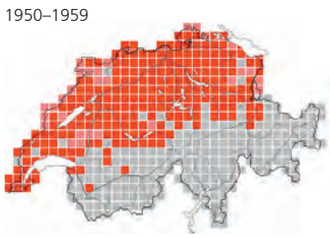
Density 2013–2016

Density change since 1993–1996

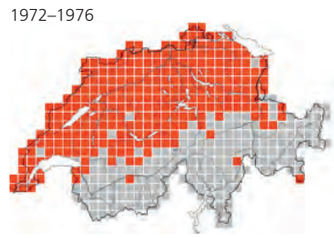


Sponsored by
Anonymous donor

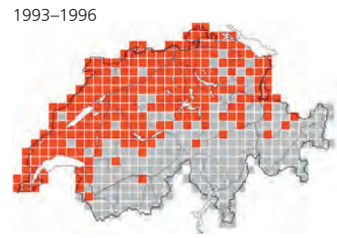
1950–1959



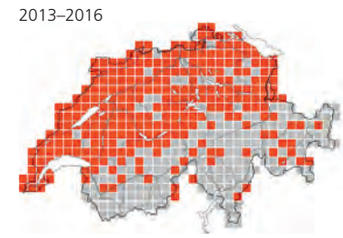
1972–1976



1993–1996



2013–2016



Common Chiffchaff

Phylloscopus collybita
Zilpzalp
Pouillot véloce
Luì piccolo
fegliarel da salesch

Dennis Lorenz

Red List Least Concern (LC)
Population 250 000–300 000 pairs (2013–2016)

Focus page 414

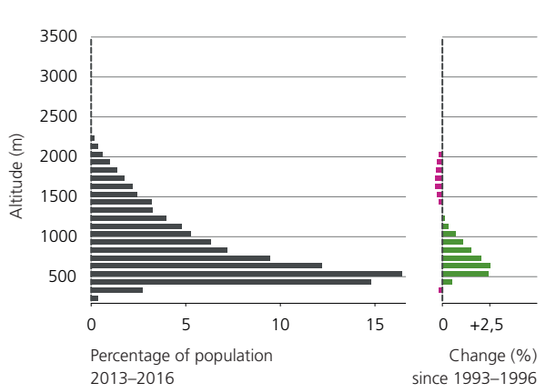
The Common Chiffchaff is widespread in wooded habitats in Switzerland. Important habitat features in forests include well-developed shrub and herbaceous layers and an open canopy. The Chiffchaff also occurs in large gardens and parks. Average densities of more than eight territories/km^2 are reached between 400 and 1400 m. In suitable kilometre squares, it is not uncommon to count 25 territories and more. The highest records of feeding adults in recent years came from Elm GL at 2050 m (M. Hammel). Earlier records document breeding up to 2100 m [AtCH2]. The highest singing male was observed at 2310 m near Zermatt VS (E. Gunzinger) [1].

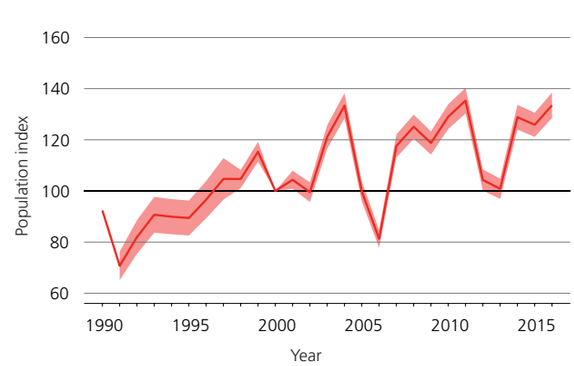
Since 1993–1996, the population has increased mainly between 500 and 1000 m. The regional differences in the population trend are striking: numbers increased in large areas north of the Alps between Lake Constance and Lake Geneva, but declined or remained unchanged in the Ticino and some Alpine valleys. While the trend was predominantly positive in Switzerland in the 1990s, it has since been highly dynamic with short-term declines followed by rapid recovery. These fluctuations may be related to winter weather in central and southwestern Europe [3]. But unfavourable conditions during migration can also cause large losses, as was seen during the cold spell in March 2013. In Germany and Italy, numbers are fairly constant [AtD, 7]; the same is true for the European population since 1990 [EBCC]. France and Austria, on the other hand, report negative trends [5, 8].

The reasons for the mixed trends in Switzerland are unknown. Populations may be stagnating or even declining in growing forests (e.g. in Ticino), while the positive trend north of the Alps could be related to the increasing occupation of semi-open farmland and settlements by the Chiffchaff, a trend that has been observed elsewhere too [3, 9]. Another factor may be the species' preference for young-growth forests (like those emerging in the wake of storm «Lothar» in late 1999) [2, 4, 6]. The observed trends could also be early signs of the expected northward shift of the range due to climate change [ClimAt].

Jan von Rönn

[1] Antoniazza (2015); [2] Christen (2018); [3] Flade & Schwarz (2004b); [4] Glutz von Blotzheim (2001); [5] Jiguet (2017); [6] Mollet et al. (2017); [7] Rete Rurale Nazionale & Lipu (2015); [8] Teufelbauer & Seaman (2017); [9] Weggler & Widmer (2000b)



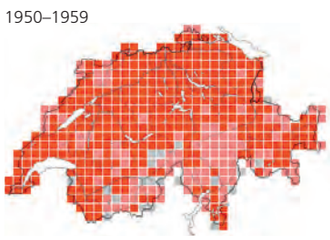


Density 2013–2016

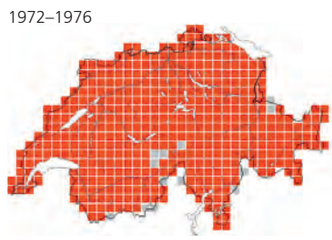
Density change since 1993–1996

Sponsored by
Regina Ebner

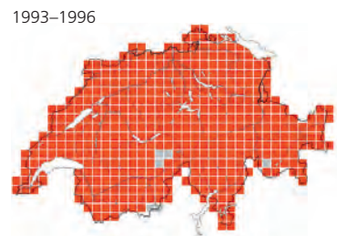
1950–1959



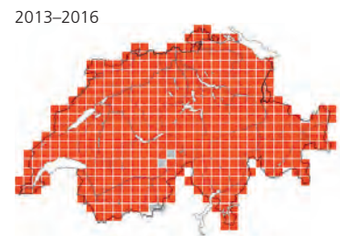
1972–1976



1993–1996



2013–2016



Greenish Warbler

Phylloscopus trochiloides
Grünlaubsänger
Pouillot verdâtre
Luì verdastro
fegliarel verdent

Markus Varesvuo

Red List –
Population 0–1 pairs (2013–2016)

Focus pages 369, 420

The Greenish Warbler breeds in open mixed forests in northeastern Europe. These populations are quite recent, resulting from a westward expansion of the range that began in the early 19th century. The species reached Finland and Poland between 1930 and 1940 and Sweden in 1953. After several influxes during spring migration and two records of probable breeding in 1935 and 1962, breeding was confirmed in Germany for the first time on Heligoland in 1990, followed by six further records elsewhere[AtD, 3, 6]. Only 13 singing males have been recorded in Austria so far[1, 6].

Switzerland's location at the southwestern front of the range expansion made it likely that the Greenish Warbler would also appear here. The first singing males were observed in 2014 in Gänsbrunnen SO[2] and Gruyères FR, in company with a probable female at the latter site (J. Gremaud, B. Posse et al.)[4]. The first breeding record came in 2015 in the Vallée de l'Hongrin VD[5] on a damp, sparsely wooded hillside with northwestern exposure. In 2017, singing males were observed at the far end of the Val d'Hérens VS (R. Arlettaz et al.) and near Rigi Staffelhöhe/Greppen LU (M. Käch). There is hope that this series of observations will lead to further breeding records in Switzerland.

Bertrand Posse & Lionel Maumary

[1] Albegger & Khil (2016); [2] Christen (2015); [3] Koschkar & Dierschke (2014); [4] Marques & Thoma (2015)/Marques et al. (2015); [5] Maumary & Schneider (2018); [6] Thoma & Althaus (2015)

1950–1959

1972–1976

1993–1996

2013–2016

Territories 2013–2016

Cetti's Warbler

Cettia cetti
Seidensänger
Bouscarle de Cetti
Usignolo di fiume
channarel da flum

Beat Rüegger

Red List Vulnerable (VU)
Population 0–2 pairs (2013–2016)

Focus page 425

The Cetti's Warbler is widespread in the Mediterranean rgion and mostly winters in its breeding grounds. In Switzerland, it is an irregular visitor, mainly observed in the border regions in Ticino, where it favours dense waterside vegetation.

In 2013–2016, breeding was confirmed twice, near Agno TI and Caslano TI, both in 2015 (M. Hammel et al.)[3]. In addition, singing males were recorded in three other atlas squares already occupied in 1993–1996. The occurrence of the Cetti's Warbler in Switzerland fluctuates depending on winter conditions. In Bolle di Magadino TI, where it is most regularly seen, it was absent in 2006, 2007, 2012 and 2013, all years that followed a cold winter. The birds breeding near Klingnau reservoir AG in 1978–1983 disappeared following the severe winters of the mid-1980s[VdS].

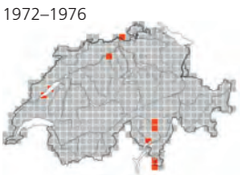
In France, the breeding population showed a small overall increase between 1989 and 2012, with numbers stabilising after 2001. Since 1985–1989, the Cetti's Warbler has again spread to the department of Ain and to Savoie, located to the southwest of Switzerland[AtF]. By contrast, the Italian breeding population has recently declined[1, 4]. The population in the Netherlands numbered an estimated 550–750 pairs in 2013[2].

Bernard Volet

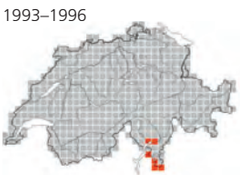
[1] Bani et al. (2014); [2] Boele et al. (2015); [3] Martinez & Maumary (2016a–b); [4] Rete Rurale Nazionale & Lipu (2015)

1950–1959

1972–1976

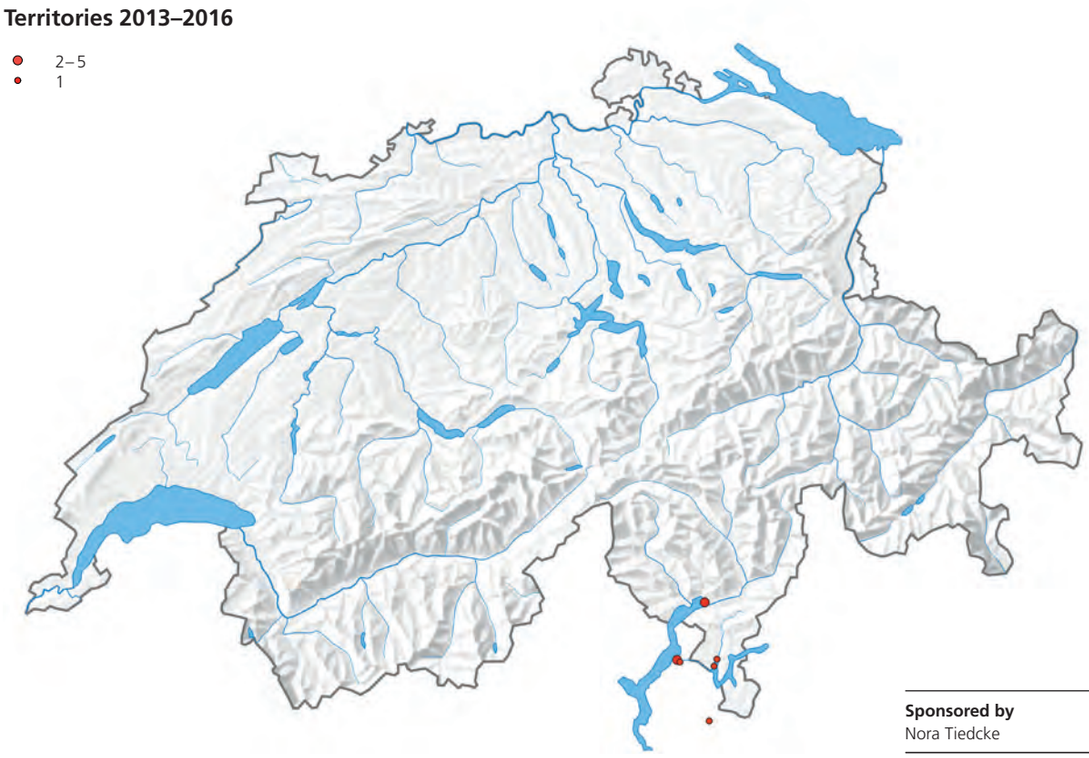


1993–1996



2013–2016

Territories 2013–2016



Sponsored by
Nora Tiedcke

Long-tailed Tit

Aegithalos caudatus
Schwanzmeise
Mésange à longue queue
Codibugnolo
sbrinzlina

Daniele Occhiato

Red List Least Concern (LC)
Population 20 000–35 000 pairs (2013–2016)

Focus page 414

In Switzerland, the Long-tailed Tit is particularly widespread at lower altitudes. Most of the population occurs below 1200 m. The Long-tailed Tit mainly inhabits deciduous and mixed woodland with a well-developed shrub layer, but is also found in parks and gardens. It is most common in Ticino and Valle Mesolcina GR; somewhat lower densities are reached in the Canton of Geneva, the Rhone Valley VS and the Val Poschiavo GR. In other areas, density is considerably lower. The highest confirmed breeding was recorded in an earlier survey at 1920 m near Samedan GR [AEn]. Observations during the breeding season were recorded up to 2080 m near Zermatt VS (C. Huwiler) and Poschiavo GR (M. Müller).

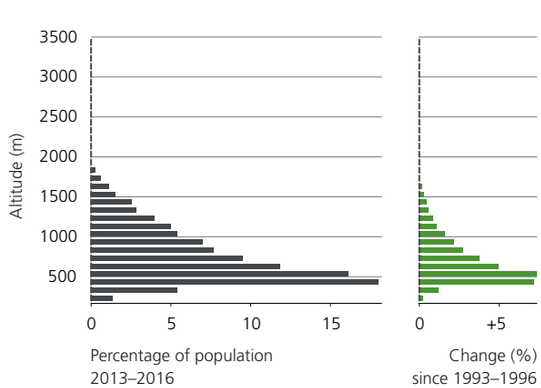
The Swiss population undergoes large annual fluctuations, but has been growing since 1990. Compared to 1993–1996, numbers have increased at all altitude levels in proportion to the overall increase. The increase was greatest in southern Switzerland, and somewhat less pronounced in the Lower Valais and on the central and eastern Plateau. In contrast, the Long-tailed Tit has become scarcer in the Upper Valais and Val Bregaglia GR.

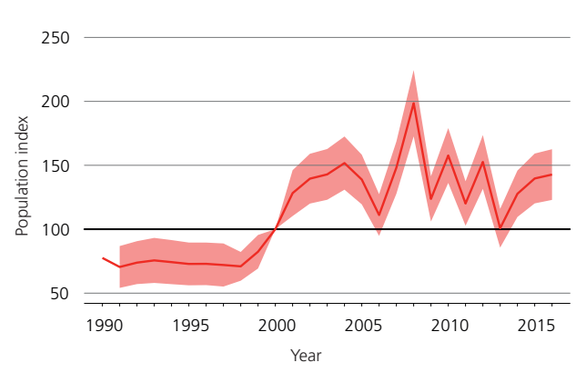
Regional surveys also show clear upward trends: numbers more than doubled in the Canton of Zurich between 1988 and 2008 [AtZH] and around Lake Constance between 1980 and 2010 [AtBo]. However, the population in the Grande Cariçaie reserve on Lake Neuchâtel remained unchanged from 2000–2016 [1]. The neighbouring countries report varying trends: in France, habitat changes have led to small declines [AtF, 10]; trends are stable in Germany and Austria [AtD, 13], while the Long-tailed Tit has become more common in Italy [2, 12]. The overall European population has remained stable since about 1985 [EBBC].

The Long-tailed Tit is sensitive to harsh winters, which can reduce populations by as much as 80 % [4, 6]. Other studies reveal an important effect of spring and autumn temperatures on the survival rate [8]. Higher May temperatures result in better breeding success [9]. Temperatures in Switzerland have been rising in all seasons since about 1980 [11], which has probably had a positive effect on the population. The Long-tailed Tit avoids pure spruce stands [3, 7] and may have benefited from the decreasing number of spruce trees in forests [5].

Livio Rey

[1] Antoniazza (2018); [2] Bani et al. (2014); [3] Bashta (2007); [4] Bauer et al. (2005); [5] Brändli (2010a–b); [6] BirdLife International (2017c); [7] Guest (2012); [8] Gullett et al. (2014); [9] Gullett et al. (2015); [10] Jiguet (2017); [11] MeteoSchweiz (2017)/MétéoSuisse (2017)/MeteoSvizzera (2017); [12] Rete Rurale Nazionale & Lipu (2015); [13] Teufelbauer & Seaman (2017)



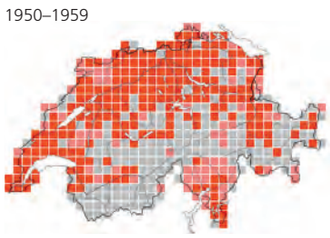


Density 2013–2016

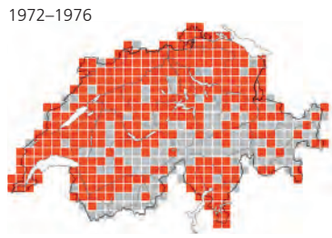
Density change since 1993–1996

Sponsored by
Christian Bobst
Anita Wetter

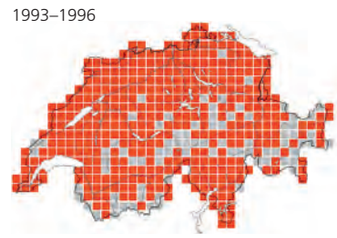
1950–1959



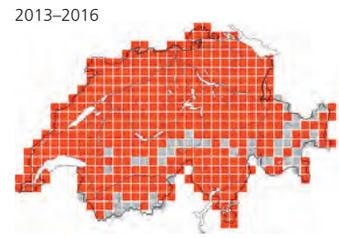
1972–1976



1993–1996



2013–2016



Eurasian Blackcap

Sylvia atricapilla
Mönchsgrasmücke
Fauvette à tête noire
Capinera
fustgetta dal chapitsch

Mathias Schäf

Red List Least Concern (LC)
Population 700 000–800 000 pairs (2013–2016)

Focus pages 314, 392, 414

The Eurasian Blackcap is widespread throughout Switzerland and occurs in habitats with trees and shrubs such as woodlands, copses, hedgerows, gardens and parks. It avoids pure coniferous forests with little undergrowth. Average densities of more than 30 territories/km² are only found below 1000 m. In suitable kilometre squares, it is not uncommon to count 60 territories and more. The highest confirmed broods were recorded at 1990 m near Riddes VS (R. Rauber), and there are earlier records from 2000 m near Stampa GR [AGR] and Martigny-Combe VS [AtCH1]. Singing males were observed up to 2290 m near Guttannen BE (M. Hammel).

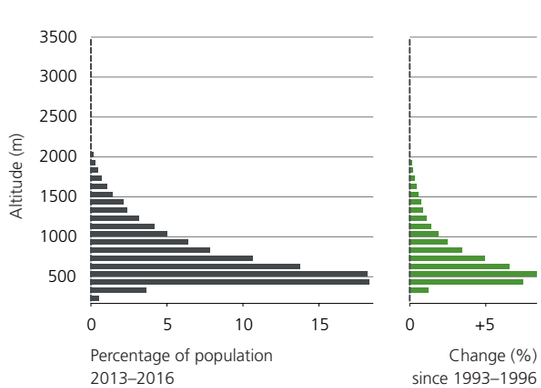
In the past 20 years, the breeding population has increased at all altitude levels in proportion to the population at that level. The Blackcap is increasingly colonising higher altitudes, as indicated by several new atlas squares in the high Alpine zone. The largest increase in numbers occurred on the Central Plateau and in the central Jura, western Pre-Alps and central Valais.

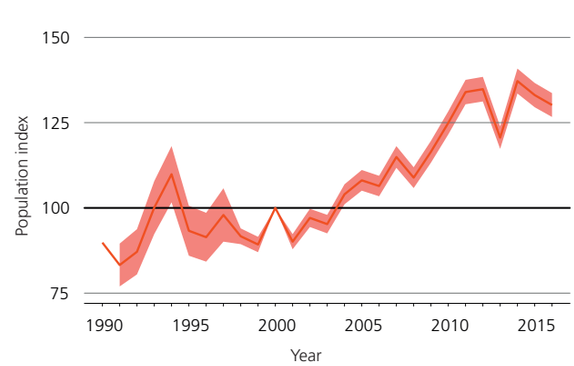
These rises in density have led to an overall increase in the Blackcap population of about 40 % in the past 20 years. Regional surveys in the Canton of Zurich between 1988 and 2008 and in the Lake Constance region between 1980 and 2010 confirm this trend [AtBo, AtZH]. Similar increases were recorded in neighbouring countries [AtD, AtF, 4, 8]. This is in line with the overall European trend, which rose by 60 % in the past 20 years [EBCC].

The causes for these positive trends in Switzerland and its neighbouring countries are unclear, but may be related to improved conditions in the wintering grounds and in part also in the breeding grounds, shorter migration routes, and more successful wintering in central Europe [AtD, AtF, EBAA1, HBW, 1, 2, 5, 6]. Increased colonisation of settlements and semi-open farmland may also play a role [AtD, 7]. The reasons for the weak or absent increase in Blackcap numbers in some of the southern Alpine regions are unknown. In Ticino, the maturing of shrubland to dense forest may be partly responsible [3].

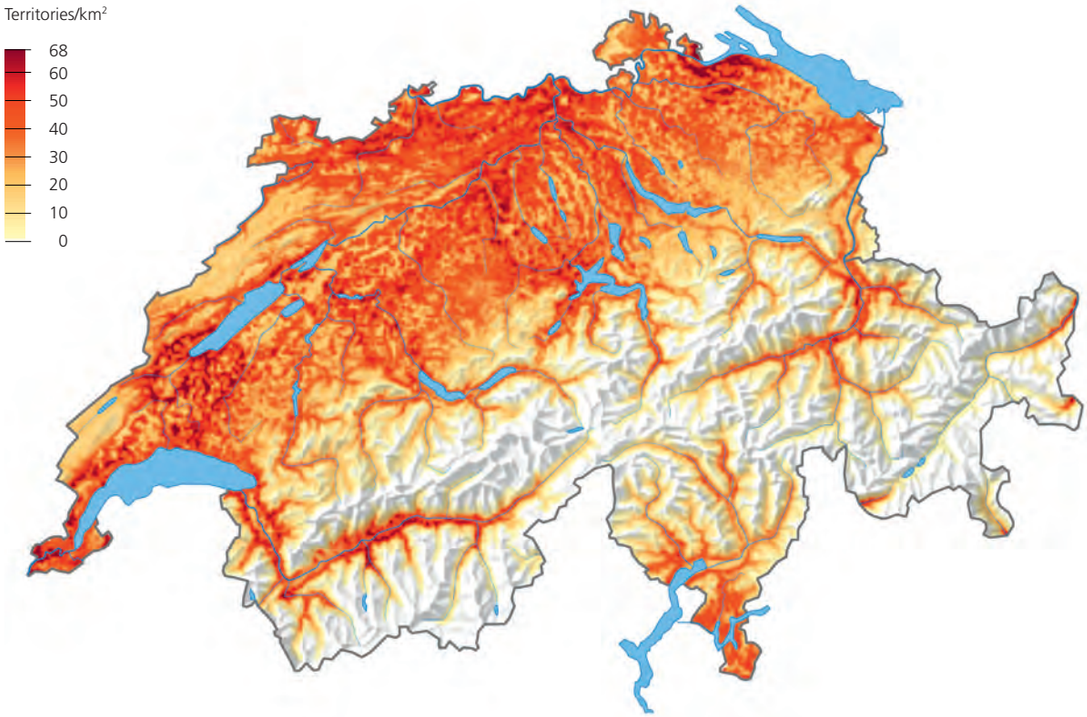
Samuel Wechsler

[1] Bauer et al. (2005); [2] Bearhop et al. (2005); [3] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [4] Campedelli et al. (2012); [5] Christen (2007); [6] Hiemer et al. (2018); [7] Steffens et al. (2013); [8] Teufelbauer & Seaman (2017)

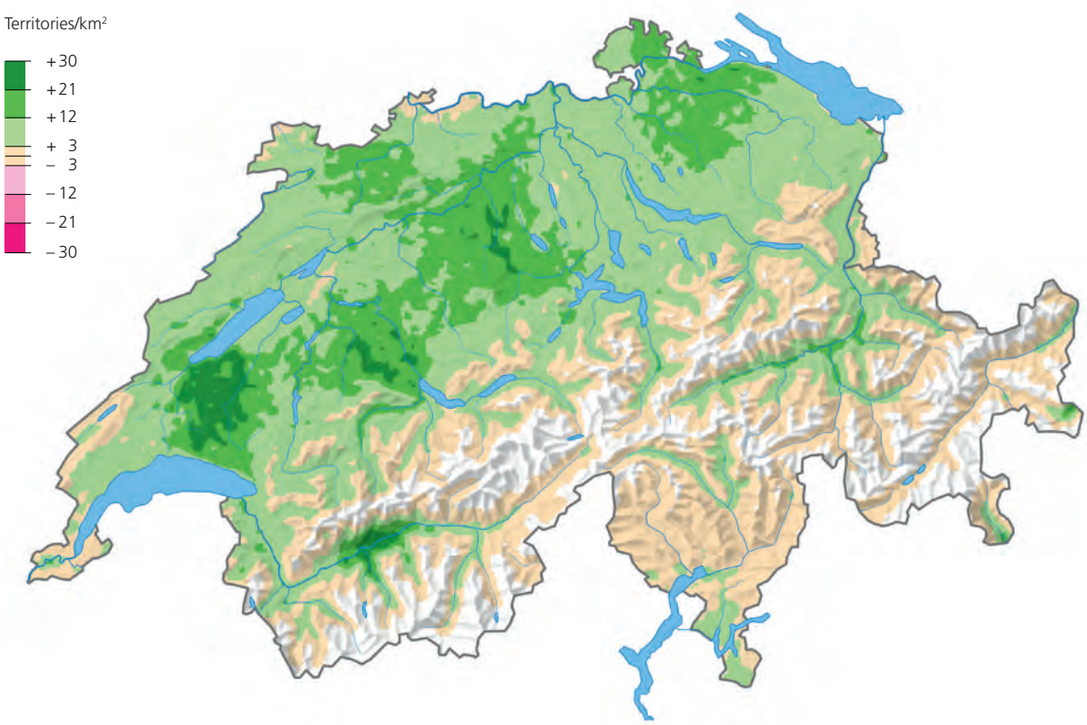




Density 2013–2016

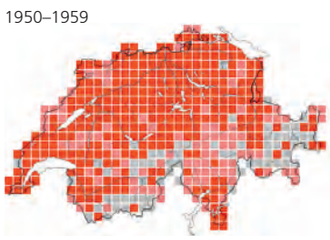


Density change since 1993–1996

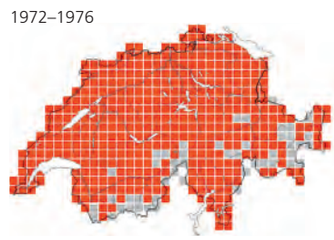


Sponsored by
Max Hirter

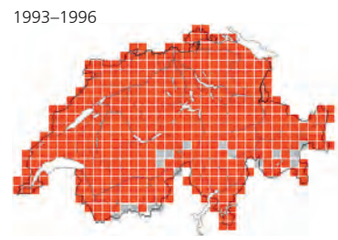
1950–1959



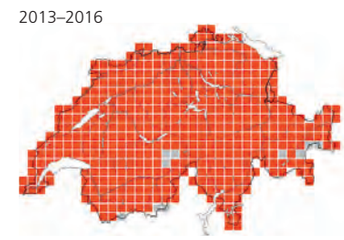
1972–1976



1993–1996



2013–2016



Many breeding birds move to higher ground

Between 1993–1996 and 2013–2016, the average altitudinal distribution of Swiss breeding birds increased by 24 m. This upward shift along the altitudinal gradient is a response to recent environmental changes, in particular to climate change.

Currently, the effects of global warming in Europe are mainly seen in the Mediterranean and the Alps [16]. The environmental changes that ensue are already having a direct or indirect effect on birds and will continue to do so in the future [15]. Initial projections show that many birds will shift their ranges to the north or to higher altitude [2, 10, 12, 20]. Other taxonomic groups are also affected (e.g. plants, butterflies) [5, 9, 19].

Two thirds of common bird species move to higher altitude

Swiss breeding birds are distributed along an altitudinal gradient of more than 3000 m. Using atlas data from 1993–1996 and 2013–2016, we examined whether a shift in altitudinal distribution had taken place. The sample included 71 common species for which we have density change maps; of these, 40 are woodland birds.

The centre of distribution of the studied species (their average altitudinal distribution) has shifted upwards by 24 m in the past 20 years. However, there are significant differences between the species: the range of the Hooded Crow, for example, has shifted downwards by 166 m, while the Willow Warbler has gained 205 m. Overall, altitudinal distribution increased for almost two thirds of all species between the two atlas periods. The difference between upward and downward shifts is particularly apparent in larger movements: only four species have shifted downward by at least 50 m, while 22 species have moved upward along the altitudinal gradient by 50 m or more.

A common pattern: losses in the lowlands and gains at higher altitudes

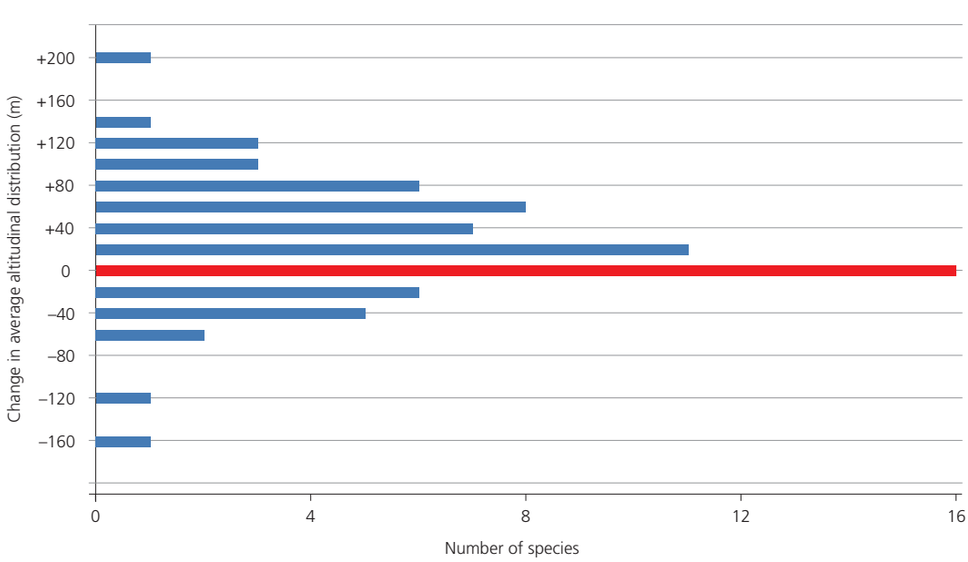
Among the 47 species that shifted their range upwards, 20 show a similar pattern: their populations have decreased at lower altitudes while increasing in the upper ranges of their distribution, independent of their ecological requirements and their average altitudinal distribution. The remaining 27 species either show only increases at higher altitudes or only losses in lower areas. Only four species show losses at high altitudes and gains in the lowlands.

The upward shift between the two atlas periods is particularly pronounced in species whose populations are concentrated at high altitude. The ten species with the highest altitudinal distribution in 1993–1996 experienced an average upward shift of 51 m; the ten species with the lowest distribution decreased in altitude by 8 m. In addition to the species included in this analysis, Black Grouse and Rock Ptarmigan also show an upward range shift [14, 17].

Finally, the ten species that are either included on the Red List of threatened breeding birds or classified as Near Threatened (NT) [RLCH] experienced a marked upward range shift of 84 m. In this group, the change presumably does not reflect a spread to higher altitudes but, rather, losses at lower elevations (e.g. Common Redstart, Garden Warbler). In contrast, the altitudinal distribution of species with increasing populations (e.g. Eurasian Blackbird, Common Woodpigeon) remained largely unchanged or even shifted downwards somewhat.

Trends with various causes

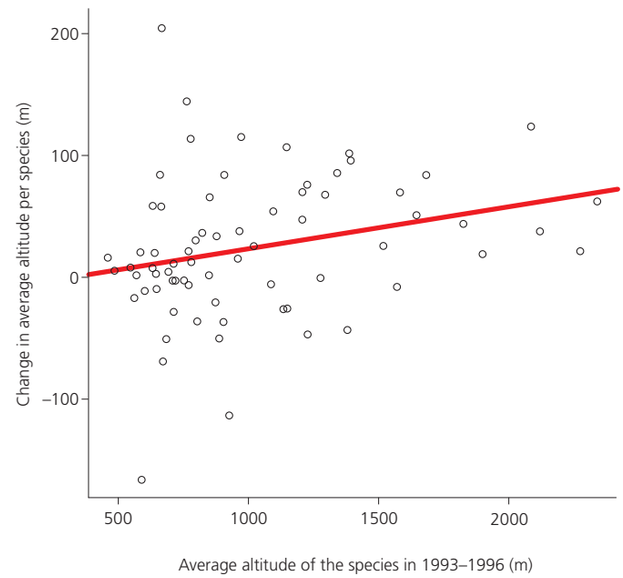
There is little doubt that climate change is influencing the upward shift in the distribution of Swiss breeding birds. Climate warming



Change in average altitudinal distribution of 71 breeding bird species between 1993–1996 and 2013–2016. The red column shows 16 species with no change (± 10 m); above the red column are 40 species whose distribution shifted upwards, below 15 species that showed a downward shift.

Change	Pattern	Examples
Upward shift (40 species)	20 species have declined at lower altitudes while increasing at high altitudes	Alpine Accentor, European Pied Flycatcher, Tree Pipit
	9 species have declined, especially at lower altitudes	Garden Warbler, Willow Warbler
	9 species have increased, especially at high altitudes	Song Thrush, European Robin
	2 species show a complex pattern	Common Cuckoo, Eurasian Siskin
No change (16 species)	Change in average altitudinal distribution between +10 and –10 m	Eurasian Collared-dove, Eur. Magpie, Eur. Blackbird, Eurasian Blackcap
Downward shift (15 species)	4 species have increased at lower altitudes while declining at high altitudes	Eurasian Green Woodpecker, Common Chiffchaff
	3 species have declined, especially at high altitudes	Red-backed Shrike
	7 species have increased, especially at lower altitudes	Stock Dove, Long-tailed Tit
	1 species shows a complex pattern	Eurasian Wryneck

Patterns in the altitudinal range shifts of 71 breeding birds between 1993–1996 and 2013–2016



Average altitudinal distribution per species between 1993–1996 and 2013–2016. Mountain birds have experienced a more pronounced upward shift than lowland species.

is twice as great in the Alps as it is in the valleys [1], which could explain the above-average upward range shift of mountain birds compared to lowland species.

Other factors also need to be considered and their effects analysed in more detail. First and foremost are human activities, especially agricultural intensification and the spread of settlements. Both these trends are much more pronounced on the Central Plateau than in the mountains [13]. Most bird species in decline in Switzerland occur at low altitudes and are therefore particularly exposed to human activities. That birds like the Eurasian Skylark and others appear to be moving to higher altitude is actually a result of population collapses in the lower reaches of the range. Changes in mountain farming also influence the distribution of breeding birds. These include intensification and the abandonment of marginal land as well as the spread of forests [4]. However, every species needs to be considered separately, as the interplay of various factors affects each one in a different way.

What does the future hold for mountain birds?

The upward shift of several species and the stable or even increasing populations of other mountain species suggest that the Alps may serve as a refuge in the future, when even more pronounced environmental changes are expected to occur [6, 8]. This is an important aspect to consider when planning large-scale conservation programmes or development projects (tourism, agriculture) in Alpine areas.

Researchers have only recently begun to study altitudinal range shifts. Many more studies are needed in this area. Current trends [3, 13, 18, 19, 21] do not bode well for birdlife. On the one hand, human activities such as intensive agriculture, leisure activities and the construction of roads and tourism infrastructure are expected to continue at much the same pace. On the other hand, the area of suitable habitat for species like the Rock Ptarmigan inevitably shrinks with increasing altitude [7, 11, 17]. Finally, habitats respond to climate warming with a certain time lag, especially forests. But how the resulting ecological imbalances will affect the species occupying these habitats is impossible to predict. The Alps therefore play a central role in conservation, because of their rich and fragile biodiversity, but also because of their future role as a refuge.

Sylvain Antoniazza

[1] Akademien der Wissenschaften Schweiz (2016)/Académies suisses des sciences (2016); [2] Chamberlain et al. (2012); [3] Chamberlain et al. (2013); [4] Chamberlain et al. (2016); [5] Chen et al. (2011); [6] Eigenbrod et al. (2015); [7] Furrer et al. (2016); [8] Gentili et al. (2015); [9] Hickling et al. (2006); [10] Huntley et al. (2008); [11] Imperio et al. (2013); [12] Maggini et al. (2011); [13] Maggini et al. (2014); [14] Marti et al. (2016); [15] Møller et al. (2010a); [16] Pepin et al. (2015); [17] Pernollet et al. (2015); [18] Revermann et al. (2012); [19] Roth et al. (2014a); [20] Thomas & Lennon (1999); [21] von dem Bussche et al. (2008)

Species pages 106, 112, 152, 154, 160, 174, 280, 286, 312, 326, 338, 360, 404, 406, 410, 412, 416, 446, 450, 458, 464, 470, 490, 504, 546

Garden Warbler

Sylvia borin
Gartengrasmücke
Fauvette des jardins
Beccafico
fustgetta da feglia

Mathias Schäf

Red List Near Threatened (NT)
Population 35 000–50 000 pairs (2013–2016)

Focus pages 314, 362, 414, 560

The Garden Warbler is widespread throughout Switzerland. In lowland areas it inhabits woodlands with dense shrub, preferably on damp ground (deciduous and mixed woodlands with dense undergrowth, young forest stands, windthrow areas, riparian vegetation, hedgerows). Its habitat overlaps broadly with that of the Eurasian Blackcap, though its requirements are more demanding. At higher altitudes, the Garden Warbler mainly inhabits willow and green alder stands. The highest breeding sites were recorded in Valais at 2230–2250 m [AtCH1].

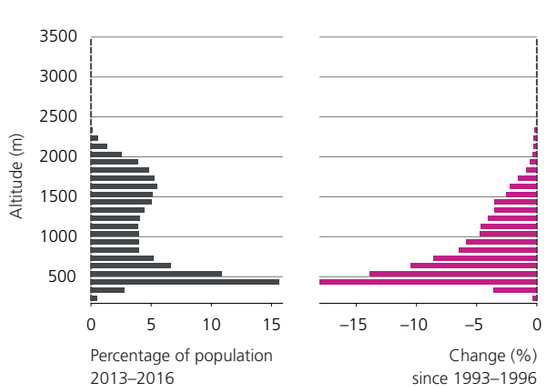
Although distribution has barely changed since 1993–1996, populations in the lowlands and Alpine valleys have declined by more than half. Above 1500 m, declines have been insignificant. As a result, half the population of the Garden Warbler, once a typical lowland bird, now occurs above 1000 m. Today, high densities can still be found at fairly high altitudes in the central and Valais Alps as well as in some wetlands, in the Seerücken range TG and along the Thur River.

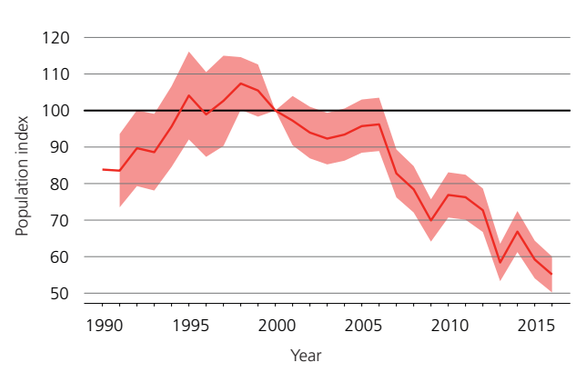
Numbers remained largely stable until 2006. Since then, there have been steep declines, also reflected in regional surveys: in the Canton of Zurich between 1988 and 2008 (50 % decline) [AtZH] and on Lake Constance between 1980 and 2010 (decline of more than 35 %) [AtBo]. Trends in neighbouring countries are negative as well [AtD, 2, 6, 9], as is the overall European trend [EBCC].

Causes for the decline may include the disappearance of field copses and hedgerows as well as reduced undergrowth in woodlands due to increased canopy cover [7], possibly aggravated by large populations of deer [5]. The Garden Warbler may also be under pressure from the Eurasian Blackcap, whose population is rapidly increasing, as the two species compete for territories [4]. The timing of the Garden Warbler's spring migration has not advanced [3, 8], so it has not been able to fully benefit from the availability of insects to feed its young, as insects have peaked earlier in the past years [1, 7]. At higher altitudes, conditions are more favourable: green alder stands are increasing, and there are few Blackcaps. Since the 1990s, long-distance migrants wintering in the more humid regions of Africa have suffered especially severe declines [8, 10], but it is unclear whether the declines in Europe are caused by changes in wintering habitats or by these species' inability to adjust the timing of spring migration [1, 7].

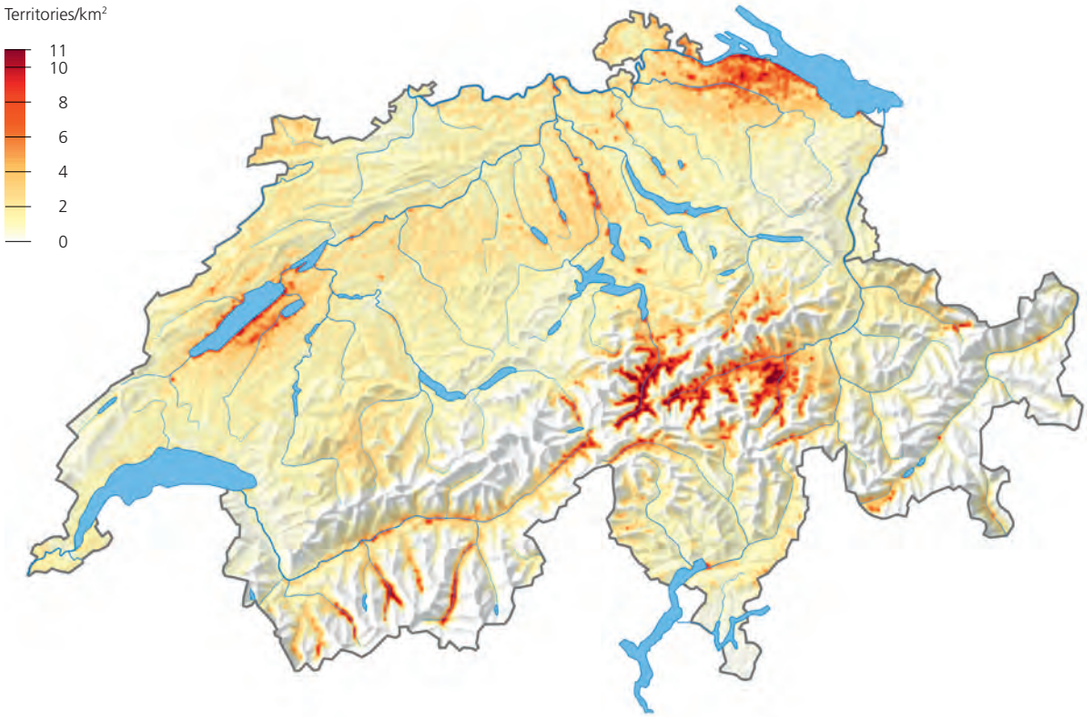
Lukas Jenni

[1] Both et al. (2010); [2] Campedelli et al. (2012); [3] Christen (2007); [4] Garcia (1983); [5] Holt et al. (2011); [6] Jiguet (2017); [7] Mustin et al. (2014); [8] Ockendon et al. (2012); [9] Teufelbauer & Seaman (2017); [10] Thaxter et al. (2010)

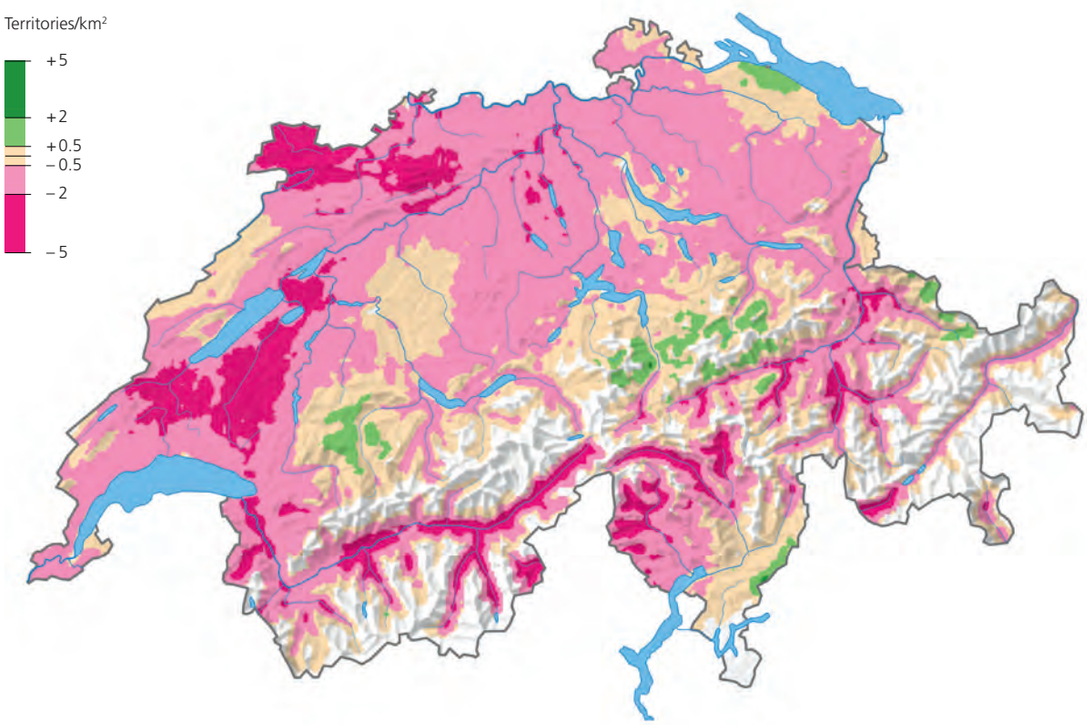




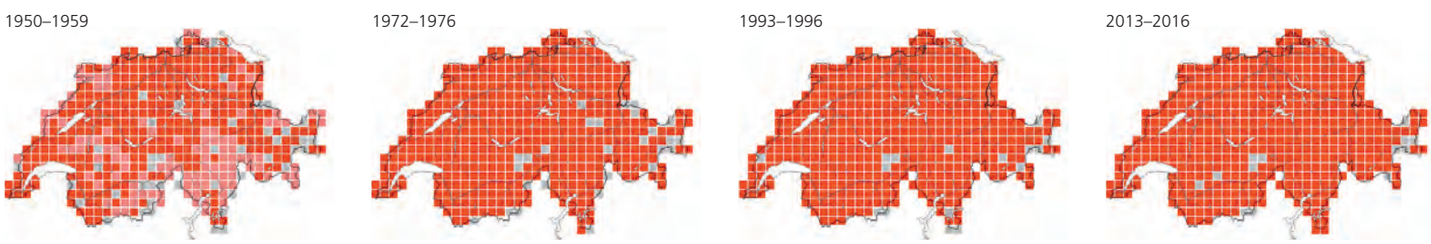
Density 2013–2016



Density change since 1993–1996



Sponsored by
Michael Widmer, Winterthur



Barred Warbler

Sylvia nisoria
Sperbergrasmücke
Fauvette épervière
Bigia padovana
fustgetta sdrimada

Mathias Schäf

Red List Vulnerable (VU)
Population 0–5 pairs (2013–2016)

Focus page 420

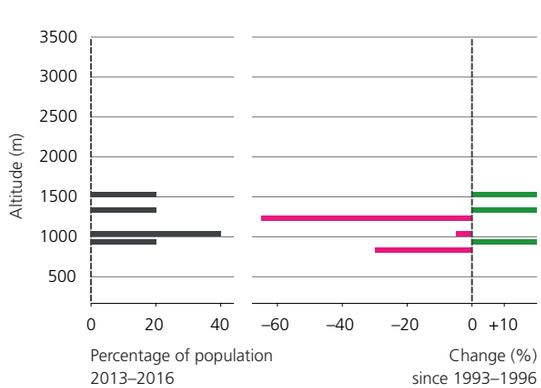
The Barred Warbler's range extends eastwards from north-eastern Italy and eastern Germany. Switzerland lies at the western limit of the species' distribution. The Barred Warbler occurs in small numbers between 900 and 1300 m; it is currently most regularly found in the Val Poschiavo GR, sporadically also in the Val Müstair GR and central Valais. It inhabits sunny, dry and warm slopes with shrub stands of varied composition, but which always include some proportion of thornbushes. The highest confirmed breeding record comes from 1510 m near Sent GR (2003; A. Gerber), and for the 2013–2016 survey period, from 1310 m near Müstair GR (M. Müller). The highest singing male in recent years was recorded at 1550 m near Reschen I (A. Mattinelli).

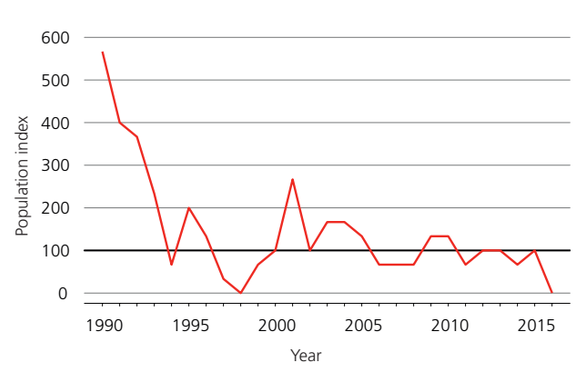
Breeding of the Barred Warbler in Switzerland was confirmed for the first time in 1952 in the Domleschg GR area. Further breeding-season observations did not follow until 1966 [VdS]. In 1979, the population averaged 3.3 territories per year. There were 2.2 territories per year in 1980–1989 and as many as 6.2 in 1990–1999. The number of territories subsequently declined again significantly: an average of 3.8 territories were counted in 2000–2009 and only 2.4 in 2010–2016. The small population in the Val Poschiavo GR currently holds 1–3 territories, the same number as in 1993–1996. However, this site was no longer occupied in 2016 and 2017; no territories were found elsewhere in these two years either. The last Barred Warbler territory near Ramosch and Sent in the Engadine GR was recorded in 2008. In 1991–1992, a maximum of 11 territories were counted in this area [AGR, 4].

Barred Warbler populations in Europe declined steeply from the nineties and appear to have stabilised somewhat since the turn of the millennium [EBCC]. While the Austrian population is stable [3], numbers have decreased in eastern Germany since the late 1990s [AtD]. Italy also reports a distinctly negative trend [2, 5]. The declines are probably related to the disappearance of hedgerows and ruderal habitats as well as agricultural intensification and the use of pesticides. At the western range margin, climatic factors are thought to play a part, as the Barred Warbler is sensitive to damp and cool weather in early summer [1, 5, 6].

Simon Hohl

[1] Bauer et al. (2005); [2] Brichetti & Fracasso (2010); [3] Dvorak et al. (2017); [4] Müller-Buser (2000); [5] Nardelli et al. (2015); [6] Steffens et al. (2013)





Territories 2013–2016

1

Certain dots on the maps have been moved to protect this sensitive species

Change in the number of territories since 1993–1996

Increase

2–3
1

0

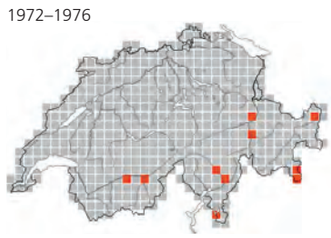
Decrease

1
2–3

Sponsored by
Katha Tränkle

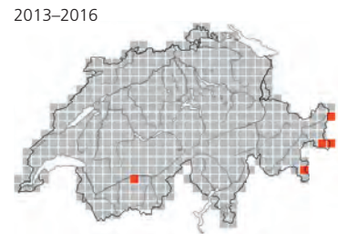
1950–1959

1972–1976



1993–1996

2013–2016



Messengers from the east

In the past 100 years, Switzerland has seen several new additions to its birdlife, especially from the east. Most new arrivals remain scarce visitors with heavily fluctuating numbers, but there are two notable exceptions: Fieldfare and Eurasian Collared-dove.

Within the western Palaearctic, the central European countries form a kind of threshold. The climate gradually changes from maritime in western Europe to continental in eastern Europe. In terms of biogeographical regions, species of western or African origin mingle with birds from the east. Switzerland lies at the western edge of this transition zone, just within reach of the wave-like advances of eastern species. Ten such species have arrived in Switzerland in the past 100 years. Two of them, Fieldfare and Eurasian Collared-dove, have become widespread, while others – White-backed Woodpecker, Citrine Wagtail, River Warbler, Barred Warbler, Greenish Warbler, Red-breasted Flycatcher, Eurasian Penduline-tit and Common Rosefinch – are still rare and subject to wide fluctuations.

Breeding by Fieldfare and Eurasian Collared-dove was confirmed in 1923 and 1950, respectively [VdS], followed by Barred Warbler and Eurasian Penduline-tit in 1952 [BCH]. The Penduline-tit bred another 32 times until 2014, although only two records date from the 21st century. The Barred Warbler population reached its peak in the 1960s and 1970s (15–20 pairs) [AtCH1] as well as in the early 1990s. In 2013–2016, only few territories were still occupied.

In the case of the Common Rosefinch, singing birds were first recorded in 1979; the first breeding attempt followed in 1983 [VdS]. After a wave of colonisation in the 1990s, a second advance has been underway since 2010, but has so far not gone beyond the Alps.

The White-backed Woodpecker has been recorded in Liechtenstein since 1981 and in Switzerland since 1996, and breeding has occurred in both countries since at least 1996 and 1999, respectively [VdS, 1]. It appears to have become firmly established in the Prättigau GR and the Rhine Valley SG/GR, gradually advancing westwards.

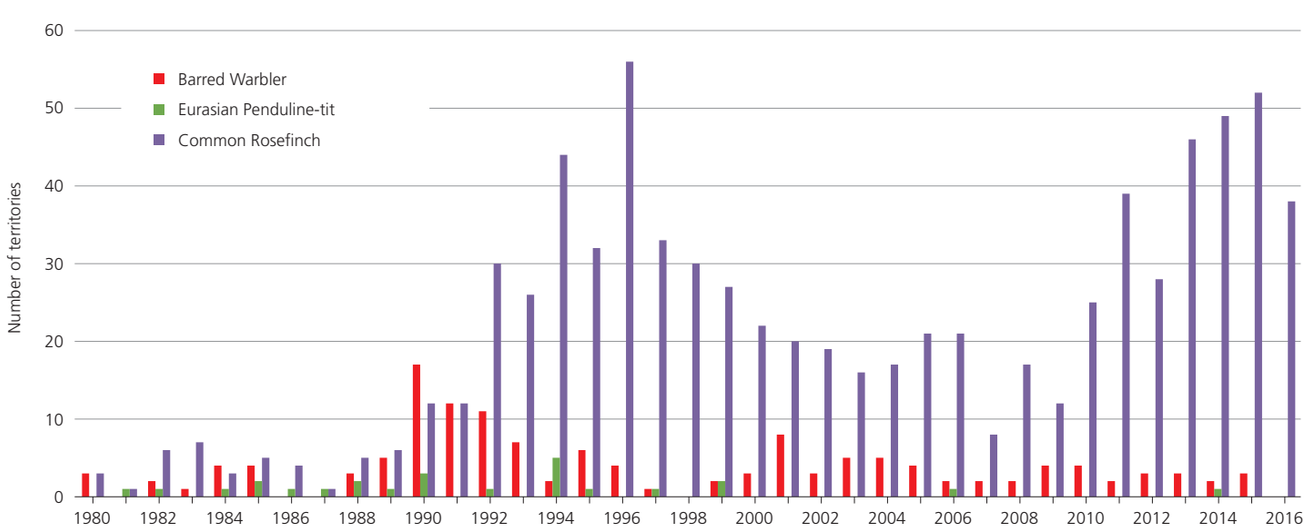
The approach of Citrine Wagtail, Red-breasted Flycatcher and River Warbler is more hesitant: for the first two species, breeding has been confirmed twice, in 1997 and 2012 (Citrine Wagtail), and in 2003 and 2006 (Red-breasted Flycatcher) [VdS, 2, 3]; the River Warbler bred just beyond the Swiss border in 2011 [5]. Finally, colonisation by the most recent arrival, the Greenish Warbler, appears to have more momentum: four territories were occupied between 2014 and 2017, resulting in at least one brood [4] and raising hopes for a positive future trend.

The advances and retreats described here are unpredictable. While the causes are not clear, they are presumably related to the dynamics, often random, of peripheral populations.

Bertrand Posse

[1] Bühler (2001); [2] Glutz von Blotzheim (1997); [3] Marques et al. (2013a–b); [4] Maumary & Schneider (2018); [5] Trösch et al. (2011)

Species pages 160, 296, 356, 408, 418, 452, 513, 524, 567, 576



Change in territory numbers for Barred Warbler, Eurasian Penduline-tit and Common Rosefinch in Switzerland from 1980 to 2016. Despite wide fluctuations, the Barred Warbler is visibly in decline.

Western Orphean Warbler

Sylvia hortensis
Orpheusgrasmücke
Fauvette orphée
Bigia grossa
fustgetta gronda

Ruedi Aeschlimann

Red List Regionally Extinct (RE)
Population 0 pairs (2013–2016)

Focus pages 319, 425

The Western Orphean Warbler inhabits the western Mediterranean region from the Iberian Peninsula to Italy and from Morocco to Libya. Switzerland lies at the northern limit of its range, but it has become scarcer in our country in the course of the 20th century. The species first disappeared from the Canton of Geneva, where the last singing male was heard in the 1950s[3]. After a brief presence in the Mendrisiotto TI, with breeding taking place in 1968[5], the Western Orphean Warbler disappeared from the southern slopes of the Valais as well, an area that had supported 10–25 territories, depending on the year, mainly between Leuk and Brig at 620 to 1100 m[AtCH1, 1]. Following the rejection of two breeding records in 1995 and 1996[AtCH2] by the Swiss Rarities Committee[6], this small breeding population is considered to have disappeared after 1994 (one singing male near Leuk)[VdS]. Since then, only two wandering birds have been sighted in Switzerland, one on 16 June 2006 near Dötra TI at 1830 m (B. Volet)[7] and a singing male on 13 May 2011 near Martigny-Combe VS at 610 m (D. Henseler)[8].

The disappearance of the Western Orphean Warbler in Switzerland corresponds with the trend in Italy[2] and France, where numbers are declining in the Alps, possibly due to climatic changes in spring, but increasing in the Mediterranean[AtF].

Bertrand Posse

[1] Bottani & Praz (1977); [2] Brichetti & Fracasso (2010); [3] Géroudet et al. (1983); [4] Piot et al. (2012)/Piot & Vallotton (2012); [5] Schifferli (1968); [6] Schweizer (2005b)/Schweizer & Piot (2005); [7] Schweizer (2007)/Schweizer & Vallotton (2007)

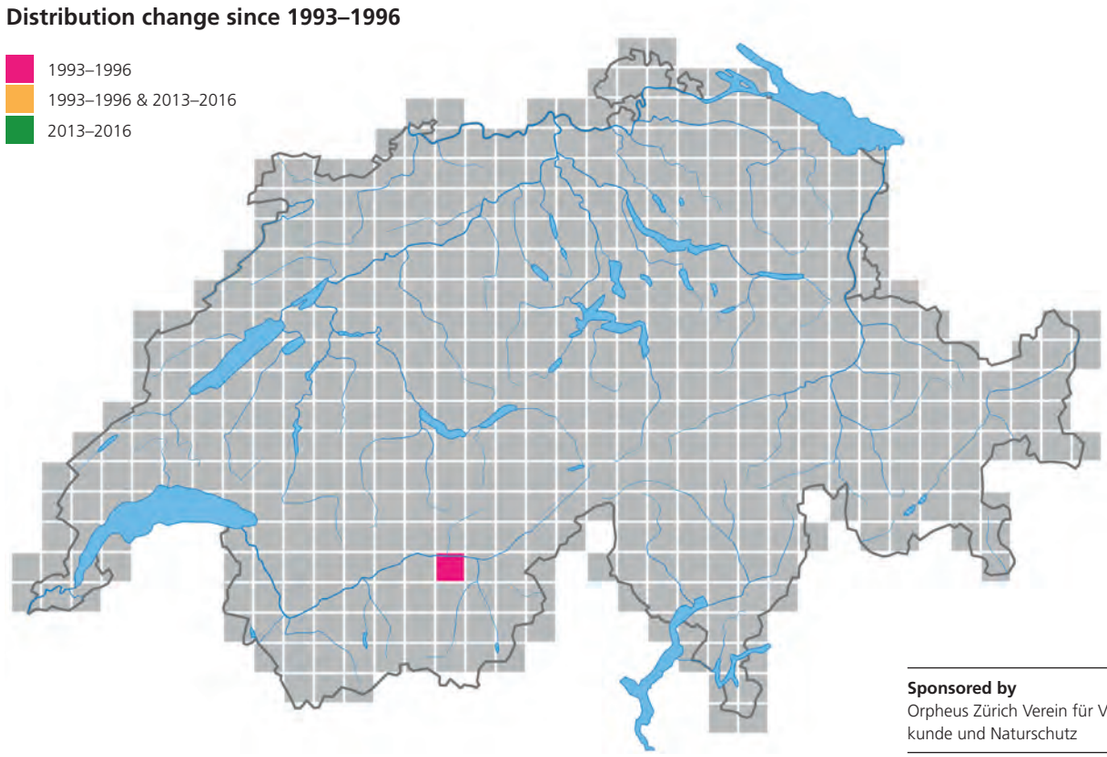
1950–1959

1972–1976

1993–1996

2013–2016

Distribution change since 1993–1996



Sponsored by
Orpheus Zürich Verein für Vogelkunde und Naturschutz

Lesser Whitethroat

Sylvia curruca
Klappergrasmücke
Fauvette babillarde
Bigiarella
fustgetta baterlunza

Dennis Lorenz

Red List Least Concern (LC)
Population 17 000–23 000 pairs (2013–2016)

Focus pages 314, 542

The Lesser Whitethroat is widespread in the Swiss Alps, but not very common. In the rest of the country, distribution is sparse, with observations most likely in the northern Jura. More than 75 % of the population occurs between 1600 and 2200 m. The most significant populations are found in Engadine GR, Val Müstair GR, the tributary valleys of the Valais, and northern Ticino. In suitable kilometre squares, it is not uncommon to count eight territories and more. Near Ennenda GL and Braunwald GL, seven territories were recorded on 50 ha and six territories on 40 ha [1].

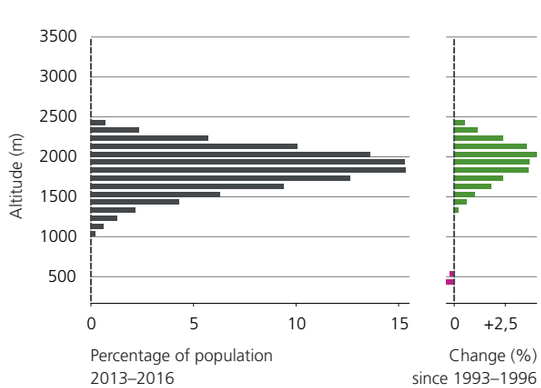
The Lesser Whitethroat is most frequently found in open landscapes with dwarf shrubs and stunted trees, where it shows a preference for low-growing conifers and green alder stands. In the lowlands, it sometimes occupies gardens and parks with young conifers and may be seen in nurseries, on fallow land or even in hedgerows on farmland. The highest confirmed breeding record comes from Täsch VS at 2380 m [AtCH2]. During 2013–2016, the highest brood was recorded near Zermatt VS at 2330 m (J.-L. Carlo) and the highest singing male near Pontresina GR at 2450 m (C. Müller).

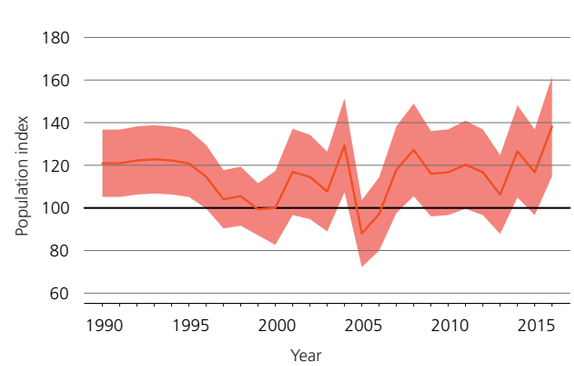
Newly occupied atlas squares since 1993–1996 are mainly in the Jura and along the western foot of the southern Jura slopes, but most lowland areas are irregularly occupied. In several Alpine regions, density has increased somewhat at all altitude levels. The population trend since 1990 appears to be slightly positive.

The Lesser Whitethroat is not threatened in the Alps, where numbers are increasing in the French Alps as well [AtF]. It may have benefited from the rising tree line and shrub encroachment on former pastures [1]. Trends are fluctuating in Germany, stable in Italy and negative in Austria [AtD, 3, 5]. Lowland regions have seen declines, for example in the Lake Constance area between 1980 and 2010 (–60 %) [AtBo] and in Bavaria [4]. Possible reasons include the lack of semi-natural, diverse gardens and the loss of hedgerows in farmland [2]. Nevertheless, the European population has been stable since 1980 [EBCC].

Jérémy Savioz

[1] Marti (2008); [2] Mayer et al. (2009); [3] Rete Rurale Nazionale & Lipu (2015); [4] Rödl et al. (2012); [5] Teufelbauer & Seaman (2017)



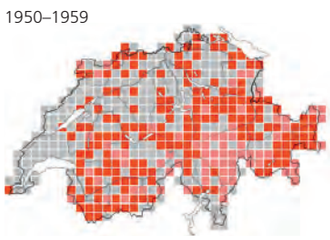


Density 2013–2016

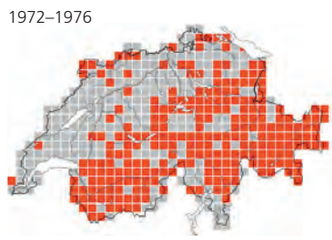
Density change since 1993–1996

Sponsored by
Kari Zombori, Seewis-Schmitten

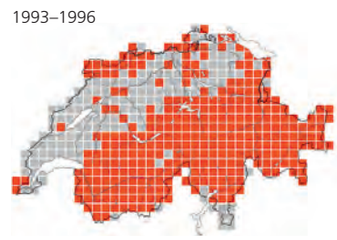
1950–1959



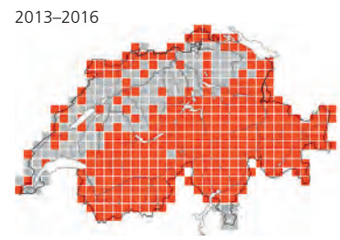
1972–1976



1993–1996



2013–2016



Subalpine Warbler

Sylvia cantillans
Weissbartgrasmücke
Fauvette passerinette
Sterpazzolina
fustgetta barbet

Mathias Schäf

Red List –
Population 0–1 pairs (2013–2016)

Focus page 425

The breeding range of the Subalpine Warbler sensu lato is confined to the Mediterranean region, extending from Portugal to Turkey and from Morocco to Tunisia. In Switzerland, breeding by this secretive warbler was confirmed in central Valais in 1996[7], 2004[5], 2006 (B. Posse et al.)[6], 2014 (D. de Heer, C. Mathys, B. Posse, A. Jacot)[3] and 2016 (A. Jacot, M. Schweizer)[4], the three most recent records coming from the Leuk area. Breeding was also confirmed near Vaz/Obervaz GR in 2012 (C. Monnerat). The warblers nested between 640 and 1160 m on slopes with a southern exposure and shrubby vegetation, either predominantly deciduous (downy oak and thornbushes) or coniferous (Scots pine, junipers).

The origin of these breeding birds is unclear, as only the 2016 record could be attributed to the western subspecies *S. c. iberiae*. It is possible that other records relate to Moltoni's Warbler *S. subalpina*, which occurs in central and northern Italy[2]. The Subalpine Warbler first bred in the Aosta Valley in 1999[1]. Expansions have been recorded in France (increase of 60 % from 2001 to 2013, with occasional pairs observed in the departments of Isère, Savoie and Ain)[AtF] and across Europe[EBCC], which may lead to an increase in observations in Switzerland as well.

Bertrand Posse & Alain Jacot

[1] Bocca & Maffei (2000); [2] Brambilla et al. (2006b); [3] Marques & Thoma (2015)/Marques et al. (2015); [4] Maumary & Mosimann-Kampe (2017)/Maumary (2017); [5] Posse & Revaz (2005); [6] Schweizer (2007)/Schweizer & Vallotton (2007); [7] Sermet & Posse (1998)

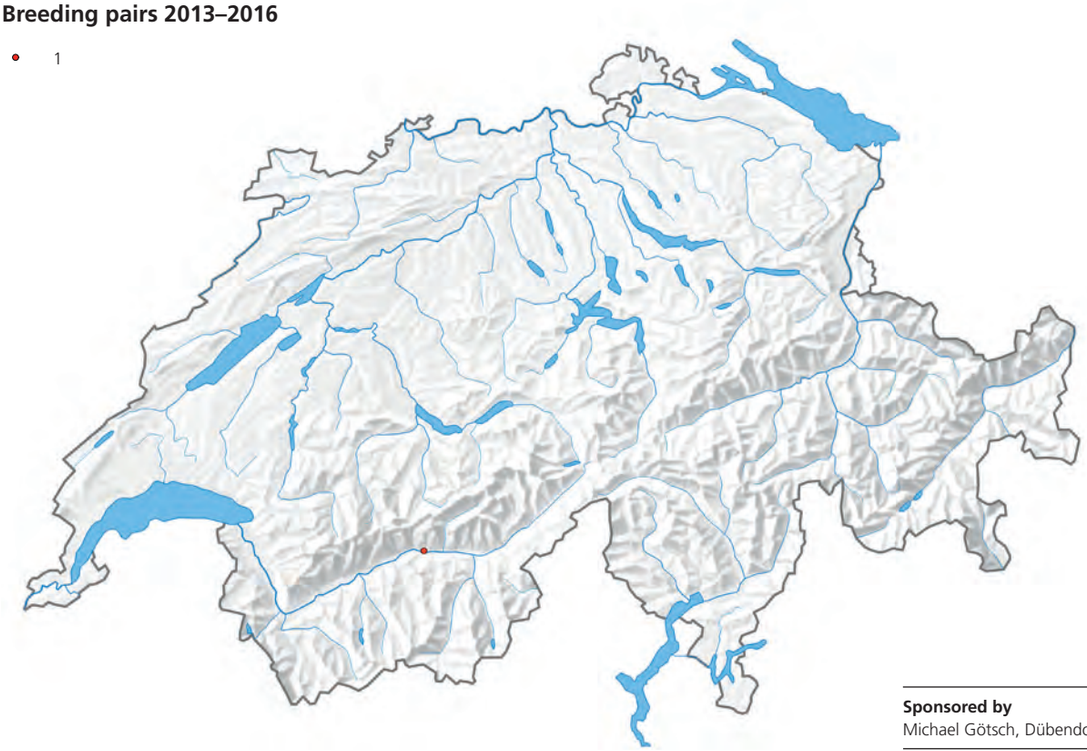
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Michael Götsch, Dübendorf

Mediterranean species in Switzerland

Climate change is expected to benefit birds with a predominantly southern distribution, but the effects are as yet barely visible when it comes to Mediterranean species in Switzerland. While Subalpine Warbler and Spectacled Warbler may soon establish themselves as breeders, the Western Orphean Warbler is in retreat.

Climate warming has accelerated since the late 1980s, especially in spring and in the Alps. In parallel with the rising temperatures, the number of visitors from the Mediterranean region has increased considerably. This phenomenon is only partially explained by increased observer effort and the more rapid transmission of records. Around the same time, certain Mediterranean species began to breed in Switzerland: Spectacled Warbler[4] and Greater Short-toed Lark[1] in 1989 and Subalpine Warbler in 1996[8]. There were no further records in the case of Greater Short-toed Lark, but the two warblers have been sighted regularly in the past two decades and have bred several times, mainly in southern Switzerland and most frequently in central Valais. Here, the topography generates a hot and dry climate, supporting vegetation that strongly resembles conditions in the species' original habitats.

Even before these localised and relatively recent cases, pioneers from the Mediterranean had bred in Switzerland. In the case of Zitting Cisticola, breeding was irregular (first record in 1975)[2], while Pallid Swift (which probably bred here even before it was first detected in 1987)[3], Cetti's Warbler and Blue Rock-thrush have established themselves permanently, at least in Ticino[AtCH2, VdS]. The population of Cetti's Warbler fluctuates widely, and the presence of the Pallid Swift is still limited to a single site in Locarno TI – with the exception of a mixed pair of Pallid and Common Swift that bred in Tramelan BE from 2009–2012[6]. The Blue Rock-thrush, on the other hand, has formed a small population in Valais[VdS].

Expansions are also apparent in species less reliant on the Mediterranean climate but with a preference for warm environments that has caused them to spread to Switzerland and beyond. Among them are Moustached Warbler (first confirmed breeding in 1981)[VdS], whose presence is irregular in our country, European Bee-eater, firmly established since 1991[7], Short-toed Snake-eagle (since 2012)[5] and Eurasian Scops-owl, on the verge of disappearance in 2000, but currently occupying at least 30 territories.

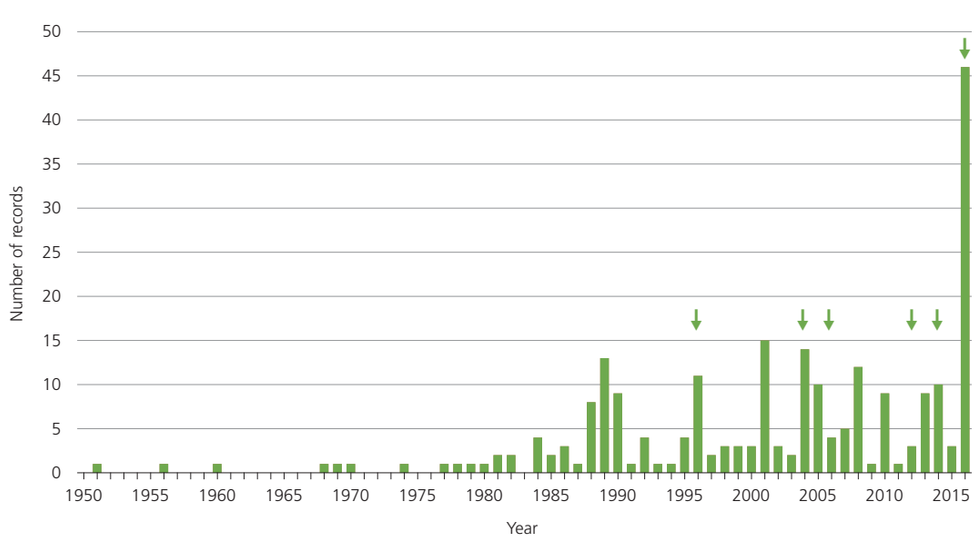
In the context of these northward expansions by Mediterranean and other southern species, only the Western Orphean Warbler stands out. It used to breed in the cantons of Geneva, Ticino and Valais before gradually disappearing. Breeding was no longer recorded in its last vestiges in the Valais after 1994.

This last example is an exceptional case, and with the climate growing warmer, the trend that began a few decades ago is likely to continue. We may not only see more frequent breeding by southern species that are currently scarce, but also breeding attempts – and successes – by new species from the Mediterranean that have never been recorded here before.

Bertrand Posse

[1] Curchod et al. (1990); [2] Gilliéron (1976); [3] Lardelli & Lardelli (1987); [4] Maumary et al. (1990); [5] Maumary et al. (2013); [6] Oberli et al. (2013); [7] Schelbert (1992); [8] Sermet & Posse (1998)

Species pages 168, 244, 258, 274, 368, 374, 409, 421, 424, 474, 574, 575



Annual number of records for the Subalpine Warbler in Switzerland from 1950 to 2016. Years with breeding records (1996, 2004, 2006, 2012, 2014 and 2016) are marked with an arrow; breeding often occurred in years when the species was especially abundant.

Common Whitethroat

Sylvia communis
Dorngrasmücke
Fauvette grisette
Sterpazzola
fustgetta da spinatsch

Markus Varesvuo

Red List Near Threatened (NT)
Population 1800–2500 pairs (2013–2016)

Focus pages 234, 240, 276, 314, 362, 392, 428, 448, 506

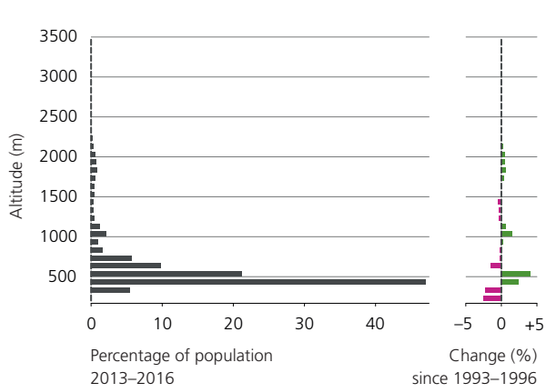
In Switzerland, the Common Whitethroat mainly inhabits the agricultural plains of the western Plateau and northern Jura. It is a typical bird of edge habitats, favouring low hedges, older wildflower strips and shrubby embankments [11, 17]. Density is low at an average of one territory/km² in occupied areas. A maximum of 13 territories/km² on 6.1 km² of farmland was reached in the Champagne genevoise, thanks to a mosaic of wildflower strips and patches of fallow land [12]. The Common Whitethroat will occasionally breed at higher altitudes, with records up to 1030 m in the Vaud Jura (E. Bernardi) or even 1920 m near Zermatt VS (E. Gunzinger) [1]. Singing males sometimes occur up to the upper tree line, for example near Saas-Almagell VS at 2260 m (R. Dajcar, H. Von Rohr) [13].

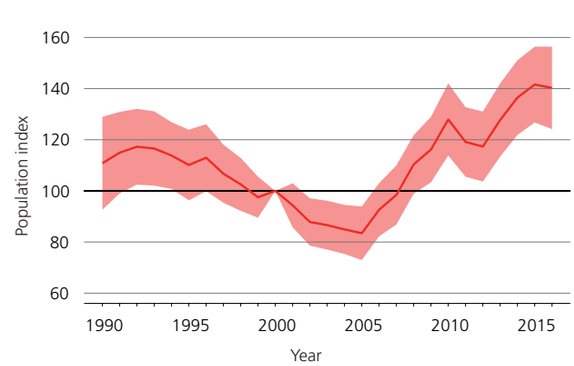
Once common, the Common Whitethroat experienced a steep decline in the 20th century [AtCH0]. There have been signs of recovery since 1993–1996; distribution appears to have expanded somewhat, but the changes must be interpreted with caution, as observer effort was greater in 2013–2016. Gains occurred in the Canton of Geneva [6, 12], in Grosses Moos BE/FR [4] and in the Klettgau SH [9]. The Common Whitethroat again breeds in small numbers in the Canton of Basel-Landschaft [10] and the western Aare Valley BE/SO [5]. In contrast, numbers continue to decline in the Canton of Zurich [AtZH] and around Lake Constance [AtBo].

The changes in population size are partly related to habitat changes. Many hedgerows have been deserted because of inappropriate management practices that favour the tree layer. On the other hand, the Common Whitethroat has found alternative habitat in older wildflower strips [3, 11, 12, 17, 18, 19]. In fact, its presence now depends on them in many places. Numbers have increased somewhat in Germany since 2000 [AtD] while decreasing in Austria [15]. In France, Italy and Europe as a whole, the population is considered stable [AtF, EBCC, 14]. As a long-distance migrant, the Common Whitethroat is sensitive to droughts in its stopover and wintering sites [16, 20]. Thus, the slight increase in precipitation in western Africa [7, 8] may benefit the population.

Jérôme Duplain

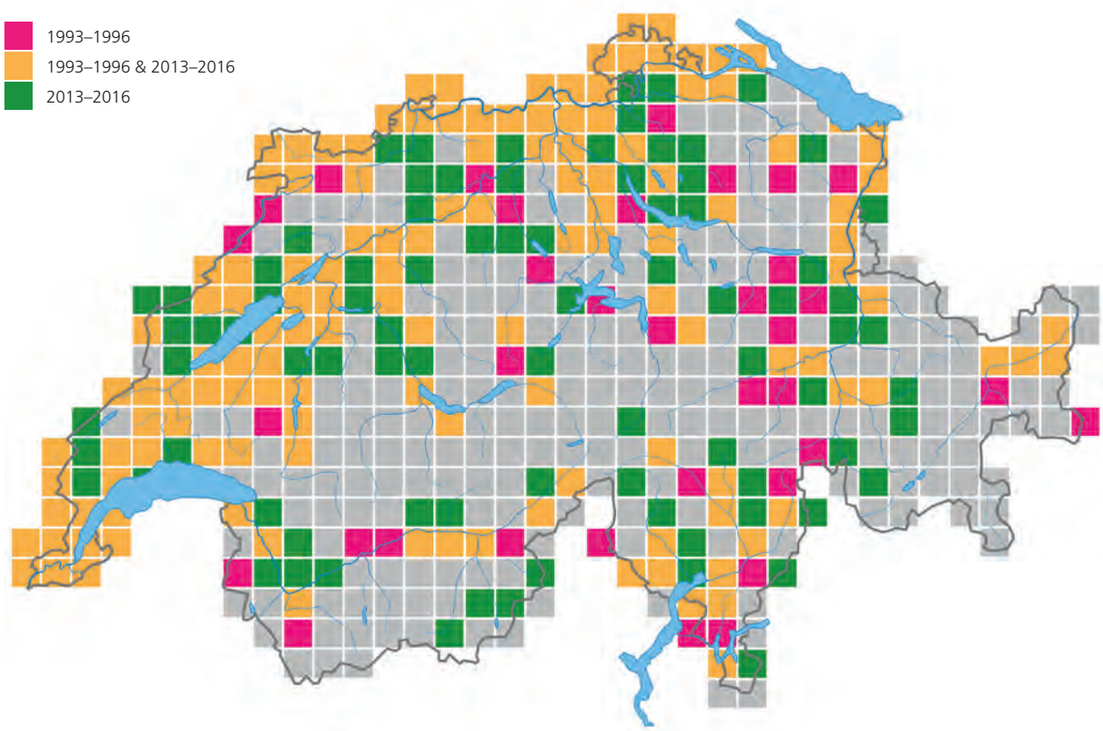
[1] Antoniazza (2017); [2] Birrer et al. (2007b); [3] Birrer et al. (2012); [4] Birrer et al. (2016); [5] Christen (2017a); [6] Duplain (2018); [7] Fontaine et al. (2011); [8] Hoscilo et al. (2015); [9] Jenny (2018); [10] Martinez & Birrer (2017); [11] Meichtry-Stier et al. (2013); [12] Meichtry-Stier et al. (in prep.); [13] Posse (2014); [14] Rete Rurale Nazionale & Lipu (2015); [15] Teufelbauer & Seaman (2017); [16] Vickery et al. (2014); [17] Zollinger (2012); [18] Zollinger (2017); [19] Zollinger et al. (2013); [20] Zwarts et al. (2009)





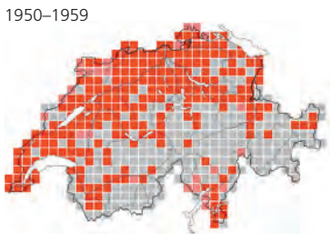
Occurrence 2013–2016

Distribution change since 1993–1996

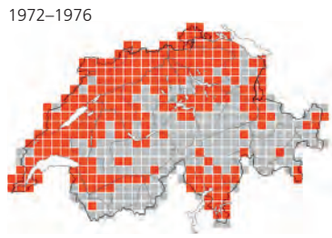


Sponsored by
Ursule Wyss

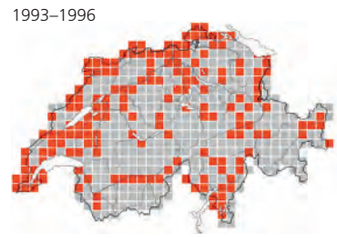
1950–1959



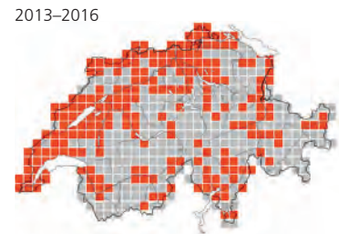
1972–1976



1993–1996



2013–2016



Birds of arable land caught in a downward spiral

In the past century, bird species that breed on arable land have severely declined. The downward spiral continues despite federal programmes to protect biodiversity in agricultural areas, indicating that measures urgently need to be adjusted. Several successful projects point the way.

Arable fields account for one quarter of the total area of farmland[4] and provide important habitats for breeding birds. Eight species are considered typical of this habitat in Switzerland: Grey Partridge, Common Quail, Northern Lapwing, Eurasian Skylark, Western Yellow Wagtail, Common Stonechat, Common Whitethroat and Corn Bunting. They all breed on arable land, building their nests among the crops or in adjacent areas of uncultivated land such as fallow land or neglected slopes. While several other species can also be observed on arable land, they generally nest in different habitats.

An alarming situation

In the second half of the 20th century, the populations of birds on arable land collapsed across Europe, and Switzerland was no exception[AtCH0, 11]. The characteristic species still present today are concentrated in the vast fields of the western Plateau, the Ajoie JU and the Klettgau SH, although certain species, Eurasian Skylark and Common Quail in particular, also occupy meadows and pastures in the Jura and the Alps.

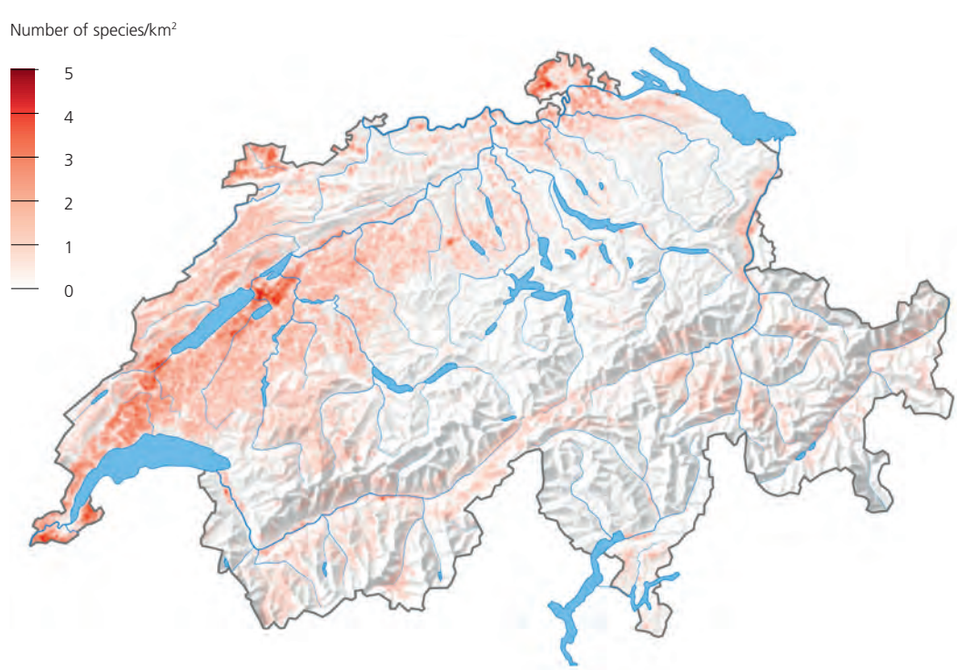
Since 1993–1996, the situation has continued to worsen for these eight species, as the distribution change maps illustrate, especially in the central and eastern parts of the Plateau, in the Pre-Alps and in the plains of the large Alpine valleys. Several regional surveys confirm this trend[7, 13, 17, 19]; the Common Stonechat is the only positive exception to the general pattern[13].

Positive trends, associated with local conservation projects for farmland birds and their habitats, are apparent in very few areas, some examples being the Champagne genevoise[10, 16], Grosses Moos BE/FR[2, 3] and the Klettgau[16].

Arable land under pressure

All birds of arable land are heavily dependent on agriculture in the plains and its methods of cultivation. Exploitation is generally intensive, subject to processes of rationalisation and industrialisation and the widespread use of pesticides[8]. More environmentally friendly forms of production such as organic farming or low-intensity cereal production (labelled «extenso» in Switzerland) are only applied on 20 % of lowland arable land[4], which has in turn lost 210 km² of its area since 1997 (–5 %), largely to building development[5].

To compensate for the negative impact of intensive production on biodiversity, the federal government supports the designation of biodiversity promotion areas (BPA) and has published a list of target species in farmland[1]. Among the five different types of BPA in arable land, wildflower strips, rotational fallows and field margins are particularly effective in the conservation of several target species and are considered high-quality habitats[18]. Birds benefit enormously from wildflower strips, especially older strips that offer a rich variety of structures[14, 15, 16, 20, 21]. At present, however,



Distribution in 2013–2016 of typical birds of arable land. The map combines all records per kilometre square of the following eight species: Grey Partridge, Common Quail, Northern Lapwing, Eurasian Skylark, Western Yellow Wagtail, Common Stonechat, Common Whitethroat and Corn Bunting.

high-quality BPA only account for 0.8 % of arable land[4]. That is an extremely small figure compared to 8 % of high-quality BPA in meadows and pastures[4]. It goes without saying that high-quality BPA are much too rare in arable land to stop the decline of birds in this habitat.

Achievable objectives

Birds of arable land desperately need more suitable habitat. The successful projects near Geneva, in the Grosses Moos and in the Klettgau demonstrate that at least 3 % of area in arable land must be set aside for high-quality BPA, mainly in the form of wildflower strips and field margins[12]. This would mean tripling the current area of BPA. At the landscape level, including the surrounding area that is not cultivated, at least 10–14 % of high-quality habitat is required to effectively promote threatened farmland species[9, 10, 15, 18]. The successful projects demonstrate that these objectives are both achievable and profitable for farmers[6]. Such projects urgently need to receive federal support. At the same time, low-intensity farming practices need to be developed.

The fate of field birds and biodiversity in arable land is directly dependent on our agricultural policy decisions. We need to make sure these decisions are focussed on reconciling agricultural productivity with the protection of biodiversity.

Jérôme Duplain

Jérôme Duplain

Older wildflower strips with a variety of structures such as shrubs, brambles and dry stems from the previous year offer cover and perches for many bird species.

[1] BAFU & BLW (2008)/OFEV & OFAG (2008); [2] Birrer et al. (2013b); [3] Birrer et al. (2018); [4] BLW (2017)/OFAG (2017)/UFAG (2017); [5] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [6] Chevillat et al. (2017a–b); [7] Christen (2017a); [8] de Baan et al. (2015a–b); [9] Guntern et al. (2013a–b); [10] Jenny et al. (2003); [11] Jenny et al. (2005a–b); [12] Jenny et al. (2011a–b); [13] Martinez & Birrer (2017); [14] Meichtry-Stier et al. (2013); [15] Meichtry-Stier et al. (2014); [16] Meichtry-Stier et al. (in prep.); [17] Rudin et al. (2010); [18] Walter et al. (2013a–b); [19] Weggler & Schwarzenbach (2011); [20] Zollinger (2012); [21] Zollinger et al. (2013)

Species pages 94, 102, 210, 360, 426, 480, 514, 548

Distribution change since 1993–1996 of typical birds of arable land. The map combines the distribution change maps of all eight species.

Short-toed Treecreeper

Certhia brachydactyla
Gartenbaumläufer
Grimpereau des jardins
Rampichino comune
pitgascorsa d'iert

Dennis Lorenz

Red List Least Concern (LC)
Population 45 000–55 000 pairs (2013–2016)

Focus page 314

The Short-toed Treecreeper occurs only in Europe and North Africa. In Switzerland, it breeds throughout the deciduous zone. More than 90 % of the population inhabits altitudes of less than 900 m, with only isolated records above 1300 m during the breeding season. The highest densities occur in Ticino and the western Lake Geneva region. Inner-Alpine valleys are only thinly populated. The highest confirmed broods were recorded at 1140 m near Spirigen UR (S. Wechsler) and at 1120 m near Cabbio TI (G. Mangili). There is the occasional record of a singing male at higher altitudes, such as at 1700 m in Safiental GR (T. Plüss, M. Zimmerli).

The habitat of the Short-toed Treecreeper is characterised by old stands of deciduous trees with mature, furrowed bark, mainly oaks, willows, poplars and pear trees, but also pine trees. It inhabits forests and open landscapes with trees such as riverbanks and farmland copses, tree-lined avenues, orchards and old stands of sweet chestnut as well as gardens and parks in residential areas, even in the centre of towns and cities. In suitable kilometre squares, observers regularly count 12 territories and more.

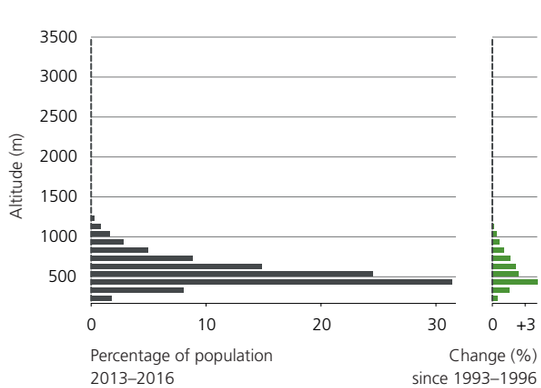
Since 1993–1996, the population has increased across its altitudinal range. Rises in density were greatest in areas where the species is currently widespread. In particular, there was a marked increase in Ticino. However, some areas appear to have seen slight declines.

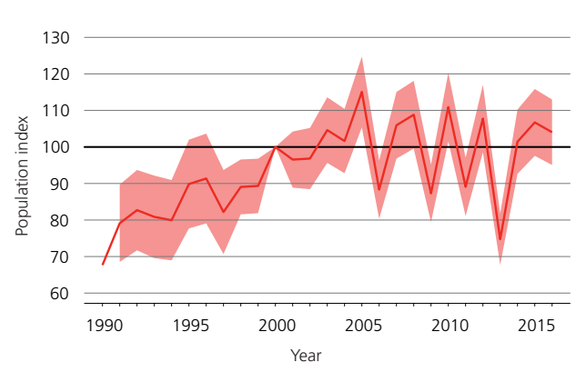
The population of Short-toed Treecreepers increased in Switzerland up until 2005. Since then, it has been fluctuating at a high level. Trends have been positive in France and Italy, too, as well as in Europe as a whole [AtF, EBCC, 2]. In Germany, the population appears to be stable in the long term [AtD], while it is declining in Austria [5].

The Short-toed Treecreeper may have benefited from the maturation of trees and the increase in deciduous trees in Swiss forests. In southern Switzerland especially, deciduous timber has increased in the past 20 years [3], which could explain the positive trend in Ticino. Winter cold spells can cause numbers to collapse, and populations may take several years to recover [AtBL, AtD, VdS, 4]. Milder winters since at least the early nineties [1] are likely benefiting the population.

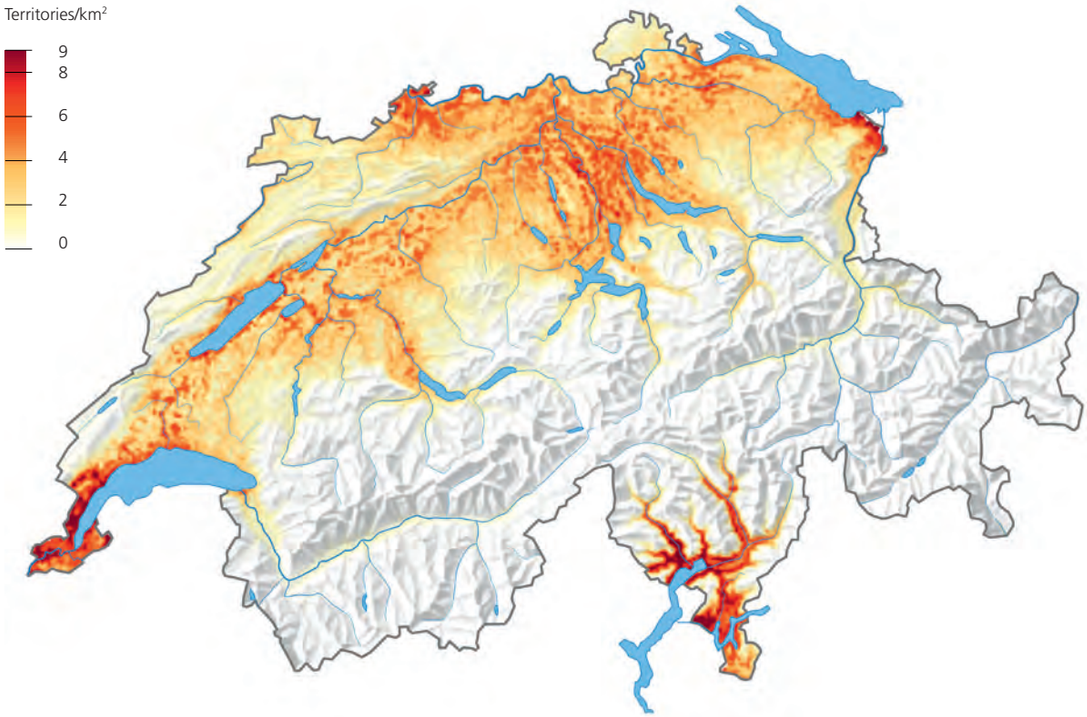
Matthias Kestenholz

[1] MeteoSchweiz (2017)/MétéoSuisse (2017)/MeteoSvizzera (2017); [2] Rete Rurale Nazionale & Lipu (2015); [3] Rigling & Schaffer (2015a–d); [4] Steffens et al. (2013); [5] Teufelbauer & Seaman (2017)

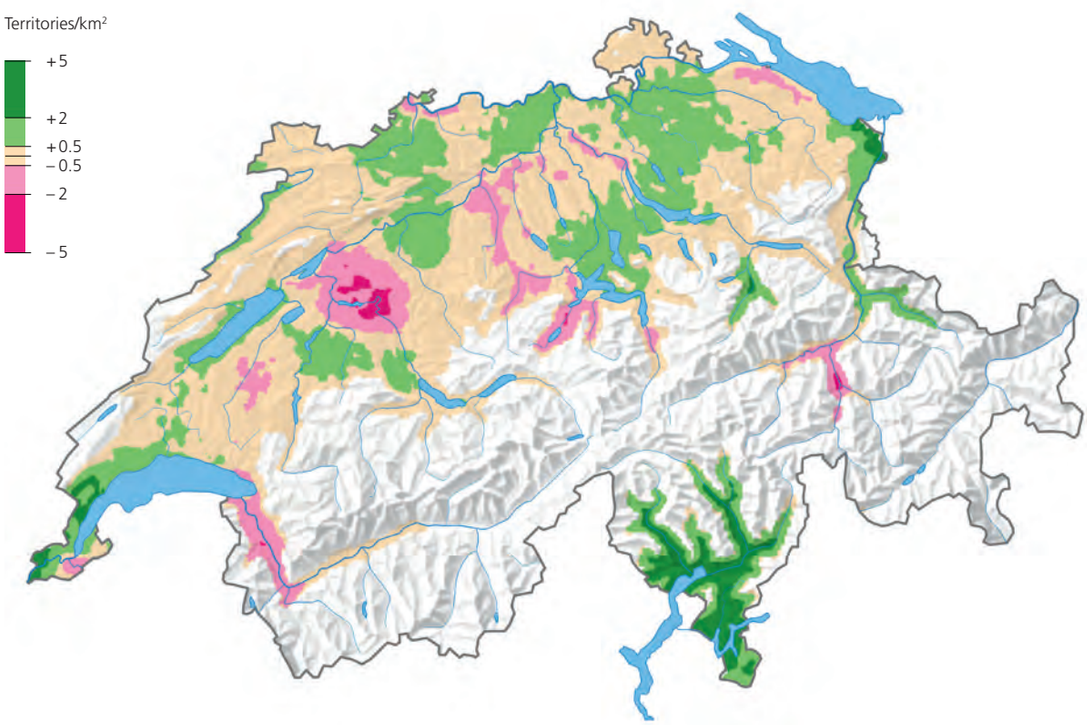




Density 2013–2016

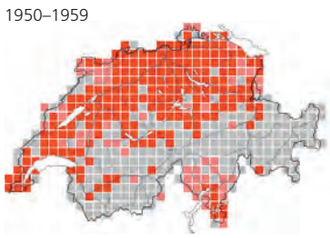


Density change since 1993–1996

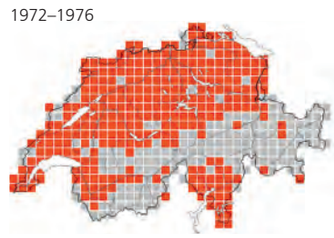


Sponsored by
Andy Baumgartner

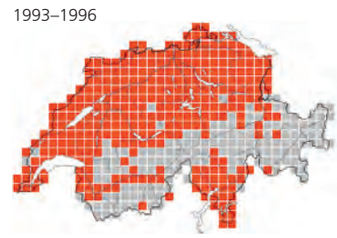
1950–1959



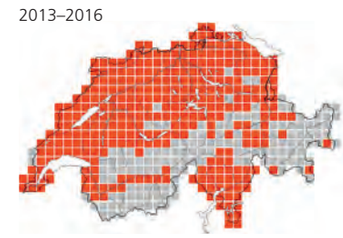
1972–1976



1993–1996



2013–2016



Eurasian Treecreeper

Certhia familiaris
Waldbaumläufer
Grimpereau des bois
Rampichino alpestre
pitgascorsa da guaud

Markus Varesvuo

Red List Least Concern (LC)
Population 75 000–100 000 pairs (2013–2016)

Focus page 298

Switzerland lies at the southwestern edge of the Eurasian Treecreeper's continuous Eurasian range. Further to the west and south, the species inhabits mountainous regions only.

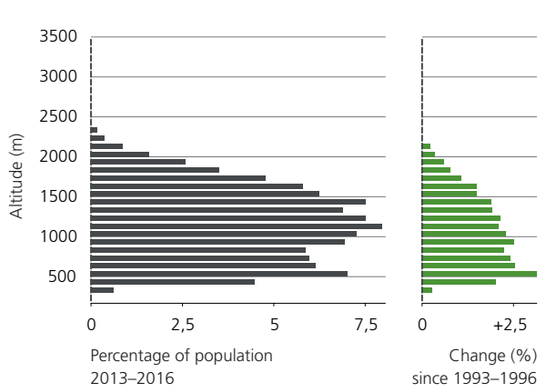
The Eurasian Treecreeper occurs in wooded areas throughout Switzerland. It is not found in the Canton of Geneva [AtGE] or the low-lying Mendrisiotto TI, probably because of the vicinity to the western and southern limits of its range. Densities are highest in the valleys of the cantons of Grisons and Valais and slightly lower in the Pre-Alps and the Jura. The Central Plateau is only thinly populated. The species' main area of distribution lies between 1100 and 1700 m, where average densities of more than 4 territories/km^2 were detected. Singing males were found at 2230 m in Poschiavo GR (M. Müller) and at 2220 m in S-chanf GR (M. Ernst). Earlier breeding season observations were made at elevations as high as 2350 m in Zermatt VS [AtCH2].

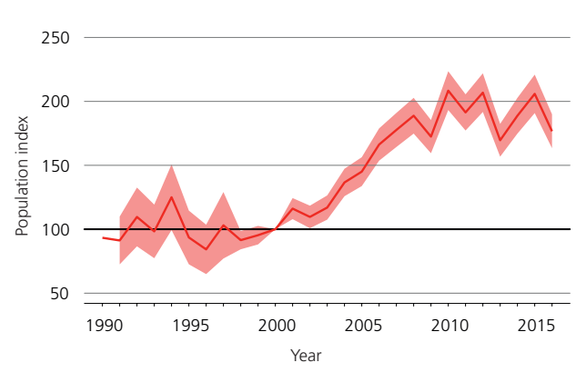
In Switzerland, the Eurasian Treecreeper inhabits closed high forests of mixed composition. Regardless of tree species composition, an abundance of old-growth trees is important. Old stands with standing dead trees offer the best conditions. The Eurasian Treecreeper occurs most frequently in spruce forests. In suitable kilometre squares, it is not uncommon to count 16 territories and more. In Switzerland, the Eurasian Treecreeper does not inhabit orchards, parks or gardens.

The national population has almost doubled since the year 2000. It has increased throughout the country, both in areas where it was already common and at lower altitudes. The Eurasian Treecreeper benefits from the growing timber stock and increasing maturation of trees as well as from large quantities of deadwood [3, 5, 7]. In Austria, the population is declining [6]. In Germany it is stable, as is the overall European trend [AtD, EBCC]. In France, too, the population has remained unchanged, though the Eurasian Treecreeper has slightly expanded its range [AtF, 1, 2]. In Italy, where it inhabits the Alps and the Apennines, the trend is positive [4].

Matthias Kestenholz

[1] Beliard & Tissier (2014); [2] LPO Champagne-Ardenne (2016); [3] Mollet et al. (2009); [4] Rete Rurale Nazionale & Lipu (2015); [5] Rigling & Schaffer (2015a–d); [6] Teufelbauer & Seaman (2017); [7] Weggler & Widmer (2001)



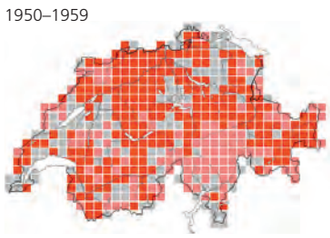


Density 2013–2016

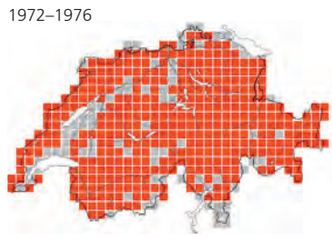
Density change since 1993–1996

Sponsored by
Yves & Florence Glanzmann-Joray

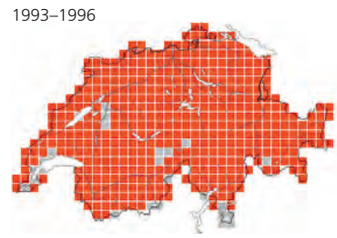
1950–1959



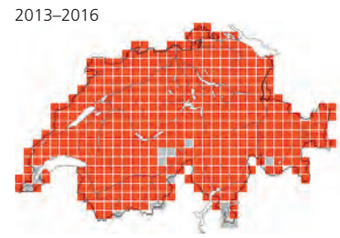
1972–1976



1993–1996



2013–2016



Eurasian Nuthatch

Sitta europaea
Kleiber
Sittelle torchepot
Picchio muratore
pitgarel

Dennis Lorenz

Red List Least Concern (LC)
Population 110 000–170 000 pairs (2013–2016)

Focus –

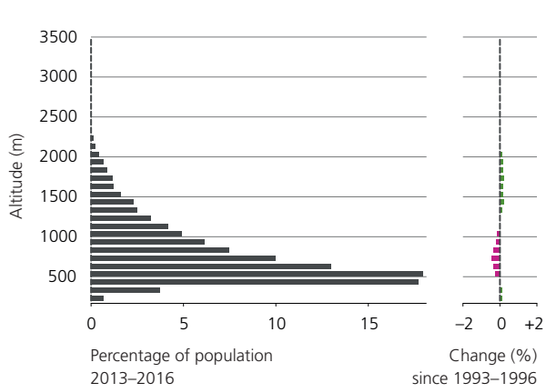
In Switzerland, the Eurasian Nuthatch is found throughout the country up to the tree line. It inhabits woodlands, orchards, tree-lined avenues, parks and settlements, as long as there are plenty of old trees. Preferred habitats are deciduous and mixed forests dominated by old trees with mature, furrowed bark. The highest densities are therefore found in the colline and montane zones below 1500 m. In suitable kilometre squares, it is not uncommon to count 15 territories and more. Average densities of more than seven territories/km^2 are only reached at altitudes between 500 and 800 m, with the exception of sub-Alpine stone pine and larch forests, where the Nuthatch can be found in high densities: 28 territories were counted in a 50 ha stone pine and larch forest at more than 1800 m in the Upper Engadine GR. Pine forests are less densely occupied, and the species rarely occurs in pure spruce forests [AEn]. Like in the previous survey [AtCH2], the highest broods were recorded near Zermatt VS at 2250 m (J. Duplain). Singing males were observed up to 2320 m near Pontresina GR (C. Rust).

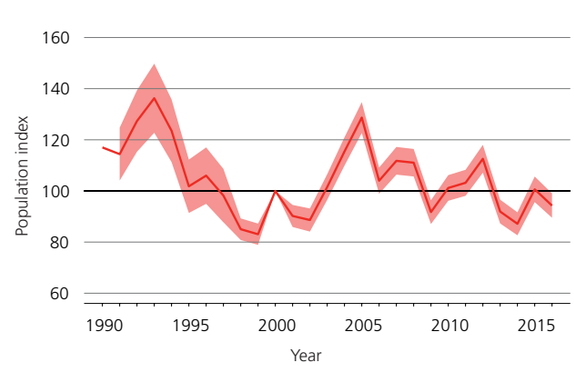
Since 1993–1996, population density has increased significantly south of the Alps, and to a lesser extent in the Valais and the Val Müstair GR. On the Central Plateau and in the Pre-Alps, declines have been recorded in some areas. There have been no significant changes in altitudinal distribution.

The Swiss population is more or less stable, though it undergoes large fluctuations. Annual fluctuations coincide with variations in beech mast, which affect winter survival [2, 9]. Unlike in Switzerland, populations are increasing in most countries of central and northern Europe [EBCC, RLEU] and in Italy [5]. The population in the Lake Constance region grew by 40 % between 1980 and 2010 [AtBo]. Austria, on the other hand, reports a negative trend [7]. Factors that may benefit the Nuthatch in Switzerland [3, 4, 8] include: increases in forest area, growing stock and deciduous trees, particularly in southern Switzerland; the maturing of woods from shrub to dense forest; the increase in deadwood [1, 6]. In Germany and France, the positive trends are attributed to increased colonisation of settlements and the growing proportion of deciduous trees, old-growth stands and deadwood in forests [AtD, AtF].

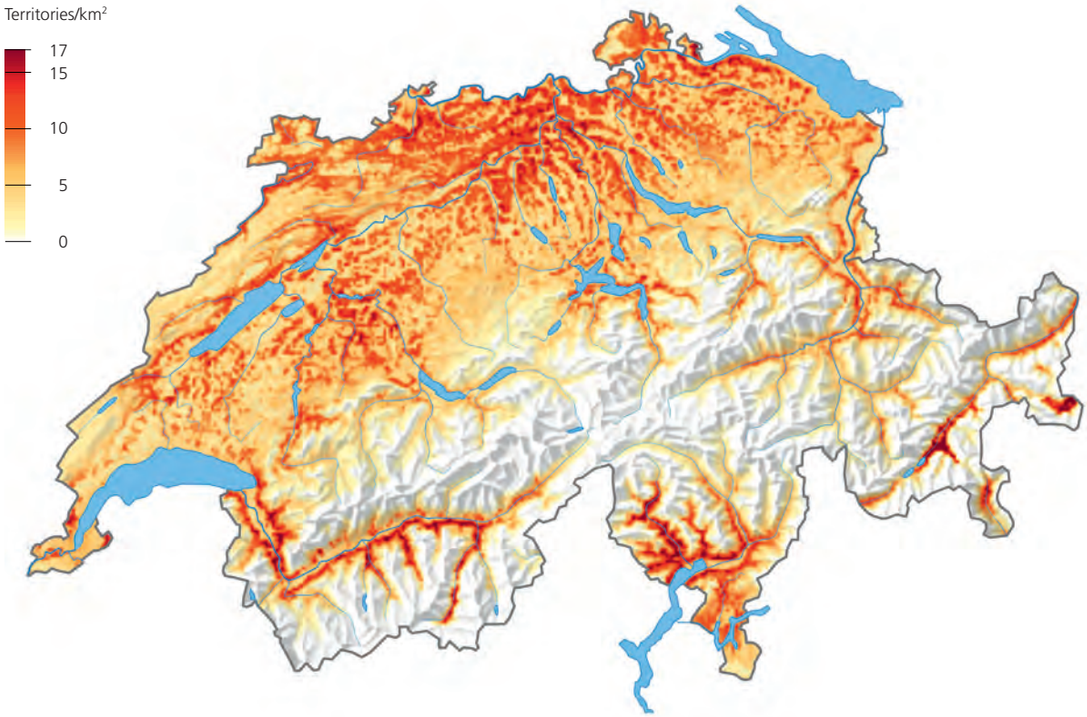
Dominik Hagist

[1] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [2] George & Zang (2010); [3] Kašová et al. (2014); [4] Matthysen (1990); [5] Rete Rurale Nazionale & Lipu (2015); [6] Rigling & Schaffer (2015a–d); [7] Teufelbauer & Seaman (2017); [8] Wesołowski & Stawarczyk (1991); [9] Zang & Kunze (2007)

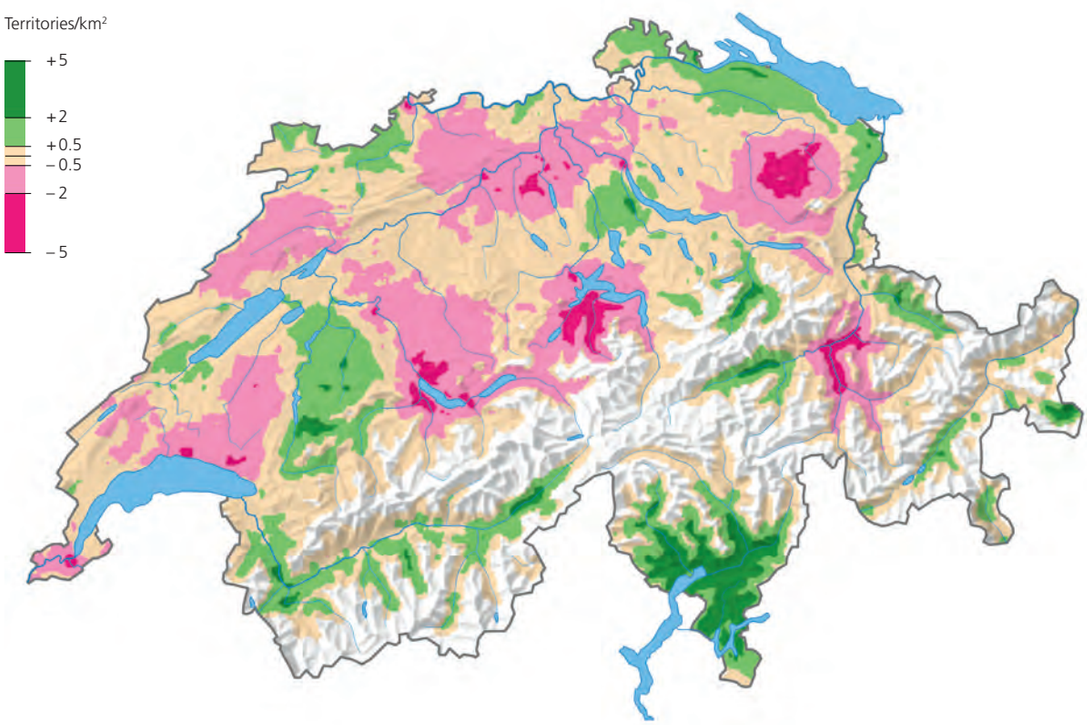




Density 2013–2016

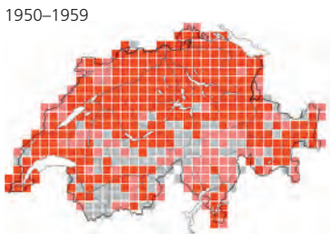


Density change since 1993–1996

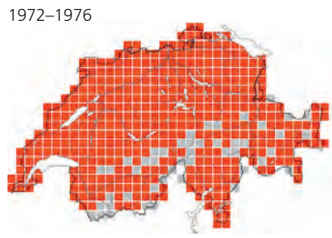


Sponsored by
Linus Scherz, Bürglen
Roland Walker

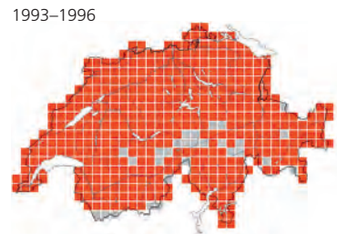
1950–1959



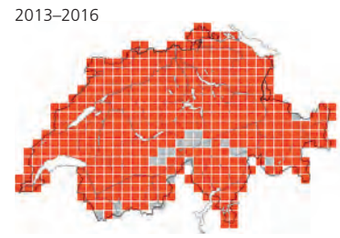
1972–1976



1993–1996



2013–2016



Wallcreeper

Tichodroma muraria
Mauerläufer
Tichodrome échelette
Picchio muraiolo
sgraflin

Dennis Lorenz

Red List Least Concern (LC)
Population 1000–2500 pairs (2013–2016)

Focus page 308

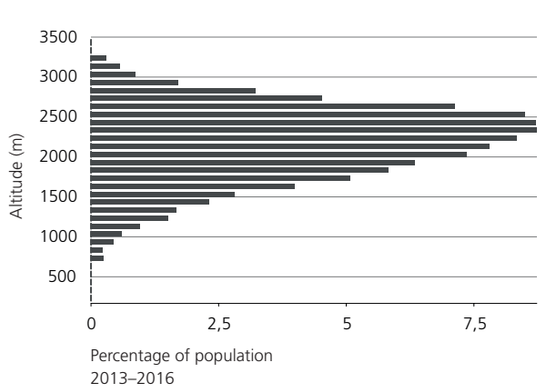
Switzerland and the Jura in particular are at the northwestern edge of the Wallcreeper's area of distribution, which includes most mountain ranges in southern and central Europe. More than three quarters of the Swiss population occurs between 1600 and 2800 m, with core areas in the Alps of Bern and Uri. The few observations in the Jura in 2013–2016 occurred between 490 and 1450 m. The Wallcreeper breeds in vast, heavily fissured rock faces with some vegetation and trickles of water, rarely on buildings and in large quarries[AEn, VdS, 2, 5, 6, 8, 9]. In lower-lying areas, its nest sites are mainly in damp gorges and vast cliff walls, while smaller rock faces are sufficient at higher altitudes[3]. The highest confirmed breeding record came from 3290 m on Oberaarhorn BE in 2011 (M. Hammel). During 2013–2016, the highest singing males were heard at 3220 m on Balmhorn BE/VS (B. Wolf) and at 3050 m on Piz Medel GR/TI (D. Bundi). An adult carrying food was observed in late July 2009 on Aiguille Purtscheller VS/F at 3470 m (A. Barras), probably associated with a wandering family after the young had fledged. The lowest breeding records come from Bodio TI at 350 m[AtCH1] and, during 2013–2016, from Seewen SZ at 510 m (P. Kühne).

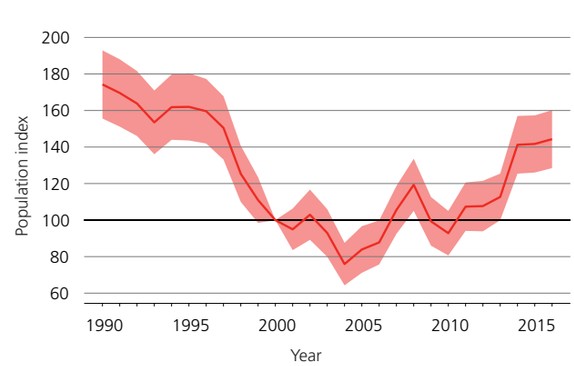
Since 1993–1996, the Wallcreeper's distribution in the Alps has remained unchanged, and any closed gaps are presumably due to increased observer effort. Especially in the eastern Jura, however, several earlier breeding sites could not be confirmed despite an intensive search. The Swiss population declined up until 2004[4], but has since recovered. Trends in Germany, Austria and Italy are considered stable; the French trend is unknown[AtD, AtF, AtV, 1, 7].

The range loss of the Wallcreeper in the Jura and its overall Swiss trend could be related to climatic conditions or increased precipitation during the breeding season. More detailed studies of population changes and the possible impact of climate change would be desirable. Disturbance from leisure activities such as rock climbing can cause breeding sites to be abandoned.

Célestin Luisier & Jérémy Savioz

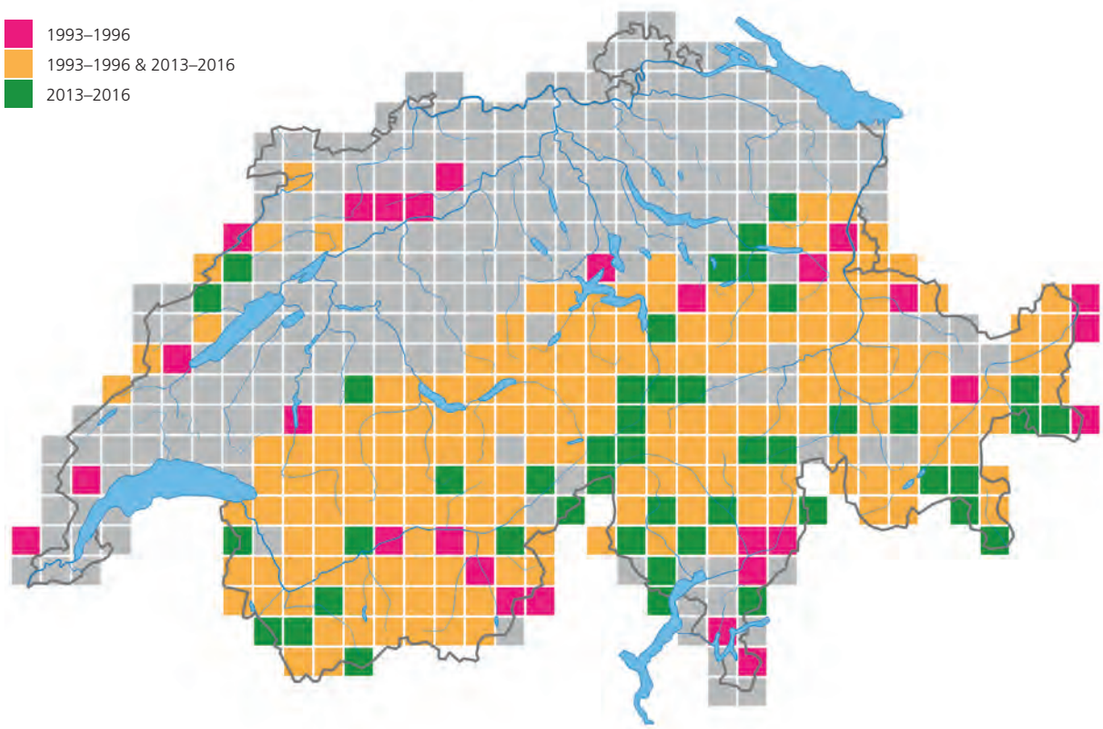
[1] Dvorak et al. (2017); [2] Gerber (2014); [3] Hauri (1978); [4] Kéry et al. (2010); [5] Luisier (2015); [6] Luisier (2017); [7] Nardelli et al. (2015); [8] Posse (2014); [9] Saniga (1999)





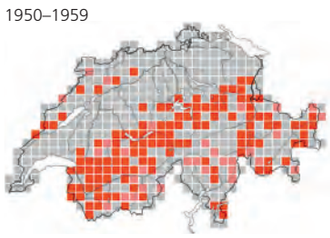
Occurrence 2013–2016

Distribution change since 1993–1996

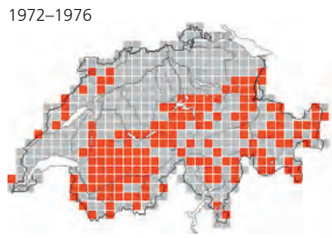


Sponsored by
Esther Haenel
Andreas Lischke
Andreas Schoellhorn
Brigitte Wolf, biologist

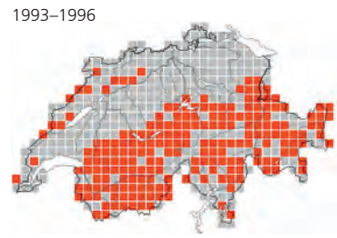
1950–1959



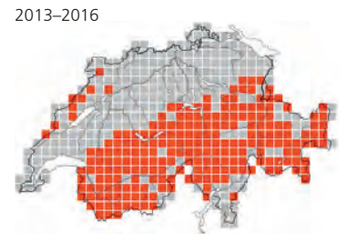
1972–1976



1993–1996



2013–2016



Northern Wren

Troglodytes troglodytes
Zaunkönig
Troglodyte mignon
Scricciolo
poleschet

Stefan Rieben

Red List Least Concern (LC)
Population 400 000–550 000 pairs (2013–2016)

Focus –

Together with the Common Kestrel, the Northern Wren is the second-most widespread breeding bird in Switzerland, surpassed only by the Black Redstart. It breeds all the way up to the dwarf-shrub belt. The highest densities over a large area are reached between 900 and 1700 m, where there is an average of more than 16 territories/km². The highest brood was recorded near Vernamiège VS at 2250 m (E. Widmann). Singing males were heard up to 2500 m near Hérémence VS (A. Barras)[6] and up to 2480 m near Lavin GR (D. Thiel).

The Northern Wren occupies all types of damp woodland from young forests to old-growth stands, as long as there is dense undergrowth to provide cover. It also inhabits richly structured gardens, parks and riparian vegetation. In the lowlands, local densities reach five territories/10 ha[1]. New and richly structured windthrow areas are favoured habitats where the Wren occupies up to 7.5 territories/10 ha[4].

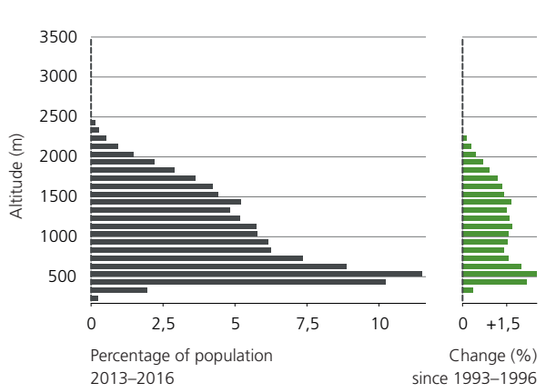
Population density has increased in all regions since 1993–1996, most significantly in the Pre-Alps, where the highest densities now occur. Density has increased at all altitude levels, with a somewhat greater proportional increase above 1500 m.

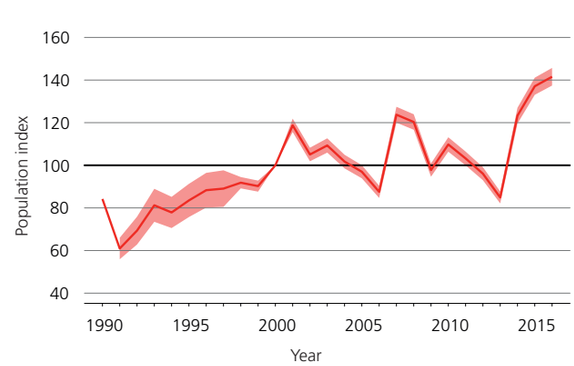
The Swiss population has grown by 40 % since 1993–1996, though it is subject to large fluctuations. Surveys in the Canton of Zurich report similar gains between 1988 and 2008[AtZH]. According to detailed analyses based on data from 1988 and 1999, density has increased by one third in forests in the Canton of Zurich and by as much as two thirds on farmland, while the Wren is largely absent from settlements[8, 9, 10]. In Germany, numbers increased by at least 30 % during 1989–2003, mainly in settlements, gardens and parks, while the populations in closed-canopy forests remained fairly stable[3]. In France, the Northern Wren is one of the species that benefited the most from storm «Lothar» in late 1999[AtF]. The Europe-wide trend is also positive[EBCC].

Cold winters can cause widespread collapses in Northern Wren populations[7]. A large number of days with snow cover can have a particularly severe impact[2, 5]. The Wren recovers well from such losses, however: after the cold winters of 2006 and 2013, numbers increased again in Switzerland by more than 30 % within a year.

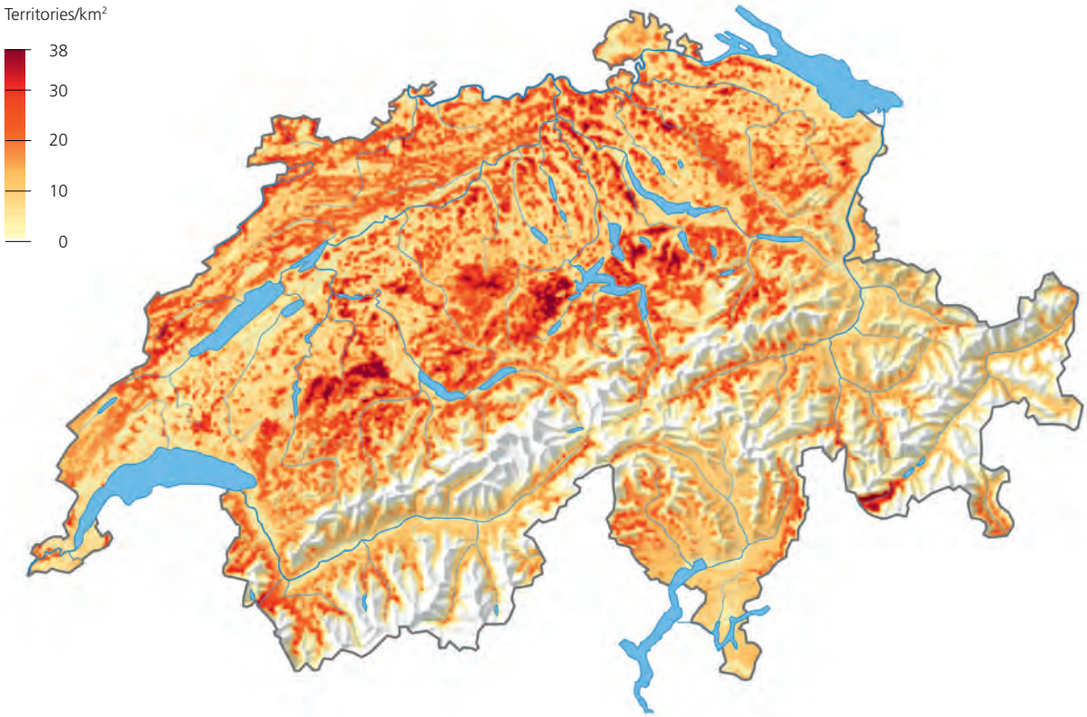
Michael Schaad

[1] Bernet (1997); [2] Christen (2008); [3] Flade & Schwarz (2004a); [4] Glutz von Blotzheim (2001); [5] Peach et al. (1995b); [6] Posse (2012); [7] Teufelbauer et al. (2017); [8] Weggler & Widmer (2000a); [9] Weggler & Widmer (2000b); [10] Weggler & Widmer (2001)





Density 2013–2016

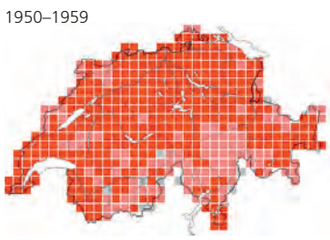


Density change since 1993–1996

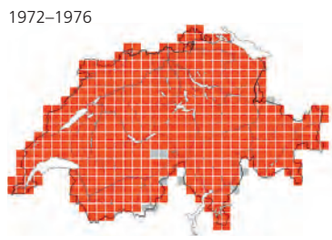
Sponsored by
Family Ackle
P.-F. Boretti, Montreux
Michèle Scherz, Bürglen

Glarner Natur- und Vogelschutzverein

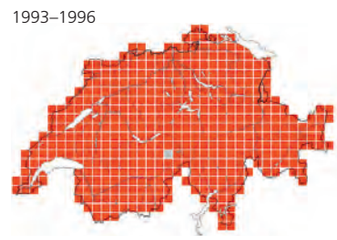
1950–1959



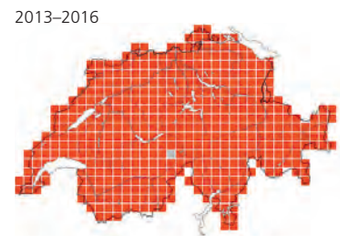
1972–1976



1993–1996



2013–2016



White-throated Dipper

Cinclus cinclus
Wasseramsel
Cincle plongeur
Merlo acquaiolo
merl da l'aua

Ralf Kistowski

Red List Least Concern (LC)
Population 6000–8000 pairs (2013–2016)

Focus –

The White-throated Dipper occurs in many areas of Europe but is mainly an inhabitant of low- and mid-elevation mountain ranges. It is widespread in Switzerland thanks to the abundance of watercourses, and most concentrated between 400 and 1000 m. The White-throated Dipper inhabits all kinds of running water. It relies on relatively clean water, the presence of aquatic invertebrates, and nest sites directly above the water (cracks in rocks and walls, bridge piers) or behind waterfalls (crevices in rocks and weirs). The Dipper is absent from larger rivers such as the Rhone downstream from Lake Geneva [AtGE].

While breeding has been recorded up to 2600 m near Cinuos-chel GR in the past [AGR], the highest current breeding site was found near Ramosch GR at 2270 m (M. Müller). In general, the highest territories lie well below the tree line, extending to somewhat higher altitudes in peak years than in normal years [1].

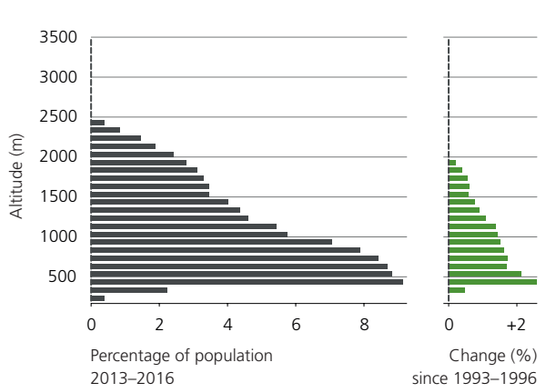
On the Küsnachter Bach ZH, 16 pairs were recorded on a 6.8-km stretch of river, which corresponds to a territory length of less than 500 m [6]. R. Maurizio [AEn] counted 25 pairs on a 13 km stretch of the Maira GR. Density was also high in the Areuse Gorge NE: 15 territories on a 10 km section of river [AtNE]. The closest simultaneously occupied nests were found in the Vosges just 120 m apart [4].

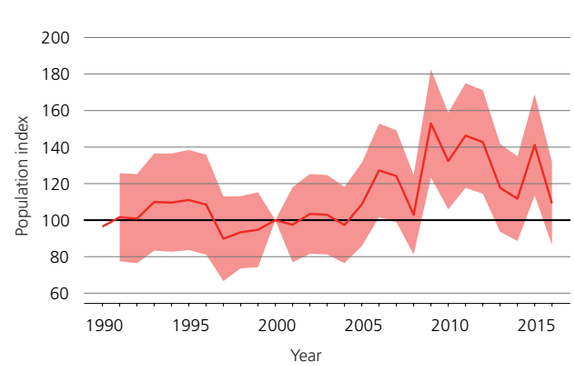
The population of White-throated Dippers has slightly increased in Switzerland since 2004, albeit with large annual fluctuations. In the Canton of Zurich, numbers doubled between 1988 and 2008 [AtZH]. The gains occurred mainly in the Pre-Alps, some areas of Grisons, and the Valais.

In neighbouring countries, the numbers appear to be fairly stable [AtD, AtF, AtV, 2, 8], although Germany reports an increasing trend since the late 1990s [AtD]. The White-throated Dipper may be benefiting from the rise in water temperatures since 1970 [3]: when first broods occur early, the birds are more likely to produce a second brood [7]. Nest boxes help to support Dipper populations [5].

Christian Marti

[1] Breitenmoser-Würsten & Marti (1987); [2] Brichetti & Fracasso (2007); [3] Bundesamt für Umwelt (2012)/Office fédéral de l'environnement (2012); [4] Fohr (2013); [5] Glutz von Blotzheim & Breitenmoser-Würsten (1990a–b); [6] Hegelbach (2004); [7] Hegelbach (2013); [8] Nardelli et al. (2015)



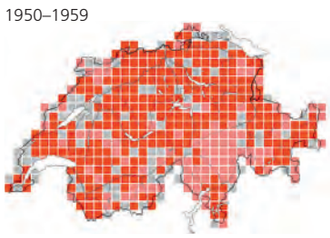


Occurrence 2013–2016

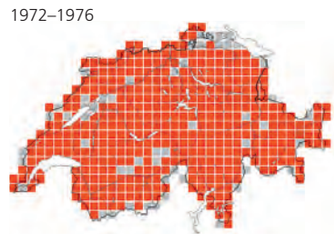
Occurrence change since 1993–1996

Sponsored by
Laurent Francey
André Lanthemann
Felix Scherz, Bürglen

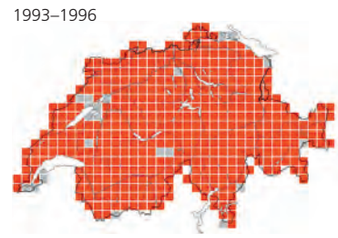
1950–1959



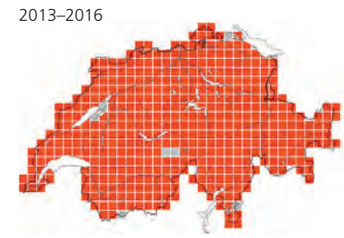
1972–1976



1993–1996



2013–2016



Common Starling

Sturnus vulgaris
Star
Étourneau sansonnet
Storno
sturnel

Marcel Burkhardt

Red List Least Concern (LC)
Population 120 000–140 000 pairs (2013–2016)

Focus –

The Common Starling is widespread in Switzerland. It inhabits orchards, copses, forest edges and settlements near pastures, meadows and fields. The highest densities are reached in northeastern Switzerland, around Lake Zurich, in the Bernese Mittelland and in the Lake Geneva basin. In suitable kilometre squares, it is not uncommon to count 25 territories and more. The Common Starling's core range is in low-lying areas up to 700 m. Above that altitude, numbers rapidly dwindle, and the species is rarely seen above 1000 m, though it can be found up to 2000 m in the Engadine GR. While breeding has been recorded at 2230 m near Zermatt VS and at 2100 m near St. Moritz GR in the past [VdS], the highest recent record comes from 2030 m near Lü GR (B. Wartmann). The highest recent evidence of probable breeding was recorded at 2120 m near Zermatt (S. Stricker).

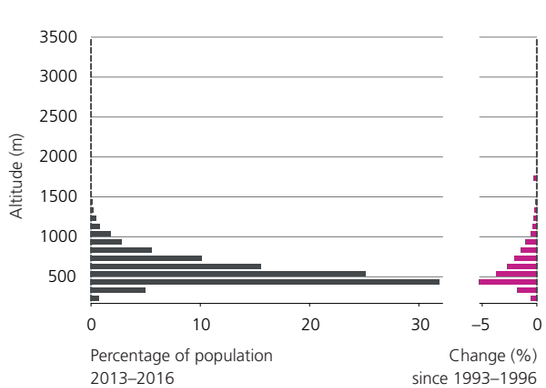
The number of occupied atlas squares has decreased somewhat since 1993–1996, continuing the decline that was recorded then in comparison to the 1972–1976 survey. Density has also diminished since 1993–1996, especially on the central and eastern Plateau. Trends are negative in Ticino and Engadine as well. On the other hand, some regions show slightly positive trends, such as the western Lake Geneva region and the Gürbetal BE. Other surveys again report declines, like in the Canton of Zurich between 1988 and 2008 (–30 %) [AtZH] and around Lake Constance between 1980 and 2010 (–39 %) [AtBo].

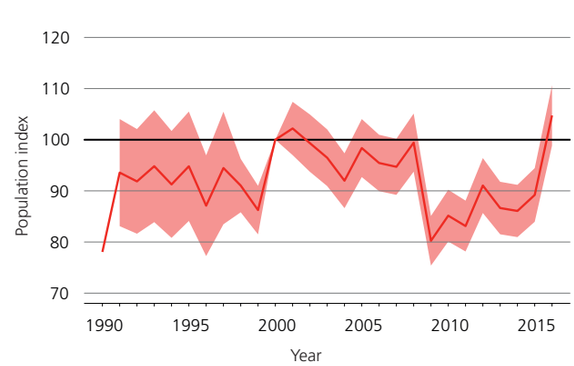
Trends are also negative in Germany and France [AtD, AtF] as well as in Europe as a whole [EBCC]. Italy has seen a slight increase [2, 5]. The population in Austria is stable [8], although breeding sites at higher altitudes appear to have been abandoned [7].

Intensified agriculture is probably the main cause of decline: nesting cavities are lost with the disappearance of old fruit trees and free-standing trees, and the trend towards larger and more uniform plots continues. The declining supply of insects (especially crane flies) might also be a contributing factor [1], as they are an important source of nestling food [6]. The decline appears to be driven by the reduced survival rate of chicks [9]. In Denmark, the disappearance of pastures and increasing distances between foraging grounds and nesting holes are having a negative impact on breeding success [3, 4].

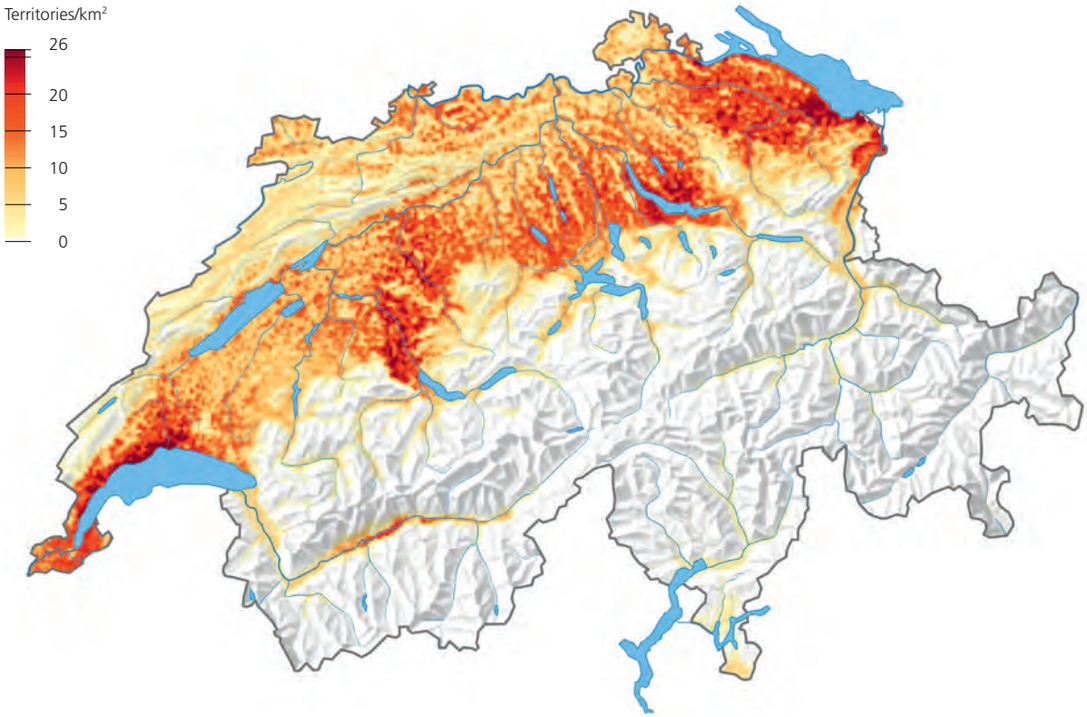
Dominik Hagist

[1] Artmann-Graf (2017b); [2] Bani et al. (2014); [3] Heldbjerg et al. (2016); [4] Heldbjerg et al. (2017); [5] Rete Rurale Nazionale & Lipu (2015); [6] Rhymer et al. (2012); [7] Teufelbauer (2014); [8] Teufelbauer & Seaman (2017); [9] Versluijs et al. (2016)

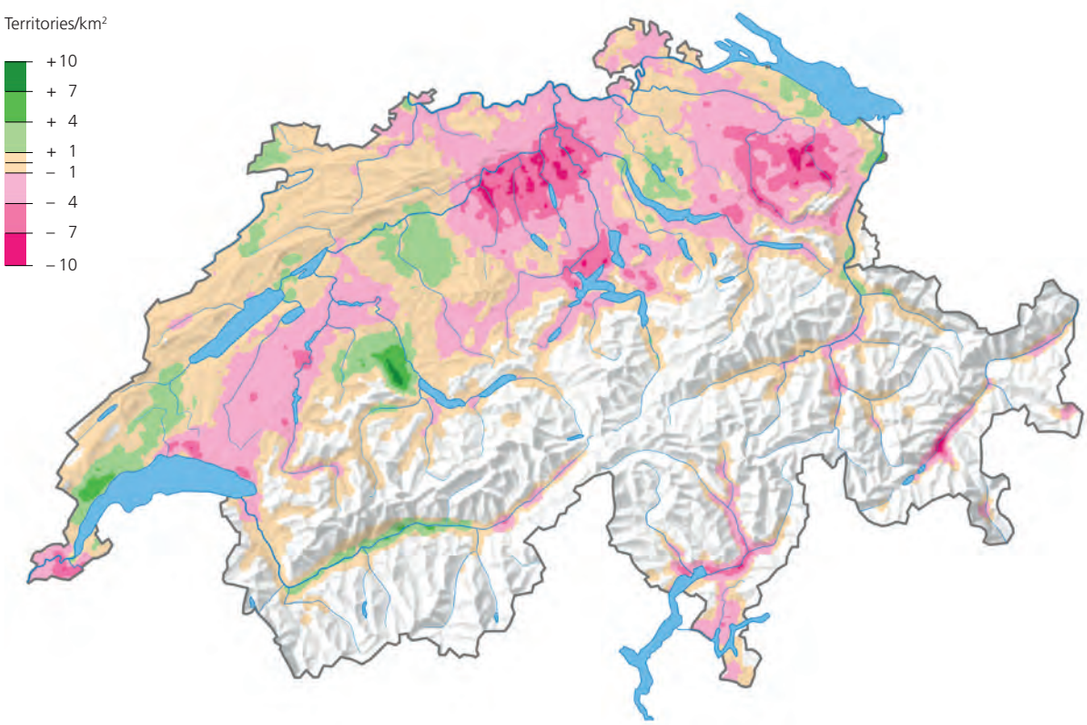




Density 2013–2016

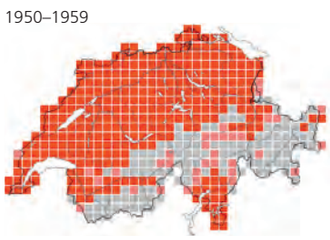


Density change since 1993–1996

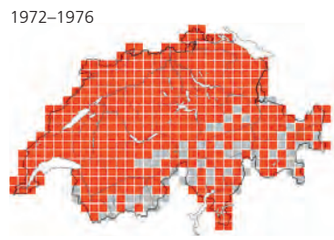


Sponsored by
Félix Decker
Sandra Schweizer

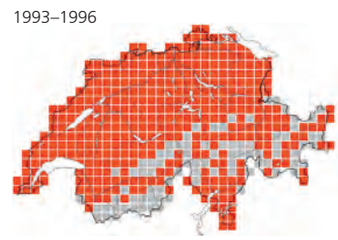
1950–1959



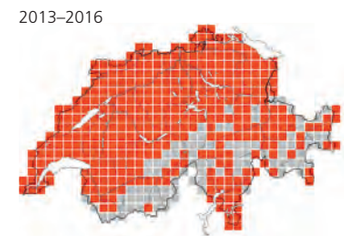
1972–1976



1993–1996



2013–2016



Mistle Thrush

Turdus viscivorus
Misteldrossel
Grive draine
Tordela
tursch perniclà

Markus Varesvuo

Red List Least Concern (LC)
Population 130 000–150 000 pairs (2013–2016)

Focus –

The Mistle Thrush is widely distributed throughout Switzerland up to the Alpine tree line. Its preferred breeding habitats are old-growth stands close to the forest edge in coniferous and mixed forests. It forages on nearby short grassland [HVM]. Hence the forest pastures in the Jura and Napf region, where woods and open farmland are closely interwoven, are among the areas with the highest densities. Other core regions include the valleys of the southern Valais as well as parts of Grisons and the northern slopes of the Alps. In kilometre squares where habitat structure is ideal, it is not uncommon to find 20 territories and more. Average densities of eight territories/km^2 are reached only between 900 and 1600 m. The highest known nests were recorded in earlier years at 2260 m near St-Martin VS [VdS] and more recently at 2240 m near Bever GR (T. Wehrli) and at 2230 m near Zermatt VS (J. Duplain). The highest record of a singing male came from 2410 m near Pontresina GR (C. Rust).

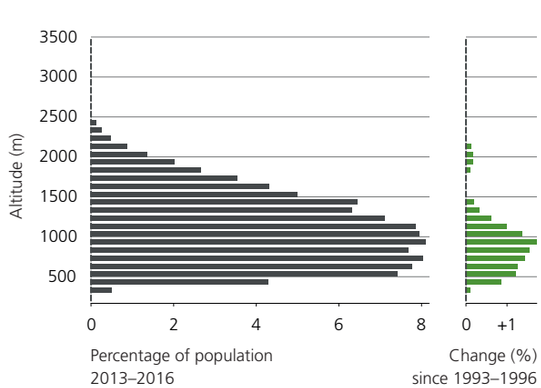
The population trend of the Mistle Thrush since 1993–1996 varies between regions. The gains outweigh the declines, leading to a rising trend for Switzerland overall. Increases occurred mainly at altitude levels below 1500 m, which corresponds well with the gains recorded in regional surveys in the cantons of Geneva and Zurich as well as around Lake Constance [AtBo, AtGE, AtZH]. At higher altitudes, the densities are more or less unchanged. In Ticino, the Mistle Thrush has spread southwards, but density remains low throughout the canton.

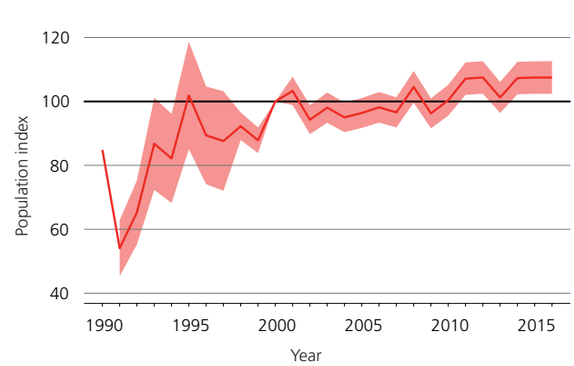
Neighbouring countries report mixed trends: numbers are increasing in Italy; the population is stable in Austria but declining in Germany and France [AtD, AtF, 4, 6]. The overall European trend is negative [EBCC].

The reasons for the differing regional trends in mountainous areas in Switzerland are unknown. Intensified grassland management is suspected to play a role: earlier and more frequent mowing [1, 3, 5] may benefit the Mistle Thrush by facilitating access to food. However, breeding success and population size could decline if the heavy fertilisation of meadows leads to a decimation of small invertebrates [2].

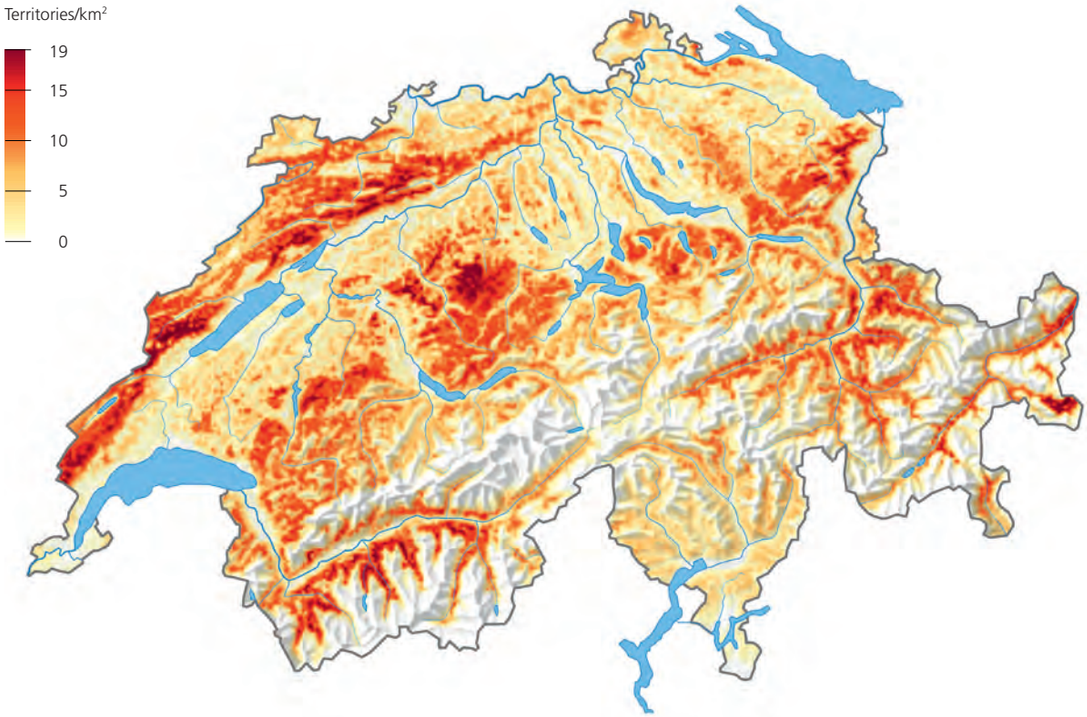
Johann von Hirschheydt

[1] Bosshard (2016a); [2] Britschgi et al. (2006); [3] Graf et al. (2014c); [4] Rete Rurale Nazionale & Lipu (2015); [5] Schmid et al. (2007); [6] Teufelbauer & Seaman (2017)





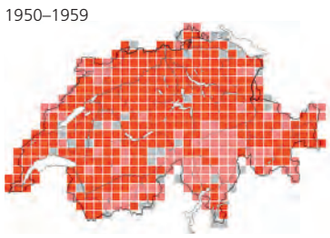
Density 2013–2016



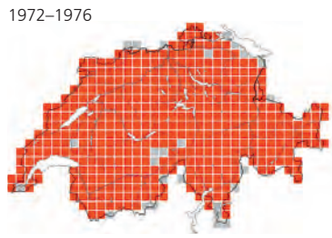
Density change since 1993–1996

Sponsored by
Anna Baumann, Altendorf

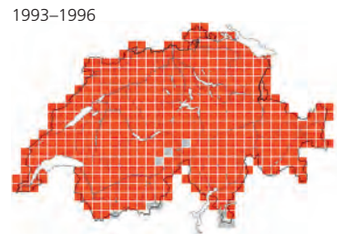
1950–1959



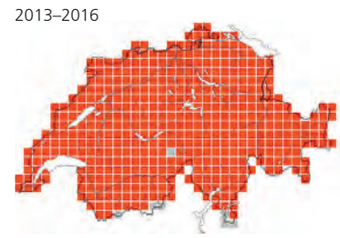
1972–1976



1993–1996



2013–2016



Song Thrush

Turdus philomelos
Singdrossel
Grive musicienne
Tordo bottaccio
filomela

Mathias Schäf

Red List Least Concern (LC)
Population 300 000–350 000 pairs (2013–2016)

Focus pages 414, 552

The Song Thrush occurs throughout Switzerland from the lowlands up to the tree line. It has a preference for damp mixed and coniferous forests with dense undergrowth. Spruce stands are important nesting sites[HVM, 9]. Unlike in many other countries of western and central Europe, where the species also inhabits urban parks and cemeteries[AtD, AtF, 3, 4, 8, 10, 12], the Song Thrush is still a typical forest bird in Switzerland. The highest average and maximum densities of over 15 and 30 territories/km^2, respectively, are reached in heavily wooded areas of the Jura with lots of rainfall and on the northern slopes of the Alps, especially between 800 and 1500 m. Densities in Ticino are low. The highest broods were recorded at 2230 m in the Swiss National Park GR (C. Irniger) and at 2180 m near Celerina GR[AEn]. Singing males were observed up to 2300 m in the Ofenpass region GR (D. Godly, M. Hofer) and near Zermatt VS (C. Huwiler).

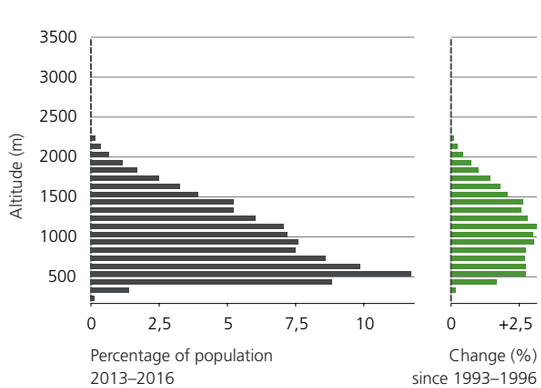
Since 1993–1996, numbers have increased throughout Switzerland; the largest gains relative to population share were recorded above 1000 m. The marked countrywide increase of about 40 % began in 2009. Before that, numbers had fluctuated with no clear trend.

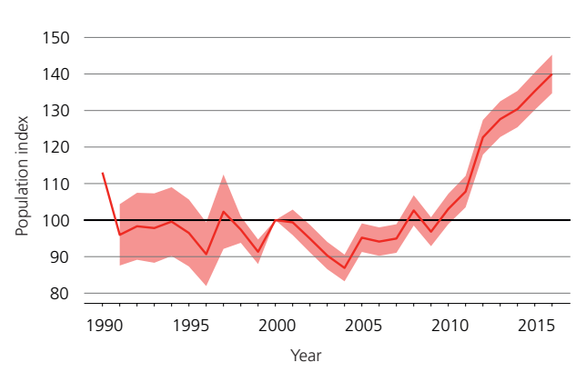
There are currently no signs of a similar increase in our neighbouring countries. Italy saw a steady, slow rise from 2000–2014[1, 2]. In Germany[AtD] and Austria[11], numbers have been stable for a long time. Likewise, the population of the Song Thrush in France was stable during 2001–2015, though this was preceded by a major increase in the 1990s[AtF, 5]. The trend for Europe overall has been slightly positive since 1990[EBCC].

The reasons for the massive gains since 2009 are unclear. However, the upward trend begins around the same time as a marked, countrywide increase in snails in Switzerland[6]. Compared to other thrush species, the Song Thrush has a particular preference for slugs and snails as a food source and to feed nestlings[HVM], so the two events could be correlated. Increasing forest density in the past 20 years, especially in the mountains[7], may also have played a part.

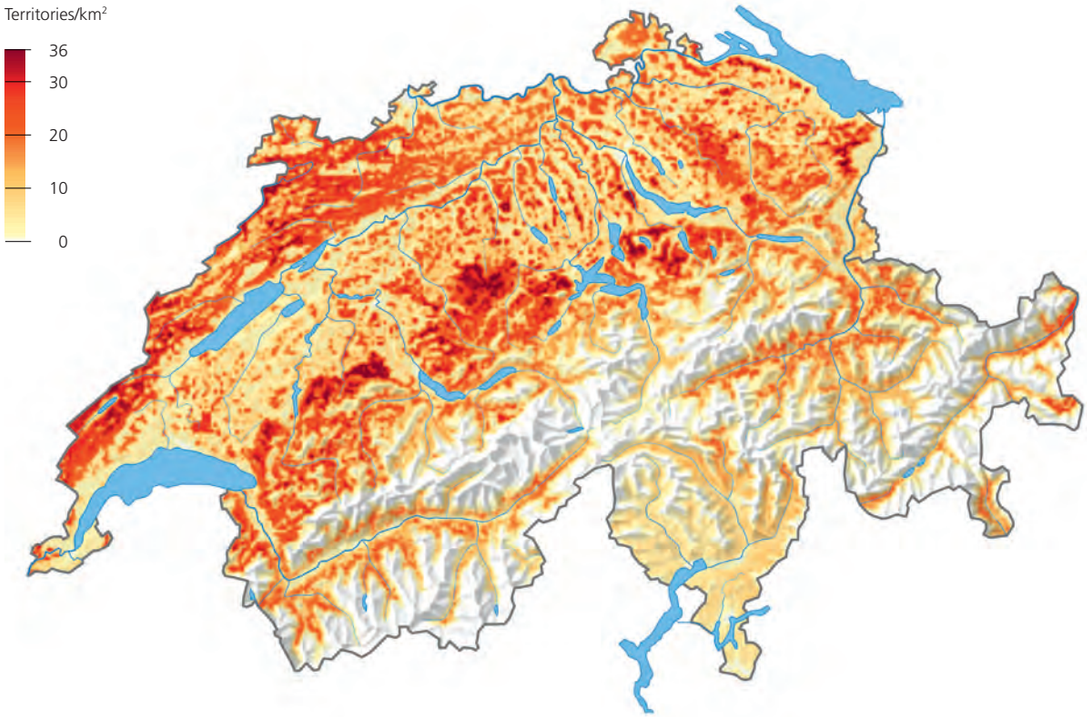
Johann von Hirschheydt

[1] Bani et al. (2014); [2] Campedelli et al. (2012); [3] Hustings (2002); [4] Jacob et al. (2010); [5] Jiguet (2017); [6] Martinez & Plattner (2015); [7] Rigling & Schaffer (2015a–d); [8] Sikora et al. (2007); [9] Spaar & Hegelbach (1994); [10] Šťastný et al. (2006); [11] Teufelbauer & Seaman (2017); [12] Vermeersch et al. (2004)





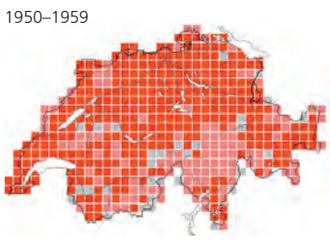
Density 2013–2016



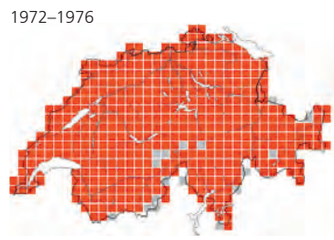
Density change since 1993–1996

Sponsored by
Anonymous donor

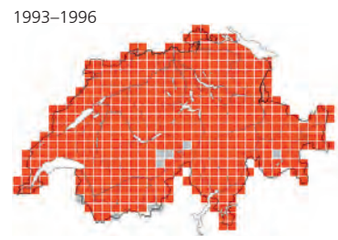
1950–1959



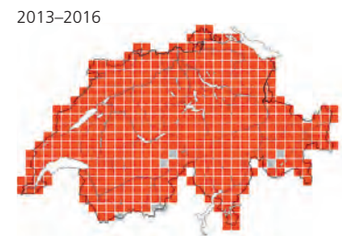
1972–1976



1993–1996



2013–2016



Long-distance migrants in difficulty

Overall, numbers of long-distance migrants are gradually declining, while those of short-distance migrants and residents appear to be increasing. This trend is not confined to Switzerland. Compared to short-distance migrants and residents, long-distance migrants are more specialised, more severely affected by habitat changes in breeding and wintering grounds, and thus more vulnerable.

Our native breeding birds can be divided into two groups based on their migration behaviour. Residents and short-distance migrants spend the winter in their breeding grounds or relocate to the Mediterranean region. In many species, only part of the population migrates, while the rest winters in the breeding grounds. The European Robin is an example of such a partial migrant. The second group includes species that mostly winter in sub-Saharan Africa. Only few of our native birds migrate to Asia (mainly India), like the Common Rosefinch.

The overall population trend of long-distance migrants in Switzerland has been negative since 1990, while residents and short-distance migrants are increasing in number. Other European countries report similar findings. Long-term declines are especially evident among long-distance migrants that winter in open habitats and breed in similarly open country in Europe [15, 17].

Distribution change since 1993–1996 of residents and short-distance migrants (85 species, above) and long-distance migrants (30 species, below). The map combines the distribution change maps of the relevant species. For residents and short-distance migrants, the resulting picture is far from uniform, but reflects a positive overall development. In contrast, the trend for long-distance migrants is almost entirely negative at lower and medium altitudes.

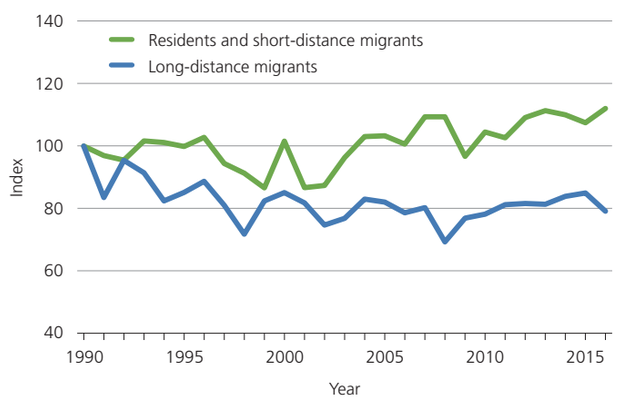
Long-distance migrants are particularly vulnerable

It became apparent around 1960 that long-distance migrants were in difficulty. A first wave of decline occurred between then and 1970, in some cases continuing into the early 1980s. The decline concerned species wintering in the Sahel zone, which was affected by drought at the time [5, 18]. A second phase began in the 1980s and involved species that winter in the tropics and the forest zone of Guinea in West Africa, such as Willow Warbler and Wood Warbler [17]. But still today, the declines predominantly affect species that winter in dry, open habitats in Africa [15].

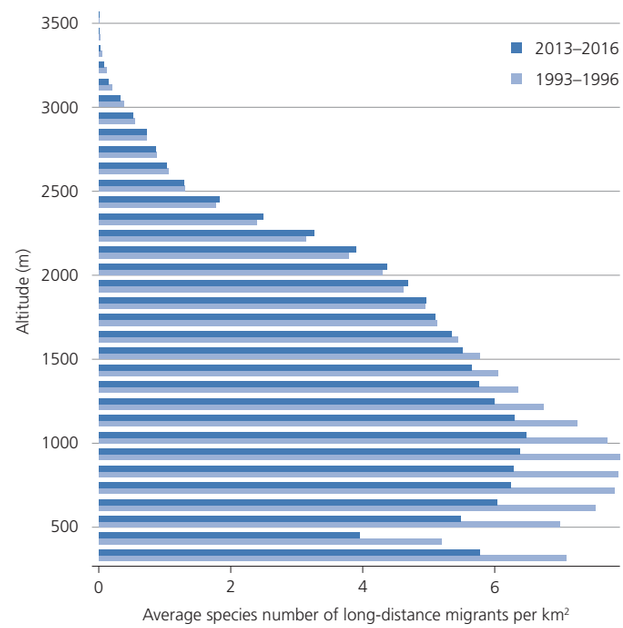
Long-distance migrants tend to be specialists. They have evolved to spend short periods of time in the breeding grounds, occupying habitats and searching for food that is available only briefly (mostly insects in dense vegetation or in open terrain that is uninhabitable in winter). Residents and short-distance migrants, in contrast, need to be generalists (e.g. corvids, finches or sparrows) that can cope with the constant seasonal change of food sources and habitats. Moreover, long-distance migrants travel between several completely different locations, spending 4–5 months in the breeding grounds, two months on spring and autumn migration, and 5–6 months in the wintering sites. Certain species move considerable distances within the wintering range [8, 9, 11, 16], while others stay in one location, returning to the same site year after year. Long-distance migrants are thus vulnerable in several respects: As specialists, habitat changes at one of the sites frequented in the course of the year can quickly put them under pressure. Moreover, they need to be in certain places at certain times, in keeping with their tight annual schedule [3]. Finally, many species face a high risk of mortality during migration [1].

Changes in breeding grounds play a decisive role in the decline

Compared to residents and short-distance migrants, the group of long-distance migrants includes more species that occupy open habitats such as farmland, but also wetlands [2]. There have been significant changes in these types of habitat both in the breeding and in the wintering grounds, so it is not possible to attribute the decline to either one or the other.



Swiss Bird Index SBI® for residents and short-distance migrants (green) and long-distance migrants (blue). While the first group has done well (with some exceptions), long-distance migrants have declined overall.



For each altitude level, the graph shows the average number of species of long-distance migrants per kilometre square in 1993–1996 (light blue) and 2013–2016 (dark blue). Species richness declined in areas below 1500 m while staying constant above that altitude, suggesting that many causes of decline can be found in the breeding grounds.

In the breeding grounds, open habitats in particular have deteriorated: farming practices have intensified, causing the decline of farmland breeding birds; wetlands have decreased in size and often suffer from a lack of water, causing the local extinction of species. The fact that long-distance migrants have above all disappeared from the Swiss lowlands, where the impact of human activity is especially strong, is an indication that the decline is largely «home-made».

Changes in the wintering grounds are also detrimental

Migrating birds face huge problems if stopover sites are unavailable. In particular, stopover sites at the edge of the Sahara are essential for migrants that replenish their fat reserves there (in northern Africa during autumn migration, in the Sahel during spring migration).

In the 1970s, the Sahel zone suffered from massive drought, leading to the decline of several species that winter in this region (e.g. Common Redstart, European Pied Flycatcher, Collared Sand Martin and Common Whitethroat)[5, 13, 18]. Rainfall has increased again in the Sahel since the 1990s, without however reaching the amounts of earlier years[7, 14]. The area also suffers from deforestation. Landscapes are changing rapidly in the more southern latitudes of Africa as well, as forests are cleared[12], trees in the savannah are thinned out, and water use increases. Other negative factors include hunting of birds in the Mediterranean region and North Africa[4, 6] as well as climate change, which tends to cause droughts and irregular rainfall along the migration routes and in Africa[10].

Long-distance migrants have evolved remarkable adaptations and accomplish extraordinary feats of flight. Barn Swallow, Common Nightingale and Eurasian Golden Oriole manage to take advantage of peak insect abundance during summer in Europe while spending the rest of the year thousands of kilometres away. We must make every effort to offer them the best possible conditions in our country.

Lukas Jenni & Hans Schmid

[1] Blackburn & Cresswell (2016); [2] Böhning-Gaese & Oberrath (2003); [3] Both et al. (2010); [4] Brochet et al. (2016); [5] Bruderer & Hirschi (1984); [6] Fisher et al. (2018); [7] Hoscilo et al. (2015); [8] Jones (1995); [9] Koleček et al. (2018); [10] Ly et al. (2013); [11] Moreau (1972); [12] Norris et al. (2010); [13] Ockendon et al. (2014); [14] Park et al. (2016); [15] Sanderson et al. (2006); [16] Thorup et al. (2017); [17] Vickery et al. (2014); [18] Zwarts et al. (2009)

Species pages 310, 390, 396, 400, 404, 426, 458, 462, 464, 470

Eurasian Blackbird

Turdus merula
Amsel
Merle noir
Merlo
merlotscha

Mathias Schäf

Red List Least Concern (LC)
Population 500 000–700 000 pairs (2013–2016)

Focus pages 156, 314, 414, 552, 560

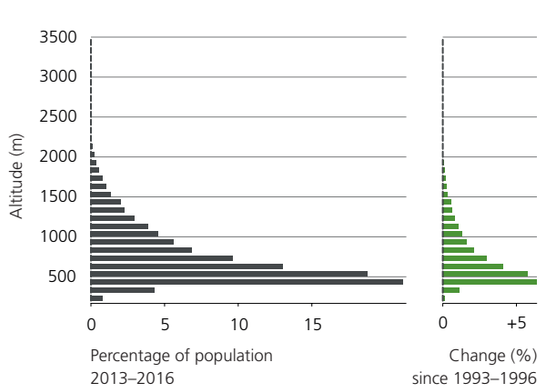
The Eurasian Blackbird occurs throughout Switzerland up to the tree line. Originally a woodland bird with a preference for dark, damp forests with dense underbrush, this highly adaptable species has occupied almost all types of habitat in central Europe where it finds at least a few trees and bushes as well as open grassy areas for foraging. Even in large city centres, the Blackbird has become well established [HVM, VdS]. Breeding is known to occur up to 2220 m [AtCH2]; recently, the highest confirmed broods were recorded at 2140 m near Zermatt VS (C. Huwiler) and at 2120 m near Arolla VS (P. Nijman) [1]. Singing males were observed near Pontresina GR at 2320 m (C. Müller). However, many males at the upper limits of the breeding range remain unpaired [8]. A series of observations conducted at 1990–2000 m near Juppa/Avers GR has shown that territories at high altitudes can be occupied for several years in a row (E. Dettli).

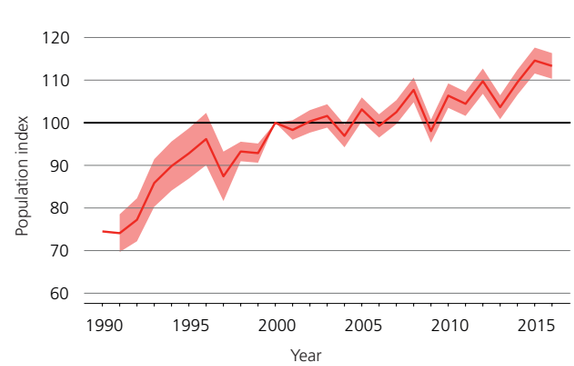
Since 1993–1996, numbers have increased by at least 20 % in all parts of the country in proportion to the population size at each altitude level. Similarly, trends of the Blackbird are positive in France and Italy and in Europe as a whole [AtF, EBCC, 4, 7]. Stable trends were recorded in Austria (1998–2016; positive trend since 2011) [12] and in the Canton of Zurich between 1988 and 2017 [AtZH, 13]. In Germany, the trend is either stable or increasing, depending on the survey methodology [AtD]. The Lake Constance area surprisingly saw a marked decline in the breeding population between 1980 and 2010 [AtBo].

The reasons for the increase in Switzerland are unclear. The fact that densities increased most significantly in villages and urban areas on the Central Plateau, in the Jura, the Valais and southern Ticino may indicate that urbanisation has a positive effect on populations [AtD, 5]. The shift towards earlier breeding [6], less frequent migration of urban birds [5, 9], and the longer breeding period in all habitats due to climate warming [6] could have a positive impact on numbers as well. The Usutu virus, which was also found in Switzerland [10, 11], can cause local collapses in Blackbird populations [2, 3], but so far does not appear to be relevant for the overall population size in our country.

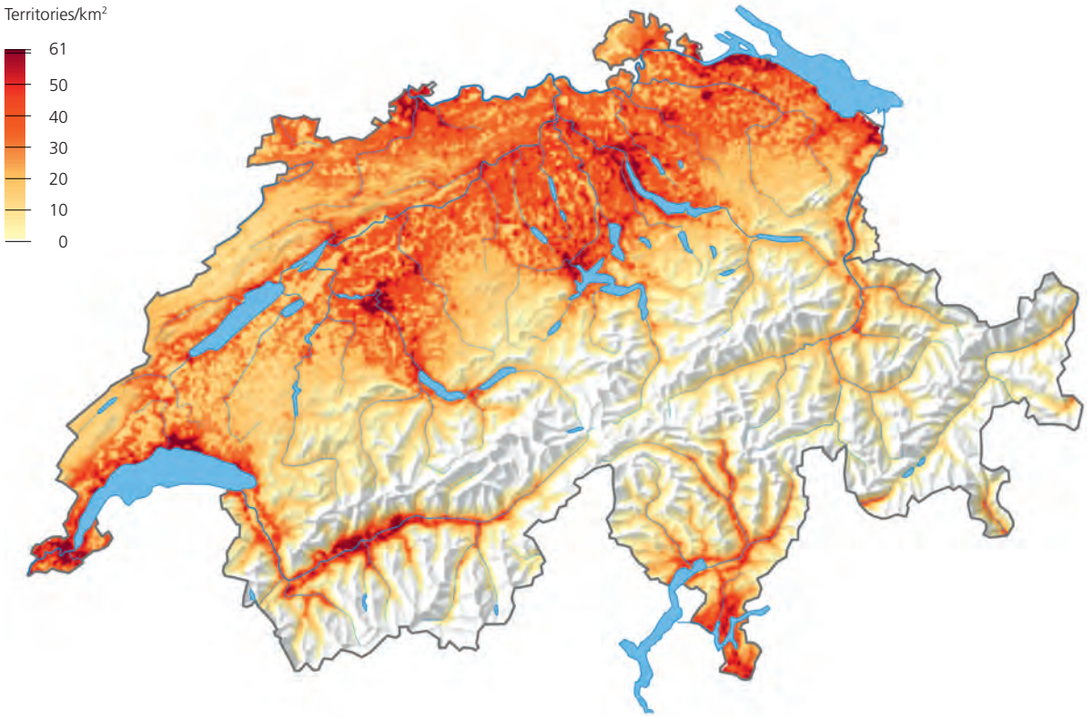
Johann von Hirschheydt

[1] Antoniazza (2015); [2] Bosch et al. (2012); [3] Cadar et al. (2017); [4] Campedelli et al. (2012); [5] Møller et al. (2014); [6] Najmanová & Adamík (2009); [7] Nardelli et al. (2015); [8] Oberwalder et al. (2002); [9] Partecke & Gwinner (2007); [10] Steinmetz et al. (2011); [11] Teubenbacher (2017b); [12] Teufelbauer & Seaman (2017); [13] M. Weggler, in litt.





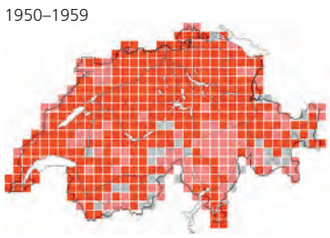
Density 2013–2016



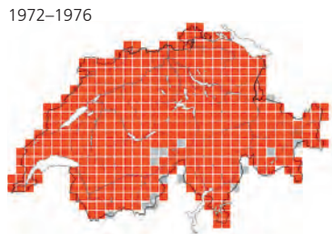
Density change since 1993–1996

Sponsored by
Anonymous donor

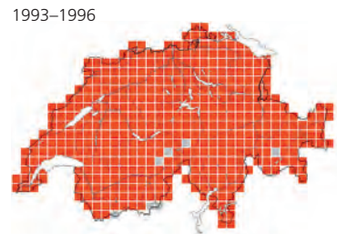
1950–1959



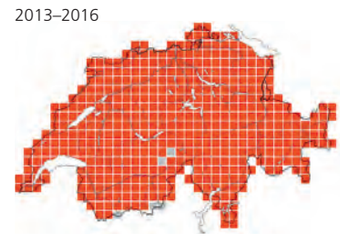
1972–1976



1993–1996



2013–2016



Fieldfare

Turdus pilaris
Wacholderdrossel
Grive litorne
Cesena
tursch giagl

Christina Roser

Red List Vulnerable (VU)
Population 40 000–45 000 pairs (2013–2016)

Focus pages 240, 284, 319, 392, 420, 506

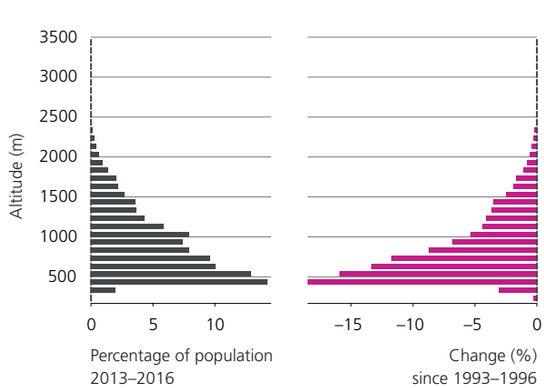
The Fieldfare's breeding range, originally in Siberia, has expanded westward in several phases and now reaches as far as southern France. Switzerland lies at the southwestern periphery of the range, which explains why the cantons of Geneva and Ticino are only sparsely populated. Prime habitat consists of single trees, hedgerows and forest edges for breeding and nearby short, damp grassland such as meadows, pastures or fields for foraging. The Fieldfare sometimes breeds in colonies; the highest densities of over ten territories/km^2 occur mainly in the Neuchâtel Jura, the Franches-Montagnes JU, the central parts of the Plateau and around Urnäsch AR. In Switzerland as a whole, however, half of the occupied kilometre squares only accommodate 1–2 territories. 80 % of the population occurs below 1200 m, though the Fieldfare can be found up to the tree line. While breeding has been recorded up to 2300 m [AtCH2], the highest recent record comes from 2140 m near Zermatt VS (J. Duplain).

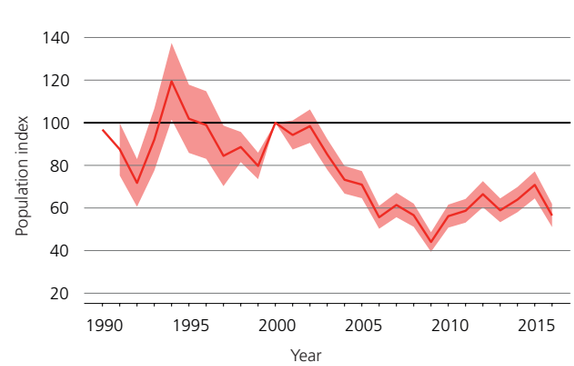
The Swiss population dropped to 60 % of its former size between 2002 and 2006 and has fluctuated around that level since then. The range expansion into southern Switzerland recorded in 1993–1996 has practically stopped. The losses occurred mainly in the Pre-Alps and on the Central Plateau. They are apparent at all altitudes, but are most severe below 1000 m. The population declined by almost 50 % in the Canton of Zurich between 1988 and 2008 [AtZH] and by 78 % around Lake Constance from 1980 to 2010 [AtBo]. Trends are negative in all neighbouring countries as well as in Belgium and the Netherlands [AtD, AtF, AtV, 1, 2, 4, 5, 8, 9]. The overall European population is stable, however [EBCC]. In Poland [6] and the Czech Republic [7] numbers continued to rise in the early years of this century, but have since levelled off [RLEU].

The greatest losses in Switzerland occurred in areas with high precipitation on the northern slopes of the Alps. Dry spells during the breeding season cause a shortage of earthworms, an important source of nestling food [ABW], but they barely correlate with annual fluctuations in Fieldfare numbers. Other factors are therefore considered more relevant. In the Aare Valley BE/SO, the decline is thought to be related mainly to decreasing colony size [3]. The mixed trends in Europe may indicate a large-scale contraction of the range at its western edge, but the reasons are unknown.

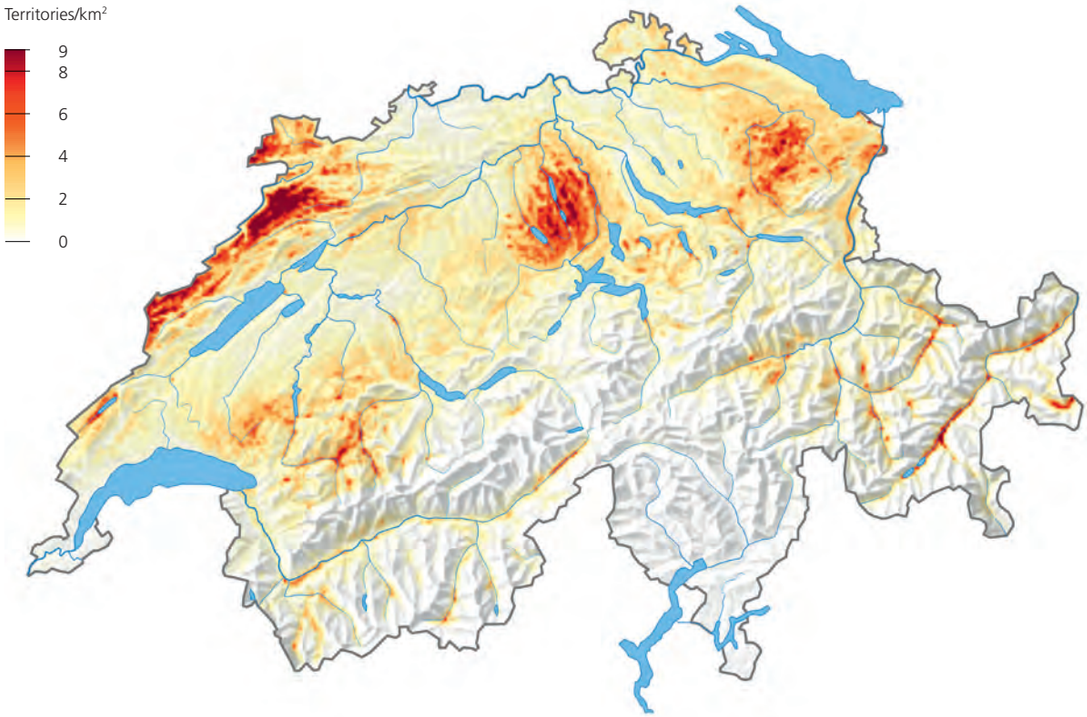
Johann von Hirschheydt

[1] Brichetti & Fracasso (2008); [2] Campedelli et al. (2012); [3] Christen (2017b); [4] Hustings (2002); [5] Jacob et al. (2010); [6] Sikora et al. (2007); [7] Šťastný et al. (2006); [8] Teufelbauer & Seaman (2017); [9] Vermeersch et al. (2004)

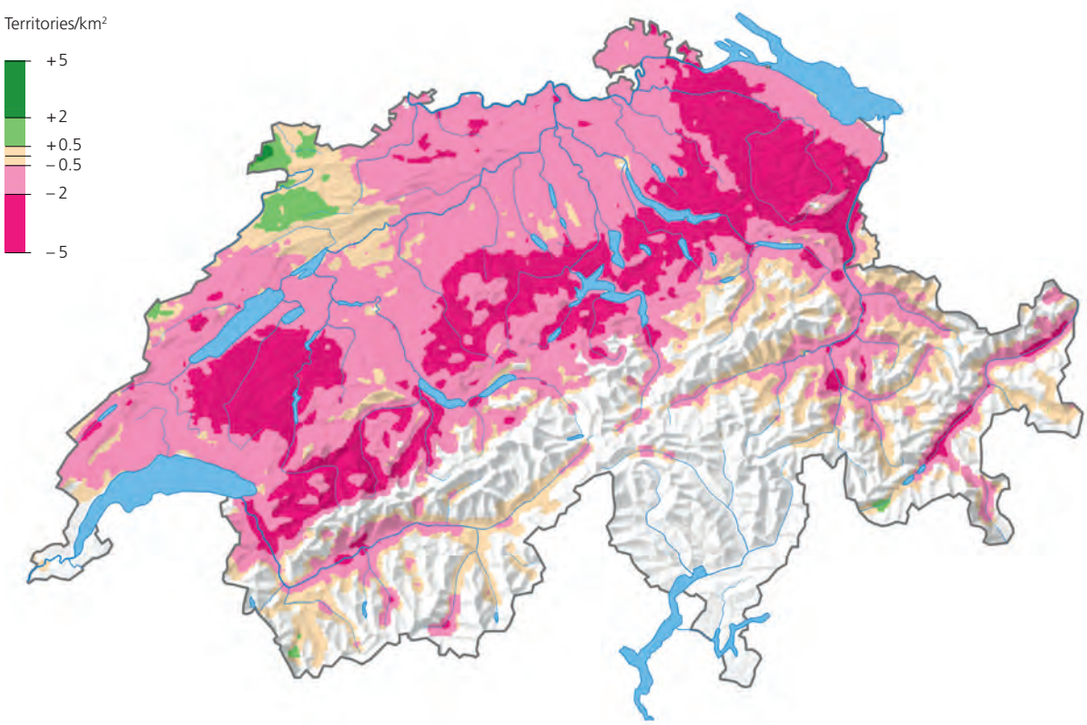




Density 2013–2016

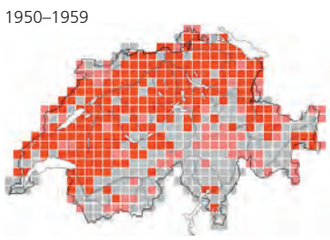


Density change since 1993–1996

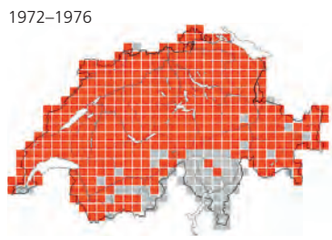


Sponsored by
Ruedi Weber, Pfyn

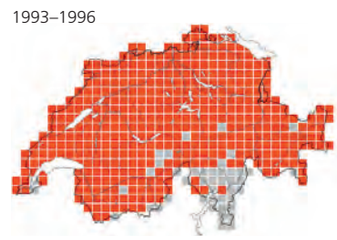
1950–1959



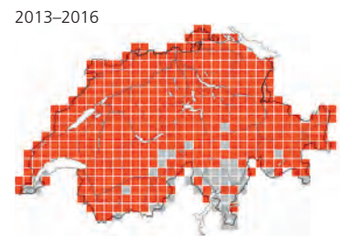
1972–1976



1993–1996



2013–2016



Ring Ouzel

Turdus torquatus
Ringdrossel
Merle à plastron
Merlo dal collare
tursch dal cularin

Gilbert Paquet

Red List Vulnerable (VU)
Population 50 000–75 000 pairs (2013–2016)

Focus pages 240, 314, 542

The distribution of the Ring Ouzel is confined to the boreal and Alpine zones. It breeds in northern Europe, the Cantabrian Mountains, the Pyrenees, the Jura and the Alps as well as locally in other mid-elevation ranges in central and western Europe. In Switzerland, the highest densities are reached in the Vaud Jura and along the northern Pre-Alps, where it mainly inhabits forests dominated by spruce, fir or larch, the adjacent meadows and pastures, and scrubland [12]. Average densities of more than seven territories/km^2 are reached between 1500 and 2100 m. Suitable kilometre squares regularly support 15 territories and more. The highest confirmed breeding record comes from 2600 m, high above the tree line, near Celerina GR (D. Thiel); in this environment, the Ring Ouzel breeds in rock faces or among boulders [HVM].

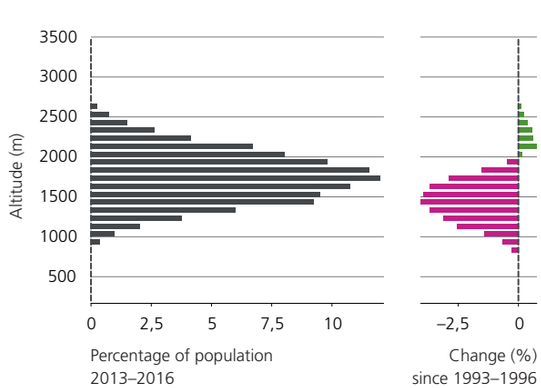
Since 1993–1996, density has decreased in the Jura and the Pre-Alps in particular, while remaining stable above 2000 m or even increasing slightly. The range losses at low and medium altitudes between 1000 und 1900 m have led to the local disappearance of the Ring Ouzel from wooded areas or valley bottoms [AEn, 5, 6, 8]. Since 2007, the declining trend has given way to wide fluctuations.

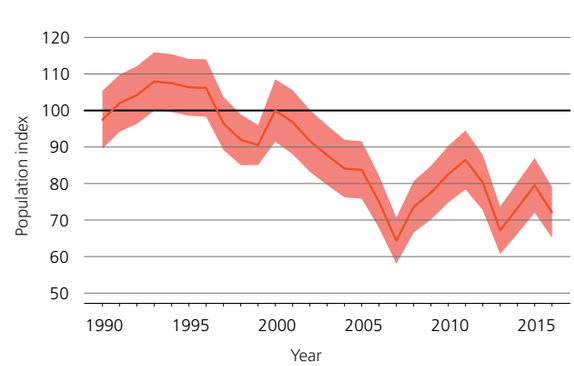
With 13 % of the European population of the Ring Ouzel occurring in Switzerland, our country has an important responsibility for its conservation [8]. In Germany, France, Italy and Austria, numbers are considered stable [AtD, AtF, 7, 11] despite regional declines in the Franche-Comté [AtF], the Vosges [4], the Black Forest [2] and the Mühlviertel and Waldviertel [10].

The Ring Ouzel is sensitive to climate change [3, 9, 12], the presumable cause of range loss at low altitude. It likes to forage in short vegetation on damp and soft ground, common at higher altitudes following the spring snowmelt. The earlier onset of the snowmelt due to climate change could prove problematic for the Ring Ouzel by advancing the timing of plant phenology in the species' current breeding grounds [1]. Changes in land use such as the intensified use of meadows or the abandonment of high-altitude pastures may also cause the degradation of habitats.

Jacques Laesser & Arnaud Barras

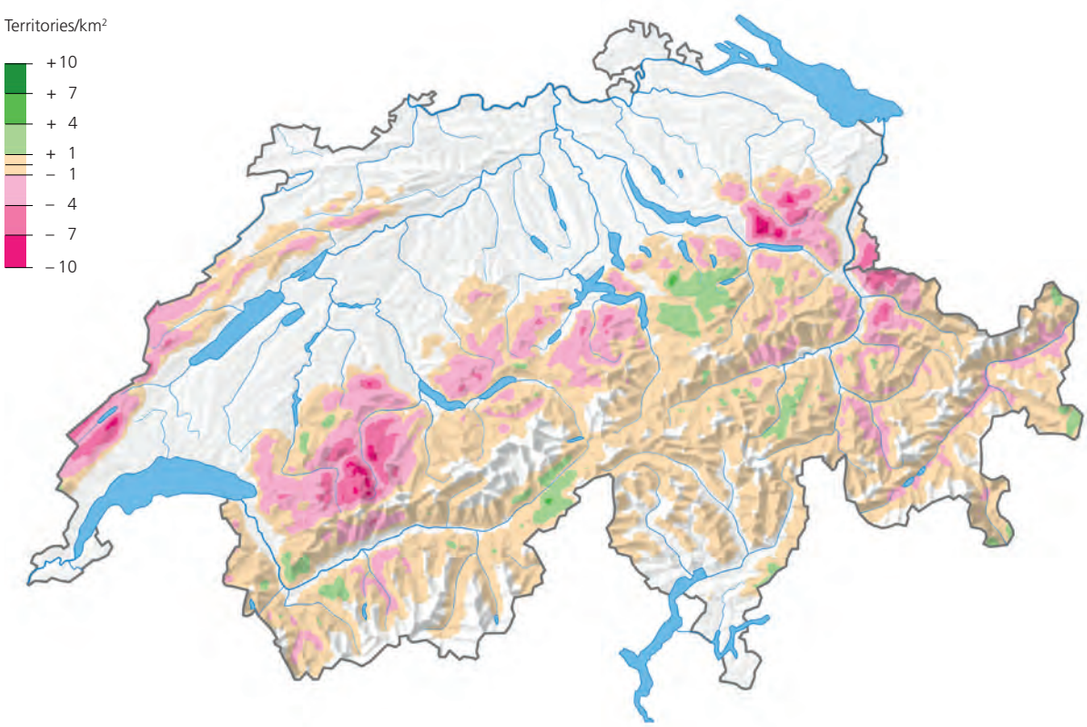
[1] Barras (2016); [2] Bauer et al. (2016a); [3] Beale et al. (2006); [4] Dronneau & les observateurs de la LPO Alsace (2016); [5] Glutz von Blotzheim (2007b); [6] Kronshage (2005); [7] Rete Rurale Nazionale & Lipu (2015); [8] Sattler et al. (2016a–d); [9] Sim et al. (2010); [10] Teufelbauer (2014); [11] Teufelbauer & Seaman (2017); [12] von dem Bussche et al. (2008)





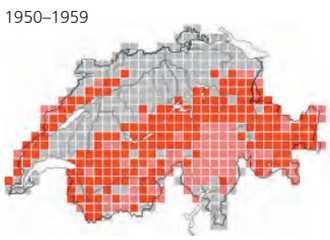
Density 2013–2016

Density change since 1993–1996

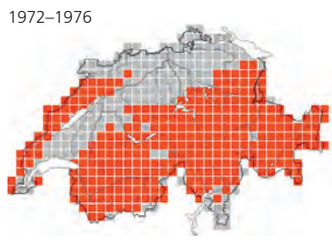


Sponsored by
Lukas Jenni

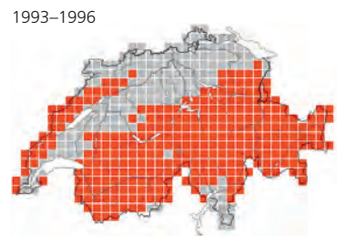
1950–1959



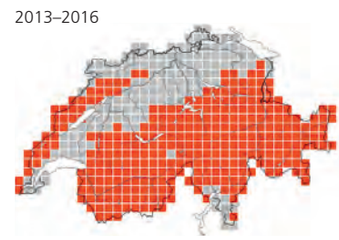
1972–1976



1993–1996



2013–2016



Spotted Flycatcher

Muscicapa striata
Grauschnäpper
Gobemouche gris
Pigliamosche
sgnappamustgas grisch

Ruedi Aeschlimann

Red List Least Concern (LC)
Population 35 000–55 000 pairs (2013–2016)

Focus pages 170, 362

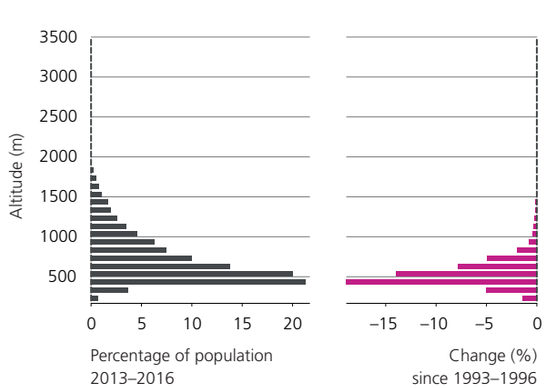
The Spotted Flycatcher is widespread in the lowland areas of Switzerland, where the highest densities are reached in the Canton of Lucerne and around Lake Constance. As an insectivorous species that hunts from perches, it mainly occupies edge habitats in landscapes that offer a variety of small-scale structures such as open areas, buildings and old trees [HVM]. Where conditions are right, it will also colonise town centres [6]. Almost 85 % of the population breeds below 1000 m. The Spotted Flycatcher appears to be sensitive to rainfall in May and June [HVM], which is probably why breeding records above 1200 m are rare north of the Alps and in the Jura. In the drier climate of the central Alps, the Spotted Flycatcher is found at much higher altitudes. The highest breeding records came from 2100 m in the Val Poschiavo GR (E. Mühlethaler) [AGR] and from 2080 m near Anzère VS (A. Barras, R. Bühler). Singing males can occasionally be observed at over 2100 m.

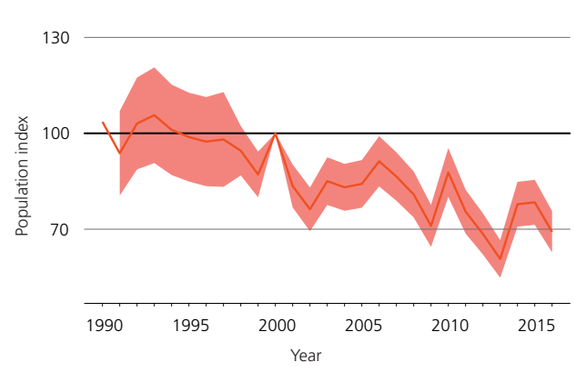
Since 1993–1996, the breeding population of the Spotted Flycatcher has dropped by about 30 % with wide fluctuations. The losses have occurred exclusively in areas below 1000 m and have been most pronounced below 600 m, especially on the Central Plateau between Bern and Zurich and in the Basel area. In the Canton of Zurich and around Lake Constance, numbers have declined by about 30 % in the past 20 years [AtBo, AtZH]. The trend in Switzerland resembles trends in neighbouring countries [AtD, AtF, 4, 7]. In Europe overall, numbers have dropped by almost 50 % since 1980 [EBCC].

Due to the warming climate, insect availability peaks earlier in the year in many places, though there are habitat-related differences [1]. This leads to losses among migrants that are unable to advance the timing of their breeding activity by a large enough margin [3]. The same dynamic could account for declines in lowland populations of Spotted Flycatcher, as the birds have been found to return somewhat later to their breeding grounds on the Central Plateau in the past few years rather than earlier [5]. The fact that populations above 1000 m are stable or even increasing substantially in Finland [8], suggests that climate change may be having a positive effect in these areas where conditions used to be extremely harsh. Should the recently discovered massive loss of flying-insect biomass [2] continue, the Spotted Flycatcher could face a bleak future.

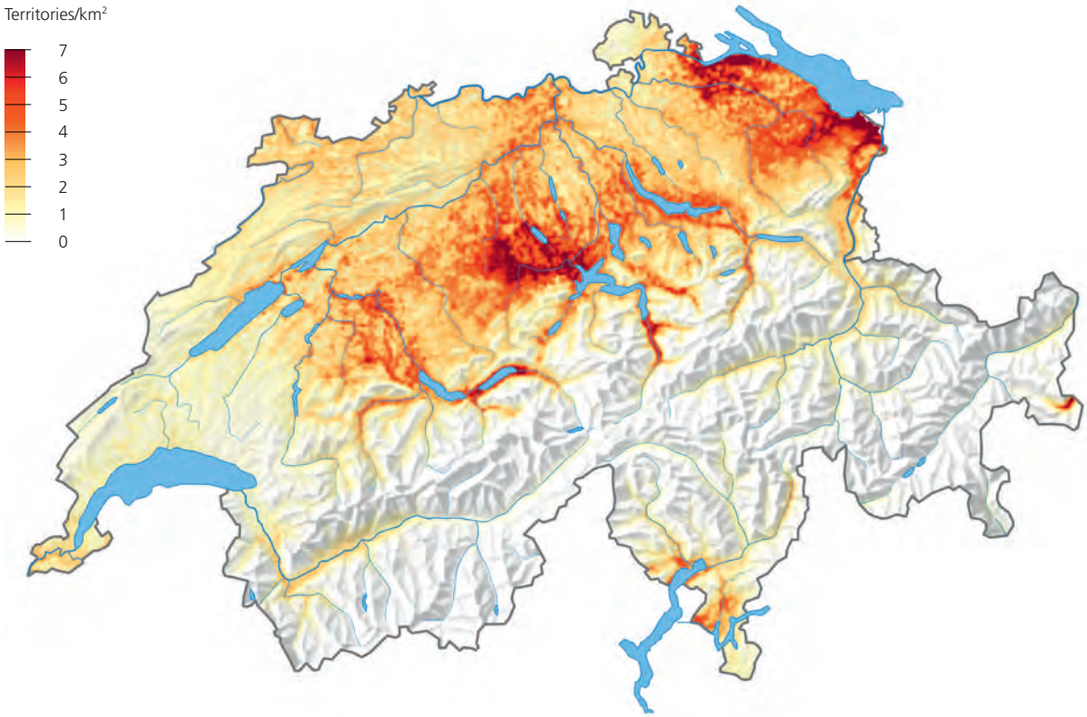
Johann von Hirschheydt

[1] Both et al. (2010); [2] Hallmann et al. (2017); [3] Møller et al. (2008); [4] Rete Rurale Nazionale & Lipu (2015); [5] Roth et al. (2014b); [6] Sorace & Gustin (2010); [7] Teufelbauer & Seaman (2017); [8] Valkama et al. (2011)

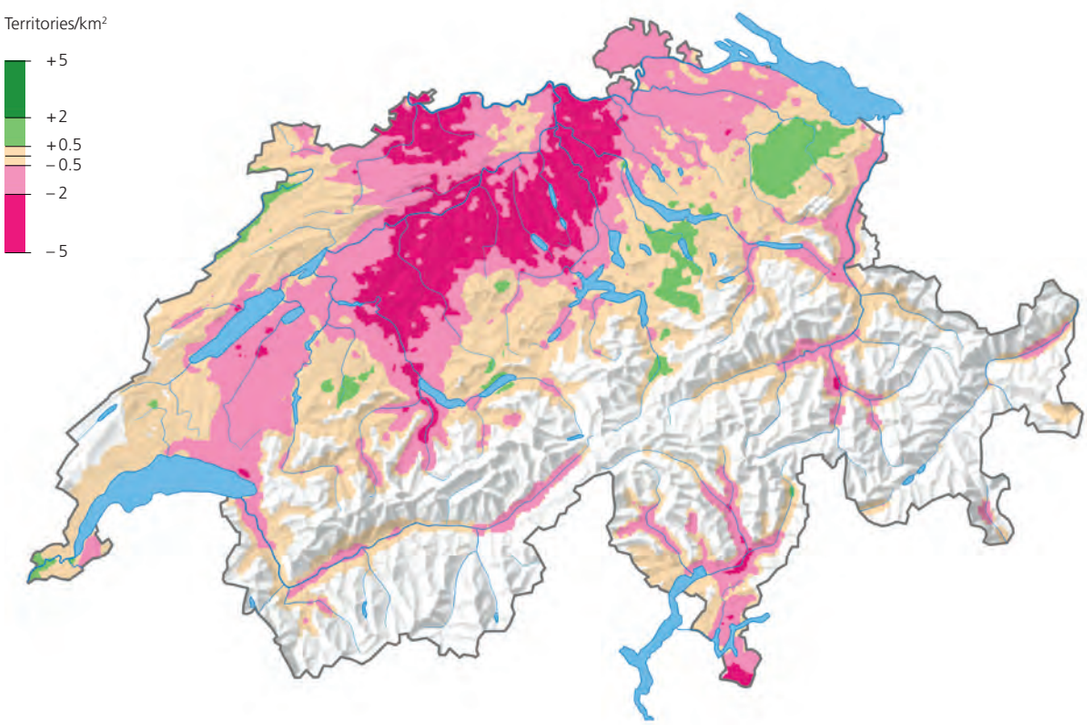




Density 2013–2016

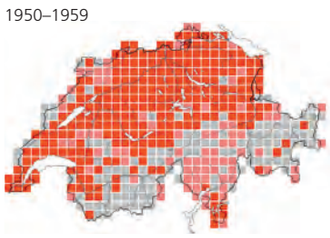


Density change since 1993–1996

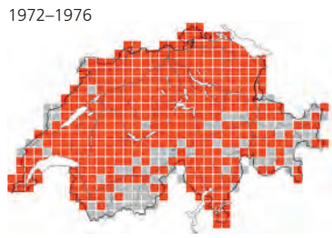


Sponsored by
Anonymous donor

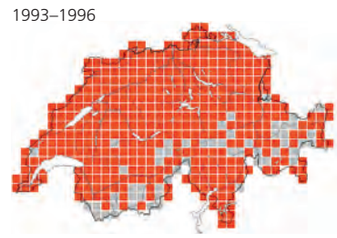
1950–1959



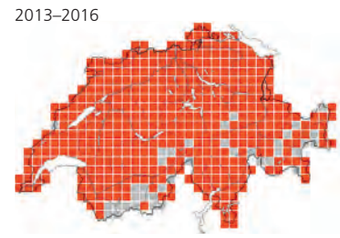
1972–1976



1993–1996



2013–2016



European Robin

Erithacus rubecula
Rotkehlchen
Rougegorge familier
Pettirosso
puppencotschen

Michael Gerber

Red List Least Concern (LC)
Population 450 000–650 000 pairs (2013–2016)

Focus pages 392, 414, 448, 552

The European Robin occurs throughout Switzerland up to the tree line. It inhabits all types of woodland, especially damp woods with undergrowth and a thin herbaceous layer. It also occupies copses, dense hedges, parks and settlements with shrub-rich gardens [HVM, VdS]. More than 80 % of the population is found between 400 and 1500 m. The highest nest in recent years was recorded at 1980 m near Fully VS (C. Luisier), the highest singing bird at 2300 m near Tschierv GR (M. Müller).

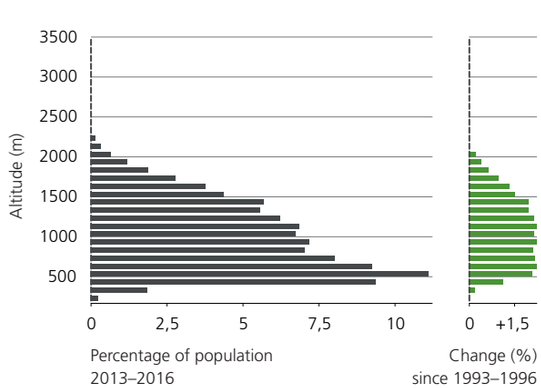
The European Robin is one of our most common species. Suitable kilometre squares regularly accommodate 40 territories and more. In windthrow areas in the Pre-Alps in the Canton of Schwyz, a maximum of 34–36 territories was counted on 38 ha (9.5 territories/10 ha) a few years after storm «Vivian» [3]; in a young forest at the southern foot of the Jura near Solothurn, 15 territories were found on 11.4 ha [1]. An average of five territories on 8.3 ha was recorded in a residential district of Solothurn [6]. In the sub-Alpine zone of the Engadine GR and Val Bregaglia GR, the average density is only 1.0 territory/10 ha [AEn].

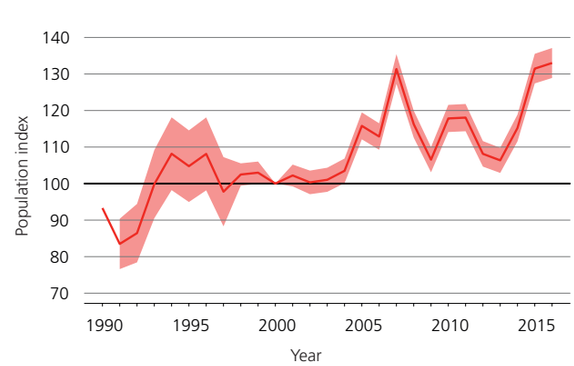
Density has increased in many areas since 1993–1996, especially in the western part of the Vaud Jura, the Pre-Alps of Schwyz and Fribourg, the Napf region and the Vorderrhein Valley GR. There have been marked gains at all altitude levels, in proportion to the population at each level except in areas below 600 m. The population index is also on the rise, albeit with large annual fluctuations. Surveys in the Canton of Zurich between 1988 and 2008 show an increase of more than 20 % [AtZH], whereas the population around Lake Constance decreased by the same percentage between 1980 and 2010 [AtBo]. According to analyses conducted with data from 1988 and 1999, the density in forested areas in the Canton of Zurich has increased by just under 20 %, while remaining largely unchanged in farmland and settlements [8, 9, 10]. In Germany, in contrast, the population index during 1989–2003 was positive in settlements and semi-open farmland, but negative in woodland [2].

Trends are positive in France, Italy and Europe as a whole [AtF, EBCC, 4, 5], but negative in Germany and Austria [AtD, 7]. The European Robin will continue to benefit from the increase in forest area and from climate change, as it is vulnerable to severe winters [2].

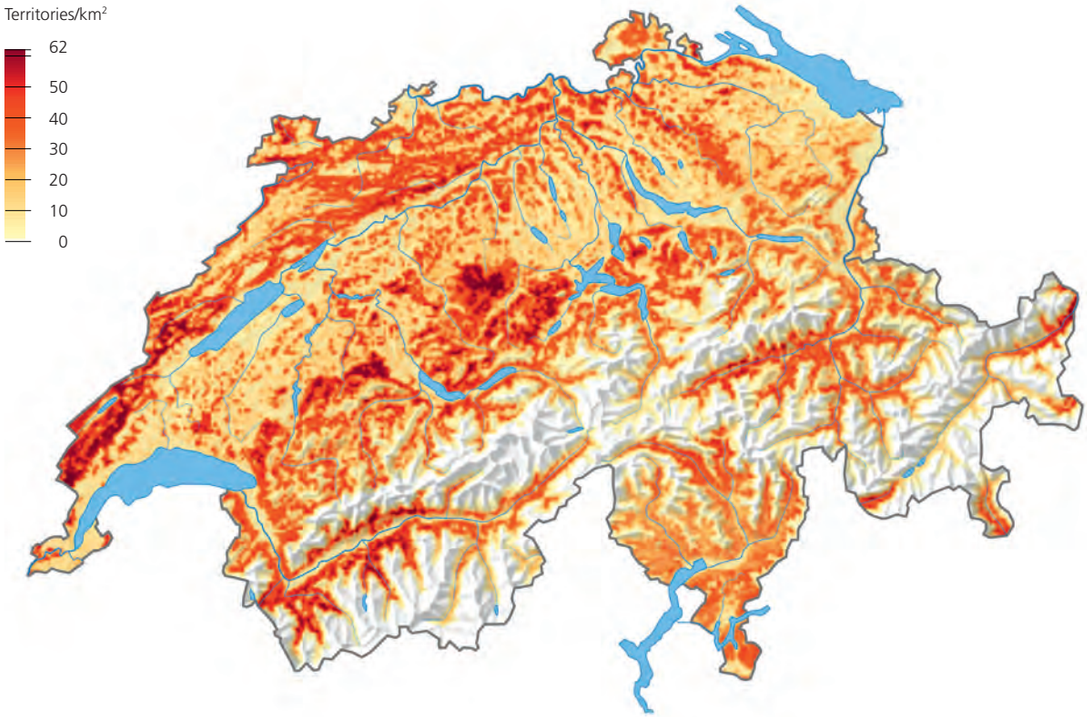
Christian Marti

[1] Christen (2018); [2] Flade & Schwarz (2004b); [3] Glutz von Blotzheim (2001); [4] Jiguet (2017); [5] Rete Rurale Nazionale & Lipu (2015); [6] Sattler & Tobler (2004); [7] Teufelbauer & Seaman (2017); [8] Weggler & Widmer (2000a); [9] Weggler & Widmer (2000b); [10] Weggler & Widmer (2001)





Density 2013–2016

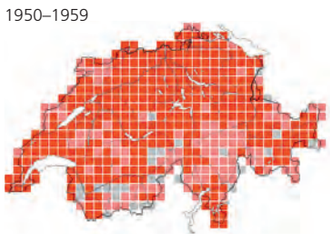


Density change since 1993–1996

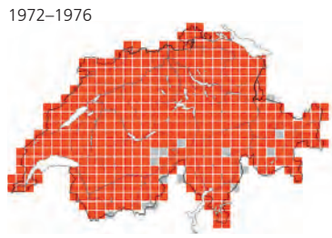
Sponsored by
Brigitte & Pierre Morel
Caroline & Olivier Spertini
Markus & Ursula Thüer

Le Rougegorge, www.lerouge-gorge.ch

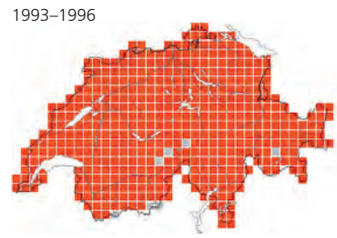
1950–1959



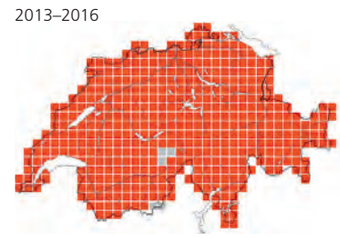
1972–1976



1993–1996



2013–2016



Red-spotted Bluethroat

Cyanecula svecica svecica
Rotsterniges Blaukehlchen
Gorgebleue à miroir roux
Pettazzurro orientale
puppenblau cun staila cotschna

Peter Keusch

Red List Vulnerable (VU)
Population 5–12 pairs (2013–2016)

Focus page 369

The Bluethroat's red-spotted subspecies mainly inhabits northern Eurasia. Apart from this core range, small populations are also found in the Alps, the Sudetes and the northern Carpathian Mountains[8, 9]. Switzerland therefore lies at the southwestern edge of the range. In our country, the Red-spotted Bluethroat breeds mainly along the Alpine divide. In 2013–2016, the species regularly occurred in the eastern part of the Canton of Bern (2–4 territories per year) and in the Alps of the Ticino (1–4 territories). In Grisons, one territory was found in 2013 and three in 2015, while one territory each was found in the cantons of Uri and Valais in 2015. The Bluethroat favours structurally diverse habitats that are wet or near water: floodplains with low willows, dwarf-shrub heath, springs, or tall forb meadows, e.g. in livestock resting areas near cowsheds in the Alps[5, 7].

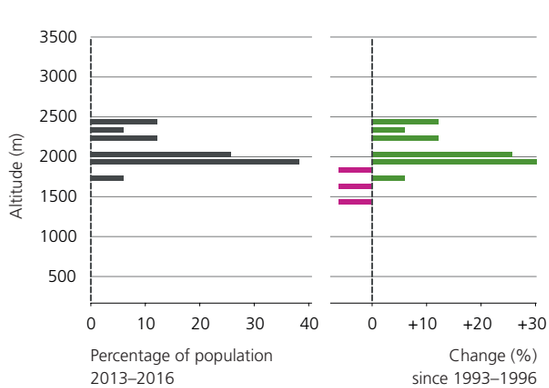
The species' altitudinal distribution is limited to a relatively narrow belt: in 2013–2016, singing males were observed between 1790 and 2290 m, while breeding was recorded between 1960 and 2260 m. Before and after the atlas period, singing males were observed at considerably lower and higher altitudes, for example at 1500 m in the Urseren Valley UR (M. Widmer, E. Weiss) and at 2580 m near Zermatt VS (M. Julen)[10].

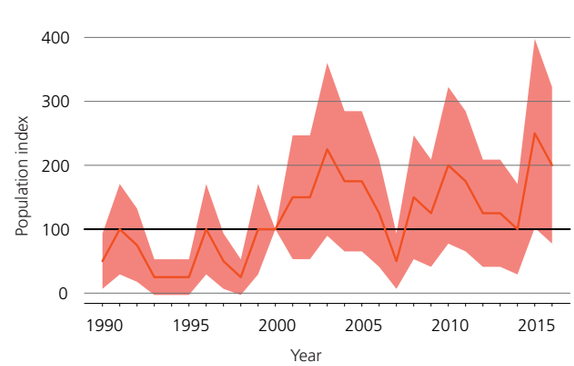
The first breeding record in Switzerland dates from 1980 in the Dischma Valley GR[11]. The range and the population have expanded somewhat since then: 2.7 territories were counted on average per year in 1980–1992 and 1.8 territories in 1993–1996. From 1997 to 2012, the average rose to 5.5 territories per year and peaked at 6.8 territories in 2013–2016. The gains are at least partially related to increased observer effort. The potential area of distribution in Switzerland is relatively large and not well monitored due to poor accessibility.

Breeding populations in the Italian and Austrian Alps have been small and sites occupied irregularly in the past 20 years, not unlike in Switzerland, although Austria reports negative regional trends[AtV, 1, 2, 3, 4, 8, 9]. Reasons for the decline in Austria include disturbance and habitat loss, partly due to the development of tourism infrastructure in the valleys and the intensified use or abandonment of Alpine pastures[AtV, 6, 8, 9]. The Scandinavian population decreased by 30 % from 1996 to 2014[EBCC].

Claudia Müller

[1] G. Agostani, pers. comm.; [2] Albegger et al. (2015); [3] Brembilla (2012); [4] Brichetti & Fracasso (2008); [5] Cereda & Posse (2002); [6] Feldner et al. (2006); [7] Glutz von Blotzheim (1987); [8] Gressel (2011); [9] Malle & Probst (2010); [10] Posse (2004); [11] Wartmann (1980)





Territories 2013–2016

2
1

Certain dots on the maps have been moved to protect this sensitive species

Change in the number of territories since 1993–1996

Increase

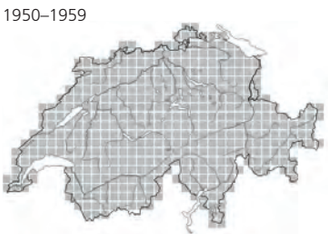
2
1
0

Decrease

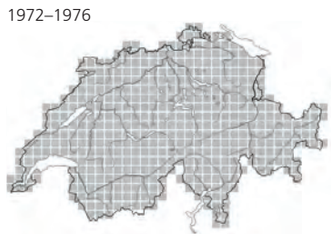
1
2

Sponsored by
Maja Suter

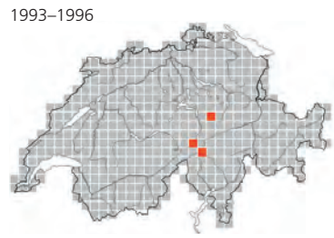
1950–1959



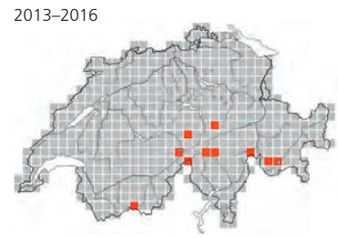
1972–1976



1993–1996



2013–2016



Common Nightingale

Luscinia megarhynchos
Nachtigall
Rossignol philomèle
Usignolo
luschaina

Ruedi Aeschlimann

Red List Near Threatened (NT)
Population 1700–2200 pairs (2013–2016)

Focus pages 314, 357, 362, 448

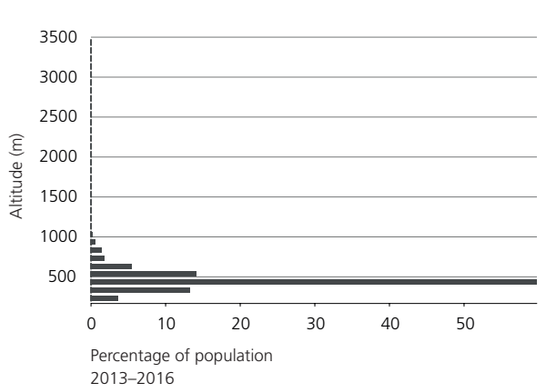
The Common Nightingale occurs in large parts of the country but is concentrated in western Switzerland, Valais and Ticino below 600 m. It inhabits both dry and damp habitats, favouring sites with rich and dense undergrowth where it forages for insects on the bare ground. The Nightingale builds its nest on the ground, often in nettles or beneath bushes at the edge of meadows [14]. High densities are reached in prime habitats; in the Petite Camargue Alsacienne F, for example, 240 territories were found on 18 km² [1]. Singing males recorded above 1000 m, like the ones near Ritzingen VS at 1290 m (2004; A. Gerber) [10] and near Ramosch GR at 1240 m (2000; R. Ayé), are probably mostly late passage migrants. The highest nest in Switzerland so far was found near Arbaz VS at 1100 m [VdS]. Observations in unusual locations may also take place towards the end of the breeding season, when unpaired males leave their territories and may briefly be heard singing at other sites [2].

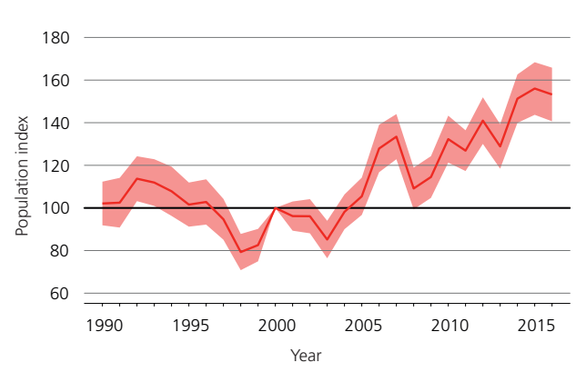
Compared to 1993–1996, the Nightingale has been found in several new atlas squares in central and eastern parts of the Plateau. Most new records relate to single singing males in small wetlands. While widespread losses have occurred in Valais, Ticino and the western Lake Geneva region, the overall Swiss population has increased by about 40 %, mainly thanks to gains between Lausanne VD and Solothurn as well as north of Zurich. Regional surveys confirm the gains in many parts of the Central Plateau but also the losses in Valais [11]. In neighbouring countries and Europe as a whole, numbers have remained stable or increased slightly since the 1990s [AtD, EBCC, 7, 9, 12].

As the Nightingale mainly breeds in warm and dry regions of Switzerland, it stands to benefit from warmer summers [ClimAt, 13]. In addition, rainfall conditions in the species' wintering grounds in the Sahel have recently normalised, which should have a positive impact on its survival [5, 8]. Locally, major forestry interventions in the Nightingale's breeding habitats can have adverse effects [11]. Rows of bushes, open forest edges and riverine woodland should therefore be managed with care, and waysides, especially nettles, should not be cut before late July.

Valentin Amrhein

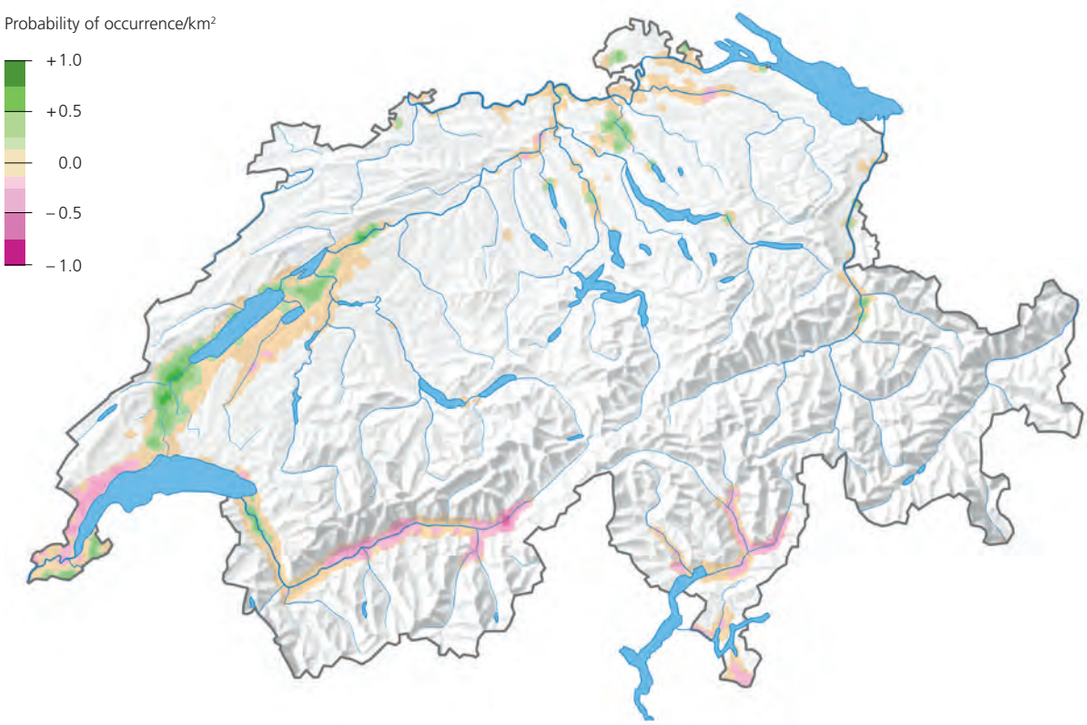
[1] Amrhein & Zwygart (2004); [2] Amrhein et al. (2007); [3] Antoniazza (2018); [4] Birrer et al. (2013b); [5] Boano et al. (2004); [6] Christen (2017a); [7] Jiguet (2017); [8] Mitchell (2017); [9] Nardelli et al. (2015); [10] Posse (2005); [11] Revaz et al. (2016); [12] Teufelbauer & Seaman (2017); [13] Wilson et al. (2002); [14] Wilson et al. (2005)





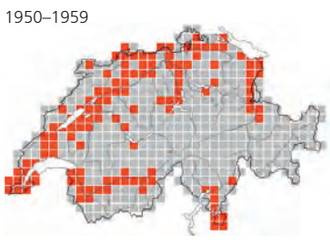
Occurrence 2013–2016

Occurrence change since 1993–1996

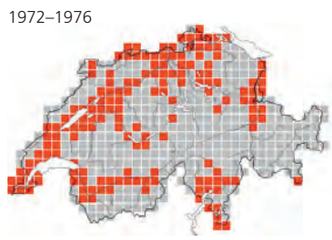


Sponsored by
Dr Hans H. Schicht

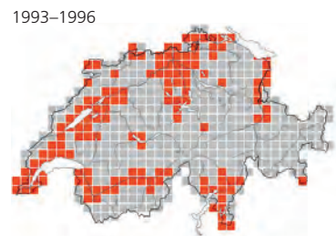
1950–1959



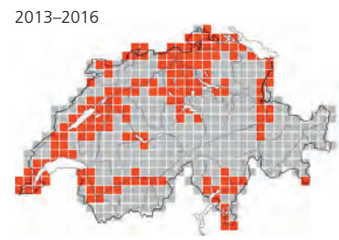
1972–1976



1993–1996



2013–2016



European Pied Flycatcher

Ficedula hypoleuca
Trauerschnäpper
Gobemouche noir
Balia nera
sgnappamustgas nair

Stefan Rieben

Red List Least Concern (LC)
Population 17 000–22 000 pairs (2013–2016)

Focus pages 284, 414, 448

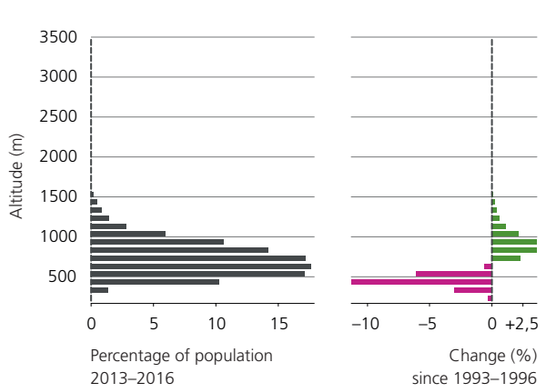
Switzerland lies at the southwestern edge of the European Pied Flycatcher's range. The Swiss population is concentrated in the hill country of Fribourg, Bern and Lucerne, in the central Jura and, to a lesser extent, in eastern Switzerland. Only small populations or isolated singing males are found to the west of Fribourg and in the Alpine valleys. Almost 90 % of the population occurs between 400 and 1000 m. The highest average densities are reached between 600 and 1000 m. The European Pied Flycatcher inhabits open woodland, orchards, parks and gardens with an abundant supply of cavities. In suitable kilometre squares, it is not uncommon to count five territories and more. While breeding has been recorded up to 1780 m in the Upper Engadine GR [AEn], the highest recent records came from 1580 m near Habkern BE (M. Hammel) and 1560 m near Sur GR (M. Schuck, R. Sonder). The highest singing male was recorded near Samedan GR at 2010 m (C. & M. Conzelmann).

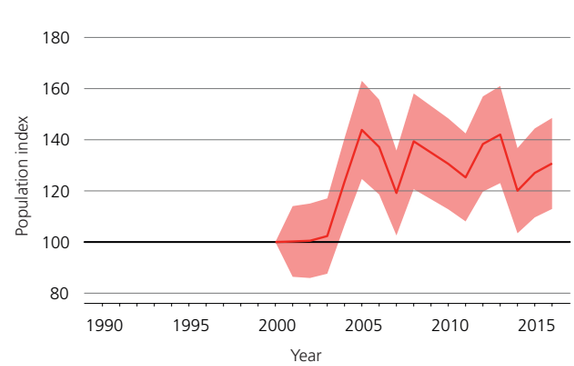
Since 1993–1996, losses have taken place on the Central Plateau and in areas below 700 m. The trend at higher altitudes in the current strongholds is positive, however. The overall Swiss trend has fluctuated widely since 2000. Numbers declined by almost 75 % in the Canton of Zurich between 1988 and 2008 [AtZH] and by 50 % around Lake Constance between 1990 and 2010 [AtBo]. The trend has been stable in France since 2001 [9], likewise in Austria since 2005 [7]. In contrast, the populations in Germany and in Europe as a whole have dropped by about 20 % in the past 20 years [AtD, EBCC].

Due to climate change, the breeding season of this long-distance migrant is no longer optimally aligned with the time of maximum food abundance [5, 6, 8, 10, 11], despite some adjustments (e.g. earlier return and earlier breeding) [3, 4, 11, 12, 13, 14, 15]. In addition, suitable nesting cavities are occupied by tits earlier and earlier in the season [1]. Trends in Europe and at the various altitude levels in Switzerland correspond with predictions based on climate scenarios [ClimAt]. At the same time, the availability of breeding habitats with abundant cavities as well as habitat changes in stopover and wintering sites are also thought to influence population size [2, 15].

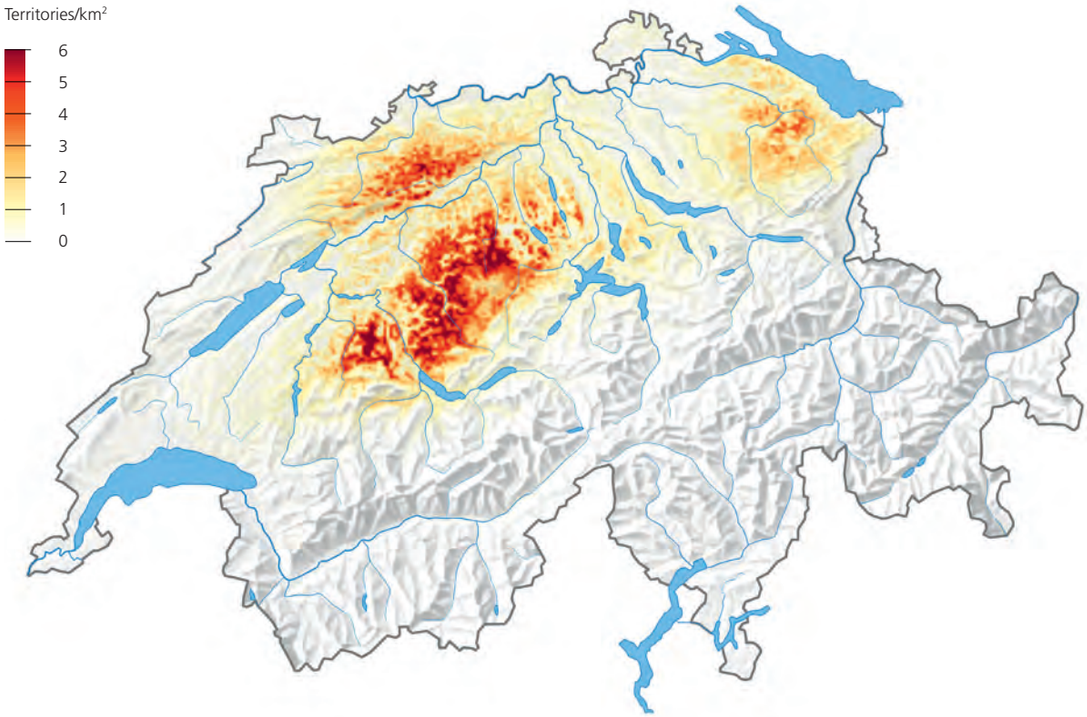
Samuel Wechsler

[1] Ahola et al. (2007); [2] Bauer et al. (2005); [3] Both et al. (2004); [4] Both & Visser (2001); [5] Both et al. (2006); [6] Burger et al. (2012); [7] Dvorak et al. (2017); [8] González-Braojos et al. (2017); [9] Jiguet (2017); [10] Laaksonen et al. (2006); [11] Ravussin & Arrigo (2012); [12] Valtonen et al. (2017); [13] Visser et al. (2015); [14] Winkel & Hudde (1997); [15] Wright et al. (2004)

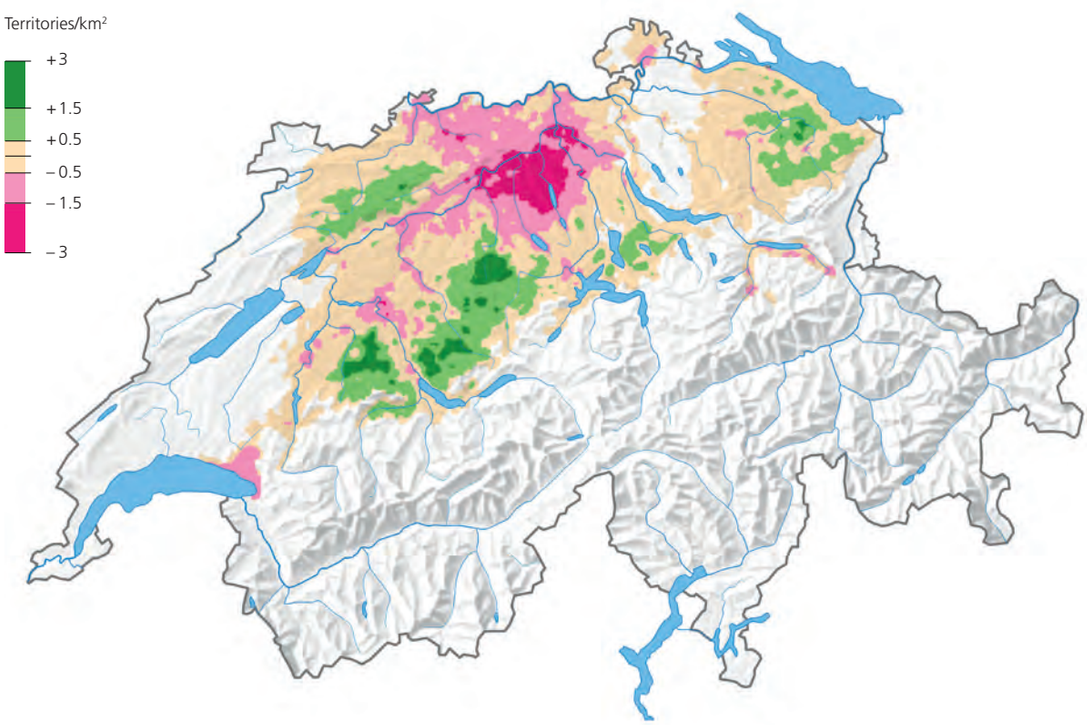




Density 2013–2016

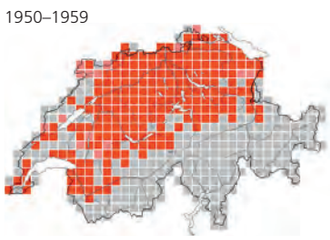


Density change since 1993–1996

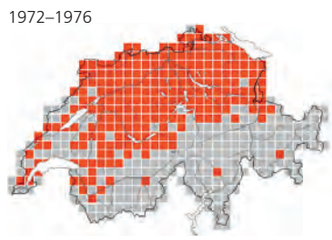


Sponsored by
Natur- und Vogelschutzverein Pratteln

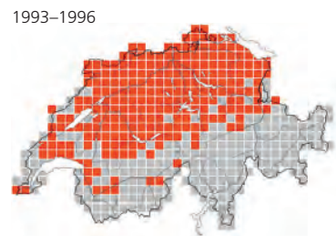
1950–1959



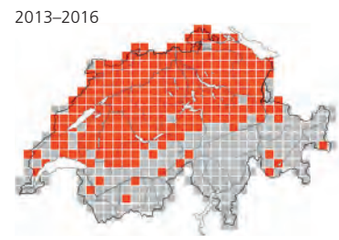
1972–1976



1993–1996



2013–2016



Collared Flycatcher

Ficedula albicollis
Halsbandschnäpper
Gobemouche à collier
Balia dal collare
sgnappamustgas dal cularin

Ruedi Aeschlimann

Red List Endangered (EN)
Population 15–25 pairs (2013–2016)

Focus –

The Collared Flycatcher's breeding range is confined to Europe, extending eastwards from northeastern France and Italy to the Volga River. Switzerland lies at the species' southwestern distribution limit. The two most significant populations (2013–2016) are found in Ticino (7–11 territories, mainly in and around the Maggia Valley), and Val Bregaglia GR (4–7 territories)[5, 6]. Preferred habitats are sunny slopes with open, mature deciduous woods, mostly chestnut or oak. Natural cavities and crevices are important habitat features. Most territories were found between 600 and 1100 m. In Ticino, altitudinal distribution currently extends from 350 m near Biasca (J. Mazenauer) to 1240 m near Cerentino (A. Ackermann), in Val Bregaglia from 770 to 1040 m (R. Roganti, M. & F. Suter).

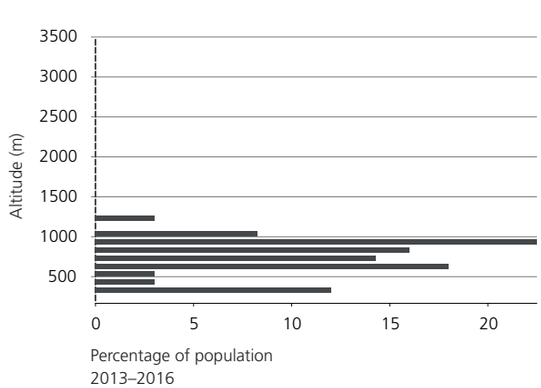
North of the Alps, breeding was confirmed for the first time in 2015 near Oberstammheim ZH; the record probably relates to a hybrid pairing with a female Pied Flycatcher[4]. Also, two singing males were observed in an oak forest near Rheinau ZH and an alluvial forest near Flaach ZH in 2013, one of which was seen repeatedly entering a tree cavity (M. Henking, E. Schatzmann)[10].

Compared to 1993–1996, the disappearance of the Collared Flycatcher from the Sottoceneri TI is particularly noteworthy. It was here that breeding was confirmed for the first time in Ticino in 1949[9]. Similarly, the Val d'Ambra TI, where several territories were found in 1993–1996, has practically been abandoned. The Swiss population was estimated at 50–100 pairs in 1972–1976[AtCH1], but had dropped to 20–25 pairs by 1993–1996[AtCH2]. Moreover, the population exhibits wide fluctuations: no breeding birds were recorded in Ticino at all in 1982–1986, for example[HVM]. The breeding sites in Val Bregaglia also remained unoccupied during 1986–1990 and 1995–2008[AtCH0].

The long-term trend is negative in Italy[2, 7], stable in France and Germany[AtD, AtF] and positive in Austria[8]. The overall European population has increased slightly since 2000[EBCC]. Reasons for the declines are thought to include periods of drought in the Sahel zone, competition and predation at the breeding sites, the abandonment of chestnut stands, and the loss of natural nest cavities due to intensified forest management[AtD, 1, 3, 7].

Chiara Scandolara

[1] Bauer et al. (2016a); [2] Brichetti & Fracasso (2008); [3] Gatter (2007c); [4] Maumary & Mosimann-Kampe (2017)/Maumary (2017); [5] Müller (2015); [6] Müller (2017); [7] Nardelli et al. (2015); [8] Teufelbauer & Seaman (2017); [9] Tinner & Mächler (1951); [10] Vallotton et al. (2014a–b)



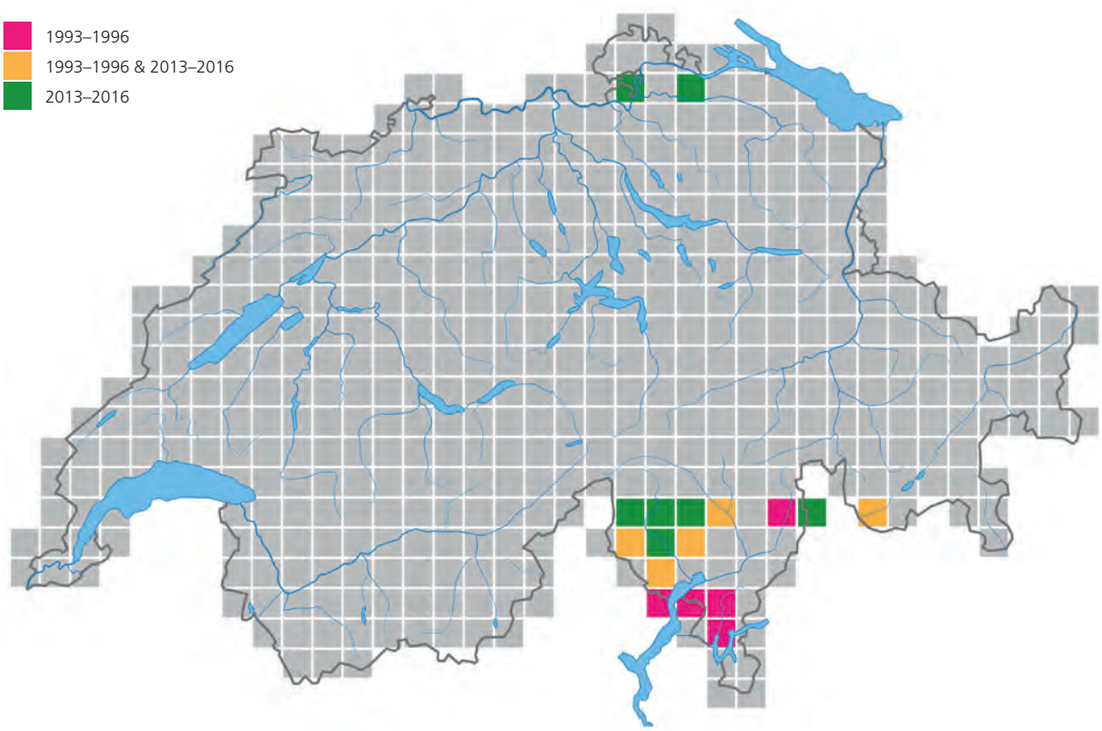
Territories 2013–2016

6–10
2–5
1

Certain dots on the map have been moved to protect this sensitive species

Distribution change since 1993–1996

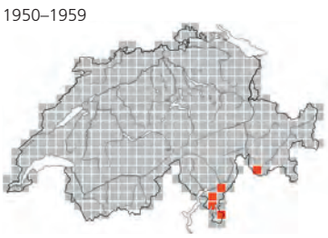
1993–1996
1993–1996 & 2013–2016
2013–2016



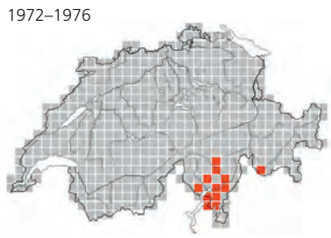
Sponsored by
Veronika Heller, Schaffhausen

FICEDULA

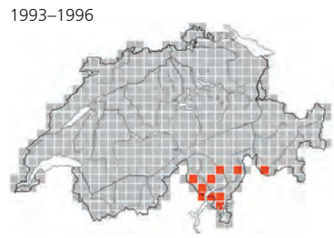
1950–1959



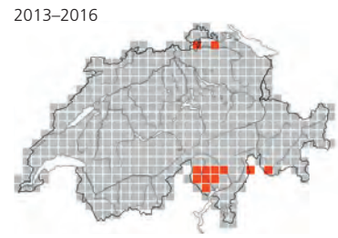
1972–1976



1993–1996



2013–2016



Black Redstart

Phoenicurus ochruros
Hausrotschwanz
Rougequeue noir
Codirosso spazzacamino
cuacotschna da chasa

Adrian Wullschleger

Red List Least Concern (LC)
Population 300 000–400 000 pairs (2013–2016)

Focus pages 156, 170

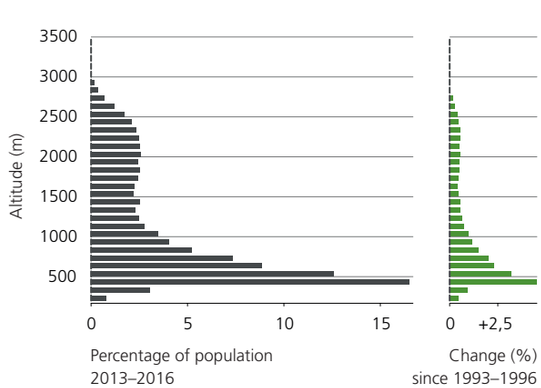
The Black Redstart occurs throughout Switzerland and is the only breeding species that was found in all atlas squares, as was the case in 1993–1996. It therefore also exhibits the widest altitudinal distribution of all species and inhabits a large variety of habitats from the lowlands up to altitudes of 3000 m or above. In suitable kilometre squares, it is not uncommon to count 25 territories and more. Over 60 % of the population occurs below 1000 m, where the Black Redstart reaches the highest densities in settlements. At medium altitude, density is lower, increasing again between 1800 and 2600 m. Breeding has been recorded up to 3200 m [BCH], though more recently, the highest records come from the Valais at 2900–3000 m (B. Gentizon, T. Jäggi, C. Luisier). Singing males were observed up to 3280 m near Zermatt VS (J. Duplain).

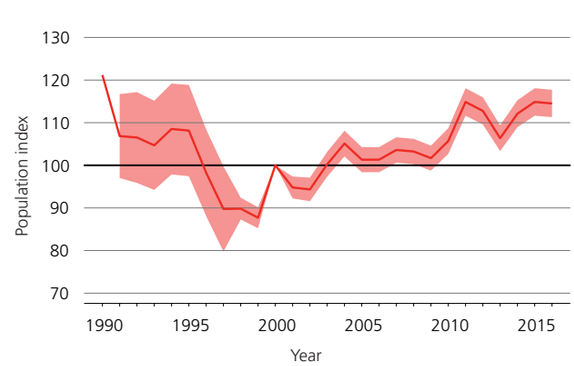
The Black Redstart originally inhabited screes and rocky terrain, but it has adapted to human presence and now occupies settlements of all types [HVM]. Today, the species is found in built-up areas throughout the country, in cities, villages, commercial and industrial zones and in rural areas with buildings. It avoids wetlands, closed forest and intensively cultivated, uniform farmland.

The population trend of the Black Redstart runs parallel to the spread of built-up areas. The largest gains since 1993–1996 occurred in urban centres and the larger cities on the Central Plateau, along the Pre-Alps, in the Rhone Valley VS and in the Sottoceneri TI. Around Lake Constance numbers increased by almost 60 % between 1980 and 2010 (mainly between 1980 and 2000) [AtBo]. In the Canton of Zurich, on the other hand, the population remained stable between 1988 and 2008 [AtZH]. The long-term European trend is slightly positive [EBCC]. Germany and Italy report an increasing trend; the French and Austrian populations are stable [AtD, AtF, 1, 2, 3, 4]. Switzerland supports more than 7 % of the overall European population of the Black Redstart. This common, widespread and undemanding species is expected to continue to benefit from the expansion of urban areas.

Jérémy Savioz

[1] Bani et al. (2014); [2] Campedelli et al. (2012); [3] Jiguet (2017); [4] Teufelbauer & Seaman (2017)



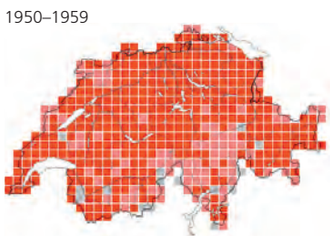


Density 2013–2016

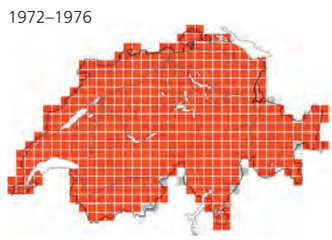
Density change since 1993–1996

Sponsored by
Fred Stähli, Langendorf

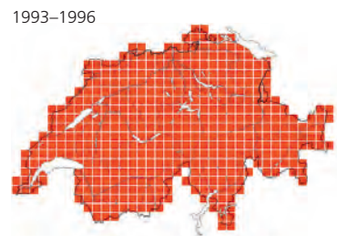
1950–1959



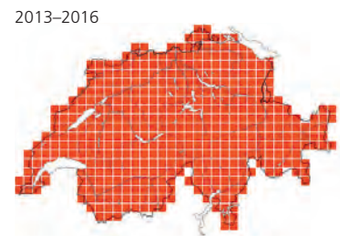
1972–1976



1993–1996



2013–2016



Common Redstart

Phoenicurus phoenicurus
Gartenrotschwanz
Rougequeue à front blanc
Codirosso comune
cuacotschna d'iert

Markus Varesvuo

Red List Near Threatened (NT)
Population 12 000–18 000 pairs (2013–2016)

Focus pages 170, 212, 319, 362, 392, 402, 414, 448, 532, 552, 560

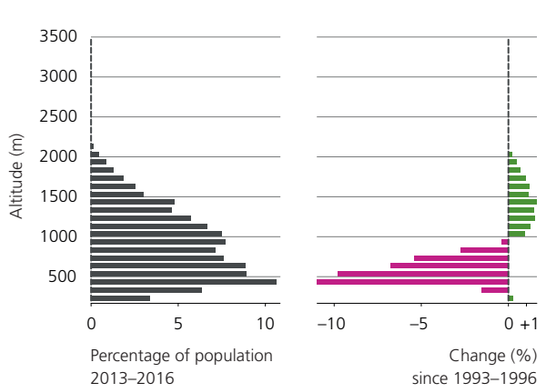
The Common Redstart occurs throughout Switzerland, though densities are often low. It is most common in the south and in the large valleys of Ticino, in Valle Mesolcina GR and Val Bregaglia GR, in central and Upper Valais and around Basel. About 90 % of the population occurs below 1500 m. The Common Redstart breeds in sites with trees, patches of bare ground and cavities, be it in rural residential areas, parks, allotments, vineyards with trees, traditional orchards or open woods. Singing males have been observed up to 2600 m near Täsch VS [VdS] and, in 2013–2016, up to 2250 m near S-chanf GR (M. Ernst). The highest confirmed breeding record came from 2220 m near Zermatt VS [VdS]. In La Chaux-de-Fonds NE, 31 territories were counted on one km² [6]. In Riehen BS, density reached a maximum of 8.1 territories/10 ha [8].

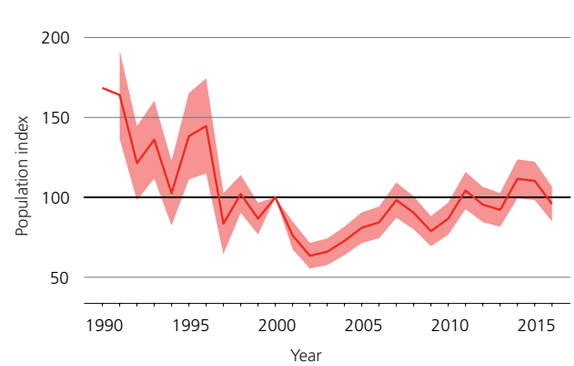
Droughts in the Sahel in the 1960s caused a decline in the Swiss population [2, 14] that lasted well into the 1990s, with the first signs of recovery in 2002. However, regional trends vary widely. In the rural areas north of the Alps, the already sparse populations have thinned out even further: losses amounted to 85 % in the Canton of Zurich between 1988 and 2008 [AtZH], about 90 % around Lake Constance between 1980 and 2010 [AtBo], and 42 % in the Canton of Basel-Landschaft between 1993 and 2013 [7]. The steep declines between 300 and 900 m, caused by the disappearance of traditional orchards, intensified grassland management and a lack of bare ground for hunting [8, 9], are only partly offset by small gains above 1000 m. For populations in settlements with lots of green spaces, less affected by declines so far, the increase in building density poses an additional threat [3]. In Valais and Ticino, populations are increasing even in low-lying areas [11] and are largely responsible for the current positive Swiss trend. A maximum of 97 territories were counted on 3.1 km² of forest destroyed by fire near Leuk VS [12], illustrating the species' huge capacity for colonisation.

In Italy and France, trends are strongly positive [AtF, 5, 10]. Despite regional losses [1, 4], Germany and Austria show largely stable trends [AtD, 13]. The European trend from 1980 to 2014 is slightly positive [EBCC].

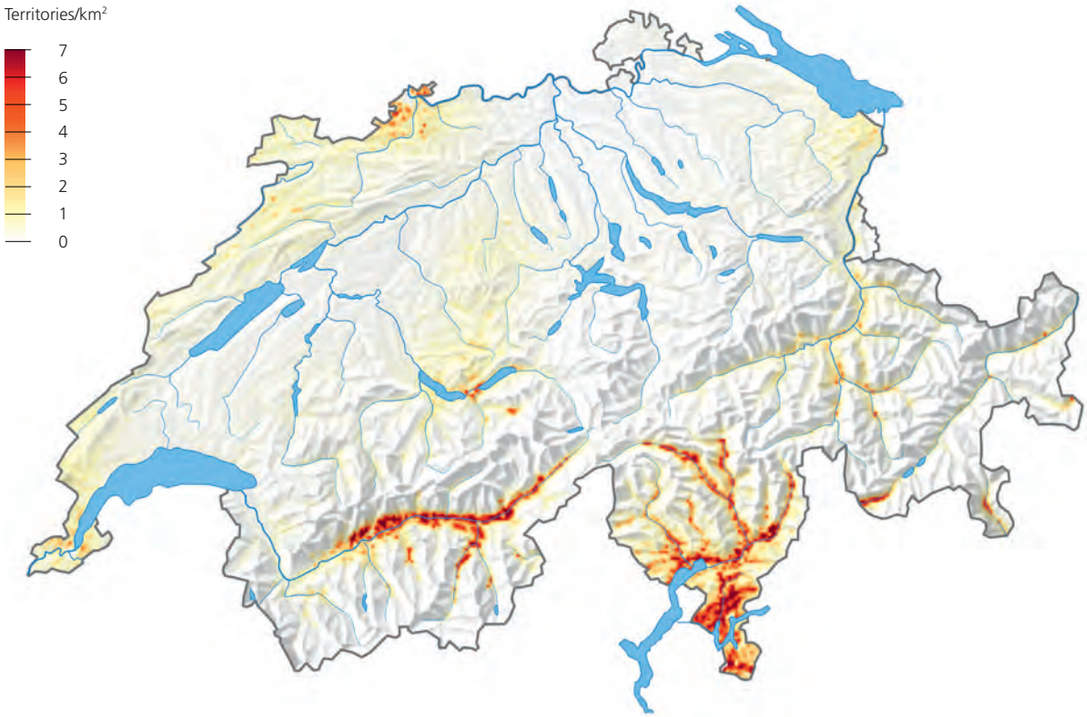
Jacques Laesser, Nicolas Martinez & Boris Droz

[1] Bauer et al. (2016a); [2] Bruderer & Hirschi (1984); [3] Droz et al. (2015); [4] Gatter (2007a); [5] Jiguet (2017); [6] Laesser et al. (2016); [7] Martinez & Birrer (2017); [8] Martinez & Roth (2017); [9] Martinez et al. (2010); [10] Rete Rurale Nazionale & Lipu (2015); [11] Scandolara & Lardelli (2017); [12] Sierro & Posse (2011); [13] Teufelbauer & Seaman (2017); [14] Zwarts et al. (2009)

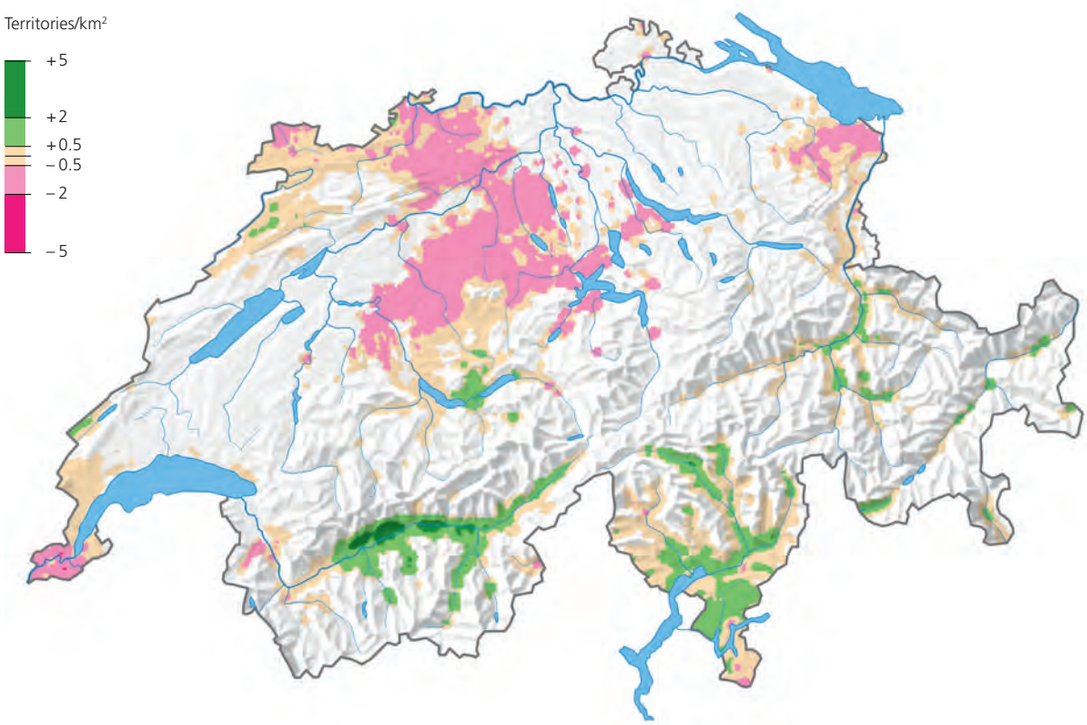




Density 2013–2016



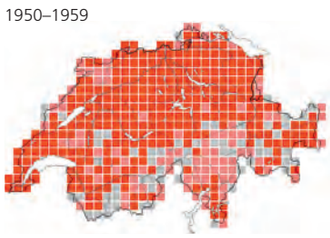
Density change since 1993–1996



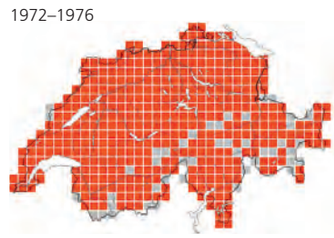
Sponsored by
Adrian Borgula, Lucerne
Geneviève Loup
Simon Zingg, Steffisburg

Natur- und Vogelschutzverein Gartenrötel Uitikon

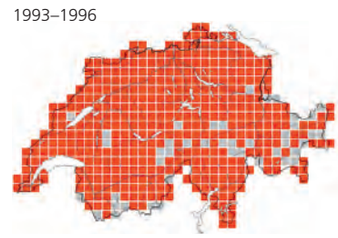
1950–1959



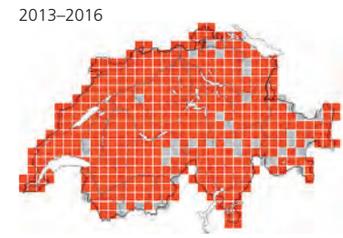
1972–1976



1993–1996



2013–2016



Rufous-tailed Rock-thrush

Monticola saxatilis
Steinrötel
Monticole de roche
Codirossone
merl da gonda

Daniele Occhiato

Red List Least Concern (LC)
Population 2000–3000 pairs (2013–2016)

Focus page 552

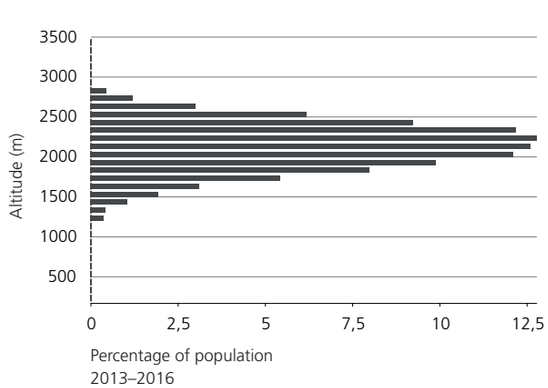
The Rufous-tailed Rock-thrush reaches its northern range limit in the Alps. It inhabits slopes with a southern or eastern exposure, where it finds rocky terrain, bare ground and nutrient-poor grassland with song posts. Distribution in Switzerland is concentrated between 1700 and 2600 m, where suitable conditions are found in the transition zone between open woodland and Alpine grassland. High densities only occur locally. For example, 9–12 territories were counted on a 4-km-long transect near Fully VS at 1950–2330 m in 2000–2009[8, 9]. The highest confirmed breeding record came from Parpan GR at 2760 m (G. Marcolli). Observations during the breeding season were recorded up to 3020 m near Zermatt VS (C. Huwiler) and Blatten VS (T. Tschopp). Outside of the Alps, only two atlas squares in the Jura were occupied, Crêt de la Neige F regularly, the Chasseral BE only sporadically.

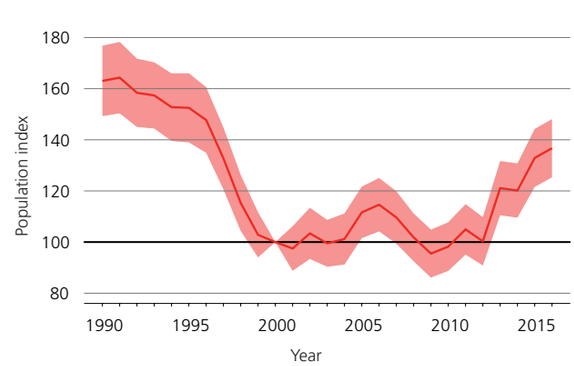
In the Alps, the number of occupied atlas squares has increased since 1993–1996. Given the species' secretive behaviour during the breeding period, the increase is probably at least partly related to greater observer effort. But increases were recorded in regional surveys as well[1]. At the lower distribution limit, 300 ha of burnt forest near Leuk VS at 800–2100 m were rapidly colonised after the 2003 fire (13 territories in 2006)[7]. The example illustrates the species' capacity for colonisation and highlights the fact that much potential habitat has been lost as forests have grown denser in recent decades.

Following declines at low and medium altitudes, also observed in Auvergne[4] and the Apennines[3], the Swiss population has been largely stable since the turn of the century. An increase has been recorded since the beginning of the 2013–2016 field surveys. The wide fluctuations related to climatic conditions in spring[5] complicate the interpretation of population changes, especially because no long-term monitoring is in place for this species. Nevertheless, the Swiss breeding population appears to have been largely stable since 2000, in line with the French trend[AtF] and in contrast to declining trends in Italy[6], Vorarlberg[AtV] and Europe[2].

Bertrand Posse

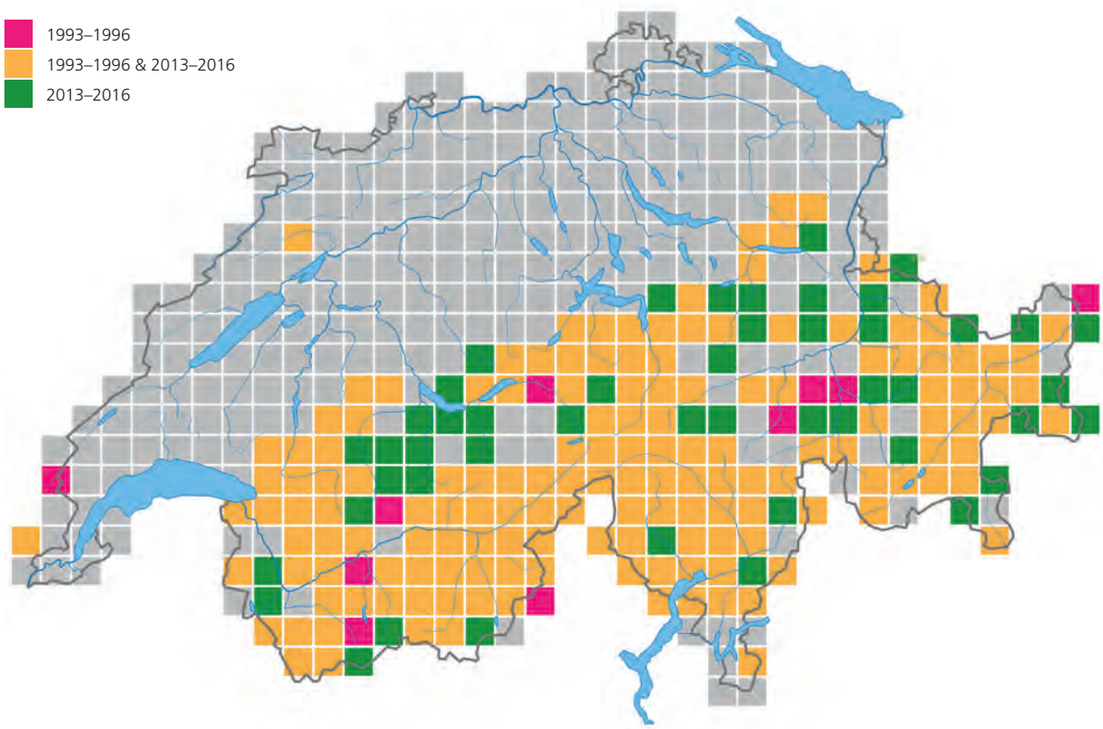
[1] Beaud & Beaud (2018); [2] BirdLife International (2017a); [3] Cagnucci (1998); [4] Clamens & Guélin (2011); [5] D'Amico (2011); [6] Nardelli et al. (2015); [7] Posse & Sierro (2007); [8] Revaz & Posse (2007); [9] E. Revaz & B. Posse, unpubl.





Occurrence 2013–2016

Distribution change since 1993–1996



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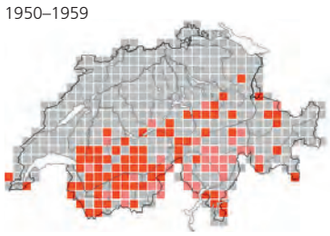
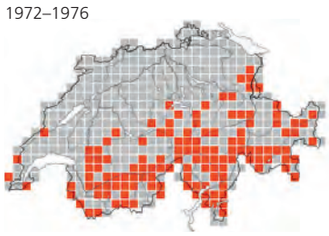
Moritz Eggenschwiler, Münster
Andreas Schoellhorn

Monticola – Internationale Arbeitsgemeinschaft für Alpenornithologie e. V.

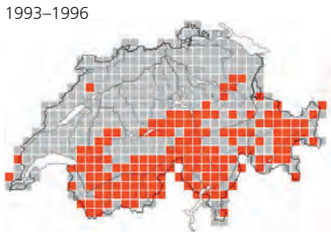
1950–1959



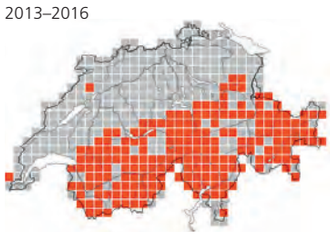
1972–1976



1993–1996



2013–2016



Blue Rock-thrush

Monticola solitarius
Blaumerle
Monticole bleu
Passero solitario
merl blau

Beat Rüegger

Red List Endangered (EN)
Population 15–25 pairs (2013–2016)

Focus pages 284, 308, 425

In Switzerland, the Blue Rock-thrush reaches the northern limit of its breeding range. Most breeding sites are in Ticino on low, sunny slopes in wide valleys (Riviera and Maggia Valley), some on the southern flank of the Valais. Altitudinal distribution extends from 280 m near Castione TI to 750 m near Chamoson VS and Faido TI, and even to 1020 m across the border in Italy near San Giacomo Filippo I (M. Belardi).

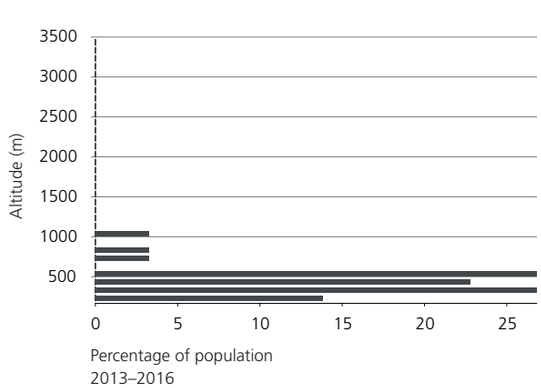
This warmth-loving species likes to breed in coastal cliffs or, inland, in towers, castles and dilapidated buildings. In Ticino, Valais and neighbouring Italy, however, it occurs almost exclusively in sunny quarries with a dry micro-climate and large areas of bare ground, where only few shrubs grow in the rock faces. Active quarries with their highly fractured walls are also occupied, especially if there are rock piles and shrubs that encourage the presence of invertebrates and small vertebrates. Other man-made structures are rarely colonised in Switzerland [1, 4]; currently, the only known case is the Verzasca dam TI. The dispersal and small size of suitable habitats limits population density. Chamoson was the only site where up to four singing males were found on 30 ha in one day (R. Arlettaz).

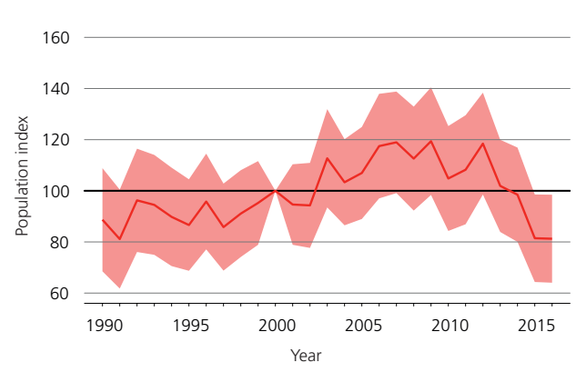
In 2013–2016, the Blue Rock-thrush was recorded in 25 different locations (21 in Switzerland and four in areas across the border) in 16 different atlas squares. The Swiss population is concentrated in Ticino, where there are 17 breeding sites and at least 10–16 territories annually; however, there have been signs of decline since 1993–1996. In Valais, breeding was first confirmed in 2001 [VdS], and the population has since fluctuated between two and six territories. As a result, the overall Swiss population has remained largely unchanged since 1993–1996.

Numbers are stable or increasing slightly in France [AtF, 3] and declining in Italy [2]. The Blue Rock-thrush stands to benefit from climate change [ClimAt], but its population is limited by the restoration of disused quarries or vegetation growth in rock faces. Leisure activities like rock climbing may also hamper the species' expansion [VdS].

Roberto Lardelli

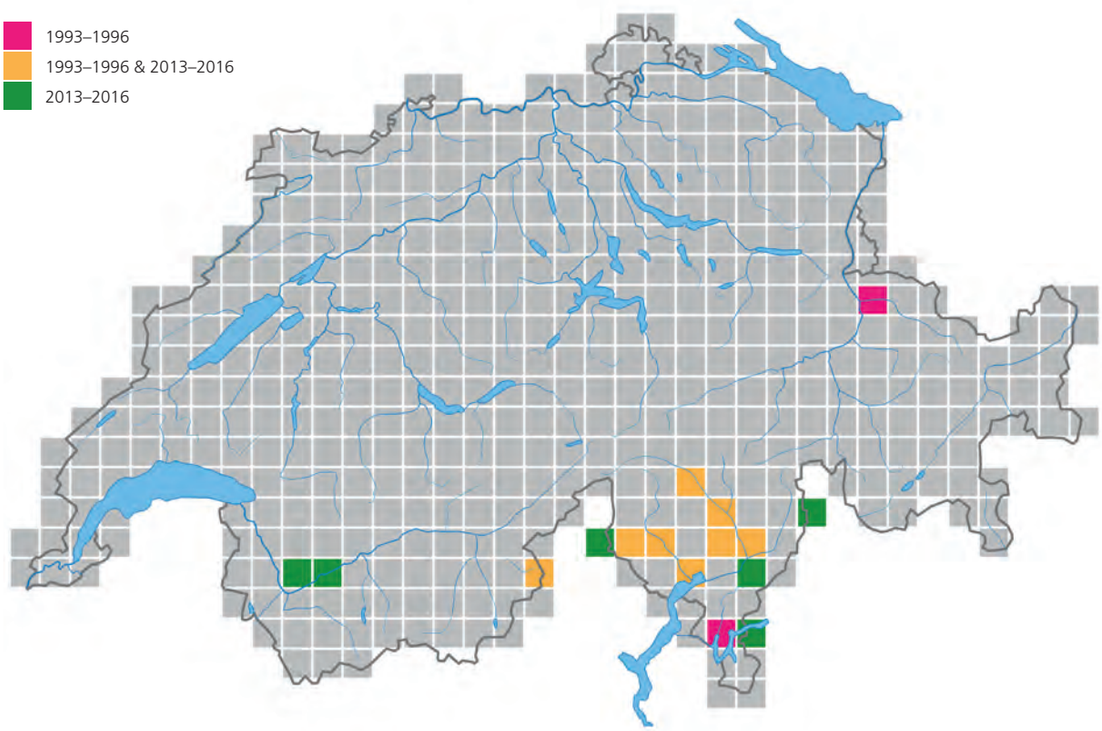
[1] Aletti & Carabella (2015); [2] Brichetti & Fracasso (2008); [3] Jiguet (2017); [4] Lardelli (2007)





Territories 2013–2016

Distribution change since 1993–1996



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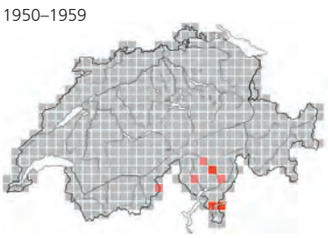
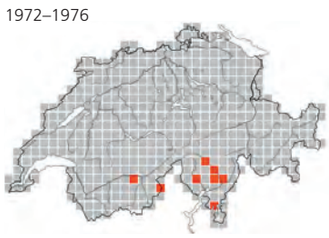
Anonymous donor

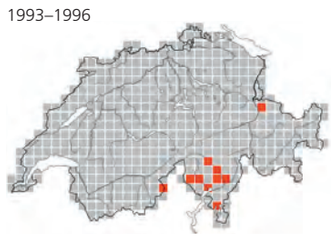
1950–1959



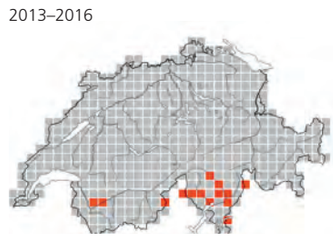
1972–1976



1993–1996



2013–2016



Whinchat

Saxicola rubetra
Braunkehlchen
Tarier des prés
Stiaccino
puppenbrin

Mathias Schäf

Red List Vulnerable (VU)
Population 7000–9000 pairs (2013–2016)

Focus pages 212, 240, 362, 392, 478, 506

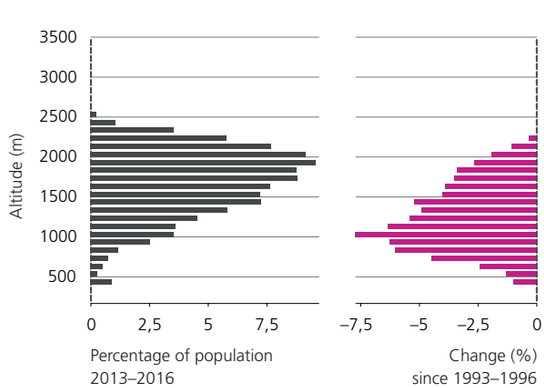
Today, the only remaining areas with substantial Whinchat populations are between 1600 und 2100 m, mainly in the southern valleys of the Valais, the Goms region VS, Urseren Valley UR, Surselva GR and Lower Engadine GR. On the Central Plateau, the species is only found occasionally. The lowest breeding sites that are still regularly occupied are located at 410 m in the Kaltbrunner Riet SG (K. Robin) and at 720 m near Grandvillars FR (J. Gremaud, G. Schaub)[1, 20]. The highest confirmed broods were recorded at 2510 m near Grimentz VS (M.-H. Biollay) and at 2470 m near Arolla VS (T. Tschopp).

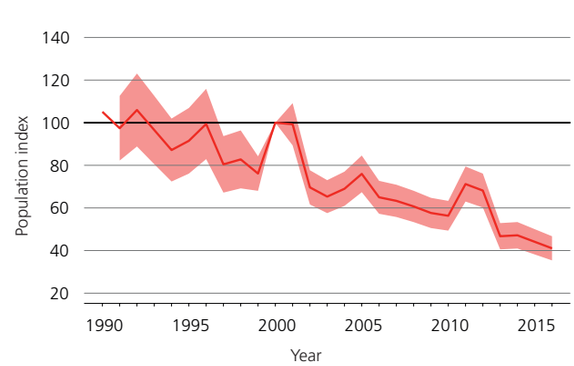
The Whinchat breeds in vast, highly structured and lightly fertilised meadow landscapes. Somewhat smaller populations are found in low-intensity pastures, raised bogs and Alpine dwarf-shrub communities. An important feature of suitable habitat are song posts and perches that rise above the surrounding vegetation[16]. The Whinchat already abandoned large parts of the Central Plateau between 1972–1976 and 1993–1996, and the range contraction has continued unabated. Distribution gaps have appeared in the northern Jura from the Randen SH to the Chasseral BE[2] and in Val de Ruz NE[AtNE] as well as in the Pre-Alps[3, 22], including the Napf region, Alpstein and Sopraceneri TI. Further losses were recorded in inner-Alpine areas[12, 15, 17]. The overall Swiss population has declined by more than half since 2000. Similarly dramatic losses have occurred in all neighbouring countries[AtD, AtF, AtV, 19, 21, 24] and to a lesser extent in Europe as a whole[EBCC].

The Whinchat is affected by the increasing intensification of grassland management, which is steadily reaching higher altitudes: today, many meadows are fertilised and irrigated, and cutting takes place earlier in the year and over larger areas, reducing the supply of insects[5, 9, 13, 18, 23]. Earlier cutting causes broods to be destroyed and may even kill breeding adults[8] or fledglings[25]. Losses in the species' African wintering grounds, on the other hand, have little impact on the population trend[4]. In Switzerland, the Whinchat only has a future in meadows where mowing is delayed until after the breeding season (early to late July, depending on the altitude)[6, 10, 12, 13, 15]. Various efforts are underway to preserve this type of habitat for meadow birds, mainly in the sub-Alpine zone, by ensuring appropriate management practices[7, 11, 12, 14].

Petra Horch

[1] Antoniazza (2016b); [2] Berger-Flückiger et al. (2008a); [3] Berger-Flückiger et al. (2010); [4] Blackburn & Cresswell (2016); [5] Britschgi et al. (2006); [6] Brunner et al. (2015); [7] Graf et al. (2014d); [8] Grüebler et al. (2008b); [9] Grüebler et al. (2015); [10] Horch (2014); [11] Horch & Spaar (2010); [12] Horch & Spaar (2015); [13] Horch et al. (2008); [14] Horch et al. (2015); [15] Korner et al. (2017); [16] Labhardt (1988); [17] Morard (2014); [18] Müller et al. (2005); [19] Pfeffer & Schmitt (2007); [20] Posse (2014); [21] Rete Rurale Nazionale & Lipu (2015); [22] Schaub et al. (2013a); [23] Strebel et al. (2015); [24] Teufelbauer & Seaman (2017); [25] Tome & Denac (2012)





Occurrence 2013–2016

Occurrence change since 1993–1996

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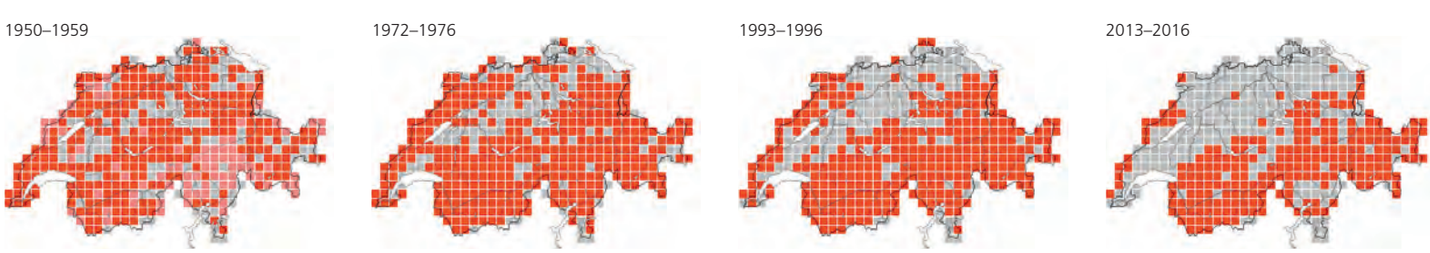
Anne Berger
Anonymous donor



Meadow birds – can they be saved?

Where flowery meadows and species-rich pastures disappear, meadow birds go with them. Early mowing destroys broods, leading to steep population declines. Intensified use has made grassland unsuitable for breeding birds even at higher altitudes. Switzerland is thus at risk of losing the entire group of meadow birds.

Meadow breeders are a group of birds specially adapted to life in grassland (meadows and pastures). They nest on the ground, well protected by their camouflaged plumage. Common Quail, Corncrake, Eurasian Skylark, Tree Pipit, Meadow Pipit and Whinchat are – or used to be – typical meadow birds in Switzerland.

Ongoing habitat loss

Grassland landscapes have undergone radical change within a relatively short time. From the 1970s to the 1990s, large expanses of species-rich grassland on the Central Plateau were converted into artificial grassland with low plant diversity. This development has now spread to the mountain areas as well[8]. In 1950, 95 % of mountain meadows were species-rich Alpine wildflower meadows; today, that figure is down to 2 %[3].

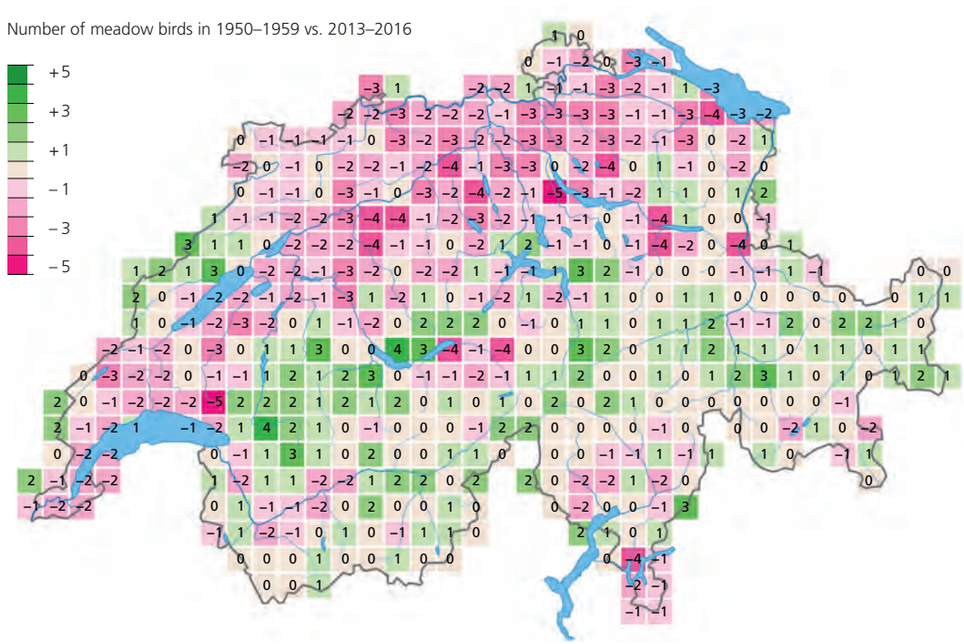
This change is driven by intensive farming practices. Faster, more powerful machinery, more farmyard manure (due to higher livestock density, made possible only by the import of feed concentrates), a rise in atmospheric nitrogen deposition[3, 26] and new harvesting methods (mower-conditioner and silage) lead to earlier and more frequent mowing, both in the valleys, where four to six cuts per year are standard, and increasingly in mountain areas. New, more efficient irrigation systems are employed in dry areas[7], and even at higher altitudes, machines level the terrain to facilitate the harvest of meadows.

Dramatic consequences for meadow birds

On the one hand, agricultural intensification means a reduced food supply for birds[4]. When a meadow is mowed, up to 50 % of insects and spiders are killed – and this happens with every cut[15]. On the other hand, habitat is lost: meadows are mowed earlier in the season. Even in mountain regions, the first cut now takes place in the middle of the birds' breeding season. Innumerable broods are lost and even incubating adults are killed by mowing machinery[10].

The example of the Whinchat in the Engadine GR is well documented. Large numbers of Whinchats used to breed successfully in low-intensity meadows located at some distance from the villages. As farms moved out of the village, livestock increased and new roads were built, the management of these remote meadows was intensified and the Whinchat population collapsed[11, 12, 17].

The intensification does not impact all meadow birds equally. The Corncrake is the most sensitive species. The population on the Central Plateau already underwent a steep decline in the 1930s[24]. To breed successfully, the Corncrake requires meadows that are not harvested before early or even mid-August[16]. The Whinchat disappeared from the Central Plateau almost completely between 1970 and 1990. At the same time, the populations in the Pre-Alps and the Jura began to dwindle[13, 25]; the decline in these areas continues unabated[14, 23]. The Skylark breeds in arable fields as well as grassland. A substantial range contraction became evident



Changes in the occurrence of the six meadow-breeding birds (Common Quail, Corncrake, Eurasian Skylark, Tree Pipit, Meadow Pipit and Whinchat) per atlas square between 1950–1959 and 2013–2016. Note, however, that there were substantial monitoring gaps in certain parts of the Jura and especially the Alps in the period 1950–1959.

Markus Jenny

Even at higher altitudes – the image shows Schamserberg GR at 2200 m – valuable vegetation cover is destroyed and the land replanted to improve forage production.

from 1990, and today, the lowland grasslands are all but abandoned[21, 22]. Common Quail populations below 800 m have also shown signs of decline since 1993–1996. The massive decline of the Tree Pipit on the Central Plateau started around 1980[20]. Further substantial losses have occurred below 1000 m since 1993–1996; above that altitude, numbers are largely stable for the time being[2, 18, 19]. Similarly, the Meadow Pipit has undergone a marked decline below 1200 m.

Solutions exist, but implementation is inadequate

To save meadow birds in Switzerland, there is an urgent need for a change in grassland management practices. Farmers whose meadows and pastures are managed at low intensity receive compensation under a system of ecological direct payments. Habitat connectivity projects have been introduced to preserve target and characteristic species according to the «Environmental Objectives in Agriculture» (EOA). If target species occur within the perimeter of a habitat connectivity project, the measures have to be geared towards the needs of these species. Corncrake, Skylark and Whinchat are target species, the other meadow birds are classified as characteristic species[1]. This means that efforts must concentrate on promoting low-intensity meadows and pastures. But scale is crucial: studies show that mowing would have to be delayed in more than 60 % of the meadows that are considered suitable habitat in order to preserve a self-sustaining Whinchat population. Meadows used at low intensity can be concentrated in regional core areas[9] so as to achieve the required 60 % of late-cut meadows. Farms can produce enough feed when 20–40 % of their meadows (more than 50 % at higher altitudes) are managed at low intensity[3]. However, only few habitat connectivity projects have been able to make full use of this potential. A consistent effort to promote meadow birds could not only save these six bird species, but also numerous insects[5, 6], hares[27], fawns and Alpine wildflower meadows.

Petra Horch

[1] BAFU & BLW (2008)/OFEV & OFAG (2008); [2] Berger-Flückiger et al. (2008b); [3] Bosshard (2016a); [4] Britschgi et al. (2006); [5] Bruppacher et al. (2016); [6] Buri et al. (2016); [7] Graf et al. (2014a–b); [8] Graf et al. (2014c); [9] Graf et al. (2014d); [10] Grüebler et al. (2008b); [11] Grüebler et al. (2012); [12] Grüebler et al. (2015); [13] Horch et al. (2008); [14] Horch & Spaar (2015); [15] Humbert et al. (2009); [16] Inderwildi et al. (2017a–b); [17] Korner et al. (2017); [18] Marti (2014); [19] Martinez & Birrer (2017); [20] Meury (1989); [21] Müller & Ernst (2014); [22] Müller & Weggler (2018); [23] Müller et al. (2005); [24] Schmid & Maumary (1996); [25] Schmid et al. (1994); [26] Schmid et al. (2007); [27] Weber (2017)

Species pages 94, 178, 360, 476, 504, 508

Distribution in 2013–2016 of the six meadow breeders Common Quail, Corncrake, Eurasian Skylark, Tree Pipit, Meadow Pipit and Whinchat. The map combines all species maps. For areas with more than two species, conservation projects should be developed and implemented.

Common Stonechat

Saxicola torquatus
Schwarzkehlchen
Tarier pâtre
Saltimpalo
puppennair

Mathias Schäf

Red List Near Threatened (NT)
Population 1500–2000 pairs (2013–2016)

Focus pages 234, 276, 428

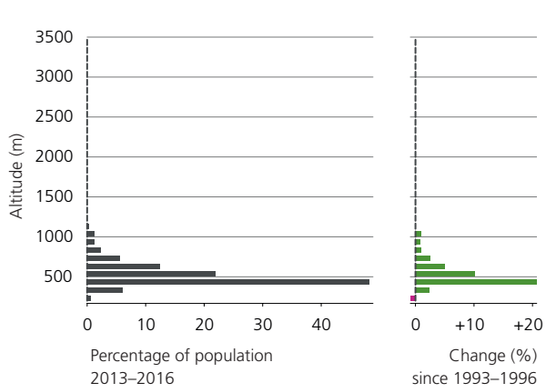
In Switzerland, the Common Stonechat occurs on plains and lower valley slopes, where it finds irregularly maintained embankments, pioneer habitats and wildflower strips that offer song posts and perches for hunting. The highest densities are reached in western Switzerland between Geneva and Lake Neuchâtel as well as in the Rhine Valley. The largest populations are still found in the Champagne genevoise[AtGE], where 70 territories were recorded on 6.13 km² in 2014, thanks to a network of wildflower strips that are 5–10 years old (B. Lugrin)[1]. The Common Stonechat rarely occurs above 800 m. Still, breeding was confirmed near Erschmatt VS at 1540 m (1998; J. Rey)[10], on Monte Generoso TI at 1480 m (2004; E. Bernardi) and near Bois d'Amont F at 1060 m (2014, M. Dvorak). Singing males were occasionally recorded in the Alpine zone, for example near Tortin/Nendaz VS at 2040 m (2012; R. Rauber) and near Guarda GR at 1990 m (2007; H. Schuler).

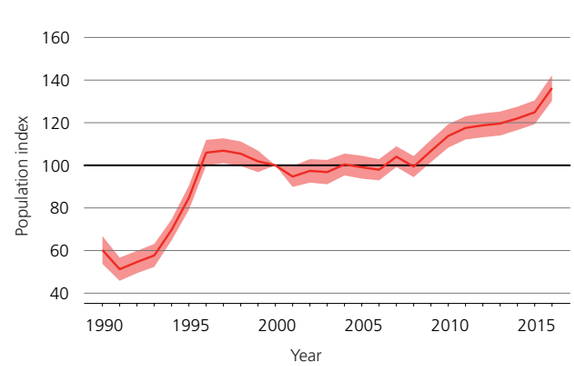
The Common Stonechat has expanded its range since 1993–1996. While populations in Valais and Ticino have declined, the overall Swiss trend is positive thanks to considerable gains on the Central Plateau and in the Rhine Valley. Regional surveys also report positive trends, e.g. in the Grande Cariçaie[2], the Aare Valley BE/SO[6], the cantons of Basel-Landschaft[9] and Zurich[AtZH], the Lake Constance area[AtBo], the Rhine Valley in St. Gallen[13] and Liechtenstein[AtFL].

The promotion of wildflower strips in farmland in Switzerland since 1993 may have contributed to this positive development[4, 5, 9, 12, 17], likewise the mild winters in the Stonechat's wintering grounds in the western Mediterranean[15]. The declines in Ticino[14] and Valais are driven by the loss of suitable habitat. As a pioneer species, the presence of the Common Stonechat depends on whether its required habitat elements are promoted by agricultural policy decisions. The overall European population is stable[EBCC], with numbers decreasing in France, Italy and Austria[AtF, 3, 11, 16] and increasing in Germany[AtD]. These trends reflect large fluctuations depending on local habitat conditions as well as gains at medium altitudes[7, 8].

Bertrand Posse

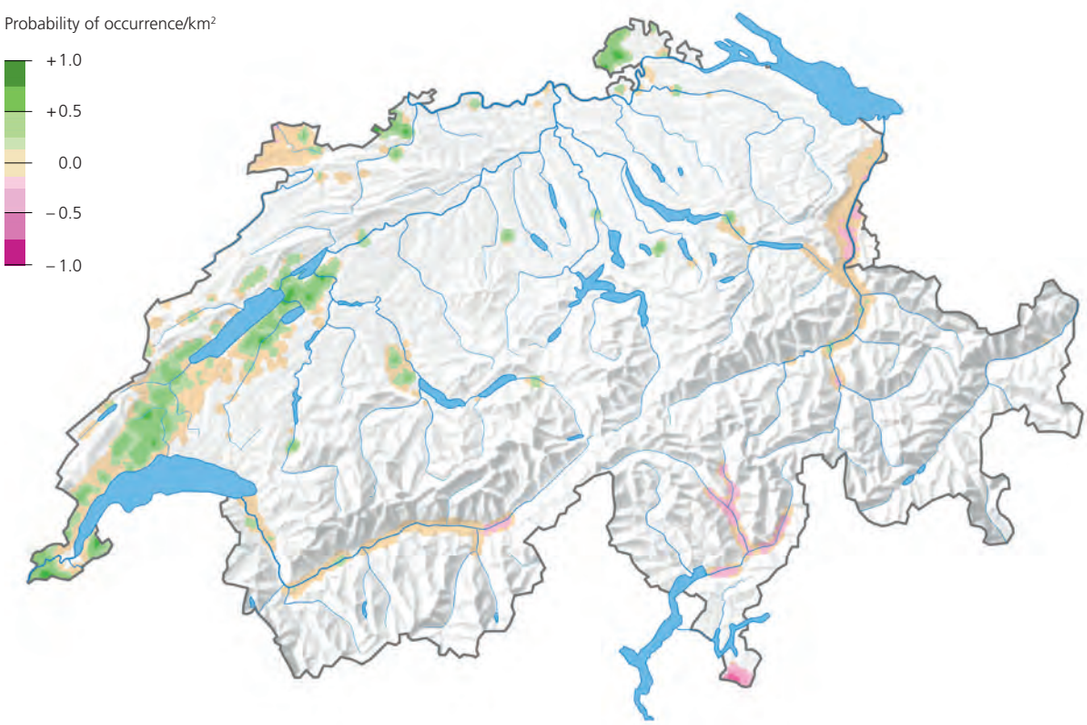
[1] Antoniazza (2015); [2] Antoniazza (2018); [3] Bani et al. (2014); [4] Birrer et al. (2007b); [5] Birrer et al. (2013b); [6] Christen (2017a); [7] Dubois et al. (2012); [8] Förschler & Kläger (2010); [9] Martinez & Birrer (2017); [10] Posse (2000); [11] Rete Rurale Nazionale & Lipu (2015); [12] Revaz et al. (2008); [13] Rudin et al. (2010); [14] Scandolara & Lardelli (2017); [15] Tassin (2012); [16] Teufelbauer & Seaman (2017); [17] Zollinger (2012)





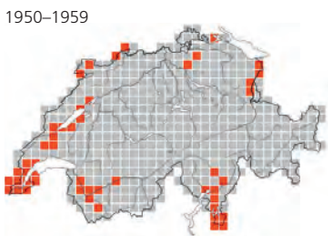
Occurrence 2013–2016

Occurrence change since 1993–1996

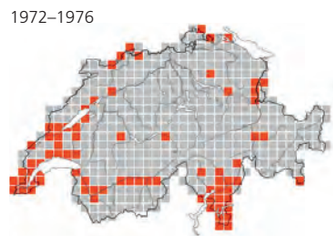


Sponsored by
Vreni Bärtsch-Frick, St. Gallen
Nathalie Cesarini

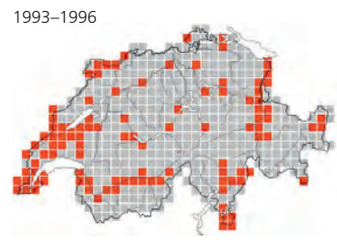
1950–1959



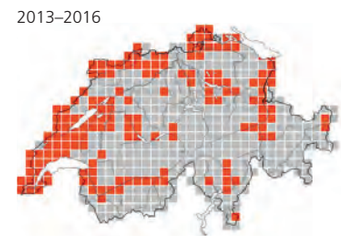
1972–1976



1993–1996



2013–2016



Northern Wheatear

Oenanthe oenanthe
Steinschmätzer
Traquet motteux
Culbianco
pitgacrap grisch

Ruedi Aeschlimann

Red List Least Concern (LC)
Population 40 000–60 000 pairs (2013–2016)

Focus pages 484, 506

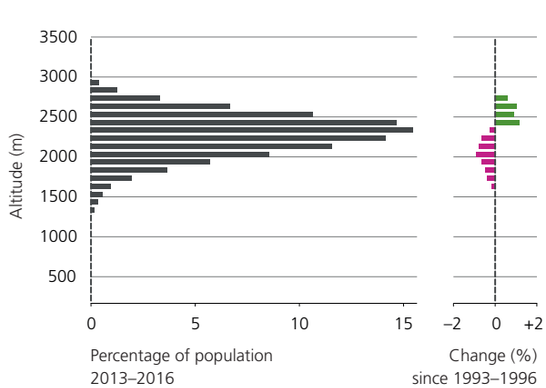
The Northern Wheatear is a typical mountain bird in Switzerland, where it is found in the Alps and locally in the western Jura. It favours open, short-grass pastures scattered with rocks and boulders. Almost 90 % of the population occurs between 1900 and 2700 m, with the highest densities at 2200 to 2500 m. The Northern Wheatear is found in high densities in the central Alps of Valais, Uri and Grisons. The populations in the Jura are small and isolated. While nests have been found up to 2880 m in the past [HVM], the highest recent breeding record comes from 2870 m near Pontresina GR (C. Müller). Singing males are occasionally observed at over 3000 m. In the past, breeding has sporadically been recorded in lowland areas [VdS]; in 2013–2016, the lowest confirmed brood was recorded at 1100 m near Herbetswil SO (R. Bee).

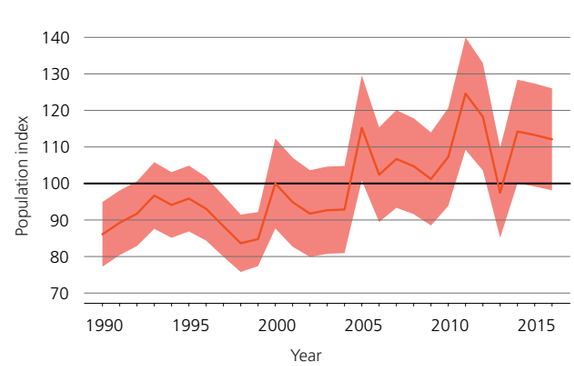
Population size of the Northern Wheatear fluctuates widely and appears to be increasing. Distribution has remained largely unchanged since 1993–1996. Regional trends are mixed, however: while numbers have mostly increased in the western Alps, they have dropped in most parts of the central and eastern Alps. Losses below 2300 m are offset by gains at higher altitudes. In the Upper Engadine GR, breeding in the valley bottom has drastically declined since 1980 [AEn]. In the Canton of Neuchâtel, the species' range is shrinking [AtNE]. In Germany and France, populations are declining [AtD, AtF], while Italy and Austria report a positive trend [2, 7, 10]. In Europe as a whole, numbers have dropped by about 30 % since 1993–1996, mainly due to declines in western Europe, though not in eastern Europe [EBCC, RLEU].

The declines are linked primarily to changes in agricultural practices, such as the abandonment of low-intensity pastures, shrub encroachment, and the removal of small habitat structures [AtD, HBW, 4, 11]. In addition, nutrient input from the air and from agriculture stimulates plant growth, making food less accessible and increasing the risk of predation [AtD, 3, 5, 12]. The same reasons may apply to the declines in lowland regions of Switzerland [AEn, AtNE, 1]. As wet and cold weather has a negative effect on reproduction [8, 9], the positive trend at higher altitudes could be related to the general rise in temperatures during the breeding season [6].

Christoph Meier

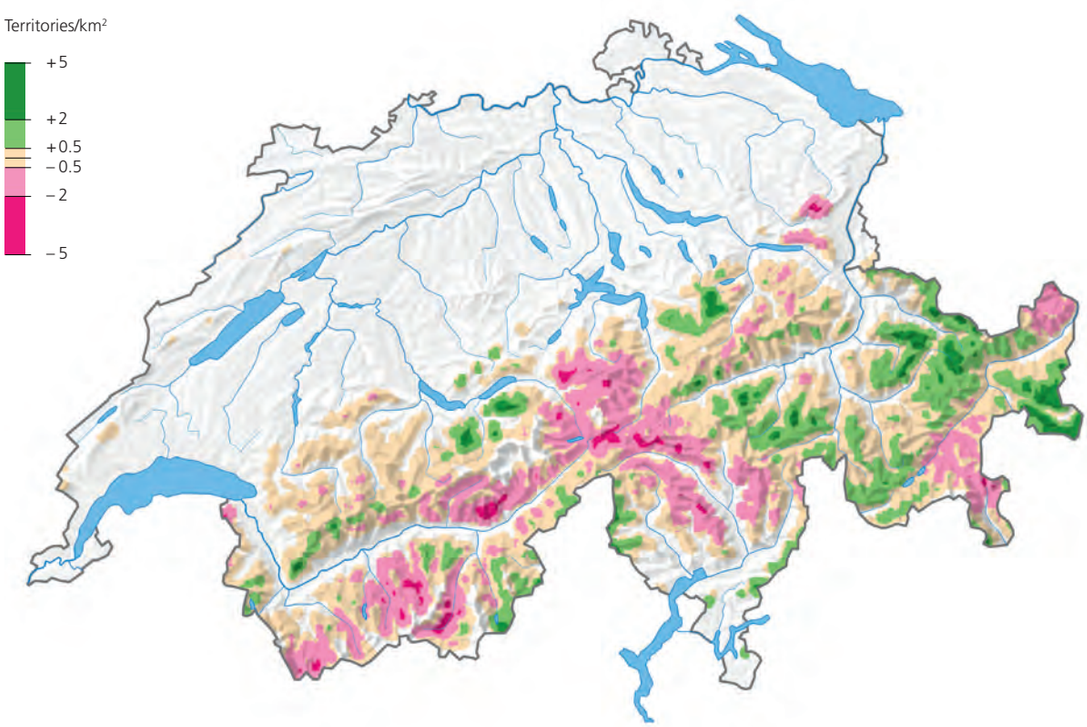
[1] Apolloni et al. (2017); [2] Bani et al. (2014); [3] Bobbink et al. (2010); [4] Estrada et al. (2004); [5] Low et al. (2010); [6] MeteoSchweiz (2017)/MétéoSuisse (2017)/MeteoSvizzera (2017); [7] Nardelli et al. (2015); [8] Öberg et al. (2015); [9] Pärt et al. (2017); [10] Teufelbauer & Seaman (2017); [11] van Oosten (2015); [12] van Oosten et al. (2014)





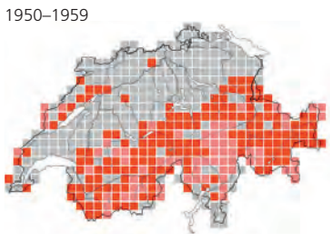
Density 2013–2016

Density change since 1993–1996

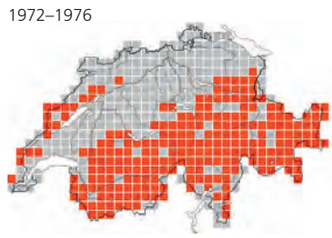


Sponsored by
W. Wanner, Oberkirch

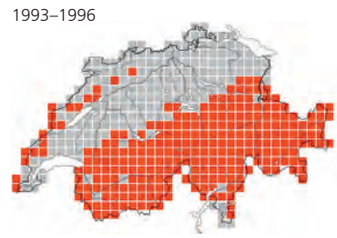
1950–1959



1972–1976



1993–1996



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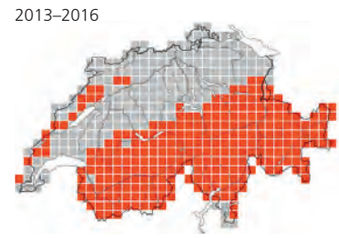
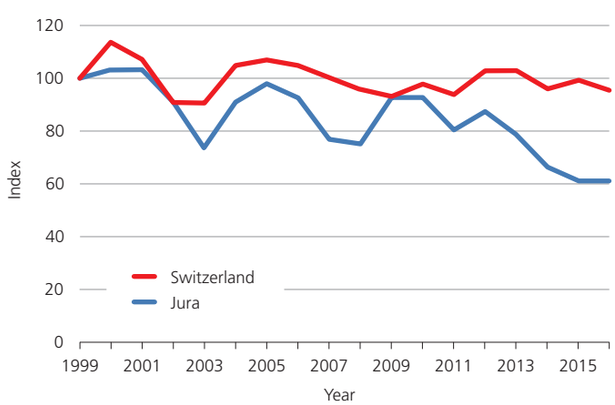


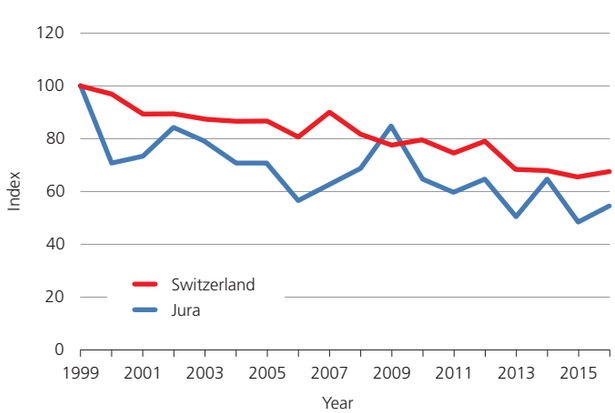
Jura pastures under increasing pressure

Traditional pastures in the Jura support a great diversity of animals and plants, including endangered species like the Woodlark. But intensified farming practices are putting this valuable habitat under increasing pressure – with devastating consequences for its inhabitants. The use of stone crushers and the mechanisation of grassland management pose a serious threat to the Woodlark and other species.

Traditional Jura pastures are among the most species-rich habitats in Switzerland [10]. Grazed at low intensity, the wooded pastures and shallow calcareous soils have created a complex landscape mosaic [3, 4, 12]. This heterogeneous habitat with its typical small-scale structures such as outcrops, rock piles, uneven ground, bushes, free-standing trees and tree stumps provides ideal conditions for high biodiversity [3, 7]. Many threatened species or species that have become rare on the Central Plateau, like the Woodlark, still occur here [6, 9]. Core areas for this species include the Chasseral BE and Mont Racine NE with 18 territories (2017) and 14 or more territories (2016–2017), respectively [2, 5]. Substantial populations of the Eurasian Skylark are also still found here: up to 30 territories/km^2 were counted on the Chasseral. Northern Wheatear and Water Pipit mainly inhabit the upper reaches of the first and second Jura chains.



Population trend of the Tree Pipit from 1999–2016 with data from the common breeding bird monitoring scheme; the base year is 1999 with an index value of 100. The population has declined markedly in the Jura (blue curve), whereas the overall Swiss population (red curve) fluctuates.



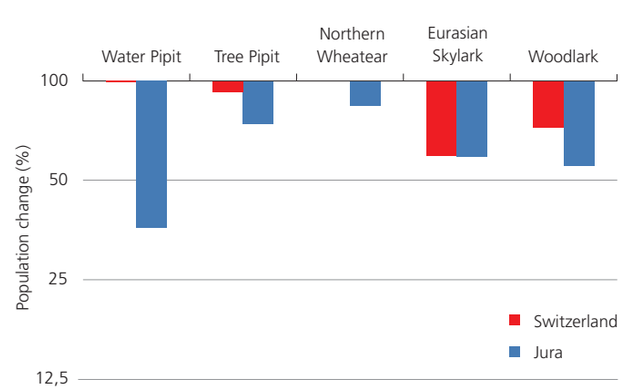
Population trend of the Eurasian Skylark from 1999–2016 with data from the common breeding bird monitoring scheme; the base year is 1999 with an index value of 100. The population in the Jura (blue curve) has declined more steeply than the overall Swiss population (red curve).

Steep decline of characteristic species

However, a sharp decrease of these characteristic species has become apparent since 1993–1996. Following a period of decline that lasted well into the 1990s, the overall Swiss population of Woodlarks has increased again in recent years, especially by colonising vineyards, but the same is not true in the Jura. In the eastern and central Jura in particular, its distribution has become smaller and patchier. The Tree Pipit has become scarcer since 1993–1996 as well. Distinctly negative trends were also recorded for the Eurasian Skylark during the same period, and singing males of Water Pipit and Northern Wheatear are now largely absent from the Jura east of Biel BE.

The overall Swiss population of Water Pipits has stayed the same since 1993–1996, making the steep decline in the Jura all the more striking. Similarly, the decline in Northern Wheatear numbers since 1993–1996 has occurred exclusively in the Jura. Tree Pipit and Woodlark populations have decreased more steeply in the Jura than in Switzerland as a whole. In the case of the Eurasian Skylark, the decline in the Jura corresponds to the Swiss average.

While land use has been intensified in the lower reaches of the Jura since the 1950s [10, 11, 13], the trend did not reach higher altitudes



Population changes of some characteristic breeding birds in the Jura (blue) and in Switzerland (red). The graph shows the 2013–2016 population size in % of its original size in 1993–1996. 100 % means that population size stayed the same; 50 % means that the population decreased by half from 1993–1996 to 2013–2016. The figures are based on the modelled maps for the corresponding survey period.

Anatole Gerber

Structurally rich wooded pasture near Cortébert BE, providing habitat for Woodlark, Tree Pipit and a diverse flora.

Anatole Gerber

In the foreground, the image shows a pasture that has been dug up by a stone crusher and re-seeded with an agricultural grass mix. The background shows the pasture near Cortébert BE in its original state, rich in species and structure.

until the 1990s. As structural improvements and the streamlining of farming operations take hold, pastures are gradually intensified. The same development can be observed in the French Jura[8].

Devastating effects of intensification, especially where stone crushers are used

Among the numerous methods of intensification, the use of stone crushers is probably the most destructive. The machines break up the ground to a depth of 25 cm, completely eliminating rocks, stones, tree stumps, bushes and uneven patches of ground. The land is then sown with a species-poor seed mix or intensified through fertilisation and frequent mowing – with devastating effects for biodiversity[1]. Managed in this way, once richly structured pastures lose their diversity forever.

Stone crushers have increasingly been put to use throughout the Jura since the early 1990s. Only the parts of the Jura range that lie in the cantons of Solothurn and Vaud have remained mostly unaffected. In the cantons of Jura, Bern and Neuchâtel, the machines have been used more frequently and across large areas (up to 13 ha). Although the use of stone crushers has been restricted by law in most cantons of the Jura since early 2000, they continue to be employed with or without a permit[1].

However, stone crushers are merely the tip of the iceberg. There are several other methods that produce a homogenised landscape (increased use of fertiliser, reseeding, more frequent and earlier mowing). Pasture and woodland are increasingly segregated, small structures are removed from pastures, and once open woodland is growing denser and darker. All bird species associated with naturally nutrient-poor pastures in the Jura are affected by this development. Recently, wind turbines installed on the Jura ridges have further restricted the potential habitat for these species of open landscapes.

Adequate compensation for sustainable land use is necessary

The few structurally rich Jura pastures that still remain today can only be preserved if they are inventoried according to standardised criteria and protected, with adequate compensation being offered for their maintenance. Important criteria for the protection of a site should include botanical quality, but also structural diversity. A general ban should be imposed on intensification methods that destroy habitat, such as the stone crusher, and their use penalised.

Nadine Apolloni

[1] Apolloni et al. (2017); [2] Apolloni et al. (2018a); [3] Buttler et al. (2009); [4] Gallandat & Gillet (1999); [5] Gerber (2018); [6] Gerber et al. (2006); [7] Gillet et al. (2010); [8] Gillet et al. (2016); [9] Gobbo (1990); [10] Lachat et al. (2010–2011); [11] Niemelä & Baur (1998); [12] Schläpfer et al. (1998); [13] Stöcklin et al. (1999)

Species pages 358, 360, 482, 504, 510

Goldcrest

Regulus regulus
Wintergoldhähnchen
Roitelet huppé
Regolo
retgottel d'enviern

Christine Jung

Red List Least Concern (LC)
Population 200 000–400 000 pairs (2013–2016)

Focus –

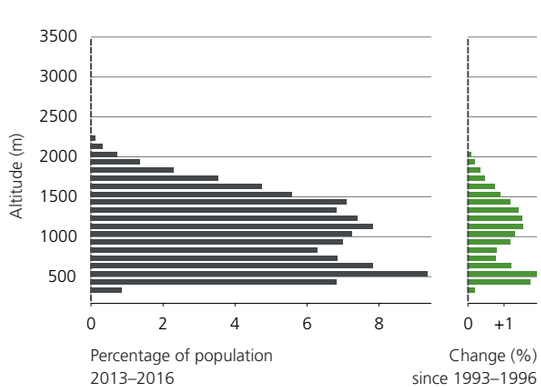
Switzerland lies at the southern fringe of the Goldcrest's European range. The species is closely associated with conifers and relies on its preferred habitat of spruce and fir forests. It avoids inner-Alpine larch and stone pine forests [AEn]. In Switzerland, the Goldcrest is absent only from the Alpine zone. Average densities of more than eight territories/km² are reached between 900 and 1700 m. In core areas in the Pre-Alps and some parts of the Central Plateau, Jura and Alps, it is not uncommon to count more than 25 territories/km². The highest broods were recorded near Celerina GR at 2070 m [AEn] and more recently near Langwies GR at 2040 m (P. Knaus); the highest singing male was observed near Tschierv GR at 2260 m (M. Müller).

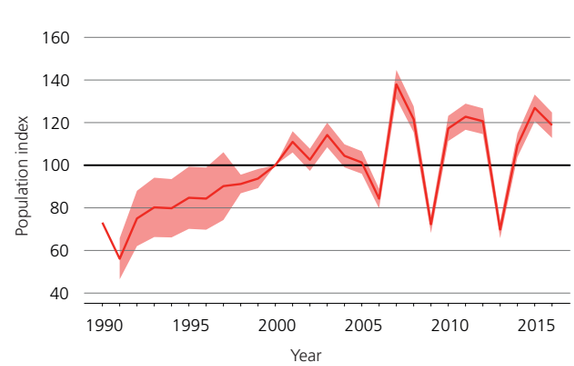
While the population showed a gradual increase from 1990 to 2003, the trend has since been highly dynamic with short-term declines followed by rapid recoveries. In Germany, no connection with harsh winters was detected, but a negative correlation with high spruce seed production, which may benefit predators (small rodents), was found [3]. In Switzerland, however, the steep declines following the severe winters of 2005/2006 and 2008/2009 and the cold spell in March 2013 are striking. Since 1993–1996, the population has increased to a similar extent at all altitude levels. The mixed trends since 1993–1996 in the species' current strongholds are noteworthy. Large gains were recorded between Lake Lucerne and Lake Zurich, in the Vaud Jura and in some parts of Grisons. Density has decreased in other areas since 1993–1996, for instance in the Val Poschiavo GR. Further regional declines were recorded in the Canton of Zurich (–13 % from 1988 to 2008) [AtZH] and the Lake Constance area (–32 % from 1980 to 2010) [AtBo].

The reasons for these regional differences are unknown. The slightly positive trend in Switzerland runs contrary to the decreasing proportion of spruce in the forests of the Central Plateau, Jura and Pre-Alps [1, 4] as well as the negative trends in neighbouring countries [AtD, AtF, AtFL, AtV, 2, 5]. The overall European trend also declined by around 30 % from 1980 to 2014 [EBCC].

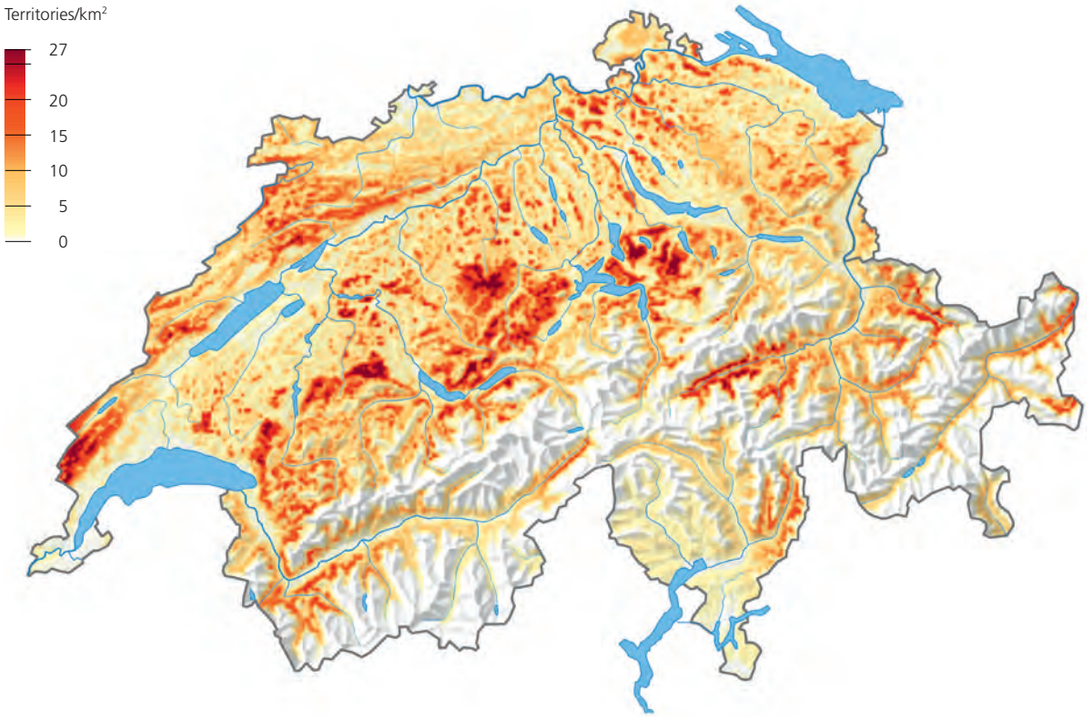
Jan von Rönn

[1] Brändli (2010a–b); [2] Campedelli et al. (2012); [3] Flade & Schwarz (2004b); [4] Rigling & Schaffer (2015a–d); [5] Teufelbauer & Seaman (2017)





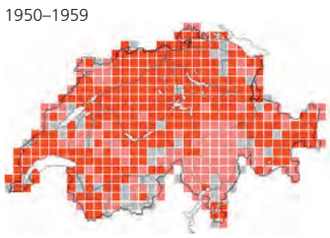
Density 2013–2016



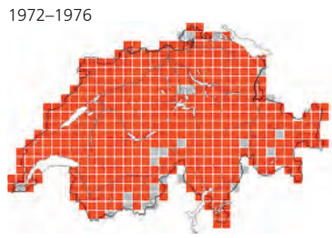
Density change since 1993–1996

Sponsored by
Family Lab, Delémont

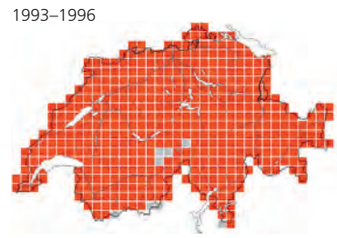
1950–1959



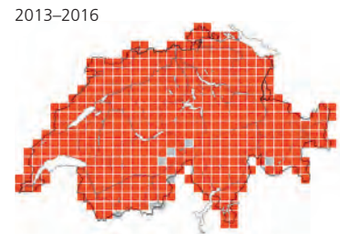
1972–1976



1993–1996



2013–2016



Common Firecrest

Regulus ignicapilla
Sommergoldhähnchen
Roitelet à triple bandeau
Fiorrancino
retgottel da stad

Dennis Lorenz

Red List Least Concern (LC)
Population 250 000–400 000 pairs (2013–2016)

Focus –

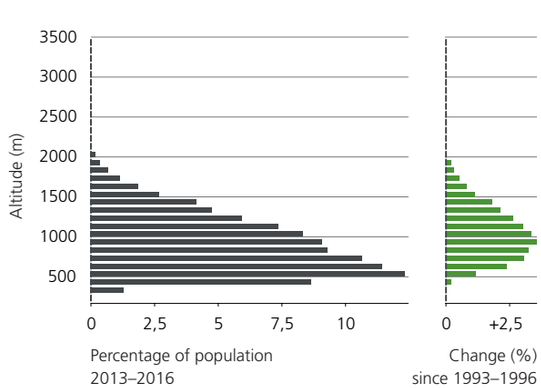
The range of the Common Firecrest is limited to western, central and southern Europe. It mainly occupies coniferous and mixed forests. Unlike the Goldcrest, however, it is also found in habitats where conifers are few, especially in settlements (e.g. parks, cemeteries and residential areas). The species is widespread in Switzerland up to the tree line. The highest densities are reached in the Pre-Alps and Jura. Accordingly, average densities of over ten territories/km² are only found between 600 and 1400 m. In suitable kilometre squares, it is not uncommon to count 30 territories and more. The highest breeding birds were recorded near Zermatt VS at 2150 m [AtCH2], the highest singing male near Riddes VS at 2160 m (C. Luisier) [1].

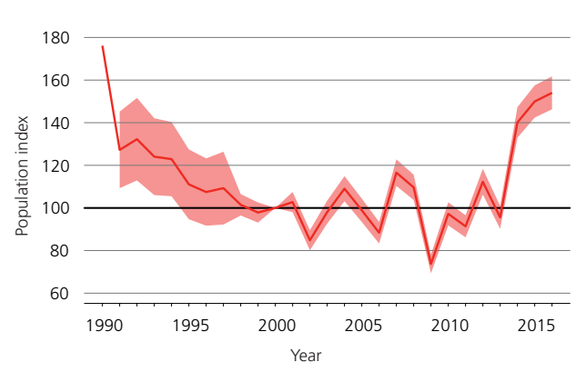
Since 1993–1996, numbers have increased at all altitude levels, with above-average gains between 800 and 1200 m. Density has increased mainly in parts of the Pre-Alps, Jura and Central Plateau as well as in some Alpine valleys, while declining around Zurich (decrease of about 30 % between 1988 and 2008) [AtZH] and other urban centres. The Lake Constance area also shows a clear negative trend, with numbers dropping by more than 60 % from 1980 to 2010 [AtBo]. It is unclear whether the marked increase at higher altitudes and the stagnation in lowland areas are the first signs of the predicted northward shift of the species' range [ClimAt]. An expansion or shift at the northern edge of the range has become evident [AtGB, 6]. In addition, a decline in numbers was found in woodland habitats in the Canton of Zurich [9], which may reflect the reduced dominance of conifers [2, 5], while the colonisation of settlements has increased [8].

Following the predominantly negative trend from 1990 to 2002 and fluctuating numbers up to 2013, the trend in Switzerland has since been rising and continued to rise until 2017. The Swiss trend matches trends in France, Italy and Austria [AtF, AtV, 3, 4, 7] as well as Europe as a whole [EBCC], which are negative in the long term but show some short-term gains. The reverse is true in Germany [AtD].

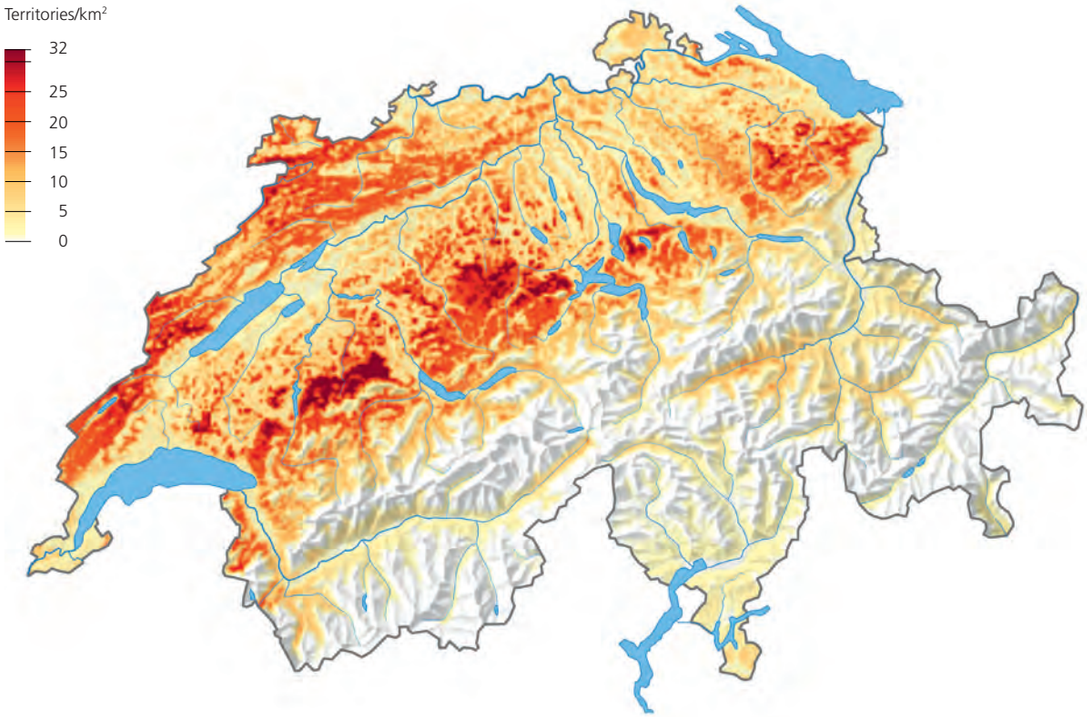
Jan von Rönn

[1] Antoniazza (2015); [2] Brändli (2010a–b); [3] Campedelli et al. (2012); [4] Jiguet (2017); [5] Rigling & Schaffer (2015a–d); [6] Svensson et al. (1999); [7] Teufelbauer & Seaman (2017); [8] Weggler & Widmer (2000b); [9] Weggler & Widmer (2001)





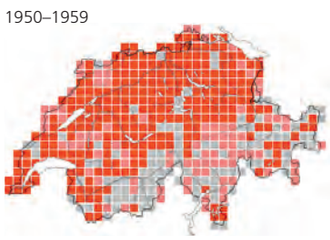
Density 2013–2016



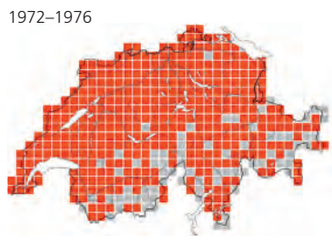
Density change since 1993–1996

Sponsored by
Rotraut Oertli

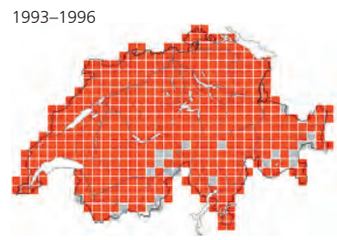
1950–1959



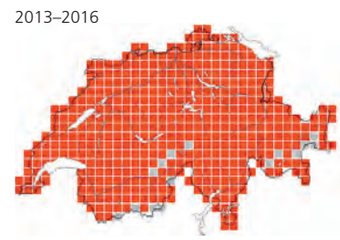
1972–1976



1993–1996



2013–2016



Alpine Accentor

Prunella collaris
Alpenbraunelle
Accenteur alpin
Sordone
brunella da muntogna

Dennis Lorenz

Red List Least Concern (LC)
Population 25 000–40 000 pairs (2013–2016)

Focus pages 414, 542

The Alpine Accentor inhabits most mountain ranges in central and southern Europe. In Switzerland, it is found throughout the Alps including the pre-Alpine ridges, with concentrations above the tree line between 1900 and 2900 m. In the Jura, it occurs only exceptionally: breeding was recorded at the Creux du Van NE in 1980. As a mountain species, the Alpine Accentor favours steep, rocky slopes, screes and other rocky habitats such as crevices and moraines, mostly near Alpine grassland [VdS]. During the breeding season, it gathers in small, polygynandrous groups, making reliable density estimates difficult [3]. Suitable kilometre squares, mostly between 2300 and 2700 m, regularly hold more than 12 territories, in the central Alps in particular.

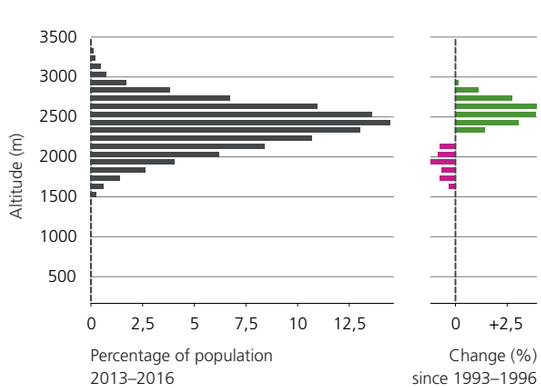
The highest confirmed breeding record came from 3450 m near Trient VS (M. Gerber) [1]. On Zinalrothorn VS at 4100 m, a fledged chick was observed that was still being fed (M. Gerber) [5], but the family probably ascended to this altitude following the fledging of the young. A singing male was recorded on Rimpfischhorn VS at 4170 m (M. Ernst) [4]. At the low end of the spectrum, breeding was recorded near Salvan VS at 1235 m [VdS]. During the 2013–2016 surveys, a singing male was observed at 1380 m near Jaun FR (A. Niclass).

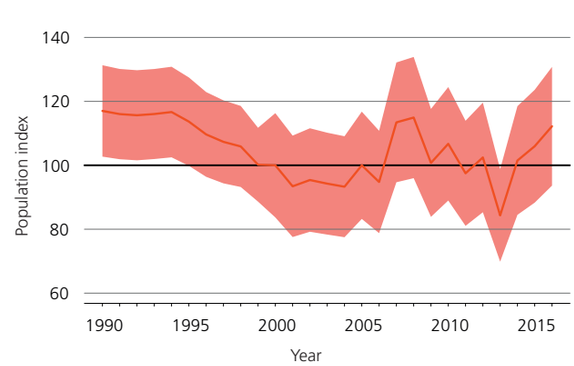
Since 1993–1996, density has increased in the central Alps while declining in the eastern Pre-Alps. Losses occurred below 2300 m, while gains were recorded above that altitude. In Switzerland as in other European countries, numbers appear to be stable overall [AtD, AtF, AtV, RLEU] despite annual fluctuations, presumably related to weather and snow conditions [HBW]. In Italy, on the other hand, some regions report a negative trend [2, 6].

The Alpine Accentor does not appear to be threatened. Still, studies on the influence of climate change are desirable, especially at medium altitudes. Some areas of the French Jura that were occupied in the 1980s have since been abandoned [AtF]. Switzerland supports about 16 % of the species' European population and therefore has an important responsibility for its conservation [7].

Jérémy Savioz

[1] Antoniazza (2015); [2] Brichetti & Fracasso (2007); [3] Heer (2013); [4] Posse (2009); [5] Posse (2013); [6] Rete Rurale Nazionale & Lipu (2015); [7] Sattler et al. (2016a–d)



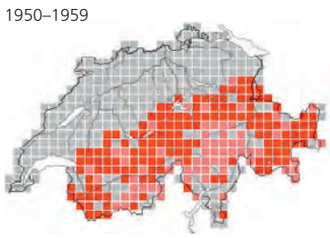


Density 2013–2016

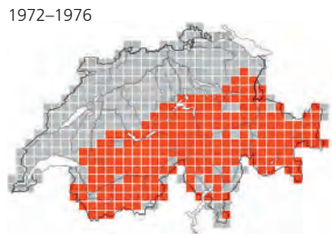
Density change since 1993–1996

Sponsored by
Lorenz Heer

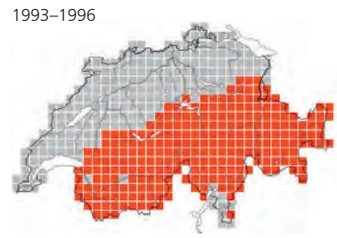
1950–1959



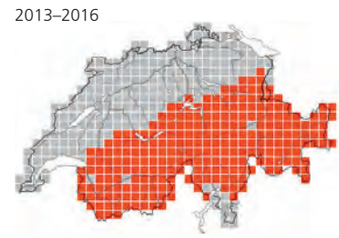
1972–1976



1993–1996



2013–2016



Dunnock

Prunella modularis
Heckenbraunelle
Accenteur mouchet
Passera scopaiola
brunella da chaglia

Daniele Occhiato

Red List Least Concern (LC)
Population 200 000–250 000 pairs (2013–2016)

Focus –

The Dunnock occurs throughout most of Switzerland, reaching the highest densities in the Pre-Alps and Alps. Between 1300 and 2100 m, average density exceeds ten territories/km². Suitable kilometre squares regularly support 30 territories and more. Densities of up to 7.0 territories/10 ha were recorded in the Pre-Alps of Glarus [5], 8.3 territories/10 ha in a windthrow area in the Pre-Alps of Schwyz [4] and 9.6 territories/10 ha in a young forest at the southern foot of the Jura near Solothurn [3].

The Dunnock mainly inhabits forests with dense undergrowth, young spruce plantations, raised bogs with trees, and green alder stands close to the tree line. In other European countries, the species is also found in urban areas [AtD, AtF, AtGB]; in Switzerland, however, it occurs only occasionally in parks or residential areas with lots of trees.

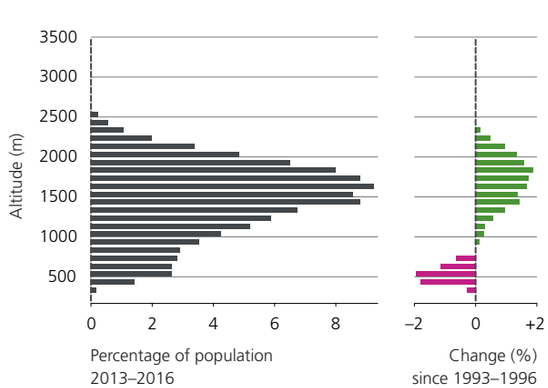
The highest singing males were recorded near Saas Almagell VS at 2520 m [HVM] and near the Great St. Bernhard Pass VS at 2490 m (M. Trocmé). The highest confirmed breeding record comes from Zermatt VS at 2390 m, where the Dunnock was observed up to 2740 m during the breeding season (J. Duplain) [1].

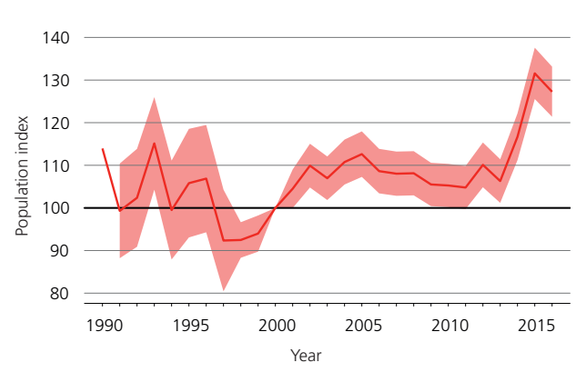
Since 1993–1996, density has declined below 800 m, especially on the Central Plateau and in the Ajoie JU, while increasing above 1000 m, particularly in the Pre-Alps and eastern Alps. Regional surveys noted steep declines: 25 % between 1988 and 2008 in the Canton of Zurich [AtZH] and 67 % between 1980 and 2010 in the Lake Constance area [AtBo]. The Swiss population has fluctuated more or less widely since 1990; a somewhat positive trend has become apparent since 2000. The Dunnock benefits from the regrowth of windthrow areas; in particular, storm «Lothar» in late 1999 is thought to have aided the colonisation of new areas [2]. The common breeding bird monitoring scheme recorded an increase of 25 % from 2013 to 2015, the gains being most pronounced (more than 40 %) between 1000 and 1500 m. The rise may have been caused by two successive mild winters.

In our neighbouring countries [AtD, AtF, 6, 8] as well as in Europe [EBCC], the trend is slightly negative. The reduction in conifer afforestation may reinforce declines in lowland areas [7].

Jacques Laesser

[1] Antoniazza (2015); [2] Beaud & Beaud (2018); [3] Christen (2018); [4] Glutz von Blotzheim (2001); [5] Marti (2018); [6] Rete Rurale Nazionale & Lipu (2015); [7] Rigling & Schaffer (2015a–d); [8] Teufelbauer & Seaman (2017)



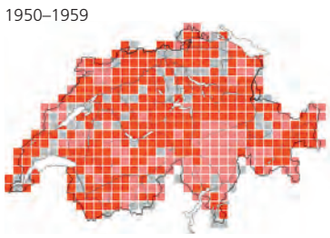


Density 2013–2016

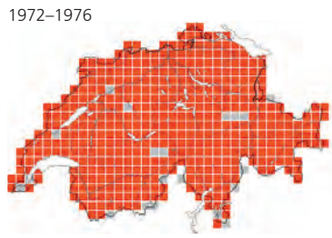
Density change since 1993–1996

Sponsored by
Philippe Petitmermet, Worb

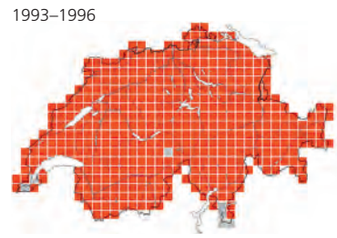
1950–1959



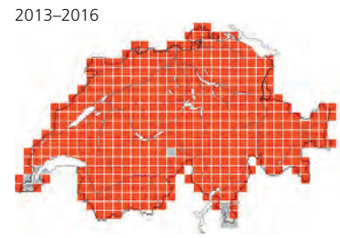
1972–1976



1993–1996



2013–2016



House Sparrow

Passer domesticus
Haussperling
Moineau domestique
Passera europea
pasler da chasa

Mathias Schäf

Red List Least Concern (LC)
Population 450 000–550 000 pairs (2013–2016)

Focus pages 170, 498, 560

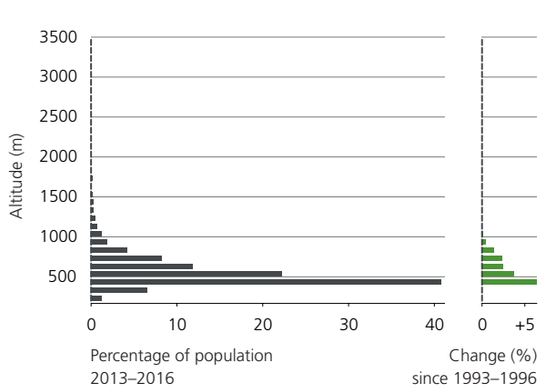
In Switzerland, the House Sparrow is found in almost all settlements north of the Alps. Distribution is concentrated below 800 m. Its range overlaps with that of the Italian Sparrow in northern Ticino, the Upper Valais and Engadine GR, where hybrids are regularly found[8, 11]. The highest nest sites are currently located at about 2120 m in Juf/Avers GR. Breeding was recorded at a maximum altitude of 2310 m on the Bernina Pass GR in 1974[AEn].

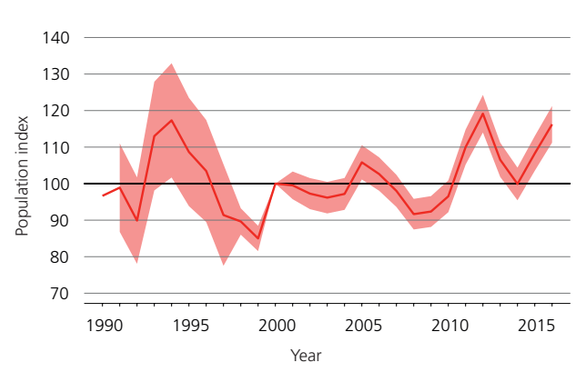
The population of this colony breeder is hard to monitor. It is suspected to be stable in Switzerland since 1990 with some fluctuations. This finding contrasts with declines observed in regional surveys: In settlements in the Canton of Zurich, the House Sparrow population decreased by 34 % between 1988 and 1999[14]. In the canton as a whole, losses amounted to 23 % between 1988 and 2008[AtZH]. In the Lake Constance area, numbers declined continuously between 1980 and 2010, resulting in a loss of 46 %[AtBo]. Since the 1980s, many European countries have reported similarly steep declines, especially in urban areas[5, 10], among them France (17 % decline in the past ten years)[6] and Germany, though regional trends are mixed in Germany[AtD, 1, 7, 12]. The Austrian population has increased by 25 % since 1998[13]. In Switzerland, the House Sparrow has presumably benefited from the expansion of settlements, which amounts to about 20 % in the past 20 years[2], even though breeding density within settlements has declined.

The decline in urban areas is thought to be driven mainly by the reduced supply of insects to feed nestlings[HBW]. The lack of insects is probably related to the loss of green spaces due to increased urban density, the use of non-indigenous plants and overly manicured parks and gardens[3, 4, 9, 10]. Other possible causes for the decline in density include loss of nest sites due to building renovations, few nesting opportunities on new buildings, the abandonment of livestock farming and the reduced availability of stubbles for winter feeding.

Fränzi Korner-Nievergelt & Luc Schifferli

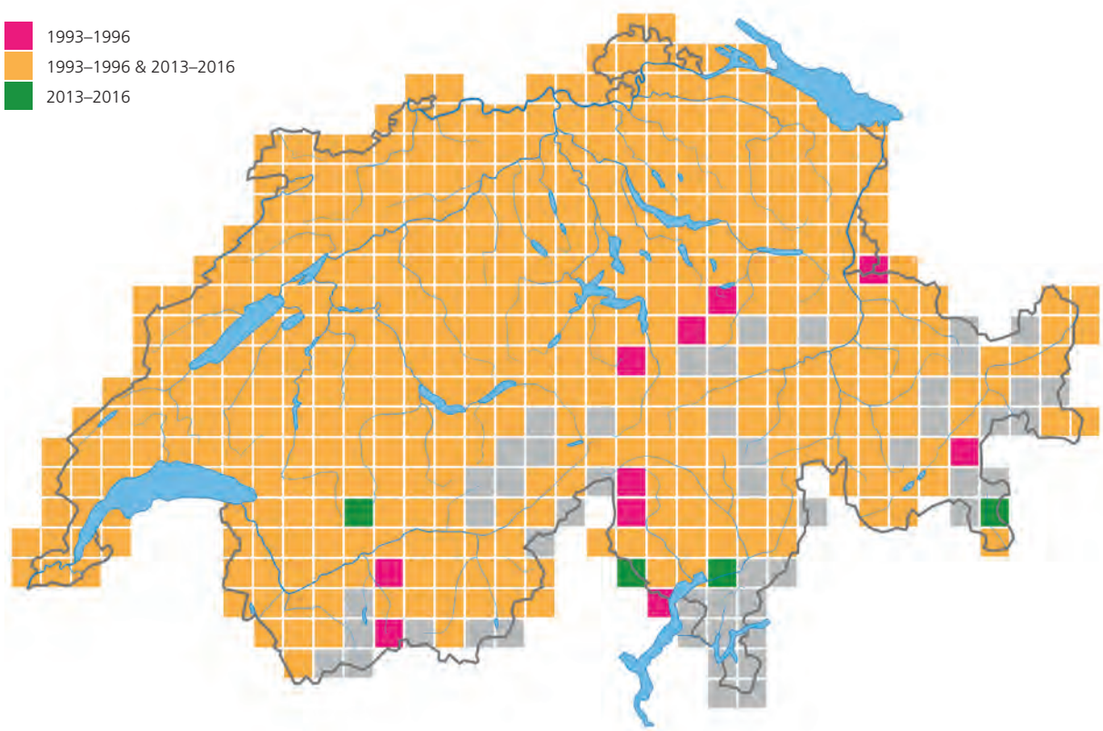
[1] Bauer et al. (2016a); [2] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [3] Chamberlain et al. (2007); [4] Chamberlain et al. (2009); [5] De Laet & Summers-Smith (2007); [6] Dubois et al. (2017); [7] Engler & Bauer (2003); [8] Nidola (2008); [9] Peach et al. (2015); [10] Shaw et al. (2008); [11] Signorell Häusler et al. (2012); [12] Steffens et al. (2013); [13] Teufelbauer & Seaman (2017); [14] Weggler & Widmer (2000b)





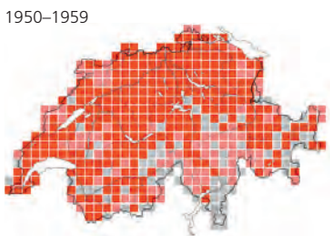
Density 2013–2016

Distribution change since 1993–1996

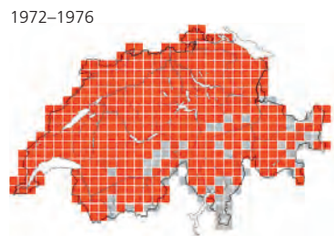


Sponsored by
Marianne & Eugen Schneider
Raffael Winkler, Basel

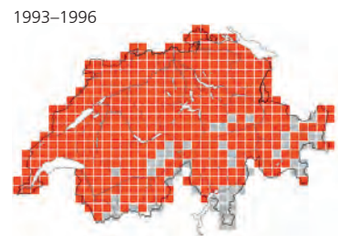
1950–1959



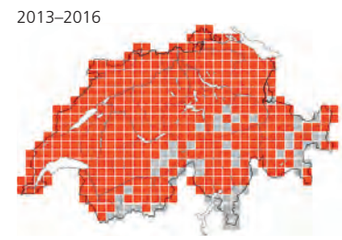
1972–1976



1993–1996



2013–2016



Italian Sparrow

Passer italiae
Italiensperling
Moineau cisalpin
Passera d'Italia
pasler talian

Daniele Occhiato

Red List Least Concern (LC)
Population 20 000–25 000 pairs (2013–2016)

Focus pages 170, 284, 498

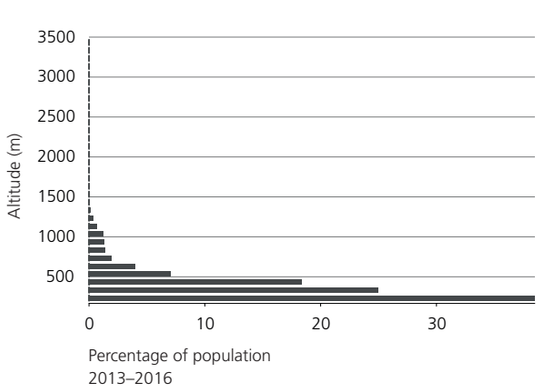
The Italian Sparrow's range is confined to Italy and some Mediterranean islands such as Corsica and Crete. It reaches the northern limit of its distribution in Switzerland, replacing the House Sparrow south of the Alps[7, 8]. Distribution is concentrated below 500 m; numbers decrease more rapidly with increasing altitude than those of the House Sparrow. Individuals have, however, been observed in settlements well above 1000 m in the Engadine GR and Valais. In the past, the highest breeding site was on the Bernina Pass at 2310 m [AEn]. In 2014, a male was sighted at 2120 m in Juf/Avers GR (S. Werner), where breeding has been recorded in earlier years [AtCH1]. In suitable kilometre squares north of the Monte Ceneri TI, it is not uncommon to count 70 territories and more. The apparently low densities in the Mendrisiotto TI in particular could be due to the position of the surveyed kilometre squares in that area, as they often do not include settlements. In Lugano TI, the Italian Sparrow was recorded at all 32 surveyed sites (circles with a 100 m radius) and accounted for nearly 30 % of all individuals in settlement areas[6].

The species' range in Switzerland has hardly changed since 1993–1996. The newly occupied atlas squares are probably due to increased observer effort rather than an actual range expansion, as some of these areas were already occupied in 1972–1976. For methodological reasons, little is known about the population trend in Switzerland. However, the few available data[7] indicate that the species has declined in Ticino as well as in neighbouring Italy in the past two decades. Declines of up to 50 % have been recorded in some places in Italy[1, 3, 4, 5], though large numbers may still occur locally. As a result of these substantial losses, the Italian Sparrow was added to the global Red List as a Vulnerable species in 2017[2].

Food scarcity due to overuse of pesticides and intensive farming is thought to be the main cause of decline. The loss of nest sites owing to renovations and modern building design may also play a part [HBW, 4].

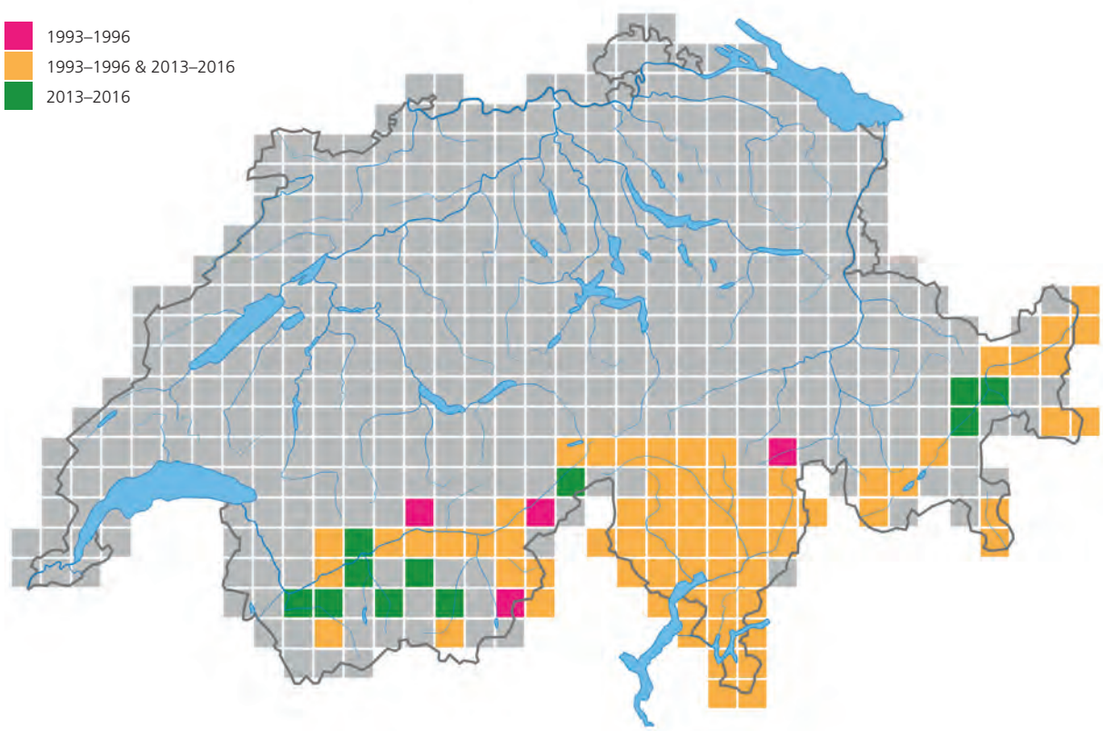
Thomas Sattler

[1] Bani et al. (2014); [2] BirdLife International (2017d); [3] Brichetti et al. (2008); [4] Brichetti & Fracasso (2013); [5] Campedelli et al. (2012); [6] Fontana et al. (2011); [7] Nidola (2008); [8] Signorell Häusler et al. (2012)



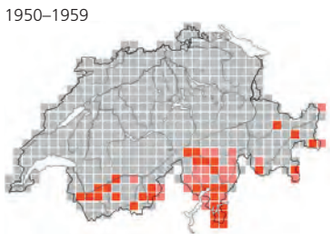
Density 2013–2016

Distribution change since 1993–1996

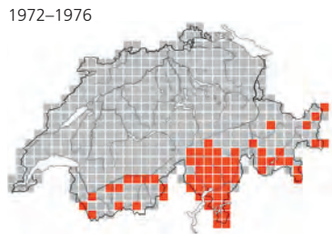


Sponsored by
Denise Aubert-Baudraz †,
grande amie des oiseaux

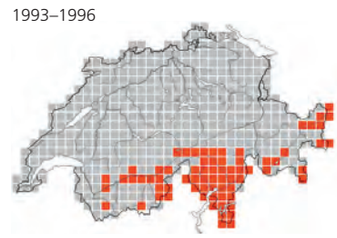
1950–1959



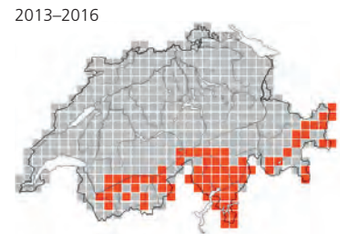
1972–1976



1993–1996



2013–2016



A closer look: crows, sparrows and hybrids

For many species, the Alps are a natural barrier that limits their range. In Switzerland there is a wide contact zone along this boundary where the ranges of Carrion Crow and Hooded Crow as well as House Sparrow and Italian Sparrow overlap. This zone has remained largely unchanged since 1993–1996.

A hybrid is the offspring of two different parent species or subspecies. When two species regularly hybridise – normally in the area of overlap between their respective ranges – hybrid zones occur that can be mobile or static. In Switzerland's southern Alps in the cantons of Valais, Ticino and Grisons, two taxonomic pairs of passerines occur that regularly hybridise: Carrion Crow and Hooded Crow, and House Sparrow and Italian Sparrow.

From black to grey: Carrion and Hooded Crow hybrids

While the Carrion Crow is solid black, the back, belly and undertail coverts of the Hooded Crow are grey. Hybrids of Carrion and Hooded Crow have features of both parent species, mostly grey and black patches on the belly and back.

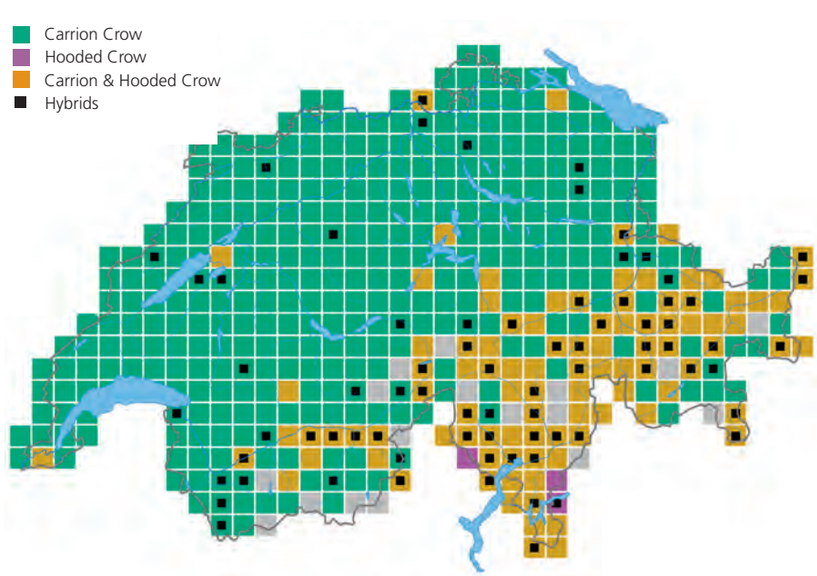
The Carrion Crow mainly inhabits Switzerland north of the Alps. Density is lower south of the Alps, where it is gradually replaced by the Hooded Crow. In Italy, the Carrion Crow is therefore found only in the Alpine and Pre-Alpine north, while the areas further south are practically exclusively occupied by the Hooded Crow[1]. Southern Switzerland lies in the middle of the hybrid zone between Carrion and Hooded Crow. Hooded Crows and hybrids have occasionally been observed north of the Alps in the Carrion Crow's range.

In Switzerland, pure populations of Hooded Crows have only been found in small pockets in southern Ticino. However, given that the hybrid zone in Italy extends at least as far as Milano[1] and that hybrid crows are not always easy to identify[4], it is likely that hybridisation also occurs in these areas in southern Ticino. An analysis of 79 entries with pictures on ornitho.ch showed that 24 % of birds recorded as Hooded Crows were in fact hybrids. The tendency to mistake hybrids for Hooded Crows makes it difficult to determine the exact delineation of the hybrid zone in other countries too, such as the UK[AtGB].

During the last ice age, isolated groups of the same species evolved separately in their southern refugia. When the ice age ended and glaciers receded about 10 000 years ago, the Carrion Crow began to recolonise central Europe from the southwest, the Hooded Crow from the southeast[3]. Thus the two ranges now meet along a natural boundary – the Alps. The Carrion Crow occurs in western Europe from Spain to England, the Hooded Crow in eastern Europe from Italy to Scotland. The hybrid zone extends from Italy across Austria and Germany to the UK. The hybrid zone can be mobile, a fact demonstrated on the Danish-German border, where the Carrion Crow has advanced northwards by about 20 km at the expense of the Hooded Crow[5]. The same pattern was found in Scotland, where the Carrion Crow expanded its range to the northwest between 1928 and 1974, causing the Hooded Crow to retreat[3]. Since 1974, the hybrid zone in the UK has remained largely unchanged[AtGB].

Same chirp, different bird: House Sparrow and Italian Sparrow

Unlike crows, only male sparrows can be identified as hybrids. Male House Sparrows have a grey crown and grey cheeks, while the crown of the Italian Sparrow is brown and the cheeks are white. Hybrids sport varying degrees of intermediate plumage with a grey-brown crown and dirty greyish-white cheeks.



Distribution of Carrion Crow (green) and Hooded Crow (purple) in 2013–2016. Areas in which both Carrion and Hooded Crows occur are shown in yellow. Atlas squares where hybrids were recorded are marked with a black square.

Heike Springer

Jérôme Sottier

Hybrids have an intermediate plumage with features from both parent species or subspecies. Carrion and Hooded Crow hybrids generally have a grey and black belly, breast and back (left); hybrids of House Sparrow and Italian Sparrow have a grey-brown crown and dirty-grey cheeks (right).

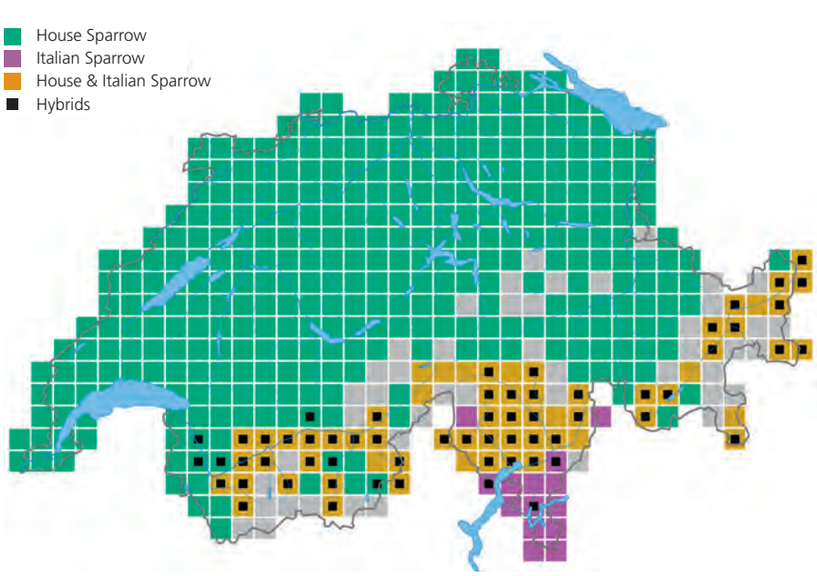
The Italian Sparrow is found solely on the Italian peninsula, from which the House Sparrow is largely absent, occurring only in the north[2]. Hybridisation exists in the relatively narrow area in the southern Alps where the two ranges overlap. While the House Sparrow occurs in northern Switzerland and in the Alps, there are but a few areas in southern Ticino where only the Italian Sparrow has been recorded. In Ticino, the Italian Sparrow is gradually replaced by the House Sparrow from south to north and with increasing altitude[7]. Earlier studies have shown that pure populations of Italian Sparrows exist in southern Ticino[6, 7]. Compared to 1970–1978[7] and 2007[6], the hybrid zone has remained largely stable up to the present.

It will be interesting to see if and how the hybrid zones of crows and sparrows in Switzerland change in the future. The data collected for this atlas provide a solid foundation for further research. In order to chart any changes that occur, it is important that attention is given to common breeding birds such as crows and sparrows and that hybrids are identified and recorded as accurately as possible.

Simon Hohl

[1] Brichetti & Fracasso (2012); [2] Brichetti & Fracasso (2013); [3] Cook (1975); [4] Duquet (2012); [5] Haas & Brodin (2005); [6] Nidola (2008); [7] Schifferli & Schifferli (1980)

Species pages 336, 338, 494, 496



Distribution of House Sparrow (green) and Italian Sparrow (purple) in 2013–2016. Areas in which both House and Italian Sparrow occur are shown in yellow. Atlas squares where hybrids were recorded are marked with a black square.

Eurasian Tree Sparrow

Passer montanus
Feldsperling
Moineau friquet
Passera mattugia
pasler da prada

Mathias Schäf

Red List	Least Concern (LC)
Population	80 000–95 000 pairs (2013–2016)

Focus

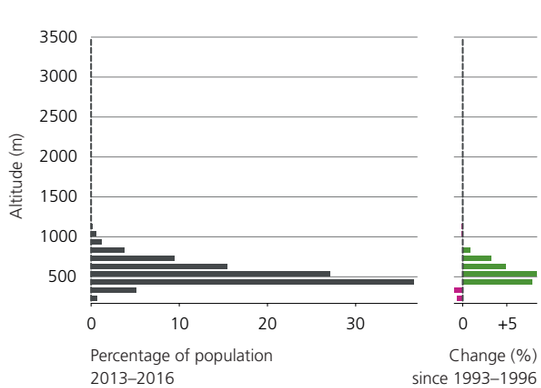
In Switzerland, the Eurasian Tree Sparrow inhabits the Central Plateau, the Jura, the lower-lying areas of southern Switzerland and the large Alpine valleys. The highest densities are reached in the lowlands of the central and northern Plateau and in the fruit-growing regions of central Valais. In suitable kilometre squares, it is not uncommon to count 20 territories and more. The Tree Sparrow favours farmland interspersed with hedges, copses and trees. Where suitable nesting cavities are present, it will also breed in orchards, on farm buildings and in parks. It can be found at forest edges, but avoids settlements with few green spaces. Density decreases rapidly above 800 m, and the species only occurs locally above 1000 m. The highest nesting sites were found at 1370 m near Geschinen VS (U. Marti)[6] and, in earlier years, at 1440 m near Sent GR[AtCH1]. Since 2002, an unusually high breeding site has been occupied in the Val Müstair GR near Craistas at 1900 m (M. Müller)[AGR, ID].

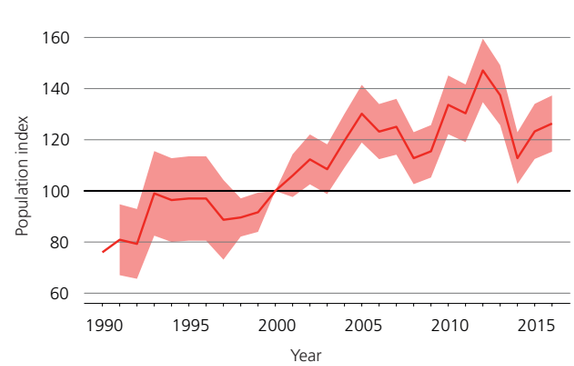
Overall, the Swiss population of the Tree Sparrow has grown by about 20 % since 1993–1996. Compared with 1993–1996, numbers have increased significantly in several places in the central and eastern parts of the Plateau and especially above 400 m, while decreasing in the lowlands of Ticino, the Lake Geneva basin and northwestern Switzerland. Regional surveys also show small gains[AtZH, 5] or at least stable conditions[AtBo]. Some marked but temporary declines may have been caused by heavy rainfall in the breeding seasons of 2007–2008 and 2012–2013 and/or the preceding cold winters.

Austria also reports a slightly positive trend since 1998[9]. In Germany, Italy and France, however, numbers have decreased significantly[AtD, 2, 4]. The overall European trend has been distinctly negative since 1980[EBCC]. Building development, intensive farming practices and pesticide use put Tree Sparrow populations under pressure. Conversely, the species would benefit from a reduction in the use of fertilisers and from efforts to preserve or create structurally varied farmland (e.g. traditional orchards, hedges, copses), wildflower plots, semi-open ruderal habitats and stubble fields in winter[1, 3, 5, 7, 8].

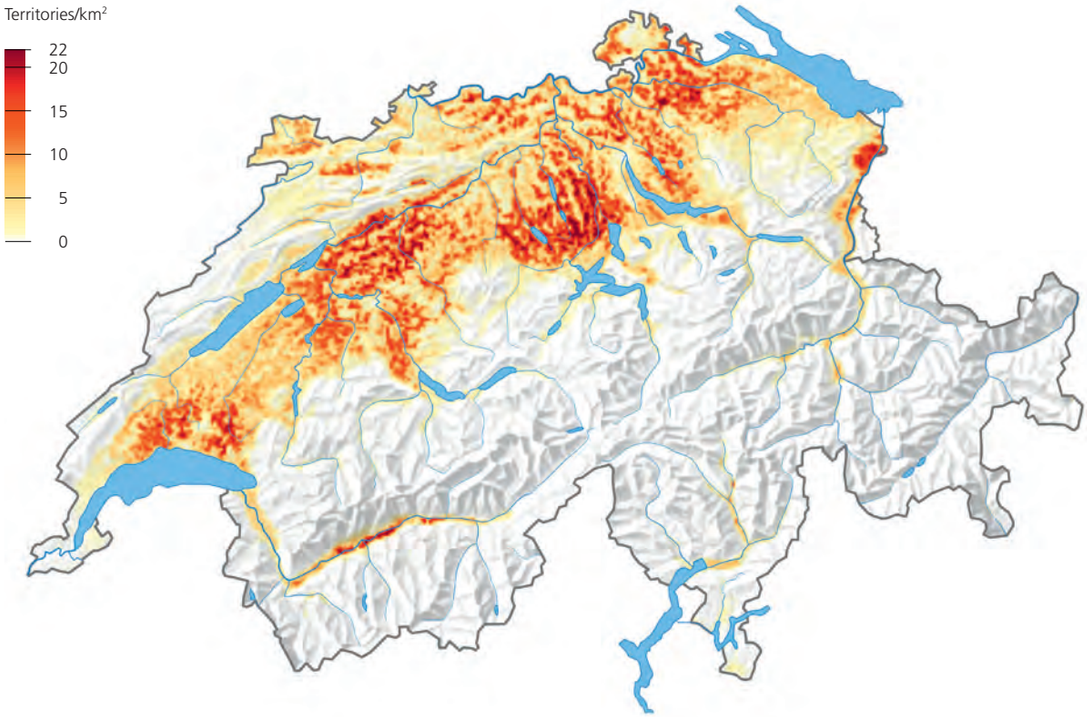
Martin Spiess

[1] Bauer et al. (2016a); [2] Campedelli et al. (2012); [3] Gatter (2007b); [4] Jiguet (2017); [5] Martinez & Birrer (2017); [6] Posse (2014); [7] Ravussin & Roulin (2007); [8] Roth et al. (2008); [9] Teufelbauer & Seaman (2017)

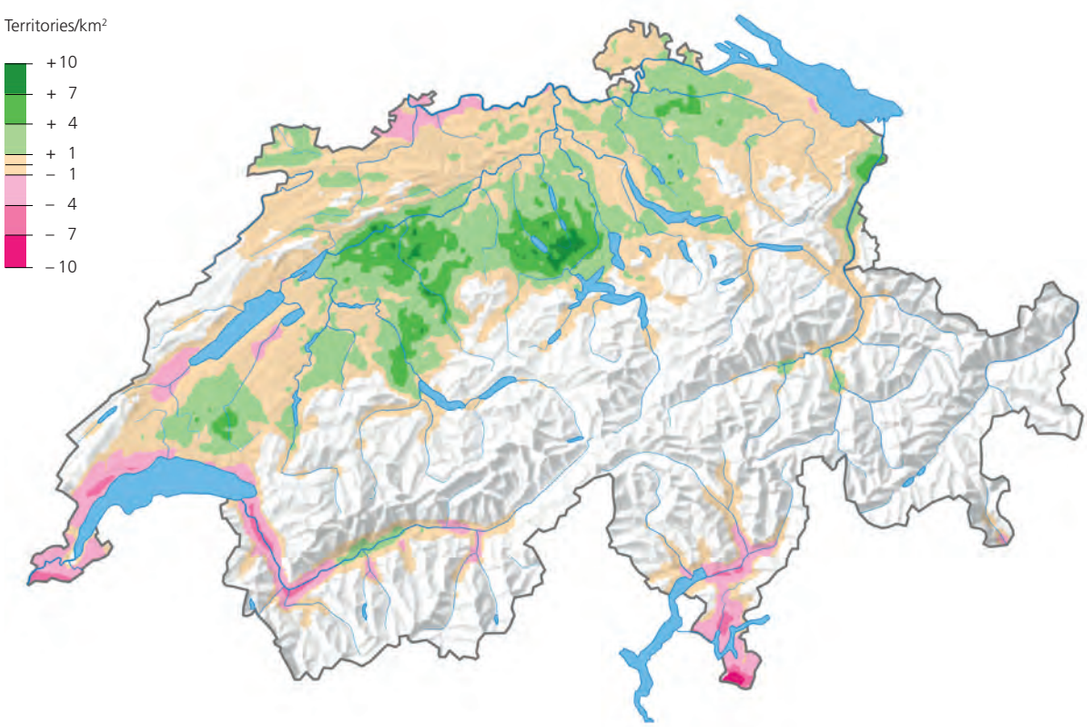




Density 2013–2016

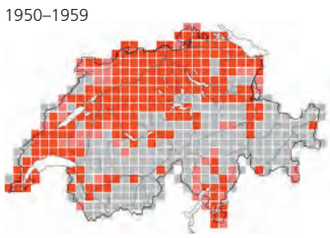


Density change since 1993–1996

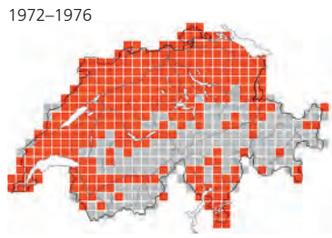


Sponsored by
Pia Steg
Anonymous donor

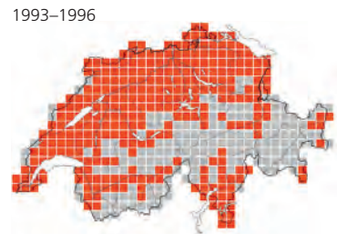
1950–1959



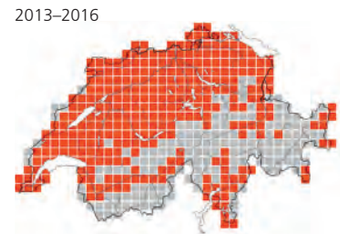
1972–1976



1993–1996



2013–2016



White-winged Snowfinch

Montifringilla nivalis
Schneesperling
Niverolle alpine
Fringuello alpino
squinz

Dennis Lorenz

Red List Least Concern (LC)
Population 6000–9000 pairs (2013–2016)

Focus pages 308, 542

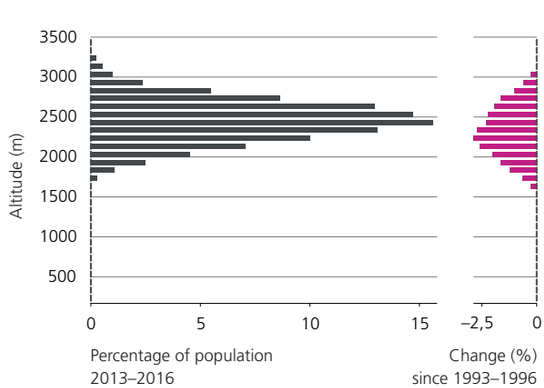
In Europe, the White-winged Snowfinch occurs in the Cantabrian Mountains, the Pyrenees, the Alps, on Corsica, in the Abruzzo region and in the mountain ranges of the Balkans. In Switzerland, the highest densities are reached in the Grisons Alps and central Alps. In suitable kilometre squares, it is not uncommon to count eight pairs and more. The White-winged Snowfinch builds its well-insulated nest in rock crevices, under the roofs of Alpine cabins and on ski-lift pylons. Nest sites must be close to Alpine grassland, where the Snowfinch forages for insect larvae to feed its young when the snow melt sets in. The species regularly breeds between 1900 and 3000 m. The lowest nest site ever recorded in Switzerland was located at 1440 m [BCH], the highest at 3490 m [VdS]. On the northern slopes of the Alps, nests at comparatively low altitudes were found for instance at 1700 m near the Trüebsee NW (K. Müller). The White-winged Snowfinch is now absent from areas below 1600 m.

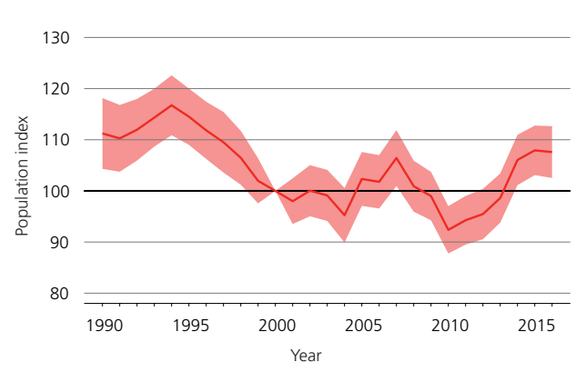
Since 1993–1996, the population has declined mainly in the Alps of the Valais and the central Alps, while remaining unchanged in the Grisons Alps. It is unclear whether this pattern is due to regional differences in the effects of climate change, or whether other factors are at play. Losses are greater below 2400 m than above that altitude. Breeding sites at lower altitudes have been abandoned in neighbouring countries as well [AtF, AtV], and winter flock sizes have declined in the past 20 years [AGR, AtF].

As a high-alpine specialist [2], the White-winged Snowfinch is retreating from areas where the climate is becoming warmer and drier [AtF]. However, the reasons for this are still unclear. They could include the loss of insect biomass or the accessibility of insects as well as changing snow conditions. Rising temperatures and nitrogen deposition result in less diverse [4] and faster growing vegetation, making it more difficult for the Snowfinch to forage on the ground [1]. Warmer spring temperatures lead to earlier and faster snow melt [3]. This means that mosquito larvae, an important source of nestling food uncovered by the melting snow, are available for shorter periods of time. The conservation of insect-rich Alpine grassland therefore plays an important role in securing the future of this species in Switzerland. Our country supports 15 % of the global population of the European subspecies of White-winged Snowfinch [5].

Fränzi Korner-Nievergelt & Claire Pernollet

[1] Brambilla et al. (2017); [2] Heiniger (1991); [3] Klein et al. (2016); [4] Roth et al. (2013); [5] Sattler et al. (2016a–d)



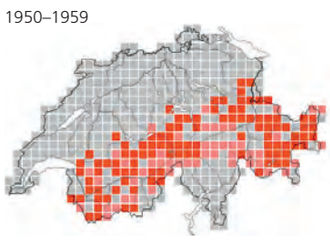


Occurrence 2013–2016

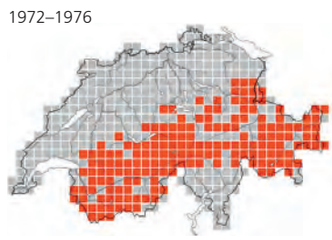
Occurrence change since 1993–1996

Sponsored by
Fritz Suter

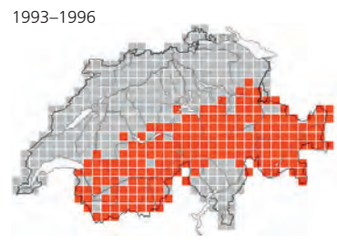
1950–1959



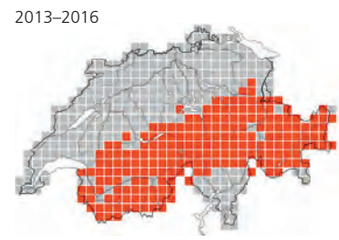
1972–1976



1993–1996



2013–2016



Tree Pipit

Anthus trivialis
Baumpieper
Pipit des arbres
Prispolone
pivet da plantas

Ruedi Aeschlimann

Red List Least Concern (LC)
Population 50 000–70 000 pairs (2013–2016)

Focus pages 314, 319, 392, 414, 478, 484, 506, 542, 552

In Switzerland, the Tree Pipit occurs throughout the Alps, in the western and central Jura as far as western Aargau, and in the Randen range SH. It breeds mainly in the high-montane to sub-Alpine zone in low-intensity pastures and meadows with scattered bushes or conifers. Other habitats often cited in the literature [AtCH1, BCH, VdS] such as orchards, vineyards, alluvial forests and field copses in the lowlands are now only rarely occupied.

The large majority of the population occurs in an altitude belt between 900 and 2100 m, though average densities of more than five territories/km² are only reached between 1300 and 1800 m. The highest confirmed broods were recorded at 2220–2300 m [ID, VdS]. Singing males were occasionally observed far above the tree line, for example near Zermatt VS at 2540 m (G. Saucy).

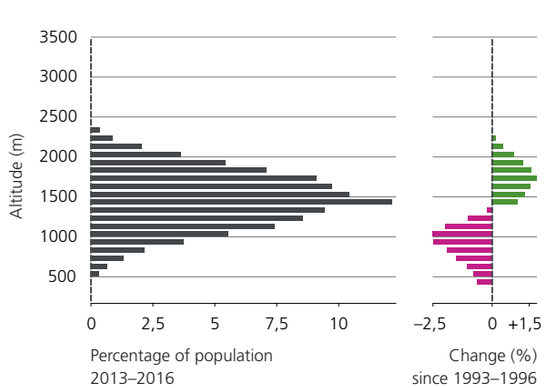
Today, the highest densities are reached in the western Pre-Alps, the Upper Valais, the central Alps and the Lower Engadine GR. In most of these areas, the recorded densities were higher than in 1993–1996. Overall, however, the Tree Pipit population in Switzerland has declined by about 50 % since 1993–1996. The decline is particularly pronounced, and sometimes dramatic, in the colline and montane zones [2, 4, 5, 8, 9, 11]. Small gains were recorded above 1400 m.

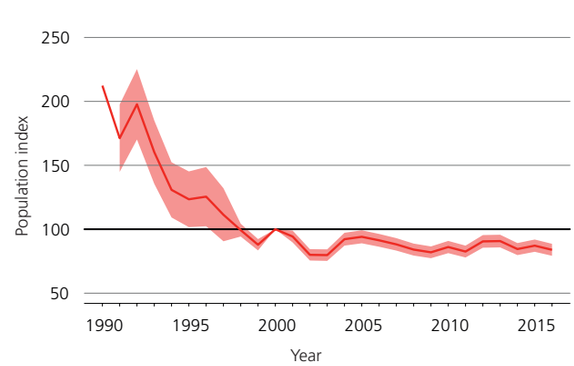
Most squares on the Central Plateau that were occupied by the Tree Pipit in 1993–1996 have now been abandoned. Even then, large parts of the species' original range on the Central Plateau had been deserted. For example, the population in the Canton of Zurich dropped by more than 90 % between 1988 and 2008 [AtZH, 15]. In the Lake Constance region, losses between 1980 and 2010 amounted to more than 95 % [AtBo]. In the part of the Jura that lies in the Canton of Basel-Landschaft, the species has all but disappeared since 1985 [AtBL, 10]. In Europe as a whole, the population is declining rapidly [EBCC]. Neighbouring countries also report negative trends [AtD, AtFL, AtV, 1, 7, 12, 14].

The main reason for the massive decline is the intensified use of meadows (earlier mowing, irrigation, loss of edge structures) that is affecting ever higher regions of the Alps [3, 6, 13]. It is unclear to what extent climate change may be responsible for the slight increase above 1400 m.

Roman Graf

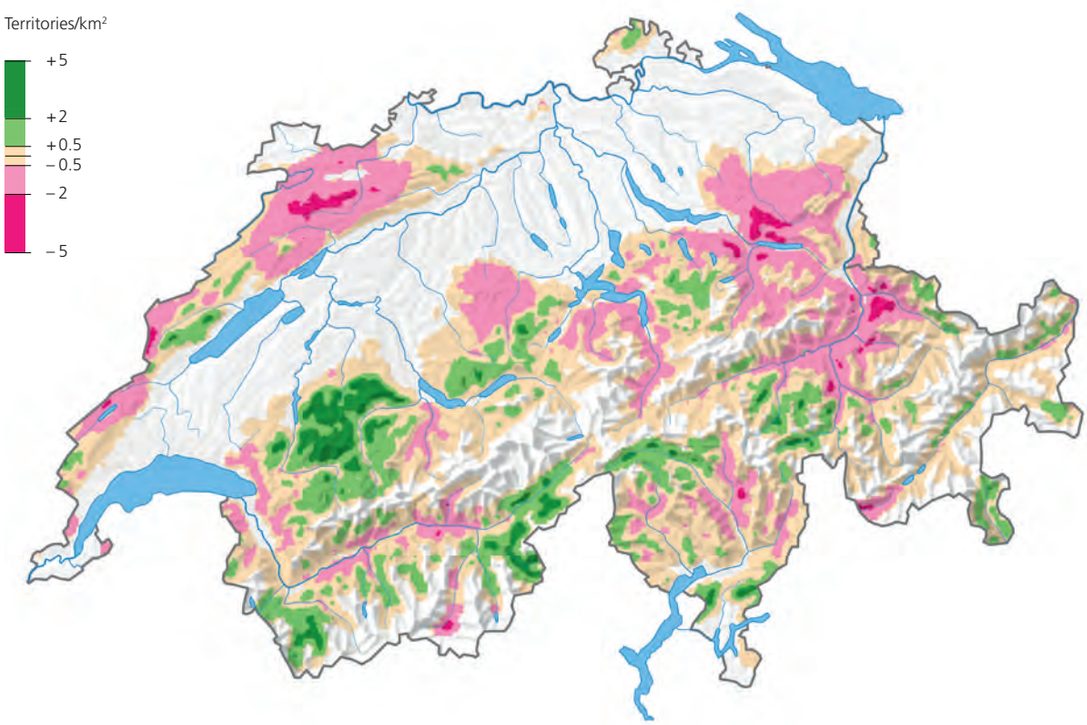
[1] Bauer et al. (2016a); [2] Berger-Flückiger et al. (2008b); [3] Birrer & Graf (2016); [4] Glutz von Blotzheim (2000); [5] Glutz von Blotzheim (2007a); [6] Graf et al. (2014c); [7] Jiguet (2017); [8] Korner et al. (2017); [9] Marti (2014); [10] Martinez & Birrer (2017); [11] Morard (2014); [12] Rete Rurale Nazionale & Lipu (2015); [13] Sierro et al. (2009); [14] Teufelbauer & Seaman (2017); [15] Weggler & Schwarzenbach (2011)





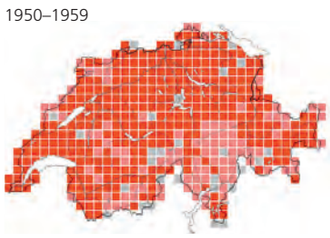
Density 2013–2016

Density change since 1993–1996

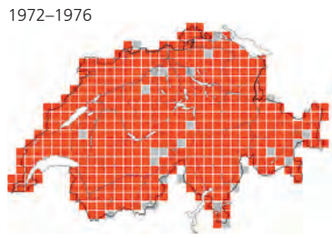


Sponsored by
Christian Bachmann, Mittelhäusern

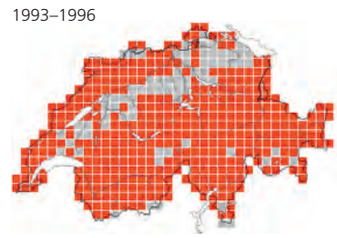
1950–1959



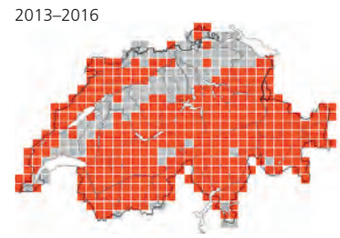
1972–1976



1993–1996



2013–2016



The Alps – a refuge for farmland birds?

While farmland birds came under pressure on the Central Plateau several decades ago, many species continued to maintain substantial populations in mountain areas. But here, too, farming practices are being intensified, and the populations of Whinchat, Eurasian Skylark and others are plummeting.

Alpine agriculture has undergone major changes in the past decades. Many farmers are only able to survive thanks to federal subsidies. But these subsidies sometimes act as catalysts for agricultural intensification. Different amounts for different types of biodiversity promotion areas (BPA) and other details can have unexpected consequences.

The following example illustrates the dilemma: Meadows on fertile soils that traditionally received only small amounts of manure are the preferred habitat of the Whinchat and can be registered by farmers as «low-intensity meadows». However, the subsidies for this type of BPA are relatively low, so many farmers choose to intensify the management of these areas to boost the grass harvest. Consequently, the area of «low-intensity meadows» decreased in mountain regions by 23 % from 1999 to 2016[2, 3]. Farmers still manage to achieve the required percentage of BPA by registering unproductive meadows in the category «extensively used meadows», for which they actually receive higher payments. However, unproductive meadows provide less suitable habitat for the Whinchat.

Subsidies lead in the wrong direction

Between 2003 and 2016, the federal government spent between 83 and 107 million francs per year on soil improvement and farm buildings. Two thirds of the expenditure have been allocated to mountain regions[15]. The funds are used, among other things, to improve road access to cultivated areas. The new roads tend to be wider than the old ones, as subsidies are only granted for roads at least three metres wide. This enables access to remote areas with larger and faster machinery, in many cases leading to intensified land use.

New, publicly funded sprinkler irrigation systems in the central Alps also result in an increase of intensively used meadows[8]. In the Engadine GR, for example, the area of nutrient-poor grassland has shrunk by 20 % in just 25 years[9].

Multiple consequences for breeding birds

Intensification can affect farmland birds in many ways. For instance, each additional processing step causes the death of insects, thus reducing the food supply for insectivorous birds. Insect mortality depends on the machinery used and many other factors. In the case of grasshoppers, mortality during mowing and the subsequent processing often exceeds 80 %[11]. Insect abundance in intensively used meadows is correspondingly low[4]. Moreover, vegetation is denser and less diverse in intensive meadows[5]. The dense cover makes it hard for Eurasian Skylark, Tree Pipit or Red-backed Shrike to access their prey and is therefore unsuitable as a hunting ground. To maximise the protein content of forage for livestock, farmers mow their meadows as early as possible in the year. In the most favourable agricultural locations in the Lower Engadine GR at 1100–1400 m, the introduction of silage allowed for the first cut to advance by 20 days between 1988 and 2002, which corresponds to an average of 1–2 days per year[14]. Only 10 % of this shift is due to changes in climate[17]. Meadows cut so early in the year turn into traps for ground breeders, as the nests, and often the incubating females[10], are destroyed during mowing.

Small-scale structures, despite often being labelled «to be preserved» in land-consolidation projects, obstruct the large modern machines more than they did when bar mowers were used, so rocks, inclines and depressions are levelled and bushes removed. In general, such change is slow and gradual, but the

Roman Graf

Where meadow sage once bloomed in the Engadine GR, nutrient-rich and species-poor grassland now grows thanks to irrigation systems and fertilisation.

Swiss Ornithological Institute

Slurry is applied to Alpine pastures from a pressure tank. An isolated incident or a flaw in the system?

effects accumulate over several decades[6, 13]. A recent development is the use of stone crushers to transform uneven pastures with scattered rocks into intensively used grassland[1]. With the disappearance of small habitat structures, potential nest sites for Woodlark, Northern Wheatear or Tree Pipit are also lost. Now that much of the required forage can be produced on intensively managed areas close to the farm, more remote and less accessible areas are abandoned[7]. The time-consuming and cumbersome maintenance of hedges on terraced land, for example, is neglected. Former thorny hedgerows grow into tall hedges and copses. The narrow strips of grassland in between disappear beneath the woody stems. Meadows are neglected and become overgrown with bushes. For birds that nest in bushes, such as Red-backed Shrike and Common Whitethroat, such a development can have positive or negative effects, depending on the situation.

Peter Hahn

Not all measures for «structural improvement» are legal. In a biosphere reserve in central Switzerland in 2014, drainage ditches several kilometres long were dug into the moorland without a permit.

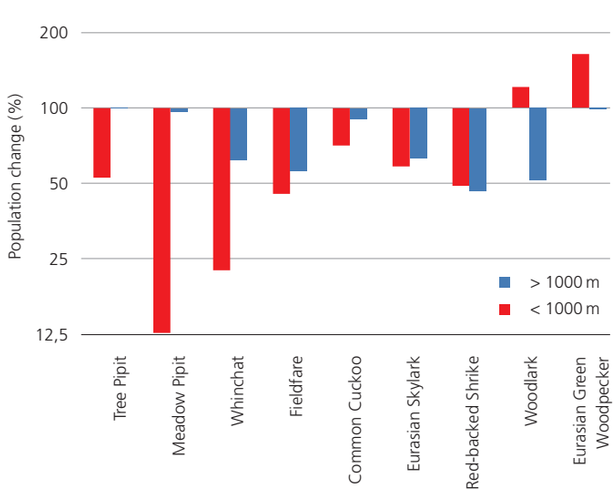
Decline of farmland birds spreads to mountain areas

Against this background it is not surprising that many farmland species have become scarcer not only in the lowlands, but also in the montane and sub-Alpine zones of the Alps, as revealed in several case studies[12, 16] and now shown for the whole of Switzerland in the present atlas. The altitudinal distribution of farmland birds such as Tree Pipit, Meadow Pipit and Whinchat has changed dramatically since 1993–1996.

For certain species, the altitude zone supporting the highest density of territories is now up to 500 m higher in some areas. However, comparing the changes in the number of territories for selected farmland birds below and above 1000 m shows that the picture differs depending on the species: Tree and Meadow Pipit have suffered massive losses in the lowlands, while numbers have remained stable above 1000 m. The Whinchat population has dropped to about 60 % of its former size in mountainous areas, while in the lowlands as little as 20 % of the population remains. Fieldfare and Common Cuckoo have seen similar, albeit less drastic, declines. Eurasian Skylark and Red-backed Shrike populations declined to about the same extent both below and above 1000 m. The Woodlark also suffered losses in mountain areas, while small gains were recorded in the lowlands (especially in vineyards). Finally, the population of the Eurasian Green Woodpecker stayed fairly constant above 1000 m, while almost doubling in the lowlands.

Overall, mountain areas have seen a marked intensification of farming practices, accompanied by a loss of diversity in their bird communities. Measures must concentrate on improvements to agricultural policy. But consumers can make an important contribution to the conservation of mountain birds too, by making a conscious choice to buy food produced on mountain farms in biodiversity-friendly ways.

Roman Graf



Population changes in selected farmland birds below (red) and above (blue) 1000 m. The graph shows the 2013–2016 population size in % of its original size in 1993–1996. 100 % means that the population size remained the same, 200 % that the population doubled from 1993–1996 to 2013–2016, and 50 % that the population halved. The figures are based on the modelled maps for the corresponding survey period.

[1] Apolloni et al. (2017); [2] BLW (2000)/OFAG (2000)/UFAG (2000); [3] BLW (2017)/OFAG (2017)/UFAG (2017); [4] Britschgi et al. (2006); [5] Dietschi et al. (2005); [6] Ewald & Klaus (2009); [7] Ginzler et al. (2011); [8] Graf et al. (2014a); [9] Graf et al. (2014c); [10] Grüebler et al. (2008b); [11] Humbert et al. (2010); [12] Korner et al. (2017); [13] Luder (1993); [14] Müller (2005); [15] Reusser & Riedo (2017); [16] Sierro et al. (2009); [17] Studer et al. (2005)

Species pages 174, 286, 312, 358, 360, 426, 452, 476, 482, 504, 508

Meadow Pipit

Anthus pratensis
Wiesenpieper
Pipit farlouse
Pispola
pivet da prada

Marcel Burkhardt

Red List Vulnerable (VU)
Population 500–800 pairs (2013–2016)

Focus pages 478, 506

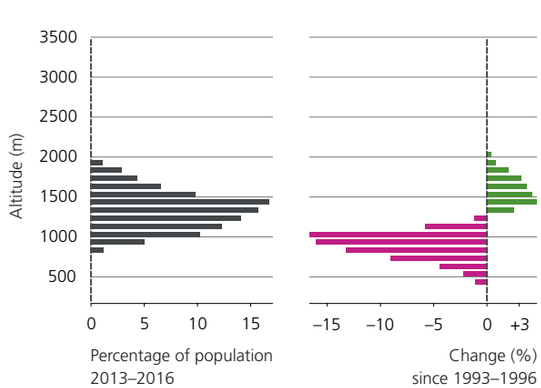
Switzerland lies at the southern edge of the Meadow Pipit's breeding range, with only a few outposts extending further south as far as the Massif Central. The Meadow Pipit inhabits large, low-intensity pastures in the mountains and damp meadows and mires in the Jura and Pre-Alps. Locally, it can reach high densities: 29 territories/km^2 were recorded on the Chasseral BE (A. Bassin). About 90 % of the population breeds between 900 and 1700 m. In 2013–2016, only three sites below 700 m were occupied by singing males; most regularly Grossried/Stans NW at 450 m (R. Furrer). At higher altitudes, a singing male was heard near Kandergrund BE at 2320 m (P. Fässler), and breeding was confirmed near Boltigen FR at 2110 m (D. Hagist).

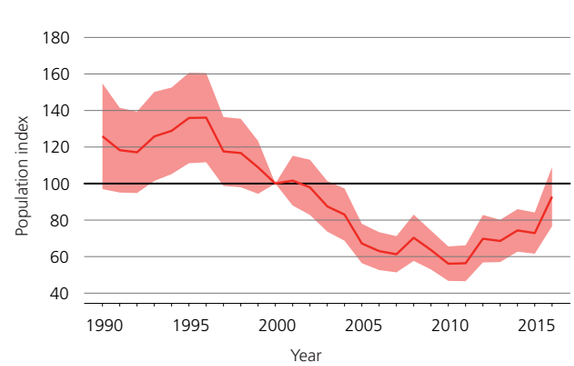
The breeding range expanded significantly between 1972–1976 and 1993–1996, though the gains were partly due to increased observer effort [AtCH2, 9]. Since then, the population has decreased by about 40 %, reaching a low in 2010–2011. The decline since 1993–1996 has occurred mainly at lower altitudes, almost leading to the species' disappearance on the Central Plateau. Many areas in the Jura and Pre-Alps have been abandoned as well. In contrast, mountain populations appear to have increased slightly. It is possible, however, that the presence of the Meadow Pipit was discovered only gradually in some places due to the abundance of the Water Pipit, whose song and habitats are very similar. The population trend at higher altitudes should therefore be interpreted with caution. In France, Germany and Austria, numbers have declined in recent decades [AtD, AtF, 2], though signs of a trend reversal have been noted in France since 2010 [6]. The overall European population has declined considerably since 1993–1996 [EBCC].

Population declines at low and medium altitudes are mainly driven by the intensified cultivation of pastures and mires (heavy grazing, fertilisation, nitrogen deposition) [HBW, 1, 3, 4, 5, 7, 8, 10]. Shrubby and increasingly dry mires are deserted by the Meadow Pipit, as was seen in the Canton of Neuchâtel [AtNE]. Due to Switzerland's location at the range periphery, the Meadow Pipit's response to fluctuations caused by large-scale phenomena, such as climate change, tends to be more pronounced [ClimAt].

Jacques Laesser

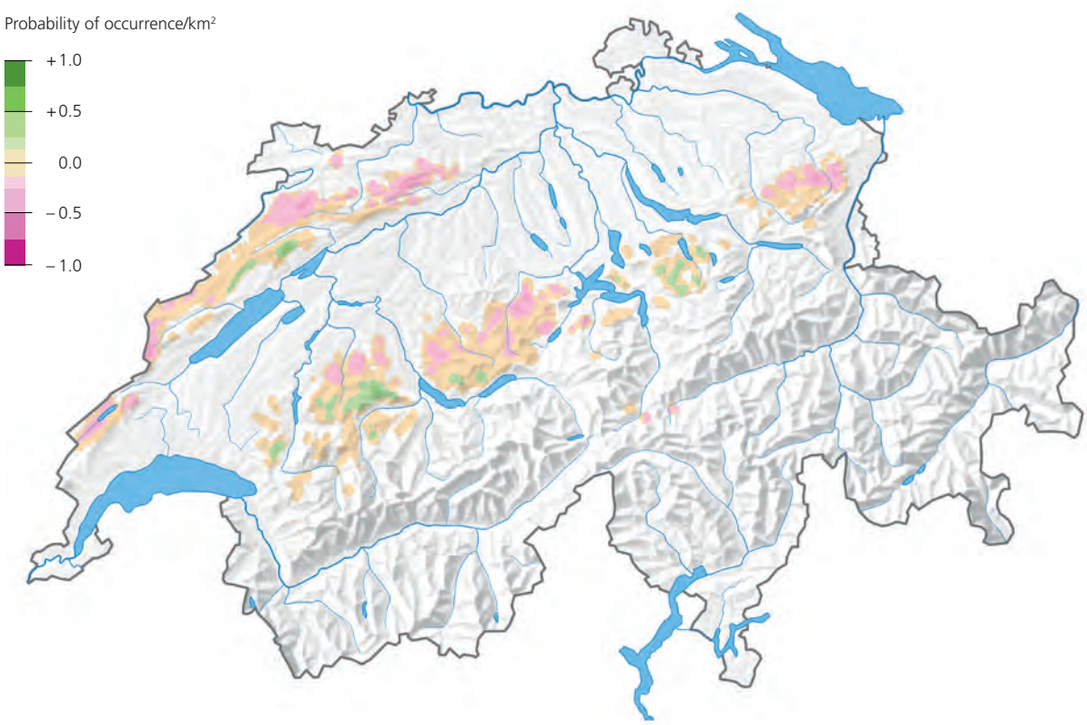
[1] Bauer et al. (2005); [2] Dvorak et al. (2017); [3] Evans et al. (2015); [4] Förschler et al. (2016); [5] Glutz von Blotzheim (2000); [6] Jiguet (2017); [7] Peter (2007); [8] Puchta et al. (2017); [9] Schmid & Denkinger (1997); [10] Vandenberghe et al. (2009)





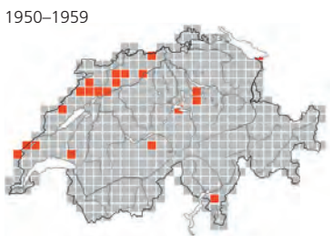
Occurrence 2013–2016

Occurrence change since 1993–1996

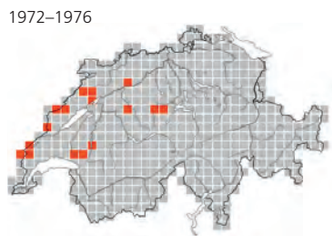


Sponsored by
Martin & Cornelia Conzelmann

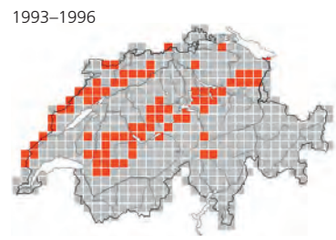
1950–1959



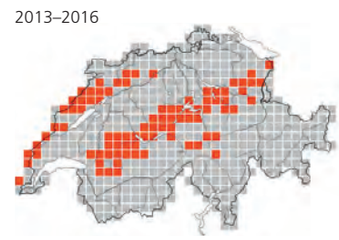
1972–1976



1993–1996



2013–2016



Water Pipit

Anthus spinoletta
Bergpieper
Pipit spioncelle
Spioncello
pivet da muntogna

Dennis Lorenz

Red List Least Concern (LC)
Population 150 000–200 000 pairs (2013–2016)

Focus pages 484, 542

The Water Pipit breeds in the mountain ranges of central and southern Europe. In the Jura, it is only found locally above 1100 m. In the Alps, however, it is the most abundant species above the tree line. Typical habitats are Alpine pastures and dwarf-shrub communities between 1700 and 2700 m, offering a mosaic of damp gullies, marshy meadows, and scattered rocks and perches. Medium densities of more than 20 territories/km^2 only occur between 2000 and 2400 m, mainly in the northern and eastern ranges of the Alps. In prime conditions, large concentrations may form, especially on north-facing slopes with late snowmelt [HVM], reaching densities of more than 60 territories/km^2. Singing males have been observed above 2900 m (e.g. near Randa VS; D. Zollinger) and even up to 3000 m near Zermatt VS [VdS]. Breeding has been recorded up to 2770 m near Sils-Maria GR [VdS] and more recently at 2740 m near Zermatt (C. Huwiler) and Saas-Balen VS (J. Schoop).

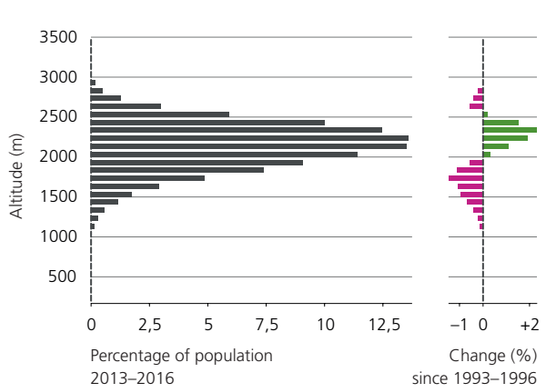
Since 1993–1996, density has increased somewhat between 2000 and 2500 m, but decreased slightly especially below this zone, declining significantly in the Alps of Uri and other northern Alpine ranges in particular. In contrast, density has increased in the Upper Valais and in Grisons. The reasons for these diverging trends are unclear.

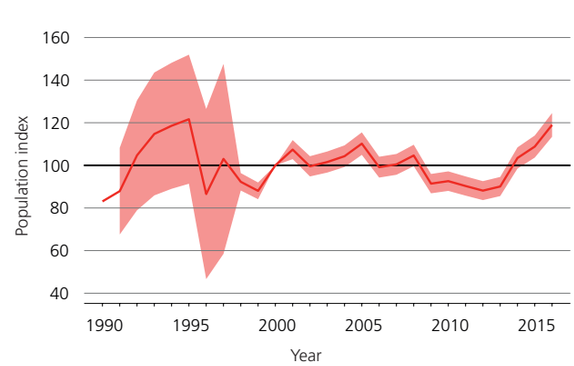
The overall population in Switzerland is stable, though some losses have been recorded on the range margins. For example, the number of occupied atlas squares in the Jura has declined by one third since 1993–1996, leading to the loss of the populations in Solothurn [AN1, 3]. Trends are also negative in the Franche-Comté and Black Forest [AtD, AtF, 2, 4]. In the Alps and Pre-Alps, several pastures at the lower limit of distribution have been abandoned in the past decades [AtV, HVM, VdS, 7, 8].

Switzerland supports one fourth of the European population of the Water Pipit, and therefore has an important responsibility for the species' conservation. The declines at lower altitude are a result of intensified farming practices, fertilisation of pastures, and the abandonment of farmed slopes, and may have been aggravated by climate change [1, 5, 6].

Jérémy Savioz

[1] Bauer et al. (2005); [2] Bauer et al. (2016a); [3] Christen (2017b); [4] Dronneau & les observateurs de la LPO Alsace (2014); [5] Glutz von Blotzheim (2000); [6] Melendez & Laiolo (2014); [7] Rödl et al. (2012); [8] Teufelbauer (2014)



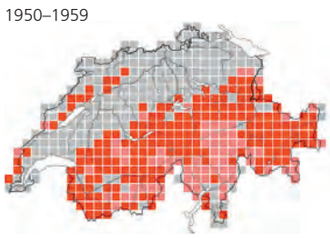


Density 2013–2016

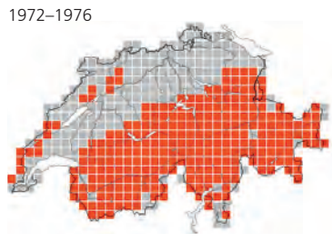
Density change since 1993–1996

Sponsored by
Erich Ramseier

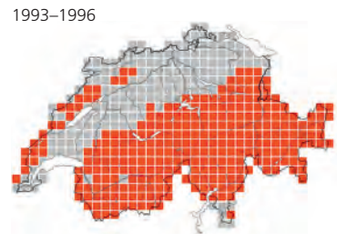
1950–1959



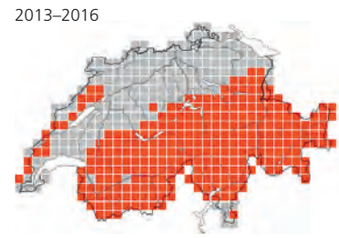
1972–1976



1993–1996



2013–2016



Tawny Pipit

Anthus campestris
Brachpieper
Pipit rousseline
Calandro
pivet cotschnì

Mathias Schäf

Red List Endangered (EN)
Population 1–3 pairs (2013–2016)

Focus –

Beyond the Mediterranean region and southern Europe, the Tawny Pipit has a patchy distribution. In Switzerland, it occupies open and dry habitats. A rare and local breeder, it is found mainly in the Valais, but also in Grisons and Ticino. In 2013–2016, 1–3 territories were recorded annually at various altitude levels, from 660 m in Leuk VS (M. Hammel) to 2350 m on the Ofenpass GR (M. Hochreutener). In 2002, a singing male was even observed at 2500 m in the Swiss National Park GR[VdS]. In Ticino, where the only earlier breeding record dates back to 1976 near Loderio at 360 m[2], the Tawny Pipit occupied a territory on Monte Generoso in 2001 (confirmed breeding)[VdS] and from 2012 to 2014 (G. Sgarbi, G. Mangili)[3, 6, 7].

Given its irregular presence in Switzerland, the species cannot be considered on the rise. Moreover, there have been only three confirmed breeding records since 2001: near Raron VS in 2013 and 2015 (P. Salzgeber, N. Künzle)[4, 7] and near Leuk in 2016[5]. The population trends in neighbouring countries, uncertain in France[AtF] and negative in Italy[1, 8] and Germany[AtD], do not appear to influence the Swiss population. The Tawny Pipit faces habitat loss due to shrub encroachment and nutrient input.

Bertrand Posse

[1] Brichetti & Fracasso (2007); [2] D'Alessandri (1976); [3] Müller (2015); [4] Müller (2016); [5] Müller (2017); [6] Müller & Volet (2013); [7] Müller & Volet (2014); [8] Nardelli et al. (2015)

1950–1959

1972–1976

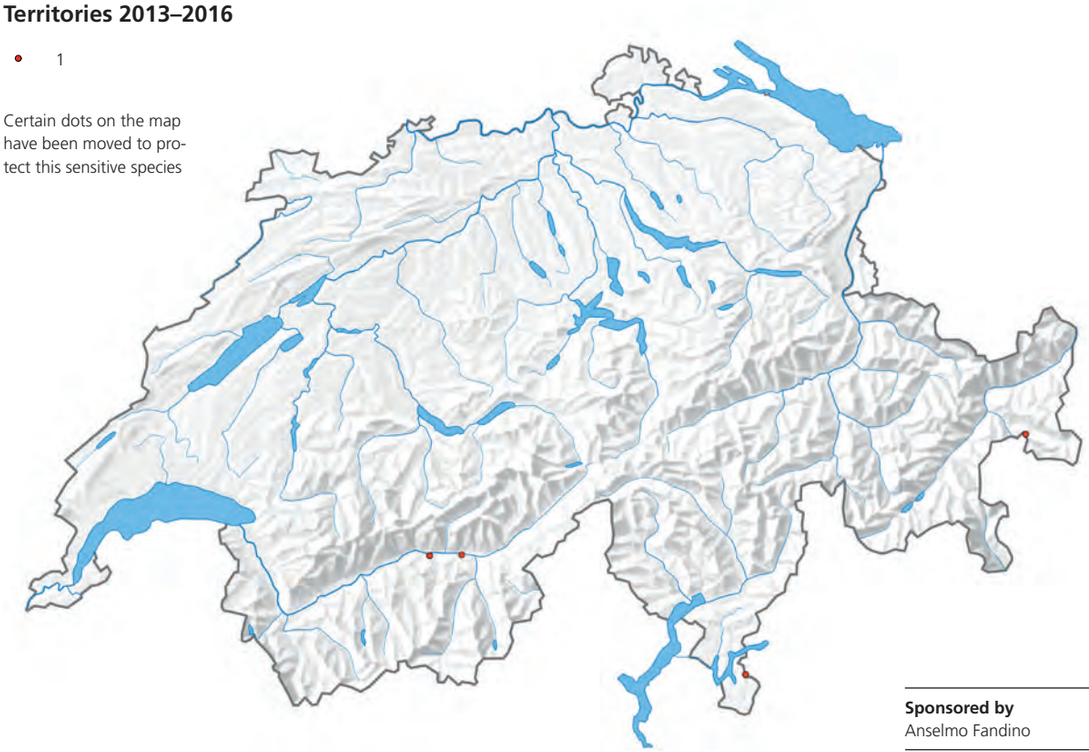
1993–1996

2013–2016

Territories 2013–2016

1

Certain dots on the map have been moved to protect this sensitive species



Sponsored by
Anselmo Fandino

Citrine Wagtail

Motacilla citreola
Zitronenstelze
Bergeronnette citrine
Cutrettola testagialla orientale
ballacua citronella

Markus Varesvuo

Red List –
Population 0 pairs (2013–2016)

Focus pages 369, 420

The Citrine Wagtail occurs mainly in central Asia and the Middle East. Regularly occupied breeding grounds currently extend westward as far as Poland and are continuing to expand[AtD, 1]. The species breeds in sparsely vegetated, swampy meadows and wetlands and the shrub tundra of various altitude levels.

The first breeding record in Switzerland dates from 1980[VdS]. Breeding has been recorded twice since then: in 1997 in the Ägeriried SZ at 910 m[2] and in 2012 in Upper Engadine GR at 1790 m (M. Ernst, C. Müller, C. Schucan, D. Jenny)[3]; the latter case may have been a hybrid brood with another wagtail species. In 2013–2016, breeding was recorded in the Rhine delta A at 400 m: in June 2014, a pair was observed feeding its young on a mud bank with sparse reed and sedge growth between the dams on the Alpine Rhine; the brood was destroyed by flooding, however[4].

Given the continuing range expansion and the growing number of observations in Switzerland, further breeding attempts are likely. Possible breeding sites include montane and sub-Alpine wetlands. As hybrid broods with other wagtails regularly occur in the peripheral regions of the range, particular care should be taken to identify the mate.

Stefan Werner

[1] Draaijer & Slaterus (2011);
[2] Glutz von Blotzheim (1997);
[3] Marques et al. (2013a–b);
[4] Werner (2016)

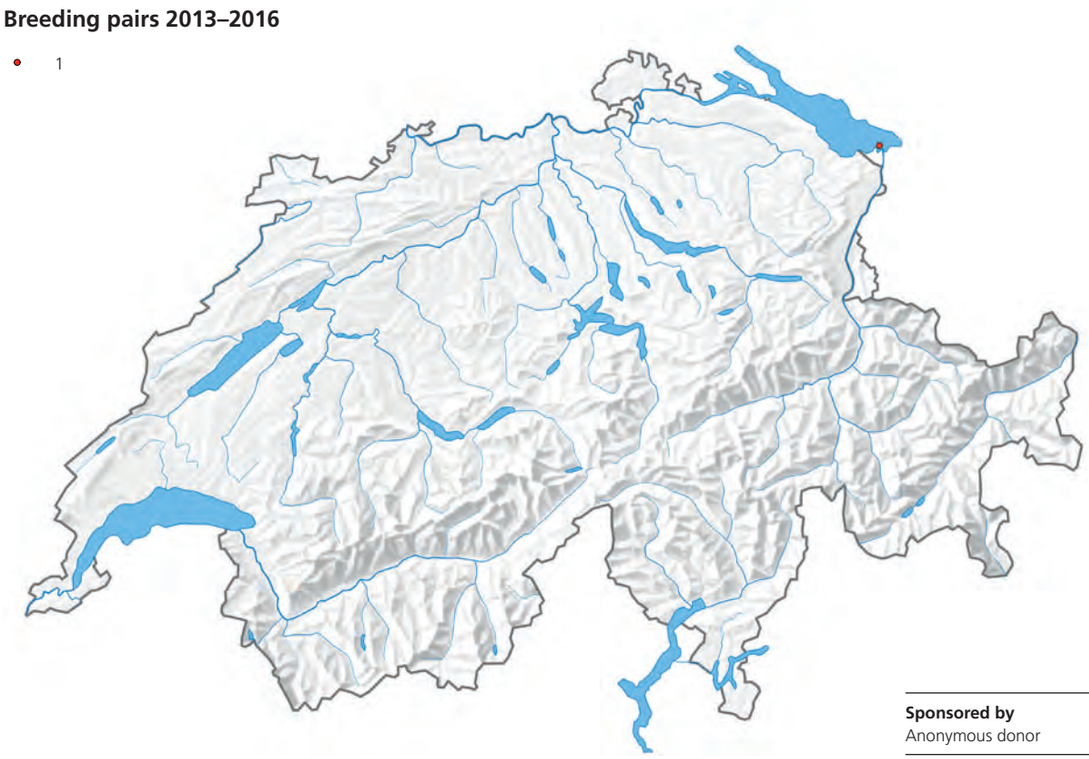
1950–1959

1972–1976

1993–1996

2013–2016

Breeding pairs 2013–2016



Sponsored by
Anonymous donor

Western Yellow Wagtail

Motacilla flava
Schafstelze
Bergeronnette printanière
Cutrettola
ballacua da pastgira

Marcel Burkhardt

Red List	Near Threatened (NT)
Population	300–340 pairs (2013–2016)

Focus pages 319, 428

The Western Yellow Wagtail is a scarce breeding bird in Switzerland. It mainly occurs between Schaffhausen and Untersee, in the Grosses Moos BE/FR, the Orbe plain VD and the lower Rhone Valley VD/VS. Other areas have very small populations or are irregularly occupied. The highest breeding site used to be in Upper Engadine GR at about 1700 m [AEn, VdS]. More recently, breeding in the Alpine region was recorded near Leuk VS and Domat/Ems GR, both at about 600 m.

The nominate subspecies flava mainly inhabits northern and western Switzerland. The Rhone Valley and Ticino are occupied by the subspecies cinereocapilla. Both subspecies occasionally occur beyond their core ranges and mixed broods can ensue [10, 11]. A male showing the characteristics of the subspecies flavissima or lutea bred in the Grosses Moos in 2014 (P. Mosimann-Kampe, M. Thoma, M. Schweizer) [6].

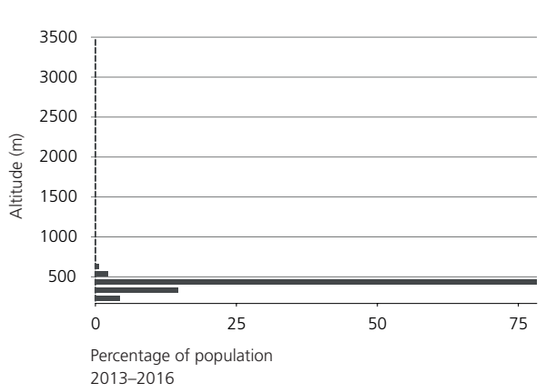
In Switzerland, Yellow Wagtails mainly nest in potato and beet fields where vegetation is not very dense. For breeding to be successful, the fields should not be harvested during the breeding season, but for both the above-mentioned crops, this is generally the case. More rarely, the Yellow Wagtail also uses pea, rapeseed, wheat, sunflower and other fields [1, 5, 7, 9]. On suitable terrain, loose colonies may form.

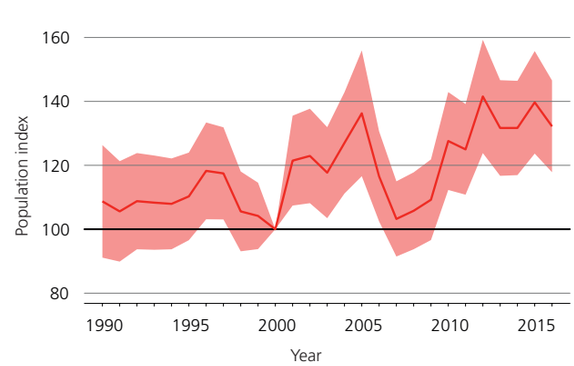
The population in Switzerland fluctuates widely. Following the first breeding record in 1947 [12] the population rose steadily until the 1970s, when the trend reversed in many areas [VdS, AtCH2]. Since 1993–1996, the population has grown again due to positive trends in the Grosses Moos, where the number of territories increased from 25–50 to about 90 [3, 4], and the Orbe plain, where 65 territories were counted. In the Schaffhausen region the population remained largely constant with about 100 territories, but the breeding area near Lake Constance [AtBo], in the Thur Valley TG and the adjacent Canton of Zurich [AtZH] has contracted. The population has grown to about 40 territories in the lower Rhone Valley, while shrinking to a mere few pairs in central Valais, the Canton of Geneva and the Magadino Plain TI [7].

Neighbouring countries show mixed trends. In Germany, there are large regional fluctuations; the population is considered stable in the long term [AtD]. Trends are positive in France and Austria [AtF, RLEU], but negative in Italy [2, 8].

Dominik Hagist

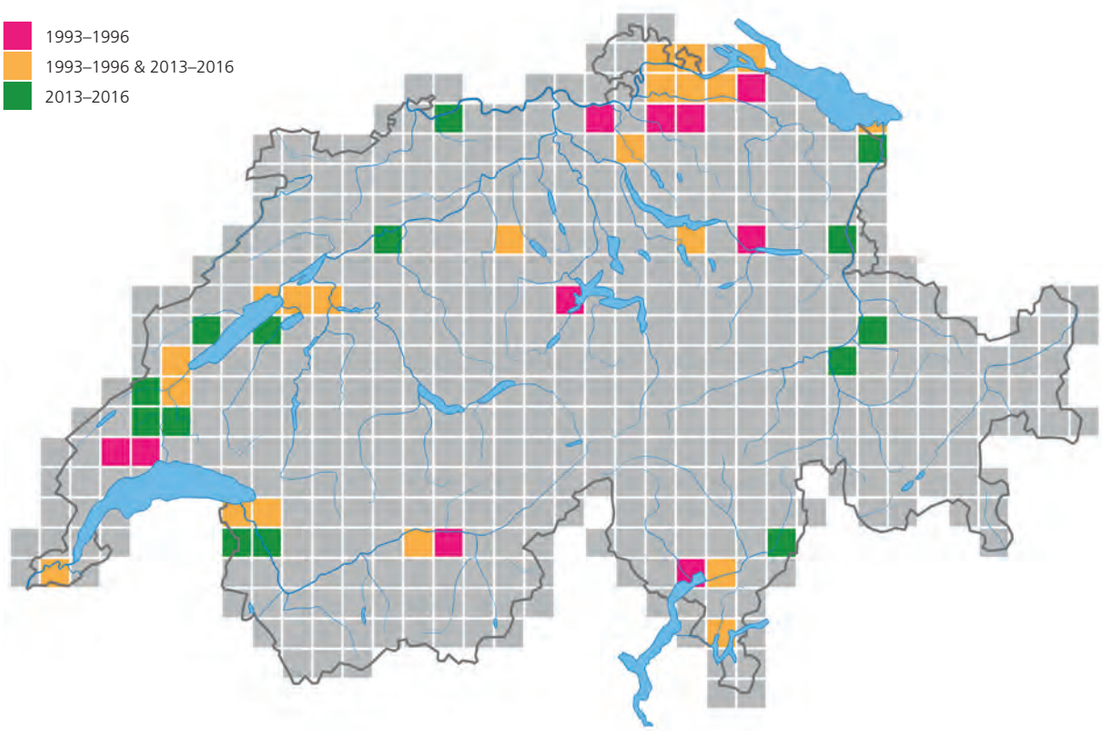
[1] Anthes et al. (2003); [2] Bani et al. (2014); [3] Birrer et al. (2013b); [4] Birrer et al. (2016); [5] Hoessly (2008); [6] Marques & Thoma (2015)/Marques et al. (2015); [7] Python (2006); [8] Rete Rurale Nazionale & Lipu (2015); [9] Schümperlin (1994); [10] Schweizer (2005a); [11] Schweizer (2013); [12] Thönen (1948)





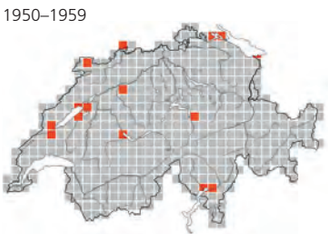
Territories 2013–2016

Distribution change since 1993–1996

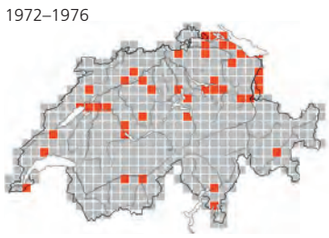


Sponsored by
LGU Liechtensteinische Gesellschaft für Umweltschutz

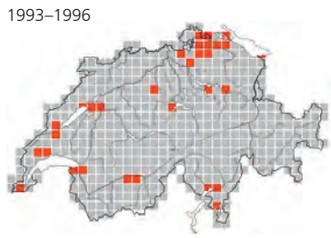
1950–1959



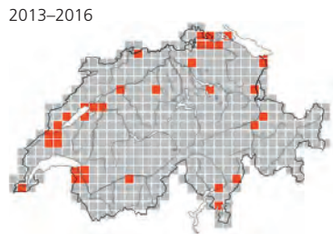
1972–1976



1993–1996



2013–2016



Grey Wagtail

Motacilla cinerea
Gebirgsstelze
Bergeronnette des ruisseaux
Ballerina gialla
ballacua da muntogna

Christoph Meier-Zwicky

Red List Least Concern (LC)
Population 17 000–20 000 pairs (2013–2016)

Focus –

Thanks to Switzerland's dense network of rivers, the Grey Wagtail is found throughout the country. It depends more heavily on rivers and streams than the White Wagtail, but there is normally no direct competition between the two species[7]. Lakes and ponds can be occupied during the breeding season if strong currents are present, like in the Gravatschaweiher GR[AEn]. Most territories lie well below the tree line[1], often about 100 m higher for the second brood than they were for the first[4]. The highest Grey Wagtail nest ever recorded was found near Zermatt VS at 2360 m in 2003[VdS]. More recently, the highest confirmed brood was recorded at 2020 m near Bourg-St-Pierre VS (E. Revaz). However, there have been recent indications of breeding at higher altitudes as well: a bird carrying food was observed in a territory near the Grimselsee BE at about 2600 m (M. Hammel). The highest observation during the breeding season was recorded in the Tödi mountain range GL at 2940 m[BCH]. The highest record of a singing male came from near Samnaun GR at 2630 m (C. Morvan).

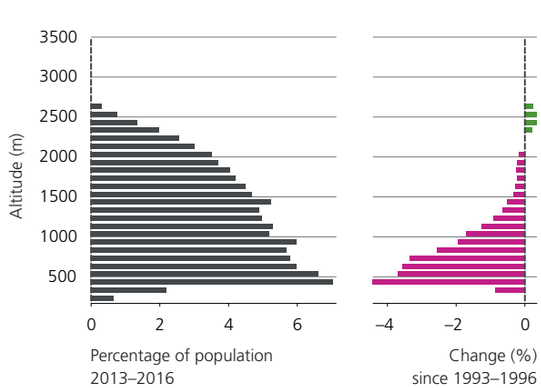
The Grey Wagtail reaches the highest densities in Alpine or Pre-Alpine regions where there is an abundance of streams with gravelly or rocky banks in shady woods or gorges. A 500 m long stretch of water is sufficient to establish a territory[1, 3]. On the Birs River BL, 19 pairs were found on 10.5 km of river; on shorter stretches there were up to 2.5 pairs/km[AtBL]. On a 14 km stretch of the Maira GR, R. Maurizio[AEn] found 28 pairs. Remarkably, six families were counted on a 1.5 km stretch of the Doubs in the Neuchâtel Jura[AtNE].

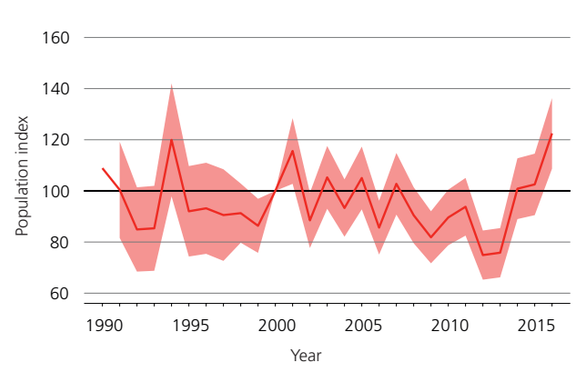
Since 1993–1996, a slight decline has begun to show in some regions where the previous survey recorded particularly high densities, which could be due to methodology. Significant losses have occurred between 400 and 1200 m. Around Lake Constance, however, numbers remained nearly unchanged between 1980 und 2010[AtBo], and there was an increase of 60 % from 1988 to 2008 in the Canton of Zurich, where the Grey Wagtail has reclaimed many stretches of rivers and streams[AtZH].

Like in Switzerland, trends in Germany[AtD], Italy[2, 5] and Europe as a whole[EBCC] are fairly stable with large fluctuations. Numbers in France show a slight decline[AtF], while Austria reports an increase[6].

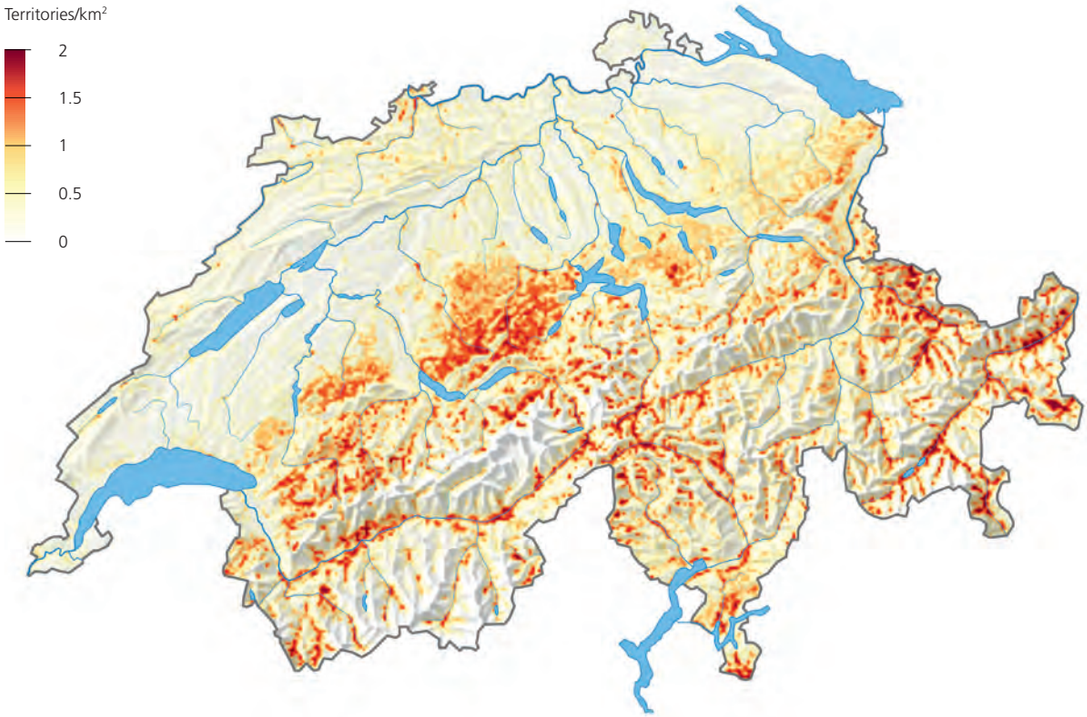
Christian Marti

[1] Breitenmoser-Würsten & Marti (1987); [2] Brichetti & Fracasso (2007); [3] Flöss & Nievergelt (1996); [4] Klemp (2003); [5] Rete Rurale Nazionale & Lipu (2015); [6] Teufelbauer & Seaman (2017); [7] Weber & Hegelbach (1993)





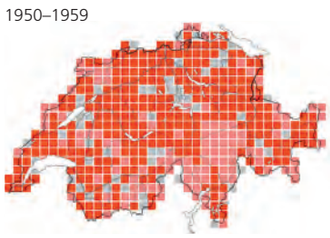
Density 2013–2016



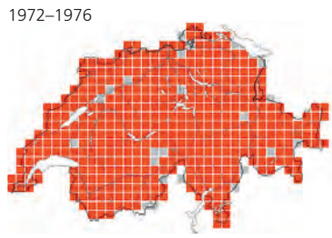
Density change since 1993–1996

Sponsored by
Konrad Eigenheer

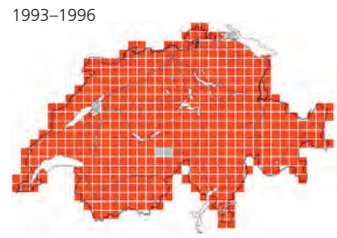
1950–1959



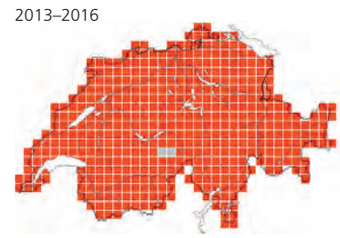
1972–1976



1993–1996



2013–2016



White Wagtail

Motacilla alba
Bachstelze
Bergeronnette grise
Ballerina bianca
ballacua grischa

Mathias Schaf

Red List Least Concern (LC)
Population 90 000–110 000 pairs (2013–2016)

Focus page 170

The White Wagtail is one of Switzerland's most widespread birds. It inhabits a range of open and semi-open habitats, but relies on sparsely vegetated terrain for foraging. The White Wagtail is also found in towns and villages, where it has adapted to use rooftops. It is absent from closed-canopy forests. In the mountains, the White Wagtail occurs up to the highest reaches of the Alps, where it keeps to human structures like mountain huts or tourist infrastructure such as cable car stations. The highest breeding sites were recorded near Zermatt VS at 2590 m (S. Trösch)[3] and Zernez GR at 2540 m (L. Cueni). The highest observation of a singing male came from Bettmeralp VS at 2640 m (B. Wolf).

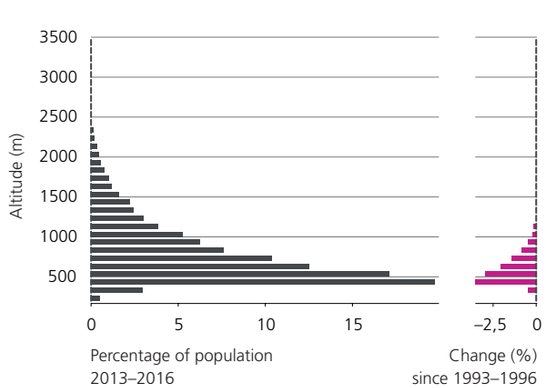
Open landscapes of the Jura, the Alpine valleys and especially the grassland areas of the northern Pre-Alps are very densely populated. The population is most concentrated between 400 and 1000 m.

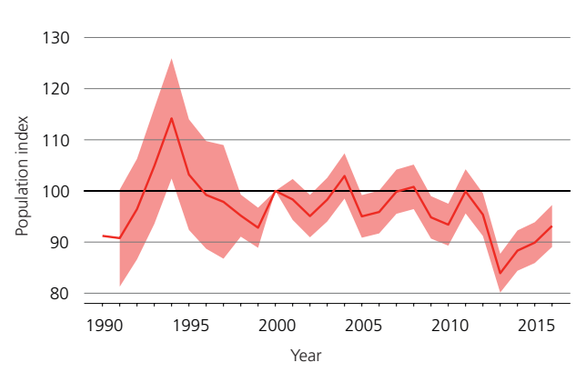
Numbers have decreased slightly since 1993–1996. The largest losses were recorded in central Switzerland, in central parts of the Plateau and in the Upper Valais. But slight declines occurred across large parts of the Plateau. According to the Breeding Bird Index, the atlas survey period 1993–1996 coincided with a population peak, while numbers were at a low in 2013–2016; the downturn was probably caused by cold weather in March 2013, which led to significant declines in other partial migrants as well. The losses since 1993–1996 have most strongly affected the altitude levels with the highest densities. The population around Lake Constance decreased by almost 40 % between 1980 and 2010[AtBo]. The Canton of Zurich registered a slight decline from 1988 to 2008[AtZH].

Trends in Germany[AtD, 1], Austria[5] and Europe as a whole[EBCC] are slightly negative. In France[AtF, 2] and Italy[4], however, numbers are considered stable. Factors that negatively impact the population include the increase in impervious surfaces, loss of nesting niches in buildings due to renovations, the general decline in insects and the decreased accessibility of insects in the denser vegetation created by intensified agriculture.

Simon Birrer

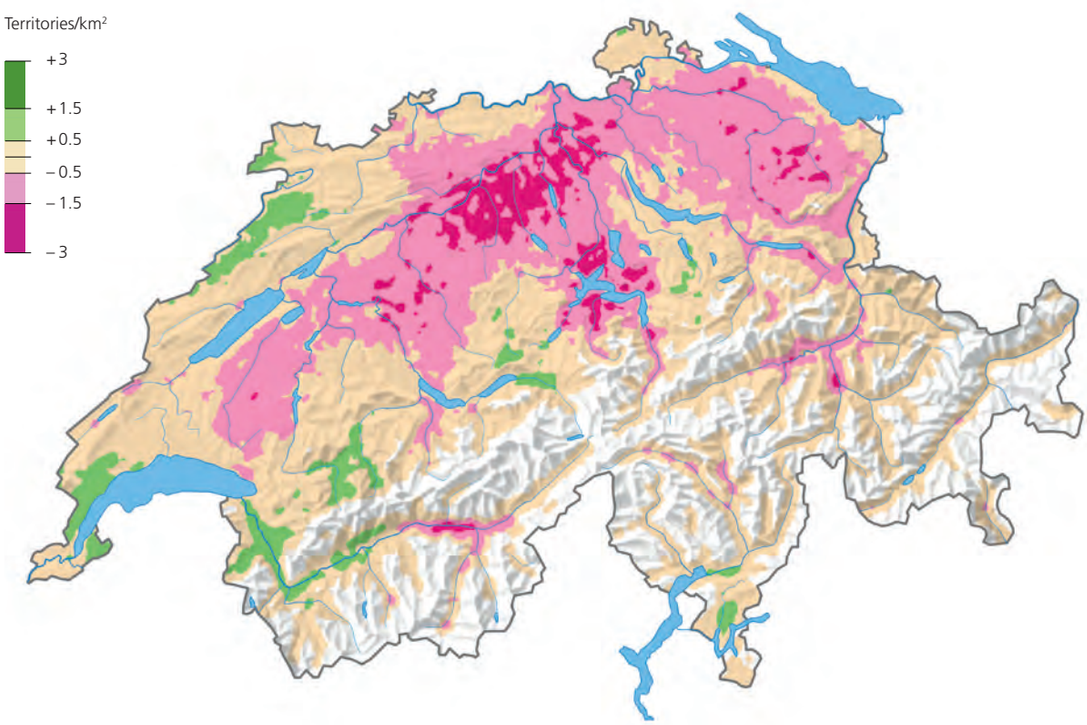
[1] Bauer et al. (2016a); [2] Jiguet (2017); [3] Posse (2014); [4] Rete Rurale Nazionale & Lipu (2015); [5] Teufelbauer & Seaman (2017)





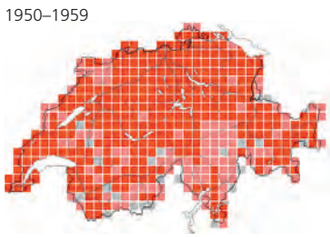
Density 2013–2016

Density change since 1993–1996

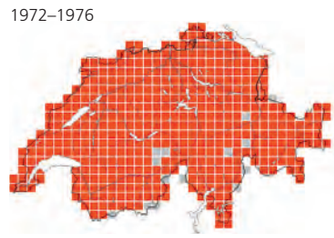


Sponsored by
Cristina D'Acquisto

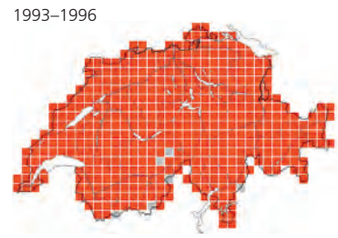
1950–1959



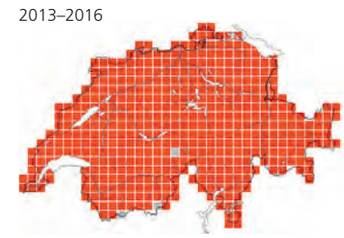
1972–1976



1993–1996



2013–2016



Common Chaffinch

Fringilla coelebs
Buchfink
Pinson des arbres
Fringuello
fringhel

Paul Reinhard

Red List Least Concern (LC)
Population 900 000–1 100 000 pairs (2013–2016)

Focus page 552

In Switzerland, the Common Chaffinch occurs in large numbers at all altitude levels up to the tree line. It remains our most common breeding bird, inhabiting all kinds of forests as well as field copses, orchards, parks and settlements wherever there are trees. The highest densities are reached in the Pre-Alps and the Jura. Interestingly, densities are somewhat lower on the south side of the Alps. In suitable kilometre squares, it is not uncommon to count more than 70 territories. High densities are reached in mixed and beech forests, but also in sub-Alpine spruce and larch forests. The number of territories is significantly higher in woodlands with a large amount of edge and sparse stands than in closed forests [AEn]. The highest confirmed broods were recorded at about 2300 m in the Ofenpass region (D. Godly), as they have been in the past [AEn]. The highest singing male was observed at 2420 m near St. Moritz GR (M. Ernst).

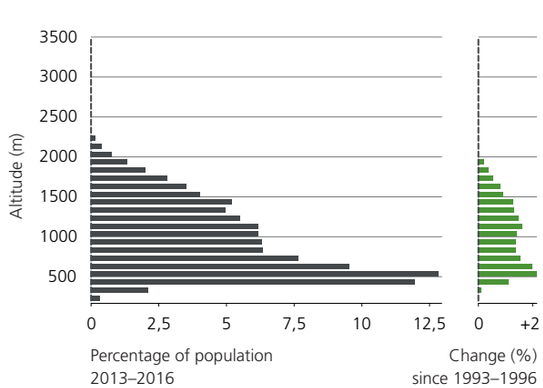
The trend in Switzerland has been slightly positive since 1993–1996. The increase has occurred at all altitude levels but is greater in proportion to population size at medium and high altitudes. Overall, the gains exceed the losses; declines were mainly charted in the central parts of the Plateau and the Jura. Regional surveys report negative trends: numbers dropped by almost 20 % in the Canton of Zurich between 1988 and 2008 [AtZH] and by 24 % around Lake Constance between 1980 and 2010 [AtBo].

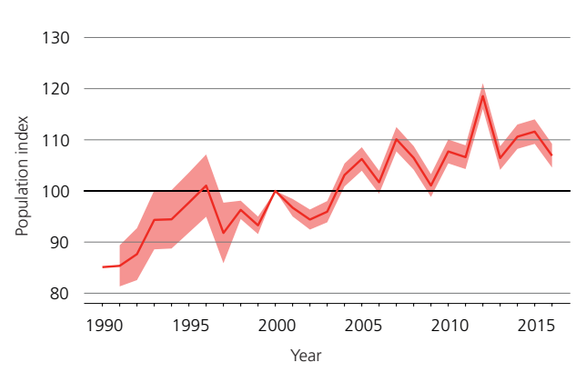
In Europe, the population has been considered stable since 1980. Germany and Austria report a slight downward trend since the late 1990s [AtD, 5]. In France and Italy, however, population trends have been slightly positive since 2000 [AtF, 2, 3].

The regional discrepancies probably have various causes. The increase in forest area and growing stock are thought to have a positive effect. Beech mast years also have a positive short-term impact [1]. The decline in the proportion of spruce trees on the Central Plateau [4] probably has a negative effect, since the highest densities were recorded in spruce forests with beech undergrowth and in mixed forests dominated by conifers [AtD, VdS].

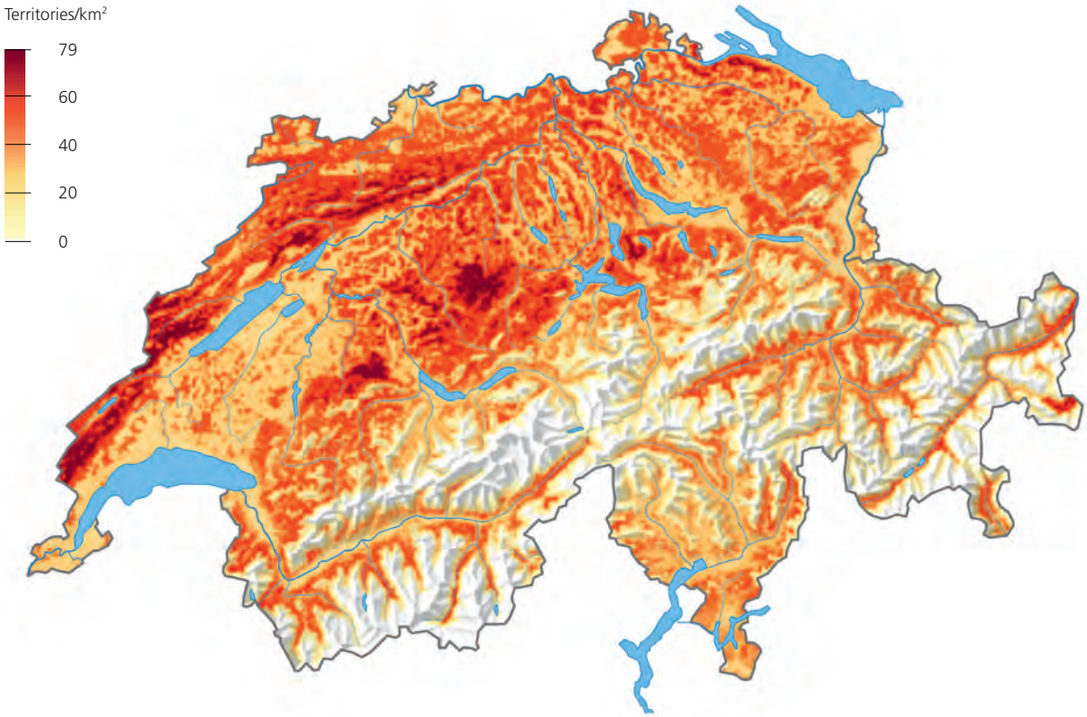
Dominik Hagist

[1] Flade & Schwarz (2004b); [2] Jiguet (2017); [3] Nardelli et al. (2015); [4] Rigling & Schaffer (2015a–d); [5] Teufelbauer & Seaman (2017)

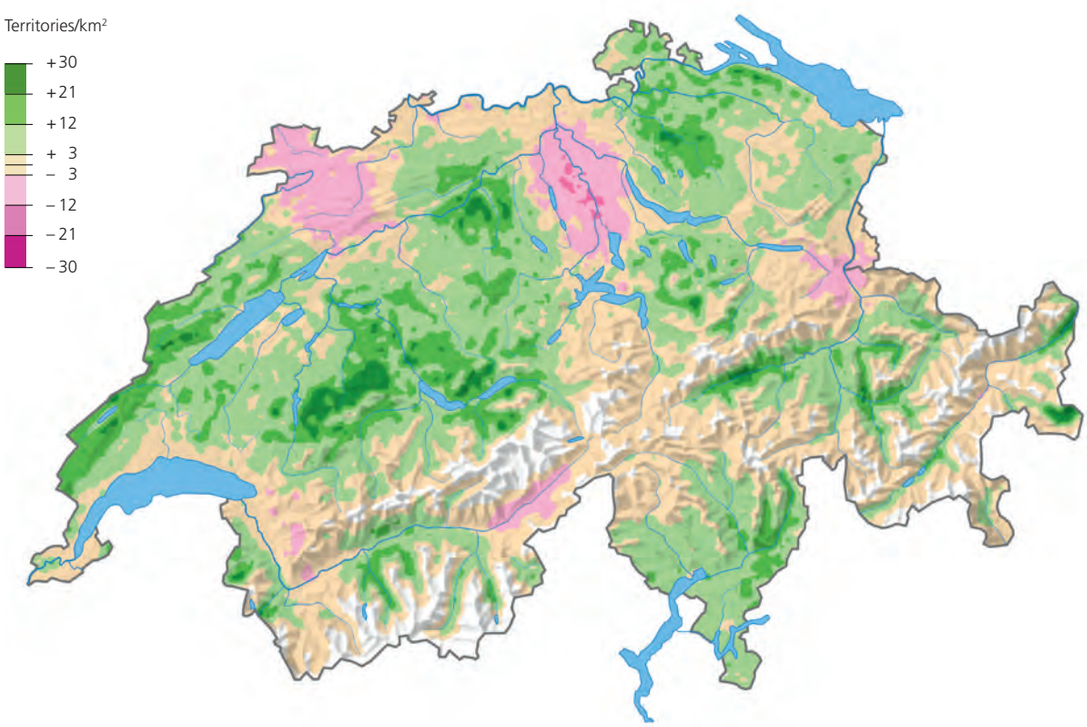




Density 2013–2016

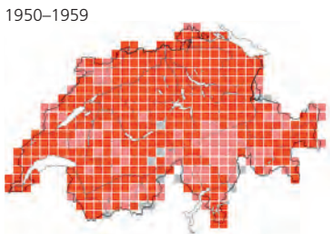


Density change since 1993–1996

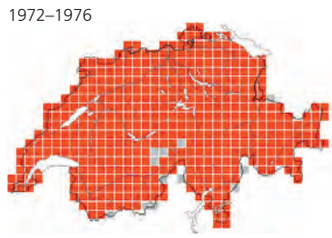


Sponsored by
Margrith Göldi Hofbauer

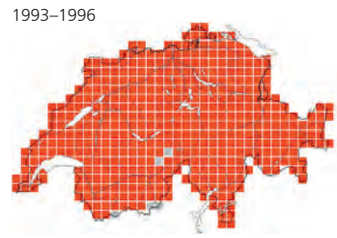
1950–1959



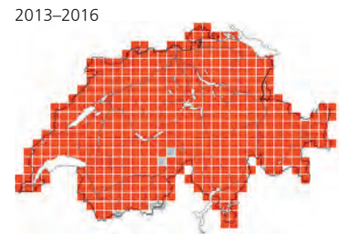
1972–1976



1993–1996



2013–2016



Hawfinch

Coccothraustes coccothraustes
Kernbeisser
Grosbec casse-noyaux
Frosone
smatget

Daniele Occhiato

Red List Least Concern (LC)
Population 13 000–17 000 pairs (2013–2016)

Focus page 314

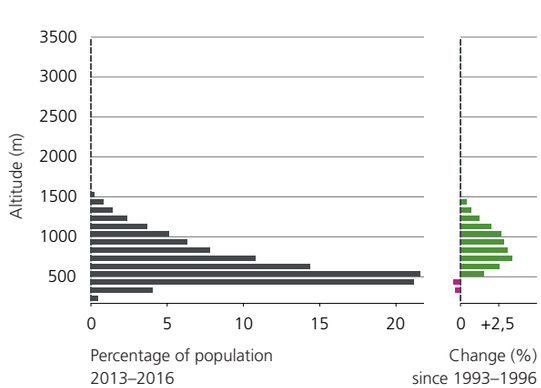
The Hawfinch is a typical bird of deciduous and mixed woodlands, but it also inhabits parks and settlements where there are old stands of deciduous trees. Its range in Switzerland covers the entire Central Plateau, the Jura and the lower-lying areas of major Alpine valleys and the Ticino. The highest densities are reached at the northern edge of Switzerland from the Canton of Jura to Lake Constance and along the southern foot of the Jura. More than 90 % of the population occurs below 1100 m. Above that altitude, it is not clear whether the species' breeding range extends beyond the upper limit of deciduous woods. Two observations near Anzère/Ayent VS at 1950 m in mid-May and early June 2015 (A. Barras)[1], an adult carrying food near Unteriberg SZ at 1580 m in 2016 (M. Hammel) and a family party near Ausserberg VS at 1540 m in mid-June 2015 (M. Hammel) indicate that breeding does occasionally occur at higher altitudes.

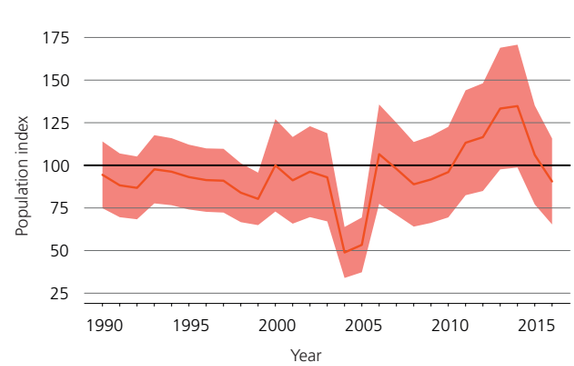
Since 1993–1996 a slight expansion into higher altitudes appears to have occurred in the Pre-Alps, western Jura and Ticino. Numbers increased by about 20 % during this period. The gains occurred primarily in large parts of the Jura and some regions of the Pre-Alps. In proportion to the population at each altitude level, the increase was most pronounced above 700 m. For example, the Hawfinch gradually colonised Haut-Intyamon FR at 750–1350 m between 1986–1991 and 2010–2016[3]. Surveys in the Canton of Zurich recorded a significant decline between 1988 and 1999[9]; numbers subsequently remained stable until 2008[AtZH]. A decline of about 20 % was observed in the Lake Constance area between 1990 and 2010, occurring mainly after the year 2000[AtBo]. The trend is positive in France and stable in Austria, while Germany reports a slight decline[AtD, AtF, 7]. In Europe as a whole, numbers appear to be stable[EBCC].

The Hawfinch may benefit from the increase in deciduous trees in the forests of the Central Plateau[6]. Beech mast years have a positive effect on population size the following year, presumably due to lower mortality in winter[4]. It is unclear whether the spread into higher altitudes is related to improved survey effort, the expansion of forested areas[5, 6], or climate-induced changes in forests[2, 8].

Dominik Hagist

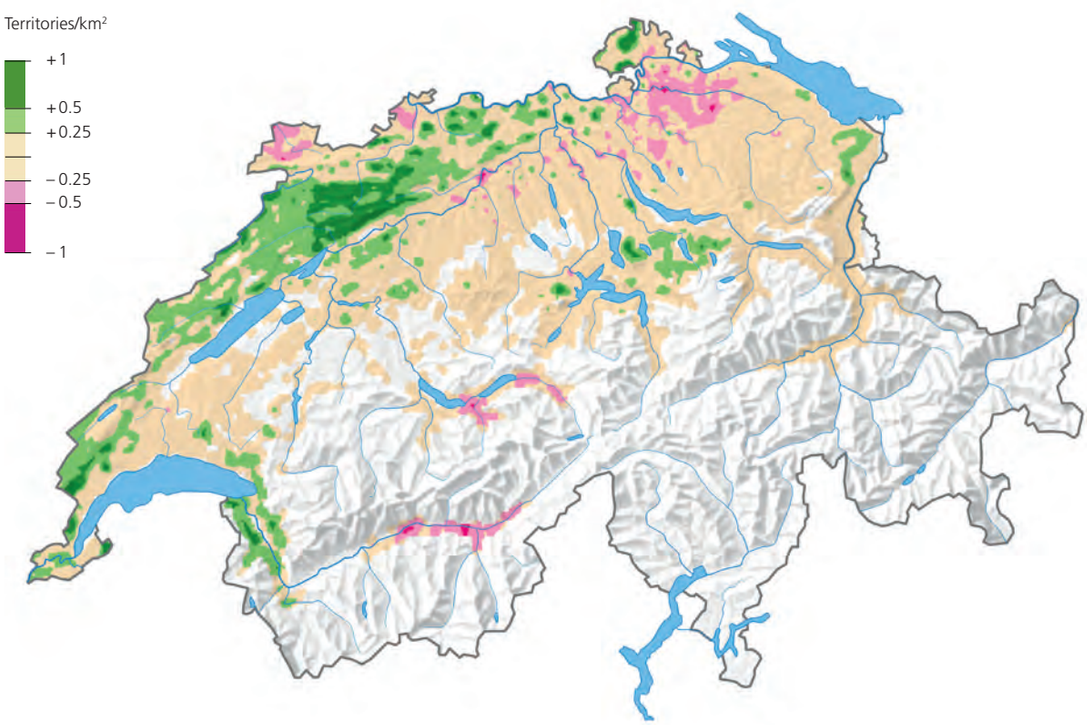
[1] Antoniazza (2016b); [2] Allgaier Leuch et al. (2017a–b); [3] Beaud & Beaud (2018); [4] Flade & Schwarz (2004b); [5] Kirby et al. (2015); [6] Rigling & Schaffer (2015a–d); [7] Teufelbauer & Seaman (2017); [8] Vitasse et al. (2018); [9] Weggler & Widmer (2001)





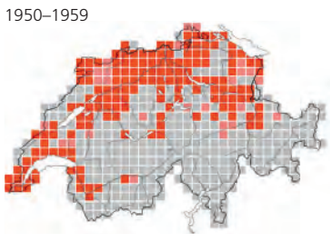
Density 2013–2016

Density change since 1993–1996

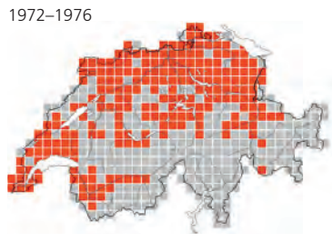


Sponsored by
Chris & Käthi Takken-Sahli

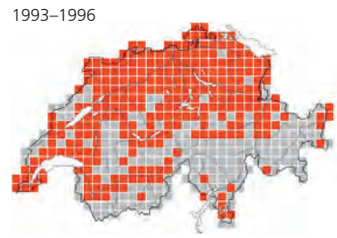
1950–1959



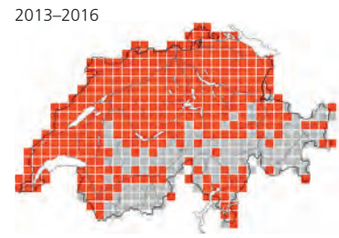
1972–1976



1993–1996



2013–2016



Common Rosefinch

Carpodacus erythrinus
Karmingimpel
Roselin cramoisi
Ciuffolotto scarlatto
carmesin

Ruedi Aeschlimann

Red List Vulnerable (VU)
Population 50–70 pairs (2013–2016)

Focus pages 319, 420

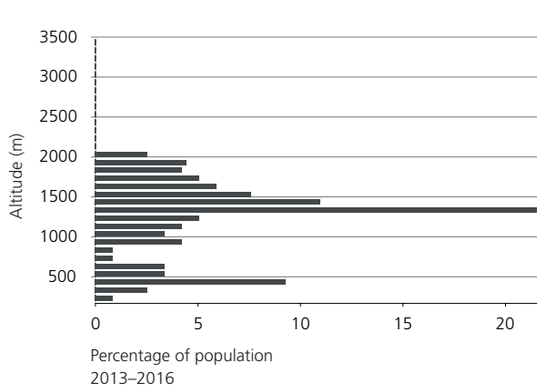
The range of the Common Rosefinch extends eastwards from central and northern Europe, with Switzerland lying at the western limit of distribution. The Rosefinch mainly breeds in the Alpine valleys and around the Furka area, for example in the Obergoms VS and the Urseren Valley UR, as well as in the northern Pre-Alps. Most observations in the lowlands during the breeding season presumably relate to wandering, unpaired males. The Common Rosefinch inhabits semi-open, shrubby meadow landscapes near water, moors or wet meadows, chiefly between 400 and 2000 m. Confirmed breeding records are rare; the highest record comes from Selva GR at 1540 m [AtCH2]. The highest singing males were recorded at 2050 m near Leukerbad VS (D. Zollinger) [3] and at 2020 m near Wassen UR (S. Nussbaumer) and Savognin GR (A. Sonder).

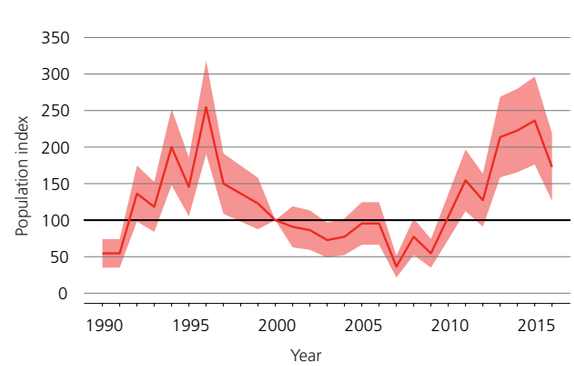
The Common Rosefinch reached Switzerland in 1979 during a westward wave of expansion, with the first breeding attempt occurring in 1983 [VdS]. The number of territories and breeding records increased significantly after 1988. Compared to 1993–1996, the Common Rosefinch was found in several new atlas squares, mainly in central Switzerland, the Bernese Oberland and Valais. Only a few areas in the western Pre-Alps and the Jura remained deserted. The population trend has been more complex, however: after a brief high in 1993–1996 with 26–56 territories, the population declined again to only eight territories in 2007. A similar development was observed during this period in many countries at the western range margin, for example in eastern France [AtF], Germany [AtD] and the Netherlands [1] The population increased again after 2010, and 39–53 territories were counted in 2013–2016.

In Europe as a whole, however, populations continue to decline following the marked increases in the 1990s [EBCC]. The same is true for Austria, where the trend was positive until the late 1990s, but has now reversed [2]. In Vorarlberg, the population was estimated at ten territories in 2001, though there have only been isolated records since 2007 [AtV, 4, 5]. The reasons for these fluctuations are mostly unknown. It is also unclear why the population has increased again in Switzerland in contrast to other areas at the range margin.

Simon Hohl

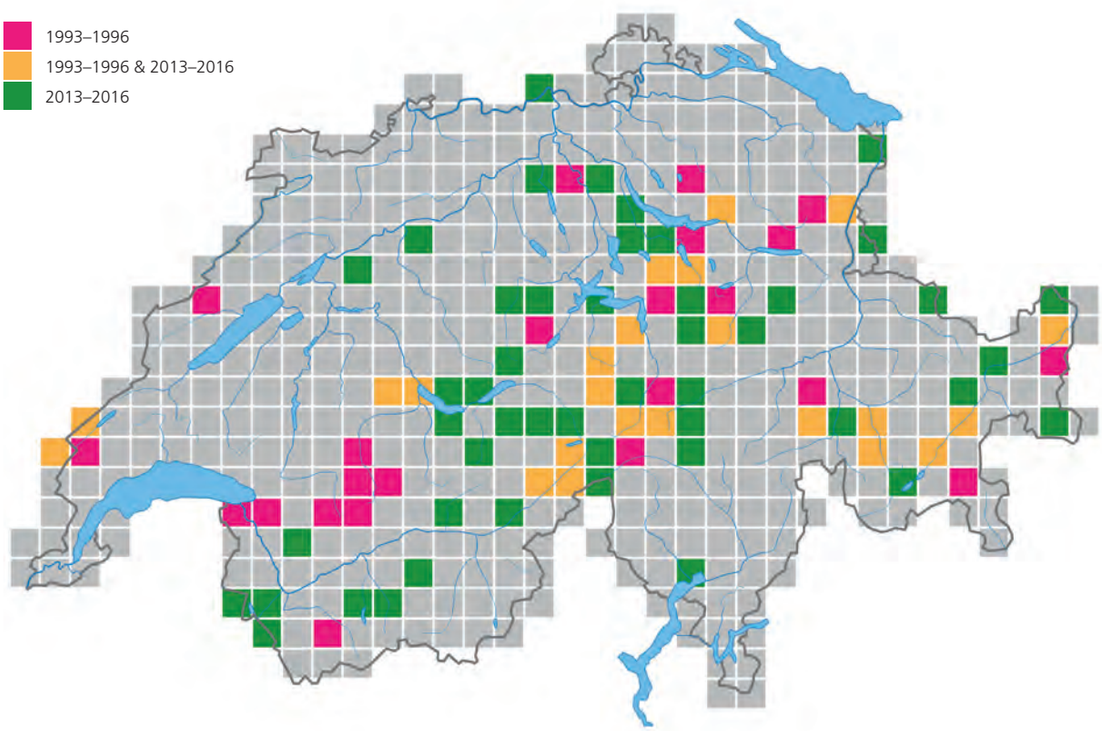
[1] Boele et al. (2015); [2] Dvorak et al. (2017); [3] Posse (2012); [4] Trösch et al. (2010); [5] Trösch et al. (2013a)





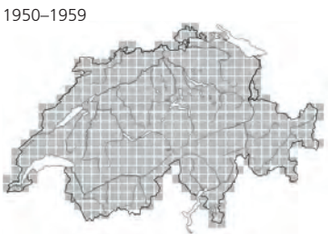
Territories 2013–2016

Distribution change since 1993–1996

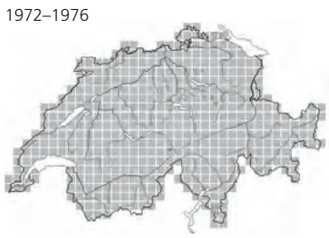


Sponsored by
Anita & René Brunner

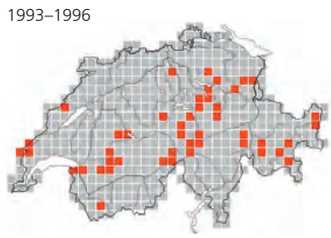
1950–1959



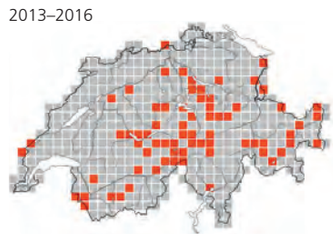
1972–1976



1993–1996



2013–2016



Eurasian Bullfinch

Pyrrhula pyrrhula
Gimpel
Bouvreuil pivoine
Ciuffolotto
prelat

Markus Johannsen

Red List Least Concern (LC)
Population 40 000–75 000 pairs (2013–2016)

Focus –

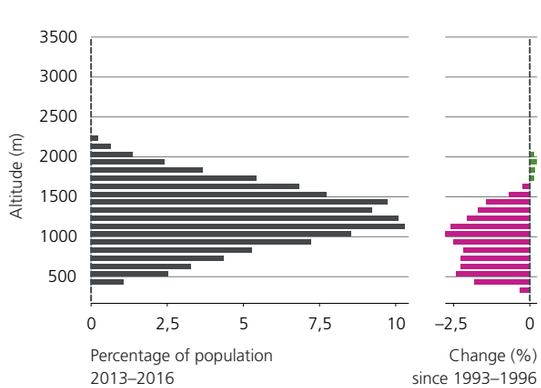
The Eurasian Bullfinch is an adaptable woodland bird that favours conifer-dominated forests with dense undergrowth. Afforested areas, young-growth forest, thickets and clearings are also popular habitats. In some places, the Bullfinch inhabits parks, cemeteries and gardens. It relies on an abundant food supply of buds, seeds and berries. Accordingly, the Bullfinch is much more common in Switzerland's montane and sub-Alpine zones than in the lowlands, with the greatest concentrations between 900–1700 m. High densities are reached mainly in the Jura, along the flanks of the major Alpine valleys and in the Pre-Alps, whereas regions like the eastern Jura, the Randen range SH, the Alpstein massif and western Ticino are quite thinly populated. Like in 1993–1996, the highest broods were recorded around the upper tree line at 2200–2300 m, for example near Tschierv GR (M. Hofer, M. Müller).

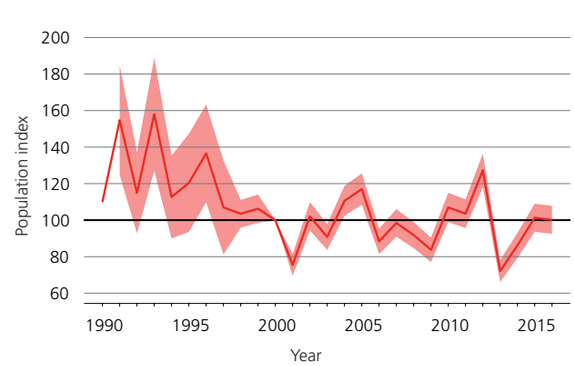
Since 1993–1996, declines have become apparent across large areas, notably in regions with high current densities in the Jura, Pre-Alps and parts of the Alps. Small regional increases occurred in Grisons, northern Ticino and Valais. The shrinking numbers in the lowlands are confirmed by surveys in the Lake Constance area (decline of 82 % between 1980 and 2010) [AtBo], in the Canton of Zurich (decline of two thirds between 1988 and 2008) [AtZH] and in the Canton of Geneva [AtGE].

For 1999–2016, the «Monitoring common breeding birds» scheme shows a stable trend above 1000 m, albeit with large fluctuations, but declines at lower altitudes. A similar picture emerges in France, where a strong expansion in the 20th century is now followed by a renewed decline, notably in the lowlands [AtF]. In Germany, the population is growing in the north, but decreasing elsewhere [AtD]. The trend is positive in Austria [5], but negative in Italy [2] and in Europe as a whole [EBCC]. The reasons for these marked increases and declines are not yet well understood. In the lowlands, the decline may be partly due to the fact that forestry measures to support spruce and other conifers have been reduced [1]. At a larger scale, habitat changes, climate warming and the recovery of Eurasian Sparrowhawk populations may play a part [AtF, ClimAt, EBBA1, VdS, 3, 4].

Hans Schmid

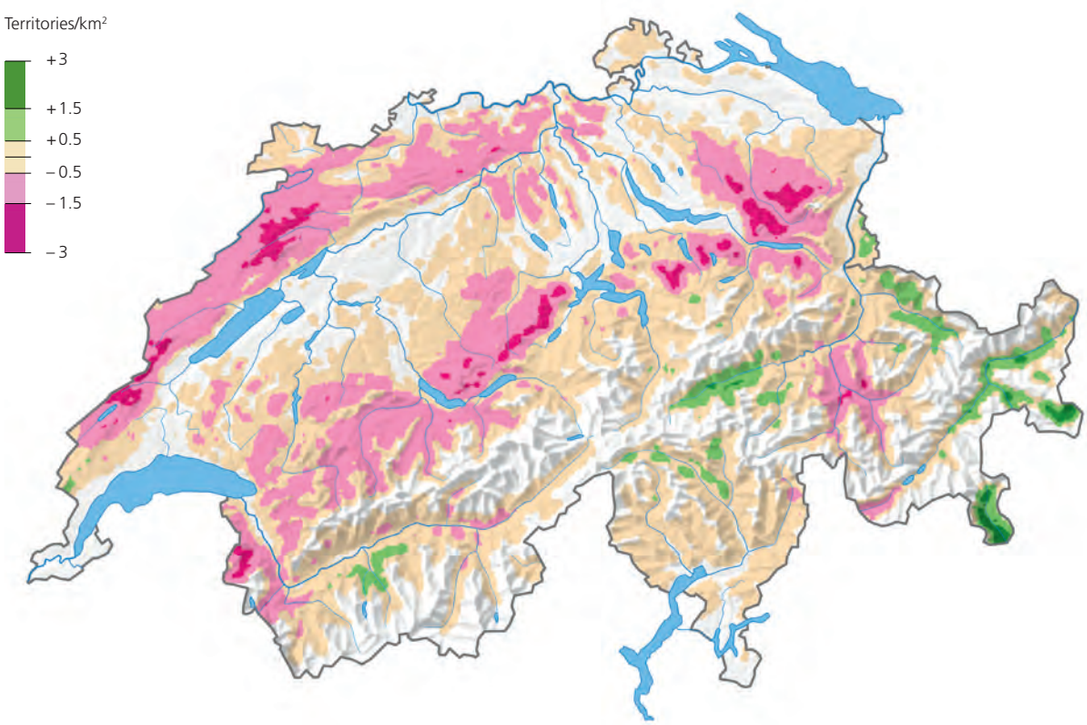
[1] Rigling & Schaffer (2015a–d); [2] Campedelli et al. (2012); [3] Marquiss (2010); [4] Proffitt et al. (2004); [5] Teufelbauer & Seaman (2017)





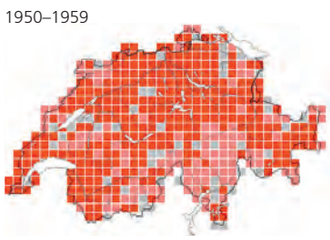
Density 2013–2016

Density change since 1993–1996

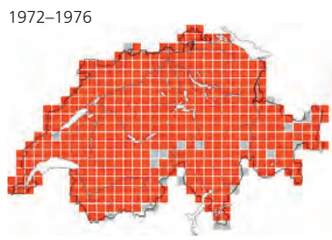


Sponsored by
Felix Girod & Beatrice Dollinger
Claude & André Huguet, Grand-Lancy
Liselotte & Hans Heinrich Siegrist, Muhen

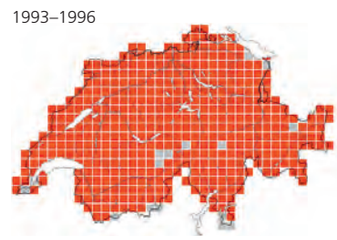
1950–1959



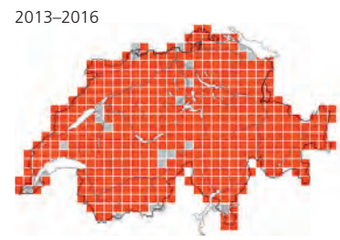
1972–1976



1993–1996



2013–2016



European Greenfinch

Chloris chloris
Grünfink
Verdier d'Europe
Verdone
verdaun

Sandra Schweizer

Red List Least Concern (LC)
Population 90 000–120 000 pairs (2013–2016)

Focus –

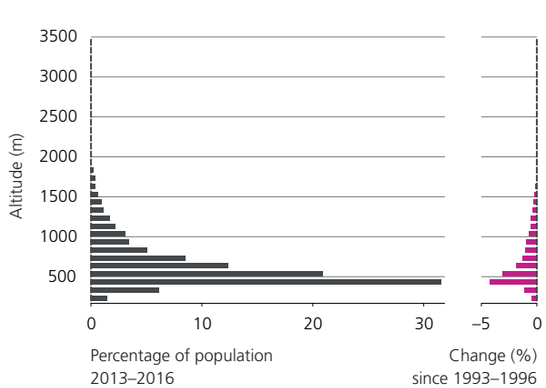
As a species closely associated with human settlements, the European Greenfinch occurs mainly in towns and villages of the Central Plateau with park-like green spaces, gardens, tree-lined avenues, single trees, hedges and green facades. In these areas, suitable kilometre squares regularly accommodate 15 territories and more. The Greenfinch also breeds in copses and on woodland edges, but rarely in closed forest. Because it builds its nest in trees, shrubs and climbing plants that provide good cover, evergreen shrubs often serve as nest sites for early broods, while later ones may occur in deciduous shrubs[HVM]. Only 10 % of the population inhabits areas above 1000 m. The highest breeding records are of families with begging chicks near Hérémence VS at 1950 m (E. Widmann) and near Arosa GR at 1930 m (J. Jelen). The highest singing male was observed by C. Huwiler near Zermatt VS at 2230 m.

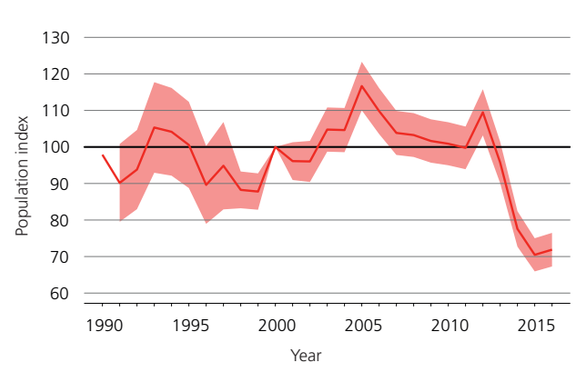
The Swiss population has fluctuated with no clear trend since 1990, but collapsed by 40 % after 2012. The expansion into higher altitudes has lost momentum since 1993–1996. Density has increased slightly in the Lake Geneva region, central Valais and southern Ticino, while decreasing somewhat in eastern Switzerland and in the core areas around Zurich and Basel. This matches the decline by 10 % recorded in the Canton of Zurich from 1988 to 2008[AtZH]. Around Lake Constance numbers declined by as much as 40 % from 1990 to 2010[AtBo]. All neighbouring countries report negative trends; declines have become more pronounced in Austria since 2011[AtD, AtF, 13, 15]. The overall European trend is fairly constant[EBCC]. In the Netherlands, by contrast, the population increased by 50 % during 2000–2010[1].

One of the reasons for the current decline in Switzerland presumably lies in poor breeding success during the cold and wet spring of 2013. Disease caused by the parasite *Trichomonas gallinae*[14], first diagnosed as the probable cause of death in Greenfinches in 2012, could prove to be more serious. The parasite emerged in the UK in 2005[4, 9], followed by northern Germany, southern Fennoscandia and Estonia[3, 8, 10, 11], and was detected in Austria and Slovenia from 2012[2]. Since 2005, the UK population has been decimated by more than 60 %[7, 12], while numbers in Finland have dropped by about 70 %[5, 6]. A similar scenario cannot be ruled out for Switzerland in the near future.

Johann von Hirschheydt

[1] Boele et al. (2012); [2] Ganas et al. (2014); [3] Hõrak & Männiste (2016); [4] Lawson et al. (2012); [5] A. Lehikoinen, pers. comm.; [6] Lehikoinen et al. (2013); [7] Massimino et al. (2017); [8] Neimanis et al. (2010); [9] Pennycott et al. (2005); [10] Peters & Ludwichowski (2010); [11] Peters et al. (2009); [12] Robinson et al. (2010); [13] Rete Rurale Nazionale & Lipu (2015); [14] Teubenbacher (2017a); [15] Teufelbauer & Seaman (2017)



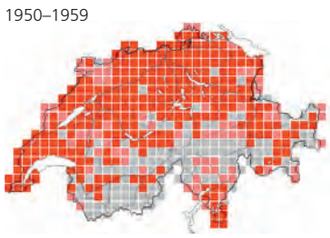


Density 2013–2016

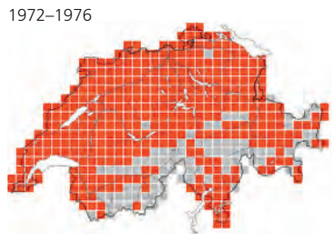
Density change since 1993–1996

Sponsored by
Susanna Komenda-Zehnder

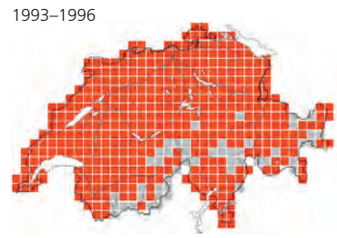
1950–1959



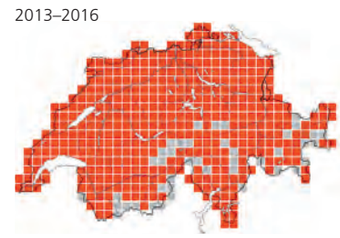
1972–1976



1993–1996



2013–2016



Common Linnet

Linaria cannabina
Bluthänfling
Linotte mélodieuse
Fanello
chanvalin

Mathias Schäf

Red List Near Threatened (NT)
Population 25 000–30 000 pairs (2013–2016)

Focus pages 276, 532

The Common Linnet occurs throughout Switzerland. Distribution is concentrated in the Pre-Alps, the Lake Geneva region as well as parts of the Jura and central Alps. Large parts of the Central Plateau and Ticino are only sparsely populated. The Linnet inhabits open and semi-open landscapes, including those created by humans such as vineyards, farmland and ruderal habitats. The majority of the population breeds on farmland between 400 and 600 m and in semi-open habitats between 1400 and 2200 m. In suitable kilometre squares, it is not uncommon to count eight territories and more. The highest breeding was recorded at 2390 m near Albinen VS (B. Guibert). Singing males have been observed up to 2640 m near Bourg-St-Pierre VS (J.-L. Carlo).

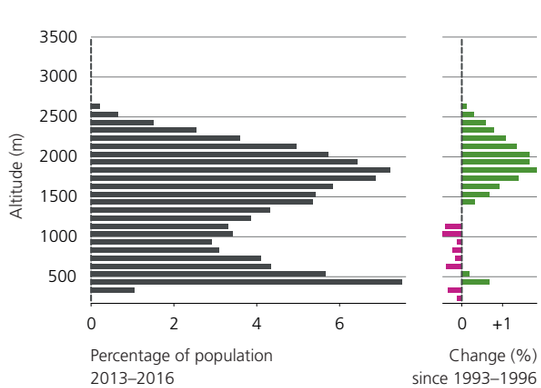
Since 1993–1996, the Common Linnet has abandoned large parts of the Central Plateau beyond Lake Geneva. Steep declines were recorded in the Canton of Zurich between 1988 and 2008 (–68 %) [AtZH] and around Lake Constance between 1980 and 2010 (–91 %) [AtBo]. Substantial gains since 1993–1996 were seen in the Pre-Alps, resulting in a rise in density between 1500 and 2500 m, and in the Lake Geneva region. Declines mainly occurred in the Jura and below 1500 m.

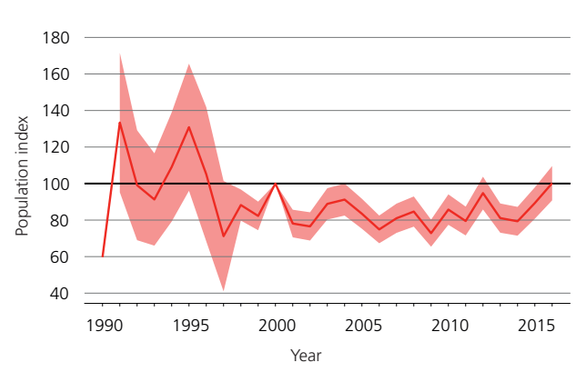
The population trend in Switzerland has remained fairly constant since 2000. This is presumably due to the fact that a large part of the population occurs at higher altitudes where it has been less affected by intensification than the lowland population, which has suffered significant losses. In Europe, the Linnet population has dropped by about half since 1994 [EBCC]. Neighbouring countries also report steep declines [AtD, AtF, 2, 8, 9].

The Common Linnet is threatened by agricultural intensification, pesticides and the loss of ruderal and pioneer habitats [VdS, 2]. In the lowlands, the species continues to occupy farmland managed at low intensity [AtCH2, AtGE, 3], but declines have been recorded here as well [7, 10]. In contrast, the population is increasing in areas dominated by vineyards. Above 1500 m, the Linnet presumably benefits from the emergence of shrub forest [1, 4] and from grazing [6]. However, the continuing intensification of agriculture has begun to cause declines at higher altitudes as well [5].

Livio Rey

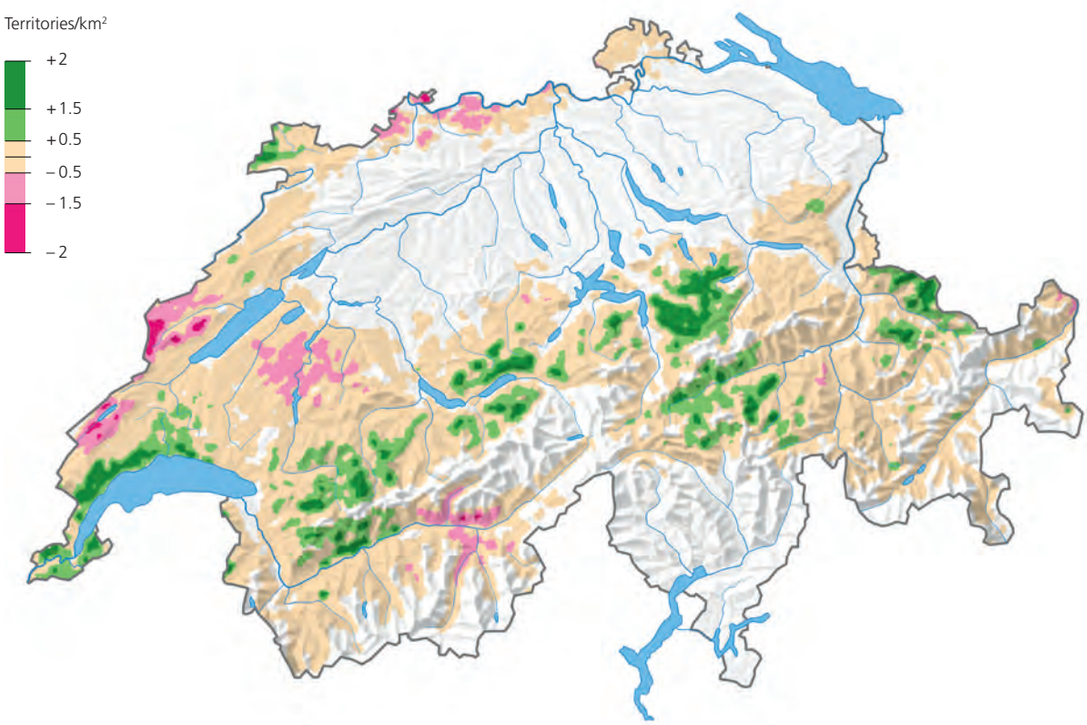
[1] Bauer et al. (2005); [2] Bauer et al. (2016a); [3] Birrer et al. (2007a); [4] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [5] Korner et al. (2017); [6] Laiolo et al. (2004); [7] Martinez & Birrer (2017); [8] Rete Rurale Nazionale & Lipu (2015); [9] Teufelbauer & Seaman (2017); [10] Weggler & Schwarzenbach (2011)





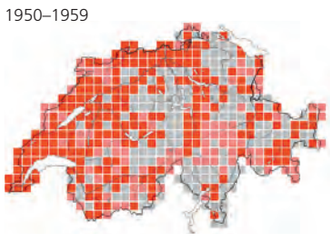
Density 2013–2016

Density change since 1993–1996

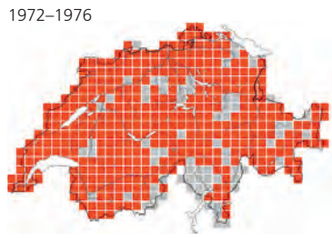


Sponsored by
André Ducry & Esther Dähler

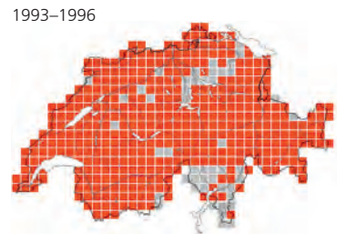
1950–1959



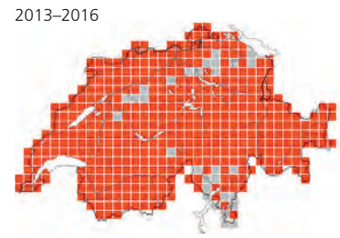
1972–1976



1993–1996



2013–2016



The rich birdlife of vineyards

Woodlark, Cirl Bunting, Eurasian Wryneck, Common Hoopoe and Common Linnet – despite intensive cultivation methods, vineyards provide habitat for these rare birds. Hedges and patchy ground vegetation between the vines benefit birds both in the summer and in the winter months.

Sunny slopes with southern exposure at low altitudes, influenced by a continental climate, offer the best conditions for winegrowing in Switzerland. Although grapes were already grown in Valais some 2000 years ago, the 20th century in particular saw a significant expansion of viticulture. Natural habitats such as rocky steppes and dry, open woodland, but also traditionally managed land (traditional orchards, low-intensity meadows and pastures) disappeared to make way for vineyards. Today, row upon row of vines dominate the landscape in many areas, especially in the dry, inner-Alpine valleys (Valais, Rhine Valley), around Lake Geneva and on the southern slopes of the Jura. About 157 km^2 of land is classified as vineyards, or about 1.5 % of agricultural land[5]. But despite the small surface area and often intensive cultivation methods, vineyards can be important local habitats for rare birds.

Valuable landscape elements in vineyards

Dry-stone walls, free-standing bushes, low hedges and patches of dry, species-rich grassland are important habitat structures for birds whose declining population trend makes them candidates for special conservation projects. Examples of these priority species are Common Redstart and Red-backed Shrike[2, 3, 9, 10]. However, the landscape elements alone are often insufficient to promote populations in an effective way. Only when combined with sustainable and biodiversity-friendly cultivation practices can their positive effects take hold. On the plots themselves, species-rich ground vegetation with an abundant supply of insects for food is the most important measure to promote biodiversity, which in turn requires reducing the use of herbicides. Woodlark and Common Linnet are typical breeding birds that have benefited from the increased ground vegetation in vineyards in recent decades.

Julien Mazenauer

Small habitat structures (dry-stone walls, hedges, rocky steppe) promote birdlife in winegrowing regions.

Laura Bosco

Several bird species benefit from partial ground cover both in the summer and in the winter months.

Ralph Martin

Vineyards are the most important habitat for Woodlarks in Switzerland.

For the Swiss populations of Woodlark, Eurasian Wryneck and Common Hoopoe, vineyards are an important habitat type. During the breeding season, these birds preferably forage in vineyards with partial ground cover, where insects are easily detected and caught on the ground and in sparse vegetation. Ideally, about 50 % of the ground should be covered, meaning there is ground vegetation in every other row [1, 7, 11]. In the case of the Woodlark, this preference applies to foraging sites; its preferred nest sites, on the other hand, are in dense and tall ground vegetation [4, 8]. Therefore, the changing requirements of the Woodlark during its life cycle are best met by a mosaic of vegetation structures, arising from natural succession. Eurasian Wryneck and Common Hoopoe need plenty of short vegetation so that insect prey remains accessible [6, 11, 12]. Alternating mowing or tilling in every other row keeps ground vegetation short and promotes a variety of vegetation structures.

The Cirl Bunting is another priority species whose population is concentrated in richly structured vineyards, especially on the southern Jura slopes, around Lake Geneva and in central Valais. In these areas, free-standing trees and bushes offer cover and nest sites, while vineyards with ground vegetation provide a year-round supply of food.

Diverse birdlife during the winter months

In winter, vineyards – often remaining snow-free due to their southern exposure – are occupied by finches (e.g. Common Chaffinch, European Greenfinch, European Goldfinch, European Serin) and thrushes (e.g. Mistle Thrush, Fieldfare). The preference for small habitat structures, especially hedges and copses, is even more pronounced in winter than in summer [7]. Species-rich ground vegetation plays a central role in winter as well; during the winter months, continuous vegetation cover is preferred [7]. Thus, partial ground vegetation, covering the ground beneath every other row, is a good compromise in view of meeting the ecological requirements of different species all year round.

A diverse future?

The future of biodiversity in vineyards is uncertain. The spread of settlements continues to fragment our landscapes, and wine-growing regions are no exception. South-facing slopes, rich in plant and animal species, are built up by housing developments. The fragmentation and loss of vineyards has dire consequences for biodiversity. But there are glimmers of hope; thanks to financial incentives, vineyards with ground vegetation and small habitat structures have steadily increased in area in Switzerland over the past few years. It is encouraging that even in Valais, where ground vegetation is not required because there is little rainfall, about 20 % of vineyard area (approximately 10 km^2) has a herb cover. Hopefully, sustainable production practices, resulting in ground vegetation in vineyards and a reduction in the use of pesticides, will lead to the long-term conservation of ecologically valuable cultivated landscapes – to the benefit of the human population and threatened bird communities alike.

Alain Jacot & Laura Bosco

[1] Arlettaz et al. (2012); [2] Assandri et al. (2016); [3] Assandri et al. (2017); [4] Bühler et al. (2017); [5] Bundesamt für Statistik (2016b)/Office fédéral de la statistique (2016c); [6] Duplain et al. (2015); [7] Guyot et al. (2017); [8] Mallord et al. (2007); [9] Posse et al. (2011); [10] Scandolara & Lardelli (2017); [11] Schaub et al. (2010b); [12] Schuck & Lanz (2017)

Species pages 272, 280, 312, 358, 470, 530, 556

Redpoll

Acanthis flammea
Birkenzeisig
Sizerin flammé
Organetto
zaisch da laresch

Bernhard Herzog

Red List Least Concern (LC)
Population 15 000–20 000 pairs (2013–2016)

Focus page 314

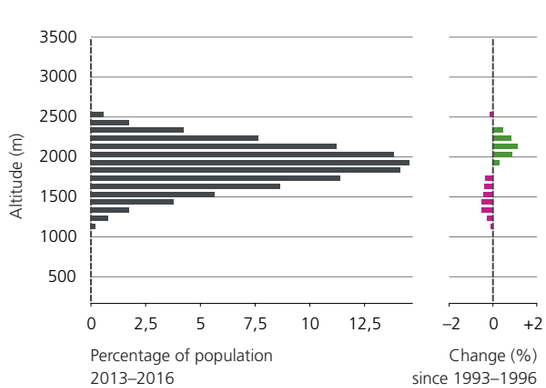
In Switzerland, the Redpoll occurs in the Alps and more rarely in the Jura. It is found at high altitudes in open stands of trees, green alder thickets with adjacent meadows or pastures, and floodplains; in the Pre-Alps, it also inhabits raised bogs. The Redpoll is sometimes found in parks and gardens [AtNE]. The highest densities are reached in valleys of the Valais, in the Gotthard massif and in southern Grisons. Most of the population breeds between 1500 and 2300 m. In suitable kilometre squares, it is not uncommon to count eight territories and more. The highest confirmed broods were recorded at 2300–2400 m [AtCH2, ID]; observations during the breeding season were made up to 2610 m near Flims GR (M. Schuck). Breeding at low altitudes (mainly in the Rhone Valley VS) has been known since about 1968 [VdS], but could not be confirmed during the atlas surveys. Recently, the lowest singing males were recorded in 2016 at 460–470 m near Martigny VS, Fully VS and Ardon VS (B. Posse, B. Volet, K. Junker).

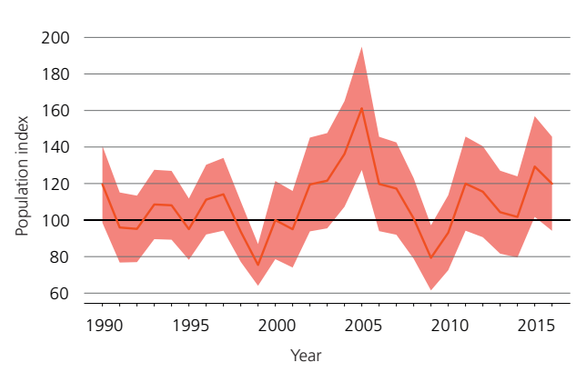
There have been no significant changes since 1993–1996 in distribution, density or altitudinal distribution. Redpoll numbers have fluctuated widely since 1990, but apart from an increase from 2000 to 2005 and a subsequent decline, they have remained at about the same level. In the Neuchâtel Jura, the population declined in some parts after 1999 [AtNE]. In contrast, there were significant gains in the small population on the German side of Lake Constance between 1980 and 2010 [AtBo].

Since the mid-19th century, the Redpoll has spread from the UK and the Alps, occupying large parts of central Europe. The range expansion was assisted by extensive conifer afforestation [3, 4]. The expansion came to an end in the 1990s [VdS], and the European population is now diminishing slightly [EBCC]. This is mainly due to declines in northern Europe [RLEU], but the causes are unknown [2]. In neighbouring countries, numbers are largely stable. In Germany [AtD], France [AtF] and Austria [7] the population fluctuates with no clear trend. Italy saw a slight decline during 2000–2014 [5]. In Austria, breeding sites at lower altitudes appear to have been abandoned as well [6]. Factors that have a negative impact on local populations include urban sprawl and the resulting habitat fragmentation, highly manicured gardens, and forestry interventions [1].

Livio Rey

[1] Bauer et al. (2005); [2] Burgess et al. (2015); [3] Ernst (1988); [4] Ernst (1998); [5] Rete Rurale Nazionale & Lipu (2015); [6] Teufelbauer (2014); [7] Teufelbauer & Seaman (2017)



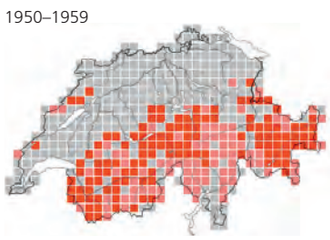


Density 2013–2016

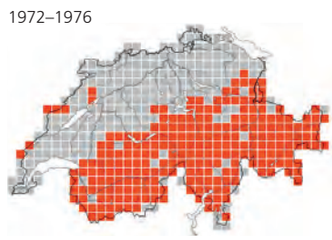
Density change since 1993–1996

Sponsored by
Anonymous donor

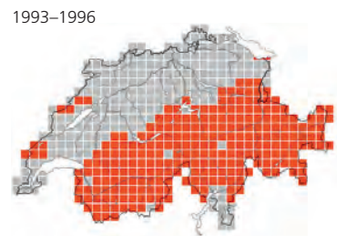
1950–1959



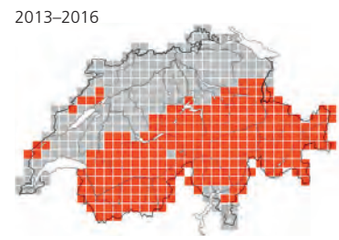
1972–1976



1993–1996



2013–2016



Red Crossbill

Loxia curvirostra
Fichtenkreuzschnabel
Bec-croisé des sapins
Crociere
cruscharel

Alexander Erdbeer

Red List Least Concern (LC)
Population 25 000–35 000 pairs (2013–2016)

Focus –

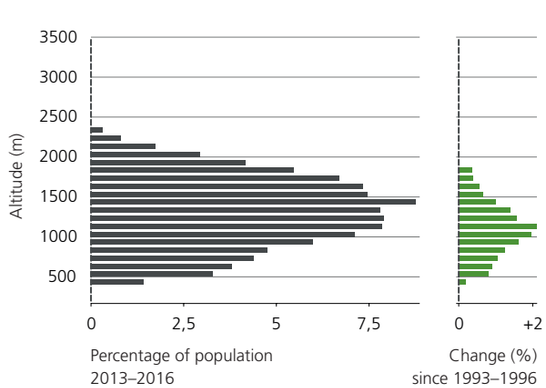
The Red Crossbill has a preference for spruce forests, but also inhabits larch and pine forests, breeding from the lowlands up to the tree line. In Switzerland, 85 % of the population occurs between 700 and 2000 m, which corresponds well with the distribution of spruce. Average densities are highest between 1100 and 1900 m. High densities are found in the Lower Engadine GR, Val Müstair GR, central Grisons, along the northern slopes of the Alps in the west and in the western Jura. The highest record of probable breeding relates to a nest-building pair seen at 2240 m near Samedan GR in 2012 (T. Wehrli).

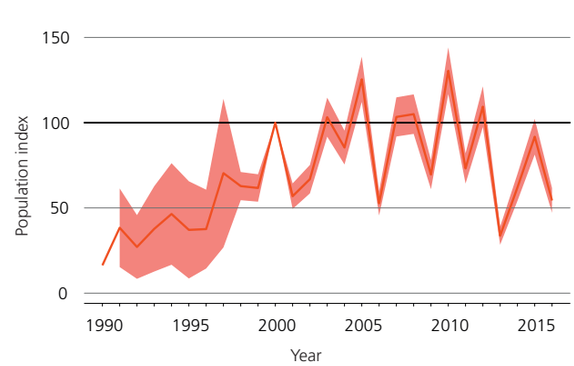
Because the Red Crossbill specialises in conifer seeds, especially spruce seeds, its population trend is greatly affected by seed production [AtCH2, HVM]. The 2013–2016 surveys recorded significantly higher numbers than in 1993–1996. This result should not be overemphasised, however, since numbers vary greatly from year to year. Thus, while the trend was somewhat negative after 2010, the 2017 population index had reverted to almost the same level as in 2010. Since 1993–1996, density has increased at all altitude levels in proportion to the population size at that level. While overall distribution in Switzerland has remained more or less the same, there have been regional changes in density which are probably related to regional differences in conifer seed production. In Germany, France and Italy, populations also fluctuate widely from year to year, but are stable overall [AtD, AtF, RLEU]. Austria, on the other hand, reports a slightly negative trend [5].

Depending on food availability, the Red Crossbill may breed year-round, or it may move to other areas or irrupt into Switzerland from elsewhere [HVM, VdS, 3]. Numbers are therefore generally high [AEn, VdS, 2] in years following a spruce mast [7]. Red Crossbill populations in Switzerland, Austria and the Czech Republic showed largely parallel trends between 1998 and 2015 [6]. Climate warming will cause the spruce to disappear from the Central Plateau and the lower reaches of the Pre-Alps [1], leading to changes in the availability of conifer seeds [4]. The future of the Red Crossbill at lower altitudes is therefore uncertain.

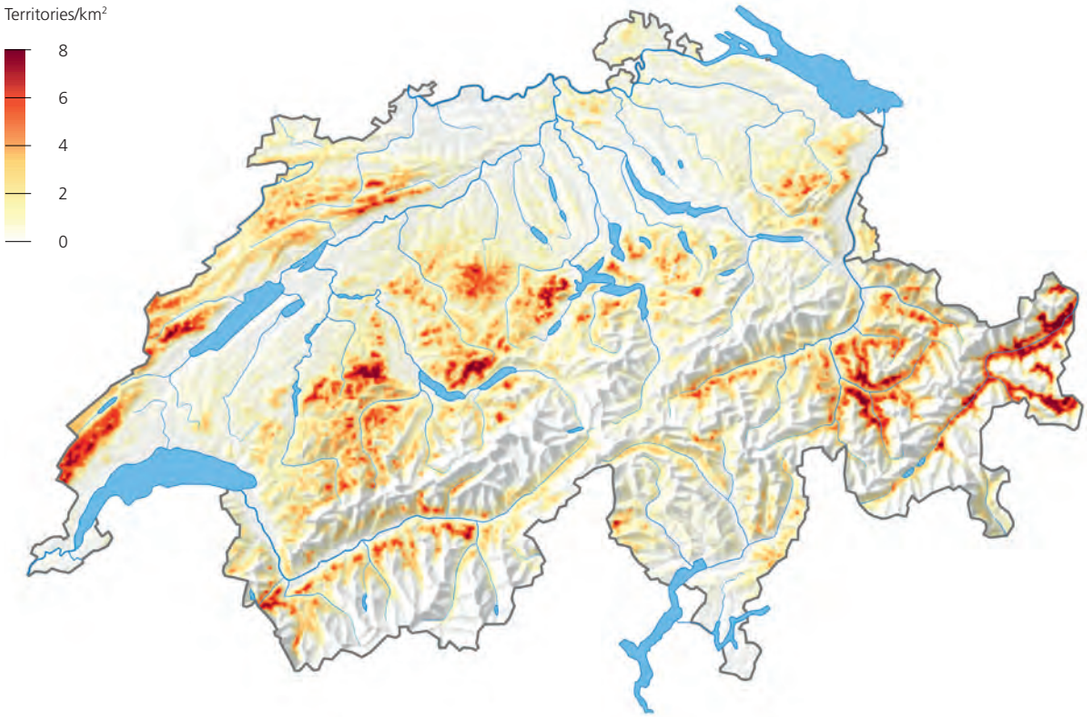
Martin Spiess

[1] Allgaier Leuch et al. (2017a–b); [2] Förschler et al. (2006); [3] Newton (2006); [4] Santisteban et al. (2012); [5] Teufelbauer & Seaman (2017); [6] Teufelbauer et al. (2017); [7] Wohlgemuth et al. (2016)





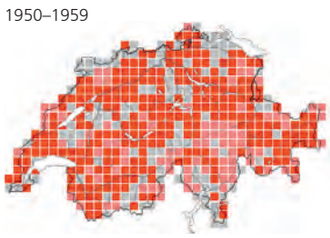
Density 2013–2016



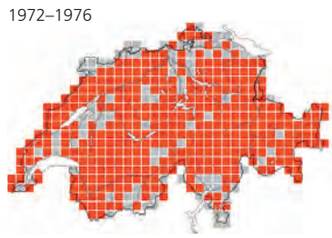
Density change since 1993–1996

Sponsored by
Sylvie Nicoud, Prilly

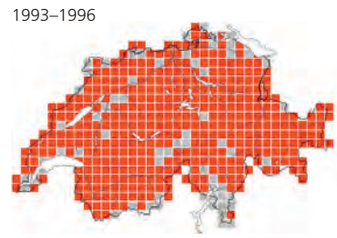
1950–1959



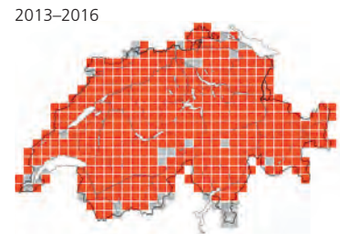
1972–1976



1993–1996



2013–2016



European Goldfinch

Carduelis carduelis
Stieglitz
Chardonneret élégant
Cardellino
chardelin

Ruedi Aeschlimann

Red List Least Concern (LC)
Population 50 000–70 000 pairs (2013–2016)

Focus page 314

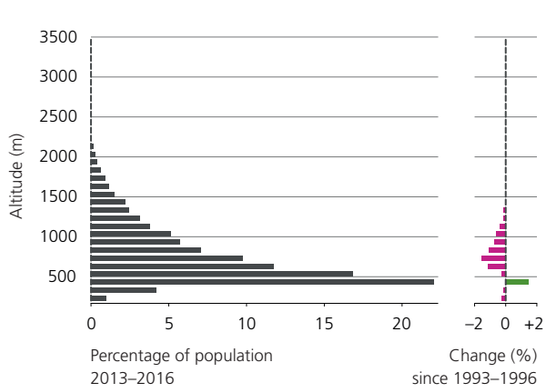
The European Goldfinch occurs in close proximity to human settlements. It relies on an abundant supply of seeds which it finds in ruderal habitats, species-rich meadows and grass verges. Its habitats include orchards, vineyards, gravel pits, gardens and parks but also richly structured farmland, riverbanks and tapered forest edges. The European Goldfinch breeds north of the Alps as well as in low-lying areas of major Alpine valleys and the Ticino. About 90 % of the population occurs below 1300 m. Average densities of more than 2.5 territories/km² are only found below 900 m. The highest breeding record came from Riederalp VS at 2060 m [AtCH2]. Family parties were seen in various places above 1900 m in 2013–2016 as well. Singing males are occasionally observed at even higher altitudes, as was the case near Tschierv GR at 2190 m (D. Godly) or during the previous atlas surveys near Zermatt VS at 2220 m [AtCH2].

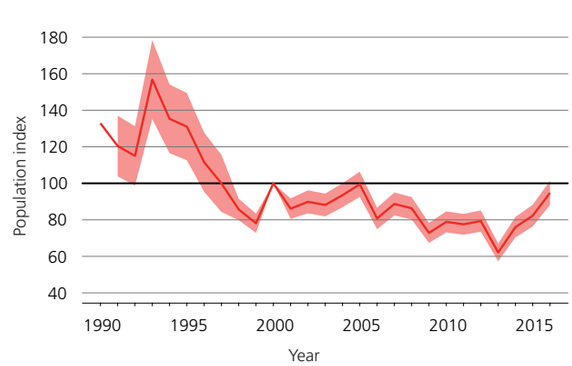
The population steadily decreased after 1993–1996, but the trend reversed in 2013 and remained positive until 2017. The population has thinned out in areas with intensive agriculture between 600 and 1000 m in particular, notably in the Fribourg Pre-Alps and in central parts of the Plateau, but also in the Canton of Basel-Landschaft. In contrast, density has increased between Geneva and the Orbe plain VD, in the Seeland BE/FR and in the Aare Valley BE/SO. Surveys in the Canton of Zurich in 1988 and 2008 show a slightly positive trend, especially in settlements [AtZH]. Around Lake Constance, the population dropped by 40 % between 1990 and 2010, although the trend on the Swiss side of the lake was in fact somewhat positive [AtBo]. Declines have also occurred since the 1990s in Germany, France and Italy [AtD, AtF, 4]; Austria, on the other hand, reports a positive trend [5]. The overall European population has been stable since 1990 [EBCC].

The increase in urban density and in impervious surfaces [1, 3], but also the over-maintenance of green spaces in settlements have led to a reduction in the food supply. Intensive management of road verges and embankments as well as the removal of edge structures also have a negative impact. Agri-environment schemes have a positive effect on local populations [6]. The food supply in the species' Mediterranean wintering grounds also affects numbers [2].

Jael Hoffmann

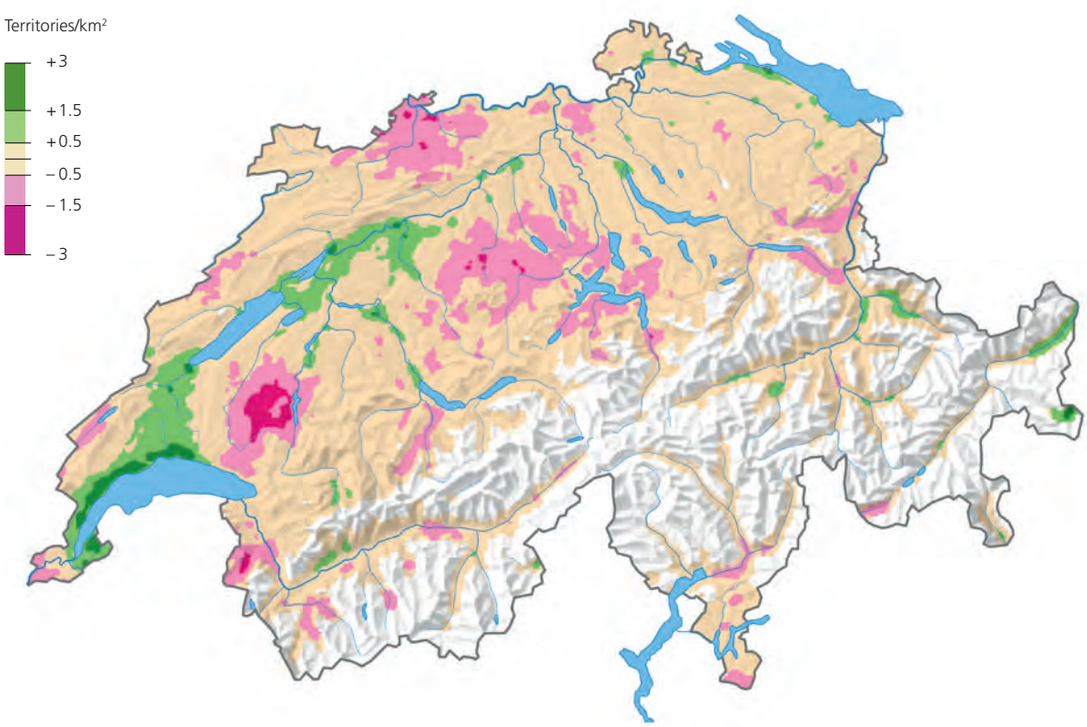
[1] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [2] Bauer et al. (2005); [3] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [4] Rete Rurale Nazionale & Lipu (2015); [5] Teufelbauer & Seaman (2017); [6] Weggler & Schwarzenbach (2011)



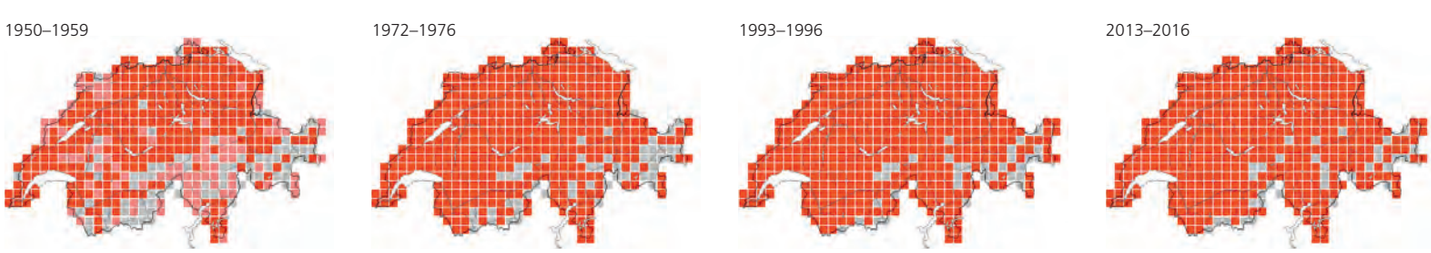


Density 2013–2016

Density change since 1993–1996



Sponsored by
Roswitha & Hans-Jörg Brey, Russikon
I. & Ch. Kuhn, Zurich
Matthias Meyer, Oberlunkhofen



Citril Finch

Carduelis citrinella
Zitronenzeisig
Venturon montagnard
Venturone alpino
citronel

Stefan Rieben

Red List Least Concern (LC)
Population 10 000–20 000 pairs (2013–2016)

Focus pages 314, 542

The Citril Finch breeds only in certain mountain ranges of central and southwestern Europe. The Alps are among the most important breeding grounds, along with the Pyrenees and several mountain ranges in northern and central Spain. Smaller populations are found in southern Spain, at Mont Ventoux, in the Massif Central, Jura, and Vosges, and in the Black Forest.

In Switzerland, the Citril Finch occurs mainly in the sub-Alpine zone of the Alps and the higher reaches of the Jura. It breeds from 1400 m upwards, in the Jura occasionally from 1200 m. The species inhabits open coniferous forests, especially those close to the tree line and in transition zones between forest and pastures. Following snowfall in the breeding habitat, the Citril Finch temporarily occurs at lower altitudes. After the breeding season, it can be found up to 2500 m.

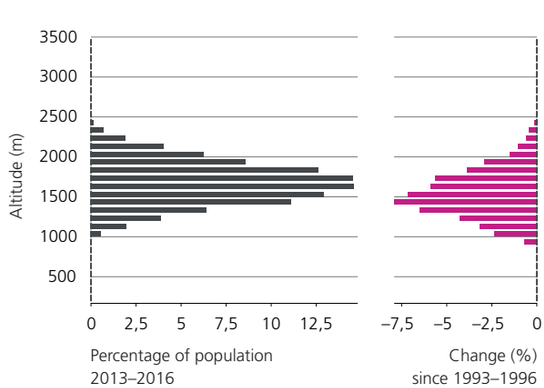
The highest densities are reached in the western and central Pre-Alps and locally in the Jura. Density decreases towards the east and south. The central Alps, where precipitation is lower, and areas south of the Alpine divide are less populated. The Citril Finch has always been rare in Ticino.

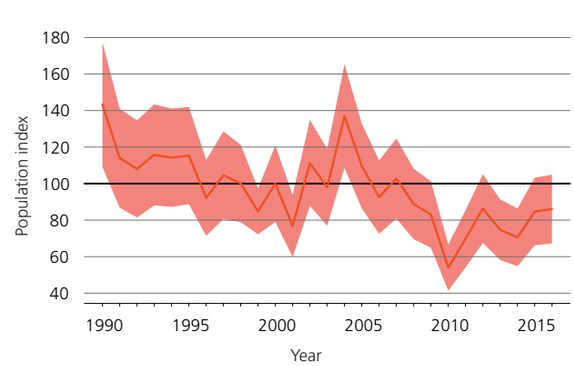
Large-scale distribution has remained more or less unchanged since 1993–1996. In some atlas squares in the central Jura and at the northern rim of the Alps, the Citril Finch was no longer detected. Changes south of the Alps are less significant due to the extremely low population density. Despite large fluctuations, a marked decline has occurred since 2004, affecting the less densely populated areas in the Jura, Valais and Grisons, but also the species' core range in the Pre-Alps [AEn, 1, 2, 5, 8]. The decline is visible at all altitude levels, but is more pronounced below 1600 m. In addition, the lower limits of the range have probably shifted upwards. Declines have also occurred in Vorarlberg [AtV], Germany, especially in the Black Forest [AtD, 3, 4], and France, mainly in the Jura and Vosges mountains [AtF, 6, 7].

The reasons for the negative trends are unknown. They may include the abandonment of woodland grazing as well as changes in the plant community caused by intensified use and climate change. It is unclear to what extent the range expansion of the European Goldfinch into Citril Finch habitats plays a part.

Dominik Hagist & Hans Märki

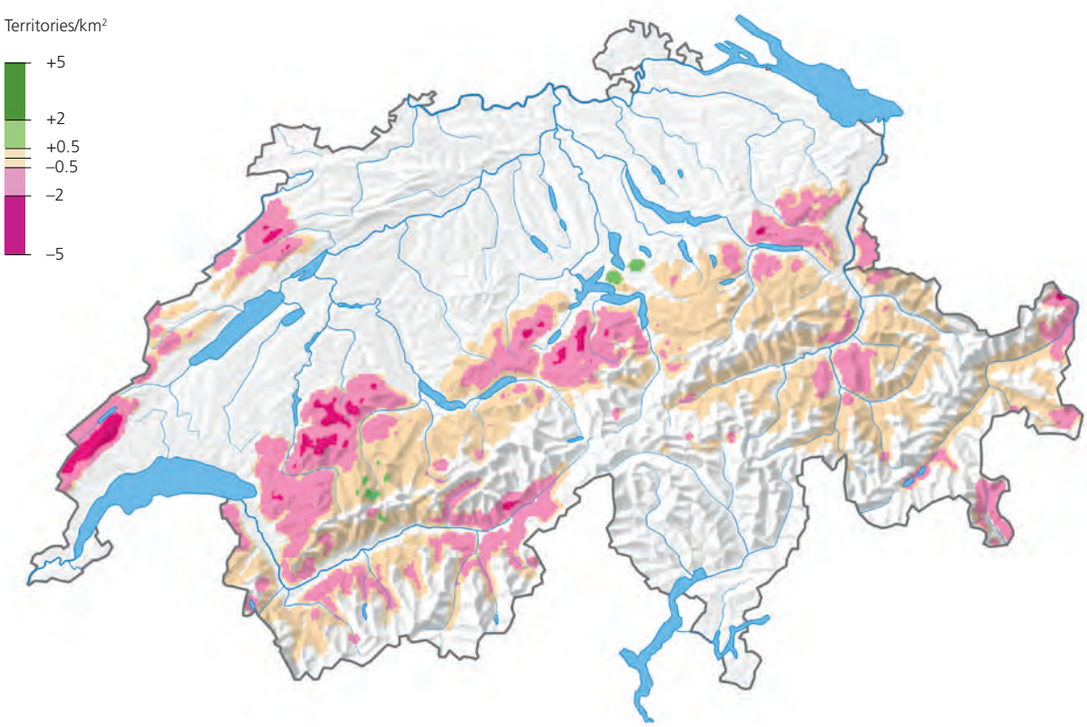
[1] Beaud & Beaud (2018); [2] Christen (2017b); [3] Förschler (2006); [4] Förschler & Dorka (2010); [5] Glutz von Blotzheim (2007b); [6] Muller et al. (2017); [7] Paul (2011); [8] Sattler et al. (2017e–h)





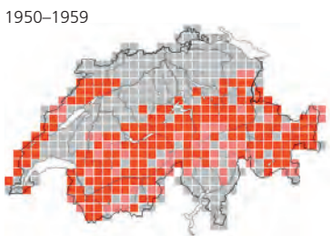
Density 2013–2016

Density change since 1993–1996

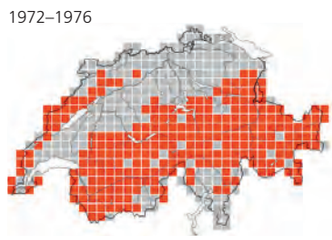


Sponsored by
Heidi Hofstetter, Zollikofen
Alain Morard, Ostermundigen

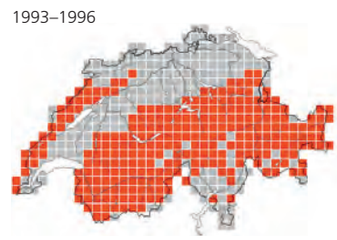
1950–1959



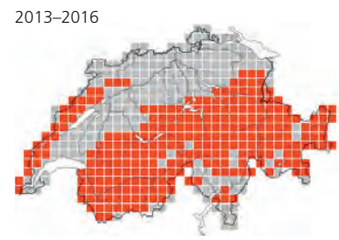
1972–1976



1993–1996



2013–2016



Alpine coniferous forests and their birds

In the coniferous forests of the Alps, species with a predominantly southern European distribution coexist with species of the boreal zone. After centuries of agri-silvicultural use and sometimes overuse, many sub-Alpine conifer forests are now being abandoned, a change that has benefited many bird species, but also created losers.

Coniferous forests cover the higher montane and sub-Alpine zones of the Alps and are characterised by the complete absence of beech in the tree layer[2]. They dominate the forested area of the Alps from about 1500 m to the upper tree line, but they regularly occur above 1100 m in locations where beech is unable to grow, and to a very small extent at even lower altitudes[2].

Spruce is by far the most abundant tree species, followed by fir. In inner-Alpine valleys with a marked continental climate (cold winters, warm and dry summers) these two species are replaced by stone pine and larch above about 1900 m. Larch also forms extensive pure stands in the southern Alps along the upper tree line. Mountain pine occasionally forms pure stands on extremely dry soils, where all other species fail to grow. The only deciduous trees in montane coniferous forests are rowan, sycamore and downy birch. Green alder also frequently occurs at these altitudes and forms pure stands, but these are generally considered shrub rather than forest.

Many montane coniferous forests, especially along the upper tree line, have an open structure, with plenty of light reaching the forest floor and light-loving plants growing in the underbrush[2]. Centuries of timber use and grazing have created even more gaps in these naturally open forests and caused the upper tree line to shift downwards[5].

Pierre Mollet

Spruce is by far the most abundant tree species in sub-Alpine coniferous forest. Light falling onto the forest floor generates young growth of spruce and pioneer deciduous plants such as mountain ash, while damp hollows are occasionally overgrown by ferns.

Diverse birdlife in mountain forests

Coniferous forests at high altitude tend to support fewer bird species than lower-lying montane mixed forests[AEn, 9, 13]. The remarkably high species numbers found in some studies can be explained by an exceptionally rich forest structure resulting from storms or bark beetle outbreaks[6, 8]. Species composition in sub-Alpine coniferous forests is particularly interesting in several respects. On the one hand, species typical of northern, Alpine regions such as Three-toed Woodpecker or Eurasian Pygmy-owl coexist with birds whose main distribution is in southern Europe, such as Citril Finch and Western Bonelli's Warbler. On the other hand, the open and semi-open forests at the upper tree line and on the margins of farmland are hugely important for species like Tree Pipit or Lesser Whitethroat, which rely on open terrain with scattered trees.

In Switzerland, but presumably also in neighbouring Alpine countries, montane coniferous forests are one of the most important habitats for European bird conservation. A total of 37 bird

Pierre Mollet

Rejuvenation of stone pine at the upper tree line. Northern Nutcrackers carry the seeds of large trees up the slopes and store them in caches. The seeds that are not recovered germinate. The birds thus cause the spread of stone pines along the altitudinal gradient. The resulting dwarf-shrub heaths and Alpine pastures with scattered trees are excellent habitat for Tree Pipit, Citril Finch and Lesser Whitethroat.

species have proportionally large populations in Switzerland, so our country has a particular responsibility for their conservation [1, 3, 4]. The Alpine species Water Pipit, Alpine Accentor, White-winged Snowfinch and Yellow-billed Chough head this list, but several species typical of sub-Alpine coniferous forests, such as Ring Ouzel, Citril Finch, Northern Nutcracker, Coal Tit and Boreal Owl also occur in Switzerland in higher numbers than would be expected given the size of the country [11].

Changes in forest use

For centuries, mountain forests have been used to a greater or lesser extent by humans, often locally in the form of mixed agri-silvicultural systems, with grazed woodland taking up large areas. But timber was also put to large-scale commercial use, i.e. sold as raw material to lowland areas, or used as fuel in the smelting of locally mined metal ores [10]. From the late 19th century, however, life began to change radically in many ways for the inhabitants of mountain areas, with changes also affecting silviculture and therefore forest development. First, timber gradually lost its significance as a fuel and building material and was replaced by other materials such as coal and steel. From then on, few mountain forests were used for large commercial timber operations. The development that began then continues to this day and is mainly characterised by a strong increase in the growing stock and in old-growth stands, but also an increase in deadwood. In addition, large expanses of cultivated land were abandoned during the 20th century, mainly less productive areas. A substantial increase in wooded area followed – another trend that continues until today.

The consequences of these changes for forest birds are only partly reflected in the survey results. The increase in the growing stock has presumably improved conditions for woodpeckers and other cavity breeders in particular. The population index for the Crested Tit did indeed increase considerably between 1999 and 2016 in forests above 1500 m, in contrast to the index below that altitude. On the other hand, the increase in the growing stock has led to denser and darker forests, which is thought to be one of the main reasons for the decline of the Western Capercaillie [7]. It is further likely that forest encroachment on former farmland has led to positive trends in species associated with young forests, but also to negative trends in species of open and semi-open terrain. Data from Ticino do in fact indicate that the abandonment of Alpine pastures and the resulting changes in vegetation may have contributed to the negative trends in Black Grouse populations [12].

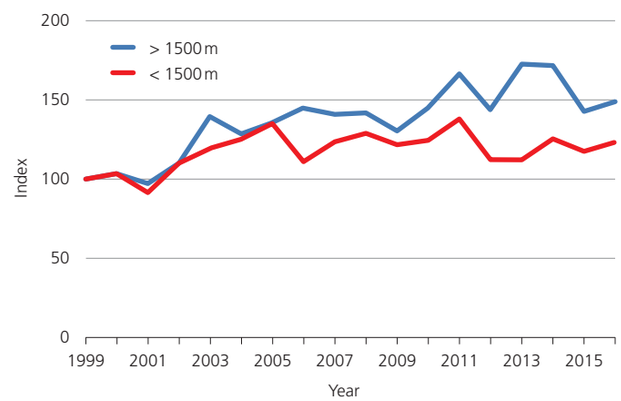
The situation is promising, but the future uncertain

The overwhelming majority of species in sub-Alpine coniferous forests are widespread and not threatened. Many have even expanded their breeding range in the past decades, or their populations have increased. How the situation develops from here depends mainly on the future anthropogenic use of these forests. Will the increase of old-growth elements and deadwood continue? Or will energy scarcity lead to a renewed exploitation or even over-exploitation of timber? And how will climate change affect sub-Alpine coniferous forests and their birds? There are no definite answers, but monitoring the forests and their avifauna will continue to be of central importance in the future to provide a sound basis for decision making.

Pierre Mollet & Gilberto Pasinelli

Pierre Mollet

For decades, old-growth stands and deadwood have increased in sub-Alpine coniferous forests, leading to the greater timber stock we have today.



Population trend of the Crested Tit from 1999–2016 with data from the common breeding bird monitoring scheme; the base year is 1999 with an index value of 100. The population increase was more pronounced above 1500 m (blue curve) than below 1500 m (red curve).

[1] Ayé et al. (2011); [2] Delarze et al. (2015a–b); [3] Keller et al. (2010); [4] Keller et al. (2011); [5] Körner (2012); [6] Mollet et al. (2008a–b); [7] Mollet et al. (2017); [8] Moning & Müller (2008); [9] Mosimann et al. (1987); [10] Parolini (2012); [11] Sattler et al. (2016a–d); [12] Zbinden et al. (2003); [13] Zbinden et al. (2010)

Species pages 108, 112, 236, 242, 290, 322, 328, 340, 342, 398, 422, 454, 490, 502, 504, 510, 540

European Serin

Serinus serinus
Girlitz
Serin cini
Verzellino
serin

Beat Rüegger

Red List Least Concern (LC)
Population 35 000–45 000 pairs (2013–2016)

Focus –

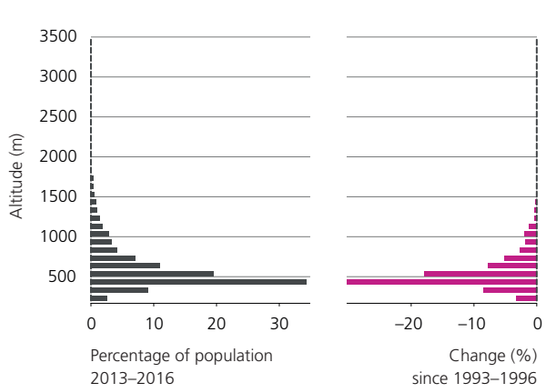
The European Serin is a common breeding bird on both sides of the Alps. It favours semi-open, sunny landscapes with conifers, bushes, forb meadows and patches of bare ground. An abundant supply of seeds for food is essential. High densities are found in the Lake Geneva region and in valleys of the Valais and Ticino. About 80 % of the population occurs below 800 m, with average densities of more than three territories/km² limited to areas below 500 m. The highest breeding record so far came from Riederalp VS at 1940 m (U. N. Glutz von Blotzheim). Singing males are occasionally observed above 2100 m, as was the case near Verbier VS (S. Stricker) and Zermatt VS (C. Huwiler), both at 2140 m [1].

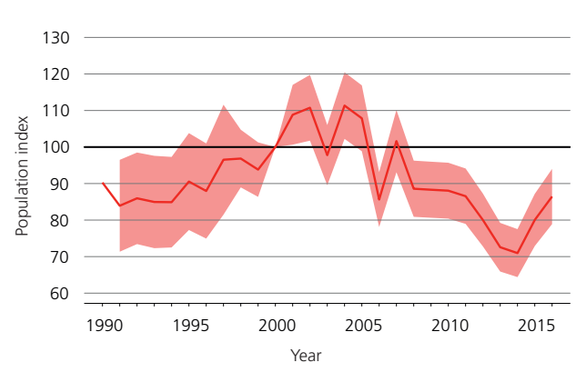
The Serin has steadily expanded its range in Switzerland since the 1970s, breeding at increasingly higher altitudes. Numbers increased until 2004, followed by a substantial decline. However, a renewed increase beginning in 2013 continued until 2017. The decline has led to a thinning out of the population compared with 1993–1996, especially in parts of the Central Plateau, Valais and Ticino and in the northern Jura. The declines occurred at all altitude levels in proportion to the population at that level. Losses were not yet apparent in surveys conducted in the Canton of Zurich between 1988 and 2008 [AtZH]. The breeding population in the Lake Constance area declined by over 20 % between 1990 and 2010 [AtBo]. Germany, France and Austria also report steep declines in some areas since the 1990s [AtD, AtF, 5, 7]. The population in Italy has been stable since 2000 [6]. In Europe as a whole, declines since 1993–1996 amount to just over 30 % [EBCC].

Although the Serin, originally a Mediterranean species, could be expected to benefit both from climate change (at least in central and northern Europe) [ClimAt] and from the expansion of settlements [4], its numbers are declining. This is probably because settlements are becoming more densely built up and impervious surfaces are increasing [4], while the remaining green spaces are often over-maintained [2, 3]. Ruderal habitats and edge structures managed at low intensity in parks and gardens, which would offer an abundant supply of seeds, are increasingly rare. Given the losses throughout Europe, it is likely that other, more large-scale causes are at work that are not yet known.

Jael Hoffmann

[1] Antoniazza (2016b); [2] BAFU (2017a)/OFEV (2017b)/UFAM (2017)/FOEN (2017); [3] Bauer et al. (2016a); [4] Bundesamt für Statistik (2015a)/Office fédéral de la statistique (2015a); [5] Jiguet (2017); [6] Rete Rurale Nazionale & Lipu (2015); [7] Teufelbauer & Seaman (2017)



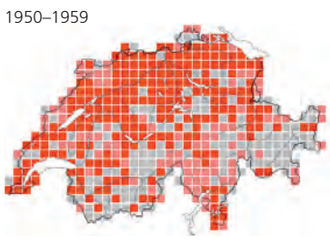


Density 2013–2016

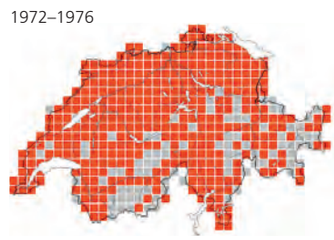
Density change since 1993–1996

Sponsored by
Peter Abderhalden, Unterwasser

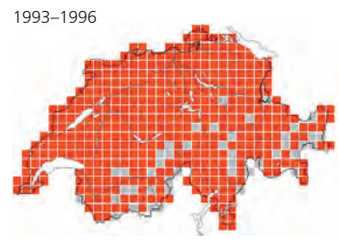
1950–1959



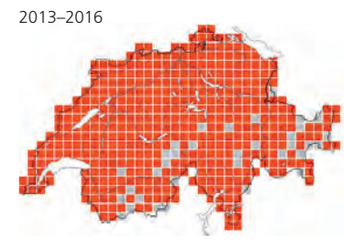
1972–1976



1993–1996



2013–2016



Eurasian Siskin

Spinus spinus
Erlenzeisig
Tarin des aulnes
Lucherino
zaisch d'ogna

Dominique Nodin

Red List Least Concern (LC)
Population 10 000–16 000 pairs (2013–2016)

Focus page 414

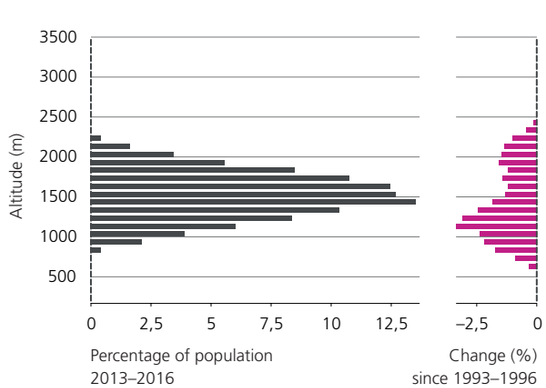
In Switzerland, the Eurasian Siskin occurs in the Alps and in the Jura as far east as the Hauenstein range BL/SO, where it favours open coniferous forests [HVM]. About 90 % of the population occurs between 1100 and 2000 m. The highest average densities are reached between 1300 and 1900 m. Breeding occurs sporadically at lower altitudes following spruce mast years. While the highest nest site was found at only 1720 m near Mesocco GR (M. Blattner), newly fledged chicks, presumably close to their nest, were observed near Zermatt VS at 2220 m (J. Duplain). The lowest nest site was found in Lugano TI at 350 m (A. Cereda).

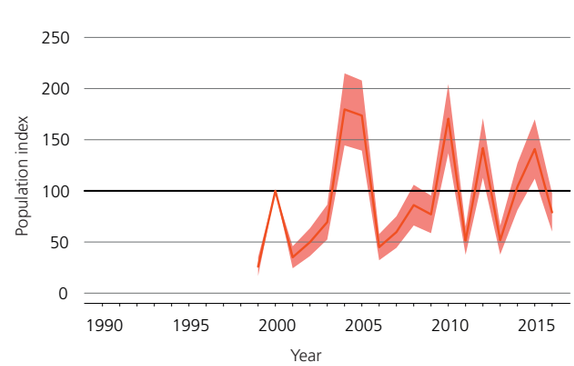
Distribution and population size are characterised by large fluctuations in response to spruce seed production [AEn, AtD, HVM, 2, 3]. Numbers were therefore particularly high in years following the spruce mast years of 1999, 2003, 2009, 2011 and 2014 [6]. The overall trend appears to be stable. Given the Eurasian Siskin's irregular and nomadic presence, the changes described below are to be understood as the comparison of two moments in time (1993–1996 and 2013–2016) rather than the description of a long-term trend. Distribution in Switzerland has remained largely unchanged since 1993–1996. Some atlas squares on the Central Plateau were no longer occupied, while new records were found in Ticino and Valais. Compared with 1993–1996, density has decreased at all altitude levels and in several parts of the country. In proportion to the population at each altitude, losses were most pronounced at the upper and lower distribution limits. While trends in neighbouring countries since the 1990s have been mostly uncertain [AtF, RLEU, 4] or stable [AtD], the overall European trend has been slightly negative since 1980 [EBCC].

Due to the large natural fluctuations, little is known about the Eurasian Siskin's long-term population trend. Not only is spruce distribution expected to move away from the Central Plateau and the lower regions of the Pre-Alps in response to climate change [1], but the seasonal supply of conifer seeds [5] will presumably change as well.

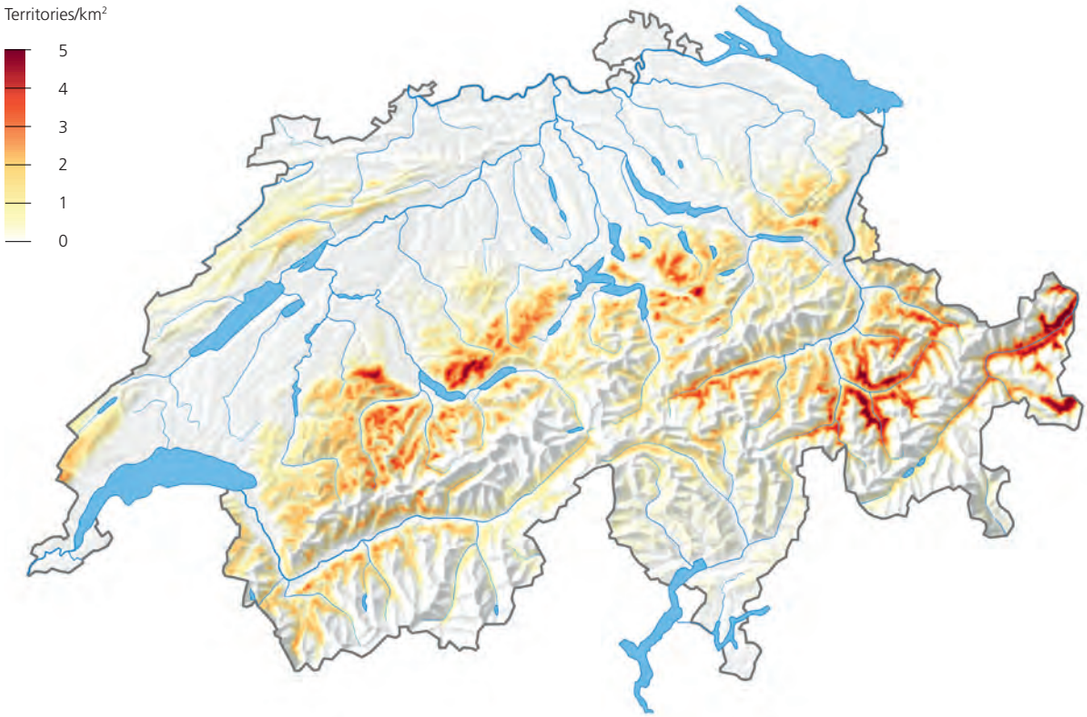
Martin Spiess

[1] Allgaier Leuch et al. (2017a–b); [2] Anger & Förschler (2016); [3] Förschler et al. (2006); [4] Nardelli et al. (2015); [5] Santisteban et al. (2012); [6] Wohlgemuth et al. (2016)

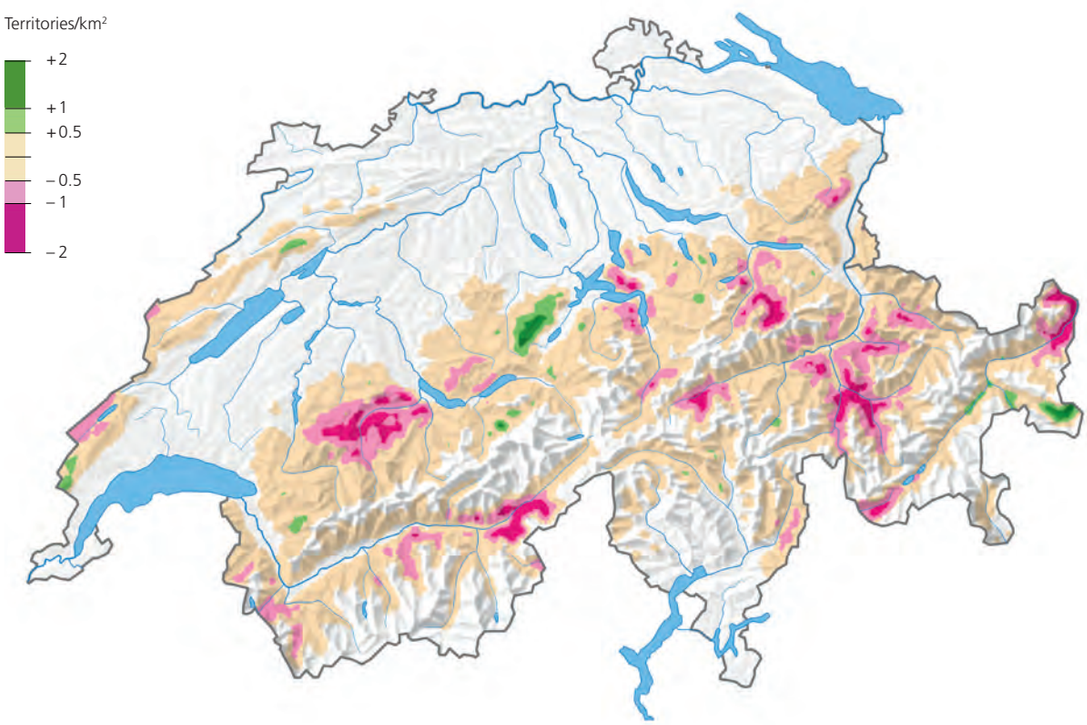




Density 2013–2016

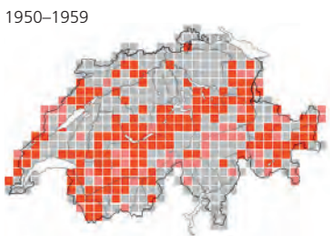


Density change since 1993–1996

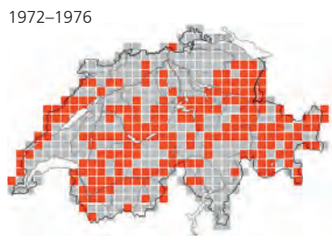


Sponsored by
Anonymous donor

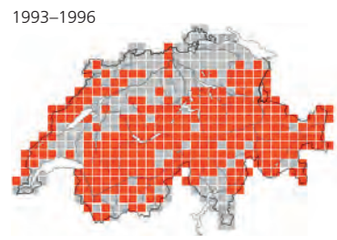
1950–1959



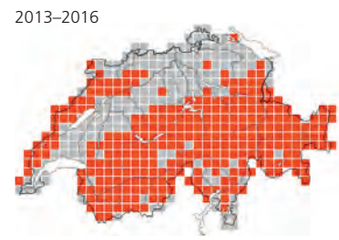
1972–1976



1993–1996



2013–2016



Corn Bunting

Emberiza calandra
Grauammer
Bruant proyer
Strillozzo
marena grischa

Mathias Schäf

Red List Vulnerable (VU)
Population 80–110 pairs (2013–2016)

Focus pages 240, 428

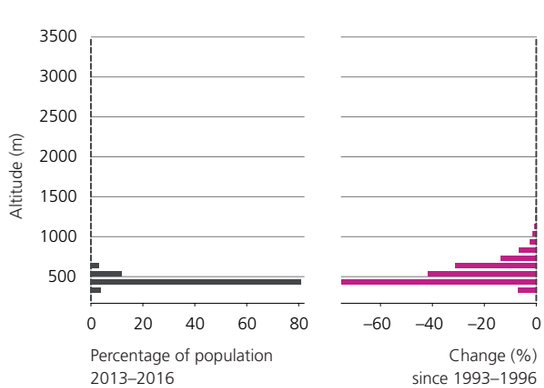
In Switzerland, the Corn Bunting breeds in open arable farmland and vegetable growing areas, sometimes in low-intensity grassland or on the edges of wetlands [VdS]. About 65–80 % of the population occurs in three large areas of ecologically improved farmland, namely the Champagne genevoise, Grosses Moos BE/FR and Klettgau SH. Small populations exist between Lake Neuchâtel and Lake Geneva, near Sionnet GE, at Zurich Airport near Kloten ZH, in the Aare Valley BE/SO and in Nuolener Ried SZ. Occasionally, singing males are observed in other areas too. More than 95 % of the population occurs below 600 m. While breeding has been recorded up to 1020 m [HVM], the highest record in the recent past comes from Sagogn GR at 730 m (2001; E. Mühlethaler). During the 2013–2016 atlas period, the highest record of a singing male came from Menzingen ZG at 790 m (D. Kronauer).

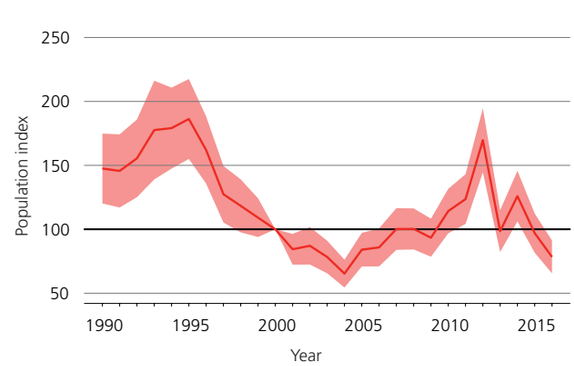
The population in Switzerland has undergone a dramatic decline [2, 7]. While numbers were estimated at 400–600 pairs in 1993–1996 [AtCH2], there were only 80–110 pairs in 2013–2016. Since 1993–1996, the Corn Bunting has disappeared from many areas – even former strongholds like the Valais and the Reuss Valley AG/ZG/ZH are now practically deserted [2]. Most newly occupied squares only represent occasional records of a singing male. In Austria and Baden-Württemberg numbers have also declined by about 80 % since the 1990s [1, 13]. Due to steep increases in eastern Germany after reunification, the overall trend in Germany from 1990 to 2000 was positive despite a range contraction; since then the population has been stable with large fluctuations [AtD]. The trend is slightly positive in Italy, but negative in France and in Europe as a whole [AtF, EBCC, 10].

The decline of the Corn Bunting is due to intensified agricultural practices and the related loss of richly structured habitats with an abundance of insects [4, 5, 12]. Studies have shown that the species benefits from high-quality biodiversity promotion areas, especially extensive wildflower plots [6, 8, 9, 11, 14]. The Corn Bunting reaches the highest densities in more mature wildflower plots, the optimal age being six years [3, 15].

Reto Spaar & Raffael Ayé

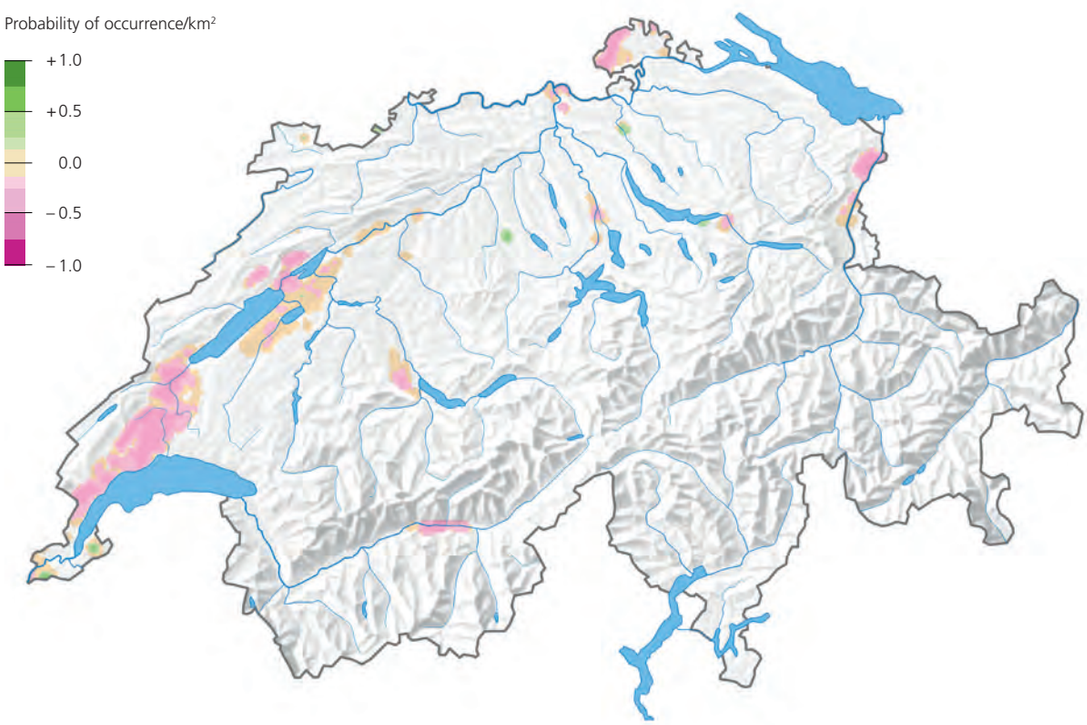
[1] Anthes et al. (2017); [2] Ayé et al. (2013); [3] Birrer et al. (2012); [4] Boatman et al. (2004); [5] Brickle et al. (2000); [6] Brodier et al. (2014); [7] Christen (2017a); [8] Jenny et al. (2002a–b); [9] Meichtry-Stier et al. (2014); [10] Nardelli et al. (2015); [11] Perkins et al. (2011); [12] Spaar et al. (2012a–b); [13] Teufelbauer & Seaman (2017); [14] Zollinger (2012); [15] Zollinger et al. (2013)





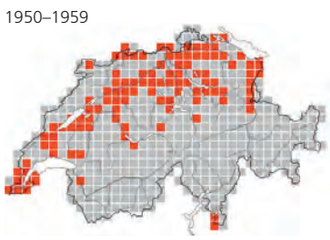
Occurrence 2013–2016

Occurrence change since 1993–1996

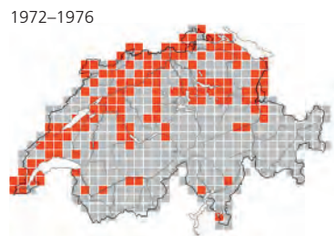


Sponsored by
Kurt Lehmann

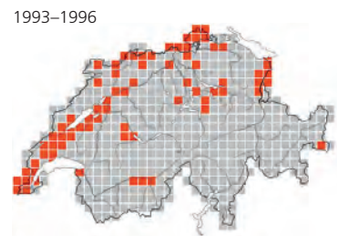
1950–1959



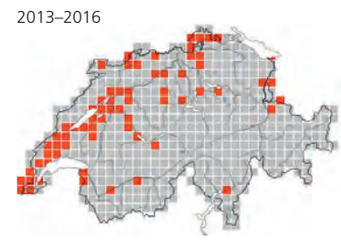
1972–1976



1993–1996



2013–2016



Rock Bunting

Emberiza cia
Zippammer
Bruant fou
Zigolo muciatto
marena da chanella

Patrick Donini

Red List Least Concern (LC)
Population 7000–10 000 pairs (2013–2016)

Focus page 552

Switzerland lies at the northern edge of the Rock Bunting's breeding range. A species that favours warm habitats, the Rock Bunting occurs mainly in southern Switzerland as well as in some parts of the Jura and northern Alps. It inhabits south-facing, open and semi-open habitats from rocky slopes and quarries to open forests, areas of new growth, and vineyards.

High densities of the Rock Bunting are only found in the Valais, Ticino and Val Poschiavo GR. In suitable kilometre squares, observers regularly count 12 territories and more. Most of the population breeds between 800 and 2000 m. The highest broods were recorded near Zermatt VS at 2300–2400 m [VdS, 7].

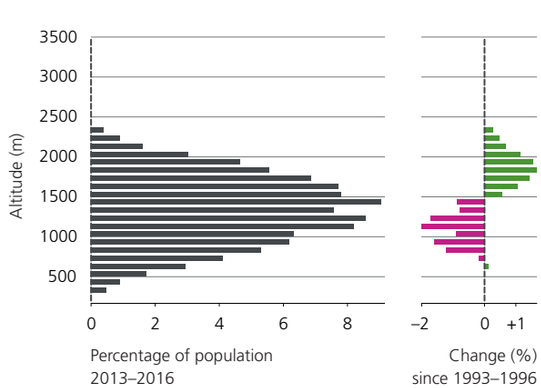
Since 1993–1996, the Rock Bunting has occupied several new atlas squares, in particular along the northern Alpine ranges and in the Grisons Alps. While these new records may be partly due to increased observer effort, some of them presumably reflect newly occupied sites. Following major declines in the Jura from the 1970s, the few atlas squares that are still occupied represent single sightings. The Vosges [4] and the Black Forest [2, 6] have also seen significant declines.

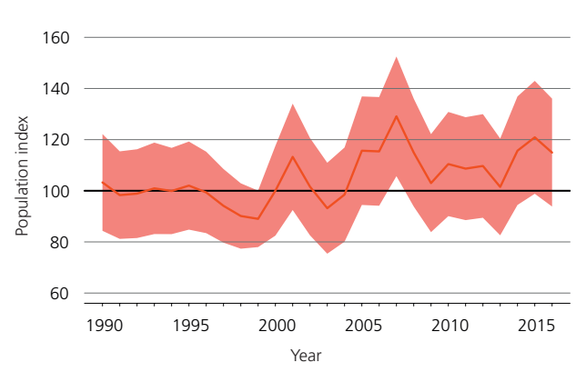
Numbers in Switzerland have fluctuated since 1990 and slight losses have been recorded in areas below 1500 m, especially in the Upper Valais, although the species continues to do well in more suitable parts of the Valais [9]. The declines are compensated by gains at altitude levels above 1500 m. In many areas, bush encroachment and afforestation are thought to be the main reasons for decline [AtD, AtF, 1, 3, 6]. At higher altitudes, however, the Rock Bunting presumably benefits from the early stages of bush encroachment [AtF].

The overall European population is stable [EBCC]. The trends in neighbouring countries are mixed: after a prolonged phase of decline, Germany has seen a positive trend since the 1990s [AtD], while the much larger French population appears to be decreasing [AtF, 5]. However, there are significant regional differences in both countries. In Italy, numbers have remained stable [8].

Livio Rey

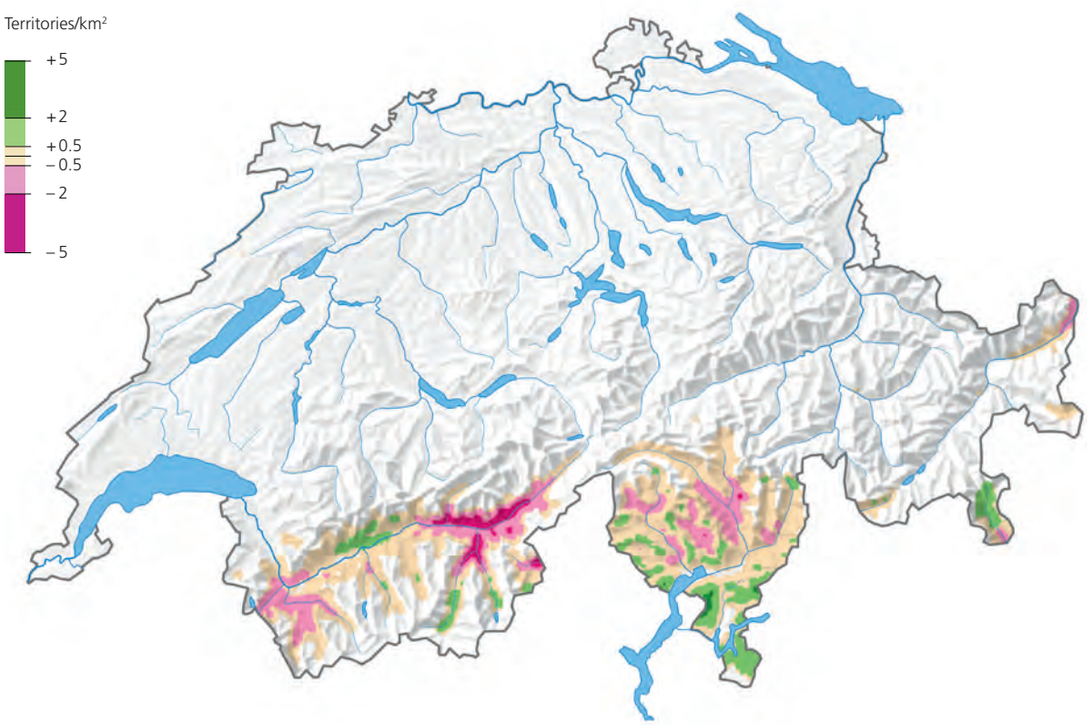
[1] Albegger et al. (2015); [2] Bauer et al. (2016a); [3] Christen (1997); [4] Dronneau & les observateurs de la LPO Alsace (2016); [5] Jiguet (2017); [6] Mann et al. (1990); [7] Posse (2011); [8] Rete Rurale Nazionale & Lipu (2015); [9] Schuphan & Wink (2016)





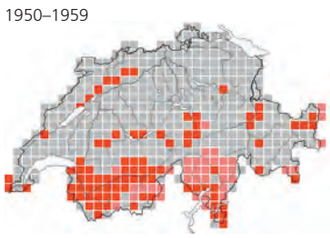
Density 2013–2016

Density change since 1993–1996

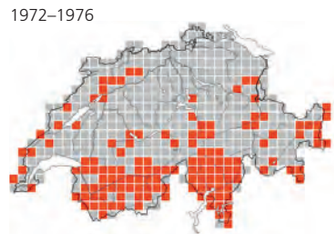


Sponsored by
Jean-Paul Gaillard-Denys

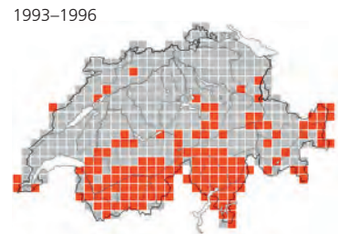
1950–1959



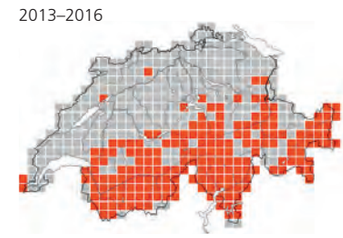
1972–1976



1993–1996



2013–2016



Natural disasters give rise to biodiversity

Forest covers about a third of the area of Switzerland, and therefore plays an important role in species conservation. For the past century, forest area has increased and stands have grown denser, while more open areas of woodland with their rich biodiversity have decreased. Only forest fires and storms interfere with this development.

In our latitudes, forest is the final stage of plant succession in almost all environments below the Alpine zone [1]. The only natural challengers of this dominance are forces such as storms, floods, avalanches or wildfires. Thus, the landscapes of the present day are the result of thousands of years of human intervention [8].

The use and management of land are our principal means of opposing the encroachment of shrub and forest. Moreover, we make huge efforts to contain the natural forces that threaten our infrastructure and protection forests: river engineering works prevent flooding, avalanche barriers stabilise great masses of snow, and forest fires are so well controlled that they normally only affect small areas. Storms are the only force beyond our control.

But the huge force of these events does not spell disaster for nature, even if the affected areas are radically altered. Various species immediately begin to occupy these new, restructured areas in the early stages of succession [1]. Amongst them are many pioneer species that have suffered under the shift from nature's unpredictable reign to the highly-controlled shaping of landscapes by humans.

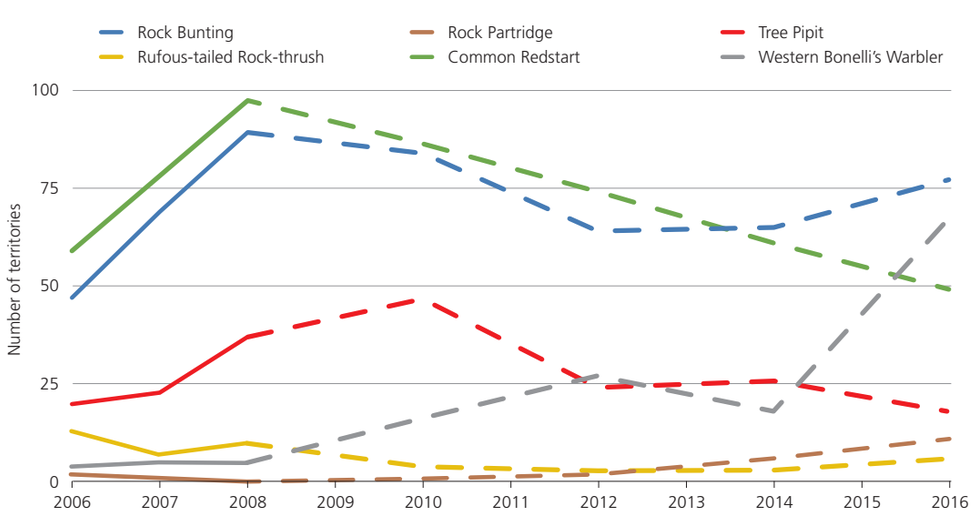
New life after the fire

Forest fires are ignited by lightning or human behaviour; they mainly occur in the central and southern Alps, especially in Ticino, but also in Valais and Grisons [6, 15]. Since the beginning of the 20th century, 160 fires that affected an area of at least 100 ha have been recorded. In the past 20 years, however, their frequency has dropped significantly, totalling only 13 cases. Two of these areas affected by wildfires have been studied in terms of their bird communities: 310 ha of woodland and meadows at 800 to 2100 m near Leuk VS, destroyed by fire on 13 August 2003 [7, 9, 12, 15], and 130 ha of forest at 650 to 1520 m near Visp VS, which burnt down on 26 April 2011 [4, 9].

The forest-fire area of Leuk provides the most remarkable findings due to its size and exposure, but also thanks to the variety of biological studies conducted there, some of them over the long term. While the studies document the disastrous temporary consequences for the local avifauna, they also show, for the first time in central Europe, the extremely positive effects on the demanding species of the Red List and priority species list [10]. One thing became clear very quickly: the juxtaposition of patches of bare ground, one-year-old plants with an ample seed supply, and blackened tree stumps offering perches and cavities provides nest sites and food for a large variety of birds (as many as 50 species in 2016). Territory density reached a first peak after five years. As natural succession progressed, deciduous trees replaced the Scots pines and spruce trees that had dominated before the fire [15], in turn changing the composition of the avifauna. The bird communities were successively dominated by Rufous-tailed Rock-thrush, Common Redstart, Rock Bunting, Tree Pipit and Rock Partridge, whereas true woodland birds, especially Western Bonelli's Warbler and Eurasian Blackbird, only slowly increased in number. The forest-fire area of Visp is characterised by the same continental climate as Leuk, but it is located on the north-facing rather than south-facing slopes of the Alps. There was a similar dominance of Common Redstart and Rock Bunting in the first few years (2012–2015). But unlike in Leuk, warmth-loving species such as Rock Partridge and Rufous-tailed Rock-thrush were absent [4].

The regenerative force of chaos

Of all natural disasters in central Europe, winter storms cause the most damage in forests. However, in the past two centuries, only six such events were considered catastrophic [13], including storms



Number of territories from 2006 to 2016 of six typical bird species on the 310-ha-large area near Leuk VS at 800 to 2100 m, affected by fire in August 2003. The species successively reach maximum abundance. Overall abundance was greatest in 2008–2010 and 2016. After 2008, surveys were conducted every two years (dotted line).

Bertrand Posse

The wildfire in August 2003 above Leuk VS completely altered the area, as this view taken 14 years later, in June 2017, shows. Deciduous woods now cover three quarters of the area, quite different from the former pine stands on the lower slopes, spruce forest in the middle, and larch stands in the upper reaches of the area.

«Vivian» from 26 to 28 February 1990, producing five million m³ of damaged timber, and «Lothar» from 26 and 27 December 1999, with 12.5 million m³ of damaged timber or about 3 % of the total Swiss timber stock [16]. Storm «Lothar» primarily affected areas on the Central Plateau and in the Pre-Alps, storm «Vivian» areas in the Alps and Pre-Alps. Most areas were cleared or left as they were, with no significant effect on the density of new growth. Altitude, on the other hand, did influence the speed of natural reforestation [14]. In some areas affected by the storms or by earlier events, bird communities have been monitored throughout the stages of forest succession [2, 3, 5, 17, 18]. In the early years, the richness of breeding birds depends mainly on the physical environment such as region, altitude or exposure. With time, these location-specific differences become blurred, as the growth of trees attracts widespread woodland species such as European Robin, Eurasian Blackbird, Song Thrush or Common Chaffinch, whose population density is more strongly dependent on forest structure.

The frequency of storms and the threats they pose for forests have increased in central and northern Europe in recent decades, a trend that is expected to continue [11]. Depending on the extent of such events, the predicted trend could have a positive impact on bird communities, especially on those scarcer species that rely on a mosaic of different forest structures or open stands. These species are at a disadvantage today as forests continue to grow denser, but given the chance, they are able to rapidly colonise suitable habitats.

Bertrand Posse

Damaged forest areas in the wake of storms «Lothar» (1999, red) and «Vivian» (1990, black). A large part of the affected areas was completely laid to waste. Federal Office for the Environment (FOEN).

[1] Blondel (1979); [2] Christen (2018); [3] Glutz von Blotzheim (2001); [4] Hintermann & Weber AG (2016); [5] Mollet et al. (2017); [6] Pezzatti et al. (2017); [7] Posse & Sierro (2007); [8] Ramade (2012); [9] Rey (2015); [10] Rey et al. (in prep.); [11] Seidl et al. (2014); [12] Sierro & Posse (2011); [13] Usbeck et al. (2010); [14] Wohlgemuth & Kramer (2015); [15] Wohlgemuth et al. (2010a–b); [16] WSL & BUWAL (2001); [17] Zollinger (2015); [18] Zollinger (2016)

Species pages 96, 398, 446, 450, 458, 470, 472, 504, 520, 550

Ortolan Bunting

Emberiza hortulana
Ortolan
Bruant ortolan
Ortolano
marena da curtin

Ruedi Aeschlimann

Red List Critically Endangered (CR)
Population 1–5 pairs (2013–2016)

Focus pages 142, 234, 240

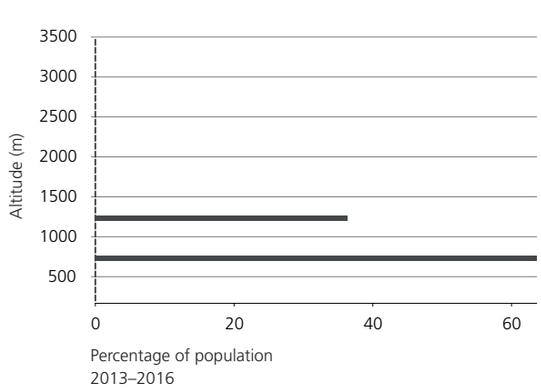
The Ortolan Bunting's distribution is patchy in large parts of Europe as a result of its preference for continental and Mediterranean landscapes. Today as in 1993–1996, its range in Switzerland is concentrated in the dry inner-Alpine valley of the Valais. The species occurs in a variety of habitats: low-intensity farmland dominated by pastures and cereal crops, south-facing rocky steppe, and various pioneer habitats, especially after fires. Today, the Ortolan Bunting has disappeared from most regions; in 2013–2016, it was found only in the rocky steppe landscape near Leuk in central Valais, between 650 and 850 m. Also, a singing male was observed on 15 July 2013 near Bürchen VS at 1240 m (T. Stalling)[5]. Five territories were found in 2013, one per year in 2014–2016, and none in 2017. Thus, the Ortolan Bunting is on the verge of disappearance in Switzerland.

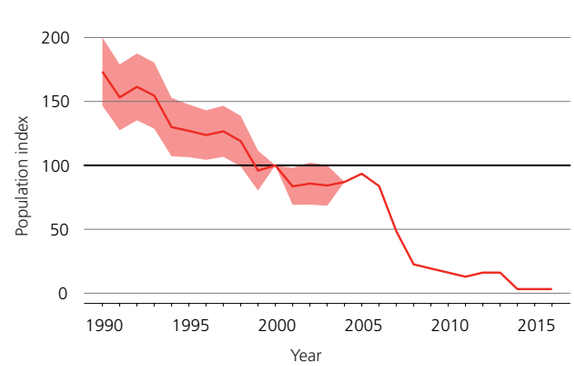
The decline in Switzerland began in the 1960s[6] and could not be stopped despite a species conservation project implemented in 2005–2015[1, 2]. Trends in central and northern Europe are just as disastrous[3]. In contrast, populations in southern Europe still appear to be stable, although there are large regional differences. In Europe, the Ortolan Bunting is not yet considered threatened due to its large, albeit declining, population of several million pairs[3].

The reasons for the decline in large parts of central Europe and in Switzerland are related to habitat changes in the species' breeding range[4]. In Switzerland, especially in the Valais, low-intensity crop management has decreased dramatically, leading to the loss of an important food source. In addition, many farmland areas have been either intensified or abandoned in the past decades, both with negative consequences for the Ortolan Bunting. Bush encroachment on formerly open farmland and pioneer habitats has expedited the species' disappearance. Securing a future for the Ortolan Bunting in Switzerland would require a profound and lasting change in agricultural practices.

Alain Jacot & Emmanuel Revaz

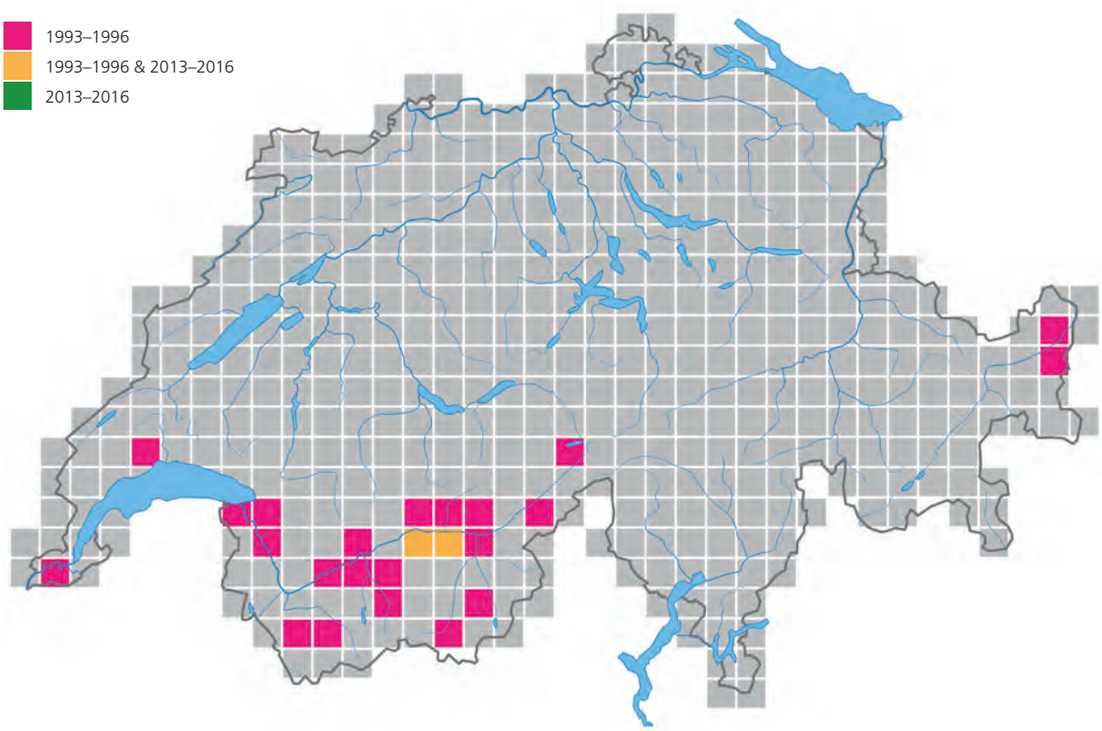
[1] Jacot & Revaz (2014); [2] Jacot & Revaz (2015); [3] Jiguet et al. (2016); [4] Menz et al. (2009); [5] Posse (2014); [6] Revaz et al. (2005)





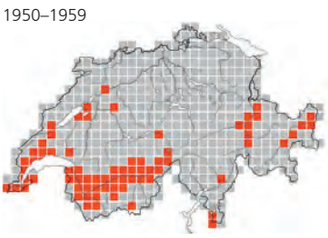
Territories 2013–2016

Distribution change since 1993–1996

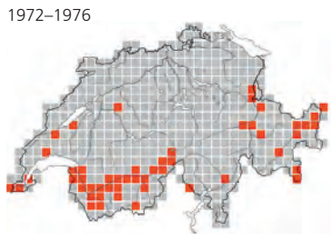


Sponsored by
Ursula Jappert

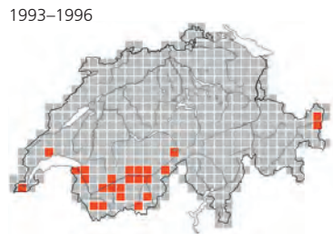
1950–1959



1972–1976



1993–1996



2013–2016

Cirl Bunting

Emberiza cirlus
Zaunammer
Bruant zizi
Zigolo nero
marena da vigna

Mathias Schäf

Red List Near Threatened (NT)
Population 1000–1500 pairs (2013–2016)

Focus pages 240, 284, 532

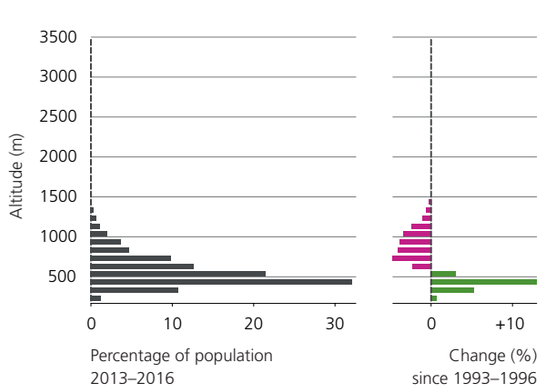
Switzerland lies at the northern edge of the Cirl Bunting's range. This warmth-loving species favours vineyards and other sunny, grassy slopes at low altitude with scattered trees and bushes [1, 9], mainly in foehn valleys and on the southern slopes of the Jura. It is also found locally in the mountains. Since 2013, singing males have been observed near Corbeyrier VD at 1450 m (J. Erard) and near L'Isle VD at 1380 m (C. Plummer) [6]. Breeding was confirmed near Zeneggen VS at 1550 m (W. Holliger) [5] and near Fully VS at 1350 m (A. Barras) [6]. The rare observations at even higher altitudes probably relate to wandering males (e.g. near Fideris GR at 1800 m; D. Bruderer).

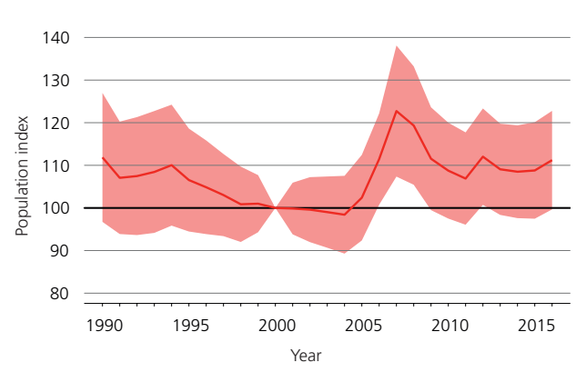
The distribution of the Cirl Bunting has changed considerably since 1993–1996. Gains outweigh losses, and areas abandoned from the 1970s to the 1990s have been recolonised. Further, two opposite trends have become apparent: density has decreased above 600 m while increasing in the lowlands. The increase is reflected in a range expansion, most pronounced in the north and east of the country, as well as higher local densities in the southwest. This is where the highest densities were recorded, notably in the Champagne genevoise (2–4 territories/km²) [AtGE] and the winegrowing regions around Lake Geneva. But high densities occur elsewhere too, for example on 25 ha of vineyards between St-Blaise NE and Le Landeron NE, where four nests were occupied at once in 2003 [AtNE]. The overall Swiss population has been largely stable since 1990.

In Europe, numbers dropped by more than 40 % between 1995 and 2014 [EBCC]. In France, the Cirl Bunting appears to benefit from climate change, though trends differ between regions like they do in Switzerland [AtF, 3, 4]. Germany and Italy also report positive trends [AtD, 2, 8]. The wide fluctuations of Cirl Bunting populations at the range periphery complicate predictions of the future trend in Switzerland. Several suitable habitats on south-facing slopes have been destroyed by the spread of settlements, on the Central Plateau in particular. In addition, the intensification of agriculture and viticulture has led to the loss of many small habitat structures [7, 9].

Bertrand Posse & Stefan Werner

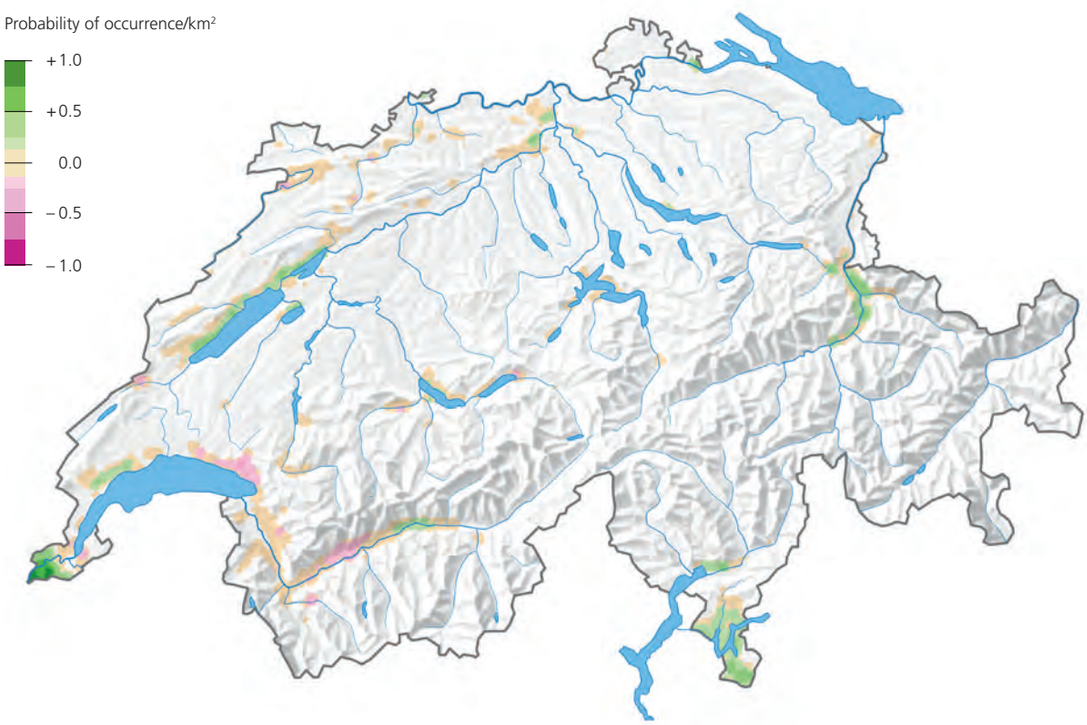
[1] Brambilla et al. (2008); [2] Campedelli et al. (2012); [3] Jiguet (2017); [4] Muller et al. (2017); [5] Müller et al. (2017a–b); [6] Posse (2014); [7] Rehsteiner (2009); [8] Rete Rurale Nazionale & Lipu (2015); [9] Spaar et al. (2012a–b)





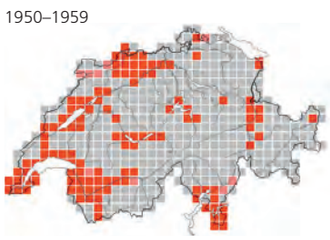
Occurrence 2013–2016

Occurrence change since 1993–1996

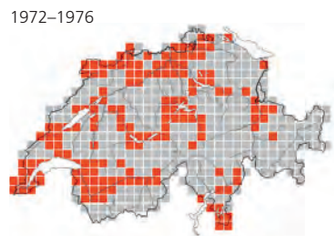


Sponsored by
Dr Matthias Bürgin

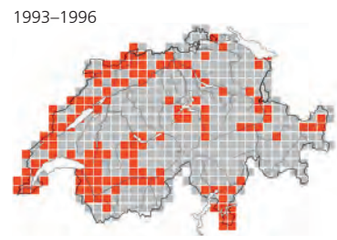
1950–1959



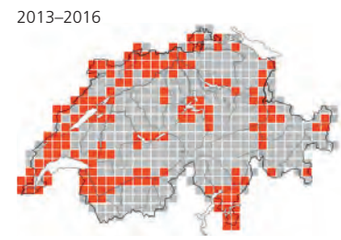
1972–1976



1993–1996



2013–2016



Yellowhammer

Emberiza citrinella
Goldammer
Bruant jaune
Zigolo giallo
marena d'aur

Mathias Schäf

Red List Least Concern (LC)
Population 65 000–75 000 pairs (2013–2016)

Focus pages 234, 314, 362, 392, 560

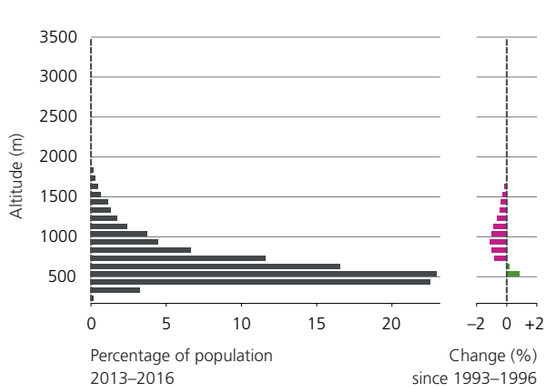
In Switzerland, the Yellowhammer inhabits the transition zones between woodland and open country: forest edges, clearings, young plantations, orchards, vineyards and especially hedgerows [8]. It forages in adjacent farmland, along fields and ditches as well as on unpaved paths and fallow plots [1, 2]. High densities are reached between 400 and 800 m on the Central Plateau and in the western Jura. In the Alps, high densities are also found in the central Valais and Lower Engadine GR. The Ticino lies at the periphery of the Yellowhammer's range and is only sparsely populated. The highest confirmed brood to date was recorded at 1870 m near Evolène VS (A. Barbalat). Singing males can occasionally reach even higher altitudes, as demonstrated by observations at 2190 m near St-Martin VS [VdS] and Poschiavo GR (P. Schmid).

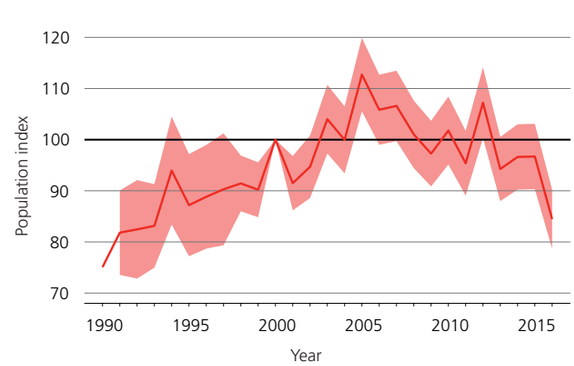
The national trend was slightly positive up to 2005, but has since reversed. At altitudes above 700 m, particularly in the Alpine valleys and the Jura, the population has thinned out since 1993–1996. Some low-lying areas have seen gains, however, especially parts of the cantons of Vaud, Bern, Lucerne and Zurich. The population was considered stable in Germany, but the trend has been negative since 2000 [AtD]. The French population dropped by half between 1989 and 2013 [AtF]. Trends are also negative in Italy and Austria [12, 15] and in Europe as a whole [EBCC].

In the course of agricultural intensification and land consolidation, the population of the Yellowhammer, once a ubiquitous bird, reached an all-time low around 1970 [AtCH2, VdS]. Since the 1980s, hedgerows have been planted in many lowland areas [5], followed by wildflower strips, resulting in a trend reversal [3, 9, 11, 13, 17, 18]. The Yellowhammer reaches the highest densities in more mature wildflower strips, the optimal age being six years [4, 19]. In the Jura and the Alps, agricultural intensification began later than on the Central Plateau [10, 14]. In addition, hedgerows did not increase in mountainous areas like they did on the Central Plateau and in urban agglomerations between 1989 and 2003 [5]. The use of pesticides also has a negative impact [AtF, 6, 7], as does crop farmers' preference for winter cereals over spring cereals [16].

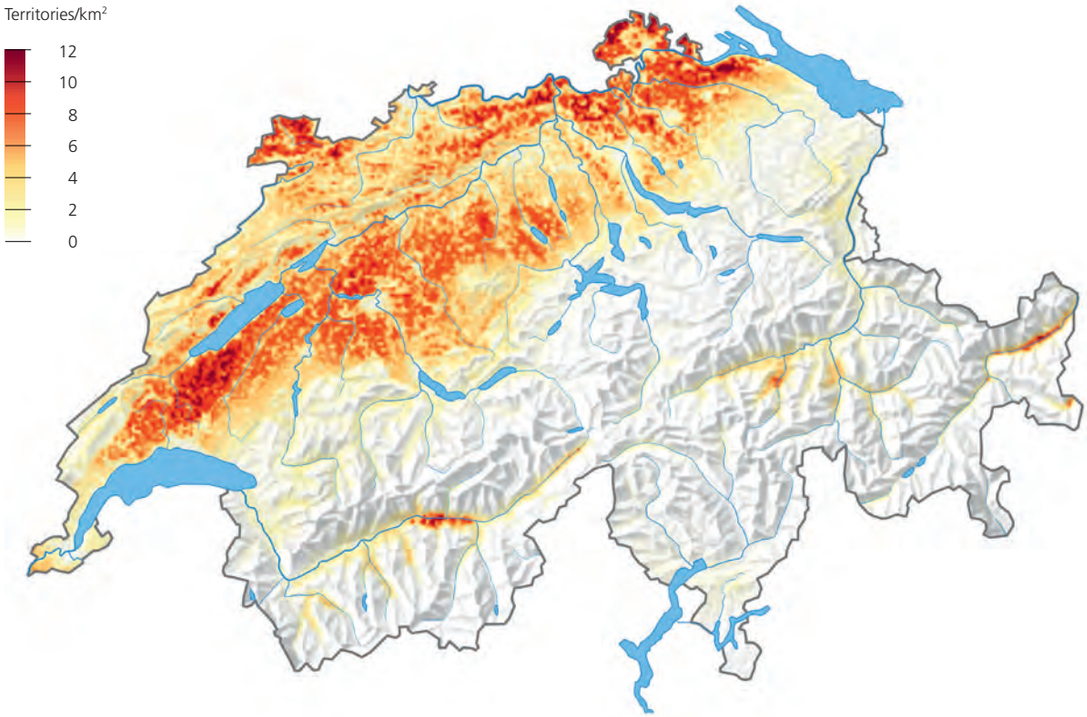
Petra Horch

[1] Biber (1993a); [2] Biber (1993b); [3] Birrer et al. (2007a); [4] Birrer et al. (2012); [5] Bundesamt für Umwelt (2007); [6] Hallmann et al. (2014); [7] Hart et al. (2006); [8] Horch & Holzgang (2006); [9] Martinez et al. (2017); [10] Morard (2014); [11] Müller & Ernst (2014); [12] Rete Rurale Nazionale & Lipu (2015); [13] Rudin et al. (2010); [14] Sierro et al. (2009); [15] Teufelbauer & Seaman (2017); [16] Weggler & Schwarzenbach (2011); [17] Weggler & Widmer (2000a); [18] Zollinger (2012); [19] Zollinger et al. (2013)

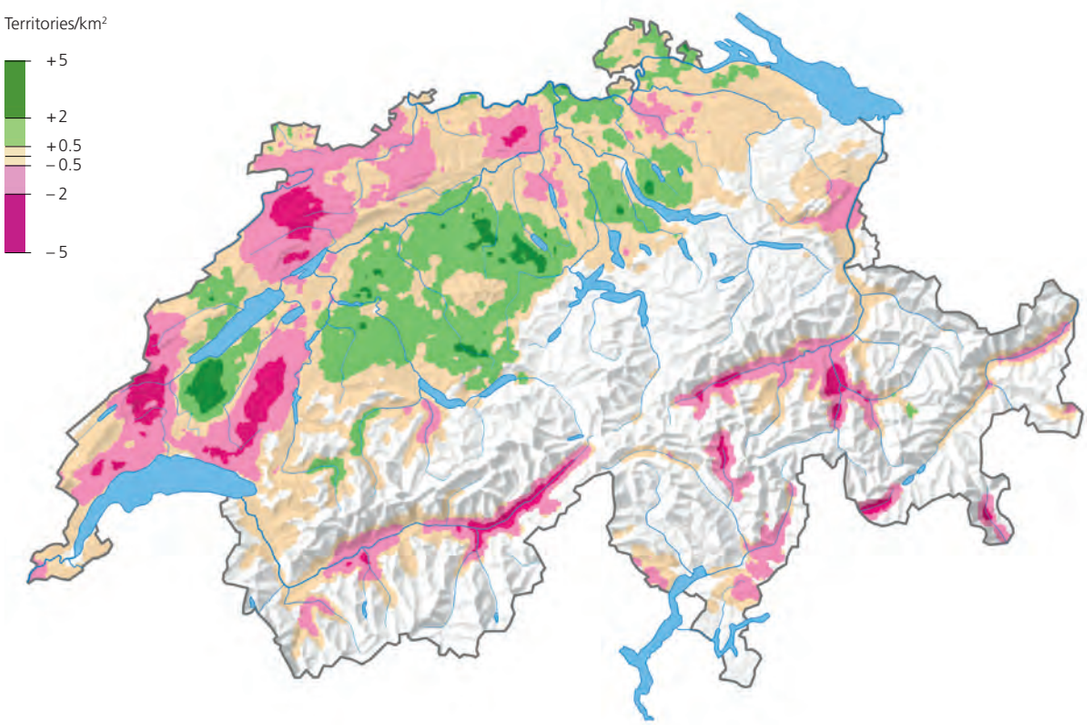




Density 2013–2016

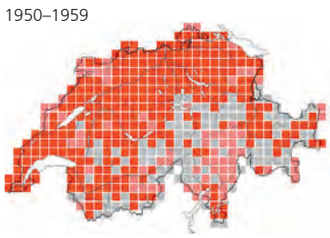


Density change since 1993–1996

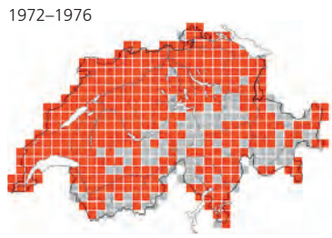


Sponsored by
Ursula & Jörg Helfenstein
Cornelia Krättli, Birrwil
Andi Tromp, Kehrsatz

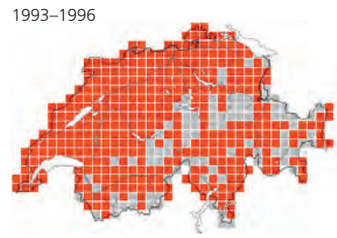
1950–1959



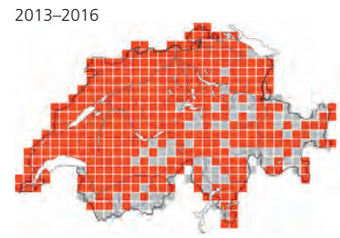
1972–1976



1993–1996



2013–2016



Richer breeding bird community beyond our border

In neighbouring countries across the Swiss border, there are more bird species, higher densities and more Red List species per kilometre square than on the Swiss side of the border. These differences are explained by the greater number of semi-natural spaces and small habitat structures in these neighbouring regions, which in turn is a consequence of different cultivation methods and land use as well as the different arrangement of landscape elements.

In addition to the kilometre squares in Switzerland, 145 kilometre squares that lie at least partly in neighbouring countries along the Swiss border were surveyed for the 2013–2016 atlas. The analysis presented here looked at a belt of 10 km on both sides of the border. Along the French border in the west, 59 kilometre squares in France and 160 in western Switzerland were included; along the German border in the north, 38 kilometre squares on German territory and 99 in northern Switzerland were covered. The border regions with Austria and Liechtenstein in the east and Italy and France in the south were not included in the analysis, as they vary considerably in terms of habitat types and altitude.

In the border regions with Germany and France, the percentage area covered by each habitat type is comparable on both sides. At 2 %, the average proportion of built-up areas is slightly higher in Switzerland than across the border, where it is 1.5 %; the proportions of woodland (31 and 35 %, respectively) and farmland (48 and 50 %, respectively) are slightly lower. The average elevation is the same on both sides of the borders with Germany and France, so climatic differences are likely to be modest.

Higher densities and greater species richness on the other side of the border

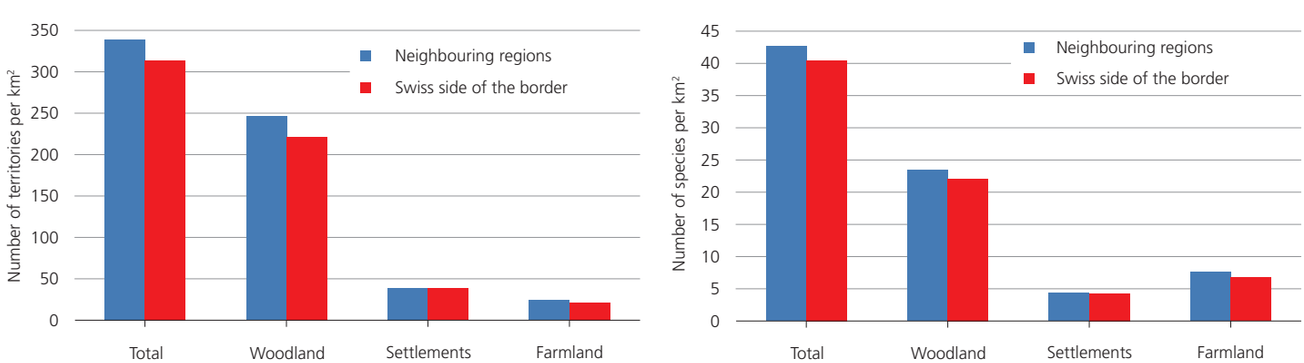
Comparing the number of territories on both sides of the border reveals that on average, there were 25 territories more per kilometre square in neighbouring regions than in Switzerland. Species richness was greater across the border too. On average, 2.2 species more per kilometre square occurred there than on the Swiss side. The same goes for species that are classified as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Near Threatened (NT) on the Swiss Red List[RLCH]. On average, the neighbouring areas supported 0.29 Red List species more per kilometre square than Switzerland. The difference was greater in the French border areas (0.37 species more) than in Germany (0.17 species more).

The higher densities in neighbouring regions could be explained by the slight differences in the proportions of woodland, settlements and farmland. However, if this were the only cause, one would expect species that typically occur in settlements to have higher densities in Switzerland, as the Swiss kilometre squares contain a higher proportion of built-up areas. But this is not the case: the number of territories per kilometre square for species associated with settlements was very similar on both sides of the border. For some species, neighbouring regions actually accommodated more territories than the Swiss areas (1.5 territories per kilometre square more in the case of the House Sparrow, for example).

A closer analysis of the differences between woodland species leads to the same conclusion. Al-though the average proportion of woodland is exactly the same on both sides of the German-Swiss border (29 % each), the density of woodland species was higher in Germany by an average of 18.3 territories per kilometre square. Thus, the slight percentage differences in habitat types cannot be the sole cause for the observed differences in density. Nor can the greater species richness be ex-plained by different habitat percentages, as more of a certain habitat type did not automatically lead to a larger number of species.

Marked differences in the case of farmland birds

A closer look at farmland species also demonstrates that the different habitat percentages cannot be the only cause for the



Average number of territories (left) and average number of species (right) per kilometre square in neighbouring regions (blue) and on the Swiss side of the border (red). The farmland species refer to the so-called EOA species («Environmental Objectives in Agriculture»). Only the border regions with France in the west and Germany in the north were included in the analysis.

observed differences. In the case of typical farmland birds, the so-called EOA species («Environmental Objectives in Agriculture» EOA, with 29 target species and 18 characteristic species)[1], both the number of species and the number of territories per kilometre square were greater in neighbouring regions. Many EOA species, such as Garden Warbler, Common Redstart or Yellowhammer, rely on small habitat structures in farmland for breeding. As the average proportion of farmland barely differs across the border, the larger populations in neighbouring regions are more likely due to differences in cultivation, land use and the arrangement of landscape elements.

These differences in habitat are visible on the aerial image below. Although the same three habitat types exist on both sides of the Rhine, namely settlements, farmland and woodland, these habitats differ in terms of their small-scale composition. The differences are particularly striking in farmland: on the German side of the Rhine, there are clearly more small structures such as copses, hedges, orchards or tree-lined roads than on the Swiss side. The same observation was made by Scherler[2] in potential breeding habitats of the Little Owl: in southern Germany, the number of small structures was much higher than in the Swiss survey areas.

Aerial view of the border region near Wallbach AG/D. The German area on the right bank of the Rhine has more small habitat structures than Switzerland on the left. These differences are particularly pronounced in agricultural areas. Reproduced with permission of swisstopo (BA180142).

No change since 1993–1996

A similar analysis was conducted in the past using data from the 1993–1996 atlas[3]. The picture has barely changed. Back then, neighbouring regions also exhibited greater species richness and a larger number of Red List species per kilometre square than the areas on the Swiss side of the border. Like today, the study concluded that EOA species in particular face poorer conditions in Switzerland than on the other side of the border[3]. While the 2013–2016 survey found more territories on average in neighbouring regions than in Swiss areas, no difference in density across all species was detected back in 1993–1996. This may be because in 1993–1996, upper limits were defined for all species regarding the number of territories. For example, if more than ten blackbirds were counted marking their territory in a given kilometre square, no further records were collected for this species. Therefore, because of this upper limit, the densities measured in 1993–1996 were incomplete. On the other hand, intensive farming practices and the maximised use of available surface area in Switzerland appear to have led to lower densities in many common species as well as rare ones. The additional finding that species richness is higher in neighbouring regions supports the assumption that small habitat structures, which many birds and other animals rely on, are scarcer or of poorer quality in Switzerland. Therefore, every effort must be made both to preserve existing semi-natural structures and farmland managed at low intensity and to eliminate deficiencies.

Simon Hohl

	Swiss side	French/German side
Number of kilometre squares	160 (in western Switzerland) 99 (in northern Switzerland)	59 in France 38 in Germany
Average number of territories/km²	313.6	338.9
Average number of species/km²	40.5	42.7
Average number of Red List species (category NT included)/km²	1.3	1.6
Average number of farmland species/km²	6.8	7.6
Average number of territories of farmland species/km²	21.9	24.0

Overview of the number of surveyed kilometre squares along the border as well as the average numbers of species and territories found per kilometre square. The farmland species refer to the so-called EOA species («Environmental Objectives in Agriculture»).

[1] BAFU & BLW (2008)/OFEV & OFAG (2008); [2] Scherler (2014); [3] Schmid & Pasinelli (2002)

Species pages 238, 416, 450, 470, 494, 558

Reed Bunting

Emberiza schoeniclus
Rohrammer
Bruant des roseaux
Migliarino di palude
marena da palì

Mathias Schaef

Red List Vulnerable (VU)
Population 1700–3000 pairs (2013–2016)

Focus pages 284, 380

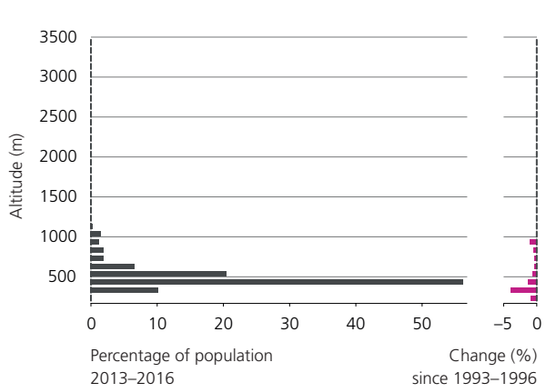
In Switzerland, the Reed Bunting is mainly found north of the Alps. It inhabits wetlands with (old) reedbeds and adjacent sedge meadows, primarily below 600 m. The major populations are found near large lakes, although there are also substantial populations in other areas (e.g. Neeracherried ZH). Single pairs often breed in small wetlands[6, 7, 8]. The highest confirmed brood since 1997 was recorded near Lenkerseeli BE at 1070 m (2000; R. Hauri). Breeding still occurred in the Rohr Lauenen nature reserve BE at 1250 m in 1993–1996[AtCH2], and a singing male was seen there in 2014 (A. Jordi). In 1976 the Reed Bunting was even found to breed near Bever GR at 1700 m[AEn]. The highest record of a singing male came from Sils-Maria GR at 1790 m (2013; D. Jenny).

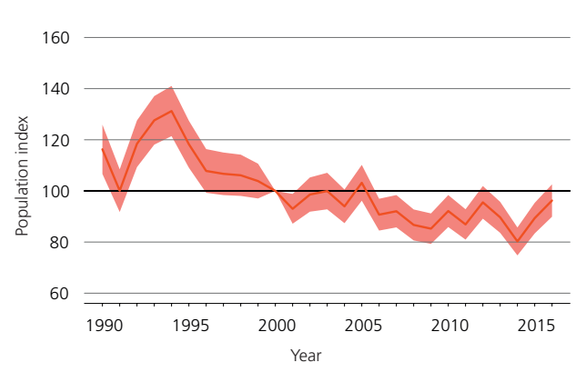
Several areas on the Central Plateau, in the Jura and in the Valais have been abandoned since 1993–1996. The population has declined since 1990. This is alarming, as suitable habitats in Switzerland are almost all protected. Around Lake Constance the population dropped by more than 50 % between 1980 and 2010, mainly in areas outside the sanctuaries[AtBo]. In the Canton of Zurich, a similarly dramatic decline took place between 1988 and 2008[AtZH]. Numbers in the Grande Cariçaie, on the other hand, have been stable overall since 1985[1]. Declines were also noted in France and Italy[AtF, 4] as well as in Europe as a whole[EBCC].

In Switzerland, the decline is probably caused primarily by more frequent reed cutting, a measure which aims to promote dragonflies and orchids and combat invasive plants. The cutting not only occurs in the interior of the reedbeds; older stands along the shore are sometimes cleared completely as well[7, 10]. Remaining old reed belts are often no more than a few metres wide, facilitating predation of the nests, which tend to be close to the ground[5, 11]. It takes three to six years after cutting for the stands again to be occupied in high densities by the Reed Bunting[2, 3]. In other countries, agricultural intensification is considered an important cause of decline, as it reduces the winter food supply of seeds and grains[9, 13]. Whether this also applies to the Swiss breeding population, which winters in the southwestern Mediterranean[12], is unknown, as are the effects of nitrogen deposition or climatic factors at the breeding sites.

Gilberto Pasinelli & Stefan Werner

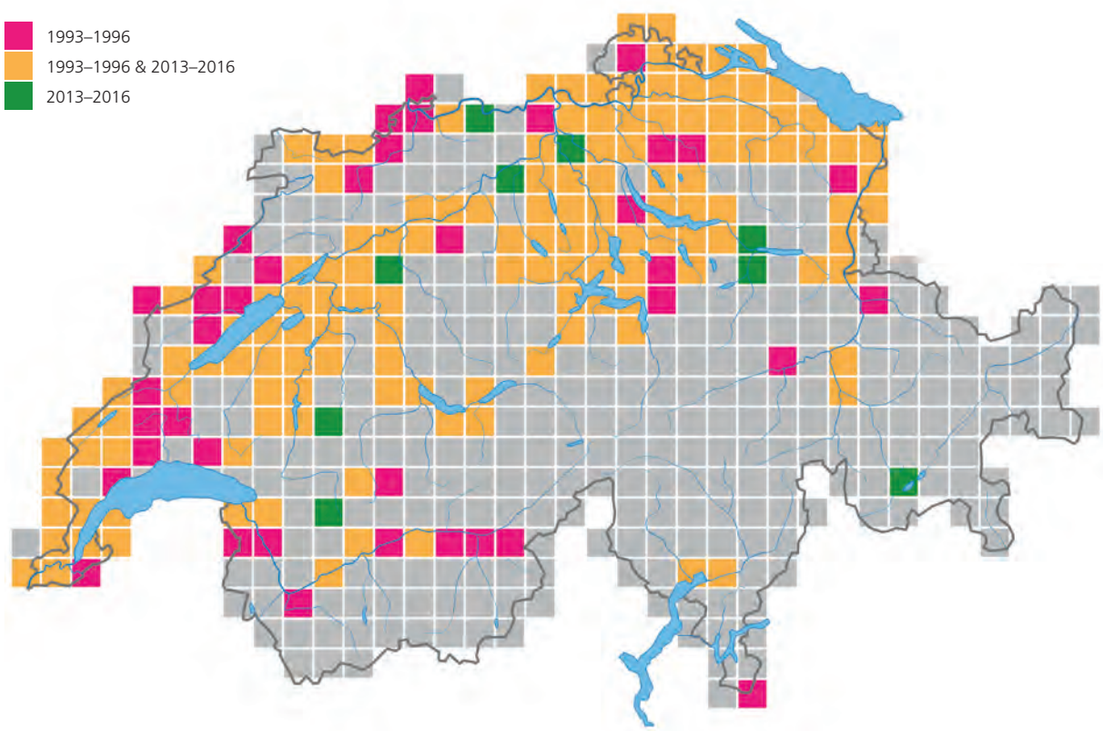
[1] Antoniazza (2018); [2] Antoniazza & Maillefer (2001); [3] Antoniazza et al. (2018); [4] Nardelli et al. (2015); [5] Pasinelli & Schiegg (2006); [6] Pasinelli & Schiegg (2007); [7] Pasinelli & Schiegg (2012); [8] Pasinelli et al. (2008a); [9] Peach et al. (1999); [10] Sautter (2008); [11] Schiegg et al. (2007); [12] Schmitz et al. (2007); [13] Vera et al. (2014)





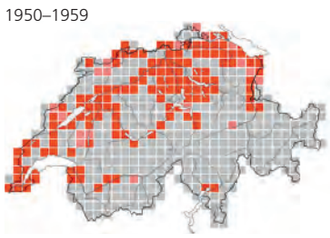
Occurrence 2013–2016

Distribution change since 1993–1996

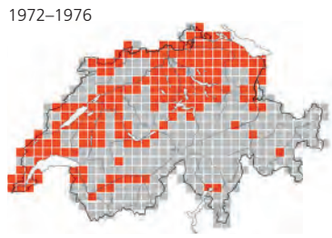


Sponsored by
Erica & Christoph Kramer, Therwil

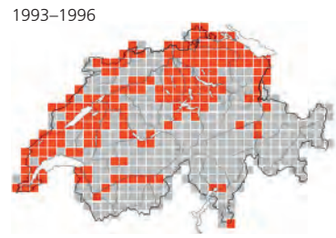
1950–1959



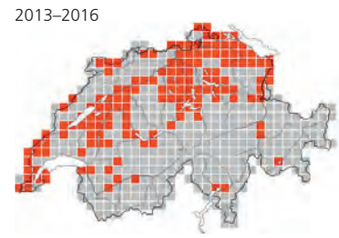
1972–1976



1993–1996



2013–2016



Ornithologist (♂ and ♀)

Homo sapiens var. *ornithologicus*
Ornithologe (♂ und ♀)
Ornithologue (♂ et ♀)
Ornitologo (♂ e ♀)
ornitholog (♂ e ♀)

Lukas Linder

Red List	Least Concern (LC)
Population	3517 individuals (2013–2016)

Focus –

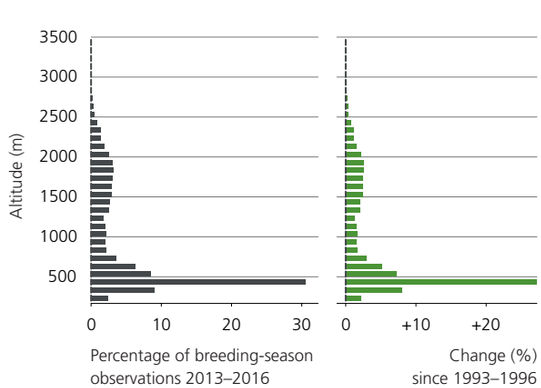
Ornithologists can have an extremely large home range, which sometimes extends throughout the entire country. As they are specialised on birds and their activities produced this atlas, this account focusses on the activities (breeding-season observations) rather than on territory distribution or nest sites. The highest densities of *Homo sapiens* var. *ornithologicus* are found below 600 m, especially in the population centres of Geneva, Bern, Basel, Lucerne and Zurich. A number of square patches on the Central Plateau are particularly striking, indicating highly active individuals with a small home range. Lowland lakes and wetlands are among the most frequented habitats.

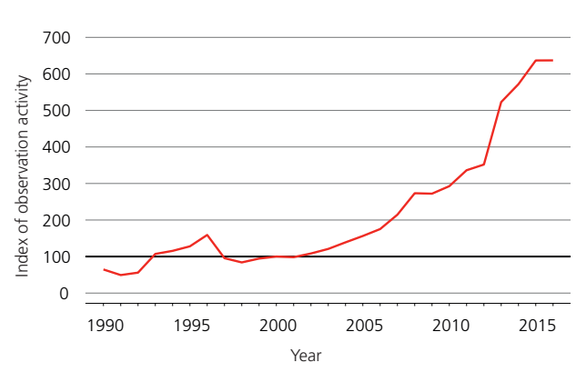
As *H. sapiens* var. *ornithologicus* is unable to fly, considerable effort or various means of transportation (e.g. automobile, cable car) are required to reach inaccessible or remote areas. Therefore, visiting frequency is inversely related to remoteness and elevation. *H. sapiens* var. *ornithologicus* was completely absent from many areas along the Alpine divide and in the Valais. The highest breeding-season observations in 2013–2016 came from the Zinalrothorn VS at 4220 and 4120 m (M. Gerber, A. Barras).

Between 1993–1996 and 2013–2016, the number of registered ornithologists increased from 913 to 3517. Observation activity also grew significantly, the increase being most pronounced in ornithological hotspots (e.g. Les Grangettes VD, Grosses Moos BE/FR, Magadino Plain TI). Most Alpine regions and large parts of the Jura have also seen positive trends since 1993–1996, with the exception of areas in the Vaud Alps and Toggenburg SG. Beyond the aforementioned hotspots, activity on the Central Plateau has remained largely constant since 1993–1996 or increased marginally.

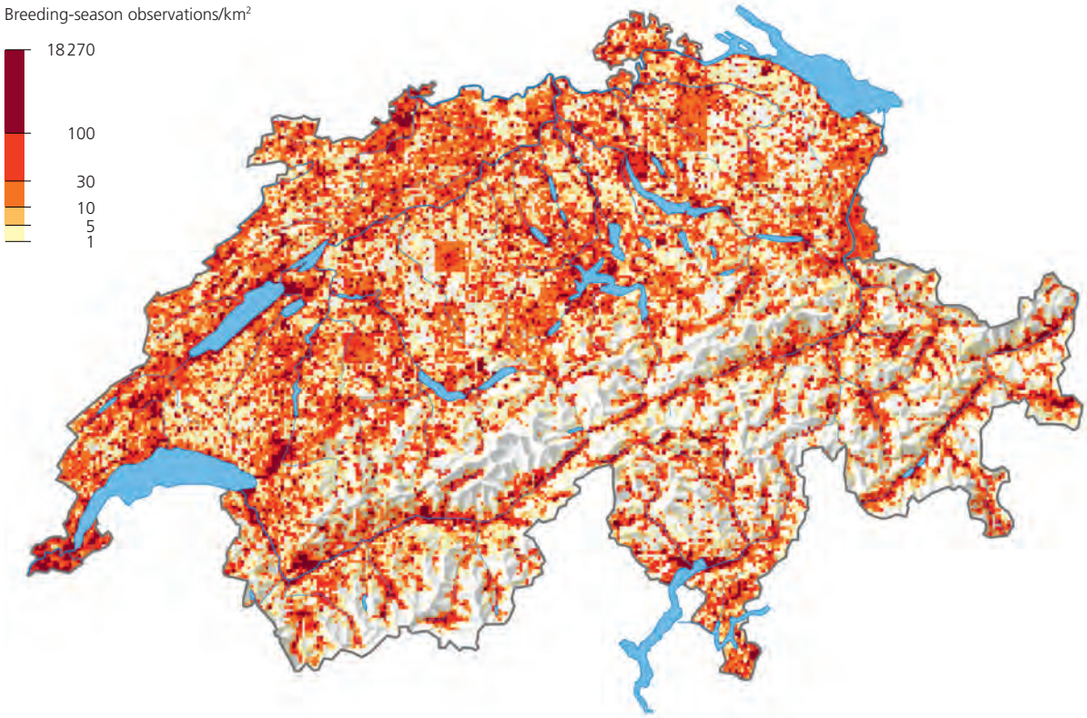
The reasons for the positive trend in activity of *H. sapiens* var. *ornithologicus* mainly include increased mobility and vastly improved data collection techniques (e.g. smartphone), allowing for most activities to take place outdoors while reducing the amount of data processed using hardware (paper and pencil) inside the dwellings. To maintain H. sapiens var. ornithologicus' excellent reporting activity, further improvements in data collection technology are recommended, as well as a continued high level of care provided by the Swiss Ornithological Institute.

Dominik Hagist & Lukas Jenni

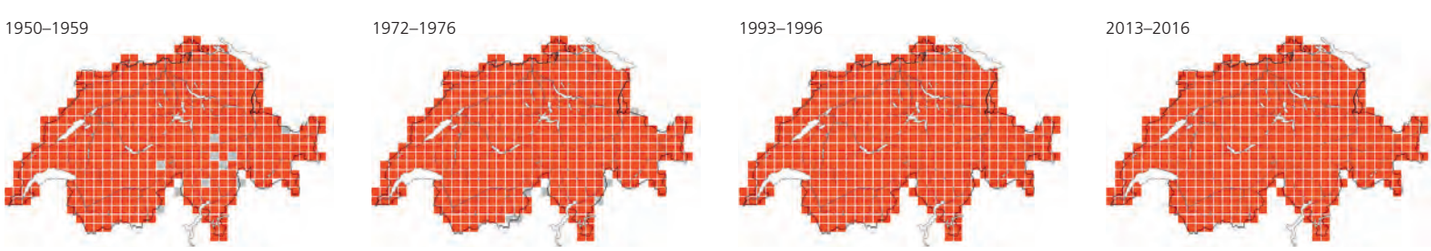




Observation activity 2013–2016



Change in observation activity since 2013–2016



Appendix 1: Species present within the atlas perimeter in 2013–2016 with no confirmed breeding record

Red-necked Grebe

Podiceps grisegena
Rothalstaucher
Grèbe jougris
Svasso collorosso
sfunsella grischa

Marcel Burkhardt

Sponsored by
Franziska Hindermann Maillard, Ettingen

In Europe, the Red-necked Grebe breeds predominantly east of a line stretching from Denmark to Turkey. Switzerland is on the range periphery, and breeding has not been confirmed here so far, though the species has bred at least twice on Lake Constance: in Ermatinger Becken D in 1982 and in the Rhine delta A in 1994 [ABo3]. Records of probable breeding come from Eriskircher Ried D in 2001 (M. Schleicher, G. Knötzsch) [1] and Wollmatinger Ried D in 2008 (S. Werner, C. Gönner) [2]. In June and July 2011, a bird was observed performing a courtship display in a colony of Great-crested Grebes in Horn D and subsequently at Radolfzeller Aachmündung D (A. Brall, S. Trösch, G. Segelbacher, H. Reinhardt) [5]. In the same area, an adult was seen building a nest in 2017 (J. Büchler) [3]. During 2013–2016, isolated summer observations were reported in Switzerland. In addition, a Red-necked Grebe was seen in Weissenau BE on Lake Thun every spring, as has been the case since 2007 [ID]; in 2015 and 2016, it performed a courtship display with a Great Crested Grebe and repeatedly carried reeds to a Great Crested Grebe nest (M. Hammel) [ID, 4]. A displaying pair was seen in Bolle di Magadino TI on 27 May 2015 (M. Hammel). On 8 June of the following year, a bird was observed at the same site disappearing into the reeds with a fish in its beak (M. Hammel) [ID]. Despite losses in southeastern Europe, the overall European population has increased thanks to positive trends in Fennoscandia and Russia [RLEU]. In Germany, the breeding population is concentrated in the northeast of the country, numbering 1800–2600 pairs in 2005–2009; it has been considered stable since the 1990s [AtD]. In France, 1–3 pairs breed every year, most regularly in the department of Aube [AtF].

[1] Jacoby et al. (2001); [2] Jacoby et al. (2008); [3] Knaus et al. (2017); [4] Müller et al. (2016a–b); [5] Trösch et al. (2011)

Eurasian Bittern

Botaurus stellaris
Rohrdommel
Butor étoilé
Tarabuso
tarbegl grond

Werner Scheuber

The Eurasian Bittern occurs from western Europe to the Pacific coast of Asia as well as in some parts of South Africa. Distribution in Europe is scattered due to the species' dependence on dense, vast reedbeds. While no breeding records exist for Switzerland, the Eurasian Bittern bred in Wollmatinger Ried on the German shore of Lake Constance in 1994 (C. Hofstätter) [ABo3]. Singing males are occasionally observed during the breeding season, mainly on the southeastern shore of Lake Neuchâtel or in Kaltbrunner Riet SG [ID]. During 2013–2016, three individual singing males were recorded in 2015: on 1 April near Ollon VD (J.-M. Fivat), on 2 May near Sionnet GE (T. Milner) and on 1 June in the Weissenau nature reserve BE (M. Hammel). A further singing male was observed on 17 April 2016 at Radolfzeller Aachmündung D (J. Kania) [1]. In 2015, 1–2 individuals were present in Kaltbrunner Riet up until 8 May [ID], and a bird was seen there until 16 May in 2016 [2]. Finally, a Eurasian Bittern was repeatedly observed in Chavornay VD between 15 June and 23 September 2016 (F. Jaquier et al.). The European populations declined steeply between 1970 and 1990, but are currently stable [RLEU]. Some countries, such as Germany, even report slight increases [AtD]. The French population is declining, and the species' breeding range shrank by 57 % between 1985–1989 and 2009–2012 [AtF].

[1] Knaus et al. (2016b); [2] Müller et al. (2016a–b)

River Warbler

Locustella fluviatilis
Schlagschwirl
Locustelle fluviatile
Locustella fluviatile
scroller da flum

Markus Varesvuo

Sponsored by
Sarah Dreyfus

Focus page 420

The breeding range of the River Warbler stretches from Germany across southern Fennoscandia and the northern shores of the Black Sea to central Siberia. The species inhabits dense vegetation on riversides and in wetlands. All 14 sightings in Switzerland since 1991 were isolated observations of singing males in spring. During 2013–2016, the species was observed from 25 to 30 May 2013 near Kleinandelfingen ZH (M. Griesser) [6] and from 13 to 24 May 2015 near Schinznach-Dorf AG (J. Landolt et al.) [2]. A male, presumably a passage migrant, was heard singing near Arch BE on 9 May 2013 (W. Christen, K. & M. Eigenheer) [6]. Finally, a singing male was present near Gunzgen SO from 31 May to 7 June 2017 (U. Elsenberger et al.). The River Warbler has been observed almost annually on Lake Constance since the 1980s [ABo3]; breeding was confirmed for the first time near Friedrichshafen D in 2011 (M. Hemprich) [4]. However, following the prolonged presence of a bird near Gaienhofen D in 2012 (G. Segelbacher, H. Reinhardt, S. Werner, S. Trösch, C. Stauch) [5], the species was not detected at all during the atlas surveys in 2013–2016. Germany reports a positive overall trend from 1985–2009. A decline has been noted since the 1990s [AtD], however, resulting in a range loss of more than 20 % in Bavaria [3]. Massive losses have been recorded in some parts of Austria as well [1]. The European population has also declined significantly since about 1995 [EBCC].

[1] Albegger et al. (2015); [2] Martinez & Maumary (2016a–b); [3] Rödl et al. (2012); [4] Trösch et al. (2011); [5] Trösch et al. (2012); [6] Vallotton et al. (2014a–b)

Brambling

Fringilla montifringilla
Bergfink
Pinson du Nord
Peppola
fringhel dal nord

Markus Varesvuo

The breeding range of the Brambling extends across the boreal zone of Eurasia from Scandinavia to Kamchatka. The species winters in large numbers in central and western Europe, where late migrants can often still be seen in spring. Summering birds are a regular occurrence in Germany, the Netherlands and Poland [AtD], but much rarer in France [4]. Breeding is even less common: it has been recorded 12 times in Germany since 1950, almost exclusively on the coast or on islands in the north [AtD], and occasional broods have been found in Carinthia [AtA]; there have been seven breeding records in the Italian Alps in the past 40 years, for example near Ponte di Legno in Lombardy, about 25 km from the Swiss border [3], though some Italian records may relate to escapes from captivity [3]. Bramblings are occasionally observed in summer in Switzerland as well; this was the case between 1976 and 1996 in the Engadine GR and Val Bregaglia GR in forests of spruce, mountain pine, larch and stone pine [AEn, VdS]. There are no breeding records for Switzerland, however. In 2013–2016, two singing males were recorded in the Jura within the perimeter of the atlas surveys: one was recorded on 20 May as well as on 7 and 9 June 2014 in the Forêt du Risoux near Bois-d'Amont F at 1250 m (J. Piaget, F. Louiton) [ID, 1], the other from 5 June to 5 July 2015 in the Vallée de Joux near Le Chenit VD at 1340 m (F. Duruz, S. Joss, C. Maillefer, Y. Menétrey) [2]. Prior to these observations, the last singing male in Switzerland was observed on 31 May 2005 near Trélex VD at 650 m in a beech-oak forest (F. Mathey) [5].

Bernard Volet

[1] Antoniazza (2015); [2] Antoniazza (2016b); [3] Brichetti & Fracasso (2013); [4] Dubois et al. (2008); [5] Posse (2006)

Appendix 2: Species having bred within the atlas perimeter at least once since 1800, but not in 2013–2016

Red-legged Partridge

Alectoris rufa
Rothuhn
Perdrix rouge
Pernice rossa
pernisch cotschna

Red List Regionally Extinct (RE)

Beat Rüegger

The Red-legged Partridge is a resident bird native only to southwestern Europe, where its range extends from Portugal to France and Italy; the populations in the UK are derived from introduced birds. The Red-legged Partridge used to occur in southwestern Germany and Switzerland as well, but disappeared in the course of a southwestward range contraction that was possibly linked to the cooling climate towards the end of the 16th century[HVM]. The last reliable Swiss reports date back to 1860 in the Vaud and Neuchâtel Jura[3]. Observations are reported almost every year near Geneva and more rarely in the Ajoie JU[ID], but they all relate to birds released for hunting in France. Hundreds of thousands of Red-legged Partridges are released throughout the country every year; according to the most recent available figures, 2.5 million birds were released in 1996 alone[2]. The populations closest to the Swiss border are found in the western part of the Franche-Comté and the Dombes[AtF]. In the species' strongholds in Spain and France, populations are in continuous decline, mainly due to loss of suitable habitat as well as hunting[RLEU, 1, 2]. In the Piedmont, breeding range and density are decreasing at higher altitudes, while an expansion is apparent in lower-lying areas. Changes in the environment and climate appear to be the main drivers of this shift[4].

[1] de Juana & Garcia (2015); [2] Dubois et al. (2017); [3] Lüps (1975); [4] Tizzani et al. (2013)

Common Goldeneye

Bucephala clangula
Schellente
Garrot à œil d'or
Quattrocchi
anda stgella

Red List Vulnerable (VU)

Sponsored by
Dr Peter Dollinger, Liebefeld-Bern

Manfred Kühn

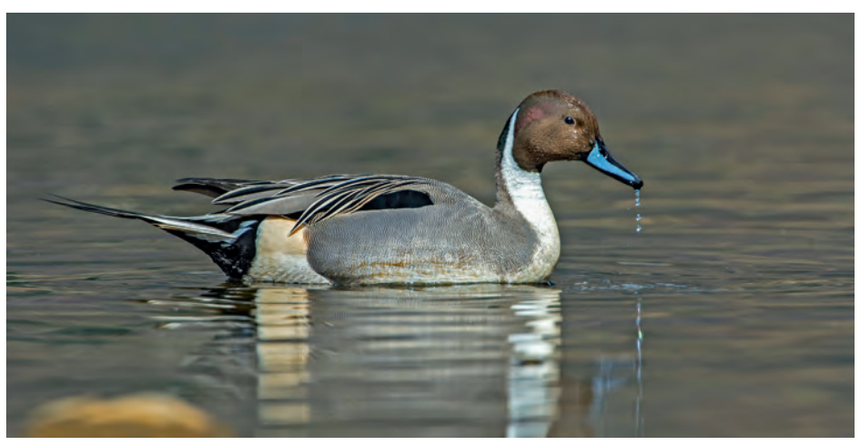
The Common Goldeneye is a bird of the Eurasian and North American taiga. Its main breeding grounds in Europe are in Finland and Sweden, followed by Norway and Russia. In other countries, the Common Goldeneye is much scarcer. Switzerland lies at the southern fringe of its breeding range. Breeding has been recorded here four times: once in Les Grangettes VD in 1955 [5], and three times near Hagneck BE in 1997–1999 [3, 6]. A few pairs escaped from captivity have bred in Arosa GR since 1991 (J. Jelen, P. Knaus) [AtCH2, VdS]. The overall European population is stable or increasing [RLEU]. In Germany, the Goldeneye has extended its range to the southwest in recent decades, resulting in a doubling of the population in Bavaria since the 1990s [AtD]. Following the first breeding record in Austria in 1986 [2], the population had increased to 10–15 pairs by 2008–2012 [RLEU]. Breeding was not recorded in France until 1999 [1]; 3–4 breeding pairs were counted there in 2014 [4].

[1] Combrisson (1999); [2] Lieb & Brader (2004); [3] Marbot (1998); [4] Quaintenne & les coordinateurs-espèce (2016); [5] Trüb et al. (1955); [6] Volet & Burkhardt (2001)

Northern Pintail

Anas acuta
Spiessente
Canard pilet
Codone
anda gizza

Sponsored by
Jean-Emmanuel Lalive



Marcel Ruppen

The distribution of the Northern Pintail covers the entire northern hemisphere, where it is concentrated to the north of the 40th parallel. In Europe, the species primarily breeds in Finland and Russia, followed by Sweden, Estonia and Norway. In all other countries, breeding populations are very small. The European population trend is negative [RLEU]. In Switzerland, the Northern Pintail is a regular but scarce winter visitor. The only Swiss breeding record dates from 1985 near Grône VS [1].

[1] Fournier & Sierro (1986)

Black-tailed Godwit

Limosa limosa
Uferschnepfe
Barge à queue noire
Pittima reale
becassina da riva

Marcel Burkhardt

The Black-tailed Godwit occurs in three separate populations in Iceland, continental Europe and eastern Siberia. While the species does not breed in Switzerland, a small breeding population existed in the Rhine delta A and its surroundings between 1955 and 2005 with numbers reaching a maximum of 19 pairs in 1985 [ABo3, 1, 2, 3]. From the 1990s, the population has dwindled with increasing speed [ABo3], paralleling the overall German trend: about 20 000 pairs bred in Germany in the 1980s; in 2005–2009, numbers were down to 3900–4400. The decline has occurred hand-in-hand with the loss of inland breeding sites [AtD]. Not far from Switzerland, the Black-tailed Godwit has bred in the Dombes F since at least 1948; breeding has become irregular here as well [AtF]. Although some Black-tailed Godwit populations remain stable or have even seen increases, such as in Iceland, the overall European trend is distinctly negative [EBCC, RLEU]. Reasons include the draining of wet meadows and the intensified use of farmland.

[1] Burtscher et al. (2017); [2] Jacoby et al. (2006); [3] Willi (1961)

Common Redshank

Tringa totanus
Rotschenkel
Chevalier gambette
Pettegola
trintga cotschna

Red List Regionally Extinct (RE)

Marcel Burkhardt

Focus page 319

The range of the Common Redshank stretches from Iceland as far as eastern China. The European breeding populations are concentrated in the north. The species is less frequent in central and southern Europe, where its distribution is predominantly coastal. The Common Redshank occurred as a breeding bird in Switzerland until the early 20th century, presumably until about 1930. The last confirmed breeding record dates from 1919 in the Kaltbrunner Riet SG, where a number of pairs had bred regularly in previous years [BCH]. On the German side of Lake Constance, breeding was recorded up to 1928, in the Wollmatinger Ried D and on Mettnau D up to 1934 [ABW, BCH] and in the Rhine delta A up to about 1940; a further breeding attempt in the Rhine delta took place in 1970 [ABo2, AtV]. The European breeding population has been in slight decline since 1970 [EBCC, RLEU]. In France, however, where the Common Redshank breeds almost exclusively along the coast, numbers increased between 1996 and 2015 [AtF, 1]. Most of the losses in Germany between 1970 and 1990 concerned the inland populations. A short period of stability followed, before a renewed decline set in around the year 2000 [AtD]. Like in the case of the Black-tailed Godwit, habitat change is responsible for the declines.

[1] Jiguet (2017)

Short-eared Owl

Asio flammeus
Sumpfohreule
Hibou des marais
Gufo di palude
piv da palì

Christine Jung

The Short-eared Owl occurs throughout the northern hemisphere. It breeds sporadically in central and southern Europe during outbreaks of small mammals, the species' main prey, or during food shortages in its habitual breeding grounds. This happened in 1993, when 6 pairs bred in the Bassin de Drugeon F, a meadow and mire landscape just 10 km from the Swiss border[2, 3]. In Switzerland, the Short-eared Owl bred in Wauwilermoos LU during vole outbreaks in 1908, 1935 (2–3 pairs) and probably in 1939 (at least two pairs)[BCH]. Further records followed in the Rhine delta A in 1936[AtV] and 1950 (6 nests)[ABo1]. Two Short-eared Owls were present in this area in April 1961, and 1–2 birds performed courtship displays between mid-April and mid-May 1965[ABo1]. Probable breeding was recorded on the Mettnau peninsula D in 1935[ABW]. In central Europe, Short-eared Owl populations declined significantly in the course of the 20th century, as its main habitats – mires, wet meadows and fallows – were drained and destroyed[AtD, EBBA1]. The European trend is difficult to determine, as numbers fluctuate widely[RLEU]. France reported 20–80 pairs in 2009–2012[AtF], 50–180 territories were recorded in Germany in 2005–2009[AtD], and 0–15 pairs were counted in Austria in recent years[1].

[1] Aistleitner et al. (2015); [2] Michelat (1997); [3] Michelat (1998)

Osprey

Pandion haliaetus
Fischadler
Balbuzard pêcheur
Falco pescatore
evla da peschs

Red List Regionally Extinct (RE)

Mathias Schäf

Focus pages 142, 190, 264, 319

The Osprey has a cosmopolitan range, breeding on all continents except Antarctica. The majority of the European population is found in Sweden, Finland and Russia. The species used to be much more widespread, but persecution caused it to disappear from many parts of Europe in the course of the past centuries. Breeding was last confirmed in Switzerland in 1911 near Ellikon ZH[3, 6]. After the ban on pesticides based on chlorinated hydrocarbons, the European population began to increase again in the 1970s, and some areas were re-colonised, such as central France after 1984[AtF, 5] and Bavaria after 1992[4]. Currently, observations during the breeding season are rare in Switzerland. In the 2013–2016 period, a female that had hatched in France in 2012 was present in the north of Thurgau from 8 July to 5 September 2014 (H. Roost, S. Trösch)[1], and again in spring 2015 until 1 June (M. Roost)[2]. Also, between 21 May and 1 October 2016, a bird was repeatedly seen in the Canton of Schwyz (P. Kühne, R. Janevski et al.). As part of a reintroduction scheme initiated by Nos Oiseaux, six juveniles were released near Bellechasse FR in 2015, and 12 in both 2016 and 2017[8]. A sufficient supply of potential nest sites exists in Switzerland[3], and the positive outcomes of such projects in England, Spain, Italy and Portugal since 1996 are reason to hope that the Osprey will breed here in the coming years[7].

[1] Knaus et al. (2014); [2] Knaus et al. (2015); [3] Krummenacher et al. (2009); [4] Müller et al. (2008); [5] Nadal et al. (2012); [6] Stemmler (1932); [7] Strahm & Landenbergue (2013); [8] Strahm & Landenbergue (2018)

Hen Harrier

Circus cyaneus
Kornweihe
Busard Saint-Martin
Albanella reale
melv da graun

Mathias Schäf

Sponsored by
Bertrand Zufferey, Vissoie

The Hen Harrier's range extends from the Iberian Peninsula to Siberia. In Switzerland, situated at the southern edge of its distribution area, the species occurs mainly as a passage migrant and winter visitor. Breeding has only been recorded twice in Switzerland: in Sionnet GE in 1917[3] and in Vendlincourt JU in 1999[1], following observations in the summer of 1998. A female (possibly the same one) was present at the same site in mid-April of 2000 and was seen in the company of 1–2 chicks in late August. The exact location of the nest was not known, however[1]. Earlier records exist in neighbouring France not far from Geneva, where the Hen Harrier bred in the Pays de Gex in 1902 and between Loisin and Veigy in 1957–1958[2]. Today, the species is practically absent from eastern France, and the French breeding population of 13 000–22 000 pairs is decreasing[AtF]. Numbers are declining in Germany too: the remaining 40–60 pairs counted in 2005–2009 are largely confined to the East Frisian coast. While the decline in that area up to the 1980s was mainly caused by the draining of wetlands, the reasons for the losses since 1997 are unknown[AtD]. The overall European trend is also negative. Causes are thought to include habitat changes due to agricultural intensification, loss of wetlands, and increased afforestation[RLEU].

[1] Challet & Monnerat (2003); [2] Géroudet (1980); [3] Poncy (1917)

Montagu's Harrier

Circus pygargus
Wiesenweihe
Busard cendré
Albanella minore
melv da prada

Red List Vulnerable (VU)

Patrick Donini

Sponsored by
Regina Schallberger-Diethelm

The Montagu's Harrier occurs from North Africa to central Siberia, although its distribution in central Europe is heavily fragmented. It has never been a regular breeder in Switzerland. There are 37 records of confirmed or probable breeding in the 20th century, mostly in western Switzerland, the last record dating from 1986[VdS]. The only more recent brood was recorded in the Klettgau SH in 2007 (M. Roost, S. Trösch, M. Jenny, P. Parodi, N. Baiker)[3]. Numbers have grown in several parts of Germany in recent years, increasing from 62 to 155 pairs in Bavaria between 2000 and 2009[AtD], which in turn led to the colonisation of northern Baden-Württemberg[2]. These successes are related to nest-site conservation measures in cereal fields, used by the Montagu's Harrier since the 1970s. In France, numbers are estimated at 5600–9000 pairs. The trend is slightly negative with some apparent range loss in the east[AtF]. About 700 broods benefit from similar conservation measures as in Germany[AtF]. The Italian population numbers 260–380 pairs and increased slightly from 1980 to 2012[1]. While the overall European trend is not known, it is negative in the countries of the European Union[RLEU].

[1] Nardelli et al. (2015); [2] Pürckhauer et al. (2014); [3] Volet & Gerber (2008)

Red-footed Falcon

Falco vespertinus
Rotfussfalke
Faucon kobez
Falco cuculo
falcun vespertin

Markus Varesvuo

The breeding range of the Red-footed Falcon extends from eastern Europe to Siberia, where the species inhabits open lowland landscapes interspersed with hedges and trees and abundant in insects. It is a regular passage migrant in Switzerland, and although it has never bred here, there are breeding records from 1956 in Rheinholz near Gaissau A [ABo2] and from 1977 in Dornbirner Ried A [1], just outside the atlas perimeter. Breeding was recorded in Germany in the 19th and 20th centuries, with the last record dating from 1978 in Sachsen-Anhalt. There were records of probable breeding in Sachsen-Anhalt and Bavaria up until the 1990s [AtD]. Several breeding attempts have occurred in France, far from the species' normal range, resulting in at least two successful broods in the departments of Isère and Vendée in 1993 [3]. The Austrian population is in steep decline, numbering 6–14 pairs in 2008–2012 [RLEU, 2]. In Italy, 50–70 breeding pairs were counted in 2013 [4]. The European trend is also negative, mainly due to habitat destruction and the loss of large insects caused by pesticide use.

[1] Blum et al. (1977); [2] Dvorak et al. (2017); [3] Legendre (2005); [4] Nardelli et al. (2015)

Greater Short-toed Lark

Calandrella brachydactyla
Kurzzehenlerche
Alouette calandrelle
Calandrella
lodola de la detta curta

Sponsored by
Sylvie Nicoud, Prilly

Mathias Schäf

Focus pages 369, 425

The Greater Short-toed Lark occurs from north Africa to central China. In Europe, distribution is concentrated on the Iberian Peninsula, Italy and the Balkans. Switzerland lies north of the species' breeding range, but a few passage migrants are observed here every year, mostly in spring. Between 2008 and 2017, the Greater Short-toed Lark was observed in 21 sites per year on average, with a greater influx in 2016 (32 sites). Breeding has only been confirmed once so far, in a sugar-beet field on sandy soil near Martigny VS in 1989 [2]. Populations are in decline in the species' European strongholds in Spain [4], and trends are negative in Italy and France as well. The French population was estimated at 3000–6000 pairs in 2000, but had dropped to 800–1500 pairs in 2009–2012 [AtF]. Italy recorded a decline of 57 % between 2000 and 2011 [1]. The Greater Short-toed Lark is presumably a victim of changes in the landscape caused by developments in agriculture, notably the decrease in fallow land and the increased use of fertiliser and pesticides as well as the decline in low-intensity pastures, the abandonment of farmland, and shrub encroachment [3, 4].

[1] Campedelli et al. (2012); [2] Curchod et al. (1990); [3] de Juana & Garcia (2015); [4] Massa & La Mantia (2000)

Spectacled Warbler

Sylvia conspicillata
Brillengrasmücke
Fauvette à lunettes
Sterpazzola della Sardegna
fustgetta dals egliers

Dennis Lorenz

Sponsored by
Dorothea Witzig

Focus page 425

The Spectacled Warbler occurs in northwest Africa, from Portugal to Italy, and in the Middle East. Although Switzerland lies far north of the species' normal breeding range, it has been recorded here ten times (until 2017) since the first observation in 1989. Breeding has been confirmed three times: in 1989 and 2008 in the Leuk area VS at 670 m [5] and 1100 m, respectively, (B. Posse et al.) [8] and in 2005 near Zermatt VS at 2050 m [9]. Also, singing males in suitable habitat were seen near Boudevilliers NE in 2008 (C. Sinz, D. Gobbo, A. Frey, J. Laesser, V. Martin) [8], near Greich VS (C. Roesti, J. Mazenauer, M. Bally) [6] and again near Leuk in 2011 (M. Zimmerli) [6], and in Val d'Hérens VS in 2017 (J.-C. Muriset et al.). The Spectacled Warbler favours dry locations with low bushy vegetation, finding suitable habitat in the sub-Alpine zone of Switzerland as well [9]. The overall European population trend is uncertain [RLEU]. On the one hand, the most important populations in the Mediterranean region in France are declining [AtF]. On the other hand, the recently discovered populations in the montane zone of the Pyrénées-Orientales [7] and the Massif Central [4] appear to be increasing, though they remain very small [AtF]. Italy reports different regional trends: the population is spreading in the mountains of Lazio and Abruzzo, while losses have occurred in the province of Lecce [2]. At the European level, the range has expanded to the north, possibly as a result of climate change [1]. The first confirmed breeding record in Germany, in North Rhine-Westphalia in 2017, is a recent example [3].

[1] Assandri & Morganti (2015); [2] Brichetti & Fracasso (2010); [3] König et al. (2017); [4] Lovaty (2015); [5] Maumary et al. (1990); [6] Piot et al. (2012)/Piot & Vallotton (2012); [7] Roy (2000); [8] Schweizer & Thoma (2009)/Schweizer et al. (2009); [9] Werner et al. (2006)

White-spotted Bluethroat

Cyanecula svecica cyanecula
Weisssterniges Blaukehlchen
Gorgebleue à miroir blanc
Pettazzurro occidentale
puppenblau cun staila alba

Marcel Burkhardt

Sponsored by
Meinrad Küttel
Swen & Karin Mischkulnig

The White-spotted Bluethroat, much less widespread than the red-spotted subspecies, occurs from Spain to Ukraine. It is mainly seen on passage through Switzerland, most often in lowland wetlands. Although breeding probably took place in the 19th and early 20th century [VdS], only two records of confirmed breeding are known: in 1927 in the Fanel BE [2] and in 2006 near Altstätten SG (R. Zingg, K. Moor, G. Sieber, P. Schönenberger, I. Hugentobler) [7], where a singing male was present every year between 2001 and 2008. During 2013–2016, two territorial males were observed on the southern shore of Lake Neuchâtel in 2013 (P. Rapin, M. Antoniazza) [5], where two singing males had already been recorded in 2012 (M. Zimmerli, P. Rapin, C. Sinz, J. Mazenauer, M. Antoniazza) [4]. Another singing male was seen near Altstätten on 17 May 2014 (G. Sieber) [3] and one on 20 April 2016 (G. Sieber). It is quite possible that the White-spotted Bluethroat breeds in Switzerland again, as numbers are increasing in most countries (except Spain and Austria) [RLEU, 1]. Its breeding range in Bavaria, for example, expanded by 25 % between 1996–1999 and 2005–2009 [6]. The population increase in France and Germany is probably related to the species' expansion in the Netherlands. Restoration measures in wetlands, climate conditions in the wintering grounds, and shorter migration routes may also play a role [AtD].

[1] Dvorak et al. (2016); [2] Hess (1927); [3] Müller (2015); [4] Müller & Volet (2013); [5] Müller & Volet (2014); [6] Rödl et al. (2012); [7] Volet et al. (2007)

Red-breasted Flycatcher

Ficedula parva
Zwergschnäpper
Gobemouche nain
Pigliamosche pettirosso
sgnappamustgas pitschen

Markus Varesvuo

Sponsored by
Mirjam Emma Studer

Focus pages 190, 420

The breeding range of the Red-breasted Flycatcher extends from central Europe to Russia, east of a line running from Denmark to Greece. Switzerland lies at the western edge of the range, and the species occurs here irregularly, mainly on autumn passage. Singing males are occasionally seen in spring, but they rarely stay. Annual observations of singing males were only recorded in the Prättigau GR from 2001 to 2006 [VdS]. The only Swiss breeding records to date were confirmed here in 2003 (F. & S. Castelli, V. Zindel, V. Oswald, C. Meier-Zwicky) [2] and 2006 (U. Bühler) [3]. The territories were located at 800 m in deciduous woods with lots of old beech trees and abundant deadwood [VdS].

The European trend appears to be positive [RLEU]. The trend is stable in Germany overall and in Bavaria in particular, but populations in the northeast of the country have declined since the late 1990s [AtD], mainly due to forestry practices that created open forest structures [4]. In Vorarlberg, a significant decline has been apparent since the 1980s, attributed mainly to increased interventions in old-growth stands; the population was estimated at fewer than ten pairs in 2001–2008 [AtV]. The overall Austrian trend is negative as well [1].

Bernard Volet

[1] Dvorak et al. (2017); [2] Preiswerk (2004)/Preiswerk & Maumary (2004); [3] Schweizer (2007)/Schweizer & Vallotton (2007); [4] Vökler (2014)

Appendix 3: Escapes from captivity that bred within the atlas perimeter in 1997–2017

Black Swan

Cygnus atratus
Schwarzschwan
Cygne noir
Cigno nero
cign nair

Stefan Pfützke / Green-Lens.de

Focus page 124

Native to Australia, Black Swans were once imported to New Zealand and many European countries, where small breeding populations have since formed. Escapes from captivity are regularly observed in Switzerland, but breeding is rare. During 2013–2016, there was a single record in an area across the Swiss border: a breeding pair with one cygnet was seen near Radolfzell D in 2014 (S. Werner, H. Reinhardt, C. Stauch, M. Rüttiger, E. Morard)[2]. Breeding had occurred successfully in the same area in 2012 (C. Stauch, G. Segelbacher, H. Reinhardt et al.)[4]. Following records of breeding near the Swiss border between Kaiseraugst AG and Altrhein/Wyhlen D in 2000–2002[1], the Black Swan bred for the first time in Switzerland in Thun BE in 2003[VdS]. Subsequently, 1–2 pairs nested there annually until 2008[5, 6, 7]; in 2009, a pair bred on Wohlensee BE (T. Schwaller, A. Jordi). The breeding population is estimated at 20–30 pairs in Germany[AtD], and at 26–30 pairs in France[AtF]. The populations in both countries are growing.

[1] Kestenholz et al. (2005); [2] Knaus et al. (2014); [3] Müller & Volet (2010); [4] Trösch et al. (2012); [5] Volet & Gerber (2008); [6] Volet & Gerber (2009); [7] Volet et al. (2007)

Barnacle Goose

Branta leucopsis
Weisswangengans
Bernache nonnette
Oca facciabianca
auca mungia

Christioph Moning/Green-Lens.de

Sponsored by
Corinne Gianola, Dübendorf

Focus page 124

The natural breeding range of the Barnacle Goose includes East Greenland, Iceland, the Svalbard archipelago, the Russian Arctic and parts of the Baltic See coast. Small populations have established themselves in other areas of Europe, mainly in the Netherlands and northern Germany. Most birds observed in Switzerland are escapes from captivity or derive from feral populations. During 2013–2016, the only Swiss record relates to a clutch with two eggs found on the island off Cheseaux-Noréaz VD in 2016 (M. Antoniazza, C. Schönbächler, M. Bastardot)[1]. In 2017, breeding occurred again at the same site (M. Antoniazza), resulting in the first record of successful breeding in Switzerland (A. Gander et al.). Clutches of unfertilised eggs had regularly been found in the Fanel nature reserve BE/NE between 1987 [AtCH2] and 2003 (B. Monnier, P. Rapin, F. Schneider)[3]. A Barnacle Goose was seen paired with a Greylag Goose in the Fanel in 2000 and 2001 (Groupe d'étude et de gestion de la Grande Cariçaie)[ID, 2]. Finally, a breeding bird was reported in Sursee LU in 2003 [VdS]. The Barnacle Goose is protected throughout its range and the population appears to be increasing [RLEU]. In Germany, the number of breeding pairs has even grown significantly: as many as 410–470 were recorded in 2005–2009, up from 15 pairs in the mid-nineties [AtD].

[1] Müller (2017); [2] Posse (2001); [3] Posse (2004)

Canada Goose

Branta canadensis
Kanadagans
Bernache du Canada
Oca del Canada
auca da Canada

Stefan Pfützke/Green-Lens.de

Sponsored by
Robin Schnyder

Focus page 124

The Canada Goose was introduced to Europe from North America. Breeding populations have become established mainly between the UK and Finland. Individuals or small troops may occur in Switzerland, mostly near the larger lakes, but breeding is very rare. During 2013–2016, an unpaired female laid three eggs in Geneva in 2014 (S. Mancini)[3]. Following several breeding attempts in Geneva in 2001 and 2002 as well as in the Reuss delta UR in 2004 and 2005, the Canada Goose bred successfully for the first time in Switzerland in Ouchy VD in 2012 (F. Maillardet, M. Gorgerat)[4]. Further breeding attempts on Lake Geneva may have gone unnoticed [VdS]. A pair presumably attempted to breed in Geneva again in 2017 (M. Müller). The Canada Goose regularly raised offspring on the German side of Lake Constance close to the Swiss border in the late 1980s and the 1990s [ABo3], but no longer breeds there today[5]. The last successful breeding was recorded near Radolfzell D in 2002 (S. Werner)[2]. The total breeding population in Germany is estimated at 3600–5000 pairs [AtD] and continues to grow. The population is also increasing in France, where the census in 2015 recorded between 9500 and 10 000 individuals[1].

[1] Dubois et al. (2016); [2] Jacoby et al. (2002); [3] Müller (2015); [4] Müller & Volet (2013); [5] S. Werner, in litt.

Bar-headed Goose

Anser indicus
Streifengans
Oie à tête barrée
Oca indiana
auca strivlada

Christioph Moning/Green-Lens.de

The Bar-headed Goose originates from central Asia, mainly from Kyrgyzstan, China and Mongolia. It has been introduced to Europe, and feral populations have become established in some countries such as the Netherlands and Belgium. Breeding has been recorded twice in Switzerland: a family with three young was observed near Hilterfingen BE in 2001 (E. Urbanzik)[3], and a pair bred near Unterseen BE in 2004 (D. Grossniklaus)[3]. Records from Germany are scattered; in 2005–2009, the population was estimated at 5–20 pairs[AtD]. Although breeding success is low almost everywhere, the population is considered self-sustaining[1]. In 2014–2015, France had 2–6 breeding pairs, one of which was recorded in the Petite Camargue alsacienne to the north of Basel[AtF, 2].

[1] Bauer et al. (2016b); [2] Dubois et al. (2016); [3] Kestenholz et al. (2005)

South African Shelduck

Tadorna cana
Graukopfkasarka
Tadorne à tête grise
Casarca sudafricana
auca dal chau grisch

Roger Wilmshurst/Alamy Stock Foto

The South African Shelduck is often kept in captivity outside of its native South Africa. All three instances of breeding in the wild in Switzerland were mixed pairings with Ruddy Shelducks; each time, a male Ruddy Shelduck was paired with a female South African Shelduck. The first case occurred in Zurich in 1988[4], the other two on Klingnau reservoir AG in 1996 and 1997[AtCH2, VdS]. A further case of mixed breeding between these two species was reported in 1998 from Rheinfelden D[3]. This appears to be the only confirmed breeding record in our neighbouring countries[1, 2].

[1] Baccetti et al. (2014); [2] Bauer & Woog (2008); [3] Bauer et al. (2016a); [4] Tobler (1988)

Muscovy Duck

Cairina moschata
Moschusente
Canard de Barbarie
Anatra muta
anda-mustgat

Eckhard Lietzow

The Muscovy Duck's native range extends from Mexico to Uruguay. Domesticated breeds of the Muscovy Duck, sometimes called Barbary Ducks, are often held in captivity in Europe; various places, for example in England and the Netherlands, support small feral populations [AtGB, 2]. Breeding was recorded for the first time in Switzerland during the 2013–2016 surveys, when a female with two chicks was observed near Caslano TI in 2013 (M. Tomasi, P. Stephani). However, an earlier breeding record exists from 1984 near Konstanz D [3]. The situation of the Muscovy Duck in our neighbouring countries is poorly documented, as field ornithologists often pay it little attention. The German population was estimated at about 20 pairs in 2004–2007 [AtD], the French population at 25–30 individuals in 2015 [4]. In Italy, the population is considered self-sustaining [1]. According to the current surveys for the new Austrian breeding bird atlas, breeding by the Muscovy Duck is not unusual in the east of the country.

[1] Baccetti et al. (2014); [2] Banks et al. (2008); [3] Bauer et al. (1995); [4] Dubois et al. (2016)

Ringed Teal

Callonetta leucophrys
Rotschulterente
Canard à collier noir
Alzavola anellata
anda dal culier cotschen

Roger Wilmshurst / rspb-images.com

The Ringed Teal is native to Bolivia, Paraguay, southeastern Brazil, northern Argentina and Uruguay. It is kept in wildfowl collections in many parts of Europe. In Switzerland, there is a single record of breeding in the wild that dates from June 1999 near Geneva [AtGE]. Occasional breeding is also reported from Germany, mostly from Dortmund [AtD, 2]. There have been three breeding records in France [3], but none in Italy [1].

[1] Baccetti et al. (2014); [2] Bauer & Woog (2008); [3] Dubois et al. (2008)

Wood Duck

Aix sponsa
Brautente
Canard carolin
Anatra sposa
anda spusa

Ruedi Aeschlimann

Focus page 124

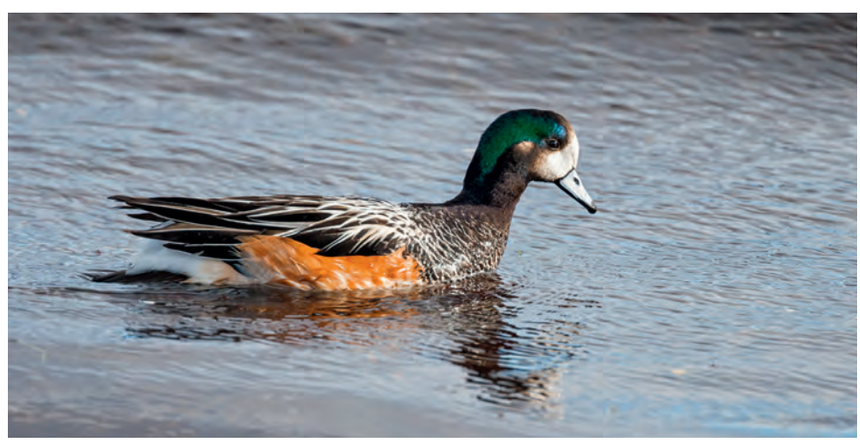
The first Wood Ducks were brought to Europe from North America in the 19th century. However, the species has not established itself as well as its close relative, the East Asian Mandarin Duck. In Switzerland, the Wood Duck is occasionally found on lakes and rivers throughout the country, mostly below 700 m. It has bred here sporadically since 1996 [AtCH2]. Breeding has been recorded on the German side of Lake Constance as far back as the 1930s, however [ABo1]. During 2013–2016, two broods were recorded in Switzerland, near Treiten BE in 2013 (C. Gartmann) [3] and near Biberstein AG in 2015 (T. Aegerter, R. Kern Fässler) [2]. These are the 22nd and 23rd breeding records in Switzerland.

Half of the known breeding sites are located between Thun BE and Aarau AG, either directly on the Aare River or nearby. The other confirmed broods occurred along the Rhine between Chur GR and Bad Ragaz SG (five broods), on Flachsee Unterlunkhofen AG (three broods) and finally, on the High Rhine near Rheinfelden AG, on Lake Neuchâtel near Yverdon-les-Bains VD and in the Valais near Sion (one brood each). Numbers are modest in our neighbouring countries as well: 3–5 breeding pairs were counted in France in 2015 [1]; in Germany, where the population is increasing, 25–40 breeding pairs were recorded between 2005 and 2009 [AtD].

[1] Dubois et al. (2016); [2] Müller (2016); [3] Müller & Volet (2014)

Chiloe Wigeon

Mareca sibilatrix
Chilepfeifente
Canard de Chiloé
Fischione del Cile
anda chilena



Chris Stenger/Buiten-Beeld

A native of southern Chile, Argentina and the Falkland Islands, the Chiloe Wigeon has bred in Switzerland only once: a female with three chicks was seen in Sursee LU on 25 May 1998 (R. Wüst-Graf) [VdS]. The species has been observed in neighbouring countries too, but without evidence of breeding [1, 3]. Elsewhere in Europe, the Chiloe Wigeon has bred in Spain and Belgium [2].

[1] Baccetti et al. (2014); [2] Banks et al. (2008); [3] Bauer & Woog (2008)

Indian Spot-billed Duck

Anas poecilorhyncha
Canard à bec tacheté
Germano indiano
anda dal bec taclà indica
Indien-Fleckschnabelente

Marcel Burkhardt

The natural range of the Indian Spot-billed Duck extends from Pakistan to southern China. Escapes from captivity are occasionally observed in Switzerland and elsewhere in Europe. A case of hybridisation between a leucistic female and a male Mallard was reported near Martigny VS in 2006 (B. Posse)[2]. Similar cases have been documented in the German region of southern Baden: near Rielasingen in 2000, near Moos in 2001 and near Grenzach-Wyhlen in 2006[1]; there have been no further records since then[AtD]. The Indian Spot-billed Duck has bred elsewhere in Germany too, but has never established permanent populations[AtD].

[1] Bauer & Woog (2008); [2] Posse (2007)

White-cheeked Pintail

Anas bahamensis
Bahamaente
Canard des Bahamas
Codone delle Bahamas
anda da las Bahamas

Patrick Donini

Focus page 124

The White-cheeked Pintail lives in the wild in the Antilles and in South America. While escapes from captivity are seen quite frequently on Swiss lakes and rivers, there was not a single record of breeding before 2013–2016. During the surveys for this atlas, breeding evidence was recorded twice: in 2013, a female with a chick was seen in Vevey VD (J.-M. Fivat, D. Rumo)[5] and in 2014, a female with six chicks was observed on a dammed stretch of the Rhine near Augst BL/AG/D (A. Niffeler, D. Kratzer)[4]. At present, breeding by the White-cheeked Pintail remains exceptional in Europe. Three cases have been documented in France[3]; in Germany, the only record is the aforementioned one near Augst[2], and Italy has none[1].

[1] Baccetti et al. (2014); [2] Bauer & Woog (2008); [3] Dubois (2007); [4] Müller (2015); [5] Müller & Volet (2014)

Monk Parakeet

Myiopsitta monachus
Mönchssittich
Conure veuve
Parrocchetto monaco
papagagl dal chapitsch

David J. Slater/rspb-images.com

The natural range of the Monk Parakeet is in South America. In Europe, isolated breeding pairs or small populations derived from escaped or released birds mainly occur in Spain, Italy, Belgium and the Czech Republic[4]. In Switzerland, breeding by Monk Parakeets in the wild has been documented twice: in Balerna TI in 1997[AtCH2] and in S. Nazzaro TI in 2005[VdS]. Contrary to information from older sources[ABo3, VdS], the breeding records in Konstanz D in the late 1970s and early 1980s did not relate to the Monk Parakeet, but to the Maroon-bellied Parakeet *Pyrrhura frontalis*[2]. Although the Monk Parakeet nested in Germany several times and in various regions during the 20th century, it has not become permanently established[1]. In Italy, on the other hand, the population of 400–500 breeding pairs[3] has continued to grow in recent years[5]. In France, the Monk Parakeet has bred in various places for short periods. In the south, the population reached 17–19 breeding pairs in 2014 (2–4 in Marseille and 15 in Toulon)[AtF].

[1] Bauer & Woog (2008); [2] Bauer et al. (2016a); [3] Brichetti & Fracasso (2006); [4] Lever (2005); [5] Mori et al. (2013)

Rose-ringed Parakeet

Psittacula krameri
Halsbandsittich
Perruche à collier
Parrocchetto dal collare
papagagl dal cularin

Mathias Schäf

Focus page 124

The Rose-ringed Parakeet lives in the wild in the African Sahel and on the Indian subcontinent, but the species has been introduced to many other parts of the globe. Several cities in Europe now have substantial breeding populations, especially in the UK, the Netherlands, Belgium and Germany. In 2015, ten countries had established populations, with the total number of birds in Europe estimated to be at least 85 000[4]. In Germany, the rapidly growing populations are concentrated in the Rhine Valley between Heidelberg and Düsseldorf[AtD]. Beyond its core population in Paris, the Rose-ringed Parakeet has colonised many towns in northern, eastern and southern France, where numbers are also increasing fast[AtF, 1, 4]. The species occurs almost throughout Italy, with centres in Rome and Palermo[2, 4]. It is regularly seen in Switzerland in very small numbers, but breeding is exceptional. In 2013–2016, a pair occupied a cavity in Embrach ZH from 20 April 2016, but later abandoned the nest (M. Gärtner)[3]. This was the fifth confirmation of breeding in Switzerland. All earlier records relate to a pair that bred in Monthey VS from 1991 to 1994[AtCH2]. Reports from other areas in Switzerland suggest that further breeding may have gone unnoticed, especially in Ticino[VdS].

[1] Dubois et al. (2016); [2] Fraticelli (2014); [3] Müller (2017); [4] Pârâu et al. (2016)

Vinous-throated Parrotbill

Sinosuthora webbiana
Braunkopfpapageimeise
Paradoxornis de Webb
Panuro di Webb
maset da Webb

Neil Bowman/FLPA

Focus page 124

Native to southeastern Russia, China and northern Vietnam, the Vinous-throated Parrotbill was introduced to the province of Varese in Lombardy I in 1995 when a pet dealer released about 150 individuals. The first indications of breeding were reported the same year[3, 4]. The Italian population continued to grow, but its expansion was limited by the availability of suitable habitat and harsh winters[3]. Numbers were estimated at 3500–5000 birds in four main sites in 2009[2]. A small population has existed in the Netherlands since 1998[1]. The Vinous-throated Parrotbill was observed in Switzerland for the first time in 2017: between April and December at least four birds were repeatedly sighted in a wetland in the Magadino Plain TI. Two individuals were seen carrying nesting material on 14 May 2017 (R. Lardelli), but no further breeding evidence followed. The Vinous-throated Parrotbill relies on wetlands with grassy vegetation and could occupy the nearby sanctuaries of Bolle di Magadino TI and the Maggia delta TI, though its expansion may be limited by severe winters.

Bernard Volet

[1] Boele et al. (2014); [2] Boto et al. (2009); [3] Brichetti & Fracasso (2010); [4] Luoni (2009)

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Michel Chesaux, Champéry
Pascal Christe, Biel
Ruedi Christen, Wichtrach
Walter Christen, Solothurn
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Solange Chuat-Clottu, Travers
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Hans-Peter Clausen, Bitsch
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Jacques Cloutier, La Fouly VS
Jean-Luc Coquoz, Bulle
Armanda Cotter, Grandson
Gottardo Crameri, Domat/Ems
Michel Crameri, Zurich
Simon Crameri, Zurich
Damien Crelier, Porrentruy
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Alexandre Deslex, Lausanne
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Paul Rogenmoser, Schüpfheim
Sigrid Rogl, Hinterkappelen
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Thomas Romanski, Tesserete
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The state of birdlife reflects our relationship with nature and our landscapes. The atlas presents the current distribution, abundance and altitudinal distribution of all breeding birds in Switzerland and Liechtenstein with unprecedented precision. Most importantly, it highlights the profound changes that have taken place in the Swiss avifauna over the past 20 to 60 years. This comprehensive reference book provides an important foundation for the protection and conservation of native birds and their habitats.

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