



Red-crested Pochard (photo: Marcel Burkhardt)

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Research and conservation across borders

Understanding and conserving birds calls for collaboration beyond national borders. The Swiss Ornithological Institute has been engaging in international activities for a long time.

The Swiss Ornithological Institute in Sempach, also known as Vogelwarte, is firmly committed to studying and conserving birds and their habitats. In this context, an international perspective is essential, and the Vogelwarte takes pride in its tradition of conducting and fostering international projects. The 22nd conference of the European Bird Census Council EBCC in April 2022 offers an opportunity to shed light on the international work of the Vogelwarte.

A recent example illustrating the international involvement of the Vogelwarte is EBBA2, the sec-

ond European Breeding Bird Atlas published in 2020. Under the auspices of EBCC, the Vogelwarte coordinated the project with a team of European experts and was heavily involved in data analysis as well as the production of maps and texts.

The Institute has been supporting various other international projects related to bird monitoring. One of the best known is ornitho.ch, the popular citizen-science platform to record animal observations online or via the Natura-List App. The Vogelwarte played a key role in developing and promoting the platform first in Switzerland and subsequently in several European countries. We have also been among the founders of European initiatives like EuroBirdPortal (EBP) and the Pan-European Common Bird Moni-

toring Scheme (PECBMS). Both projects allow for continent-wide overviews of seasonal and temporal changes in bird distribution as well as trends of breeding populations.

The Vogelwarte has long been examining the factors affecting the ecology, behaviour and physiology of birds in Switzerland and beyond. For example, bird migration has been studied with dedicated radars in Switzerland since the late 1960s, an investigation that has since expanded to the Mediterranean and the Sahara. As of late, weather radars are used to quantify the flow of bird and insect biomasses across the continent. The advent of geolocators, to which the Vogelwarte and partners have contributed some of the smallest available devices, has made it possible to examine the

whereabouts of increasingly small bird species outside the breeding season. Many of these geolocator studies are conducted with international collaborators.

Since 2021, the Vogelwarte has been running the coordination unit of the African-Eurasian Migratory Landbirds Action Plan AEMLAP on behalf of the Convention on Migratory Species CMS. The AEMLAP aims to improve the conservation status of migratory landbirds through internationally coordinated actions in the African-Eurasian region, and thus to conserve and restore species and sustainably manage their habitats.

To learn more about the Vogelwarte Sempach, please visit www.vogelwarte.ch.

Gilberto Pasinelli
Scientific director



Counting birds all year round



Late snowmelt, rockfall, sudden changes in weather and long distances make surveys in the alpine zone extremely challenging (photo: Roman Graf).

At the Swiss Ornithological Institute, one of our core tasks is to keep track of the presence and numbers of breeding and wintering birds in Switzerland. We have several tools to help us do this, most importantly our monitoring programmes.

Because they have wings to fly, birds are much more mobile than other groups of animals. Keeping track of these movements keeps the coordination team in Sempach busy all year round. Thanks to the approximately 5,000 people active on ornitho.ch, standardised

waterbird counts on more than 300 sections of rivers and lakes, and ringing stations in wetlands and on mountain passes, the presence of wintering and migrating birds is well documented. Monitoring the species that regularly breed here – around 180 – takes more time and effort. Numbers are currently available for 176 species, in most cases starting in 1990. At the heart of our monitoring efforts is the common breeding bird monitoring scheme or MHB (in German, Monitoring Häufige Brutvögel): since 1990, it has recorded the pop-

ulation sizes of common and widespread breeding birds, including many passerines, in 267 kilometre squares across Switzerland. Additional data come from the national biodiversity monitoring programme (BDM), which surveys about 500 kilometre squares every five years. On top of this, the Swiss Ornithological Institute collaborates with local partners, ornithological groups and species experts to conduct surveys in approximately 100 wetlands, special habitats, military training grounds and parks. And finally, we organise counts of colonial species as well as special surveys, for example of nocturnal species or cliff-nesting birds.

Territory mapping: a proven method

Many surveys use a simplified form of territory mapping, which involves recording the location of all birds detected in a kilometre square while following a predetermined route. The method has a long tradition in Switzerland; it is well-suited to the often rather small habitats and the results are easy to communicate. The quantitative surveys conducted for the breeding bird atlases 1993–1996 and 2013–2016 used the same method. As a rule, three survey

visits are undertaken in every area, although some Alpine areas are only visited twice, while wetlands and special habitats are surveyed in five to six visits.

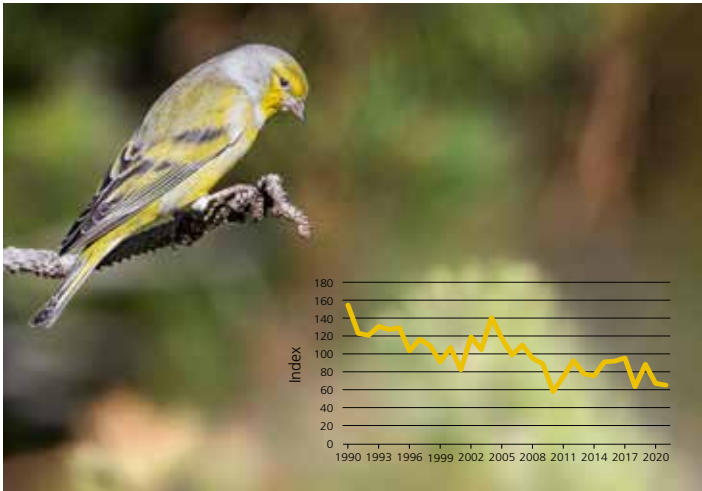
Various tools help us to keep the territory mapping method as simple and as standardised as possible: Observers receive detailed maps that indicate the routes and the duration for the survey visits, and migratory species that arrive late in the season are only counted after a given date. A mapping app developed by the Association of German Avifaunists (Dachverband Deutscher Avifaunisten DDA), a digitisation tool (TerriMap online) and software for automatic territory delimitation (Autoterri) are available to us today to help collect and analyse data efficiently. The goal is always to make any desk work as easy as possible for the surveyors.

Mountain birds are especially challenging

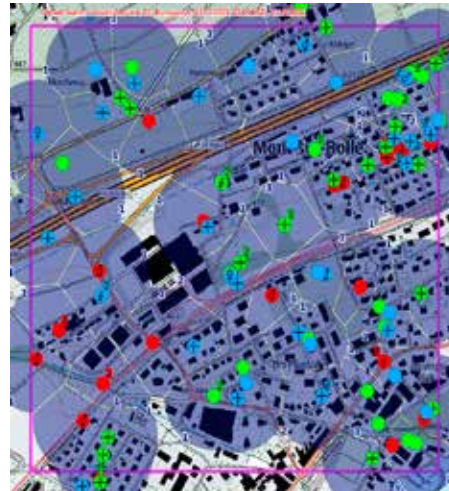
The Alps cover 58 % of the territory of Switzerland, the Jura mountains Jura 11 %. Because our country has a special responsibility for the conservation of birds in alpine and sub-alpine habitats, it is important that these areas are well represented. We survey areas up to 2,500 m above sea level. Surveys in these areas are particularly challenging: weather changes, late snowmelt, rockfall, and bridges or paths washed away by avalanches or floods can cause problems. Moreover, the Alps are home to many species that are extremely hard to survey. Birds like Rock Ptarmigan, Rock Partridge, Rufous-tailed Rock-thrush and Wallcreeper are well camouflaged or use vast habitats in rugged terrain where the view is often obstructed. The Alpine Accentor moves in family groups, the Yellow-billed Cough forages in flocks and covers great distances, as do White-winged Snowfinch, Redpoll and Common Linnnet. Fortunately, other species like Water Pipit and Northern Wheatear are more territorial and easier to record.



The areas in the scheme MHB have been surveyed annually since 1999, those in the BDM scheme are visited every five years (figure: Swiss Ornithological Institute; map: © swisstopo).



Thanks to many survey sites in the Alps, we now have reliable trends for species that Switzerland has international responsibility for, like the Citril Finch. The index shows the relative trend of the breeding population in Switzerland (100 = mean 1990–2021) (figure: Swiss Ornithological Institute; photo: Ralph Martin).



The Swiss Ornithological Institute favours a simplified territory mapping method. Observers benefit from a range of tools to support them: an app facilitates surveys in the field, Terimap online supports the digitisation and processing of the records, and Auto-terri is a new tool for automatic territory delimitation. The example shows records of Eurasian Blackbird (figure: Swiss Ornithological Institute, map: © swiss-topo).

Combining data sources for more accurate trends

In a small country like Switzerland, it is particularly difficult to collect enough data to calculate meaningful trends for scarce and elusive species. Besides mountain birds, these include grouse, birds of prey, woodpeckers and some rare songbirds. The general monitoring programmes do not record them frequently enough for us to calculate trends. Statistical methods developed at the Swiss Ornithological Institute now allow us to combine data from different sources for trend calculation. We combine opportunistic observations from ornitho.ch with the quantitative data collected for the MHB,

BDM and wetland schemes as well as for the breeding bird atlases. Complementing opportunistic observations with more standardised data is valuable for two reasons: Firstly, the monitoring schemes survey the sample areas regularly following rules that stay the same over time, which facilitates the assessment of long-term trends. And secondly, we can incorporate changes in population density per kilometre square – information that cannot be drawn from opportunistic observations. The resulting trends differ quite substantially from those based solely on opportunistic observations, especially for the 1990s. An in-depth analysis has confirmed that the new

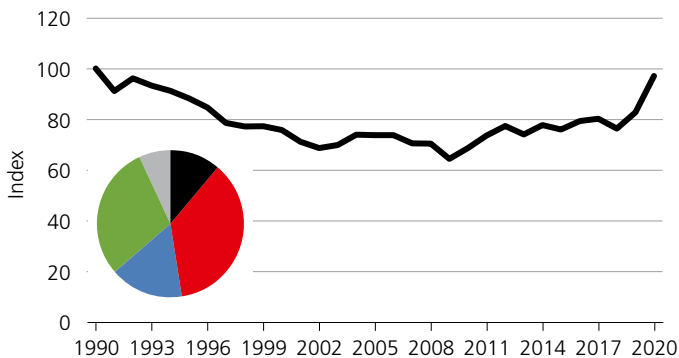
method produces more reliable trends in many cases.

Treasure trove for methodological research

Over the years, the standardised MHB surveys have proven to be an excellent source of raw material for novel statistical analyses. In particular, the long-term collaboration between the Swiss Ornithological Institute and Andy Royle from Patuxent Wildlife Research Center (USA) has resulted in new analytical methods that take into account the probability of detecting a species. The new methods provide insight into presence and population size, changes in these variables, as well as environmental factors that influence them. As a consequence, the MHB scheme has become known worldwide and figures prominently in numerous research articles and even textbooks. Its value thus goes far beyond measuring the natural diversity of birds in Switzerland. MHB is a true treasure trove of data that serves to develop new methods and verify fundamental biological hypotheses.

database extracts to assess infrastructure or restoration projects, to scientific analyses and modelling, all the way to large data packages for the EuroBirdPortal or other international projects. Furthermore, our methodological innovations and the outputs from our basic research are in greater demand than ever. But none of this would be possible without the engagement of countless motivated volunteers. Every project begins with their willingness to go out and collect the best possible data even in extremely challenging terrain. A heartfelt thank you to all of them!

*Hans Schmid, Marc Kéry,
Thomas Sattler and
Nicolas Strebel*



The SBI © provides population trends for individual breeding bird species, but also for species groups. The graph shows population trends for the species on the Red List. The pie chart segments indicate the percentage of breeding bird species that have disappeared (black), are declining (red), fluctuating (blue), increasing (green), or have newly occurred (grey) (figure: Swiss Ornithological Institute).

Growing use of data

Looking back at the past decades, it is clear that the data produced by the Swiss Ornithological Institute's monitoring projects are in growing demand. Requests range from simple da-

Following the wingbeats of migratory birds

2008 marked a turning point in bird migration research – it was the year when miniaturised light-level geolocators were first deployed on small landbirds, Hoopoes, in Switzerland. What new insights have we gained since then?

GPS trackers allow us to record the movements of large birds like eagles or storks around the clock. However, transmitting GPS coordinates uses a lot of energy, and a battery with enough power to last a whole year would be too large and too heavy for small birds. That's why 15 years ago, the Swiss Ornithological Institute – in collaboration with the Bern University of Applied Sciences in Burgdorf and as one of the first institutions in the world – took up the challenge of developing geolocators for use in bird migration research. In early days, geolocators were relatively simple devices that measure ambient light intensities or light-levels at a given interval and store each recording together with a timestamp. This is also where the commonly used name – light-level geolocators – comes from. Later, measured day length is translated into latitude and solar noon time into longitude using astronomical algorithms, and this information can be used to determine the whereabouts of birds, their wintering and stopover sites, and migration timing.

Unlike GPS trackers, geolocators store the data without sending them, which means they can make do with a small, light battery. If the tagged birds can be recaptured at the breeding site at the end of their journey, this technique allows us to trace the migratory pathways of small birds down to the size of a Whinchat.

Rapid advances in the technology soon followed, revolutionising the potential applications of geolocators and our knowledge on bird migration. In addition to ambient light, more advanced types of geolocators can nowadays measure atmospheric pressure, acceler-

ation and temperature, providing far-reaching insights into the lives of birds across full annual cycles. The newest generation of these geolocators, called μ Tag, provides a remote data download option via a VHF antenna. When combined with a solar panel, these tags can theoretically last for years providing data without the need to recapture the bird in hand.

Surprising new insights into bird migration

Geolocators have become an irreplaceable tool for researchers studying small-bodied birds (<100g body weight), their migration patterns, distribution, behaviour, and interactions with the environment. Geolocators have brought light into the hitherto little-known lives of birds after they leave their temperate breeding grounds in Europe.

As recently as 2009, there was only one ring recovery of a Hoopoe from sub-Saharan Africa, and we hardly knew anything about their migration. The application of geolocators has helped to map population-specific wintering regions and estimate migratory connectivity

(i.e., linkage between breeding and wintering populations) of Hoopoes breeding across Europe. They have revealed that the Hoopoe – long assumed to be a diurnal migrant – in fact migrates predominantly during the night. Around 90 % of all flights of the tracked individuals were carried out in the dark, while the regular occurrence of short diurnal flights, and thus the potential for visual observations during the day, may have

led to the false assumption that the species was a mostly diurnal migrant.

Through studies with Tawny Pipits, we learnt that the ratio of time that the birds actually spend flying versus on the ground during migration is about 1 to 7. That means, for every hour of flight, Tawny Pipits need about 7 hours for resting, feeding, and accumulating energy reserves to power their next flight.



Geolocators are tiny and weigh less than 1 gram. They enable us to study the migration routes and migratory behaviour of small birds (photo: Swiss Ornithological Institute).



Geolocators give us surprising insights into the social behaviour of migratory birds. Data show, for example, that European Bee-eaters travel with "friends" (photo: Bernd Skerra).



Alpine Swifts are true athletes of the avian world: they can stay in the air non-stop for up to 200 days, as we now know thanks to geolocators (photo: Marcel Burkhardt).

Marathon flights

The use of geolocators has also revolutionised our knowledge on how long-distance migrants cross ecological barriers, like the Mediterranean Sea and the Sahara Desert, where resting and feeding opportunities are scarce. Most trans-Saharan migratory passerines are nocturnal migrants, i.e., they travel at night and rest during the day. The predominant view up until recently has been that they do so also during the approximately 2,000 km long crossing of the Sahara Desert. Data from the three sensors – light, atmospheric pressure, and accelerometer – situated on geolocators all independently indicated that this might not be the case in most species. Instead, the data suggested that these birds regularly prolong their flights into the day and can fly uninterrupted for as long as 44 hours, as found in a Great Reed Warbler breeding in Kaliningrad, Russia. Such a marathon flight can carry the bird across the Sahara Desert in one go. Furthermore, data recorded on the pressure sensor allows us to estimate altitudes at which the birds are flying – as the sun rises, some Great Reed Warblers climb to astonishing 6,000 m above sea level. They likely do so to take advantage of favourable wind conditions in the upper layer of

troposphere and/or to escape the sweltering daytime heat of the desert below.

When it comes to marathon flights, no other group of birds takes it to extremes as swifts do. The application of geolocators on Alpine Swifts in a breeding colony in Baden, canton of Aargau, provided the first unequivocal evidence that swifts can stay airborne continuously for more than six months throughout migration and the non-breeding period in Africa. This means that all physiological processes, including resting, moulting feathers, and sleeping, are carried out while in flight. Coupling this information with data on atmospheric pressure, we could later reveal daily patterns of vertical airspace use by the Alpine Swifts. Interestingly, every evening and morning swifts appear to ascend several hundred meters higher into the air for about an hour before descending again. The reason behind these twilight ascents remains a mystery, but it may well be a part of social behaviour that we do not yet fully understand.

Social interactions between individuals are an aspect of bird behaviour where geolocators have provided unforeseen information. Tracking of European Bee-eaters using multi-sensor geolocators revealed that some non-kin indi-

viduals remain together year-round, breeding, migrating, and spending the non-breeding period as a group – one could say “a group of friends”. These birds not only used the same non-breeding sites, but also displayed coordinated social foraging behaviour, often feeding together. Even more surprisingly, some individuals that did separate while migrating met again later in the non-breeding areas, having flown more than 5,000 km apart.

International collaboration

These are just some of the highlights from more than 100 geocator studies the Swiss

Ornithological Institute has been involved in during the last 15 years. Many of them are carried out together with international partners to uncover previously unknown migration routes, stopover areas, and non-breeding sites of little-studied species and populations. International outreach is also important for comparative studies and an improved understanding of large-scale migration patterns that link European breeding grounds with African and Indian non-breeding sites. It helps to understand how migratory birds interact with the environment, how their physiology and health status influence migratory decisions, performance, and individual survival. Since birds don't know borders, international collaboration in this field is vital. Joining forces with other researchers helps to identify places along the flyways and on the non-breeding grounds that are important for species conservation. Joint efforts in fundamental research can therefore improve the protection of migratory birds, many of which are currently in steep decline.

*Martins Briedis and
Christoph Meier*



Contrary to what many people thought, Common Hoopoes migrate mainly at night and only fly short distances during the day (photo: Marcel Burkhardt).



ARTENFÖRDERUNG VÖGEL SCHWEIZ
 PROGRAMME DE CONSERVATION DES OISEAUX EN SUISSE
 PROGRAMMA DI CONSERVAZIONE DEGLI UCCELLI IN SVIZZERA
 SWISS SPECIES RECOVERY PROGRAMME FOR BIRDS



Today, thanks to the engagement of the Swiss Ornithological Institute and its partners over many years, the Klettgau region in the canton of Schaffhausen is a structurally diverse agricultural landscape with lots of biodiversity areas (photo: Markus Jenny).

New regional branch in north-eastern Switzerland

Following the retirement of Markus Jenny, who advanced and coordinated the projects in the Klettgau for years, the Swiss Ornithological Institute is committed to continuing its work in the region. In May 2022, a new regional branch will open in Schaffhausen. Along with the Klettgau projects, the regional office will supervise a wide range of activities in north-eastern Switzerland, especially in the cantons of Schaffhausen and Thurgau.

A flourishing landscape

The Swiss Ornithological Institute has supported the ecological restoration of the Klettgau region in the canton of Schaffhausen since the 1990s – with considerable success: today, it is among the most diverse and ecologically rich farmland regions in Switzerland.

In the early 1990s, the Swiss Ornithological Institute set the objective of conserving the last two populations of Grey Partridge in Switzerland, in the Champagne genevoise (Geneva) and the Klettgau (Schaffhausen). Extensive restoration was required in these two regions of open farmland: at least 10 % of the area needed to be covered by wildflower plots, rotational set-asides, high-quality, extensively grazed pastures, field margins and low hedgerows. Other species stood to benefit from this ecological enhancement along with the Grey Partridge. The effective cooperation between employees of the Swiss Ornithological Institute and local farmers and the support supplied by the cantons resulted in a close network of high-quality habitat in both regions. In the

Klettgau, non-intensive emmer and einkorn fields have come to complement these semi-natural habitats since 1994. The various sections of the Klettgau area developed very differently depending on the character of the land and the respective interests of the farmers. In the Widen section, high-quality biodiversity promotion areas (BPA) increased to 14.1 % in 2019. The percentage in the other two sections only reached 6.4 % and 4.8 %, but was still above average compared to the rest of Switzerland.

These measures led to a rise in several bird populations. The increases were significantly greater in Widen, the section with the highest proportion of BPA. Studies showed that some breeding bird species require 14 % of semi-natural areas, such as high-quality BPA or uncultivated areas, to reach the density needed for the population to survive. Despite the enhancements, there were also setbacks: the measures came too late to save the Grey Partridge, and the Corn Bunting population has recently collapsed, despite a positive trend until 2010.

But agriculture is not the only challenge to conservation. Construction projects also repeatedly create problems. For instance, a railway line of the Deutsche Bahn runs straight through the Klettgau. The embankments provided particularly valuable habitat for Red-backed Shrikes and Greater Whitethroats to breed. When the line was double-tracked, much of this habitat was destroyed. Thanks to the efforts of the Swiss Ornithological Institute and local conservation groups, measures have since been taken to compensate for

the loss, and the habitat quality has improved.

Large-scale ecological restoration of a landscape like in the Klettgau requires the commitment and cooperation of many different actors; in this case it involved the Swiss Ornithological Institute, farms, conservationists and the cantonal authorities. The Klettgau is a showcase project for all of Switzerland demonstrating that farming and ecology really can go hand in hand.

Simon Birrer



One of many bird species that benefit from the changes: Common Stonechat (photo: Marcel Burkhardt).

A vision of nature-friendly farming

For four decades, Markus Jenny worked in service of ecological and bird-friendly farming, making a lasting impact. He is now going into retirement.

Almost 40 years ago, Markus Jenny began his doctoral thesis at the Swiss Ornithological Institute on the ecology of the Skylark, with the aim of better understanding the species' range use, feeding ecology and population dynamics. Even then, his curiosity went far beyond generating knowledge: he wanted to find solutions for nature-friendly forms of agriculture and implement them. This made him the ideal choice for director of the Swiss Ornithological Institute's project in the Klettgau region (see opposite). His persuasive and open manner won the trust of many farmers, whom he motivated to establish set-asides, grass margins and other structures. Markus was always available when farmers faced problems, and he often knuckled down in the fields himself. Thanks to his commitment and with the help of appropriate compensation pay-

ments, the share of ecologically valuable habitats in the Klettgau soon increased substantially.

Markus frequently surprised his collaborators with unconventional ideas. For example, he began planting emmer and einkorn in the Klettgau in the 1990s – old wheat varieties that had almost been forgotten. But planting and harvesting wasn't enough; the harvest had to be turned into marketable products. That's how Markus became the co-founder and president of "IG Emmer und Einkorn", devoting himself not only to conservation and farming, but to questions of food processing and marketing. His enthusiasm drove this project and many others as he continually developed new ideas, proposed solutions and brought his partners on board.

While on holiday in the early 2000s, Markus bumped into Hans Luder, the then president of IP-Suisse. They spent long evenings in conversation, eventually laying the foundation for the close partnership between IP-Suisse and the Swiss Ornithological Institute. Markus came

up with the idea of a point system to assess biodiversity on a farm. Today, this point system underpins the IP-Suisse label and has been pivotal in encouraging farmers to integrate ecological measures into their work and achieve measurable results.

Anyone working in nature conservation and farming will inevitably come into contact with agricultural policy and policy instruments. Markus shared his extensive knowledge and experience in numerous committees. He played a key role, for example, in shaping the ordinance on ecological quality and the habitat network programme. He never tired of reminding his interlocutors how important it was to contend with the complexity of the agricultural and food production system as a whole and to align production with agro-ecological principles.

Thanks to his broad knowledge and talent for getting the message across, Markus is a popular guest speaker. He has given countless talks to diverse audiences, from local conservation groups and hunting associ-

ations to expert committees at international conferences. He was never afraid to take the bull by the horns, addressing sensitive issues and drawing attention to shortcomings. At the annual meeting for volunteers in 2011, he was the one to bring up the effects of meat consumption on nature and ask participants to take a critical look at their own eating habits – a topic that has since become widely discussed.

When Markus retires at the end of April, we don't picture him putting his feet up. Too numerous are his interests, talents and passions. We wish him continued joy in his pursuits in nature!

Simon Birrer



Mad about hares! Brown hares find suitable habitat again in ecologically restored areas, not least thanks to Markus Jenny's tireless work (photo: Markus Jenny).



During his long career, Markus Jenny was concerned with many farmland species – the Eurasian Skylark is a particular favourite (photo: Markus Jenny).

What counts when counting birds

Not choosing monitoring sites randomly or not surveying them every year can heavily influence the estimates of population size and trend.

When conducting a species survey, it can be tempting to visit

the best and most promising locations first. Places that are harder to access or irregularly occupied are visited later or not at all. Such behaviour leads to a biased and overly positive sample of sites, and hence to prob-

lems when calculating population trends.

This was found to be the case in a recent study that analysed data from a Peregrine Falcon monitoring programme that started in the 1960s. In an area encompassing the entire Jura mountain range, 420 Peregrine Falcon nest sites were monitored between 2000 and 2020, but not all sites could be visited every year.

To solve the problem of non-random site selection in the data, so-called Bayesian occupancy models were used, with remarkable results: the counts suggested an increase in the population, while the models showed that it was in fact declining.

Citizen-science projects are especially prone to such non-random site coverage, because understandably, the volunteers want to survey as many

locations as possible where the species in question is likely to be present, or to occur in greater density. It is all the more important to aim for random coverage, or else to employ models that correct the bias, so that better trend estimates can be achieved.

Kéry, M., G. Banderet, C. Müller, D. Pinaud, J. Savioz, H. Schmid, S. Werner & R. Monneret (2021): *Spatio-temporal variation in post-recovery dynamics in a large Peregrine Falcon (Falco peregrinus) population in the Jura mountains 2000–2020. Ibis 156: 217–239. doi.org/10.1111/ibi.12999.*



Who wouldn't love to spot a young Peregrine Falcon? During monitoring, observers often favour areas that offer a greater chance of detecting the species, but this tendency can cause methodological problems (photo: Mathias Schäf).

How do upper range limits form?



Barn Swallows are found at up to 1,000m above sea level. The upper limit of distribution depends heavily on the number of immigrating first-year breeders (photo: Marcel Burkhardt).

The environmental conditions in a species' range change with elevation above sea level. They influence immigration, emigration, reproductive success and survival rates, and therefore also the upper limit of distribution.

As part of a study on Barn Swallows, volunteers examined a breeding population in the Prätigau region (canton of Grisons) over a 700 m elevational gradient. In a period of 14 years, 1,337 nestlings and 194 adults were ringed on 63 farms. Ring

recoveries allowed us to estimate immigration, emigration and survival rate, all important factors in population dynamics. More than 90 % of recaptured juveniles did not return to breed on their natal farm, but dispersed to a different one, whereas only 17 % of adult birds changed breeding site from one year to the next. Both juveniles and adults from the highest-lying farms showed a tendency to disperse to sites at below-average elevation. The birds dispersing to high-lying farms were almost all juveniles.

How can these results be explained? Barn Swallows feed almost exclusively on flying insects. The activity of the insects depends on temperature and is often reduced at high elevation due to cold spells. The lower reproductive output makes high-lying breeding sites less attractive. So in spring, adults and juveniles select low-lying

sites first, until all the best sites are occupied. Late arrivals or weaker birds, mainly juveniles, are forced to higher locations with less competition but more difficult conditions.

This means that the upper distribution limit can be expected to rise after years with high reproductive success due to large numbers of returning juveniles, and to descend after years when breeding success was poor.

Grüebler, M. U., J. von Hirschheydt & F. Korner-Nievergelt (2021): *High turnover rates at the upper range limit and elevational source-sink dynamics in a widespread songbird. Scientific Reports 11: 18470. doi.org/10.1038/s41598-021-98100-x.*

Federal Supreme Court supports our conservation work

The Federal Supreme Court has ruled that it is legal for the Swiss Ornithological Institute to purchase parcels of farmland to dedicate to the conservation of Eurasian Scops-owl. The Swiss Ornithological Institute can now continue its efforts to protect this threatened species.

The Eurasian Scops-owl came close to extinction in Switzerland. Twenty years ago, a single breeding pair and a few unpaired singing males remained. The drastic decline was related to increasing landscape homogeneity, intensive agriculture and loss of orchards to urban sprawl. Thanks to extensive protection efforts, the population has since grown to 30–40 breeding pairs, most of them in the Valais. Scops-owls require structured, semi-open landscapes with a mix of old trees and insect-rich meadows where the birds hunt for grasshoppers, their main source of food. They breed in old tree cavities or suitable nest boxes.

In spring 2017, the Swiss Ornithological Institute planned to purchase a few small parcels of farmland in the Valais municipality of Grimisuat to make targeted habitat improvements for Scops-owls. The institute was responding to a recommendation by the Valais Office for Forest, River Engineering and Landscape, our partner with whom

we review and coordinate conservation measures for threatened bird species. Two parcels were slightly larger than 2,500 m², which meant that a change of ownership needed to be authorised based on the Federal Act on Rural Land Law. The Cantonal Legal Department for Economic Affairs denied the authorisation to purchase, and the appeal against that decision to the Valais Council of State was rejected. A new appeal brought

before the Cantonal Court of Valais, however, upheld the decision in favour of the Swiss Ornithological Institute and authorised the purchase of both parcels. This judgement was then challenged before the Federal Supreme Court by the Federal Department of Justice and Police (FDJP).

The Federal Supreme Court has now rejected the FDJP's appeal and has definitively confirmed the institute's purchase of the parcels. In their judgement (ATF 2C_1069/2020 of 27 October 2021), the judges point out that the main purpose of the Federal Act on Rural Land Law (RLLA) is to avoid speculation on agricultural land and to ensure that these parcels remain in the hands of farmers. The RLLA should not, however, interfere with public responsibilities of equal importance, such as the protection of nature. For this reason, the Act provides for exceptions allowing the acquisition of agricultural land by non-farmers, as long as it is in the public interest. The protection of nature is one reason that justifies an exception to acquisition by a farmer in a personal capacity, provided that the par-

cells are formally protected or that their acquisition enables the conservation of a threatened species or rare biotope.

In the present case, the parcels are dedicated Scops-owl habitat, and the purchase is therefore legitimate. In fact, it is doubtful whether the parcels would have been preserved as farmland in the spirit of the RLLA. The previous owner, as the Federal Supreme Court took care to note, was not a farmer but a society planning to build a golf course on the land!

The ruling is a fundamental one, because it clarifies the application of the RLLA in cases where farmland parcels are acquired for the purpose of nature conservation. It is the first ruling on this issue. The Federal Supreme Court clearly stated that the purchase of land in the agricultural zone is an appropriate and proper instrument of conservation where threatened species and their habitats are involved.

*Jean-Nicolas Pradervand
and Matthias Kestenholz*



In Switzerland, the endangered Eurasian Scops-owl is found almost exclusively in the Valais, which is why conservation measures in that part of the country are so important (photo: Marcel Ruppen).



The parcels acquired by the Swiss Ornithological Institute in Grimisuat can now be managed to suit the needs of Scops-owls (photo: Jean-Nicolas Pradervand).

A degraded bog returns to life



Machines at work for nature: a digger is building dams and excavating ponds to re-wet the bog (photo: Yvan Matthey).

Habitat quality for birds

The Swiss Ornithological Institute has initiated a multi-year programme that aims to improve habitats for birds and biodiversity in general and to safeguard habitat quality in the long run. We are looking for partners all over Switzerland who own at least 3 ha of land. More information and a form to contribute projects and ideas can be found on our website: www.vogelwarte.ch/aufschwung.

The area covered by fens and bogs in Switzerland has diminished by 80 % since 1900. Although fens and raised bogs are now protected, habitat quality continues to decline. But targeted restoration projects can reverse the trend.

The valley of La Brévine in the canton of Neuchâtel is home to bog lands of national importance. They are made up of several distinct areas that are catalogued in the inventory of raised bogs, including the “Marais de la Châtagne”. Peat was extracted here for horticulture up until 1995. After peat extraction was shut down, the bog was left alone. But extraction had heavily modified the raised bog so that it dried out over the years and was colonised by willow, resulting in a huge loss of the typical flora and fauna of a raised bog. In 2020, Pro Natura Neuchâtel purchased about 5 hectares of land in the raised bog with the aim of restoring the Marais de la Châtagne. The plan was to remove scrub, raise the water table and create pools. At this point, Pro Natura contacted the Swiss Ornithological Institute with a request for support.

As part of a new multi-year project (see box), the Swiss Ornithological Institute contributed expertise as well as funds to the restoration of the Marais de la Châtagne. We made a list of bird species that could potentially benefit from the restoration and assessed the measures in view of their effectiveness for bird conservation. Continued monitoring and impact assessment following the restoration ensure that the management of the area can be adjusted if necessary. The Swiss Ornithological Institute monitors the impact of measures on birds, especially on target species such as Tree Pipit and Willow Warbler. Working with the Cantonal Office for Fauna, Forest and Nature, we also monitor the dragonfly population, as dragonflies are the project’s main target species group. We know from earlier raised bog restorations in the region that threatened and extremely rare species of dragonfly such as Yellow-spotted Whiteface (*Leucorrhinia pectoralis*) and Dark Whiteface (*Leucorrhinia albifrons*) show a quick and positive response to restorations. Our hope and aim is therefore to see the newly created pools

in the Marais de la Châtagne being swiftly colonised.

The restoration work was carried out in November 2021. All in all, we hope that a species-rich bird community will benefit from the enhanced habitat, not only in the breeding season but during migration as well. As re-wetting the raised bog and fostering the formation of a mosaic habitat requires regular, site-adapted

management, the Swiss Ornithological Institute and Pro Natura Neuchâtel have agreed to continue their cooperation on this site in the long term.

*Arnaud Barras and
Petra Horch*



The Yellow-spotted Whiteface, an endangered species in Switzerland, is one of the target species for ecological restoration in the Marais de la Châtagne (photo: Sébastien Tschanz).

... Célestin Luisier

Endowed with insatiable curiosity, Célestin Luisier is an active researcher and an inspiration for young birdwatchers – a portrait.

It was while growing up in the Valais, helping his parents in the vineyards, that Célestin Luisier discovered his interest in birds. He gradually learnt to identify the species he observed using a field guide belonging to his grandmother, and before he knew it, a passion was born.

What makes birds so interesting, in his view, is their surprising diversity, and the fact that

you can encounter them almost everywhere. But if birdwatching is an easy hobby to pick up, it doesn't take long to realize how much there is to learn. Célestin knows what he's talking about: his research on his favourite bird, the Wallcreeper, is nothing short of pioneering.

When he talks about it, his fascination for this beautiful species is palpable. A unique, little-known bird that lives in a rugged environment, the Wallcreeper is often only seen from afar. But Célestin has been studying it for a long time and has had the opportunity to watch it up close. In his high-school graduation thesis, he described the species' nestling diet. Now he is investigating selection criteria for wintering sites, something he can only do because he is able to identify individuals based on the pattern of spots on their wings – another of his research topics. In summer, whenever he has some extra time, he likes to closely observe breeding pairs.

And time is a limited resource for one as active as Célestin! Besides his fieldwork on Wallcreeper-

ers, he is currently completing a bachelor's degree in biology at Bern University and also serves as president of the youth group at Nos Oiseaux, which brings together western Switzerland's bird enthusiasts under 25 years of age. The group's dynamic energy is a source of motivation, as is knowing that the next generation of birdwatchers is raring to go.

So what's next? Célestin has many more projects lined up, all

to do with nature in general and birds in particular, though one life may not be enough to put them all into action. While he loves watching birds in his neck of the woods, he is also planning a trek in the Caucasus to discover the region's landscapes and watch birds, including the Wallcreeper, of course.



Deeply attached to the mountains where he grew up, Célestin Luisier never tires of exploring them to deepen his knowledge of native birds (photo: Julia Wildi).



Wallcreeper (photo: Célestin Luisier).

Some welcomes and farewells

At the start of the year, Prof. Dr. Barbara Helm took up her position as the new head of migration research. In her work, Barbara Helm explores the biological rhythms of birds, such as daily and seasonal patterns, as well as the environmental or behavioural factors that influence them.

The migration research team also welcomes another accomplished scientist, Dr Elizabeth Yohannes. Drawing on many years of experience in chemical analysis, Elizabeth Yohannes will focus on individual-based research of European long-distance migratory birds.

There have been some changes in marketing and operations as well. Our long-standing inventory manager Paul

Albisser has retired. He was in charge of the marketing stock, helped with mailing campaigns and supported the institute with a range of other jobs. We thank Paul Albisser for his many years of service and wish him all the

best! His successor Philipp Ineichen has already settled into his new position and familiarised himself with the storage facilities, products and his various other tasks. Finally, Astrid Trutmann has joined the personnel

department, which means that the recruiting of all the field assistants will be able to go ahead as scheduled.

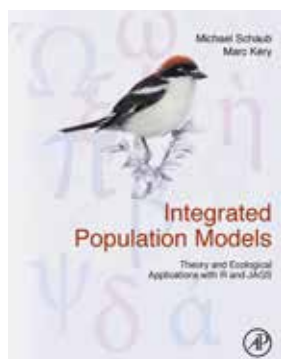


From left to right: Barbara Helm, Elizabeth Yohannes, Philipp Ineichen, Astrid Trutmann.

New textbook on Integrated Population Models

Integrated population models (IPMs) are population models fit to multiple, disparate data sets via a joint likelihood. Using all available information not only makes sense, but it also leads to more precise parameter estimates and lets one estimate more parameters. Academic Press have just published the first monograph on IPMs. In part 1, the theory of IPMs is developed in detail, including concise presentations of matrix population models, which IPMs generalise, and a vast overview of the types of statistical models that form the building blocks for an IPM. Part 2 contains 10 case studies. Each species is illustrated in a superb colour photograph, which will please the naturalist heart of every statistical ecologist.

All population models are defined by informative life-cycle graphs and algebra, which naturally leads to their definition in JAGS software. All essential R and JAGS code is printed in the book, while a webpage contains complete code, and an R package contains all data sets and necessary R functions. The target audience of this book ranges from ecological statisticians looking for a synthesis of the state of the art in the field, to population ecologists and conservation biologists asking scientific questions, and to wildlife managers wanting to base their decisions on scientific evidence rather than on gut feelings. The book is highly accessible and suitable for university courses and self-study alike.



The new IPM textbook by Schaub and Kéry will kick-start your own population modelling with this powerful class of models. This book is an invaluable resource on animal population modelling in the 21st century.

AGENDA

1–31 May 2022

Photo competition: <https://photo.vogelwarte.ch>

18 June 2022

National Swift Conference in Zunzgen BL



Our first video on winter bird feeding was a success (photo: Marcel Burkhardt).

Videos and podcasts

It was the culmination of a long process: our first video tutorial on winter bird feeding was finally published last November. The enthusiastic response encouraged us to create more video content.

Our website offers a wealth of regularly updated tips on interactions with birds. Topics range from the threats that birds face to bird feeding and building nest boxes. Our goal is to complement this information with videos that are both informative and appealing.

Our next series on bird-friendly gardens is just about

finished. We look forward to launching the series in the coming weeks and are eager to see how our viewers respond.

The podcast format was new territory for us in 2022. In the podcast series (available in French and German), nine experts from the Swiss Ornithological Institute introduce “their” bird species. Numerous anecdotes allow listeners to delve into the world of science and conservation. Listen in and gain fascinating insights into the lives of birds!

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