

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 2009². Contrary to the declared political intent, construction regularly occurs outside of building zones, sometimes even in landscape conservation zones⁷. According to the 2004–2009 land-use statistics, almost 38 % of total settlement area lies outside of the building zones⁶.

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 1980–2002⁸. 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.

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 years¹. Nevertheless, species richness (e.g. birds, vascular plants and mosses) is often higher in settlements than in the adjacent farmland¹. Still, in Switzerland as a whole, the dominant process of urbanisation is resulting in the homogenisation of biodiversity⁵.

Expansion of settlements and decline of farmland birds: an example

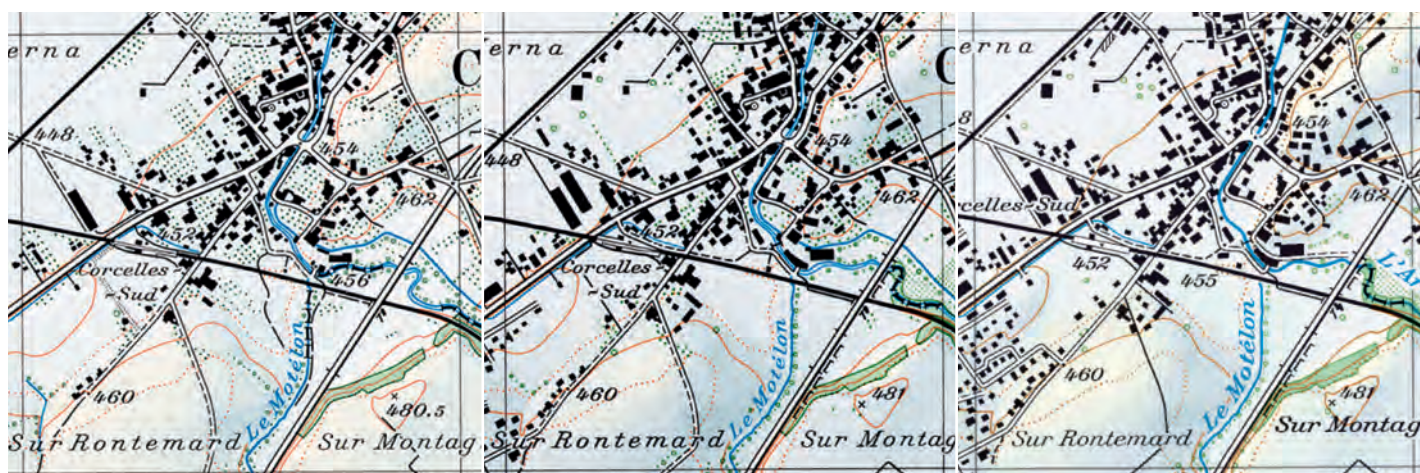
Landscape change often happens gradually and locally^{4,6}. The effects on bird communities are serious, but not always evident based on the data from the kilometre squares (1 × 1 km) surveyed for the 1993–1996 and 2013–2016 atlases. Many agricultural areas were already farmed so intensively 20 years 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 2015³. 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.



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The expansion of settlements often results in the loss of valuable habitats such as orchards or low-intensity pastures.



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	+
Carriion 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.

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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)