

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

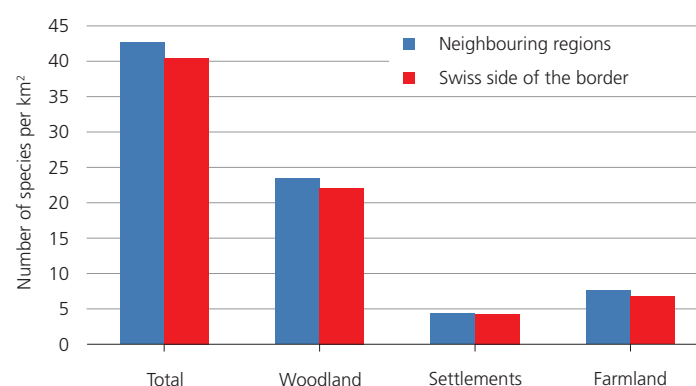
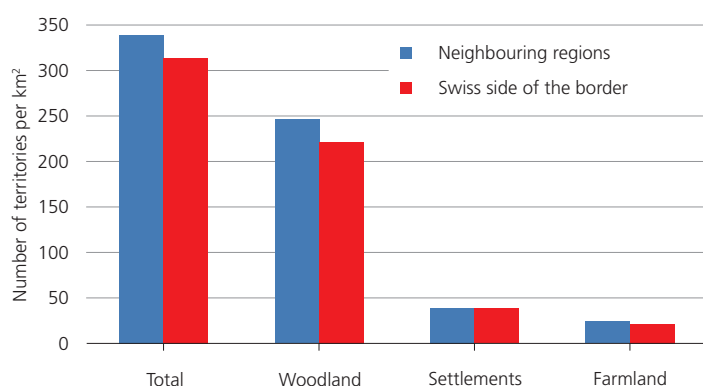
(NT) on the Swiss Red List^{RLCH}. On average, the neighbouring areas supported 0.29 Red List species more per kilometre square than Switzerland. The difference was greater in the French border areas (0.37 species more) than in Germany (0.17 species more).

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. Although 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 explained 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 Scherler² 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.

No change since 1993–1996

A similar analysis was conducted in the past using data from the 1993–1996 atlas³. 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 border³. 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



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).

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/km ²	313.6	338.9
Average number of species/km ²	40.5	42.7
Average number of Red List species (category NT included)/km ²	1.3	1.6
Average number of farmland species/km ²	6.8	7.6
Average number of territories of farmland species/km ²	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)