



HAFL Master's Thesis Abstract

Year: 2021

Student's Name: Kevin Schoch

English Title: **The effect of the surrounding landscape on biodiversity in annual wildflower strips**

English Summary: Although effects of the surrounding landscape on biodiversity in annual wildflower strips (AWFS) were reported for some specific insect species, little is known about how landscape context individually affects pollinators and beneficials, or the insect community as a whole. We therefore modelled, how different landscape and local AWFS factors influence the abundance and diversity of insect communities, including pollinators, beneficials, and wild bees, within 74 AWFS located in the Swiss lowland. Landscape variables were assessed on scales of 250 m and 1000 m and covered different land-use types, ranging from utilized agricultural area (UAA) and biodiversity promotion area (BPA), to settled or natural areas.

Total, beneficial and pollinator abundance correlated negatively with the proportion of BPA within 1000 m. Contrastingly, total BPA with quality correlated positively with pollinator abundance at the same scale. We explained this by a competition effect of BPAs which dilute insect communities and a facilitation effect, where improving habitat quality increased pollinator populations. Other landscape variables at 1000 m related to settled areas, crop diversity or UAA impacted insect abundance and diversity in ambiguous ways. Local AWFS factors such as flower coverage and AWFS area were still important predictors of pollinator abundance and wild bee diversity. We conclude that AWFS are particularly important for insects in landscapes with low amounts of BPAs and positive outcomes such as pollination and natural pest control more likely. Furthermore, the competition effect of BPAs indicates, that different Swiss BPA represent an important complementary habitat for insects, beside AWFS.

Keywords: Annual flower strips, biodiversity promotion areas, landscape, insect biodiversity

Principal advisor: Silvia Zingg, Hans Ramseier