



Agricultural Species and Habitats – Recording Diversity in the Agricultural Landscape



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Agroscope

Federal Office for Agriculture FOAG

Federal Office for the Environment FOEN



ALL-EMA 'Agricultural Species and Habitats' Monitoring Programm

Many species and habitats owe their existence to agriculture, and their continued existence is dependent upon agricultural management ensuring their protection.

In Switzerland, the agricultural landscape accounts for around 36% of the land area. In 2008, in order to preserve and promote biodiversity, the Federal Offices for the Environment (FOEN) and Agriculture (FOAG) formulated Agriculture-related Environmental Objectives. These objectives are to be achieved with the aid of agricultural policy measures.

The ALL-EMA Monitoring Programme is tasked with systematically quantifying the development of biodiversity in the Swiss agricultural landscape. In this way, the efficacy of the agricultural policy measures can be evaluated and the measures themselves optimally refined.

The objectives of 'ALL-EMA':

1. **Monitoring the Agriculture-related Environmental Objectives concerning species and habitat diversity**
Recording the state of and change in species and habitat diversity in the agricultural landscape.
2. **Evaluating the Ecological Focus Areas**
Assessing the state of and change in species and habitat diversity in ecological focus areas.
3. **Research**
Analysis and provision of data to answer questions concerning species and habitat diversity in the Swiss agricultural landscape.

The data collected are not used for control purposes at farm level.



Using Synergies

ALL-EMA is anchored in the agricultural environmental monitoring programme of the Federal Office for Agriculture (FOAG) as an indicator for biodiversity and landscape and fills a gap in the set of national biodiversity monitoring programmes which the Federal Office for the Environment (FOEN) is responsible for. It investigates the moderately common species and habitats that are relevant for the agricultural sector.

Synergies with existing programmes are used, e.g. by including data on butterflies from the Swiss Biodiversity Monitoring Programme (BDM) and data on birds from the Common Breeding Bird Survey (MHB) directly in the evaluations for the agricultural landscape. Findings from other programmes are also included.

The Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), Hintermann & Weber AG (Biodiversity Monitoring Switzerland BDM), the Swiss Ornithological Institute (Common Breeding Bird Survey MHB) and numerous other experts are partners in project development and implementation.



Measuring Diversity

To describe the state of the Agriculture-related Environmental Objectives concerning species and habitat diversity, five mutually complementary key indicators were compiled:

1. Habitat diversity in a landscape
2. Spatial heterogeneity of habitats in a landscape
3. Local habitat-typical species diversity
4. Species diversity in a landscape
5. Local species diversity

These key indicators are supplemented with a range of additional indicators.

① Habitat diversity in a landscape

Agricultural landscapes are shaped both by their natural site conditions as well as by agriculture itself. Together, both influence the occurrence of different habitats. A variety of different habitats is an important precondition for high biodiversity in a landscape.

② Spatial heterogeneity of habitats in a landscape

The spatial heterogeneity of habitats constitutes an addition to habitat diversity. It describes e.g. the extent to which different habitat types alternate within a survey square, thereby highlighting an important aspect of a diverse landscape.



3 Local habitat-typical species diversity

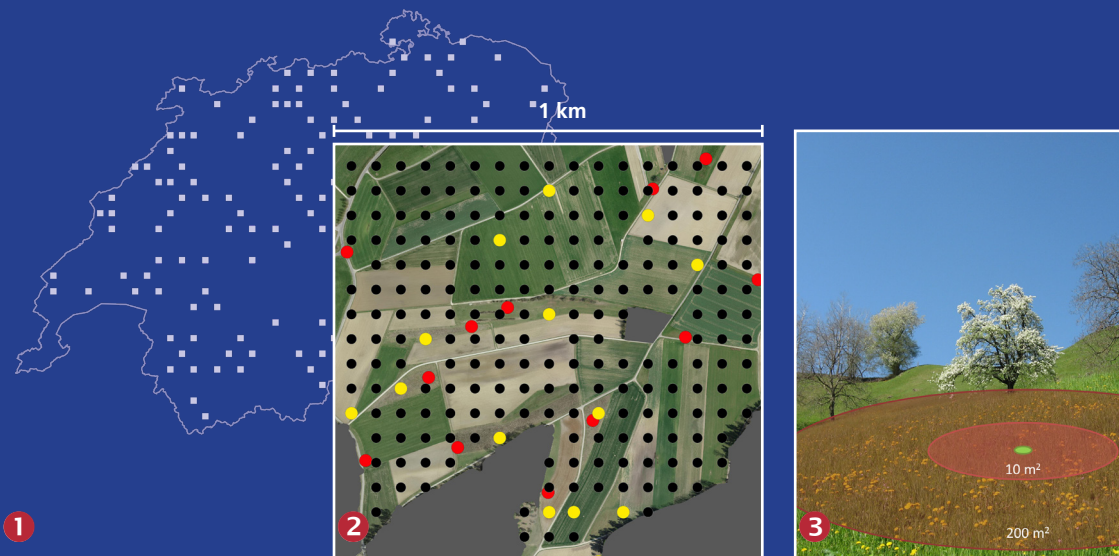
Abiotic and biotic conditions may vary within a habitat type, which influences the expression of a species community within that habitat type. Hence, the expression of the habitat-typical species community within the habitats is also assessed.

4 Species diversity in a landscape

The number of all plant, butterfly or breeding-bird species occurring within a survey square describes the species diversity in a landscape. This species diversity is influenced by various factors, e.g. the expression of the local species diversity in the habitats and the diversity of the habitat types, but also by the previous long- and short-term land-use trends or the extent of species diversity in the wider region.

5 Local species diversity

Local species diversity is determined by calculating the average of local species numbers per survey square.



ALL-EMA Survey Method

1 The ALL-EMA data survey is conducted in five-year cycles in 170 survey squares (i.e. 20% of the squares are sampled per year). The first cycle began in 2015 and was concluded in 2019 (for the Status Report, see www.all-ema.ch). The choice of survey squares allows representative results to be derived for the individual agricultural zones and the main regions of the Agriculture-related Environmental Objectives.

2 Only the agricultural landscape is sampled within the 1 km² survey squares (e.g. forests and settlements are not considered – see grey areas). Habitat surveys are conducted in the field on a regular 50 m grid (black dots), and detailed vegetation surveys are conducted on around 10% of the surveyed grid points (yellow dots). Ecological focus areas are also sampled (red dots).

3 The habitat surveys are conducted on two different sizes of circle and include:

- Identification of the habitat type using the identification key for the habitats of the open cultural landscape (circular area of 10 m²)
- Counting of the characteristic habitat-type species (circular area of 10 m²)
- Counting of neophytes on the Black List (circular area of 200 m²)
- Recording of small structures such as piles of branches, clearance cairns or small water bodies (circular area of 200 m²)



4 For the detailed vegetation surveys, the cover of all occurring plant species on a circular area of 10 m² is determined.

5 A precision GPS device is used to navigate to the survey areas.

6 Data is entered directly into the smartphone.



Agroscope has developed a key for ALL-EMA that enables the determination of habitats in the open agricultural landscape. This key distinguishes around 100 habitats, e.g nutrient-rich mountain pastures, nutrient-rich lowland pastures and nutrient-rich herbaceous margins.



Further Information

www.all-ema.ch

The ALL-EMA 'Agricultural Species and Habitats' Monitoring Programme records the state of and change in species and habitats in the Swiss agricultural landscape, including the summer-grazing area.

It enables the evaluation of the ecological focus areas and supplies data to answer questions of practical relevance.

Contact

Agroscope
Eva Knop
Reckenholzstrasse 191
CH-8046 Zürich
Tel. +41 (0)58 468 71 11

www.all-ema.ch / www.agroscope.ch
info@agroscope.admin.ch

This leaflet is also available in German, French and Italian.

© 2022 Agroscope



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Agroscope

Federal Office for Agriculture FOAG

Federal Office for the Environment FOEN