

**B**iodiversity Monitoring (BDM) is a long-term program launched by Switzerland's federal government to record the country's biological diversity. Biological diversity, or biodiversity for short, encompasses the full range of animal and plant species including genetic diversity within individual species, plus the complete spectrum of habitats. Even though Switzerland is small, its nature is incredibly rich: national species diversity alone is composed of roughly 50 000 animal and plant species.

Humankind depends on biodiversity to survive. For this reason, Switzerland has signed several international treaties committing it to monitor, protect and promote biological diversity. BDM is an important instrument in achieving these objectives, since the program not only observes long-term trends in biodiversity, but also provides the basis for long-term conservation of nature in all its fabulous abundance.

**Sampling network**

**Z9 Species Diversity in Habitats**

This sampling network consists of 1600 sampling areas covering ten square meters each. In addition to registering ferns and flowering plants, biologists collect mosses and take soil samples in order to identify moss and mollusk species in the lab. Being small, each sampling

area exemplifies a specific habitat such as forest, settlement, or pasture. As a result, surveys reflect the species diversity in these habitats. In other words, sampling areas on e.g. farmland stand for farmland habitats as a whole, making it possible to follow the development of biodiversity in agriculture.

**Sampling area**



**Method**

- Step 1:** Precisely localize sampling area.
- Step 2:** Take a soil sample for subsequent lab analysis.



- Step 3:** Identify plants.
- Step 4:** Digitally record findings.



**How does it work?**

As it is impossible to record biodiversity in its entirety, BDM makes do with 33 indicators (see list on reverse). These indicators represent important, well-measurable segments of biodiversity. Just like the Dow-Jones average points towards economic trends, BDM indicators reveal where nature is headed.

For financial reasons, BDM taps existing data sources to compute the majority of its indicators. However, the program has also started to make its own surveys of select animal and plant species groups all over Switzerland (Z9 and Z7 indicators, see insets above and below). These surveys allow new and crucial insights into the country's biodiversity.

In order to record data for the two Z7 and Z9 key indicators, BDM has established two nationwide sampling networks (see map). Within these, specially trained biologists walk more than 2000 sampling areas overall, surveying animal and plant diversity every five years.

**Two Sampling Networks**

- Purple: sampling grid for key indicator Z9, 1600 sampling areas.
- Red: sampling grid for key indicator Z7, 500 sampling areas.



Schematic representation: locations and sizes of sampling areas on the map do not exactly correspond to the actual situation.

**The Complete Picture**

Focusing on species diversity in the "normal" landscape is one of BDM's strong points. In doing so, the program complements other flora and fauna surveys such as the Red Lists, which are dedicated to rare or particularly threatened animal and plant species. Such species mostly occur in uncommon habitats such as alluvial forests or raised bogs.

Based on its extensive sampling networks, however, BDM takes a look at all of Switzerland—including regions that are home to common and abundant species. Many sampling areas are located in settlement or intensely farmed areas, helping to create a complete picture of the country's species diversity. This enables us to learn how nature is really doing, for it is just the populations of common and unglamorous species that have changed considerably in the past decades. For example, the whinchat—once widespread—has now become a rare bird indeed.

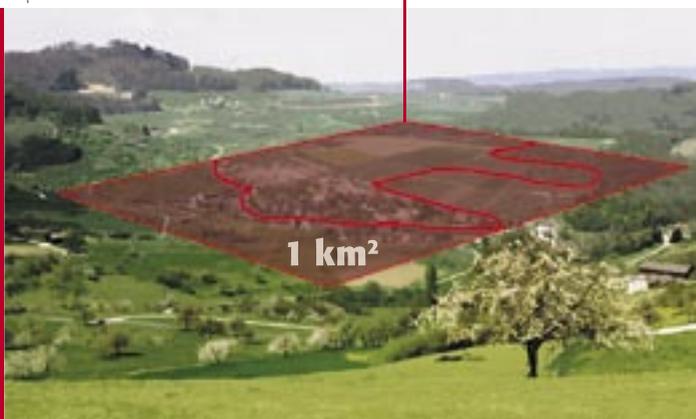
**Sampling network**

**Z7 Species Diversity in Landscapes**

This sampling network consists of roughly 500 sampling areas covering one square kilometer each. Following a predefined route within each area (see illustration on the right), specialized field biologists identify ferns and flowering

plants as well as breeding birds and butterflies. These surveys reveal how varied large-scale landscapes are. Among other things, the Z7 indicator makes it possible to compare the development of biodiversity in Switzerland's regions, e.g. in the Jura or on the Central Plateau.

**Sampling area**

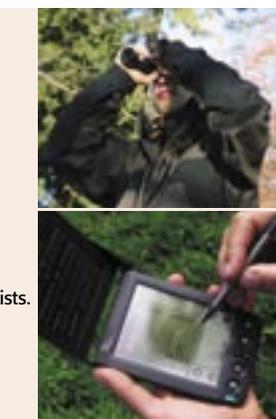


**Method**

- Step 1:** Identify plants along a route.
- Step 2:** Identify butterflies.



- Step 3:** Watch birds.
- Step 4:** Compile species lists.





### More Information

The BDM website provides both basic information about the program and current reports, also available for downloading in PDF format. [www.biodiversitymonitoring.ch](http://www.biodiversitymonitoring.ch)



## BDM Reveals Long-Term Trends of Biodiversity



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Office for the Environment FOEN



### What Do We Get Out of It?

We depend on biodiversity to survive. It causes natural circles to stay balanced. Intact ecosystems generate the air we breathe, purify the water, produce our food and create a climate that is pleasant to live in. Without biodiversity, Earth would be about as hospitable as Mars.

But although it is so crucial, even experts are at a loss to say just how exactly biodiversity has developed over time and how it will continue to change. Quite often, we have to rely on assumptions where we would need facts. For example when it comes to taking measures to conserve biodiversity and evaluating their effectiveness.

Unlike other environmental areas such as airborne pollutant control, biodiversity used to lack numerical set targets. BDM closes this gap, supplying the data it takes to make nature conservation even more effective. A vital step towards permanence in conserving and promoting our basis for survival.

### All Indicators at a Glance

**Z1** Number of Livestock Breeds and Plant Varieties *Provides an overview of the number of livestock breeds and crops in Switzerland.*

**Z2** Proportion of Livestock Breeds and Plant Varieties *Shows the importance of various farm animals and crops for food production.*

**Z3** Species Diversity at National and Regional Level *Aside from Z7 and Z9, this is one of the most important indicators. It records animal species living in the wild in Switzerland.*

**Z4** Number of Species in Switzerland Facing Global Extinction *Records species categorized as "threatened" or "vulnerable" by Red List definition.*

**Z5** Change in the Endangerment Status of Species *Reveals whether the endangerment of redlisted species has increased or decreased.*

**Z6** Population Size of Endangered Species *Uses select species to describe general trends.*

**Z7** Species Diversity in Landscapes *Illustrates fauna and flora diversity in the "normal" landscape and registers the influence of the habitat mosaic on species diversity.*

**Z8** Population Size of Common Species *Responds to changes in quality of the "normal" landscape which is home to common species.*

**Z9** Species Diversity in Habitats *Records species diversity in habitats such as meadows, forests and settlements.*

**Z10** Size of Valuable Habitats *Focuses on habitats of national importance in which many threatened species occur.*

**Z11** Quality of Valuable Habitats *The quality of habitats determines long-term survival of species.*

**E1** Size of Valuable Habitats *Same definition as Z10.*

**E2** Size of Areas of Defined Use *Registers the way land is being used. Many species depend on the way their habitats are used for survival.*

**E3** Size of Wilderness Areas *By definition, a "wilderness area" is an area the development of which is not or hardly influenced by man.*

**E4** Length of Linear Landscape Features *The length of rivers, hedges and forest edges is important for the migration of numerous species.*

**E5** Diversity of Land Use and Land Cover *Biodiversity is impacted by the variety and the layout of habitats.*

**E6** Nutrient Supply in the Soil *As a rule, high nutrient supplies in the soil reduce plant diversity.*

**E7** Intensity of Agricultural Land Use *Makes it possible to estimate the intensity of land use.*

**E8** Forest Area Dominated by Non-Indigenous Trees *Non-indigenous tree species diminish native species diversity.*

**E9** Area of Artificially Regenerated Young Woodland *Regenerating nature often promotes biological diversity.*

**E10** Deadwood *Changes in the amounts of deadwood found in various forest types in Switzerland as a whole and in individual regions.*

**E11** Volume of Water Extracted from Watercourses *Extracting large volumes of water has a negative impact, as many species lose their habitats due to low water levels.*

**E12** Proportion of Adversely Affected Watercourses *Channeling watercourses means losing habitats, since channels offer no shelter for small animals and fishes.*

**E13** Water Quality of Watercourses and Captive Water *Clean waterbodies are a prerequisite for many aquatic organisms to survive.*

**E14** Proportion of Polluted Waterways *Reveals whether Switzerland's water protection regulations are being implemented to the desired effect.*

**E15** Landscape Fragmentation *The density of Switzerland's transportation system results in habitat fragmentation.*

**M1** Size of Protected Areas *Records the overall surface of all areas protected by law.*

**M2** Size of "Secure" Protected Areas *Legal protection (M1) does not guarantee*

*the implementation of protective measures. M2 measures the size of protected areas in which plants and animals are actually protected.*

**M3** Endangered Species Living in Protected Areas *Shows whether endangered species benefit from protected areas.*

**M4** Ecological Compensation Areas *Since areas protected by law alone are too small to protect certain species, Switzerland's government subsidizes ecological compensation areas.*

**M5** Areas Farmed Organically *Organic farming is expected to help create a diverse and species-rich environment.*

**M6** Implementation of Environmental Regulations *Reveals how well the country's environmental regulations are being put to practice.*

**M7** Financial Resources for Nature and Landscape Conservation *Registers the amount of money Switzerland invests in nature conservation.*

### Z, E and M Indicators?

Analogous to the OECD's Pressure-State-Response (PSR) model, BDM uses three kinds of indicators: Z indicators supply data on the state (for *Zustand* in German) biological diversity is in, directly revealing the status quo of Switzerland's biodiversity. These state data can then be put into perspective using

other indicators, i.e. those dealing with pressure or influences (E, for *Einflüsse*) and response or measures (M, for *Massnahmen*). E indicators record factors impacting biodiversity, such as water quality, while M indicators reflect the extent of measures launched to conserve biodiversity.

## Biodiversity Monitoring Switzerland BDM

# KEEPING A CLOSE EYE ON NATURE