
> Biodiversity in Switzerland

*Summary of Switzerland's Fifth National Report
under the Convention on Biological Diversity*



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Swiss Confederation

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> Contents

Foreword	3
Summary of the Key Points	5
The Value of Diversity	6
Biodiversity under Pressure	8
A Critical Situation	12
Conserve and Develop	14
International Biodiversity Policy	16
Progress in International Comparison	18

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– More information about Switzerland's biodiversity policy can be found on line at:
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> Foreword

Biodiversity is life in all its diversity. It provides us with food, drinking water and fuel and ensures our survival. However, biodiversity has greatly declined in the last 100 years – both worldwide and in Switzerland. Today, nearly half of all habitats and over one-third of all species are threatened in Switzerland. The intensification and expansion of land use are primarily responsible for this.

If current policy does not succeed in changing this trend, more and more species will simply become extinct and ecosystem services that are critical for our country's economic performance will disappear. These biodiversity losses would cost Switzerland approximately CHF 25 billion per year by 2050. Our livelihoods are under threat of erosion, and human well-being is at risk. For that reason, a policy shift in favour of biodiversity is necessary.

In response to the severe threat to biodiversity, the Federal Council adopted the Swiss Biodiversity Strategy, which also serves as the basis for an action plan that Switzerland is now developing. While its cornerstone is the development and maintenance of an ecological infrastructure of protected and connection areas, the plan will also be accompanied by sustainable use and biodiversity promotion measures and take into account the targets set out in the Strategic Plan for Biodiversity of the Convention on Biological Diversity.

I am convinced that we can change this trend and maintain biodiversity and our quality of life in the long term. However, all sectors must be willing to help out. Ultimately, we all benefit from the services provided by biodiversity. It is our responsibility to ensure that future generations can continue to count on this fundamental building block of life. With that in mind, this summary of Switzerland's national report is intended to increase awareness of the urgent and absolute need for action in favour of biodiversity at the political, economic and social levels in order to ensure that this action is sound.

Franziska Schwarz
Vice Director of the Federal Office for the Environment (FOEN)



> Milestones 2010 – 2014

2010

“Biodiversity change in Switzerland since 1900”: A study published by the Swiss Academy of Sciences’ Biodiversity Forum concludes that biodiversity loss has still not been halted in Switzerland.

Switzerland’s Fourth National Report on the Convention on Biological Diversity Implementation concluded that it had not achieved the “2010 Biodiversity Targets” to which the Parties had committed in 2002 and which were aimed at significantly reducing or halting the rate of biodiversity loss at the global, regional and national levels by 2010.

The tenth meeting of the Conference of the Parties to the Convention on Biological Diversity took place in Nagoya, Japan. No Party had achieved the “2010 Biodiversity Targets”. The comprehensive Strategic Plan for Biodiversity 2011–2020, together with the twenty Aichi Biodiversity Targets, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization were adopted.

2011

The UN General Assembly declared 2011–2020 the United Nations Decade on Biodiversity.

The revised Waters Protection Act came into force. It set out funding for rehabilitation projects, among other measures.

Switzerland signed the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization.

The Federal Council adopted the Forest Policy 2020, in which it set the conservation and improvement of forest biodiversity as one of its five strategic goals.

2012

The Federal Council adopted the Swiss Biodiversity Strategy (SBS), whose overarching goal is the sustainable conservation of rich and resilient biodiversity and its ecosystem services. At the same time, it issued the mandate for developing an action plan.

The eleventh meeting of the Conference of the Parties to the Convention on Biological Diversity took place in Hyderabad, India. The Parties agreed that twice as many international financial resources would be put toward biodiversity.

2013

The Swiss Federal Council and Parliament adopted the Agriculture Policy 2014–2017, which raises the incentives for the creation, maintenance and connection of biodiversity priority areas.

2014

The Swiss Parliament approved the Nagoya Protocol and its implementation in the Federal Act on the Protection of Nature and Cultural Heritage.

The twelfth meeting of the Conference of the Parties to the Convention on Biological Diversity and the first meeting of the Conference of the Parties to the Nagoya Protocol took place from October 6 to 17 in Pyeongchang, South Korea.

> Summary of the Key Points

Switzerland submitted its fifth national report in anticipation of the twelfth meeting of the Conference of the Parties to the Convention on Biological Diversity in October 2014. The report explains how the Convention on Biological Diversity is being implemented in Switzerland. This summary covers the key information contained in the international report.

Biodiversity makes it possible to produce a wide range of goods and services. In fact, ecosystems are used to produce food, medicine, construction materials, textiles and other raw materials. Biodiversity is the key to many regulating services (water cycle, soil fertility, protection from natural disasters). It is also aesthetically important, increases the recreational value of the landscape and provides a basis for tourism and leisure activities. Regardless of the ways they personally benefit from it, many people certainly attach great value to the mere existence of biodiversity.

Generally speaking, Swiss biodiversity is not in a satisfactory state. 47%, or almost half, of all 160 types of habitats in Switzerland are threatened. As rare species completely disappear from many areas and common species continue to spread, habitats lose a part of their uniqueness. 36% of all evaluated animal, plant and fungus species are categorised as threatened on the Red Lists.

Most habitats are under intense pressure. They are also disappearing, particularly in agricultural areas, where areas used for settlement and transport are spreading and land use is becoming more and more intensive. Many water bodies are being heavily affected by the use of hydropower and damming. Pollution caused by nitrogen inputs from the air can be found virtually nationwide. Plant protection products and micropollutants are momentarily reaching high levels in some places. Settlement areas and infrastructure facilities are fragmenting the landscape, thereby isolating stocks of species. Invasive alien species and climate change pose an additional threat to many native species and ecosystems.

The cornerstone of Swiss biodiversity policy is the Swiss Biodiversity Strategy (SBS), which is now being developed into an action plan for the purposes of implementation. Both the Agriculture Policy 2014–2017 and the Forest Policy 2020 already include instruments to promote biodiversity. The Waters Protection Act, which was revised in 2011, lays the legal basis for improving the state of water bodies.

Reserves play a key role because they are the centre-pieces of the ecological infrastructure. Existing gaps must be closed and species conservation measures must be applied

wherever individual species continue to be threatened despite habitat protection and upgrading efforts. Finally, genetic diversity should be given greater consideration. An important gap was closed and another step was made toward an integral biodiversity policy by explicitly including settlement areas in the SBS.

The huge pressure on biodiversity is in large part a result of high resource consumption. The Federal Council adopted the Green Economy Action Plan in 2013 to reduce this pressure. Since Switzerland imports the vast majority of the raw materials it needs, it bears partial responsibility for the state of global biodiversity. By implementing the Nagoya Protocol in the Federal Act on Protection of Nature and Cultural Heritage, Switzerland is helping to create easier access to genetic resources and fair and equitable sharing of benefits arising from their utilization.

Progress has been made in various areas toward the twenty targets set by the Parties to the Convention on Biological Diversity in Nagoya in 2010 (Aichi Biodiversity Targets). Examples include public awareness of biodiversity and the conservation of the genetic diversity of cultivated plants and farmed animals. Major steps were taken toward other targets, such as the elimination of incentives that are harmful to biodiversity. However, the sustainable use of natural resources, the reduction of pollution and the creation of sufficiently large connection and protected areas still pose huge challenges.

> The Value of Diversity

Biodiversity makes it possible for nature to achieve its full potential and to supply society with food and raw materials. It enables ecosystems to regulate the water cycle and climate and protects against natural disasters. However, biodiversity also creates the beauty and recreational value of nature and is the expression of life in all its diversity.

The term ‘biodiversity’ refers to life in its all its diversity. However, the benefits of diversity and the justification for its value cannot be surmised in one word. Biodiversity provides many services, such as the production of food, the supply of raw materials, and the regulation of natural processes. The diversity of natural habitats and species allows humans to experience nature and improves our quality of life.

Many people place high value just on the fact that diverse life exists, regardless of whether it has practical uses or not. In fact, 93 % of the respondents of a representative survey claim that biodiversity must be protected because it is our moral responsibility to nature. An even stronger agreement was elicited when respondents were asked if biodiversity should be protected for future generations: 97 % of them agreed. Being close to nature (96 %) and the beauty of

nature (95 %) were also very convincing arguments, while more than 80 % of respondents agreed that economic reasons justify the protection of biodiversity.

Food

Swiss farmers produced approximately CHF 10 billion worth of products on just one-fourth of the country’s territory. These products are used primarily as food and meet 56 % of the domestic demand. The consumption of fish and crustaceans in Switzerland has risen sharply, but its CHF 36 million worth of domestic production meets less than 10 % of the demand. Forest honey, game, mushrooms and chestnuts are other foods primarily supplied by the forest; their production is valued at CHF 83 million.



Fig.1 Food production. Many organisms maintain soil fertility.



Fig.2 Timber harvest. Forests provide raw materials that can be used for many different purposes.

Raw Materials

Every year, approximately 5.1 million cubic metres of timber are harvested domestically. Wood is a very valuable building material, a carbon-neutral fuel and is still very present in our everyday lives in the form of furniture and paper. Cotton, wool, linen, rope or leather, which are mostly imported, are raw materials required to produce clothes and shoes. Many organisms are used to produce medicines.

Regulation

Biodiversity provides services that go beyond the productivity of specific species. These services are often difficult to measure, which is why it is most often assumed that they are naturally free. In fact, intact ecosystems regulate the water supply by storing rainfall, which curbs flood peaks, or by reducing pollution from seepage water, which is useful in obtaining drinking water. Forests and mires store CO₂ in the form of biomass and counteract climate change as a result. Finally, vegetation protects against soil erosion, rock falls, avalanches and other natural disasters in many places. The cost of replacing ecosystem services through technical measures would be enormous.



Fig. 3 *Drinking water supply.* Intact ecosystems ensure high quality water.

Experience

Tourism benefits from diversified, beautiful landscapes. They make recreation possible in nature and increase the attractiveness of leisure activities. National parks, nature parks, nature centres and hiking paths draw many people and create jobs at the same time. Studies show that a large portion of the population uses natural landscapes for recreation and that experiences of nature have a positive effect on the health of the respondents.

Even the everyday biodiversity of agricultural landscapes or settlement areas provides experiences of nature and raises the quality of life. For example, it has been demonstrated that hospital patients recover better if they have a view of trees and green spaces from their window instead of walls. The population places greater value on green spaces in cities that are rich in species and diverse than on areas lacking in biodiversity.



Fig. 4 *Hiking.* Diverse nature provides for intense experiences and recreation.

> Biodiversity under Pressure

There is a great deal of pressure on biodiversity due to habitat loss and deteriorating habitat quality. The responsibility lies not only with the exploiters of these areas, but also with other sectors whose activities impact them.

Switzerland, with its contrasting flat and steep landscapes, differing climates, diverse geology and extremely varied local forms of traditional agriculture, offers many opportunities to develop biodiversity.

However, the diversity that has resulted from centuries of development is now under great pressure. In fact, a detailed analysis of roughly 1,800 plant and animal species revealed that the primary cause of their endangerment is adverse changes in agricultural areas (mowing too often, using unsuitable machines, fertilisation, and plant protection products). The second and third causes are the loss of habitat structures (groves, ecotones, field margins) as well as disruptions of the hydrological balance (drainage). Other causes are encroachment in rivers and streams (straightening, channelling, and culverting) and changes in the forest (artificial afforestation, abandonment of groves and coppice forest or coppice with standards). Chemical and physical pollutants (air pollution,

light) and the abandonment (forest encroachment) and reduction (weed and scrub growth) of agriculture are also causes of plant and animal endangerment.

Habitat Loss

Historical maps show that Switzerland still had widespread alluvial zones, mires and dry meadows and pastures around 1850. Since then, these habitats have shrunk considerably due to watercourse corrections, damming and drainage and use intensification. Between 1900 and 2010, alluvial zones shrunk by 36 %, mires by 82 %, and dry meadows and pastures by as much as 95 % (Fig. 6).

Habitat losses continued to be increasingly significant well into the 20th century mainly due to the growing demand for land; to free land for agriculture and settlement, mires



Fig.5 *Urban sprawl. Habitat loss and fragmentation are the consequences.*

were dried up and bodies of water were drained and dammed. In the last three decades, agriculture has also been adversely affected by the transformation of landscapes and has therefore continued to lose more and more area. The main cause of this has been the growth of settlements. Between 1995 and 2009, the settlement area of Switzerland grew by nearly a quarter and now takes up around 8% of its territory. Natural meadows, vegetable gardens and other valuable areas from the perspective of biodiversity continue to fall prey to settlement growth. However, the rate of settlement growth has slowed somewhat since 1997.

Abandonment and Intensification of Land Use

Traditional forms of agriculture and forestry (extensive meadows, meadow irrigation, wooded pastures and groves) have a positive effect on biodiversity. However, once land use is disrupted, as is increasingly the case in steep marginal areas, the typical species that were once plentiful begin to disappear. In summering areas, shrubs and bushes are spreading, while below the tree limit, the forest is growing in again in meadows and pastures. Thicker and therefore darker stocks grow in forests that are no longer used, which causes orchids and other light-requiring species to disappear.

However, biodiversity is especially threatened in lowlands and well developed areas, not by abandonment, but rather by the intensification of land use. Technological advances and one-sided economic incentives, among other things, led

to an increase in agricultural production starting in the mid-20th century, thanks to the substantial use of fertiliser and pesticides. Obstacles to efficient, mechanised agriculture were removed. Patches of woodland, walls and other small structures that were valuable to biodiversity disappeared. Water-logging with drainage pipes and ditches was discovered, and arid areas were increasingly irrigated.

The intensive use of water bodies to produce electricity and protect against floods made dams and barriers necessary, while rivers and streams slowed to a trickle because they were limited to the residual flow stretch. Fish cannot get past many of these artificial obstacles, which makes it impossible for them to migrate. The heavy fluctuations in water levels caused by power plant operations are lethal for many aquatic organisms. Dams and steep slopes also prevent ecological interactions between water, shore and bordering habitats.

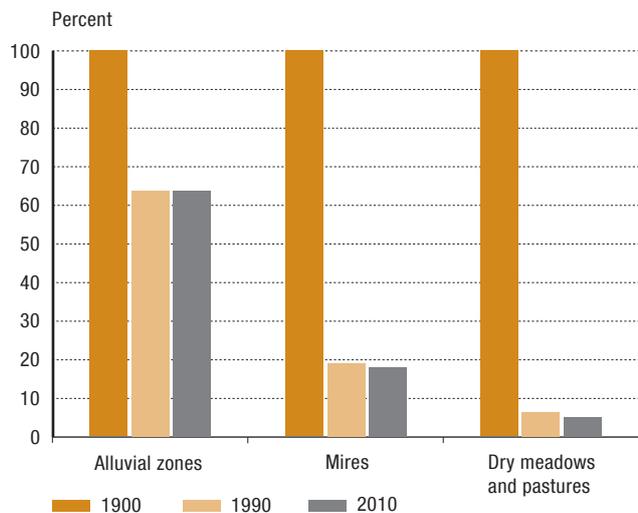
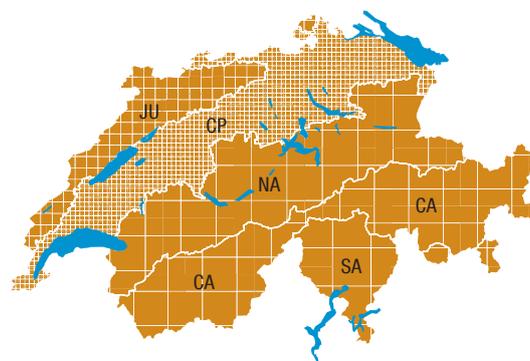


Fig. 6 *Particularly valuable habitats.* Reduction in the area of alluvial zones, mires and dry meadows and pastures.

Meshes per 1,000 square kilometres



JU Jura 128 (+4%) CP Central Plateau 1250 (+10%) NA Northern Alps 5 (+6%)
CA Central Alps 12 (+27%) SA Southern Alps 3 (+9%) Switzerland 10 (+9%)

Fig. 7 *Landscape Fragmentation.* Number of divisive “meshes” per 1,000 square kilometres in 2007. In parentheses: Increase since 2001.

Urban Sprawl and Landscape Fragmentation

Urban sprawl over landscapes and the construction of transport infrastructures often create impenetrable barriers that keep plants and animals in isolated stocks. Landscape fragmentation has increased in the last 30 years. The density of elements that fragment the landscape has doubled particularly on the Central Plateau. Fragmentation is lowest in the mountain regions, which have large expanses of unused land. Most of the existing fragmentation has taken place in the valleys. The greatest increase in landscape fragmentation nationwide was observed in the Central Alps between 2001 and 2007 (Fig. 7).

Pollution

Plant protection products and biocides destroy organisms that harm agricultural crops, green spaces, gardens, homes and street and railway maintenance. However, the use of these substances can also harm other living things. In recent decades, rapidly degrading plant protection products with specific effects have been introduced on the market. Nevertheless, they cause temporary high pollution levels in specific habitats, such as in small bodies of water, for example, where they are barely diluted.

Even in very small concentrations, so-called “micropollutants” have adverse effects on the health of living things in water. Endocrine disruptors, which are residues of phar-

maceutical products or cosmetics that enter rivers and lakes through wastewater treatment plants, can cause change in the gender of fish. Knowledge is not yet advanced enough to assess the potential effects of other pollutants such as nanoparticles or microplastics.

Excessive levels of nitrogen compounds have demonstrable and undesirable effects on biodiversity. In naturally nutrient-poor habitats such as raised bogs or dry meadows, fertilisation and air pollution encourage the growth of more competitive plants, which replace the characteristic species. The critical pollution limit for nitrogen inputs is exceeded in 55% of all near-natural ecosystems (Fig. 8). The main cause of nitrogen pollution is agriculture, which releases ammonia into the air as a result of the application and storage of slurry. Between 1990 and 2000, emissions fell by approximately 10% and have remained stable since. Transport contributes less to over-fertilisation since nitrogen oxide emissions have been cut roughly in half since 1990.

Invasive Alien Species

The term “alien” refers to plants, animals and other organisms that are intentionally (e.g. ornamental plants, pets) or unintentionally (e.g. in packaging materials or as pathogens) brought into habitats outside of their natural range by human activities. They are called “invasive” if they spread into Switzerland and harm biodiversity and its sustainable use or threaten humans and the environment. Over 800 animal, plant and fungus spe-

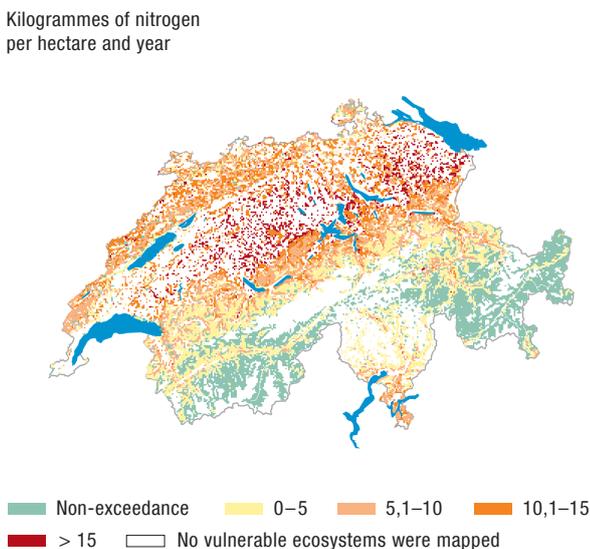


Fig. 8 Nitrogen input. Exceedance of the critical load for nitrogen deposition in kilogrammes of nitrogen per hectare and year in near-natural ecosystems and forests.

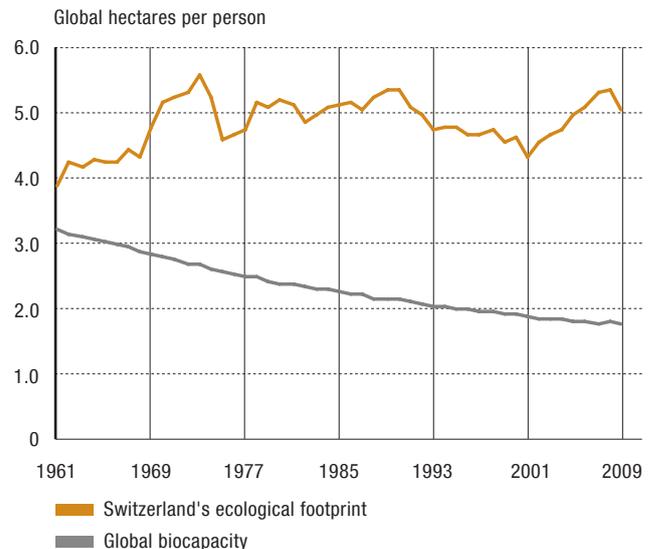


Fig. 9 Consumption. Change in Switzerland's ecological footprint compared to the global biocapacity.

cies have spread from their natural ranges into Switzerland due to human activities and established themselves in new habitats here. 107 of these species are considered invasive.

Climate Change

The warming of the planet may encourage alien species to spread and establish themselves outside their normal ranges and cause a growing number of them to adopt invasive behaviour. Native species also react differently to climate changes in temperature and humidity. As the climate changes, plant and animal ranges shift. A milder climate could lead to an expanded range for several species, such as the endangered cirl bunting. Other species, such as the brown trout, may see their habitat continue to shrink as watercourses warm up.

Tourism

Leisure activities can harm biodiversity, such as when outdoor enthusiasts flush wild animals, as this reduces their chances of survival, especially in winter. Because tourist facilities provide a basis for promoting new leisure trends in many areas, they play a role in increasing the disturbances. Isolated and original habitats are often affected as a result.

Consumption

Consumers, commerce, construction, electricity plants and other market participants steer production conditions in agriculture, forestry and water management by purchasing food, building materials or electricity. The percentage of biodiversity-friendly production systems (organic agriculture or integrated production in agriculture, the FSC, PEFC and Q labels for forests, the naturemade label for electricity, etc.) rises or falls depending on demand.

Considerable proportions of food, other raw materials and energy are imported from abroad. For that reason, the influence of consumption does not stop at national borders. The extraction of minerals or fossil raw materials also impacts biodiversity because natural habitats are destroyed or contaminated in many cases as a result of this activity.

The ecological footprint measures the demand for natural resources. Switzerland consumes almost three times the amount of environmental services and resources that are available per capita worldwide (Fig. 9). Switzerland's consumption level is therefore not sustainable – it consumes natural resources at a faster rate than they can be naturally regenerated – and remains steady only because people in other countries consume considerably fewer resources than Switzerland.

> A Critical Situation

Biodiversity in Switzerland is in an unsatisfactory state. Around half of its habitats and one-third of its species are listed as threatened on the Red Lists. The negative developments outweigh the positive developments in terms of the area and quality of habitats that merit special conservation efforts.

Swiss biodiversity is generally in an unsatisfactory state, and the losses continue. The same scientifically-based assessment was provided by Switzerland in its Fourth National Report under the Convention on Biological Diversity in 2010. All three levels of biodiversity are in an unsatisfactory state: ecosystems or habitats, species and genetic diversity.

Habitat Diversity

Despite its limited space, Switzerland enjoys a plethora of extremely diverse habitats. However, roughly half, or 47%, of the 160 described habitat types are considered threatened. This percentage is particularly high for bodies of water and wetlands. While an above-average number of habitats are threatened in agricultural areas, not as many are threatened in forests.

One-fourth of all bodies of water have an unnatural structure, thereby adversely affecting discharge regimes, bed load transport and fish migration. According to a five-year study, the quality of habitats in wetlands has deteriorated since around one-fourth of all evaluated raised bogs and fens are even more overfertilised than previously (Fig. 10). The decline in quality is caused by nitrogen input from the atmosphere and neighbouring agricultural lands.

Arable land used for agriculture lost much of its once rich biodiversity between the mid-20th century and the 1990s (cf. Fig. 6). At the same time, the area of land used for agriculture has generally shrunk by 3% since 1996.

Switzerland's forest area has been growing for several decades. Natural regeneration is on the rise in forests, which is enabling growth in the number of tree species that are suitable to local conditions and promoting genetic diversity. An increase in deadwood, a valuable element in habitats, has been

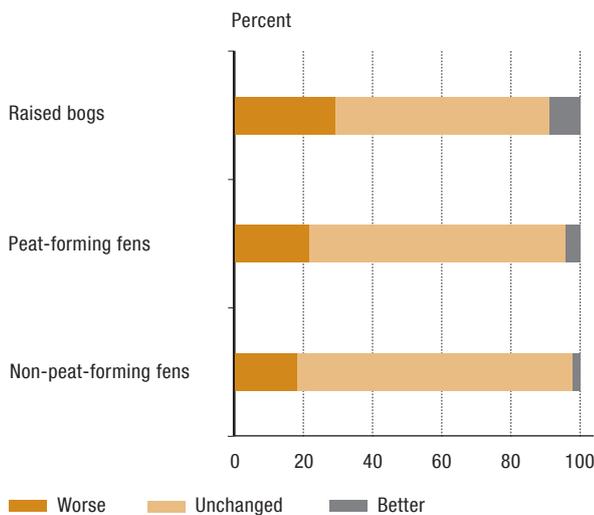


Fig. 10 *Quality of protected habitats.* Changes in nutrient contamination in mires between the surveys of 1997/2001 and 2002/2006.

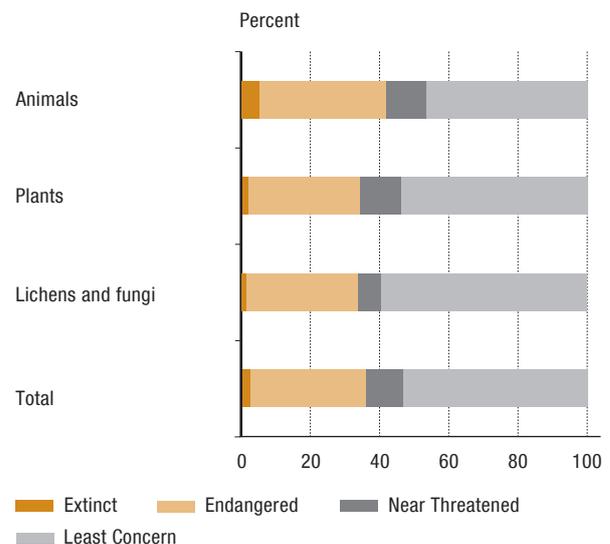


Fig. 11 *Red Lists.* Percentage of species in Switzerland that are either threatened (extinct or endangered), near threatened or not threatened.

observed, but the values in the Jura and the Central Plateau are only about half those in the Alps and the Lower Alps. Both old forests in late development stages and clear, young forest communities continue to be underrepresented.

Wall grooves, roof ledges, gardens, fallow land and other habitats in settlement areas are home to a wide variety of species. However, some areas have so many disturbances and pressures that threatened species are able to find a habitat only in exceptional cases.

Species Diversity

A total of 45,890 plant, animal, fungus and lichen species are known in Switzerland. Since 49 of these cannot be found in any other country, they are considered Swiss endemic species. More than half of the range of 97 species lies in Switzerland.

According to the Red Lists, 36% of all evaluated species are threatened (Fig. 11). Many native species continue to exist only in isolated stocks of a few individuals and have poor chances for survival as a result. Although the decline of several species since the 1990s has been stalled and reversed in some cases, there is still much work to be done.

Because rare species are disappearing and common species continue to spread, some habitats are losing some of their original uniqueness (Fig. 12).

Genetic Diversity

When several individuals in a stock of plant or animal species are all very genetically similar, it increases the risk of inbreeding and widespread disease and decreases their adaptability to changing environmental conditions at the same time.

At present, 2,017 cultivated plant varieties occurring in Switzerland are registered in the national database for plant genetic resources. However, only a very small number of these varieties are grown on a large scale. A stud book is kept for 76 breeds of cattle, pigs, sheep and goats in Switzerland (Fig. 13). Little is known about the genetic diversity of wild species.

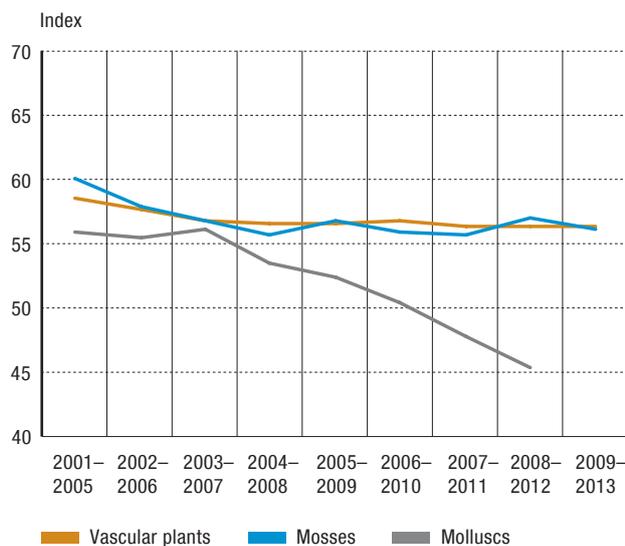


Fig. 12 Uniqueness of meadows and pastures. Changes based on the species composition of vascular plants, mosses and molluscs (Simpson Index).

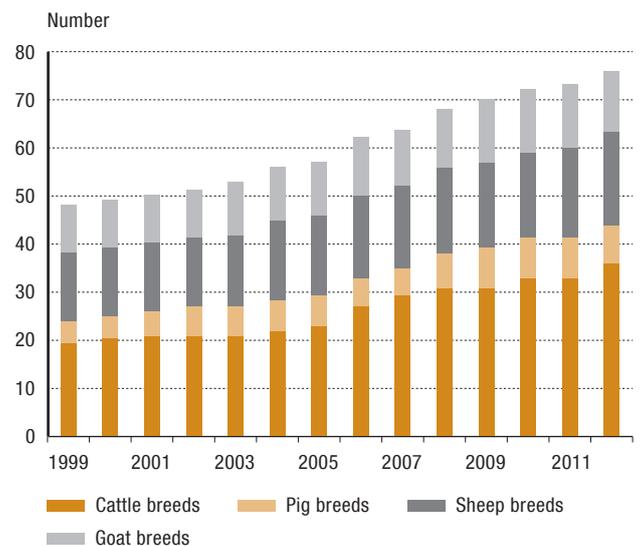


Fig. 13 Genetic diversity of breeds. Number of cattle, pig, sheep and goat breeds with a stud book.

> Conserve and Develop

The Swiss Biodiversity Strategy (SBS) is the cornerstone of Switzerland’s biodiversity policy, but various sectorial policies should generally help reach its goals. Protected and connection areas are to be connected to an ecological infrastructure, and the quality of natural habitats is to be improved. Targeted development measures should prevent the extinction of threatened species and ensure genetic diversity.

Biodiversity conservation is a cross-sectorial undertaking. In 2012, the Federal Council adopted its guiding principle, the Swiss Biodiversity Strategy (SBS), in which it set the goals that it wants to reach by 2020. Concrete actions toward these goals were set out in an action plan (SBS AP) that involved over 600 experts from 250 different institutions and organisations. The SBS AP is slated for adoption in 2015.

Soil use in Switzerland is dominated by agriculture, forest, water bodies and settlements. Various sectorial policies are pivotal for that reason. However, cross-cutting measures are required for biodiversity at the habitat, species and genetic diversity levels.¹

Arable Land

The legal framework for ecological compensation introduced in 1993 has ensured that agriculture helps conserve and cultivate nature and landscape, in addition to growing food. The percentage of biodiversity priority areas has risen to 12% of the area used for agriculture (Fig. 14). Parliament adopted the Agriculture Policy 2014–2017 in 2013 because the federal government wanted to strengthen biodiversity in agricultural areas and set out appropriate incentives.

Sustainability standards such as organic farming ensure that land use is biodiversity friendly through regulations that exceed the minimum legal requirements (Fig. 15).

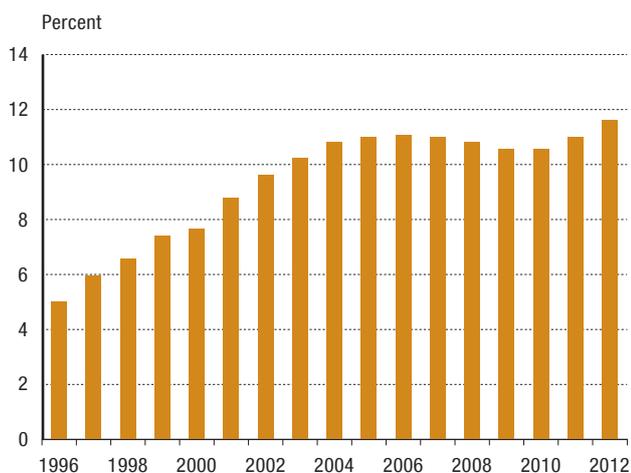


Fig. 14 Biodiversity priority areas (BFF). Changes in biodiversity priority areas under the Direct Payments Ordinance, as a percentage of the total area used for agriculture.

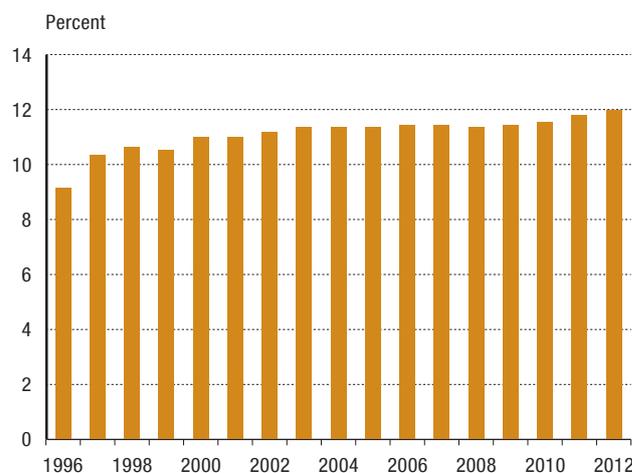


Fig. 15 Organically farmed areas. Changes in the organically farmed area as a percentage of the area used for agriculture.

Forest

With the introduction of the principles of sustainability in the 19th century, a stricter legislative framework and near-natural forestry policies, the negative influences of timber use on biodiversity were significantly reduced. For instance, the then widespread practice of clear-cutting large expanses of forest was prohibited, and afforestation with alien tree species became rarer.

One of the biodiversity targets of the Forest Policy 2020 adopted by the Federal Council in 2011 is to increase the current area of forest reserves from roughly 5 % to 8 % (and to 10 % by 2030) of Switzerland's total forest area. Priority habitats such as forest borders and wooded pastures are to be developed. Staggered targets were set out regionally for the percentage of deadwood.

Water Bodies

The Waters Protection Act, which was revised in 2011, provides for the restoration of the natural functions of streams, rivers and lakes. In the next 80 years, approximately 4,000 kilometres of river and stream courses will be revitalised. Some of the measures, which also improve flood protection in many cases, have already been implemented, and attractive recreational spaces are being created.

There are roughly 1,500 withdrawal sites for hydropower in Switzerland. About half of these must be remediated due to inadequate residual flow quantities.

Settlement Areas

Switzerland is using only a little of its full potential for more biodiversity in gardens, green spaces, village streams and other biotopes. By setting targets and standards and planning models, it is possible to improve the passability of the landscape and the connection of habitats. At the same time, land use caused by the settlement and transport growth must be slowed in accordance with spatial planning policy.

Ecological Infrastructure

Biodiversity requires space. However, since natural and near-natural areas in Switzerland are often small and isolated from each other, they are unable to fulfil all of their ecological functions. Designated biodiversity areas currently make up around 11 % and national protected areas 6.2 % of the total land area (Fig. 16). The latter are key elements of the ecological infrastructure, in addition to communal, cantonal and private protected areas. They must be qualitatively enhanced, expanded with new protected areas and made continuous for plants and animals through connection areas.

Species and Genetic Diversity

Habitat conservation and development measures are not enough for some species. Specific arrangements are required to prevent their extinction. The List of National Priority Species includes some 3,600 species whose protection and development are a priority.

The diversity of the different varieties of cultivated plants is recorded and promoted through the National Action Plan for the Conservation and Use of Plant Genetic Resources for Nutrition and Agriculture (NAP-PGREL).

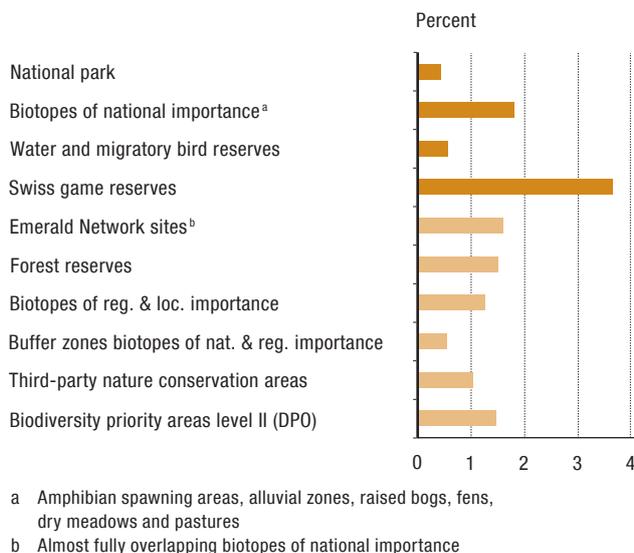


Fig. 16 Designated biodiversity areas. Percentage of the total land area. Darkened areas: protected areas (without overlapping, approximately 6.2 %).

1 Other instruments are discussed in connection with the Aichi Biodiversity Targets (in the section entitled "Progress in International Comparison").

> International Biodiversity Policy

Global biodiversity is in a poor state. The Parties to the Convention on Biological Diversity have agreed on principles and goals to prevent further losses. Global ecological interactions, the import of goods whose production depends on biodiversity and ethical considerations are the reasons for Switzerland's strong international commitment.

Studies around the world are documenting the advanced state of declining biodiversity.² Furthermore, the Red Lists show that an increasing number species are nearing extinction. In fact, amphibians are exposed to the highest risk, while the state of coral stocks is deteriorating at the fastest rate. Around one-fourth of all evaluated plant species around the world are considered threatened, and the stocks of more than 2,500 monitored mammals have decreased by one-third since 1970, especially in the tropics and freshwater ecosystems. Despite regional progress, the area and quality of natural habitats are decreasing in many places. The genetic diversity of cultivated plants and farmed animals is in decline.

Global Biodiversity Goals

The worrying state of biodiversity prompted participants at the global summit in Johannesburg in 2002 to set the goal of significantly reducing biodiversity by 2010. However, the goal was not achieved on a global or national level, not even in Switzerland. This sobering assessment motivated the participants of the tenth meeting of the Conference of Parties to the Convention on Biological Diversity (COP10) in Nagoya, Japan to set new concrete goals under the Convention on Biological Diversity.



Fig. 17 Palm oil plantation. In many places, primeval forests are losing ground to the cultivation of export products.

Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is one of the most important international environmental agreements. It was negotiated in 1992 at the global summit in Rio. Switzerland is one of the 194 Parties to the CBD. The goals of the Convention on Biological Diversity are the conservation and sustainable use of biodiversity as well as the fair and equitable sharing of benefits arising from the utilization of genetic resources.

A global strategic plan for the period from 2011 to 2020 was adopted at the COP10. It is supported by the UN and intended to fight the causes of the decline in biodiversity, reduce pollution, promote the protection and sustainable use of biodiversity, secure ecosystems, species and genetic diversity, increase the benefits of ecosystem services for everyone and improve the implementation of measures through participation, knowledge management and competence. At the same conference, the Aichi Biodiversity Targets were also agreed upon (cf. P. 18–19), and the countries committed to mobilise substantial financial resources for biodiversity.

Protocols

The Convention on Biological Diversity was expanded in 2003 by the Cartagena Protocol on Biosafety. This protocol was also signed by Switzerland and is intended to ensure the safe transport and use of genetically modified organisms (GMOs). The principle of “advance informed agreement” applies to transport between countries.

The Convention on Biological Diversity was expanded again 2010 in Nagoya. The Nagoya Protocol, which was approved by the Swiss Parliament in 2014, governs access to genetic resources and the equitable sharing of benefits arising from their utilization. This protocol makes it easier for researchers and companies in Switzerland’s agriculture, biotechnology, pharmaceutical and cosmetics industries to gain access to materials and ensures that they acquire the animals, plants or microorganisms. In return, for example, the benefits of developing and marketing the active agents of a traditional medicinal plant or of growing new plant varieties are shared with each country that provided the genetic resources.

Switzerland’s Commitment

Switzerland is committed to take firm measures for biodiversity protection and use. It would like international development institutions such as the World Bank and the United Nations Development Programme (UNDP) to pay more attention to biodiversity in their activities. While Switzerland advocates mobilising additional financial resources for biodiversity conservation, it also believes that a serious clarification of the amount of financial resources required is important.

For instance, the benefits of ecosystems resulting from climate regulation or the pressure on biodiversity caused by pollutants or invasive species do not stop at national borders. Switzerland’s dependence on imported food and raw materials, which requires the use of ecosystem services, is a strong economic argument for an international commitment. Finally, Switzerland is ethically obligated to actively participate in global efforts to conserve biodiversity. Swiss consumption of resources abroad actually causes a large portion of the pressure on the environment. Populations in countries with widespread poverty often greatly depend on biodiversity.

2 The following overview is based on Global Biodiversity Outlook 3 of the international Convention on Biological Diversity. Secretariat of the Convention on Biological Diversity 2010: Global Biodiversity Outlook 3. Montreal, 94 pp. Global Biodiversity Outlook 4 will be released in October 2014.

> Progress in International Comparison

In October 2010, the Parties to the Convention on Biological Diversity adopted a strategic plan at their tenth meeting. This strategic plan lists twenty targets that will be used to measure progress in the conservation of biodiversity at the international level. If not otherwise noted, the targets should be achieved by 2020.

	Aichi Target	Progress in Switzerland
Fix the causes of the of the losses	1. People are aware of the value of biodiversity	Awareness of the term "biodiversity" increased from 48 % to 65 % between 2009 and 2010 and remained constant until 2013. In contrast, the majority of the population provided an unrealistically positive assessment of the state of biodiversity, which can be attributed to ineffective communication.
	2. The value of biodiversity is considered and integrated in planning	Efforts are being made to take full consideration of biodiversity concerns in the planning processes of various sectors. However, there is still no overarching framework. An economic assessment and consideration of biodiversity is almost completely lacking. The value of biodiversity has not yet been included in national accounting and reporting systems.
	3. Negative incentives are eliminated and positive incentives are created	Certain incentives that negatively affect biodiversity have been observed in Switzerland. Progress has been made in eliminating them in agricultural policy. Methods and means of dealing with the negative incentives are now being studied.
	4. Resources are sustainably used	Significant advances have been made in the sustainable use of genetic resources of cultivated plants, farmed animals and tree species. However, Switzerland's large ecological footprint shows that it uses nearly three times more natural resources than can be sustained.
Reduce the pressure on biodiversity	5. Habitat loss is halted or halved	Most habitat losses occurred before 2010. The growth of areas used for settlement and transport has slowed in recent years. However, habitats are still under pressure due to the continuous deterioration of their quality, landscape fragmentation, climate change and invasive species.
	6. Fish stocks are protected from overfishing and decimated stocks are developed	The cause of the pressure on fish stocks in Switzerland is not as much overfishing as the poor state and pollution of water bodies. However, 93 % of the fish and seafood consumed come from abroad, which is why Switzerland bears a great deal of responsibility in the conservation of global fish stocks.
	7. Areas under agriculture and forestry are managed sustainably	12 % of the areas used for agriculture serve the purpose of ecological compensation and another 12 % are organically farmed. Both percentages are slowly growing. 53 % of the forest area is certified.
	8. Pollution is reduced	Progress has been made by limiting air pollution and developing wastewater treatment installations since the 1970s. However, new pollutants have also been observed, such as endocrine disruptors and other micropollutants that are not removed by wastewater treatment installations. Nitrogen compounds pollute much of the ecosystems.
	9. The spread of invasive species is prevented	Regulations have been introduced in recent years to deal with alien species (e. g. Release Ordinance). A Swiss strategy to contain invasive alien species is being developed.
	10. Vulnerable ecosystems are protected (by 2015)	Practically all ecosystems in Switzerland are under pressure from human influences and under even more pressure from climate change in the medium term. As a result, Switzerland is pursuing a broad approach to reduce pressure on all ecosystems and maintain their integrity and functioning.

	Aichi Target	Progress in Switzerland
Improve the state	11. Reserves are increased to 17 % of the entire national territory	The area of reserves increased from 0.7 % to 6.2 % of Switzerland's territory between 1991 and 2013. The Swiss Biodiversity Strategy is designed to help reach the international target of 17 %.
	12. Extinction is prevented	36 % of all evaluated animal, plant and fungus species are categorised as threatened or extinct on the Red Lists. Since 2010, a decrease in pressure from habitat loss, landscape fragmentation, climate change and invasive species has not been observed.
	13. Genetic diversity is maintained in agriculture	Successful efforts to inventory and conserve the genetic diversity of cultivated plants and farmed animals are in progress. This provides a good basis for maintaining genetic diversity in agriculture.
Increase the benefits for everyone	14 Ecosystem services are safeguarded	Progress has been achieved in the restoration and safeguarding of ecosystem services, e.g. revitalising watercourses increases their capacity to regulate floods. However, ecosystem services are in decline due to habitat loss. Switzerland bears a large part of the responsibility for safeguarding ecosystem services abroad due to the high proportion of food and feed it imports.
	15. Resilience is maintained	By improving the passability of the landscape for plants and animals through landscape connection projects in agriculture, renaturation of water bodies and other forms of habitat upgrading, ecosystems can better react to disruptions (resilience). Since the landscape continues to fragment and changes take time, a clear trend has not yet been observed.
	16. Nagoya Protocol is accepted	Switzerland signed the Nagoya Protocol on 11 May 2011. Parliament approved the protocol and its implementation in the Federal Act on the Protection of Nature and Cultural Heritage (NCHA) on 21 March 2014.
Develop participative planning, knowledge and competencies	17. The action plan is revised (by 2015)	The Federal Council adopted the Swiss Biodiversity Strategy (SBS) in consideration of the strategic plan of the Convention on Biological Diversity. In 2012, the related action plan began to be developed.
	18. Traditional knowledge	Under patent law, traditional knowledge and/or innovations must be disclosed. Local customs are included in the Inventory of Living Traditions in Switzerland. Many of the customs related to biodiversity come from farming and are supported by measures such as the proof of ecological performance, among others.
	19. Biodiversity knowledge	Information on biodiversity is widely available in Switzerland. Biodiversity knowledge must be maintained and further developed in the future. Efforts need to be made to make knowledge accessible to the wider public.
	20. Implementation resources are mobilised	Switzerland invests national and international resources to implement the biodiversity-related agreements. Detailed reporting is submitted in a specific format reserved for that purpose.