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Change in the Endangerment Status of Species

Within the past 150 years, roughly 250 animal and plant species have gone missing or extinct in Switzerland, with others critically endangered on a local, regional or even global level. Species endangerment is documented by Red Lists (RLs), which provide essential information required for nature conservation measures against species extinction. The FOEN has been establishing legally valid Red Lists since the early 1990s, updating them every 10 to 20 years depending on species group.

Red Lists established according to IUCN criteria are available for the following species groups: bats, breeding birds, reptiles, amphibians, fishes and cyclostomes, butterflies and zygaenids, caddisflies, stoneflies, grasshoppers, dragonflies, mayflies, decapods, bivalves, mollusks, ferns and flowering plants, mosses, stoneworts, tree-dwelling and ground-dwelling lichens, and macrofungi.

Status: October 2015

Contents

Red Lists are well-known and time-tested instruments of nature conservation, particularly for enforcing authorities. Assessing the extinction risk of classified species, Red Lists conversely express an estimate of their chances of survival. The international criteria laid down by the IUCN incorporate factors that are crucial for the continued existence of a species. Red Lists established or recognized by the Federal Office for the Environment FOEN are put to various uses such as evaluating the environmental compatibility of regional planning measures.

The Z5 indicator monitors changes in the endangerment status of species. So far, however, most available Red Lists for Switzerland reflect initial data only, since new IUCN criteria have been issued in 2001, making it impossible to compare Red Lists established since then with their predecessors. For this reason, statements about any trends or changes cannot be made until these new Red Lists have been updated.

Red Lists differentiate by the following categories of endangerment:

- Extinct (EX)
- Extinct in Switzerland (RE)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Least Concern (LC)
- Data Deficient (DD)

The term “redlisted species” refers to any species assigned to one of five endangerment statuses: “extinct”, “extinct in Switzerland”, “critically endangered”, “endangered”, or “vulnerable”. FOEN Red Lists assess indigenous species belonging to a species group; neobiota are disregarded.

The Z5 indicator only considers Red Lists based on IUCN criteria, referring to the following species groups found in Switzerland:

- Bats
- Breeding birds
- Reptiles
- Amphibians
- Fishes and cyclostomes
- Butterflies and zygaenids
- Caddisflies
- Stoneflies
- Grasshoppers
- Dragonflies
- Mayflies
- Decapods
- Bivalves
- Mollusks
- Ferns and flowering plants
- Mosses and stoneworts
- Tree-dwelling lichens

- Ground-dwelling lichens
- Macrofungi

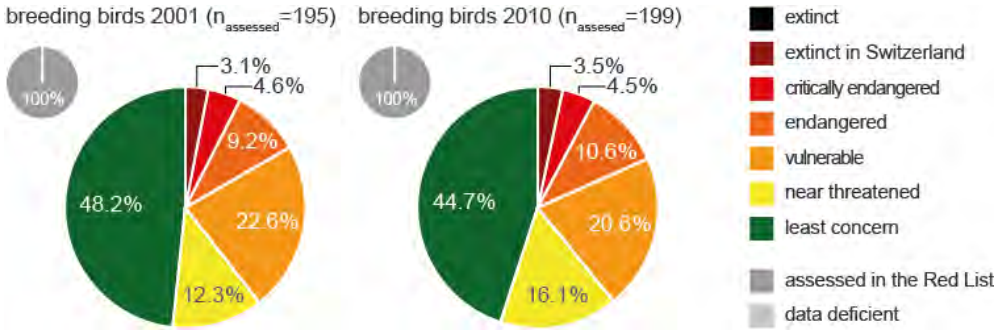
In addition to Red Lists in accordance with IUCN criteria, there still are other legally valid Red Lists established in 1994 and covering mammals (excluding bats), crane flies, ants, bees, ground beetles and tiger beetles, water scavenger beetles and net-winged insects. Primarily based on observations in the field, literature research and expert knowledge, these earlier Red Lists partly differ widely in the assessment criteria they apply. At this time, several of these Red lists are being revised or prepared to be revised, which includes evaluating endangerment status by IUCN criteria.

Development in Switzerland (vertebrates)

Comparable data gathered by two surveys and, hence, change data are only available for breeding birds so far. While fishes/cyclostomes are covered by a Red List established in 2007 and another established in 2011, the latter is partially based on different systematics, making it impossible to compare the two. The indicator has been computed using 2011 data.

Fig. 1: Red List of breeding birds in Switzerland

Extinction risk of breeding birds in Switzerland expressed by endangerment categories



Comments

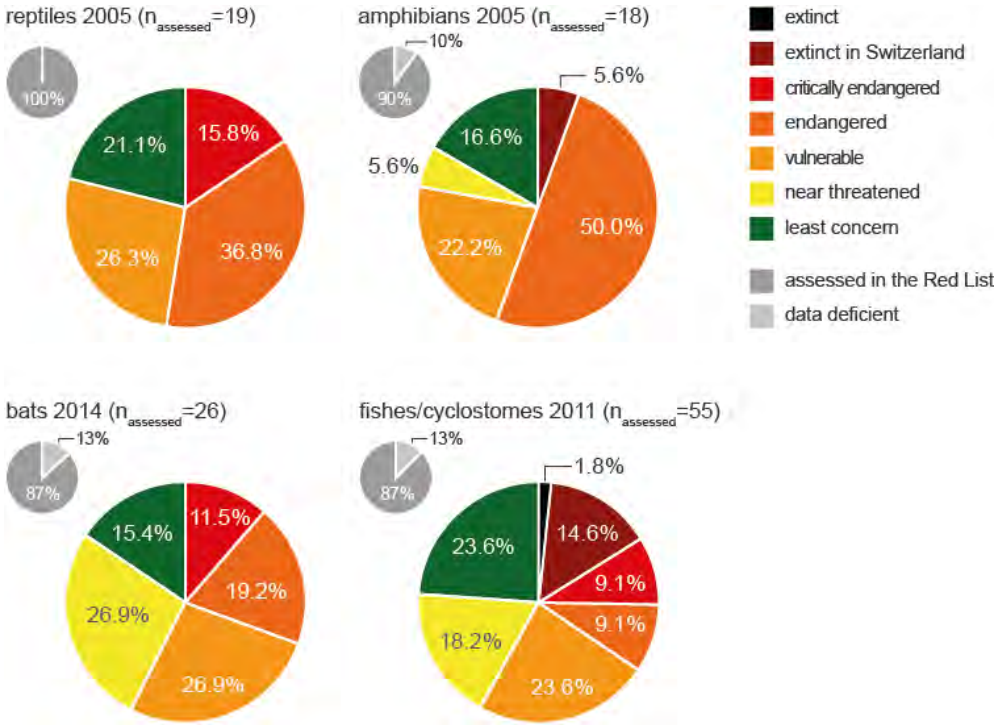
- There has hardly been any change in the period under review. The share of redlisted species (i.e. categories ranging from “extinct” to “vulnerable”) has decreased from 39.5% to 39.2%, whereas the share of species gone extinct in Switzerland (RE) has increased from 3.1% to 3.5%, with endangered (EN) species going up from 9.2% to 10.6%. However, the share of vulnerable (VU) species has dropped from 22.6% to 20.6%.
- Between 2001 and 2010, Switzerland has lost two breeding bird species: the Great Grey Shrike (*Lanius excubitor*) and the Orphean Warbler (*Sylvia hortensis*). In exchange, the Bearded Vulture (Lammergeier, *Gypaetus barbatus*) has been successfully reintroduced into the Alps.
- For more comprehensive analyses please refer to Keller et al. (2010).

Indicator value

Overall, 39 species have been reclassified, with 19 ending up on a higher and 20 on a lower level. The indicator value changed for the better by +13 points. This favorable result is mainly due to four species being redlisted for the first time: the Common Shelduck (*Tadorna tadorna*), the White-backed Woodpecker (*Dendrocopos leucotos*), the Moustached Warbler (*Acrocephalus melanopogon*) and the Cormorant (*Phalacrocorax carbo*). In 2001, their occurrence was still considered to be exceptional, but in the meantime, all four have become established species, developing viable albeit vulnerable populations. The Cormorant has even been classified as least concern. Disregarding these four species, the indicator value would have changed slightly for the worse by -4 points (see below for surveying methods).

Fig. 2: Red Lists of various vertebrate groups in Switzerland

Extinction risk expressed by endangerment categories



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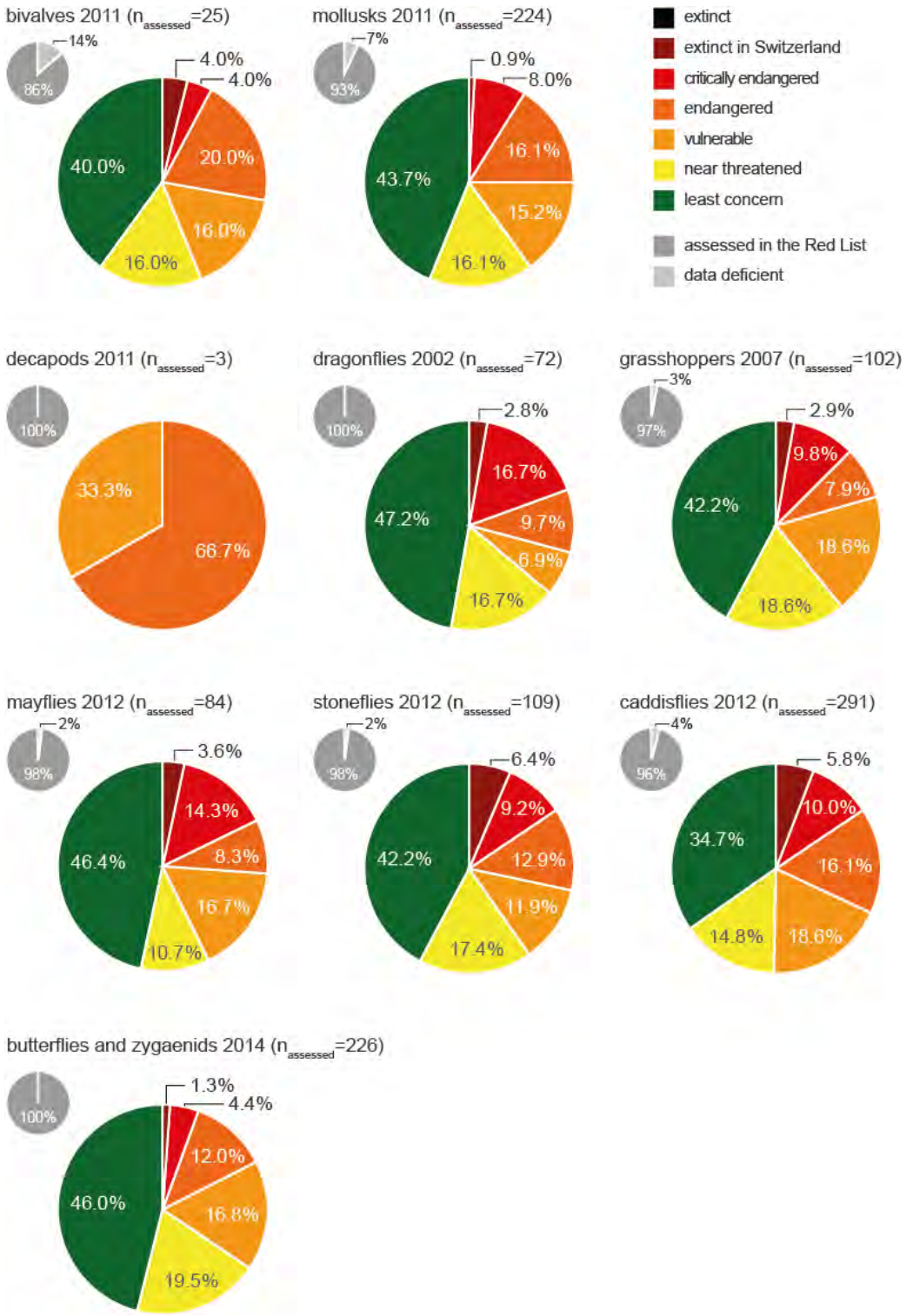
Comments

- Roughly 60% of Switzerland's bats are redlisted. Among other things, bats are threatened due to loss of suitable roosts, reduction of food supply by intensified farming and use of pesticides, light pollution, landscape clearance and uncontrolled proliferation of settlements.
- More than half of all reptile species occurring in Switzerland are endangered or critically endangered.
- The European Green Toad (*Bufo viridis*) is considered to be extinct in Switzerland, as there are no more sites to be found. However, it has always been rare in this country, occurring only in the Basel area and the southern Tessin. Overall, the Red List holds around 75% of all amphibian species found in this country.
- 51% of Switzerland’s fish species are redlisted. Nine species had to be classified as extinct in this country, which means that the Jaunet (*Salvelinus neocomensis*), a species endemic to Lake Neuchâtel, has gone extinct worldwide (see Kottelat & Freyhof, 2007). Data regarding eight species are insufficient for classification.
- Stipulated by the Ordinance on the Federal Fisheries Act (VBGF) of November 24, 1993 (as amended on June 1, 2011), whitefish are considered at the genus level only. As a result, the endangerment status of individual whitefish species (*Coregonus* sp., see Z3 indicator) has not been assessed in a legally valid manner. The genus as a whole has been classified as near threatened (NT), entering into calculations as if it were one species. However, there are individual whitefish species such as the Férit (*Coregonus restrictus*) that went extinct when they disappeared from their Swiss habitat (see Z4 indicator). Endemic to Lake Morat, the Férit was last evidenced in 1890.

Development in Switzerland (invertebrates)

Fig. 3: Red Lists of various invertebrate groups in Switzerland

Extinction risk expressed by endangerment categories



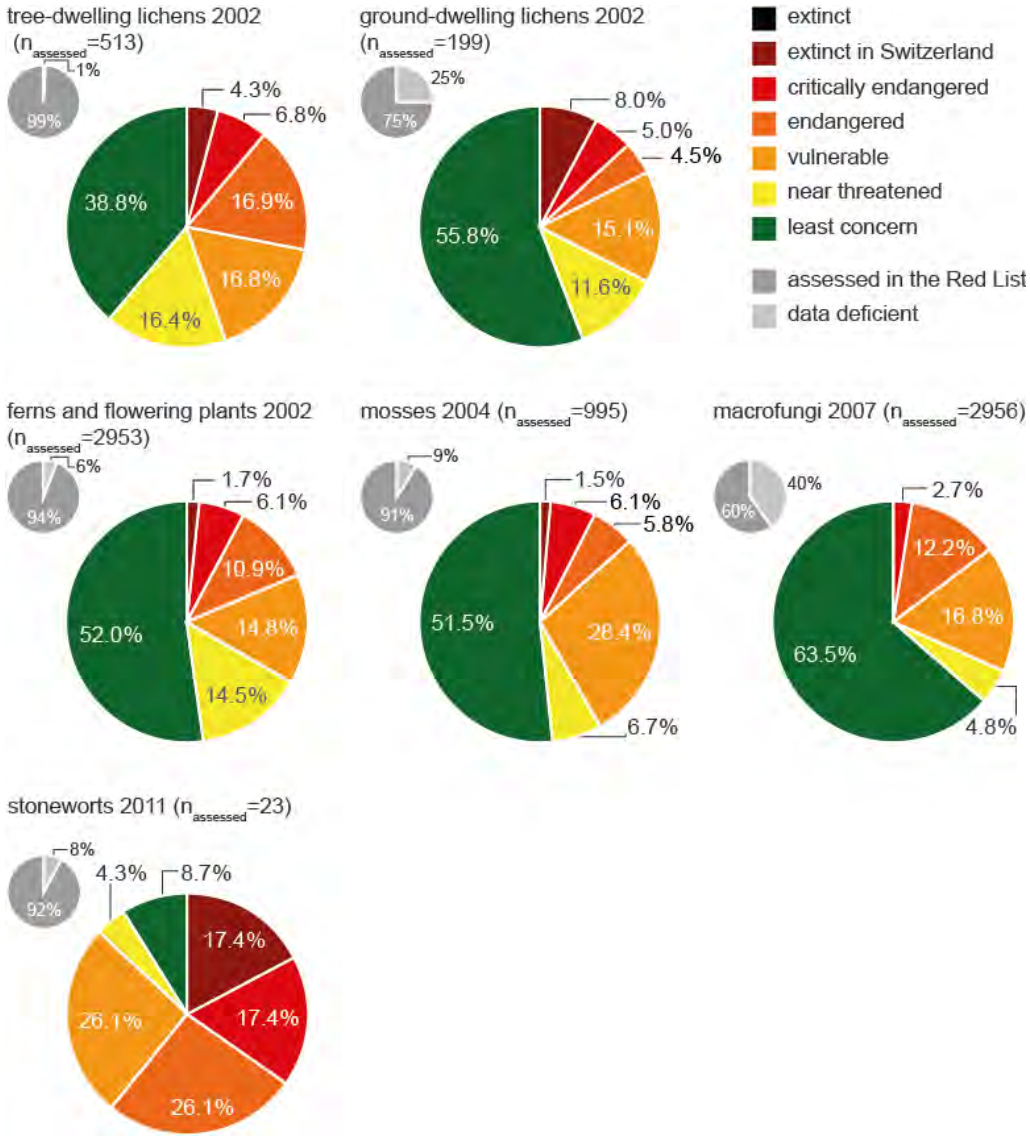
Comments

- As regards invertebrates, the total of redlisted species varies from 35% (butterflies and zygaenids) to 100% (decapods). Still, decapods are a special case insofar as they are represented by only three species in this country. Overall, 46% of invertebrates are redlisted, with the median value at 38%.
- Except for the decapods, all invertebrate groups hold species that have disappeared from Switzerland. In absolute terms, we are talking about a range of 1 (mollusks) to 17 species (caddisflies). None of these species, however, went extinct worldwide by disappearing in Switzerland.
- 17% of dragonfly species and 14% of mayfly species are facing extinction. The critically endangered share of other invertebrate groups amounts to 10% or less.
- Species affected by deficient data are found among mollusks (7%) and bivalves (14%) in particular.
- Insects whose larval stages are tied to waterbodies are threatened for various reasons, the most important dangers being habitat fragmentation, habitat destruction, fish stocking (the use of small watercourses for raising brown trout), eutrophication (particularly of lowland stagnant waterbodies), wide variability of water levels e.g. in impounding reservoirs, etc. (for detailed information please refer to Lubini et al., 2012).

Development in Switzerland (plants, fungi)

Fig. 4: Red Lists of various plant groups and of fungi in Switzerland

Extinction risk expressed by endangerment categories



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Comments

- Roughly a third (31%) of ferns and flowering plants are endangered.
- The Lake Constance Saxifrage (*Saxifraga oppositifolia* ssp. *amphibia*) is Switzerland's only plant taxon to go extinct not only on a regional but also on a worldwide level. Observed for the last time close to 50 years ago, the species only ever occurred in a few spots on the shore of Lake Constance.
- 44% of all tree-dwelling and 24% of all ground-dwelling lichens in this country have been redlisted. 4% of Switzerland's tree-dwelling and 6% of its ground-dwelling lichens have already gone extinct.
- Between 19% (macrofungi) and 80% (stoneworts) of all species mentioned here are either threatened (with their status ranging from "vulnerable" to "critically endangered") or have already gone extinct. The 19% share recorded for macrofungi must be considered the lowest possible, as a very large percentage (40%) of species have been found to be data deficient. More than one in two species is at least near threatened. Near threatened species are in need of special attention as well because they are particularly susceptible to threats.
- Almost two fifths (38%) of moss species are either extinct or threatened.
- Four fifths (80%, corresponding to 20 species) of Switzerland's 25 stoneworts are endangered (16 species) or have already disappeared (4 species). Quickly affected by eutrophication, these algae prefer oligotrophic lakes. Even though water quality has been improving for some time, the endangerment status of stoneworts overall has not. Some species remain missing. Additional pressure is created by the loss of habitats, pioneer sites in particular.
- For some species, available data are not sufficient to assess the degree of their endangerment. This applies to roughly 25% of ground-dwelling lichens and to 40% of macrofungi.

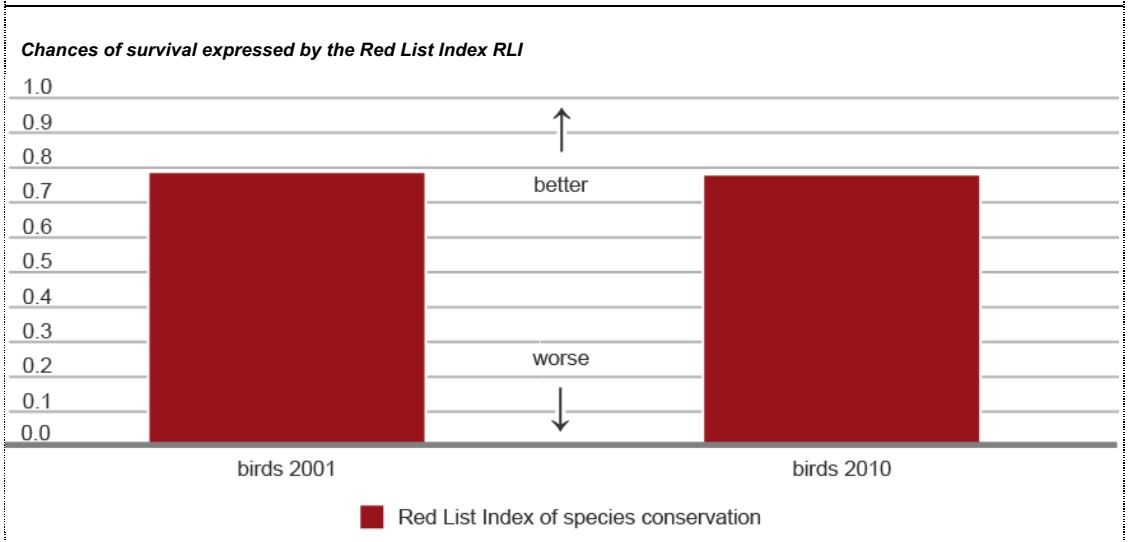
Red List Index RLI

In cooperation with BirdLife International, the International Union for Conservation of Nature IUCN has developed the Red List Index RLI (Butchart et al., 2007). The RLI measures both the rate at which species go extinct and changes in the extinction rate over time. It varies between 0 (= all species in a group have gone extinct) and 1 (no species in a group is threatened). This makes the RLI a plain and easy-to-read figure expressing the conservation status of redlisted species. Switzerland's Red List Index of threatened species ranges between 0.47 (decapods) and 0.84 (ground-dwelling lichens). On average, it amounts to 0.71, with the median value at 0.74. Comparisons between species groups must be taken with a grain of salt, since the reclassification of a species has a larger impact on a species-poor group than on a species-rich group.

When calculated for several years, the Red List Index indicates an increase or a decline in the rate of loss of biodiversity. However, if the RLI fails to change between two points in time, this does not mean that biodiversity did not decline, but rather that the rate of loss did not change. The larger the number of years for which the Red List Index is calculated, the greater the weight it carries. Based on only one year, the RLI is not very meaningful.

The only species group to feature comparable RLIs established in different years are the breeding birds. For this reason, figure 5 below only presents the RLI of breeding birds in Switzerland. As Red List Indices for fishes/cyclostomes calculated in 2007 and 2011 respectively are based on differing taxonomic concepts (see above), the two cannot be compared.

Fig. 5: Red List Index of breeding birds in Switzerland



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Comments

- Between 2001 and 2010, the Red List Index for breeding birds has declined by 0.006 units, which means that chances of survival have been very slightly reduced.
- The RLI also includes near threatened species, although they are not considered to be redlisted.

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Status

October 2015. Data are updated whenever Red Lists are updated or published for the first time.

Development in the regions

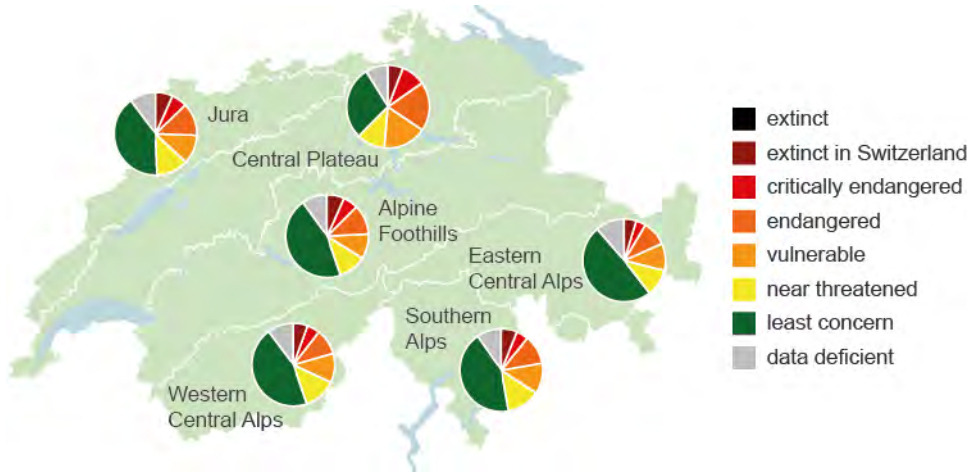
Red Lists of ferns and flowering plants and of tree-dwelling lichens also include regional assessments. The endangerment statuses of ferns and flowering plants are shown individually by biogeographical region. The assessment of tree-dwelling lichens refers to the five production regions used by the Swiss National Forest Inventory (NFI).

Ferns and flowering plants

Tab. 1: Extinction risk faced by ferns and flowering plants in Switzerland's biogeographical regions

	Jura		Central Plateau		Northern Alps		Western Central Alps		Eastern Central Alps		Southern Alps	
Extinct	0	0%	1	0%	0	0%	0	0%	0	0%	0	0%
Regionally extinct	149	7%	133	6%	175	7%	141	6%	110	5%	166	6%
Critically endangered	135	6%	218	10%	156	6%	131	5%	88	4%	124	5%
Endangered	279	13%	442	19%	299	11%	250	10%	216	10%	293	11%
Vulnerable	251	11%	386	17%	257	10%	287	11%	232	10%	313	12%
Near threatened	270	12%	255	11%	282	11%	329	13%	239	11%	342	13%
Least concern	887	40%	656	29%	1176	45%	1134	45%	1100	49%	1126	43%
Data deficient	220	10%	203	9%	257	10%	258	10%	250	11%	252	10%
Total number of assessed species	2191	100%	2294	100%	2602	100%	2530	100%	2235	100%	2616	100%
Total number of redlisted species	814	37%	1180	51%	887	34%	809	32%	646	29%	896	34%

Fig. 6: Regional endangerment of ferns and flowering plants



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Comments

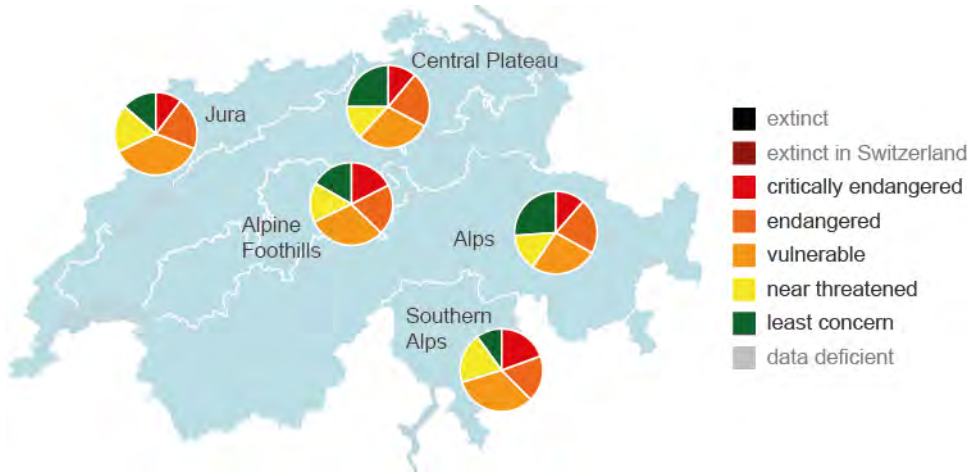
- On the Central Plateau, more than half (52%) of all plant species found are redlisted.
- In the Alpine region (Northern, Central and Southern Alps), redlisted species make up roughly a third of the total number.

Tree-dwelling lichens

Tab. 2: Extinction risk faced by tree-dwelling lichens in NFI production regions

	Jura		Central Plateau		Alpine Foothills		Alps		Southern Alps	
Extinct	0	0%	0	0%	0	0%	0	0%	0	0%
Regionally extinct	-	-	-	-	-	-	-	-	-	-
Critically endangered	35	10%	34	11%	69	18%	49	12%	54	20%
Endangered	69	20%	67	22%	77	20%	92	22%	49	18%
Vulnerable	125	37%	89	29%	120	31%	113	27%	90	33%
Near threatened	63	19%	40	13%	60	15%	61	14%	54	20%
Least concern	45	13%	76	25%	65	17%	111	26%	27	10%
Data deficient	-	-	-	-	-	-	-	-	-	-
Total number of assessed species	337	100%	306	100%	391	100%	427	100%	275	100%
Total number of redlisted species	229	68%	190	62%	266	68%	254	60%	193	70%

Fig. 7: Regional endangerment of tree-dwelling lichens



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Notes

- It is not reliably possible yet to differentiate the number of extinct species by region.
- There is no regional information available regarding the number of species classified to be data deficient.

Comments

- At 427 species, the greatest number of tree-dwelling lichens occurs in the Alps.
- More than 60% of the tree-dwelling lichens found in the Alps and on the Central Plateau are redlisted species. In the remaining regions (Jura, Alpine Foothills and Southern Alps), this share even rises to roughly 70%.

- Between 30% (Jura) and 38% (Alpine Foothills and Southern Alps) of all tree-dwelling lichens are endangered or critically endangered.

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Status

October 2015 (Data: 2002). Data are updated whenever Red Lists containing regional assessments are updated or published for the first time.

Significance for biodiversity

National Red Lists (RLs) help assess the endangerment potential of species living in Switzerland.

Meant to be warning signals, RLs also show the impact made by conservation and support measures. Furthermore, Red Lists have legal significance: Under the terms of article 78, section 4 of the Swiss Federal Constitution of April 18th 1999, Switzerland is legally bound to protect endangered species from extinction. Red Lists are used to verify whether Switzerland is meeting its constitutional obligation in this respect.

The Z5 indicator is designed to show changes in the number of redlisted species and their level of endangerment. The shorter Red Lists become, the better for biodiversity. In turn, any additional redlisted species signifies a setback. However, current Red Lists are not directly comparable to their predecessors established prior to 2001, as species are now classified applying the new IUCN criteria. For this reason, it will be impossible to indicate changes in a quantitatively exact manner for some years to come. Except for fishes/cyclostomes and breeding birds, the information stated herein is based on initial data so far. Still, certain trends are emerging already:

Losing large-scale wetlands, for example, has had a negative impact on certain bird species such as the Great Reed Warbler and the Grasshopper Warbler. Other species that are dependent on isolated patch habitats are becoming rarer as well, as these habitats tend to diminish both in surface area and number. As a result, species primarily occurring in such habitats are more widely represented in Switzerland's Red Lists. But the new RLs also include an increasing number of species associated with the normal landscape. For example, populations of the Skylark and the Corn Bunting—both typically found in agricultural areas—have sustained dramatic losses over the last ten years. This implies that the pressure on biodiversity exercised by agriculture has not relented yet.

However, not all cases of endangered species found in Switzerland are the result of negative developments. The European Bee-Eater, for one, is classified as an endangered species because being a new arrival, it has been breeding in Switzerland for just a few years, establishing only a small population to date.

Aside from breeding birds, growing endangerment compared to earlier Red Lists affects bats, reptiles and fishes/cyclostomes as well. Regarding bats, the increase in redlisted species is not only the result of a change in assessment criteria, but above all also of a surge in threats and/or the registration of an actual decline in population sizes.

Still, some species groups—among them the amphibians, grasshoppers, dragonflies and butterflies—now comprise a lower share of redlisted species against previous assessments. This decrease must mainly be attributed to applying stringent IUCN criteria and, as regards grasshoppers and butterflies, improved knowledge of species ranges. Unfortunately, a lower share of redlisted species does not reflect an improvement in the overall situation of said species groups in Switzerland. On the contrary: almost one third of redlisted plus some relatively common butterfly species follow an adverse trend. The situation of several endangered grasshopper and dragonfly species has continued to deteriorate, too. Merely some individual grasshopper, dragonfly and butterfly species have managed to increase their ranges and population densities in the past decades. Since the large majority of them are heat-loving species, the possibility of climate change playing a role cannot be excluded.

Not least in the case of plants, the extinction risk has been exacerbated, with the share of redlisted species increasing from roughly 25% in 1991 to just under 33% in 2002. The percentage of moss species classified as endangered stayed about the same compared to the 1991 RL.

Definition

Number of species in Switzerland whose endangerment status has decreased by one level minus the number of species whose endangerment status has increased by one level. Species whose endangerment status has changed by two or three levels are counted twice or three times respectively.

Surveying methods

Red List endangerment statuses are governed by the IUCN criteria of 2001 (Version 3.1). Assigning species to a endangerment status is a two-step procedure: First, a species is assessed according to global criteria, as if the Swiss population were the world population. Next, an evaluation is carried out to determine whether the extinction risk faced by the species in Switzerland is being increased or decreased by outside populations. Depending on the result, the species is then either reassigned to a higher or lower endangerment status or keeps the status it was assigned in step one.

The procedure used to assign species to an endangerment status is adapted for each species group, based not only on available information about the species concerned, but in certain cases also on field surveys.

Except for breeding birds and fishes/cyclostomes, data available at this time merely reflect the current situation. However, due to differing taxonomies used for fishes/cyclostomes (see above), change values can only be computed for breeding birds so far.

Change values are computed based on movements of species through Red List categories: If a redlisted species deteriorates in status by one level, e.g. from VU (vulnerable) to EN (endangered), that change counts as one point. A change by two levels, e.g. from CR (critically endangered) to VU, counts as two points. Changes from VU to NT (near threatened) or LC (least concern) or from NT/LC to VU count as one point in each case, while transitions (either up or down) between the non-RL categories NT and LC will be disregarded completely. For change value computation purposes, species assigned to an endangerment status for the first time are considered to have been RE (regionally extinct) before.

Species whose systematic classification has changed between two editions of the applicable Red List will be disregarded. At this time, this only concerns the Yellow-legged Gull (*Larus michahellis*), which did not use to be differentiated from the Herring Gull (*Larus argentatus*).

The Red List Index is calculated according to Butchart et al. (2007). Species that were already extinct (RE or EX) at the time of the first evaluation or species that are data deficient (DD) will not be taken into account. First, the number of species in each category is multiplied by that category's weighting. Next, all products are added, divided by the maximum possible value (all species N are extinct, N*5), and finally subtracted from 1. Weightings linearly range from EX/RE=5 to LC=0.

Further Information

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Related indicators

> Z4 “Number of Species in Switzerland Facing Global Extinction”
http://www.biodiversitymonitoring.ch/en/data/indicators/z/z4.html

> Z6 “Population Size of Endangered Species”
http://www.biodiversitymonitoring.ch/en/data/indicators/z/z6.html

Additional sources of information

> www.bafu.admin.ch/biodiversitaet/14377/14378/index.html?lang=en FOEN Red Lists

> www.admin.ch/ch/e/rs/c101.html Federal Constitution, Art. 78 on the protection of nature and cultural heritage

> www.redlist.org/ IUCN database

> www.iucnredlist.org/technical-documents/categories-and-criteria 2001 IUCN Red List categories and criteria

> www.bafu.admin.ch/publikationen/publikation/01631/index.html?lang=en&show_kat=%2Fpublikationen Red List Synthesis Report, Status 2010

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