

CBD Notification 56333:

Invasive alien species

Information submitted by Switzerland

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Content:

	Page
1 Background	1
2 Legislative measures and national policies	1
2.1 Legislative measures	1
2.2 National policy	2
3 Assessment of IAS in Switzerland	5
4 Economic instruments	8
5 Provision of resources	8
6 Communication, education and public awareness	8
6.1 Public awareness	8
6.2 Capacity building	9

1 Background

Switzerland implements the CBD within its national legislation. Due to Switzerland federal structure, the framework set on the national level may lead to different laws, strategies and plans at the cantonal and municipal level.

The information provided in Switzerland's response to notification 56333 is weighted towards the federal perspective and does not reflect the totality of measures and activities implemented at the cantonal and municipal level.

2 Legislative framework and national policies

2.1 Legislative framework

The Swiss legislation is based on a sectoral approach. With regard to IAS, the **Federal Law on the Protection of Nature and Landscape** (SR 451) stipulates in its article 23 that the introduction of alien species necessitates the permission from the Federal Council. Exceptions are granted to the agricultural and forestry sectors as well as for gardens and parks.

A precautionary approach regarding the handling of organisms in general is included in article 29a of the **Federal Law on the Protection of the Environment** (SR 814.01) which specifies that organisms be dealt with in a way not affecting biodiversity.

The above-mentioned conditions for using organisms is further specified in the **Ordinance on the release of Organisms** (SR 814.911) by establishing the principle of due diligence (art. 4), the obligation of self-control prior to release of organisms (art. 5) and the duty to inform (art. 6). Further, the ordinance specifies that cantonal authorities are in charge to take appropriate steps to control organisms that affect the environment, plants and/or animals (art. 32).

The ordinance is currently under revision, with the goal for a better integration of invasive alien species. It is planned to include into the revised ordinance a list of prohibited invasive alien species as well as a list of invasive species to be monitored.

With regard to the agricultural sector, the revised **Ordinance on Plant Protection** (SR 916.20) entered into force on 1. July 2006 and does now specifically address *Ambrosia artemisiifolia* - one of the most problematic invasive alien species in Switzerland - by introducing a notification requirement and an obligation to act (art. 27). The cantonal authorities are in charge to take appropriate steps for control measures (art. 29) with the federal authorities refunding 50% of the costs (art. 37).

The **Federal Law on Fishery** (SR 923.0) stipulates that the authorization of the federal authorities is necessary to import and/or to release alien species, races or varieties of crayfish and fish into the wild. Further, such an authorization is also necessary for the release of native species, races or varieties of crayfish and fish in habitats outside their natural range (art. 6).

Switzerland has ratified the **International Plant Protection Convention**, as recommended in COP decision VI/23.

2.2 National policy

The national policy is based on a participative dialogue between the federal administration, experts from cantonal authorities, from the scientific community and practitioners. The Swiss national policy builds on the principle of prevention.

The Federal Office for the Environment (FOEN) has organized various workshops to discuss the state of the art and to identify needs for future activities. Based on the results of these workshops, as well as on a report the following needs were identified:

- to designate focal points on cantonal level;
- to improve coordination between the national and the cantonal level;
- to strengthen information exchange;
- to define and list priority species;
- to develop recommendations;
- to systematically monitor alien species;
- to develop and broaden capacities for early detection of alien species;
- to register alien species in databanks; and
- to foster risk analysis.

Based on these findings, the Federal Office for the Environment has defined a framework for the national policy. The framework includes:

- a monitoring system that focuses on early detection and the assessment of trends;
- information, research, capacity building and advice for action;
- coordination of and exchange of experiences between stakeholders at various levels; and
- strengthening the implementation of the legislation in this regard.

A study called “**What makes a species invasive**”¹ was conducted in order to better understand the risk of bioinvasions in Switzerland. The study

¹ SCHAFFNER U., 2005: What makes a species invasive?. Environmental Documentation Nr. 191 . Swiss Agency for the Environment, Forests and Landscape, Berne. 92 p.

summarizes the information available on species and habitat characteristics that are correlated with an increased risk of biological invasions. A number of species traits have been identified to correlate with an increased risk of invasiveness in plant and animal taxa. The best indicator for increased risk of invasiveness seems to be whether the species has already become invasive in another region of the world. Furthermore, changes in disturbance regimes and increased resource availability are key characteristics that affect habitat invasibility. Modern forecasting models predict future invasions by exotic species with relatively high accuracy rates and provide valuable indications as to which exotic or transgenic organisms exhibit an increased invasive potential and should therefore be studied more closely.

An **Action-plan for the conservation of indigenous crayfish species** was elaborated by the Federal Office for the Environment (FOEN)². Since several decades, the distribution of crayfish in Switzerland has experienced deep modifications due to the intervention of the man. The chemical and physical degradation of inland water ecosystem and the introduction of more resistant species from North America had severe impacts on many populations of the three native crayfish species, i.e. the *European crayfish* (*Astacus astacus*), the *White-clawed crayfish* (*Austropotamobius pallipes*) and the *Stone crayfish* (*Austropotamobius torrentium*).

The intentional and unintentional introduction of alien crayfish had severe impacts on the native crayfish population. With exception of the Danube crayfish (*Astacus leptodactylus*) whose population tends to regress, an invasion of the signal crayfish (*Pacifastacus leniusculus*), the spinycheek crayfish (*Orconectes limosus*) and red swamp crayfish (*Procambarus clarkii*) was observed in the past ten years. All these species are vectors of the crayfish plague, a fatal disease for the indigenous species.

The action plan is intended to support activities by cantonal authorities. It proposes a series of measures for conservation of the indigenous species and for eradication, control and mitigation of impacts of alien species. The control measures of alien crayfish are organized according to the following categories: (i) identification of alien crayfish populations, (ii) stopping the invasion process through coordinated eradication campaigns, (iii) increased public awareness, (iv) monitoring of the crayfish plague, and (v) elaboration of guidelines for the commercial exploitation of alien crayfish species.

The publication can be downloaded from:
http://www.bafu.admin.ch/publikationen/index.html?action=show_publ&lang=de&id_thema=23&series=UM&nr_publ=191; last visited November 2007.

² Stucki P., Zaugg B. (2006) Plan d'action national pour les écrevisses. Office Fédéral de l'Environnement (OFEV), Bern. 41p. The publication can be downloaded from:
<http://www.bafu.admin.ch/fischerei/00698/00733/index.html?lang=de>; last visited November 2007.

An **Action-plan for the Ruddy Shelduck (*Tadorna ferruginea*)** was elaborated by the cantonal authorities and the Federal Office for the Environment (FOEN). The Ruddy Shelducks living in Switzerland escaped from captivity or were released. Currently, they multiply quickly and compete with the indigenous water birds. The population of Ruddy Shelducks in Switzerland is highest one outside the natural distribution area. Therefore, Switzerland has a particular responsibility to control non-native individuals. During the moult in autumn, the Ruddy Shelducks gather in a reserve of waterbirds of international importance, the Klingnau reservoir.

The Black list and the Watch list for neophytes: Both lists were elaborated by the Swiss Commission for Wild Plant Conservation (CPS/SKEW). The Black List includes invasive alien plants of Switzerland that actually cause damage in the areas of biodiversity, health, and/or economy. The establishment and the spread of these species must be prevented. The Black List includes the following species (version 7. april 2007): *Ailanthus altissima*, *Ambrosia artemisiifolia*, *Artemisia verlotiorum*, *Buddleja davidii*, *Elodea canadensis*, *Elodea nuttallii*, *Heracleum mantegazzianum*, *Impatiens glandulifera*, *Lonicera japonica*, *Polygonum polystachyum*, *Prunus laurocerasus*, *Prunus serotina*, *Reynoutria japonica*, *Reynoutria sachalinensis* + *R. X bohemica*, *Rhus typhina*, *Robinia pseudoacacia*, *Rubus armeniacus*, *Senecio inaequidens*, *Solidago canadensis* s.l., *Solidago gigantea*, *Ludwigia grandiflora*, *Lysichiton americanus*, *Pueraria lobata*.

The Watch List includes invasive alien plants of Switzerland that have the potential to cause damage. Their spread needs to be monitored and if necessary prevented. They already cause damage in neighboring countries. The Watch List includes the following species (version 7. april 2007): *Bunias orientalis*, *Cornus sericea*, *Cyperus esculentus*, *Helianthus tuberosus* s.l., *Impatiens balfourii*, *Lonicera henryi*, *Lupinus polyphyllus*, *Mahonia aquifolium* s.l., *Parthenocissus inserta*, *Paulownia tomentosa*, *Phytolacca americana*, *Phytolacca esculenta*, *Sedum spurium*, *Viburnum rhytidophyllum*, *Amorpha fruticosa*, *Asclepias syriaca*, *Bassia scoparia*, *Glyceria striata*, *Senecio rupestris*, *Trachycarpus fortunei*.

A manual for the eradication and mitigation of impacts of the Japanese knotweed (*Reynoutria japonica*) for train facilities was elaborated³. The conclusions of the manual are as follows: Japanese knotweed spreads successfully via runners and rhizome or shoot fragments. The role played by

³ BOLLENS U. 2005: Bekämpfung des Japanischen Staudenknöterichs (*Reynoutria japonica* Houtt., Syn. *Fallopia japonica* (Houtt.) Ronse Decraene, *Polygonum cuspidatum* Sieb. et Zucc.). Literaturreview und Empfehlungen für Bahnanlagen. Umwelt-Materialien Nr. 192. Bundesamt für Umwelt, Wald und Landschaft, Bern. 44 S. (with abstracts in E and F). The publication and related factsheets can be downloaded from: <http://www.bafu.admin.ch/php/modules/shop/files/pdf/phpEGJoax.pdf>; last visited November 2007.

seed dispersal is negligible. Frequent mowing over a period of several years leads to a weakening of stands, as well as grazing, pulling up, covering with plastic sheeting, or grubbing up. The most effective approach consists of regular mowing, followed by the application of herbicides. It is recommended that glyphosate should be applied in September after mowing (6 weeks previously) or in May, with a follow-up treatment in September. If herbicide application is not possible, stands can be mown or pulled up 3–5 times a year. Monoculture stands can first be weakened by being covered up (for at least 2 years) or grubbed up (to a depth of 3 meters, with a 7-metre radius). Whatever control method is used, care should be taken to promote competing plant species, and monitoring and follow-up treatments are required. The recommendations for controlling Japanese knotweed are based on the scientific literature and reports of practical experience.

Cantonal authorities and NGOs have published several series of information sheets. The information sheets provide general information about the ecology of IAS, their threat to native species and/or specify measures to control and eradicate IAS. Published information sheets include for instance:

- Factsheets related to the inventory of alien species and their threat to biodiversity and economy in Switzerland;⁴
- Information Sheets: invasive alien plants elaborated by the Swiss Commission for the Wild Plant Conservation CPS/SKEW (neophytes included in the Black List and the Watch List);⁵
- Factsheets for the Ruddy Shelduck (*Tadorna ferruginea*) and the Ruddy Duck (*Oxyura jamaicensis*) published by SVS/Birdlife Switzerland in cooperation with the Swiss ornithological Institute and the Federal Office for the Environment;⁶

3 Assessment of IAS in Switzerland

An **Assessment of IAS in Switzerland** was commissioned by the Federal Office for the Environment (FOEN)⁷. The report compiles information about

⁴ Factsheets related to the inventory of alien species and their threat to biodiversity and economy in Switzerland: http://www.bafu.admin.ch/publikationen/index.html?action=show_publ&lang=de&id_thema=23&series=UW&nr_publ=0629 ; last visited November 2007.

⁵ Information Sheets: invasive alien plants (in F): <http://www.cps-skew.ch/francais/fiches-envahissantes.htm>; last visited November 2007.

⁶ Factsheets for the Ruddy Shelduck (*Tadorna ferruginea*) and the Ruddy Duck (*Oxyura jamaicensis*) german only: Factsheets for the Ruddy Shelduck (*Tadorna ferruginea*) and the Ruddy Duck (*Oxyura jamaicensis*) http://www.birdlife.ch/d/projekte_ch_arten_neozoen.html; last visited November 2007.

⁷ Wittenberg, R. (ed.) (2005) An inventory of alien species and their threat to biodiversity and economy in Switzerland. CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape. The environment in practice no. 0629. Federal Office for the Environment, Bern. 155 pp.

alien species in Switzerland from published sources and experts in Switzerland and abroad. Imminent future bioinvasions are also included. The availability of national lists varies greatly between taxonomic groups. Thus, unfortunately, it is not possible to list all the alien species of Switzerland, since not all resident species are known yet. However, for well-known groups, complete lists have been compiled.

The situation regarding IAS in Switzerland is similar to the one in other Central European countries, in particular Austria, which is also a land-locked country containing part of the Alps. This report lists about 800 alien species and characterizes 107 IAS in Fact Sheets: five mammals, four birds, one reptile, three amphibians, seven fish, four mollusks, sixteen insects, six crustaceans, three spiders, two 'worms', seven fungi, one bacteria, and forty-eight plants.

Pathways can be divided into those for species deliberately introduced and those for species accidentally introduced. Pathways for deliberate introductions include the trade of species used in aquaculture, for fisheries, as forest trees, for agricultural purposes, for hunting, for soil improvement and solely used as ornamentals. Most of these can also transport hitchhiking species and people can accidentally introduce species while traveling. In general, most aquatics and terrestrial invertebrates and diseases are accidental arrivals, whereas most plants and vertebrates are deliberately introduced. The global trend for the latter groups also holds true for Switzerland, e.g. 75 % of the 20 Black List plants were introduced principally as ornamentals, and 35 of the 37 vertebrates were deliberately introduced. Thus, many damaging invaders were deliberately introduced for aesthetic reasons and with little justification on their role in the landscape, e.g. ornamental plants and waterfowl.

Limited *resources* dictate the need for setting priorities and allocating funds where it will have the greatest impact in combating IAS. Important points, for example, are to critically assess the feasibility of different approaches to control IAS, and to target species for which there is no conflict of interest. Opposition to action against less-important ornamentals on the Black List and species of direct human health concern (e.g., giant hogweed or *Ambrosia artemisiifolia*) should be therefore considered as negligible.

As part of a special study programme, the increase in **alien invertebrates in the riverbed of the High Rhine in Switzerland**⁸ was observed, together

The publication and related factsheets can be downloaded from:
http://www.bafu.admin.ch/publikationen/index.html?action=show_publ&lang=de&id_thema=23&series=UW&nr_publ=0629 ; last visited November 2007.

⁸ Rey P., Ortlepp J., Küry D., 2004: Wirbellose Neozoen im Hochrhein. Ausbreitung und ökologische Bedeutung. Schriftenreihe Umwelt Nr. 380. Bundesamt für Umwelt, Wald und Landschaft, Bern. 88 S. (with abstracts in E and F; with summary in F).

with their distribution dynamics. The investigation focused on the current distribution front of invasive alien species in the Basel region.

The report on the status of alien invertebrates of the High Rhine includes data up from 1987 and focuses on the dynamics of colonization of these invasive neozootics. Their current spread in the High Rhine is given with a margin of a few kilometers. Indicative sites made it possible to detect zoogeographical modifications due to neozootics in the remainder of the High Rhine, in the southern part of the higher Rhine, in the Aare and the Lake of Constance.

Together with the Zebra mussel (*Dreissena polymorpha*), which appeared much earlier, the invertebrate neozootics represent today more than 90% of the individuals and more than 95% of the benthic biomass in the bed of the High Rhine in the sector of Basle. In some places, their density of colonization is still increasing.

It is supposed that the invasion goes along with the loss of the habitat structures in the navigable sections of the Rhine. The natural sections of the High Rhine are important retreat areas for native species.

An **Assessment of intentionally and unintentionally introduced bird species in Switzerland** was conducted by Birdlife Switzerland. A summary of the assessment is available as a position paper⁹. The assessment identifies alien species in need of immediate action (i.e. eradication/control) as they have negative impacts on the native avifauna (i.e. *Oxyura jamaicensis*, *Tadorna ferruginea*, *Anser anser* (introduced individuals only), *Alopochen aegyptiacus*, and *Phalacrocorax carbo* (introduced individuals only).

Further species with no observed impact on the native avifauna (activity proposed: monitoring, avoidance of further introduction) include: *Anser indicus*, *Branta leucopsis*, *Branta canadensis*, *Tadorna cana*, *Aix sponsa*, *Aix galericulata*, *Cairina moschata*, *Callonetta leucophrys*, *Bubulcus ibis*, *Psittacula krameri*, *Myiopsitta monachus*, *Threskiornis aethiopicus*, *Phoenicopterus chilensis*, *Cygnus atratus*, *Alectoris greca*, *Alectoris rufa*, *Alectoris chukar*, *Colinus virginianus*, and *Coturnix japonica*.

The publication can be downloaded from:
http://www.bafu.admin.ch/publikationen/index.html?action=show_publ&lang=de&id_thema=13&series=SRU&nr_publ=380 ; last visited November 2007.

⁹ Schweizer Vogelschutz SVS/BirdLife Schweiz: Absichtlich und unabsichtlich ausgesetzte Vogelarten in der Schweiz: Positionspapier des SVS, seiner Landesorganisationen und Kantonalverbände. The publication can be downloaded from:
http://www.birdlife.ch/pdf/positionsvs_ausgesetzt.pdf ; last visited November 2007.

4 Economic instruments

The economic instrument developed so far includes the financial support by the federal office for agriculture of measures taken by the cantonal authorities to control *Ambrosia artemisiifolia*. An additional element is the control of IAS in protected areas of international, national and local importance (see chapter 5).

5 Provision of resources

Based on the Federal Law on the Protection of Nature and Landscape (SR 451), the federal and cantonal authorities share the task, wherever possible, of containing the spread of neophytes in protected areas of international, national and local importance. The costs for those activities are supported by both federal and the cantonal competent authorities.

For the period 2008 -2011, the Federal Office for the Environment foresees the following allocation of resources:

Fishery: Additional financial resources will be allocated for punctual activities to combat neozoics in inland water ecosystems. This amount only covers costs for specific equipment. Cantonal authorities conduct activities.

Mammals and birds: Additional financial resources will be allocated annually for punctual activities to combat neozoics.

Soils: The costs for processing soil contaminated with neophytes (e.g. the Japanese knotweed *Reynoutria japonica*) are borne by cantonal authorities, by proprietary and/or owners concerned (e.g. railroads, roads, construction).

6 Communication, education and public awareness

6.1 Public awareness

During the past years, IAS received increased media coverage. For instance, IAS were addressed in the FOEN's publication "Environnement"¹⁰ and the Swiss Biodiversity Forum dedicated a whole issue of its periodical "Hotspot" to bioinvasions¹¹. Further, factsheets (see p. 5) as well as many articles in the daily press and reports in the national television helped to increase the

¹⁰ Magazine ENVIRONNEMENT 3/2006:
<http://www.bafu.admin.ch/dokumentation/umwelt/02924/index.html?lang=fr>, last visited November 2007.

¹¹ Magazine HOTSPOT 5/02: <http://www.biodiversity.ch/publications/hotspot/>, last visited November 2007.

awareness on IAS and the need to act in the broad population. A highlight of the campaign was the "national *Ambrosia* root-out day" on the 26. June 2007. The continuous media coverage of IAS over the past years is a merit of the concentrated efforts of the scientific community and NGO's.

Even though public awareness has significantly increased in the last years, additional efforts are needed to prevent further unintentional and intentional releases of IAS. Indeed, releases by private persons counteract efforts to eradicate or control IAS.

6.2 Capacity building

Education and capacity building are prerequisites for a successful management of IAS. Various cantons offer specialized courses on IAS for practitioners and/or an interested audience. The goals of these courses are to raise awareness on the consequences of bioinvasions, to introduce the IAS and to demonstrate techniques for the management of these species.

At universities and the federal institutes of technologies, IAS are integral part of environmental studies (e.g. biology, ecology forestry and others). However, the Swiss Academy of Science draws attention upon the fact that the knowledge on systematic biology is rapidly lost in Switzerland due to cutbacks during the past decades, even though, systematic biology is the very basis for the management of species.¹²

A communication concept is actually being developed. An internet-based national platform is going to be developed for improving coordination and communication of the various activities in-between the stakeholders.

¹² L'avenir de la systématique en Suisse - La systématique: une discipline biologique fondamentale. Une prise de position de l'Académie suisse des sciences naturelles: http://www.biodiversity.ch/publications/other_publications/index.php?lang=fr; last visited november 2007.