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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee

37th meeting
Strasbourg, 5-8 December 2017

**GROUP OF EXPERTS ON
INVASIVE ALIEN SPECIES**

1-3 June 2017
Funchal, Madeira, Portugal

- NATIONAL REPORTS -

Compilation prepared by the Directorate of Democratic Governance

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ARMENIA / ARMÉNIE

NATIONAL REPORT OF REPUBLIC OF ARMENIA

Invasive alien species

The National report of Armenia includes information about the invasive alien species based on the results of the last years studies done in the scope of the scientific thematic state projects of the Institute of Botany of NAS and Scientific Center of Zoology and Hydroecology of the National Academy of Sciences of Armenia in recent years and activities in the frame of different documents adopted by the Government of RA.

1. The Government protocol decision N49-A, 2015 adopted <<Biological diversity conservation, use and reproduction strategy and plan of activities of Republic of Armenia- 2016-2020>> which includes the following activities about invasive alien species:
 - Point 1.3.1 Create an interagency coordinating committee on issues of invasive alien species and confirm the framework of activities.- (2016),
 - Develop the monitoring guidelines about the pathways of distribution of invasive alien plant and animal species, (2017-2019),
 - 1.3.3 Develop and invest in the plan of activities about the distribution and influence of prevention of invasive alien and expansive species, (2016),
 - 5.2.2 Implement the inventory of invasive species and the pathways of their distribution in Armenia and evaluate their distribution in nature ecosystems-(2016-2020).
2. The following regulations on <<The draft of changes and supplements in law of Flora>> and <<The draft of changes and supplements in law of Fauna>> of RA include the changes in the definitions and articles about invasive alien animal and plant species,
3. The Government decision N190-N, 2017, adopted <<Management plan of Dilijan national park- 2017-2026>> which includes researches, threats and activities about IAS in the Dilijan national park.

INTRODUCTION

Invasive alien species are now one of the greatest threats to natural ecosystems, and their investigations and control and limitation are one of priorities in nature conservation. Also they threat agriculture, forestry, fishery as well human health. We define invasion as the act of exotic species entering natural communities, potential displacing native vegetation and species. At present, data on the spread and distribution of invasive plant and animal species in the territory of the Republic of Armenia, and their impact on agricultural and natural areas are missing. One of the objectives of this research proposal is the study of the recent spread of invasive species and their impact on biodiversity and natural ecosystems used as pastures, hayfields and disturbed forests.

Armenia is a Transcaucasian republic, bordering Georgia, Azerbaijan, Turkey, and Iran. It is a landlocked country with a total area of 29,740 km², and lies between 38°50' and 41°18' of northern latitude and between 43°27' and 46°37' eastern longitude, and measures 400 km along its main axis (Northwest to Southeast). Armenia is generally a mountainous country, having its lowest point at 375 m above sea level and culminating at 4095 m, with an average altitude of 1850 m. Variations in altitude have important effects on the climatic and landscape zones, and consequently on the vegetation of the country.

During last years (since 1992) the economic and energy crisis mainly threatened Armenia's forests. Poor forest management combined with illegal wood cutting for fuel and construction damaged about

10 % of the total forest area. At the same time, overgrazing destroyed the grasslands surrounding the villages and degraded the formerly unspoilt pastures of remote mountains.

Similarly to other Eastern European countries the period of economic transition seriously affected the development of the country agriculture. Small individual economies have become unprofitable in the majority of cases. Modern agricultural technology is of no avail on small private farms. As a result on the one hand the process of enlargement of agricultural economies started, and on the other hand remarkably big territories of agricultural land became abandoned and are not utilized as appropriate during last years. Also now Armenia is the main route between Iran and Georgia. The deficiency of the state quarantine service has much facilitated the entry of new alien species in particular along transport routes. These alien species are potential hazards to biodiversity, agriculture and natural ecosystems. In addition, it is possible that some of the large stocks of crop seed stocks received as humanitarian assistance were contaminated by weeds.

Armenia is a unique country; it has very rich composition of ecosystems of different origin. Now there is a threat for changing natural ecosystems as a result of invasions alien plant and animal species. It is well known that many weed invasive species distribute in disturbed natural ecosystems. Now there is a situation in Armenia that weed species distribute in natural ecosystems, which used as pastures and hay lands, as well as in cutted and disturbed forests.

Until present time the problem of invasive species was practically not in the focus of attention in Armenia. Within last 50 years vegetal flora and vegetation of the republic was investigated more or less in details. What about alien, invasive plant species – there were no special investigations carried out. New species detected on the territory of Armenia, herbarium sample of it was stored in the herbarium of the Institute of Botany of the NASA RA (ERE). The most interesting cases were published in articles about new findings in the flora of the republic. Species that were specially introduced and used for town and settlement greenery or artificial afforestation and further penetrated to natural ecosystems were totally out of attention. The first national report on Armenia biodiversity (1999) had a small section dedicated to alien invasive species. Presently Armenia is experiencing spontaneous dissemination of several species including jackal (*Canis aureus*), porcupine (*Hystrix leucura*), Persian squirrel (*Sciurus persicus*), musquash, pheasant, Caspian turtle (*Mauremis caspica*), crucial, silver carp, white carp, sazan (*Cyprinus carpio*), rainbow trout, crayfish.

FLORA AND VEGETATION

Flora of Armenia is very rich – about 3800 vascular plants species on the territory less than 30.000 sq. km. The largest families of the flora of Armenia are Asteraceae (442 species), Fabaceae (317), Poaceae (274), Rosaceae (192), Brassicaceae (176), Caryophyllaceae (166), Lamiaceae (142), Scrophulariaceae (144), Apiaceae (124) and Cyperaceae (105). Armenia is the center for many genera, the largest among them are *Astragalus* (119 видов), *Centaurea* s.l. (more than 70), *Allium* (43 species), *Verbascum* (39), *Vicia* (37), *Silene* (36), *Veronica* (35), *Ranunculus* (34), *Pyrus* (32), *Euphorbia* (37) and *Trifolium* (30). The diversity of landscapes and orography is an important determinant of Armenia's diverse vegetation. The lower mountain belt (480–1200 m) is covered by semi-desert (or phryganoid) formations, gypsophilous or halophilous vegetation. There are salt marsh areas as well as the Transcaucasian sand desert. The middle and upper mountain belts (1200–2200 m) are characterized by various kinds of steppe and forest vegetation, meadow-steppes, shrub steppes and thorny cushion (tragacanth) vegetation. The altitudinal span of the forest belt varies from 500 to 1500 (–2000) m depending of the region, and may be approaching to 2400 m when open park-like tree stands are included. The subalpine and alpine belts (2200–4000 m) are covered by meadows and turf.

From the previous list of endemic plants of Armenia (124 species) 9 have been removed as it has been identified that they have wider distribution. At the same time thanks to new taxonomic studies 29 species have been added to the list of endemics (with the majority being new for science) and the others are the species with clarified distribution. Thus, at present the flora of Armenia includes 144 endemic

species (3.8% of total flora). In the Red Book of Plants of Armenia 452 species of vascular plants (11,89% of the flora of Armenia) and 40 species of fungi (1,05% of the biota of Armenia) are registered.

The plants belong to the following categories:

- Critically Endangered (CR) - 141 species
- Endangered (EN) - 248 species
- Vulnerable (VU) - 64 species

FAUNA

According to the recent data in the fauna of Armenia the vertebrates are represented by 549 species, including 93 mammals (instead of previously mentioned 83), 357 birds (instead of previously mentioned 353), 53 reptiles, 7 amphibians and 39 fish species. In Armenia the smallest terrestrial mammal Etruscan shrew (*Suncus etruscus*) has been identified. The insects (Insecta) make 90% of invertebrates. The fauna of Armenia is notable for high endemism (about 500 species making about 3% of the fauna).

In recent years a lot of work has been implemented to identify and assess the risk of extinction of the rare and vulnerable animals with analysis and overview of existing data, implementation of new studies and assessment of conservation status of the threatened species according to IUCN criteria. In the result the Red Book of Animals of Armenia has been prepared and published, which includes 308 species: 155 vertebrates and 153 invertebrates.

INVASIVE ALIEN PLANT SPECIES OF ARMENIA; MAIN THREATS FOR NATURAL ECOSYSTEMS (INSTITUTE OF BOTANY OF NAS OF ARMENIA, ALEKSANYAN A. FAYVUSH G.)

The problem of anthropogenic transformation of natural ecosystems is closely linked to the various political, economic and cultural processes: even speak about the human evolution of ecosystems and a new type of biodiversity called ksenobiodiversity formed by alien species.

The expansion of invasive alien species (IAS) is considered to be the second most significant threat to the biodiversity; in many cases it is linked to the transformation of the natural ecosystems due to the human activities. From the other hand the sustainability of natural ecosystems will be disturb under climate change, which impacts are visible nowdays and which also creates suitable condition for establishment and spread of IAS.

For the country like Armenia with small territory but high species richness and habitat diversity, the rapid establishment and spread of invasive plant species remains a threat to native ecological biodiversity. Disturbance of the natural ecosystems triggers intensification of the expansion of IAS which results in the full change of those ecosystems. Freedom from natural predators, high seed production, and affinity for disturbed habitat sites all contribute to the success of invasive species, leaving native species to struggle for space and resources.

In recent decades, IAS in Armenia much progress. A variety of natural conditions and habitats, vegetation mosaic extend the capabilities of the invasion and spread of alien species in the country. The number of IAS in Armenia is several times larger than in lowland countries. Our research has shown that one IAS cannot occupy large territories in Armenia. Actually, large numbers of IAS spread in suitable habitats, occupying relatively small areas but as a whole, the picture is rather concerning.

Preliminary estimation of the results of the threat of invasive plant species to the natural ecosystems and biodiversity in Armenia has allowed us to prepare a list of more than 100 species requiring immediate attention, which is approximately 25% of all alien plants of Armenia. Should be mentioned that invasive alien species IAS have expanded their areas in Armenia. Estimation of threats from IAS to some ecosystems has started. Trends in their distribution over the last 40–50 years are being evaluated and forecasts for their future distribution are being processed.

We can assume that the present period of the study should be described invasions as a transition from the description of the facts of introduction of species into new areas to analyze the causes and consequences of invasion. As a case study during last 3 years we investigate and monitor distribution and main ways of spread, traits, population genetics and population dynamics, impact of human health of *Ambrosia artemisiifolia* in Armenia, which need special attention and should be listed as a quarantine weed and one of main allergens.

The invasive plant species problem in Armenia is not estimated and has not enough attention. During last 10 years researchers from Institute of Botany of NAS Armenia are doing different scientific researches of invasive alien plants in Armenia, but we have no any legislation, regulation, prevention and control measures for any IAS. As a first book, which is include list of IAS of Armenia in 2014 was published manuscript G. fayvush, K. Tamanyan "Invasive and expending plant species of Armenia". Now we have several ongoing small projects mainly linked to problems of invasion and public awareness.

The National strategy and National program on the IAS have to be elaborated. As each country engaged in biodiversity conservation and sustainable use of natural resources, Armenia also should develop and implement a national plan of action for IAS and the ecological impact of the invasive plant must be placed in the context of conservation goals. We consider that the National program on invasive plant species in Armenia has to be elaborated and regional system of observations, monitoring, data exchange and rapid reaction has to be created.

Strategically investing in programs and projects to address IAS threats will help reduce the economic and environmental impacts of IAS on all lands. But nowdays in Armenia there are now big projects and programs for invasive plant species monitoring, management, prevention and control.

At the same time we should remember that IAS are of global importance and the need to solve this problem at the international level, at least at the level of a large region that is absolutely necessary international cooperation.

Modeling of possible distribution of common ragweed (*Ambrosia artemisiifolia* L.) under climate change in Armenia (Institute of Botany of NAS of Armenia, Aleksanyan A., Aleksanyan T., Fayvush G.)

Understanding the spread of an alien invasive species opens the chance to design and implement adequate mitigation measures in early phases of spread. In case of ragweed it is highly indicated to prevent or at least slow down the spread because of the disastrous allergic reaction caused by its pollen. In 2013-2015 was carried out the present distribution of *Ambrosia artemisiifolia* on the territory of Armenia for monitoring of population dynamics and for assessment of main threats. Only during these 2 years were found 12 new populations, based on which we can assume that common ragweed can occupy new habitats and extend its spread. Our hypothesis was that for next 100 years orographical condtions and urban areas will not undergo significant changes, but climate change will be determining factor for its further spread. For forecasting future distribution in territory of Armenia we've used Species Distribution models, which are internationally widely used tools for such issues. Here we've used 4 models: RF, MARS, GBM, MAXENT. As input data were used: anthropogenic roads and railways (with buffers of 3 km), urban areas (with buffers of 10 km), orographical, edaphic and climatic variables. For modeling of distribution under climate change was used the worst RCP 8.5 climate change scenario for different climatic models CSM4, GISS-E2-R, HadGEM2-AO and GFDL-CM3. All bioclimatic models show trends of further spread of common ragweed in Armenia. According to results the best models are GISS-E2-R and HadGEM2-AO, the worst - GFDL-CM3. According to GISS-E2-R ragweed in Armenia has big potential of spread and till 2080 will occupy all Central and North-Eastern Armenia and some territories in south of the country. According to GFDL-CM3 potential of further distribution is low and current occupied territories will not be expanded. But in fact, *Ambrosia artemisiifolia* will continue its spread and will become even more dangerous for both agricultural and natural ecosystems and for biodiversity of Armenia.

SOME NEW DATA ON THE DISTRIBUTION OF INVASIVE PLANT SPECIES IN ARMENIA

(INSTITUTE OF BOTANY OF NAS OF ARMENIA, G.M.FAYVUSH, A.S.ALEKSANYAN, H.I.HOVHANNISYAN)

The article provides new information about the distribution of seven invasive and expanding plant species (*Ambrosia artemisiifolia*, *Silybum marianum*, *Astragalus galegiformis*, *Conyza canadensis*, *Amorpha fruticosa*, *Helianthus tuberosus*, *Clematis vitalba*) in Armenia. All data was received during special field investigations in 2014-2015. During field work all new locations of these species were recorded (using GPS receiver), for new habitats the area, approximately number of individuals and average density were estimated, and permanent plots for future monitoring (0,5 x 0,5 m) were laid. During post-processing work the results of field investigations were entered into a computer database, and all coordinates were superimposed on the maps. It is shown that in the last 2 years (after the publication of monograph of G.M.Fayvush and K.G.Tamanyan, 2014) investigated species significantly expanded their area of distribution, taking the new locations in disturbed habitats, and some intensely penetrate into natural ecosystems. The latter include *Silybum marianum* (in southern Armenia intensively penetrates into forest and shiblyak communities), *Astragalus galegiformis* (rapidly penetrates into steppe and meadow-steppe communities), *Helianthus tuberosus* (often is found in coastal habitats). The remaining species are mainly distributed on disturbed habitats (along roads and railways, in abandoned fields and furrows, sometimes as weed in fields, often in ruderal places in the settlements). *Ambrosia artemisiifolia* spreads very rapidly. Its population was found in the resort town of Dilijan. This is of concern because of its allergenic potential, and possible threat for people here. It indicates the need to intensify research of invasive plant species in Armenia.

Sciurus vulgaris Linnaeus,1758 in Armenia (Scientific Center of Zoology and Hydroecology, National Academy of Sciences of Armenia, 2016 Ghasabyan M.)

Data on first registration of *Sciurus vulgaris* Linnaeus,1758 as a invasive alien species was done in autumn of 2016. In Armenia as a leaving native species spread *Sciurus anomalus* Gmelin,1778.

Harlequin ladybird harmonia axyridis pall. (coleoptera, coccinellidae) in Armenia (Scientific Center of Zoology and Hydroecology, National Academy of Sciences of Armenia, 2017 Kalashian M.Yu., Ghrejyan T.L., Karagyan G.H.)

Data on first registration of harlequin ladybird *Harmonia axyridis* in Armenia are presented. It is presumed penetration of species from Georgia due to self-dependent expansion or unintentional delivery.

Key words: Ladybird *Harmonia axyridis*, invasive species, Armenia, first record.

AUSTRIA / AUTRICHE

COUNCIL OF EUROPE – BERN CONVENTION; BIENNIAL REPORT 2013-2014 (NATIONAL
NATIONAL FOCAL POINT OF AUSTRIA FOR THE IAS, DR. MANFRED PÖCKL,
MANFRED.POECKL@NOEL.GV.AT)

1. GENERAL SITUATION – PROTECTED SPECIES / PROTECTED SITES

Austria with a total coverage of 83.870,9 km², is rich in landscapes and species. The country houses about 45.000 animal species, of which almost 37.000 are insects, and nearly 3.000 are vascular plant species. 38 % of mammals, birds and fishes are either extinct or threatened to a varying degree. 64,3% of reptiles and 60% of amphibians are listed „vulnerable“, „endangered“, or „critically endangered“.

Austria is characterized by a high diversity of landscapes ranging from high alpine areas to the pannonic plains, from wetlands to forest regions. Austria's biodiversity has been shaped by human intervention throughout the ages, especially through agriculture and forestry, hunting and fishing. Among the main causes of biodiversity loss are habitat destruction, degradation and fragmentation, in particular the sealing and fragmentation of landscapes by settlements and transport infrastructure. Additional threats are the abandoning of traditional forms of land use and land use intensification, as well as threats caused by non-indigenous, invasive species.

About 35% of the territory is classified as protected under various protection categories. About 3,6% of the territory is under strict protection through the nature reserve designation. Categories of the protected areas include „protected landscapes“ (15,4% of the territory), „nature parks“ (4,39%), and „nature monuments“ (2%). Six National Parks cover 2,9% of the territory and are all recognized by the World Conservation Union – IUCN. As a member of the EU, Austria took part in NATURA 2000, the European network of protected sites, according to the Habitats (92/43/EWG) and Bird Directive (79/409/EWG). Austria has designated 214 NATURA 2000 sites, covering about 16% of the country which is part of two biogeographic regions: the alpine and the continental region. There are also 19 Ramsar sites covering 1,6% of the territory. Biosphere reserves covering 1,8%, Biogenetic reserves totaling 2,1%, three European Diploma sites and one Wilderness area („Wildnisgebiet Dürrenstein“). There are also 15 lakes protected under the Austrian Act on the Protection of Lakes.

2. NON-NATIVE, INVASIVE SPECIES

The ecological, economic and health-related impacts of non-indigenous species are considerably in many countries. They have been recognised to be one of the most important causes of biodiversity loss all over the world and, in many countries, lead to serious economic damage.

The Convention on Biological Diversity (CBD) was adopted in 1992 and ratified by Austria in 1994 (Federal Law Gazette No 213/95). According to Article 6 of the CBD every Contracting Party shall either develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity, or adapt its existing strategies, which in any case, are to reflect the measures set out in the Convention. According to this provision the National Biodiversity Commission in April 1998 set out the Austrian Strategy for the Implementation of the Convention on Biological Diversity based on the preparatory work of the Federal Environment Agency and presented it to the Federal Government.

On the basis of the evaluation of the Austrian Biodiversity Strategy it was decided to revise and further develop the Biodiversity Strategy. As a new instrument, action plans on topical issues which are to supplement the **Austrian Biodiversity Strategy** are being introduced. The **Austrian Action Plan on Invasive Alien Species** is to serve as a tool to further develop, and put into more concrete terms, the

Austrian Biodiversity Strategy. This Action Plan is to be supplemented by detailed measures for selected species.

The Bern Convention was adopted and ratified by Austria on September 1st 1983.

3. STRUCTURE OF THE INVASIVE ALIEN ACTION PLAN (FEDERAL ENVIRONMENT AGENCY)

3.1 Scope

The Action Plan on Invasive Alien Species relates to alien species as defined in the CBD (Chapter 1.4.2) of all taxonomic groups and taxonomic levels (species, sub-species, strains, varieties etc.) This definition complies with the criteria applied in the study on alien species in Austria (ESSL & RABITSCH 2002). The Action Plan on Invasive Alien Species does not refer to genetically modified organisms (GMO).

3.2 Terminology

The Terminology is based on the definitions applied in the „Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species“ of the 6th Conference of the Parties to the CBD (CBD/COP6/VI/23):

3.3 Structure

The Action Plan on Invasive Species is structured according to the following topical issues:

- Education and awareness-raising
- Capacity building
- Research and monitoring
- Legal and organisational implementation
- **Objectives:** Indication of the sub-goals to be reached within the framework of the Action Plan on Invasive Species.
- **Measures:** Indication of the measures required to reach the defined objectives. In some cases more than one measure has been assigned to one objective.
- **Time periods:** Indication of the period within which the proposed measures are to be launched.
 - Short term: < 3 years
 - Medium-term: 3-5 years
 - Long-term: > 5 years
- **Priority:** Indication of the degree of priority with which the proposed measures are to be implemented:
 - Low: Implementation of the proposed measures is moderately urgent to reach the objective
 - Medium: Implementation of the proposed measures is highly urgent to reach the objective
 - High: Implementation of the proposed measures is of essential importance to reach the objective.
- **Actors:** Indication of the institutions, groups of individuals, vocational groups and organisations concerned by the implementation of proposed measures. Indicated are all actors that may be of importance for the implementation of measures. This concerns the fields of funding and implementation (e.g. project management, integration of existing data, information and preparatory work).

4. ORGANISATION AND RESPONSIBILITY IN AUSTRIA

The Federal Republic of Austria is made of **nine Federal States (Bundesländer)** which have a strong local power and the sovereignty of law making in the nine autonomic regional parliaments. These Federal States are the following: Burgenland, Vienna, Lower Austria, Upper Austria, Salzburg, Styria, Carinthia, Tyrol, and Vorarlberg.

For example, Austria has nine different laws in nature conservation, fisheries and hunting, but an overall national law is lacking. The implementation of the Habitats Directive (92/43/EWG) and Bird Directive (79/409/EWG) has brought some harmonisation between the laws in nature conservation, fisheries and hunting.

It is the Ministry and the Federal Government which sign International Conventions, and they can make suggestions and proposals (especially the Federal Environment Agency) to the Federal States, but these are not binding legally. In Austria the power and authority **in nature conservation is in the hand and responsibility of the nine Federal States (Bundesländer)**. However, there is a coordination between them.

In this groups of experts within the Bern Convention, Dr. Manfred Poeckl speaks on behalf of the nine Austrian Federal States.

5. NEW ACHIEVEMENTS IN THE FEDERAL STATES

Campaigns in education and awareness-raising are being realised by meetings, folders and posters at different levels of education (from primary schools to universities and the general public) within the Federal States. Information is also broadcasted by regional radio and television programmes.

Especially in legally protected areas and sites, campaigns to control and eradicate invasive alien plant species are realised. These sites are monitored and the management success is evaluated. Long-term unemployed people are asked to take part voluntarily in eradication work.

Plant species that are controlled / eradicated in protected areas in the Federal States of Austria are the following: Japanese knotweed (Jap. Staudenknöterich, *Fallopia japonica*), Goldenrod (Kanad. Goldrute, *Solidago gigantea*), Himalayan balsam (Ind. Springkraut, *Impatiens glandulifera*), Ragweed (Beifuß-Ambrosie, *Ambrosia artemisiifolia*), Giant hogweed (Riesenbärenklau, *Heracleum montegazzianum*), Bloodflower (Seidenpflanze, *Asclepias curassavica*), American pokeweed (Amerikanische Kermesbeere, *Phytolacca americana*), but also two tree species, the **Robinia** (Robinie, *Robinia pseudoacacia*) and the **Holly** (Götterbaum, *Ailanthus altissima*).

Special attention is paid to the cultivation of new disturbed soils after the finish of construction works, especially infrastructure projects and works along streams and rivers. It is no longer wise to allow the free natural succession of soils to pioneer plants because most of these are invasive alien species.

For biotope management more and more grazing projects are realised, especially in protected sites and along streams and rivers. Livestock involved are mostly cattle, sheep and horses.

Regionally a number of small projects are being realised, and there are many different bodies, NGOs and stakeholders involved.

More focus has to be paid on the flow of information in the bottom-up direction. In other words: it is hard to follow and overlook the many enthusiastic and excellent work done at the regional and local scale. People at those lower levels often forget to report their activities, results and success to the higher interested authorities (Landesregierungen, Ministerien).

The activities, the engagement and enthusiasm of people is outstanding. However, a higher degree on communication, cooperation and collaboration has to be reached within and between the Federal States on the one hand and to the Ministry and Federal Governments on the other.

No information is available about control or eradication activities referring to non-native, invasive animal species.

6. ACTIVITIES IN LOWE AUSTRIA AS AN EXAMPLE

- **NSG Pielach-Neubacher Au:** Weidemonitoring - Neophytenbekämpfung durch Beweidung (2008-2014)
 - (Springkraut *Impatiens glandulifera*, Japanischer Knöterich *Fallopia japonica*, Goldrute *Solidago canadensis*)
 - Monitoring ist abgeschlossen, Erfolg der Reduktion von Neophyten durch Beweidung allein nicht ausreichend, Beweidung wird aber fortgesetzt, zusätzliche Pflegemaßnahmen sind erforderlich
- **Biosphärenpark Wienerwald:** Neobiotabekämpfung und Managementmaßnahmenentwicklung (2011-2015)
 - (Springkraut *Impatiens glandulifera*, Japanischer Knöterich *Fallopia japonica*, Riesenbärenklau *Heracleum giganteum*, Robinie *Robinia pseudoacacia*, Götterbaum *Ailanthus altissima*, Signalkrebs *Pacifastacus leniusculus*, Rotwangenschildkröte *Trachemys scripta elegans*, Gelbwangenschildkröte *T.s.scripta*, Goldfisch *Carassius gibelio*, Waschbär *Procyon lotor*, Marderhund *Nyctereutes procyonoides*)
- **Nationalpark Donauauen:** Neophytenmanagement (ab 2013)
 - (Eschenahorn *Acer negundo*, Götterbaum *Ailanthus altissima*)
 - laufende Maßnahmen zur Reduktion durch Ringeln
- **Nationalpark Thayata** Neophytenmanagement seit 2000
 - Indisches Springkraut (*Impatiens glandulifera*), Robinie (*Robinia pseudoacacia*), Staudenknöterich (*Fallopia japonica*), Riesenbärenklau (*Heracleum giganteum*)
 - Aktuell noch Schwerpunkt auf Robinie, ansonst laufende Nacharbeiten nach Bedarf; Sprinkrautbekämpfung weitestgehend abgeschlossen
- „**Wachau Volunteer**“ Bekämpfung von Götterbaum und Robinie ist regelmäßiger Bestandteil des Projektes;
- LIFE **Untere March-Auen** hat Neophyten-Bekämpfungs-Teil, Betreuung durch WWF;
- **Neubacher Au:** „Act for Nature“ der NFI (http://www.nfi.at/index.php?option=com_content&task=view&id=681&Itemid=225) Springkrautbekämpfung (startet jetzt aber erst!);
- **Auenwildnis Wachau:** Neophytenmanagement ist inkludiert, (startet erst!)
- **March-Thaya-Auen:** „Ramsar SKAT“ (ist aber Ende 2012 ausgelaufen!) aktive Bürgerbeteiligung an Pflege- und Erhaltungsmaßnahmen zum Schutz dieser international bedeutenden Feuchtlebensräume; gemeinsam mit österreichischen und slowakischen Projektpartnern und den March-Thaya-Gemeinden wurde u.a. Eschenahorn entfernt.

7. IMPORTANT NEW PUBLICATIONS ARE THE FOLLOWING:

- 2016

<http://www.oewav.at/Page.aspx?target=66045&mode=form&app=134598&edit=0¤t=167725&view=134599&predefQuery=-1>

This link of the Austrian Water- and Waste Management Society (ÖWAV) refers to 16 invasive plant species that are characterised in a richly illustrated booklet on 34 pages. The species are the following:

- *Bambus spp.*
- *Palownia tomentosa*
- *Acer negundo*
- *Rhus typhina*
- *Robinia pseudacacia*
- *Lycium barbatum*
- *Buddleja davidii*
- *Ailanthus altissima*
- *Fallopia japonica, Fallopia sachalinensis*
- *Solidago canadensis, Solidago gigantea*
- *Impatiens glandulifera*
- *Phytolacca americana, Phytolacca acinosa*
- *Asclepias syriaca*
- *Helianthus tuberosus*
- *Ambrosia artemisiifolia*
- *Heracleum mantagazzianum*

For each species general remarks, description, distribution and origin, habitats, economic and ecological problems, and advices for management / eradication are given, as well as safety regulations. The booklet can be found as attachment.

- **2017**

A new edition of the leaflet „**How to Identify Freshwater Crayfish in Austria**“ by **PÖCKL, M., R. PEKNY & J. PENNERSTORFER** has been published in huge numbers and is well distributed amongst angling societies, boaters, aquarists and other stakeholders with relevance to aquatic environments.

With this well illustrated guide everybody should be able to correctly identify all species occurring in Austria.

Native/indigenous species are:

- Noble crayfish (*Astacus astacus*)
- Narrow clawed crayfish (*Astacus leptodactylus*)
- White clawed crayfish (*Austropotamobius pallipes*)
- Stone crayfish (*Austropotamobius torrentium*)

Invasive / alien species are:

- Signal crayfish (*Pacifastacus leniusculus*)
- Spiny cheek crayfish (*Orconectes limosus*)
- Red swamp crayfish (*Procambarus clarkii*)

These invasive crayfish species were imported from North America and transmit the crayfish plague pathogen, to which they are relatively immune. But almost all populations of the indigenous species die when infected by this fungus. Therefore it is essential avoiding to release alien species (and this is strictly forbidden). Hence, it is a pre-requisite to know the species. The leaflet can be found as attachment.

CROATIA / CROATIE

Republic of Croatia
REPORT TO THE BERN CONVENTION GROUP OF EXPERTS
ON INVASIVE ALIEN SPECIES
Report period: 2015 – May 2017
The Ministry of Environment and Energy and
the Croatian Agency for the Environment and Nature

During this report period (2015 – May 2017), the Republic of Croatia carried out several activities and projects dealing with the invasive alien species, specifically related to the following issues:

LEGAL AND STRATEGICAL FRAMEWORK

- *Act on the Prevention and Management of the Introduction and Spread of Alien and Invasive Alien Species*

Since 2015, a new national act specifically dedicated to alien and invasive alien species is in the process of drafting. This new act, after its adoption and coming into force, will ensure the implementation of the EU Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species in Croatia, by defining competent authorities for the implementation, expert tasks and official controls, as well as the misdemeanour provisions for offences. It will regulate the issue of the prevention and management of the introduction and spread of invasive alien species of EU concern, but also IAS of concern in the Republic of Croatia, in order to prevent or mitigate their adverse impact on biodiversity, ecosystem services, the economy and/or human health. This act will regulate the introduction of alien species into Croatia, their placing on the market, breeding and intentional release into nature, as well as risk assessment protocols for assessing their invasiveness. It will establish restrictions and control mechanisms for invasive alien species of concern in the Republic of Croatia ("black list") which will be proclaimed by an ordinance.

In 2016, the Act was notified to the European Commission, since it goes beyond the area harmonised in all the EU Member States by the Regulation (EU) No 1143/2014 and sets stricter national measures for movement of alien species between other EU Member States and Croatia, hence affecting intra-Union trade. In February 2017, Croatia got a positive answer from the European Commission, so the Act was sent for a final round of consultation with other relevant ministries in Croatia and will be forwarded to the Government in June and after that to the Parliament for adoption.

- *Ordinance on alien species which can be placed on the market and invasive alien species*

Based on the alien and invasive alien species provisions in the current Nature Protection Act, the Ordinance came into force in February 2017, setting a list of alien species that can be bred in a controlled environment and placed on the market in Croatia without a prior permit, since they currently do not pose an ecological risk. For breeding, placing on the market or releasing into nature of all other alien species, a prior permit is needed. With this "white list" of alien species proclaimed by the Ordinance, the administrative burden was reduced. The Ordinance also has a reference to the EU "black list" of invasive alien species from the *Commission Implementing Regulation (EU) 2016/1141*, that cannot be introduced or placed on the market in Croatia.

- *Strategy and Action Plan for the Protection of Nature of the Republic of Croatia*

The new Strategy and Action Plan for the Protection of Nature was sent to the Parliament for adoption in February 2017. Specific Objective dealing with the IAS is to establish a management system and implement measures to prevent the introduction and spread of IAS, with the following actions:

- Establish a comprehensive legislative framework for the management of IAS in the Republic of Croatia
- Develop standards for risk assessment
- Establish training programs to improve official controls
- Define the pathways of introduction and establish IAS management system

IMPLEMENTATION AND CAPACITY BUILDING

Funds from the EU Operational Programme Competitiveness and Cohesion 2014-2020 have been ensured for the following IAS projects in Croatia:

- *Project „Establishing National Monitoring System for Invasive Alien Species“*

Project proposal was prepared in 2016 by the Croatian Agency for the Environment and Nature. On 10 April 2017, the grant agreement was signed for the mentioned project between the Ministry of Environment and Energy (Intermediate Body 1), the Environmental Protection and Energy Efficiency Fund (Mediation Body 2) and the Croatian Agency for the Environment and Nature (the Beneficiary) with a total amount of HRK 15,221,322.96 (€2,029,510) out of which the amount of EU aid from the Cohesion Fund is HRK 12,916,704.51 (€ 1,722,227). The projects runs from 2017 to the end of 2020. The main purpose of the project is to increase knowledge on alien and invasive alien species in order to create the basis for future management activities and to reduce adverse impacts of IAS on biodiversity. The main project activities are to collect spatial data (by analysis of existing literature and field mapping) in order to determine the actual state of alien and invasive alien species in Croatia, to develop and test monitoring programmes for priority IAS, to establish information system about alien species and IAS (including catalogue of species with all relevant information, interactive maps etc.), to create a mobile application for recording IAS in the field and to develop a network of citizen scientists.

- *Project "Development of Management and Control System for the Invasive Alien Species"*

The Ministry of Environment and Energy is the applicant for this project call. The call is opened until June 7th 2017 with the aim to contribute to the development of the IAS management and control system in order to minimize their negative impact on biodiversity. Eligible project activities are: development of action plans with measures and activities for management of the pathways of IAS introduction, development of management plans for priority IAS and IAS widely spread in Croatia, development of training programmes, guidelines and identification manual to build capacity of the competent authorities and enforcement agencies for detection and control of IAS introduction, preparation and implementation of a public awareness campaign on IAS.

- *Capacity building*

In 2015 and 2016, the Ministry of Environment Energy and the Croatian Agency for the Environment and Nature had conducted training modules aiming to build capacity for the implementation of national and EU legislation dealing with wildlife trade and alien and invasive alien species. These trainings were financed by a World Bank loan as a part of the EU Natura 2000 Integration Project – NIP. 10 seminars were held with altogether 159 officials participating, mainly customs officers, border veterinary and phytosanitary inspectors and nature protection inspectors. The emphasis was on strengthening cooperation between the institutions and officials responsible for enforcement, inland and border controls. In 2016 the training was expanded to include more detailed information on species from the EU list including common pathways and species identification.

REGIONAL CO-OPERATION

- **ESENIAS-TOOLS**

Croatian Agency for the Environment and Nature participated in the project „East and South European Network for Invasive Alien Species – A tool to support the management of alien species in Bulgaria – ESENIAS-TOOLS“ as project partner. Project main goal is networking and development of invasive alien species tools within the frame of ESENIAS in order to support the management of alien species in Bulgaria.

Project objectives are:

1. To develop the necessary technical infrastructure and tools within ESENIAS to support the management of IAS in Bulgaria and in the region;
2. To strengthen the regional cooperation within ESENIAS to ensure early detection and rapid response against IAS;
3. To raise the public awareness and gain wide support for combating IAS in Bulgaria;
4. To develop networking and cooperation with other IAS databases and gateways at national, regional and European level.

Work on the project was organized in 10 Working groups (WGs):

WG1: Database development and organisation (Bulgaria, IBER-BAS)

WG2: Data collection, analysis, standardisation and harmonisation on alien marine species (HCMR, Greece)

WG3: Data collection, analysis, standardisation and harmonisation on alien freshwater species (Croatian Agency for the Environment and Nature, Croatia)

WG4: Data collection, analysis, standardisation and harmonisation on alien plant and fungi species (UNS PMF, Serbia)

WG5: Data collection, analysis, standardisation and harmonisation on alien terrestrial invertebrate species (IBER-BAS, Bulgaria)

WG6: Data collection, analysis, standardisation and harmonisation on alien terrestrial vertebrate species (UOC, Romania)

WG7: IAS research, management and legislation review (IBER-BAS, Bulgaria)

WG8: Capacity building (IBER-BAS, Bulgaria)

WG9: Awareness raising (NMNH-BAS, Bulgaria)

WG10: Networking and dissemination of project results (DU, Turkey)

The project is in a final stage. Scientific and expert literature and available databases were checked and analysed with help of experts. Prioritization of alien species in the ESENIAS-TOOLS region was carried out in accordance with the methodology defined in individual working group. National lists of alien species for individual groups of organisms were made. Tables with data on records of priority alien species in each ESENIAS-TOOLS county, which will be imported in the database, were prepared. Data sheets for the priority invasive species, which will be published in the ESENIAS book and on the web, were also made.

- **DIAS**

Croatia continued to participate in the regional initiative Danube Region Invasive Alien Species Network (DIAS) and took part in preparation of Danube Region Invasive Alien Species Strategy to manage and control risks from IAS in the Danube Region.

OTHER ACTIVITIES

- The educational leaflet „Be the responsible pet owner“ was prepared and printed. The distribution campaign for pet shops is in preparation.

- During 2015 and 2016 monitoring of the giant hogweed (*Heracleum mantegazzianum*) in Krapina-Zagorje County continued and control measures (cutting and removal of the plants) were carried out. Monitoring activities and control measures will continue in 2017.
- During 2016 and 2017 Croatian Agency for the Environment and Nature in collaboration with the Faculty of Science and Mathematics, University of Zagreb, held lectures for biology students taking course on IAS in order to get acquainted with practical problems and experiences in dealing with IAS.
- 2nd Croatian Symposium on invasive species was organized in Zagreb from 21-22 November 2016 by the Croatian Ecological Society, and Faculty of Science, University of Zagreb, Croatian Forest Research Institute and Public Institution „Maksimir“ as co-organizers (<http://www.ekolosko-drustvo.hr/2HSIV-2CSIS.html>)
- In the framework of Croatian Rural Development Programme for the period 2014-2020 (Measure 4) five invasive alien species were proposed for removal from the agricultural land: *Ailanthus altissima* (Mill.) Swingle, *Amorpha fruticosa* L., *Reynoutria japonica* (Houtt.) Ronse Decr., *Reynoutria sachalinensis* (F.Schmidt) Ronse Decr. and *Robinia pseudoacacia* L. The calculations have been made and the respective Ordinance is in preparation.
- In 2016 the population status was estimated and methodology of population control developed for three invasive alien species in pilot areas: *Ailanthus altissima* (Mill.) Swingle in Kornati National Park and Telašćica Nature Park; *Oryctolagus cuniculus* on the islands Brusnik and Lokrum, *Herpestes javanicus auropunctatus* on the island Mljet. Legal constraints were also analysed and some legislation changes proposed.
- Except the planned activities on the national level for population control of the tree of heaven (*Ailanthus altissima* (Mill.)), there was one local initiative on peninsula Pelješac conducted by NGO Mala Sirena which aimed to educate local community, map ailanthus trees using mobile application and conduct population control measures on local level (<https://www.ekomalasirena.org/pajasen>).

CZECH REPUBLIC / RÉPUBLIQUE TCHÈQUE

THE CZECH REPUBLIC

Because both intentional and accidental introduction proportion is similar in all basic taxa or ecological/functional groups, except invertebrates, and due the present rate of international trade and adopted phytosanitary and veterinary measures, the current trend in the rate of invasive alien species introductions, *i.e.* a sharp increase, is supposed to continue in the Czech Republic in the near future (ZEDEK *et al.* 2010, MARKOVÁ & HEJDA 2011, PLESNÍK 2017), similarly to other Europe's parts (PERGL *et al.* 2016a, RABITSCH *et al.* 2016, SEEBENS *et al.* 2017). According to generally accepted and respected robust scenarios, the current and projected climate change shall also significantly contribute to the trend (EEA 2012, 2017, BELLARD *et al.* 2013).

The Czech Republic does not have any special legislation on invasive alien species: the issue is treated with a plenty of laws, decrees and other legal measures (DOLEŽALOVÁ 2012, GÖRNER 2014).

In 2015-2016, a robust scheme for assessing invasive alien species in the Czech Republic was developed, primarily for the purpose of nature conservation. It was applied in elaborating the Black, Grey and Watch Lists of invasive alien species for the Czech Republic, supplemented with recommended management measures for land managers, policy makers and other stakeholders. The scheme was based on four criteria: current distribution of the species and its invasion status; environmental impact; socioeconomic impact; and options for suitable management. In total, there are 78 plant and 39 animal species on the Black List, 47 and 16 on the Grey List, and 25 and 27, respectively, on the Watch List. The Black List is further divided into three subgroups according to the recommended management. In the group of species with recommended eradication are the Giant hogweed (*Heracleum mantegazzianum*), ragweed (*Ambrosia* spp.), the American mink (*Neovison vison*), the Varroa mite (*Varroa destructor*), and the Northern raccoon (*Procyon lotor*, PERGL *et al.* 2016b, 2016c). The study is one of the background information sources for the on-going legislative procedure.

In summer 2016, there was a debate on invasive alien species and non-native species in mass media in the Czech Republic due to coming of the relevant European Union legislation, namely Regulation EU No. 1143/2014 and Implementing regulation (EU) No. 2016/1141 (EU 2014, EC 2016) into force. The Nature Conservation Agency of the Czech Republic, in collaboration with the Ministry of the Environment, developed a fact sheet on all the invasive alien species and subspecies of Union concern (the Union list) listed in the implementing regulation as well as FAQ on the above invasive alien taxa in the Czech Republic and in the European Union: both are available in Czech at invaznidruhy.nature.cz/unijniseznam.

At present, the Ministry of the Environment of the Czech Republic is preparing an amendment to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, reflecting the EU regulations and fully taking into account national needs. The amendment was originally planned to be submitted to the Government of the Czech Republic by the end of the first quarter of 2017, after having been discussed with all relevant stakeholders (other sectors in charge of various aspects on invasive alien species, professional chambers/associations, private landowners organizations, universities, research institutions, NGOs aiming at environmental protection, hunting and game-keeping, gardening, *etc.*) through regular consultations and debates organised by the Ministry of the Environment, *e.g.* as official and informal roundtables (DOLEJSKÝ 2017). However, due to high number of comments provided by the stakeholders as well as the need of further consultations with the Ministry of Agriculture, the original deadline was extended to the end of 2017.

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GEORGIA / GÉORGIE

INFORMATION ON ACTIONS RELATED TO INVASIVE ALIEN SPECIES

National Biodiversity Strategy and Action Plan (NBSAP)

Invasive species are acknowledged as one of the threats to Georgian biodiversity together with degradation and fragmentation of habitats, unsustainable use of natural resources, climate change and pollution. Plant species *Paulownia tomentosa*, *Ailanthus altissima* and *Ambrosia artemisiifolia* are among the most common invasive plant species, while *Rapana venosa* imposed greatest threat to the Black Sea Ecosystems.

Therefore, it should be noted that one of the national targets set under the National Biodiversity Strategy and Action Plan 2014-2020 is related to the invasive alien species. According to the NBSAP: “By 2020 alien invasive species have been assessed with regard to their status and impact. Their pathways have been evaluated and identified, and measures are in place to prevent their introduction and establishment through the management of these pathways. No new alien species have been recorded.”

Actions under this target involve monitoring of invasive species, development of legal framework and strategy for the management of invasive alien species, assessment of distribution of invasive alien species and conduct a modelling of the threats they impose to native biodiversity and species.

National Legislation

Currently introduction of alien fauna species is regulated according to the Georgian Law on Wildlife. According to this law introduction of the alien fauna species, including invasive, is prohibited. However, there is no regulation for flora species.

The Ministry of Environment and Natural Resources of Georgia has prepared new draft law on Biodiversity. According to the draft law introduction of alien invasive fauna species will be prohibited, and at the same time introduction of invasive flora species in the forest and protected areas will also be prohibited. It is supposed that the new law will be adopted early 2018 year.

National Biodiversity Monitoring System (NBMS)

As identified in NBSAP, one of the indicators under the National Biodiversity Monitoring System is Indicator P9: Distribution area of invasive species (Change in the distribution area and abundance of main invasive species). It is supposed that indicator will be calculated every three years. Currently baseline data is collected for the protected areas, the species included in the list of 50 worst invasive alien plant species threatening biodiversity in Georgia were surveyed. The 50 worst invasive alien plants (See Annex) have been selected from review of literature sources, herbarium and anecdotal data. All available data were georeferenced and distribution maps were produced. It is supposed that next set of surveys will be conducted in 2018.

Other activities

In 2015, rangers from the 10 protected areas (Mtirala National Park, Machakhela National Park, Kolkheti National Park, Vashlovani National Park, Tbilisi National Park, Kobuleti protected Areas, Kintrishi Protected Areas, Batsara-Babaneuri Protected Areas, Chachuna managed reserve and Mariamisdzvari strict nature reserve) were trained in monitoring of invasive species. The Agency of Protected Areas has started permanent monitoring of invasive species within these 10 protected areas.

Annex: List of 50 worst invasive alien species of Georgia

SPECIES	FAMILY	ORIGIN	LIFE FORM	ECOL. GROUP ¹
<i>Ailanthus altissima</i> (Mill.) Swibgle	Simaroubaceae	East Asia	Tree	R, F
<i>Amaranthus albus</i> L.	Amaranthaceae	North America	Annual herb	R
<i>Ambrosia artemisiifolia</i> L.	Asteraceae	North America	Annual herb	R
<i>Amorpha fruticosa</i> L.	Fabaceae	North America	Shrub	F
<i>Buddleja davidii</i> Franch.	Buddlejaceae	East Asia	Shrub	R
<i>Cercis siliquastrum</i> L.	Fabaceae	West Asia	Tree	R
<i>Chenopodium album</i> L.	Chenopodiaceae	South America	Annual herb	R
<i>Commelina communis</i> L.	Commelinaceae	East Asia	Annual herb	R
<i>Conyza canadensis</i> (L.) Cronq.	Asteraceae	North America	Annual herb	R
<i>Conyza graminifolia</i> Spreng.	Asteraceae	North America	Annual herb	R
<i>Coronopus didymus</i> (L.) Smith	Brassicaceae	South America	Annual herb	R
<i>Crassocephalum crepidioides</i> S. Moore	Asteraceae	South America	Annual herb	R
<i>Cyperus esculentus</i> L.	Cyperaceae	Mediterranean	Perennial herb	H
<i>Cyrtomium falcatum</i> (L. fil.) Pr. & C. Chr.	Dryopteridaceae	East Asia	Perennial herb	G
<i>Elsholtzia ciliata</i> (Thunb.) Hyl.	Lamiaceae	East Asia	Annual herb	R
<i>Galinsoga parviflora</i> Cav.	Asteraceae	North America	Annual herb	R
<i>Gleditsia triacanthos</i> L.	Fabaceae	North America	Tree	F
<i>Hydrocotyle ranunculoides</i> L. fil.	Apiaceae	East Asia	Perennial herb	P
<i>Hydrocotyle vulgaris</i> L.	Apiaceae	East Asia	Perennial herb	H
<i>Ixeridium dentatum</i> (Thunb.) Tzvel.	Asteraceae	East Asia	Perennial herb	R
<i>Kyllinga gracillima</i> Miq.	Cyperaceae	East Asia	Perennial herb	H
<i>Lathyrus aphaca</i> L.	Fabaceae	Atlantic Europe	Annual herb	R
<i>Ligustrum japonicum</i> Thunb.	Oleaceae	East Asia	Shrub	R
<i>Lonicera japonica</i> Thunb.	Caprifoliaceae	East Asia	Shrub	R
<i>Lycium barbarum</i> L.	Solanaceae	East Asia	Shrub	R
<i>Lysimachia japonica</i> Thunb.	Primulaceae	East Asia	Annual herb	H
<i>Microstegium imberbe</i> (Nees.) Tzvel.	Poaceae	East Asia	Annual herb	R
<i>Microstegium japonicum</i> (Miq.) Koidz.	Poaceae	East Asia	Annual herb	R
<i>Miscanthus sinensis</i> Anderss.	Poaceae	East Asia	Perennial herb	R
<i>Opuntia humifusa</i> (Raf.) Raf.	Cactaceae	North America	Shrub	S
<i>Opuntia phaeacantha</i> Engelm.	Cactaceae	North America	Shrub	S
<i>Paspalum dilatatum</i> Poir.	Poaceae	South America	Perennial herb	P
<i>Paulownia tomentosa</i> (Thunb.) Steud.	Scrophulariaceae	East Asia	Tree	F
<i>Perilla nankinensis</i> (Lour.) Decne.	Lamiaceae	East Asia	Perennial herb	H
<i>Phytolacca americana</i> L.	Phytolaccaceae	North America	Perennial herb	R
<i>Polygonum thunbergii</i> Siebold & Zucc.	Polygonaceae	East Asia	Annual herb	H
<i>Pueraria hirsuta</i> (Thunb.) Matsum.	Fabaceae	East Asia	Perennial herb	F
<i>Rhus javanica</i> L.	Anacardiaceae	East Asia	Tree	R
<i>Robinia pseudoacacia</i> L.	Fabaceae	North America	Tree	F
<i>Sisyrinchium septentrionale</i> Biecknell	Iridaceae	North America	Geophyte	R
<i>Spiraea japonica</i> L.	Rosaceae	East Asia	Shrub	R
<i>Ulex europaea</i> L.	Fabaceae	Mediterranean	Shrub	R
<i>Vandellia diffusa</i> L.	Scrophulariaceae	North America	Annual herb	R
<i>Vitex rotundifolia</i> L. f.	Verbenaceae	East Asia	Shrub	P

¹ F=forest plant, M=mountain plant, P=lowland (incl. sandy beaches, etc.) and pioneer plant, E=aquatic plant, H=marsh and wet meadow plant, S=dry grassland plant incl. semi-deserts and steppes, G=grassland, scrub and rock plant, R = ruderal and segetal plant

ICELAND / ISLANDE

ACTIONS ON INVASIVE ALIEN SPECIES IN ICELAND SINCE LAST BERNE CONVENTION IAS GROUP OF EXPERTS MEETING (JUNE 2015)

In Iceland, a number of actions relevant to IAS were carried out in the last two years. These include (1) Legislative changes and (2) efforts to map the occurrence of IAS.

1. LEGISLATIVE CHANGES

Nature Conservation Act

A new Nature Conservation Act came into force that includes many provisions about IAS. Chapter 9 of the new Nature Conservation Act deals with legislative measures to minimise the impact of imported living organisms on the Icelandic nature. The act stipulates that a special importation permit has to be obtained from the Environment Agency of Iceland (Umhverfisstofnun) to import living organisms to Iceland. The application for such a permit should contain i.a. a risk assessment that should clearly state possible effects of the imported organism on Icelandic nature. The application should also contain a statement whether the species in question will be kept in one place or distributed within Iceland. The new Act states that a special committee consisting of six specialists has to evaluate each application and prepare a recommendation for the Environment Agency of Iceland.

The Act bans all actions that can contribute to the spread of non-native organisms within the country unless a special permission from the Environment Agency of Iceland was issued.

The Environment Agency of Iceland received a legal permit to take measures to control and/or eradicate non-native species that pose a threat to biodiversity and have a significant impact on the environment.

The new Act states that the minister of environment can publish a list of species that can not be imported to Iceland (or spread within Iceland). The minister can also publish a list of species that can be imported without permission from the Environment Agency of Iceland.

Arctic Invasive Alien Species Strategy and Action Plan

Iceland, as a part of the Arctic Council, signed recently (May 2017) an Arctic Invasive Alien Species Strategy and Action Plan that sets forth the priority actions that the Arctic Council and its partners are encouraged to take to protect the Arctic region from a significant threat: the adverse effect of invasive alien species. These priority actions span terrestrial, aquatic, and marine ecosystems. The actions take environmental, cultural, and economic perspectives into consideration, including drivers, impacts, and response measures.

2. EFFORTS TO MAP THE OCCURRENCE OF IAS

Research projects were carried out by Icelandic Institute of Natural History in order to map the occurrence of non-native and invasive alien species in Iceland.

Distribution of *Lupinus nootkatensis*

A new distribution map of the main terrestrial invasive alien *Lupinus nootkatensis* was prepared and based i.a. on data from remote sensing. This research showed that currently *L. nootkatensis* occupies at least 314 km².

Distribution of forests in Iceland

There are just a few natural or semi-natural forest areas in Iceland, and most of the contemporary forests consist of non-native and potentially invasive species (e.g. *Pinus contorta*). Therefore, it was essential to map all the forest areas within Iceland, and this aim has been recently achieved by Icelandic Institute of Natural History during a recently concluded major project focused on habitat type mapping.

Distribution of *Heracleum* species

Icelandic Institute of Natural History has also performed mapping of *Heracleum* species in Akureyri (N Iceland). These new non-native taxa are currently becoming invasive in Iceland. A similar project is now underway in the capital region of Reykjavik.

Non-native plant species in Icelandic highlands

Icelandic Institute of Natural History has also recently concluded a project aiming to establish the number and distribution of non-native plant species in highlands and mountainous areas of Iceland. Results of this study were published as a peer-reviewed paper (Wasowicz P. 2016. Non-native species in the vascular flora of highlands and mountains of Iceland. *PeerJ* 4:e1559 <https://doi.org/10.7717/peerj.1559>)

16.05.2017

MALTA / MALTE

SHORT WRITTEN CONTRIBUTION ON IAS WORK BY MALTA

Information provided by the Biodiversity and Water Unit,
Environment and Resources Authority (ERA)
2017

LEGAL FRAMEWORK

The implementation of national legislation, such as the Flora, Fauna and Natural Habitats Protection Regulations (S.L. 549.44)

<http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11550&l=1>, which incorporates provisions on the prevention, regulation and control of alien and invasive species has continued, in line with requirements of the Bern Convention, other multilateral environmental agreements and related EU policy. The EU Regulation 1143/2014 of the European Parliament and of the Council on the Prevention and Management of the Introduction and Spread on Invasive Alien Species came into effect on 1 January 2015. Additionally, a list of invasive alien species of Union concern was adopted on 13 July 2016 through a Commission Implementing Regulation. Malta is also attending the meetings of the Committee on Invasive Alien Species to discuss the implementing acts required by Regulation (EU) 1143/2014, as well as the meetings of the Scientific Forum on Invasive Alien Species in line with Article 28 of the Regulation (EU) 1143/2014.

Within the framework of the Animal Welfare Act, the ‘Owning and Keeping of Dangerous Animals Regulations (S.L.439.19)’ were issued in July 2016. These regulations include the concept of contingency with regard to escapees and in cases of emergency. The regulations are available in English from:

<http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=12462&l=1>.

Through the CITES applications process, the Environment and Resources Authority endorses Import Licences and Customs entry forms. All the species listed in the EU IAS list are automatically refused entry in the country.

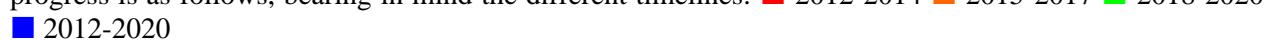
NATURE-RELATED STRATEGIC POLICY AND SUPPLEMENTARY POLICY GUIDANCE

The first review of implementation of Malta’s National Biodiversity Strategy and Action Plan (2012-2020) entitled “Working Hand-in-Hand with Nature” was completed and is available as part of Malta’s Fifth National Report to the Convention on Biological Diversity (<http://www.cbd.int/doc/world/mt/mt-nr-05-en.pdf>). Within the context of invasive alien species, reported progress is as follows for the national target and related NBSAP measures, respectively:

National Target	Progress	Comments
NBSAP Target 9 - By 2020, <i>measures are in place to prevent, in so far as practical, the introduction and establishment of new invasive non-native species, while those that are established are identified and prioritised for eradication or control, where feasible. [Linked to Aichi Target 9]</i>	☺ - Good progress made but further action is required to achieve the target	Progress is reported vis-à-vis implementation of the specific NBSAP measures (see below), reinforcing of the national target via the adoption of targets as part of Malta’s implementation of the Marine Strategy Framework Directive (MSFD) (http://era.org.mt/en/Pages/MSFD.aspx), and the completion of the EU co-financed MedPAN North project, which included a survey of targeted marine alien species in Malta’s marine protected areas.

		<p>As part of the MSFD Initial Assessment a review of 56 non-indigenous species (NIS) recorded from the Maltese Islands was carried out. Moreover, good environmental status and targets have also been established for non-indigenous species.</p> <p>(http://era.org.mt/en/Pages/MSFD-IAs-GES-Targets.aspx)</p> <p>When considering indicators used to assess progress towards the target, there is an increasing trend of alien species introductions in the marine environment as verified by records being documented in scientific literature (e.g. Evans, Barbara & Schembri, 2015²), as well as unintentional introduction of terrestrial alien species with the movement of goods.</p>
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In the case of the NBSAP measures under the Theme 4: Biological Introductions (Code - BI), progress is as follows, bearing in mind the different timelines:



■ 2012-2020

Measure	Progress	Comments
BII: A national information and early warning system (e.g. species black list + existing border controls and permitting procedures) is in place to prevent the introduction and spread of invasive non-native species via priority pathways. Accidental introductions are addressed by way of contingency planning thereby avoiding/minimising any socio-economic and environmental impacts.	⌚ - Good progress made but further action s/initiatives are required to implement the measure	Malta currently adopts border inspection posts as required by relevant EU policy, as well as applies permitting procedures for importation from third countries and transport, as required. Release of species into the environment is also controlled. The EU Regulation 1143/2014 of the European Parliament and of the Council on the Prevention and Management of the Introduction and Spread on Invasive Alien Species requires restrictions to be applied to IAS listed as of EU concern combined with <i>inter alia</i> the use of official controls at borders at Member State level plus the establishment of a permitting system (combined with conditions such as contingency plans). This Regulation is binding to all Member States, including Malta as from 1 January 2015. Monitoring of alien species through Rapid Assessment Surveys in hotspots (namely harbours which are considered to be the main points of entry in view of shipping activities) has been included in Malta's monitoring programme for the marine environment for non-indigenous species (http://era.org.mt/en/Documents/MonitoringFactSheet_D2_NonIndigenousSpecies.pdf) This would allow detection of alien species at an early stage.

² Evans, J., Barbara, J. & Schembri, P.J. (2015) Updated review of marine alien species and other 'newcomers' recorded from the Maltese Islands (Central Mediterranean). *Mediterranean Marine Science* 16(1): 225-244

<p>BI2: A systematic and coherent national strategy on invasive non-native species is in place by 2015 and is based on the CBD's three-stage hierarchical approach, which includes prevention, early detection of the species, and rapid action by eradication, containment and control (where feasible). This strategy is supported by other policy guidance on the removal of invasive species.</p>	 - Good progress made but further action is/initiatives are required to implement the measure	<p>Policy guidance was adopted in 2013 to address invasive plants and restoration of terrestrial plant communities as mentioned in the previous short written contribution by Malta to the Bern Convention. The guidelines are available in English from: http://era.org.mt/en/Documents/PlantInvaders-RestorationGuidelines-2013.pdf</p> <p>Work is progressing on the drafting of the national strategy as required by the NBSAP Measure BI2.</p>
<p>BI3: Endemic species and areas of conservation value at risk by invasive species are identified, and prioritised for targeted, well-planned, ecologically and financially feasible remedial action, with the goal of reinstating self-sustaining native communities and healthy ecosystems.</p>	 - Good progress made but further action is/initiatives are required to implement the measure	<p>Eradication or control activities are currently identified on an <i>ad hoc</i> basis, and are focused on priority cases and in certain protected areas. For those terrestrial protected areas where IAS has been identified as a pressure/threat, conservation measures to address such IAS have been defined in the respective management plans. Management plans or conservation orders have been adopted for all terrestrial protected areas forming part of the Natura 2000 network https://era.org.mt/en/Pages/Natura-2000-Management-Planning.aspx.</p>
<p>BI4: Key stakeholder groups, such as traders (pet shops, breeders and nurseries), as well as land and sea users cooperate to prevent the unwanted release/escape and spread of non-native and invasive species into the environment. To assist this, national codes of best practices are established in consultation with key stakeholders and adopted for those sectors that can aid the introduction and spread of invasive species. The drawing up of such codes builds on European Codes of Conduct as adopted under the Bern Convention.</p>	 - limited progress due to action not yet being made or action still very early in its implementation	<p>Progress is assigned an inadequate status since the timeline was not met. However, work on drafting of recommendations to serve as national codes of best practice is now being done in parallel with the development of the national strategy (see BI2 above).</p>

Malta has also drafted a Dossier on the Capture and Killing of Wild Terrestrial Fauna in the Maltese. The latter addresses species of fauna which are threatened by deliberate and/or incidental capture and killing, as well as animal species whose exploitation should be managed. It aims to assist Malta in building a strict protection regime, by devising strategic plans for each species or group of species addressed and includes a number of conservation measures for such species, including recommendations on the eradication of Invasive Alien Species.

ACTIONS TO CONTROL/ERADICATE ALIEN SPECIES WITHIN NATURA 2000 SITES.

Control of the spread of invasive alien species by site managers within protected areas, combined with monitoring to assess progress and effectiveness of the measures adopted, as well as planting of native species as appropriate, has continued since the last report submitted in 2013.

The following is a summary of the main actions undertaken:

- Rehabilitation of sand dunes at ir-Ramla tal-Mixquqa (Natura 2000 site), with species targeted for removal having included: *Carpobrotus spp.*, *Lavatera arborea*, *Agave americana*, *Agave attenuata*, *Aloe ferox*, *Aptenia cordiflora*, *Opuntia stricta* and *Yucca gloriosa*.
- BirdLife Malta has been successful in restoring sand dune remnants within the l-Ghadira Natura 2000 site and Bird Sanctuary through the removal of *Arundo donax*.
- GAIA Malta (eNGO) has for a number of years continued with efforts to remove, and control the further spreading of, *Acacia saligna* from coastal clay slopes at Ghajn Tuffieha Natura 2000 site.
- LIFE Saving Buskett is another EU funded project whereby alien species were tackled in a Natura 2000 site. In this case, *Ailanthus altissima* specimens were removed to make way for the regeneration of a maquis habitat.
- At Dwejra (Gozo), *Carpobrotus edulis* and *C. acinaciformis* were completely eradicated from this Natura 2000 site.
- IAS considerations have been integrated in the management plans that have been drawn up for terrestrial Natura 2000 sites under the EAFRD Funded Project on Natura 2000 Management Planning for Malta and Gozo. More information is available at: <http://era.org.mt/en/Pages/Natura-2000-Management-Planning.aspx>
- The Environment and Resources Authority has itself carried out an exercise of complete eradication of *Agave americana* from Ghadira Safra Natura 2000 site.
- The Environment and Resources Authority has also embarked on a series of actions to eradicate *Agave americana* and *Carpobrotus edulis* from the island of Comino (also a Natura 2000 site).

In addition to the above actions on terrestrial sites, monitoring initiatives are also being carried out in the marine environment.

The University of Malta launched the citizen science campaign “Spot the alien fish”. As a support to surveillance, data gathered through this campaign will help early detection of IAS in Maltese waters that are already present in the Mediterranean Sea.

Furthermore, the mobile application “Malta Flora & Fauna” has been launched. This provides data about species present in the Maltese Islands and allows citizens to upload photos and information of particularly interesting species come across. Meanwhile, it can serve as a tool to report alien species encountered.

In relation to the Ballast Water Management Convention, which is expected to come into force in the near future, Malta is carrying out a study to assess its preparedness to implement the obligations as laid down in this Convention. As part of the study, an assessment of marine IAS through this pathway will be carried out.

REPUBLIC OF MOLDOVA / RÉPUBLIQUE DE MOLDOVA

NATIONAL REPORTS ON INVASIVE ALIEN SPECIES OF THE REPUBLIC OF MOLDOVA (2017)

The Republic of Moldova is located near the Carpathian Mountains, the Black Sea, and the East European Plain in the south-eastern part of Europe. Occupying a landlocked area of 33,843 km², the country is surrounded by Ukraine on its northern, eastern and southern boundaries and by Romania in the west. The landform of the country comprises of a hilly plain, gradually sloping from the northwest to the southeast, with altitudes varying between 5 to 429 metres, and an average elevation of around 147 metres above sea level.

The country straddles three main European eco-regions: the Central-European mixed forests, the Pontic steppe and the East European forest steppe. Steppe zone biodiversity has been more affected by human activities than forest zone biodiversity (found in the central and northern parts of the country), which has led to a non-uniform distribution of biodiversity.

Agricultural lands cover around 75% of the country.

Many populations are situated at the extremes of the natural areas of species, which increases vulnerability to climate change and anthropogenic factor. As a mainly agricultural country, the biodiversity of crop plants and livestock is especially important for the country's economy.

The flora of the Republic of Moldova includes 5,568 species of plants (of which 2,044 species of superior plants and 3,524 species of inferior plants), with a series of relict tertiary and quaternary species, while several very rare species are the sub-endemic element. Over 30 species of ligneous plants are important sources of existence for the rural population, about 200 species of medicinal plants, while about 700 species of plants from spontaneous flora are fodder plants that serve as food for wild animals and the livestock. The Red Book of the Republic of Moldova (3rd edition) includes 208 species of rare, vulnerable and endangered plants.

The diversity specific to the animal kingdom is explained by the landscape variety where there are, at relatively small distances, various types of ecosystems (forests, water, steppe, grasslands, rocks) and morphologic structures of the relief (hollows, terraces, narrow valleys, etc.). The Republic of Moldova borders the Balkan region and forms a transition zone between the elements of the continental Asian steppe fauna and the European forest steppe.

There are about 15,000 species of animals, of which: 474 species are vertebrate (75 species of mammals, 281 species of birds, 14 species of reptiles, 14 species of amphibians and 90 species of fish), other species being non-vertebrate (mainly insects).

The 3rd edition of the Red Book of the Republic of Moldova includes 219 species of rare, vulnerable and endangered animals. The most endangered ones are reptiles.

The invasive species cause a strong negative impact on the biodiversity of the Republic of Moldova. The invasion of synanthropic species in the degraded natural ecosystems hinders the processes of restoring the natural biocenosis and affects their functionality.

The irrational use of natural ecosystems has led to their fragmentation, to a considerable reduction of the number and even extinction of some species. The absence of rivals and the presence of free ecological niches, create preconditions for the emergence of alien (foreign) species and the numerical growth of some native species, which by their excessive development may become invasive.

About 150 species of invasive animals inhabit the territory of the republic, including about 130 species that damage the crops and 15 species - forests. It was found that the annual losses from agriculture constitute 5-10% at grain crops, 15% at weeding plants and 25% at perennial crops.

Native invasive species are considered the common vole (*Microtus arvalis*), the common rat (*Rattus norvegicus*), the house mouse (*Mus musculus*) and dozens of species of insects – the main pests of agricultural crops and forests. Alien invasive species are considered the Colorado potato beetle (*Leptinotarsa decemlineata*), the fall webworm (*Hyphantria cunea*) Mediterranean fruit fly (*Ceratitis capitata*), San Jose scale (*Quadrastrioides perniciosus*), etc.

Many non-native species of animals were introduced deliberately, though not always scientifically argued (raccoon dog, muskrat, dappled deer, pheasant, etc.). Over the years it was observed that the raccoon dog and the muskrat have become invasive species and the dappled deer proved to be dangerous for maintaining the native species of common deer.

The weeds with aggressive nature constitute 114 species, of which 11 - quarantine species (Arceuthobium spp. (noneuropean population), Acroptilon repens D.C., Ambrosia psilostachia D.C., Cuscuta approximata Bob., Cuscuta europaea L., Cuscuta Lehmanniana bge, Cuscuta monogyna Vahl., Iva axillaris Push., Solanum elaeagnifolium Cav., Solanum rostratum Dun., Solanum triflorum Nutt., Striga sp.sp.). The representatives of these species damage mostly natural ecosystems of degraded pastures and agricultural ecosystems.

By Government Decision no. 356 of 31.05.2012 was approved the List of harmful organisms, plants, plant products and other objects whose introduction and distribution in the Republic of Moldova is prohibited and the List of harmful organisms whose introduction and distribution in the Republic of Moldova is prohibited in the case where they are present on certain plants or plant products.

Along with the damage that can be caused to the national economy, there are intensifying processes of spreading dangerous infections (tularemia, pseudo-tuberculosis, rabies, etc.). Of the 12 ixodid tick species, four of them (*Dermatentor marginatus*, *D. reticulatus*, *Haemaphysalis punctata*, *H. inermis*) have a high adaptive capacity, inhabiting various ecosystems and parasitizing a large number of animals and transmitting dangerous infections.

The Ministry of Environment, being aware of the danger posed by invasive species, found the need to develop a national strategy to address non-native species, integrated European strategy on biological invasions with funding from the National Ecological Fund project "Identification of invasive animal species in Moldova and assessing their impact on natural and human ecosystems", a project implemented by the Institute of Zoology of the Academy of Science.

Thus, within the project took place the inventorying of species of mammals, birds, reptiles, amphibians, insects, nematodes, fish, mollusks, crustaceans, algae, was established the specific composition of communities of animals, was determined the abundance of species, were identified invasive species and assessed their ecological impact, economic and social, were determined the ways invasive species enter the Republic of Moldova. There were established the main factors favoring overdevelopment invasive species.

Registry data and information base was initiated on non-indigenous species from the Republic of Moldova, which served as the basis for drawing up the national list of invasive animal species - 149 species (-12 mammals, birds, -2, reptiles-3, fish – 4, molluscs-6, crustaceans -1, haematophagous arthropods-11, insects -67, flukes -1, tapeworms -6, nematodes-36).

The list of the most dangerous invasive species for Moldova (107 species) was made. Of the 100 most dangerous invasive species worldwide of which 55 are animals in Moldova were identified 14 species (25%). (*Dreissena polymorpha*, *Anopheles quadrimaculatus*, *Vespa vulgaris*, *Cinara cupressi*, *Lymantria dispar*, *Salmo trutta*, *Cyprinus carpio*, *Sturnus vulgaris*, *Felis catus*, *Capra hircus*, *Mus musculus*, *Sus scrofa*, *Vulpes vulpes*, *Mustela erminea*).

The Atlas of alogenic invasive entomofauna in Moldova was published in 2015, which includes information on invasive entomofauna of corn, Solanaceae, greenhouse plants, fruit trees, vines, ornamental trees and useful invasive entomofauna.

Unfortunately, we do not have a complete inventory of invasive plant species that could fill the real situation and create the prerequisites for reducing the impact of invasive species on biological diversity.

The Action Plan for the enforcement of the Strategy for Biodiversity for the Period 2015-2020 (Annex 2 to the Government Decision no. 274 dated 18 May 2015) provides the measures to diminish the negative impact of invasive species, including the development and implementation of the action plan on invasive species in accordance with the requirements of the Berne Convention, study of the impact of invasive alien species, drafting a program of measures to combat *Acer negundo*, developing guidelines on effective practices combating invasive species and training for the land owners (public and private) on the impact of invasive species and measures to combat them.

MONACO / MONACO



Direction de l'Environnement

**PRINCIPAUTÉ DE MONACO
CONTRIBUTION
Référence : ACR/DE-2017-008a
Juin 2017**

SOMMAIRE

Biodiversité terrestre

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- L'entomofaune
- L'avifaune
- L'herpétofaune

Biodiversité marine

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Bibliographie

* * *

La Principauté de Monaco a réalisé de nombreux inventaires de la biodiversité présente sur son territoire tant terrestre que marin. Ils sont effectués par la Direction de l'Environnement avec le concours de scientifiques et de spécialistes.

L'objectif de ces inventaires est de répertorier le plus exhaustivement possible toutes les espèces en se focalisant souvent sur celles plus remarquables de par leur valeur patrimoniale ou leur rareté.

Les espèces invasives n'ont de ce fait pas fait l'objet d'inventaire particulier et sont identifiées au fil des programmes menés sur la biodiversité en général.

Prenant en compte la géographie monégasque, pays entre mer et montagne, comportant des frontières avec la France, accueillant un héliport ayant des liaisons notamment avec l'aéroport international de Nice en France et abritant deux ports dont l'un équipé pour les bateaux de croisière

internationaux, Monaco comme tout espace soumis aux échanges internationaux n'échappe pas à l'introduction d'espèces dites invasives dans son milieu. Certaines ont été volontairement introduites, d'autres non. Elles ont été observées et certaines font désormais partie du paysage naturel. Certaines font l'objet de suivi et d'observation et pour certaines des actions sont mises en place pour leur régulation voire leur éradication.

Ainsi, de par sa géographie, sa topographie et son urbanisme, le territoire monégasque peut être qualifié de quasi insulaire, regorgeant d'espèces et d'habitats particuliers, mais il est également un territoire soumis à une forte pression extérieure et de nombreux apports internationaux.

Le phénomène du changement climatique favorise également l'installation et l'adaptation de ces espèces. En quatre décennies, la moyenne des températures en Principauté s'est élevée de plus de 1° C. cette tendance se poursuit sur la décennie en cours avec une augmentation constante et plus particulièrement sensible sur les moyennes des températures minimales.

Ce rapport ne pouvant ainsi prétendre à l'exhaustivité se présente comme une contribution pour présenter les espèces exotiques invasives qui ont été observées à Monaco et les actions préconisées.

1. BIODIVERSITÉ TERRESTRE

La biodiversité terrestre de la Principauté de Monaco a été étudiée plus spécialement dans les domaines suivants :

- La flore ;
- L'entomofaune ;
- L'avifaune ;
- L'herpétofaune.

Elles ont permis de mettre à jour une biodiversité particulièrement riche dans un milieu pourtant fortement urbanisé mais qui bénéficie d'une particularité et d'une singularité propres à Monaco : cette quasi insularité ouverte sur le monde.

La flore

Concernant la flore, les scientifiques en charge de l'inventaire effectué en 2006, ont découvert un milieu riche d'espèces patrimoniales et/ou rares. Ils ont cependant aussi constaté la forte présence de plantes exotiques qui se sont acclimatées.

Les plantes exotiques à Monaco sont originaires principalement des régions tropicales, subtropicales et méditerranéennes.

Monaco est réputé pour ses plantes grasses et cactus qui ont été introduites au fil des ans et qui se sont reproduites *in situ* (phénomène de naturalisation). Un jardin inauguré en 1933 leur est entièrement consacré. Environ 5000 taxons de plantes succulentes y sont cultivés.

Ces plantes xénophytes ont peu à peu colonisé les espaces comme les falaises et pentes rocheuses (Rocher, Jardin Exotique).

Certaines ont un caractère envahissant, colonisant et occupant l'espace au détriment des espèces locales moins compétitives.

Notamment ont été repérées : *Acanthus mollis*, *Aeonium div. sp.*, *Aloe div. sp.*, *Crassula div. sp.*, *Freesia corymbosa*, *Iberis*, *Ipomoea indica*, *Nicotiana glauca*, *Opuntia div. sp.*, *Senecio angulatus*, *Senecio deltoideus*, *Erigeron karvinskianus*, *Erysimum cheiri*, *Medicago arborea*, *Pittosporum tobira*.

Se référer au tableau suivant extrait du rapport : « *L'inventaire de la flore terrestre sauvage de la Principauté de Monaco* », réalisé en collaboration par l'Institut Méditerranéen d'Ecologie et de Paléoécologie, Université Paul Cézanne Aix-Marseille III.

Tableau 5.1. Principaux végétaux exotiques à caractère envahissant présents en Principauté de Monaco, et liste des communautés végétales indigènes et des végétaux menacés à caractère patrimonial

Plantes envahissantes	Famille	Habitats envahis et menacés (*)	Végétaux indigènes patrimoniaux menacés
<i>Acanthus mollis</i> L.	Acanthaceae	B – C – E	<i>Adonis nicaeensis</i> (Bd Charles III), <i>Coronilla valentina</i> subsp. <i>valentina</i>
<i>Aeonium</i> spp. : <i>A. arboreum</i> (L.) Webb & Berth., <i>A. smithii</i> (Sims) Webb & Berth., <i>A. haworthii</i> Webb & Berth.	Crassulaceae	A – B – C – E	<i>Adonis nicaeensis</i> (Vallon Ste-Dévote), <i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i> , <i>Critmum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Limonium cordatum</i> (falaises ouest du Rocher), <i>Matthiola incana</i>
<i>Agave americana</i> L.	Agavaceae	A – B – C	<i>Chamaerops humilis</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Allianthus altissima</i> (Miller) Swingle	Silmaroubaceae	B – C	<i>Euphorbia dendroides</i> , <i>Pimpinella peregrina</i>
<i>Aloe</i> spp. : <i>A. arborescens</i> Miller, <i>A. salm-dyckiana</i>	Alzoaceae	A – B – C – E	<i>Chamaerops humilis</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Aptenia cordifolia</i> L. fil.	Alzoaceae	A	<i>Allium acutiflorum</i> , <i>Critchum maritimum</i> , <i>Limonium cordatum</i> (falaises ouest et sud du Rocher), <i>Matthiola incana</i>
<i>Crassula iycopodioides</i> Lam.	Crassulaceae	A	<i>Allium acutiflorum</i> , <i>Critchum maritimum</i> , <i>Limonium cordatum</i> (falaises ouest et sud du Rocher)
<i>Crassula ovata</i> (Mill.) Druce	Crassulaceae	A – E	<i>Limonium cordatum</i> (falaises ouest et sud du Rocher), <i>Matthiola incana</i>
<i>Cotyledon orbiculata</i> L.	Crassulaceae	A – E	<i>Allium acutiflorum</i> , <i>Limonium cordatum</i> (falaises ouest et sud du Rocher), <i>Matthiola incana</i>
<i>Drosanthemum floribundum</i> (Haw.) Schwantes	Alzoaceae	A	<i>Allium acutiflorum</i> , <i>Critchum maritimum</i> , <i>Limonium cordatum</i> (falaises ouest et sud du Rocher), <i>Matthiola incana</i>
<i>Echium fastuosum</i> Alton	Boraginaceae	B – C – E	<i>Critchum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Matthiola incana</i>
<i>Erigeron karvinskianus</i> DC.	Asteraceae	D	<i>Adonis nicaeensis</i> (Bd Charles III), <i>Adiantum capillus-veneris</i> , <i>Asplenium petrarchae</i>
<i>Erysimum cheiri</i> (L.) Crantz	Brassicaceae	B – C – E	<i>Adonis nicaeensis</i> (Bd Charles III), <i>Rampe Major</i> , <i>Valion Ste-Dévote</i> , <i>Allium acutiflorum</i> , <i>Carduus litigiosus</i> , <i>Campanula macrorhiza</i> , <i>Critchum maritimum</i> , <i>Matthiola incana</i>
<i>Freesia alba</i> (G.L. Meyer) Grumbleton	Iridaceae	B – C – E	<i>Adonis nicaeensis</i> (Bd Charles III), <i>Rampe Major</i> , <i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i>
<i>Iberis sempervirens</i> L.	Brassicaceae	B – C – E	<i>Adonis nicaeensis</i> (Bd Charles III), <i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i> , <i>Matthiola incana</i>
<i>Ipomoea Indica</i> (Burm.) Merr.	Convolvulaceae	B – C – E	<i>Allium acutiflorum</i> , <i>Critchum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Kalanchoe verticillata</i> Elliot	Crassulaceae	A – E	<i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i> , <i>Matthiola incana</i>
<i>Lantana camara</i> L.	Verbenaceae	B – C – E	<i>Allium acutiflorum</i> , <i>Critchum maritimum</i> , <i>Matthiola incana</i>
<i>Lavandula dentata</i> L.	Lamiaceae	B – C – E	<i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i> , <i>Matthiola incana</i>
<i>Ligustrum lucidum</i> Alton fil.	Oleaceae	B – C	<i>Euphorbia dendroides</i> , <i>Pimpinella peregrina</i>
<i>Medicago arborea</i> L.	Fabaceae	A – B – C – E	<i>Adonis nicaeensis</i> (Tour de l'Esperon), <i>Chamaerops humilis</i> , <i>Critchum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Nicotiana glauca</i> R.C. Graham	Solanaceae	B – C – E	<i>Adonis nicaeensis</i> (Bd Charles III), <i>Matthiola incana</i>
<i>Opuntia</i> spp. : <i>O. ficus-indica</i> (L.) Miller, <i>O. vulgaris</i> Miller	Cactaceae	A – B – C – E	<i>Allium acutiflorum</i> , <i>Critchum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Pittosporum tobira</i> (Thunb.) Alton fil.	Pittosporaceae	B	<i>Adonis nicaeensis</i> (Rampe Major), <i>Allium acutiflorum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Ricinus communis</i> L.	Euphorbiaceae		
<i>Senecio angustatus</i> L. fil.	Asteraceae	A – B – C – E	<i>Adonis nicaeensis</i> (Vallon Ste-Dévote), <i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i> , <i>Chamaerops humilis</i> , <i>Critchum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>
<i>Senecio deltoideus</i> Less.	Asteraceae	B – C	<i>Euphorbia dendroides</i> , <i>Matthiola incana</i>
<i>Trachelium caeruleum</i> L.	Campanulaceae	A – D	<i>Adiantum capillus-veneris</i> , <i>Campanula macrorhiza</i> , <i>Critchum maritimum</i> , <i>Phalaris aquatica</i>
<i>Tradescantia fluminensis</i> Vellosa	Commelinaceae	D	<i>Adiantum capillus-veneris</i>
<i>Tropaeolum majus</i> L.	Tropaeolaceae	B – C – E	<i>Allium acutiflorum</i> , <i>Campanula macrorhiza</i> , <i>Chamaerops humilis</i> , <i>Critchum maritimum</i> , <i>Euphorbia dendroides</i> , <i>Lavatera maritima</i> , <i>Matthiola incana</i>

(*) A : Végétation des fissures des falaises calcaires littorales à *Limonium cordatum*; B : Fourrés thermophiles méditerranéens à euphorbe arborescente; C : Fourrés thermophiles méditerranéens à palmier nain; D : Parois calcaires suintantes thermophiles à campanule; E : Falaises calcaires thermophiles à campanule.

Les experts ont proposé des méthodes en vue de gérer les végétaux exotiques envahissants tout en attirant l'attention sur les difficultés de mise en oeuvre :

- Techniques mécaniques : arrachage manuel, passage au feu, limitation de la lumière, ...
- Techniques chimiques (herbicides) : exclues sur le territoire monégasque (politique du

Gouvernement, exigüité du territoire).

- Techniques biologiques : herbivorie, lutte biologique.

Il est très difficile d'éradiquer en une seule fois et en totalité les populations xénophytes.

La plupart des espèces exotiques de Monaco sont des plantes héliophiles pour lesquelles la limitation de la lumière par installation de bâche, serait une bonne solution.

Les techniques de lutte biologique constitueraient également une solution à envisager.

Cependant, l'éradication des espèces envahissantes doit se faire précautionneusement et sous contrôle pour ne pas entraîner des conséquences plus néfastes (glissement et érosion des sols, introduction de nouvelles espèces, ...).

Source : Etude réalisée en collaboration par l'Institut Méditerranéen d'Ecologie et de Paléoécologie, Université Paul Cézanne Aix-Marseille III sous la coordination de Madame Diadema : rapport « *Inventaire de la flore terrestre sauvage de la Principauté de Monaco* », 2006.

Ce travail a été repris et complété en 2016 lors de la réalisation d'une étude spécifique sur les espèces exotiques envahissantes. Rapport réalisé par le Conservatoire d'espaces naturels Provence-Alpes-Côte d'Azur par Madame Motta : « *Les espèces exotiques envahissantes sur le territoire monégasque* », 2016.

Des stratégies de gestion sont proposées pour éviter leur expansion voire les éradiquer lorsque cela est faisable. L'accent est mis sur la prévention par des méthodes d'observation et de signalement afin d'éviter l'installation de nouvelles espèces envahissante.

Le tableau suivant est extrait de ce rapport :

Tableau 3. Liste des 35 espèces végétales exotiques envahissantes et potentiellement envahissantes de la Principauté de Monaco. Leur statut est indiqué : MAJ : Majeure ; MOD : Modérée ; EME : Emergente ; AL : Alerté.

Code REF	Nom scientifique reconnu (TAXREF v7)	Noms vernaculaires (TAXREF v7)	Statut
80332	Aeonium haworthii Webb & Berthel., 1840	Aeonium de Haworth	AL
900222	Aeonium smithii (Sims) Webb & Berth.		AL
80383	Agave americana L., 1753	Agave d'Amérique	MOD
446092	Agave americana 'Marginata'		AL
610762	Agave salmiana Otto, 1842		AL
80824	Ailanthus altissima (Mill.) Swingle, 1916	Faux-vernis du Japon, Vernis du Japon, Ailanthe	MAJ
81588	Aloe arborescens Mill., 1768	Aloé arborescente, Aloé de Krantz, Aloé candélabre	AL
81605	Aloe x principis (Haw.) Stearn, 1938	Aloé	AL
82018	Amaranthus retroflexus L., 1753	Amarante réfléchie, Amaranthe à racine rouge	MOD
83235	Aptenia cordifolia (L.f.) Schwantes, 1928	Baby sun rose, Ficoïde à feuilles en cœur	AL
85068	Atriplex halimus L., 1753	Halime, Arroche halime	MOD
89211	Carpobrotus acinaciformis (L.) L.Bolus, 1927	Ficoïde à feuilles en sabre, Griffé de sorcière	MAJ
92734	Cotyledon orbiculata L., 1753	Nombobil de venus, Oreille-de-cochon	AL
92799	Crassula muscosa L., 1760	Orpin musqué, Chaîne-de-montre	AL
93020	Crepis bursifolia L., 1753	Crépide à feuilles de capseille	MOD
96775	Erigeron karvinskianus DC., 1836	Érigéron de Karvinsky, Pâquerette, Marguerite folle	EME
96814	Erigeron sumatrensis Retz., 1810	Vergerette de Barcelone	MOD
98958	Freesia alba (G.L.Mey.) Grumbleton		EME
103493	Iberis sempervirens L., 1753	Ibéris toujours fleuri	AL
160174	Kalanchoe delagoensis Eckl. & Zeyh., 1837	Chandelier plant	AL
105304	Lavandula dentata L., 1753		AL
105960	Ligustrum lucidum W.T.Aiton, 1810	Troène luisant	MOD
107575	Medicago arborea L., 1753	Luzerne en arbre	MAJ
109608	Nicotiana glauca Graham, 1828	Tabac glauque	AL
109711	Nothoscordum borbonicum Kunth, 1843	Ail inodore, Ail odorant	MOD
110758	Opuntia ficus-indica (L.) Mill., 1768	Oponce figuier de Barbarie	MAJ
111910	Oxalis pes-caprae L., 1753	Oxalis pied-de-chèvre	MAJ
113785	Pittosporum tobira (Thunb.) W.T.Aiton, 1811	Arbre des Hottentots	MOD
116285	Pteris vittata L., 1753	Ptéris rubané, Fougère à feuilles longues	AL
122545	Senecio angulatus L.f., 1782	Sénéçon anguleux	EME
122586	Senecio deltoideus Less., 1832		EME
122630	Senecio inaequidens DC., 1838	Sénéçon sud-africain	MOD
613615	Symphytum subulatum var. squamatum (Spreng.) S.D.Sundb., 2004	Aster écailloux	MOD
126930	Trachelium caeruleum L., 1753		AL
128956	Veronica persica Poir., 1808	Véronique de Perse	MOD

L'entomofaune

Les différentes prospections effectuées dans les zones vertes, rupestres ou aménagées, de Monaco ont révélé une richesse insoupçonnée en matière d'entomofaune.

L'étude de la faune du sol a permis de confirmer la bonne qualité des sols des espaces verts. Cela conforte la politique menée par le Gouvernement Princeps de bannir tout traitement et intrant chimiques et de privilégier des pratiques culturelles raisonnées.

Des espèces exotiques, introduites volontairement ou non, ont été recensées. Elles sont notamment dues à la plantation de végétaux en motte provenant de pépinières étrangères ou à une forte capacité de dispersion. Leur présence crée des situations de concurrence avec les espèces indigènes partageant la même niche écologique.

Parmi ces espèces, sont considérées comme invasives et sont à surveiller plus particulièrement :

- Le coléoptère *Ataenius picinus* Harold, 1867 : espèce nuisible qui endommage les pelouses de certains jardins publics. Originaire d'Amérique tropicale en expansion dans la région.
- *Trachyphloeosoma advena* Zimmerman, 1956 : charançon originaire de l'Asie du Sud Est. Sa découverte serait une première en Europe. Il aurait été importé avec les cerisiers d'ornement plantés au Jardin Japonais.
- *Rhynchophorus ferrugineus* Olivier, 1791 : espèce redoutable qui fait l'objet d'une surveillance particulière. Plus connu sous le nom de charançon rouge des palmiers, il est actuellement très présent dans toute la région entraînant la mortalité de nombreux palmiers.
- *Belonochilus numedius* Say, 1831 : hétéroptère originaire d'Amérique du Nord vivant sur les platanes. Signalée récemment en Europe, départements de Corse et de l'Hérault (Matocq, 2008).
- *Leptoglossus occidentalis* Heidemann, 1910 : hétéroptère de grande taille, largement répandue en France, originaire des Etats-Unis. Se nourrit des graines et des fleurs de diverses espèces de conifères mais ne causerait pas de dégâts significatifs mais une vigilance s'impose. Son impact sur la reproduction des conifères pourrait être important.

Le tableau suivant reprend la liste des espèces de coléoptères pouvant être considérés comme invasifs – extrait du rapport « *Arthropodes de la Principauté de Monaco, coléoptères, hétéroptères* »

Anobiidae	<i>Synanobium</i> n.sp.
Anthribidae	<i>Araecerus fasciculatus</i> (DeGeer 1775)
Bruchidae	<i>Acanthoscelides pallidipennis</i> (Motschulsky 1874) <i>Bruchidius siliquastri</i> Kergoat et al. 2007
Cerambycidae	<i>Xylotrechus stebbingi</i> Galan, 1906
Chrysomelidae	<i>Luperomorpha xanthodera</i> (Fairmaire, 1888) <i>Cryptolaemus montrouzieri</i> Mulsant 1853
Coccinellidae	<i>Harmonia axyridis</i> (Pallas 1773) <i>Novius cruentatus</i> (Mulsant 1850) <i>Rhyzobius forestieri</i> (Mulsant 1853) <i>Rhyzobius lophanthae</i> (Blaisdell 1892) <i>Rodolia cardinalis</i> (Mulsant 1850)
Corylophidae	<i>Sericoderus brevicornis</i> Matthews 1890
Cryptophagidae	<i>Atomaria lewisi</i> Reitter 1877
Curculionidae	<i>Cirellus japonicus</i> (Reitter 1877) <i>Neoderelomus prififormis</i> (Hoffmann, 1938)
Dermestidae	<i>Trogoderma versicolor</i> (Cretzschmar, 1799)
Dryophtoridae	<i>Sitophilus oryzae</i> (Linnaeus 1763)
Hydrophilidae	<i>Cercyon laminatus</i> Sharp 1873 <i>Cryptopleurum subtile</i> Sharp, 1884 <i>Dacylosternum abdominalis</i> (Fabricius 1792)
Lathridiidae	<i>Cardiophorus bifasciatus</i> (Reitter 1877)
Mycetophagidae	<i>Litargus baileatus</i> LeConte 1856
Nitidulidae	<i>Carpophilus mutillatus</i> Erichson 1843 <i>Carpophilus nepos</i> Murray 1864 <i>Carpophilus zeaphilus</i> Dobson 1969
Scolytidae	<i>Epuraea luteola</i> Erichson 1843 <i>Epuraea ocellaris</i> Fairmaire 1849 <i>Meligethinus pallidulus</i> (Erichson 1843) <i>Stelidota geminata</i> (Say 1825)
Staphylinidae	<i>Urophorus rubripennis</i> (Heer 1841) <i>Coccotrypes dactyliperda</i> (Fabricius 1801) <i>Dactylotrypes longicollis</i> (Wollaston 1864) <i>Alianita mucronata</i> (Kraatz 1859) <i>Hypomedon debilicornis</i> (Wollaston 1857) <i>Lithocharis nigriceps</i> Kraatz 1859 <i>Paraphloeostiba gaudichainensis</i> (MacLeay 1873) <i>Oryzaephilus surinamensis</i> (Linnaeus 1758)
Silvanidae	

Un cas un peu différent est celui des coccinelles importées dans le cadre de la lutte biologique, et dont plusieurs espèces sont maintenant bien établies dans la Principauté, ce qui peut également constituer une menace pour les espèces indigènes de coccinelles. Il s'agit de *Harmonia axyridis*, *Cryptolaemus montrouzieri*, *Novius cruentatus*, *Rodolia cardinalis*, *Rhyzobius lophantae*, *Rhyzobius forestieri*.

- *Rhyzobius forestieri* (Mulsant 1853) : originaire d'Australie introduite en France en 1986 dans des vergers de l'île de Porquerolles (Var). Elle s'est ensuite très rapidement répandue dans les départements du sud de la France puis plus récemment dans la moitié nord du pays.
- *Harmonia axyridis* (Pallas 1773) : importée de Chine en 1982 par l'INRA pour la lutte biologique. Après une période d'étude en serres, elle a été utilisée à partir de 1990 en région méditerranéenne sur les pucerons et les psylles dans les vergers. L'intérêt de cette espèce en lutte biologique est sa fécondité élevée, sa voracité et la possibilité de l'élever en milieu artificiel, son coût de production moins élevé que celui de la Coccinelle à deux points *Adalia bipunctata* indigène. Expansion très importante et risque de concurrence avec les espèces indigènes. Il est pour le moment impossible de préciser la menace que constitue cette coccinelle pour la faune locale de la Principauté car nous ne disposons pas du recul nécessaire.

Des recommandations ont été préconisées par les experts pour les mesures à mettre en œuvre pour empêcher la prolifération de ces espèces invasives : observations et interventions *in situ* dès les premiers signes de présence, tamisage de la terre, traitement biologique par des nématodes, installation de pièges à phéromones, ...

Sources :

Etude de 2011 réalisée en collaboration par l'Institut Méditerranéen d'Ecologie et de Paléoécologie, Université Paul Cézanne Aix-Marseille III sous la coordination de Monsieur Ponel. Rapport : « *Arthropodes de la Principauté de Monaco, coléoptères, hétéroptères* », 2011.

Etude de 2016 réalisée par l'association Troglorites sous la responsabilité de Monsieur Lemaire. Rapport : « *La faune des sols des jardins publics de Monaco* » 2016.

Le rapport rédigé en 2016 sur les espèces exotiques envahissantes reprend les résultats de ces études. Rapport réalisé par le Conservatoire d'espaces naturels Provence-Alpes-Côte d'Azur par Madame Motta : « *Les espèces exotiques envahissantes sur le territoire monégasque* », 2016.

Indépendamment des inventaires, deux espèces exotiques envahissantes doivent être prises en compte à Monaco :

- *Aedes albopictus* dit « moustique tigre » ;
- *Vespa velutina nigrithorax*, frelon à pattes jaunes ou frelon asiatique.
- *Aedes albopictus* : originaire des forêts d'Asie du Sud Est, les conditions climatiques favorables ont permis la prolifération de ce moustique sur tout le territoire. Il a été observé pour la première fois en Principauté en 2006. Son introduction est préoccupante car en plus d'être considéré comme nuisible, il est vecteur de transmission de maladies comme le virus de la dengue ou du chikungunya.

Les études scientifiques menées par le Gouvernement ont mis en évidence un allongement de la période d'activité de l'*Aedes albopictus*. Ainsi, les périodes où les conditions sont favorables à la transmission des virus se prolongent en fonction de la durée de la période estivale.

Aussi le Gouvernement monégasque a élaboré un plan national de lutte comprenant notamment des mesures d'information du public et des actions préventives et de démoustication.

Une réflexion a aussi été initiée pour contrer la prolifération avec notamment une amélioration de la gestion de l'eau. L'utilisation d'un larvicide biologique (une bactérie) permet de cibler les larves de façon sélective, sans toxicité pour les humains ou les animaux.

- *Vespa velutina nigrithorax* : originaire d'Asie continentale c'est une espèce envahissante à forte capacité d'adaptation et de dispersion. Elle représente un danger particulièrement pour les abeilles domestiques (*Apis mellifera*) auxquelles il s'attaque pouvant entraîner la mort de la ruche. Il a été signalé sur le territoire français dès 2004 et est désormais présent à Monaco. Des mesures d'observation et d'éradication sont mises en place.

L'avifaune

Un inventaire de l'avifaune présente à Monaco a été effectué sur la période 2010-2011.

Cinq espèces d'oiseaux exotiques ont été inventoriées sur ces deux années. Ce sont des oiseaux de la famille des anatidés qui fréquentent les mares des jardins de Fontvieille :

- le canard carolin *Aix sponsa*,
- le canard de Barbarie *Cairina moschata*,
- le canard blanc (espèce indéterminée),
- l'oie de Guinée.

Ces espèces sont d'origine allochtone (américaine pour le canard carolin *Aix sponsa* par exemple), d'élevage ou de ferme pour les autres spécimens. Ce sont des espèces « prisonnières » soit de leur « handicap » par éjointage (action de rogner les ailes des oiseaux qui sont alors incapables de voler), soit de leurs habitudes (nourriture distribuée par les passants, promeneurs fréquentant ces jardins publics). Elles sont censées « agrémenter » les zones aquatiques des jardins.

Les préconisations visent à éviter les introductions volontaires d'espèces exotiques ornementales pour favoriser l'avifaune endémique.

Source : Etude réalisée en collaboration par le Conservatoire d'espaces naturels Provence-Alpes-Côte d'Azur sous la coordination de Mesdames Beaudoin et Ménétrier : « *L'inventaire de l'avifaune de la Principauté de Monaco* », 2012.

Cet inventaire a été confirmé en 2016 lors de la réalisation de l'étude spécifique sur les espèces exotiques envahissantes. Rapport réalisé par le Conservatoire d'espaces naturels Provence-Alpes-Côte d'Azur par Madame Motta : « *Les espèces exotiques envahissantes sur le territoire monégasque* », 2016.

Une espèce complète la liste avec une observation en 2015 du Capucin bec-de-plomb *Eodice malabarica*, espèce nicheuse probable (un mâle chanteur identifié sur le secteur pendant 2 semaines). En l'état des connaissances, l'espèce ne semble pas présenter un danger pour l'avifaune locale.

L'herpétofaune

L'étude réalisée en 2016 sur les espèces exotiques envahissantes a mis l'accent sur la Tortue à tempes rouges ou Tortue de Floride - *Trachemys scripta elegans*, présente à Monaco.

Elle est considérée comme potentielle envahissante mais elle ne colonise pas de nouveaux habitats, et reste dans les zones périurbaines où elle a été observée. Son alimentation est suspectée d'avoir un effet négatif sur la flore et la faune aquatiques si les tortues sont présentes en forte densité, en particulier sur les amphibiens et les invertébrés. Cette tortue est porteuse de pathogènes tels que *Salmonella enterica*, pouvant occasionnellement se transmettre à l'homme.

Les mesures de gestion préconisées visent à la régulation/limitation des populations.

Source : Rapport réalisé par le Conservatoire d'espaces naturels Provence-Alpes-Côte d'Azur par Madame Motta : « *Les espèces exotiques envahissantes sur le territoire monégasque* », 2016.

2. BIODIVERSITÉ MARINE

La biodiversité marine des eaux de la Principauté de Monaco a fait l'objet de nombreuses études. Cependant aucun inventaire gouvernemental n'a été mené spécifiquement sur les espèces exotiques envahissantes marines.

La présence de certaines d'entre elles est cependant notoire. La forte fréquentation par des navires de plaisance de gros tonnage constitue un potentiel d'introduction d'espèces exotiques invasives et le phénomène de réchauffement climatique favorise leur installation dans les eaux monégasques.

La flore

Parmi les espèces exotiques envahissantes les plus remarquées se retrouvent *Caulerpa taxifolia* et *Caulerpa racemosa*.

Ces espèces ont un comportement envahissant et leur expansion dans les eaux monégasques a été étudiée pour la dernière fois entre 2006 et 2008. Plusieurs cartographies ont été effectuées.

Dans de nombreux secteurs prospectés au cours de cette étude, *Caulerpa taxifolia* était toujours l'algue la plus présente, dans la tranche bathymétrique 0-30 m en particulier. Son recouvrement atteignait même 100% au niveau de certains sites. *Caulerpa taxifolia* était peu fréquente dans l'herbier dense. En général, elle restait cantonnée en lisière ou dans les inter-mattes d'herbier. Elle pouvait également couvrir les têtes de coralligène et les roches affleurantes. Sa population serait stabilisée.

La présence de ces algues est toujours observée avec intérêt lors des différentes études menées sur le milieu marin en Principauté. Aujourd'hui, il est possible de constater une régression de cette colonisation par la disparition de nombreux petits points de colonisation et par une baisse de la densité dans les zones colonisées.

Quant à *Caulerpa racemosa*, elle se répartit principalement à des profondeurs débutant autour de 35/40 m. Sa dynamique de colonisation semble être plus rapide que celle de *Caulerpa taxifolia* et toute tentative d'éradication est inefficace. Son évolution est suivie pour observer les impacts susceptibles sur la faune et la flore locales.

Autre espèce préoccupante : *Ostreopsis ovata*.

Cette algue microscopique habituellement présente dans les eaux tropicales, a été observée depuis 1972 dans les eaux méditerranéennes. Les eaux de ballast des navires seraient à l'origine de son introduction accidentelle et le réchauffement climatique aurait favorisé son développement. Elle produit de la palytoxine et peut être毒ique pour la faune marine et peut provoquer des intoxications alimentaires et divers troubles plus ou moins importants chez l'homme. En période d'efflorescence, les plages sont interdites à la baignade.

Le Gouvernement a mis en place un programme de surveillance de cette algue. Des prélèvements d'eau de mer et d'algues sont effectués régulièrement.

Le suivi d' *Ostreopsis ovata* est également inscrit dans les travaux de l'Accord de prévention et de lutte contre la pollution du milieu marin, dit Accord RAMOGE, entre la France, l'Italie et Monaco.

La faune

Souvent associées à la présence d'algues tropicales, certaines espèces de poissons exotiques sont désormais présentes dans les eaux monégasques comme le poisson flute, originaire des océans Indien et Pacifique, vu pour la première fois en 2010 à Monaco.

Les différentes explorations et le suivi des espèces patrimoniales marines permettent l'observation des nouvelles espèces rencontrées mais dont le listing n'est pas à ce jour finalisé.

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NORWAY / NORVÈGE

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THE BERN CONVENTION: ALIEN SPECIES EXPERT WORKING GROUP MEETING 1-3. JUNE 2017

Presentation to the IAS Working Group of the Bern Convention: Update on the work with Invasive Alien Species in Norway

Contents

1. Legislation
2. Scientific Committee for risk assessment
3. New cross-sectoral action plan on alien species
4. Revision of national black list
5. Action programs
6. Collection of data on distribution by the Threatened Species Unit
7. Pathways

1. Legislation

As of 1 January 2016 the new regulation on alien species entered into force in Norway. This is regarded as a major shift since this is the first time that the environmental authorities will control import of live species from all categories, and not as previous mostly vertebrates. The regulation imposes a ban on import, trade and release/planting of several alien species. Further main requirements are that all import of live species (some exemptions including plants) and release/planting need a permit issued by the environment authorities, unless they are listed on the exemption list. Permits will only be issued after a screening and risk assessment and may be issued with conditions of responsibility if unintended spread occurs. Any activity that relates to alien species falls under a requirement of cautious behavior and are in particular relevant for commercial enterprises, but also applicable for private persons. The regulation includes inspections of enterprises, including check on knowledge, control systems and information to customers. A new electronic system/portal for applications informs and handles registration of customers and processing of applications.

General information on the regulation: <http://miljodirektoratet.no/no/Regelverk/Forskrifter/Forskrift-om-fremmede-organismer/> in Norwegian)

The regulation: <https://lovdata.no/dokument/SF/forskrift/2015-06-19-716> (in Norwegian)

English version: <https://www.regjeringen.no/en/dokumenter/forskrift-om-fremmede-organismer/id2479700/>

The regulation falls under the Nature Diversity Act (2009), and both this act and again explicitly in the new regulation, increases the obligation by both the environmental authorities and the sectors to minimize or compensate for any nature use and potential damage, through risk analysis and mitigation. The same protection and focus on sustainability is expressed in the Constitution Article 112. The diversity act already states that all (incl. sectors) have a responsibility to avoid negative impacts on the environment. This could occur from transport of soil, planting of trees along roads or in parks etc. If negative effects occur, then it is the sector that must remedy the situation.

Another relevant regulation is the regulation on planting of foreign tree species, as used by forestry (dated 2012). This regulation requires permits for any such planting activities and the intent is to avoid potential spread of alien species beyond the planted areas.

2. National committee for risk assessments

As a result of increased legal frameworks for import and use of alien species (see para 1 above), more documentation and risk-analysis are now required before import and release permits can be granted. A new committee was therefore established in 2016 under the umbrella of the national scientific committee for food safety (<http://www.english.vkm.no/>). The panel will be given tasks to analyse species and groups of species. Concluded analyses can be found at <http://www.english.vkm.no/scientific-panels/panel-on-alien-organisms-and-trade-in-endangered-species-cites> and so far include i.a. analysis of aquarium water plants, arachnids and some insects.

3. New cross-sectoral plan on alien species

After Parliament debate following the new White Paper on the environment in 2016 (cf. <https://www.regjeringen.no/no/aktuelt/stortingsmelding-natur-for-livet/id2468165/>) a decision was made to establish a committee to initiate a broad action plan against alien species in collaboration with the different sectors. The former cross-sectoral plan for alien species (2007) wil provide the framework for the action plan. The plan will be finalized in 2018 and will include focus on cost-benefit analysis aspects and implementation of common measures against prioritized alien species and pathways. Cf. also commissioned study on cost-benefit of alien species: http://www.miljodirektoratet.no/Documents/Nyhetsdokumenter/VA2014-52_Samfunnsøkonomiske_kostnader_av_fremmede_arter.pdf

4. The Norwegian Black List

The first edition of *Alien Species in Norway – with the Norwegian Black List* was first issued in 2007 by the Norwegian Biodiversity Information Centre (<http://www.artsdatabanken.no/>) & English: <http://www.biodiversity.no/>). The next edition of the black list is under production and is expected to be published by spring 2018. The most recent version was published in 2012 and use a new method to categorize the evaluated species. The method was developed by the Centre for Conservation Biology at the Norwegian University of Science and Technology. The methodology can be used for any group of organism (taxa) and therefore the impact categories are comparable across taxa (fungi, insects, plants etc). The black list serves both as a management tool, as well as a source of information for relevant authorities and the public. The used criteria are semi-quantitative and uses precisely defined threshold values (as also used with red lists). Use of quantitative impact assessment reduces the subjectivity, and enables a transparent, repeatable and testable results. Expected ecological effect can be described as the product of invasion potential and ecological effect. A species will have a small impact whenever one of the factors are small, regardless of large the other factor is. This is portrayed on a two dimensional figure, where impact is indicated by the species position along two axes, an invasion potential axis and an ecological effect axis. The end result categorizes the species in five categories: Severe impact (SE), high impact (HI), potentially high impact (PH), low impact (LO) and no known impact (NK). Sub categories, criteria and threshold values for classifying the invasion potential of alien species are assessed according to set criteria on expected population lifetime, expansion velocity, increase in area of occupancy, increase in occurrence and area of habitat type occupied. For ecological effect the subcategories, criteria and values are similarly described along set timelines.

The 2012 black list was established by a working group of 50 experts under the auspices of the biodiversity centre. Of 2595 recorded alien species in Norway, 1180 was listed: 106 in the highest category with severe impact (SE), 111 with high impact (HI), 198 with potentially high impact (PH), 399 with low impact (LO) and 366 with no known impact (NK). An English version of the black list (212 pp) can be seen at <http://www.artsdatabanken.no/Article/Article/133437>

5. Management and action plans

Most action plans are focusing on reducing the effects of fairly common invasive alien species. These are conducted mostly by municipalities, while the central conservation authorities has issued guidelines and in some cases support financially these activities. The support was important in the initial phase in the late 1990ies. Today funds are mostly channeled through the government representative at the regional level (ie County Governors). These coordinate and encourage local activities. The counties also manage protected areas. Since it is considered that invasive alien species is a serious threat to >30% of the protected areas, special focus is afforded to support activities in these areas. The national State Rangers are often used to handle machinery and manpower in these areas.

For some species it has been published national action plans against invasive alien species. Importantly these are on raccoon dog (2008), cf also a Nordic collaboration programme; American mink (2012) and for Japanese rose *Rosa rugosa* (2013), see list of more recent plans below. For the mentioned species the aim is to prevent the raccoon dog from becoming established in Norway, as it is seen as a tremendous threat to birds and mammals. So far the species has been eliminated from the country, while substantial populations exists in Finland, Denmark and Sweden. The mink eradication programme is highly successful in removing the species from breeding islands for seabirds. However it need annual and regular follow up, while the reward is successful breeding of seabirds. Japanese rose eradication is foremost focusing on protected areas and aims to eliminate the species totally in many areas in large tracts of the country. The species is mostly spread on sandy beaches, but can also be dominant on rocky beaches.

On monitoring programs the national environment authority remarks that here is generally a serious lack of resources to undertake adequate monitoring. The authorities especially sees a challenge with horticulture import (cf several studies on plant imports and accidental follow organisms), introduction and spread of alien freshwater fish through both aquafarming, private releases (strictly forbidden) and ornamental fish trade, and the ongoing spread of coastal alien marine species of many different taxa (eg jellyfish, mussels, crabs, seaweed).

Norway sees it as important that the international community steps up its efforts to ban or regulate trade in known pest species. This could be through increased efforts by for instance the EPPO, EU, IMO and nationally through compliance with decisions made by the biodiversity Conventions.

One of the alien species where most funds have been spent in Norway is the fight against *Gyrodactylus salaris* (salmon lice), cf. info sheet: <http://www.miljodirektoratet.no/old/dirnat/attachment/1155/03-2010%20Fremmede%20og%20skadelige%20arter%20i%20vann.pdf>. This alien species has infected a number of watercourses and significant sums are used towards eradication. Mostly this includes treatment with rotenone of entire watercourses.

As a result of the new regulation in 2016 on alien species, the import of live american lobster has been banned. While it may be too late as it is already under spread along the coast.

The Arctic realm

Climate change has exacerbated the situation and enabled the spread of more alien species not only in mainland Norway, but also into the Arctic region where expanding human economic activities is a cause of concern. The Arctic Council has recently released a report on Arctic alien species, which aims to tackle the rising environmental threats from alien species. The Arctic Invasive Alien Species Strategy and Action Plan (ARIAS), produced by the Conservation of Arctic Flora and Fauna (CAFF) and the Protection of the Arctic Marine Environment (PAME) working groups, recommend priority actions that the Arctic Council and its partners are encouraged to take to protect the Arctic region from one of the most significant emerging stressors: the adverse impacts of invasive alien species. The ARIAS report acknowledges that while there are currently few invasive alien species in the Arctic, more are expected with climate change and increased human activity. Rapidly changing environmental conditions and a growing interest in resource extraction, settlement and tourism make the Arctic region particularly vulnerable to biological invasions. Norway has therefore established a new program for monitoring and controlling alien species in

the Norwegian Arctic. The program has not yet been made public, but this is expected summer 2017 on the following webpage: <http://www.sysselmannen.no/Toppmeny/Om-Sysselmannen/Sysselmannens-oppgaver/Miljøvern/Artsforvaltning/>.

CAFF media-release: <https://caff.is/council-recommends-actions-to-protect-the-arctic-from-invasive-alien-species-may-11-2017>

The Strategy and Action Plan: <https://caff.is/strategies-series/415-arctic-invasive-alien-species-strategy-and-action-plan>

Other recent plans for elimination or restriction of distribution of alien species

Japanese rose (2013):
http://www.miljodirektoratet.no/Global/dokumenter/Publikasjoner/Rapporter/DN-rapport-1-2013_nett_endelig%20versjon.pdf

Canadian waterweed and Nuttall's waterweed (2015):
<http://www.miljodirektoratet.no/Documents/publikasjoner/M347/M347.pdf>

Pacific oyster (2016): <http://www.miljodirektoratet.no/Documents/publikasjoner/M588/M588.pdf>

American mink (2011): http://www.miljodirektoratet.no/old/dirnat/attachment/2362/DN-rapport-5-2011_nett.pdf

How the spread of alien fish species threatens the environment (2017):
<http://www.miljodirektoratet.no/no/Nyheter/Nyheter/2017/Mai-2017/Fremmed-fisk-skader-miljoet/>

6. Collection of data on distribution by the Norwegian Biodiversity Information Centre

The biodiversity centre continues to develop its role as a national source of updated information on species and their distribution, cf. <http://www.biodiversity.no/>. This includes records of alien species. This knowledge bank can be used for risk analysis and background information for future revisions of present regulations.

7. Pathways

Knowledge about dispersal pathways and vectors is central to effective prevention of immigration, spread and establishment of alien species. The pattern observed in Norway corresponds to other analyses undertaken on pathways. Most alien species have established in Norway as a result of naturalization, followed by species that have come to the country as a stowaway. This is in contrast to the non-reproductive alien species, where stowaway is by far the most important dispersal pathway. Terrestrial vascular plants is the most important group represented in the data used. In Svalbard, vascular plants constitute the dominant species group, but in recent years there has also been reports of invertebrates and fish (see Hendrichsen et al. 2014).

Recent publications, with focus on pathways:

- General:
 - Hendrichsen, D.K., Åström, J., Forsgren, E. & Skarpaas, O. 2014. Dispersal pathways for alien species in Norway. - NINA report 1091, 113 pp. [in Norwegian with English summary]
- Specific pathways with high risk:
 - Hagen, D., Endrestøl, A., Hanssen, O., Often, A., Skarpaas, O., Staverløkk, A. & Ødegaard, F. 2012. Alien species. Mapping and monitoring of «horticultural import» as a vector for invasion LINK:
http://www.nina.no/Portals/0/Nyhetsaker/Dokumenter/NINA%20Rapport%20915_1%C3%A5st.pdf [in Norwegian with English summary]

- Westergaard, K.B., Hanssen, O., Endrestøl, A., Often, A., Stabbetorp, O., Staverløkk, A. & Ødegaard, F. 2015. Dispersal of alien species through plant import to Norway – NINA Report 1136. 105 pp [in Norwegian with English summary]
- Hagen, D., Endrestøl, A., Hanssen, O., Often, A., Skarpaas, O., Staverløkk, A. & Ødegaard, F. 2012. Alien species. Mapping and monitoring of «timber-import» as a vector for invasion. – NINA Report 980. 92 pp. LINK: <http://www.nina.no/archive/nina/PppBasePdf/rapport/2013/980.pdf> [in Norwegian with English summary]

PORTUGAL / PORTUGAL



INVASIVE ALIEN SPECIES - PORTUGAL (2013-2014)

ICNF, IP, PORTUGUESE AGENCY FOR NATURE CONSERVATION AND FORESTS³

STRENGTHENING NATIONAL POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS

Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species

The Regulation entered into force on 1 January 2015 and it is binding in its entirety and directly applicable in all Member States.

Decreto-Lei n.º 565/99, de 21 Dezembro

According to this legislation there is a number of alien species with invasive capacities or that can have ecological negative impacts that can't be held, released into the nature or traded. Furthermore, any request for introduction of an alien species needs to be accompanied by a risk analysis and obtain a positive advice by ICNF.

ICNF (*Instituto da Conservação da Natureza e das Florestas*), the Portuguese agency for nature conservation and forests is the major responsible for the implementation of national and EU regulations on IAS.

The revision process of this Portuguese regulation on invasive alien species is almost finished. A technical draft prepared by ICNF was subject to a consultation period and the contributions from public institutions, universities, research centres and stakeholder associations were taken into consideration to prepare a revised version. This version, which includes a proposal of blacklist (National List of Invasive Alien Species) is under consideration by the Portuguese government.

Portaria n.º 1226/2009, de 12 de Outubro

Prohibits/regulates holding and possession of live specimens of several animal species (especially alien species).

Under the **legal regime of Environmental Impact Assessment** and in what concerns to mitigation/compensation measures, several EIA processes are submitted to changes on the recovery projects in order to include measures of control/recuperation of areas occupied by invasive alien species.

National Forest Strategy 2015

According to the revised National Forest Strategy published in early 2015 the evolution of the territorial expression of woody IAS (mainly from the genera *Acacia* and *Hakea*) is evident. According to

³ Except for the reference to LIFE projects (funded by the European Union), this report does not include information from Madeira and Azores regions, only from the Portuguese mainland.

the 6th National Forest Inventory (INF 6) indicates that from 1995 to 2010 the area occupied by forest dominated by species of the genus *Acacia* almost duplicated (approx. 98.5% increase) corresponding to an average increase of approx. 7% per year. The National Action Programme to Control Invasive Woody Species, identified as one of the measures to adaptation of forests to climate change, is still to be designed/implemented. Despite that, control measures are being used, even if in a random/localised basis: pulling out young acacia trees after mechanical cleaning or cutting down and chemically treating acacia trees in several protected areas/state owned forests.

Alien organisms harmful to plants/plant products and animals are dealt under **national phytosanitary and animal health legislations** that include the transposition of EU regulations on these issues.

AWARENESS AND SUPPORT

Awareness activities on Invasive species

Every year several activities on the importance to control invasive plants are promoted by public institutions (ICNF, universities and research centres), NGO's, municipalities, and other civil society organisations.

An example are the Scientific Working Camps on Control of Invasive Plants, promoted by Centro de Ecologia Funcional / Universidade de Coimbra and Escola Superior Agrária de Coimbra in order to contribute to the dissemination of the theme of biological invasions and simultaneously to the resolution of this serious environmental problem (see <http://invasoras.uc.pt/>). These camps are linked to another type of actions, the 'Days on Invasive Plants Control', which consist of one day activities for volunteers that participate in control and awareness actions.

Specific actions directed to university students are also frequent, in order to attract more people to specialise in this important area of knowledge. Some university courses already have curricular units specifically on invasive species.

We also stress the participation of IAS experts in sectorial fairs and exhibitions (angling, ornamental plants, etc.) where IAS problems related to that specific sector are presented and discussed.

COLLECTING, MANAGING AND SHARING INFORMATION

Research and development in the context of invasive species are needed to better know, inter alia, dispersal mechanisms and techniques for species control and recovery of affected areas.

Research programs on IAS are steadily increasing, what is reflected on the number of publications, oral communications and posters that have been presented during this period. We also assist to an increase in MSc and PhD thesis on invasive species, both on animal and plants issues.

The number of projects on invasive species is also increasing. Some examples of pre-existing and new projects are shown.

Project FRISK - Determination of invasion pathways of fish introduced in freshwater ecosystems: risk assessment (2015)

Program: PTDC/AAG-MAA/0350/2014

Funding: Fundação para a Ciência e a Tecnologia

Proposing institution: MARE research center

Assessment of population trends and genetic diversity of the critically endangered *Iberochondrostoma olisiponensis* (“boga-de-boca-arqueada de Lisboa”) (2016)

This critically endangered species was only discovered in 2006 in two small tributary rivers of the lower Tagus River. The project goals are to evaluate the current state of the populations, propose priority areas for their conservation and disseminate knowledge about this national rarity among the Portuguese population.

Program: 152510795

Funding: Fundo para a Conservação de Espécies - Mohamed Bin Zayed (co-funded by Câmara Municipal de Loures and Fluvíario de Mora)

Proposing institutions: Centro de Ciências do Mar e do Ambiente (MARE); University of Basel (Switzerland), Universidade Federal do Maranhão (Brasil) and CIBIO-INBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos.

Alive bait – Polychaets used as live bait in Portugal: harvesting management, importation and culture (2104 - 2015)

The major objective of this project was the development of technological solutions for cultivation of *Hediste diversicolor* and other polychaetes with commercial interest as a support to promote a sustainable harvesting management and control impacts of alive bait importations, including the introduction of non-indigenous species.

Program: Fisheries Program PROMAR

Funding: European Fisheries Fund

Proposing institutions: Instituto Politécnico de Leiria; MARE; Centro em Rede de Investigação em Antropologia (CRIA)

Current status of the Portuguese oyster (*Crassostrea angulata*) in the Sado estuary, threats and opportunities for its commercial exploitation – CRASSOSADO (2015)

The major objective of this project is to assess the current status of the Portuguese oyster (*Crassostrea angulata*) natural populations at the Sado estuary, as a support for a sustainable management of the harvesting of this species. The current status of *C. angulata* natural reefs is assessed, as well as the occurrence of *Crassostrea gigas*. Growth, reproductive cycle and pathologies of the Portuguese oyster and influence of environmental conditions are studied. Contamination of sediments by metals are also determined. Molecular techniques are used to identify possible occurrence of hybridization between *C. angulata* and *C. gigas*.

Funding: PORTUCEL, S.A.

Proposing institutions: ICNF; Centro de Ciências do Mar e do Ambiente (MARE); Centro de Estudos do Ambiente e do Mar (CESAM).

INVASORAS Website (invasoras.pt)

Website about Invasive Plants in Portugal, including Science-Citizen platform for mapping invasive plants in Portugal. “*What are they, where are they and how to control them*”.

Linked to Facebook, Twitter, Youtube, etc. In Portuguese and English languages.

Responsible institutions: ESAC / IPC and CEF / UC.

SOSVespa Platform (www.sosvespa.pt)

The Platform aims to support the identification and control of *Vespa velutina* in Portugal. Through the online geolocation of the nests of this alien invader, this WebSIG contributes to the communication between the local civil protection, the population and the central administration, as well as for the decision

making. It is a free and collaborative web application that supports the monitoring of the distribution and spread of the Asian hornet through online geolocation of nests on a map server. When a sighting is introduced, the Platform sends automatic warnings to the local administrators, so they can act faster and appropriately in the destruction of nests or specimens.

Since this Platform is operational (January 2015), circa 7200 nests and 900 sightings were registered. Each register is subject to validation by the local administrator of the Platform and is visible to the public only after that. Circa 6900 nests were already validated from which approx. 5000 were destroyed by the local authorities. Nests are built each year so many of the registers were of already abandoned nests. These nests usually get destroyed by heavy storms but destruction is recommended to tranquilise the population and avoid confusion with recently built nests. Only in Portuguese.

Responsible institution: ICNF

GESVESPA - Strategies for the sustainable management of *Vespa velutina* (2016 - 2017)

Includes 5 major priority actions covering all project goals:

1 - Identification and ecological characterization and 2 - Monitoring / surveillance – both directly related to the goal "analysis of the biological behaviour of the species in the areas of dissemination / occupation"

3 - Sustained control - directly related to the goal "development and testing of good practices of control and eradication of the species"

4 - Impact on beekeeping and biodiversity - directly related to the goal "assessment of the impact of Asian hornet on ecosystems and their pollination services"

5 - Information / dissemination / awareness - related to the goal "problematics associated with the introduction of the species in Portugal and promotion of public awareness for the associated risks".

Program: POSEUR-03-2215-FC-000008

Funding: Portugal 2020 (Programa Operacional Sustentabilidade e Eficiência no Uso de Recursos)

Proposing institutions: INIAV, Comunidades Intermunicipais, DGAV and national beekeepers federation (FNAP)

Wildgum - a multi-scale approach to studying the naturalization of common eucalyptus (*Eucalyptus globulus* Labill.) in Portugal

Program: PTDC / AGR-FOR / 2471/2012

Funding: FCT (COMPETE) and supported by FEDER

Proposing institutions: ISA and CEF/UC

Project BioMar PT - Learning to know the marine environment of Portugal

The project aims to contribute to the increase of competency frameworks to ensure the implementation of the "Marine Strategy" Framework Directive in mainland Portugal, providing training and qualifications to perform the continuous multidisciplinary monitoring, acquisition of technical skills for application of methodologies uniform processing and analysis of collected samples, and the processing and analysis of data and its availability in a simple, standardized and easy to understand format. The proposal covers a total of 25 training courses and qualifications at the level of higher education corresponding to 618 hours of training, intended for a universe of 450 students, and a total of 25 technical guides (minimum) to support MSFD on topics covered in the courses. The courses are organized in five thematic areas addressing the MSFD descriptors, in order to acquaint the trainees with the overall objectives of the MSFD and the importance of the monitoring programs for its implementation.

Target audience: BSc, MSc, PhDs, post-docs, graduation students, professionals from relevant fields related to the implementation of the MSFD and the sustainable management of the marine environment.

This project includes 5 training courses on identification of non-indigenous species in the Portuguese coast for the following taxonomic groups: tunicates, mollusc, crustaceans, bryozoan and macroalgae.

Some of the end products are already available at:
<http://biomarpt.ipma.pt/conteudo/formacao/produtos-finais->

Program:

Funding:

Proposing institutions: Estrutura de Missão para a Extensão da Plataforma Continental (EMEPC – Portuguese Task Group for the Extension of the Continental Shelf)

PREVENTION

INTENTIONAL INTRODUCTIONS

Trichilogaster acaciaelongifoliae (the Australian bud-galling wasp) – a chalcid wasp of the order Hymenoptera, used to control *Acacia longifolia* in South Africa; the request for introduction was made in the beginning of 2012 by the joint research team of Escola Superior Agrária de Coimbra and Centro de Ecologia Funcional / Universidade de Coimbra. The process was presented for advice by the Portuguese phytosanitary agency (DGAV) who requested new information from the research team. After analysing the complete process DGAV submitted it to the analysis of the EU phytosanitary council as it was the first time that this species was proposed for introduction in the EU. A favourable opinion was released by EFSA and the species started to be released in heavily invaded areas after authorisation by ICNF.

Anaphe inexpectatus – a parasitic wasp used to control the gum tree weevil (*Gonipterus platensis*) a defoliating insect from the Curculionidae family that feeds on *Eucalyptus* leaves. After some laboratorial essays the pulp sector afforestation companies started a program of experimental releases. ICNF asked the companies for a new assessment of the possible impact of the release of this species into the environment and the results were considered acceptable due to the high specificity of this parasitoid, so new releases have been authorized by ICNF to complement the effects of the previously released *Anaphes nitens*.

Torymus sinensis - a parasitic wasp used to control the chestnut gall wasp (*Dryocosmus kuriphilus*), a gall-making oak cynipid insect. Due to high damages caused by *D. kuriphilus* this parasitoid started to be released by the agriculture official agencies. However, there is a discussion about the specific/generalist character of this alien parasitoid, hybridization and the potential use of indigenous chalcid parasitoids.

UNINTENTIONAL INTRODUCTIONS

During the period 2015-2017 the establishment was confirmed for *Baccharis spicata*. Native to South America (Brazil, Paraguay, Uruguay and Argentina) this species is reported for the first time in Portugal (and Europe). Two naturalized populations were recorded in September 2015 near the city of Porto (Vila do Conde and Matosinhos).

In 2016 *Salvinia molesta* was detected in an artificial pond in southwest Portugal (Aljezur)

Until the moment there are no legal requirements to control these species through domestic legislation. The listing of these species was proposed under the revised national legislation.

CONTROL AND ERADICATION

Control of woody invasive alien species

In 2015-2017 ICNF, municipalities and some stakeholders continued the intervention especially in northern and central Portugal. Actions were directed to species of the genera *Acacia* and *Hakea* in order to control continuity and dispersal of these invasive trees.

Several techniques were used: manual taking of shoots from stumps and roots, and of seedlings resulting from seed germination; cutting and application of chemical products to the cut surface; planting hardwoods on high densities in clear cut areas.

In some of the areas it involved awareness actions with local communities (schools, local authorities, NGO's) and the support of volunteers.

Monitoring plan of the fish fauna in Vale do Guadiana Natural Park (2007-...)

Started in 2007 it includes the control of alien fish species in river Vascão sub-basin (Guadiana basin). Catches of alien species are held once a week during August, September and October, and focus primarily on the existing river pools. Usually, specimens of three fish species are captured (*Lepomis gibbosus*, *Micropterus salmoides* and *Australoheros facetus*) as well as specimens of the Louisiana crayfish (*Procambarus clarkii*).

Eradication plan for *Xenopus laevis* in the streams of Oeiras municipality area (2010 - ...)

Started in 2010, it is aimed to eradicate *Xenopus laevis* (Daudin, 1802), the African clawed frog, in the streams of Laje and Barcarena (Oeiras), and its screening in adjacent watercourses. Annual reports are being produced.

Proposing institutions: ICNF, Oeiras municipality, Centro de Biologia Ambiental / Faculdade de Ciências da Universidade de Lisboa and Instituto Gulbenkian de Ciência.

National program of action for the control of the pine wood nematode (*Bursaphelenchus xylophilus*)

Forest phytosanitary measure aiming at the removal of conifer trees host to the pine wood nematode and its transportation for disposal of the respective surpluses that must be eliminated by chipping or burning. Originating in the USA, the pine wood nematode endangers national pine forests and, consequently, the actions of removal of the affected pine trees can also disrupt the occurrence of other native species, such as *Armeria rouyan*, *Santolina impressa* and *Thymus capitellatus*, by reducing the area of suitable habitat.

LIFE+ BRIGHT - Bussaco´s Recovery from Invasions Generating Habitat Threats (2011 - 2017)

The Buçaco National Forest was created in the 17th century by the Unshod Carmelites, who fenced off an area of 400 ha and planted 'Biblical' tree species such as cypress and cedar. In 1834, the forest came under State ownership and new trees were planted. Together with other surviving parts of the original forests which are characteristic of the region – especially oak and laurel woods – these autochthonous woods encompass about 17.5 ha of an aernal habitat, which is unique in Portugal and Europe. Sharing some characteristics with Thermo-Mediterranean and pre-steppe scrub habitats, these relict woods are under threat from the expansion of alien invasive species, such as three acacia species, which have been the subject of eradication attempts in other areas

This project, developed at Buçaco National Forest aims the recovery of local habitats, trough the implementation of a set of integrated actions of control/eradication of exotic species, propagation and plantation of autochthonous plant species and active involvement of stakeholders (schools, local communities, visitors and private sector).

LIFE+ Biodiscoveries - Invasive species control through public participation (2014 - 2019)

Following a decision by the municipality of Barreiro to create a local protected area for the Machada forest and Coina marshes, surveys of flora and vegetation were carried out. These identified the need to protect the native woods of Machada, including the plant species *Euphorbia uliginosa* that is under threat from the spread of various invasive acia species. In the surrounding marsh areas the less aggressive, ice plants (*Carpobrotus edulis*) also posed a threat to native vegetation.

Considered the experiences of other LIFE projects, the aim is to develop an alternative to traditional models of invasive species' control combining public participation and a strong support of volunteers. It aims to show through its management model based on public participation that it is possible to achieve a better cost/benefit ratio, in terms of the allocation of resources and environmental impact, and also in terms of the social involvement in the control of invasive species.

LIFE RECOVER NATURA - Recovery of the species and land habitats of the Natura 2000 sites Ponta de São Lourenço and Desertas Islands (2013 - 2017)

The Natura 2000 sites Desertas Islands (located in Deserta Grande and Ilhéu Chão) and Ponta de São Lourenço on the Madeira archipelago are home to unique habitats listed in Annex I of the Habitats Directive: vegetated sea cliffs with endemic flora of the Macaronesian coasts and low formations of euphorbia close to cliffs.

These areas consist of a large number of species (218) and subspecies that are endemic to the Macaronesian bio-geographical region, Madeira and the Natura 2000 sites themselves. Seabirds, terrestrial molluscs, arthropods and plants are of greatest concern to conservationists. The flora and fauna of these islands have been threatened by numerous factors since their discovery, especially the introduction of invasive alien species. The implementation of appropriate management measures to control or eradicate these threats can help restore the area's natural biodiversity.

The long-term objective of this project is to ensure the ecosystems of the targeted Natura 2000 network sites reach a stable, 'favourable' and self-sustaining conservation status. This objective will be reached by creating the conditions for the recovery of the habitats and species present in these areas, namely through the eradication and control of introduced vertebrates, invertebrates and plants.

LIFE Fura-bardos - Conservation of Macaronesian Sparrowhawk and Laurissilva habitat in Madeira Island (2013 - 2017)

The distribution area of the Macaronesian sparrowhawk (*Accipiter nisus granti*) is restricted to the island of Madeira and to some islands of the Canary archipelago (Gran Canaria, Tenerife, La Palma, La Gomera and El Hierro). It is a bird of prey that favours forest environments, especially low-growing shrub areas (heathers, hollies and beeches). However, the species can still be seen near agricultural fields, open spaces or urban areas, which it uses as hunting grounds.

Although there are no accurate data on its actual population on the island of Madeira, it is estimated at between 1 000 and 2 500 individuals, whereas in the Canary Islands it is thought that the population is between 250 and 1 000 pairs. The species is faithful to its territory, building a new nest each year in a location close to the previous one. Considering recent changes in its habitat, particularly due to the expansion of invasive exotic plants, which have significantly reduced the potential nesting area, the recovery of areas of laurel forest habitat is essential in order not to compromise the reproductive capacity of the species, and thus its conservation.

The project is targeting the conservation of the Macaronesian sparrowhawk and its habitat, the Madeira Macaronesian laurel forest.

LIFE Maciço Montanhoso - Recovery and conservation of species and habitats on the Madeiran Central Massif (2012 - 2017)

In August 2010, a large wildfire destroyed approximately 2 800 ha, or 80% of the SPA “Maciço Montanhoso Oriental” (MMO) (PTZPE0041), on the island of Madeira. This SPA is part of the Natura 2000 site “Maciço Montanhoso Central” (MMC) (PTMAD0002). Understandably, the recovery of the natural environment has been slow, and the spread of several aggressive invasive species in burned areas poses a significant threat to the normal recovery of the indigenous flora, fauna and habitats. The goal of this project is to facilitate the regeneration and conservation of the fragile natural ecosystem of the MMO, including the recovery of plant, snail and bird communities within selected areas of the habitats. These include several endemic Madeiran species, 13 of which are listed in the Birds and Habitats Directives.

Ecological, environmental and genetic information will be gathered and used to produce habitat and species management plans, as well as to support the recovery of degraded habitats and create new populations of endangered species.

This project targets three priority habitats for conservation: endemic Macaronesian heaths, endemic forests with *Juniperus* spp., and European yew (*Taxus baccata*) woods. It will also target 11 plant species included in the Annex II of the Habitats Directive and Annex I of the Birds Directive, such as Zino’s petrel (*Pterodroma madeira*) and the Madeiran land snail (*Leiostyla cassida*), the distribution of which is mostly or completely restricted to the MMO.

LIFE Terras do Priolo - Active protection of the population of the Azores bullfinch (Priolo) and its habitats and sustainable management of Pico da Vara/ Ribeira do Guilherme SPA's (2013 - 2018)

The “Pico da Vara /Ribeira do Guilherme” Natura 2000 site is a major hotspot for biodiversity within the EU and the Macaronesia biogeographical region. It is home to one of Europe’s most endangered birds - the Azores bullfinch (*Pyrrhula murina*). Listed as a priority species for conservation in the EU Birds Directive, it is severely threatened by the growth of invasive alien plant species (IAS), which are destroying the native forests, heaths and shrubs, including the priority, Habitats Directive-listed, Macaronesian laurel forests – which provide a vital food source. The control of IAS, particularly on islands, is one of the priorities of biodiversity conservation in the EU.

The conservation of the Azores bullfinch was the target of a previous LIFE Nature project at this site, “PRIOLÓ” (LIFE03 NAT/P/000013). Selected as a ‘Best of the Best’ LIFE project, it resulted in new techniques of IAS control, habitat restoration and the improvement of economic benefits to local communities. However, some significant gaps still need to be filled in order to complete this work and secure the site’s priority species and valuable habitats.

The project’s main objective is to implement sustainable management measures for the conservation of the priority Azores bullfinch and the preservation of rare and endangered habitats.

LIFE+ INVASEP - Combating Invasive Species within the Tagus and Guadiana River Basins in the Iberian Peninsula (2012 - 2018)

Invasive alien species are a major threat to native biodiversity; competing with native species for food and habitat. Associated problems include reductions in the populations of native species and decreased genetic diversity. Non-native species can also act as reservoirs of infectious diseases that can lead to the extinction of some rare or endemic species.

This LIFE+ Biodiversity project’s global objective is to halt the loss of biodiversity associated with invasive alien species on the Iberian peninsula, thereby contributing to the aims of the European Commission’s strategy for "Halting the Loss of Biodiversity by 2010 and Beyond" [COM (2006) 216 final].

Involving cooperation between Spain and Portugal, this is the first trans-boundary project launched in the EU to tackle invasive alien species.

This Iberian project aims, among other, to establish a basis for Iberian cooperation on the fight against invasive alien species, including the development of a Strategy and an Action Plan and to proceed with the control/eradication and prevention of introduction of alien species to the Tagus and Guadiana river basins.

LIFE Berlengas - Conserving threatened habitats and species in Berlengas SPA through sustainable management (2014 - 2018)

In 2011 the Berlengas Natura 2000 site (SPA) was enlarged to include a significant proportion of its marine area. Linked to this site extension, the Portuguese nature conservation agency (ICNF) launched an initiative to develop a management plan for the new area.

The project aims to establish a legally binding management plan with clear and measurable actions and targets for defined sites in the Atlantic coastal archipelago. The Portuguese government has joined forces with SPEA (Portuguese Society for the Protection of Birds) for this objective. Project goals will be achieved through the use of tailored versions of proven archipelago management methodologies. Outcomes will be ready to apply at local, regional, national and international levels.

Three key project phases are planned: first, understanding the main threats affecting seabird populations and endemic plant species on land and at sea (for seabirds) and defining actions to minimise/eradicate them, including a long-term monitoring scheme; second, promoting sustainable use of the recently created Berlengas Natura 2000 site (SPA), focusing on its three main economic activities (fisheries, recreational activities and tourism); and third, confirming the necessary monitoring framework for the completion and approval of the management plan.

This project includes, *inter alia*, monitoring the impacts of introduced plant species on three endemic plant species, the assessment of *Carpobrotus edulis* (main invasive plant species), including its expansion range and the test of eradication methods at specific areas and the identification of human pressures and its relation to alien plants/mammals;

Action Plan for the management and control of the Asian hornet (*Vespa velutina*)

Since 2013 the municipalities in the north-western part of the country, with the support of beekeepers' associations and the local civil protection structures, started to destroy the summer nests of the Asian hornet. In 2014 ICNF together with DGAV (national authority for animal and plant health) and INIAV (national research laboratory for agriculture and veterinary) started working on an action plan to tackle the growing problem of dissemination of the species. This plan was only finished by the end of 2014 and presented to the public in January 2015.

ICNF and DGAV share the responsibility for the general coordination of the plan: ICNF is also responsible for the information management (an online platform was created to register all the sightings of specimens or *Vespa velutina* nests and allow the day to day management of the destruction process) while DGAV is the responsible for the coordination of training programs and information/dissemination. The municipalities take care of the destruction of the nests while INIAV is responsible for the setting of an active system with sentinel apiaries to monitor the dispersal of the species and for the general scientific support.

Regarding the training program, 16 sessions have taken place in the north and centre of the country, with 632 attendants, mostly from municipal and law enforcement authorities and local beekeepers associations. The national beekeepers federation is one of the entities responsible for the training, together with DGAV, INIAV and ICNF.

One of the major control measures is the destruction of nests: a small primary nest (approx. 10cm diameter) is built by the colony founder ("queen"), a fertilised female that survived winter and then the hornets from the first brood build a secondary nest, much bigger, that may grow until the colony has 2000-3000 hornets (and produce 150 or more founder hornets). Trapping founder hornets is an important

measure (each founder killed is one colony less) and new traps and baits are to be tested under project GESVESPA.

INVADER-B - Management of invasive plants in Portugal: from the prevention to the remote detection and biological control of *Acacia longifolia* (2013 - 2015)

Program: PTDC/AAG-REC/4607/2012

Funding: FCT (COMPETE) co-funded by FEDER.

Proposing institutions: CEF/UC and ESAC.

INVADER-IV - INnoVative Approaches to Detect invasive spEcies and biocontRol agents" (2016 - 2019)

Program: (PTDC/AAG-REC/4896/2014),

Funding: FCT and FEDER (Portugal 2020 - Programa Operacional Competitividade e Internacionalização).

Proposing institutions: CEF/UC, ESAC and Introsys.

GANHA - Sustainable management of *Acacia* spp.: natural control and other methodologies for recovery of habitats in classified areas (2017 - 2020)

Program: POSEUR-03-2215-FC-000052)

Funding: Portugal 2020 (Programa Operacional Sustentabilidade e Eficiência no Uso de Recursos) co-funded by RAIZ - Instituto de Investigação da Floresta e Papel.

Proposing institutions: Universidade Coimbra (Líder), RAIZ, CM Vagos, CM Figueiró-dos-Vinhos.

Project for the eradication of *Baccharis spicata* in the Metropolitan Area of Porto (2017 - ...)

Program: FUTURO – a project for 100,000 trees in the Metropolitan Area of Porto

Proposing institutions: Univ. Católica do Porto and CRE Porto

SLOVAK REPUBLIC / RÉPUBLIQUE SLOVAQUE

ACTIONS ON INVASIVE ALIEN SPECIES IN SLOVAKIA (IMPLEMENTATION OF THE EUROPEAN STRATEGY ON IAS IN SLOVAKIA) (2015 – 2016)

Invasive Alien Species (IAS) work done in Slovakia in the period of 2015 - 2016 covers various activities important for the solution of the IAS problem in the Slovak Republic (SR).

Following information gives some examples of what was done in Slovakia in that period and illustrates how the European Strategy on IAS was implemented in Slovakia. However, it is not a comprehensive information covering all country sectors, it is rather information focusing on environment sector mostly.

1. BUILDING AWARENESS AND SUPPORT

IAS issues have stable place in study/ education programmes and research work. In 2015 Slovakia started with implementation of the EU Regulation on IAS and in 2016 IAS issues were also on the agenda of the Slovak Presidency of the Council of the EU under the Bern Convention and Convention on Biological Diversity, so media covered the issue more frequently.

State Nature Conservancy of SR continues its cooperation in IAS management with stakeholders, mostly with local authorities and landowners. Activities of some NGOs are also very helpful in the work with local and district authorities, namely Civic Association Tatry is still very active not only in the Tatras region but all over Slovakia. Members of that NGO are mapping invasive alien plant species and sending letters with results to the district authorities with request for identification of the land owners and users and eradication of recorded species.

Besides activities of NGOs, more people from the general public, mostly people having gardens, come to the regional administration offices of the State Nature Conservancy of SR and ask for an advice for effective eradication of some invasive alien plant species.

2. STRENGTHENING NATIONAL POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS

When the EU Regulation No. 1143/2014 on the prevention and management of the introduction and spread of IAS entered in force, Slovakia (Ministry of Environment of SR) intensified its work on the implementation of the EU Regulation. First idea was to amend the *Act No. 543/2002 on Nature and Landscape Protection as amended* because this legal norm covers the IAS issues. After discussions and negotiations with other relevant sectors that idea was changed and in July 2016 Ministry proposed a new act on the prevention and management of the introduction and spread of IAS. Second half of the year 2016 was important for Slovakia because of its Presidency of the Council of the EU. IAS issues were on the agenda of the Slovak Presidency at the 36th meeting of the Standing Committee to the Bern Convention (Strasbourg, 15 – 18 November 2016) and at the 13th meeting of the Conference of the Parties to the Convention on Biological Diversity (Cancun, 4 – 17 December 2016).

3. COLLECTING, MANAGING AND SHARING INFORMATION

State Nature Conservancy of SR developed the *Complex Information and Monitoring System* (KIMS) within the EU Structural Funds project. KIMS covers gathering data on IAS in one of its modules (occurrence data). It is providing for experts as well as general public, e.g. on-line or mobile phone application for sending the data into the system. KIMS also offers the option for finding some information on IAS in Slovakia.

More information on IAS both IAS of Union concern (EU List of IAS) and Slovak concern (National List of IAS) can be downloaded from the updated homepage of the State Nature Conservancy of SR: <http://www.sopsr.sk/invazne-web/>.

The Central Controlling and Testing Institute in Agriculture also published information on IAS of the Union concern on its homepage: <http://web.uksup.agroinstitut.sk/oor-buriny-a-popisy/>.

State Nature Conservancy of SR is sharing gathered information on IAS at various conferences and workshops. In 2015 e.g. the Ministry of Environment of SR organized with other partners (Slovak Environment Agency, Union of Towns and Cities of Slovakia and Association of Towns, Cities and Villages of Slovakia) the workshop *Biodiversity and Urban Areas* (Banská Bystrica, 16 – 17 June, 2015). IAS issue was one of the topics discussed at the workshop. IAS issues were also presented at the conference organized by the Greek Catholic Archiepiscopate in Prešov *Land as a Gift of the God and its responsible use in the contemporary world* (Eutina, 22 – 23 May, 2015). Information on current situation on invasive alien plant species and nature conservation in Slovakia was presented at the European Workshop on Control and Eradication of Invasive Alien Species in Budapest (19 – 21 April 2016).

4. REGIONAL COOPERATION AND RESPONSIBILITY

Traditionally there is a good bilateral cooperation between neighboring countries: Czech Republic, Poland, Hungary, and Austria. The cooperation is both formalized (via annual protocols on bilateral cooperation) and informal based on the cooperation of the staff of the relevant nature protection bodies (ministries and expert institutions – administrations of protected areas) in neighboring countries.

IAS e.g. were subject to the meeting of bilateral Slovak Hungarian Commission on Nature and Landscape Protection in 2016 where the results of bilateral projects were presented including elimination of IAS in the border areas covered by projects. Bilateral projects (7) were realized within *Transboundary Cooperation Programme Hungary – Slovakia 2007 -2013*, however, some of them were finalized in 2015. IAS issues were covered e.g. in the framework of the project HUSK 1101/2.2.1/0004 *Survey of the river Hornád and its tributaries from nature conservation point of view* and HUSK 1101/2.2.1/0063 *Survey of water habitats and the waters of Slaná watershed from nature conservation point of view*. The projects focused not only on mapping of IAS but also on their elimination in cooperation with local municipalities and involving unemployed people in the elimination of IAS.

5. MITIGATION OF IMPACTS AND RESTORATION OF NATIVE BIODIVERSITY

Most of the IAS management activities (eradication, containment, control) are still mostly coordinated and implemented by State Nature Conservancy of SR and they are concentrated in protected areas and their buffer zones. However, there is significant progress in IAS management effort in other sectors too, e.g. water management authorities contribute to the elimination of invasive alien plant species through more or less regular management of water courses, rivers of Laborec, Uh, Poprad, Dunajec, Orava can be mentioned as examples; National Motorway Company and Railway Company Slovakia implements measures aimed at increasing of safety which include management of invasive alien species along motorways, expressways, and railways. For other management activities see also point 1.

IAS management activities are eligible for financing also within EU Structural Funds in the programming period 2014 - 2020, especially in the framework of the Operational programme *Quality of Environment*. Investment priority 3 of Priority axis 1: 1.3 *Protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure* will support elimination of invasive alien plant species. Priorities and guidelines for the implementation of the programme as well as other relevant documents were prepared in 2016.

May 2017

Ministry of Environment of SR

State Nature Conservancy of SR

(Report prepared by Ema Gojdičová, State Nature Conservancy of SR)

SLOVENIA / SLOVÉNIE

REPORT ON ACTIVITIES ON INVASIVE ALIEN SPECIES (2015-2017)

REPUBLIC OF SLOVENIA

During the report period 2015 – 2017, several projects and activities were carried out regarding invasive alien species (IAS):

LEGISLATION

For strengthening national policy on invasive alien species and for the implementation of the EU Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species national authorities started an ongoing process for amendment of the national legislation on Nature protection and a preparation of a dedicated implementing act. The amendments are foreseen to be sent to public consultations by the end of the year 2017.

MANAGEMENT

Management of IAS is included in yearly management programs of public authorities managing state protected areas and in the management program of the Institute of the RS for nature conservation.

Several biodiversity conservation projects financed under the Norway and EEA grants for the period 2009-2014 addressed IAS and provided for their removal and revitalisation of ecosystems. In the project GoForMura (<http://goformura.gozdis.si/>) invasive tree species were removed and replaced by the local native tree species with the aim of improving the unfavourable status of selected riparian forest habitat types. In the project Ljuba (<http://www.ljuba.si/en/about/project-ljuba/>) 21 ha of wet meadows were cleared of the Canadian goldenrod and Giant goldenrod. Invasive alien plant species were also removed in the project Gorički travniki (http://travniki.park-goricko.info/page/page.asp?id_informacija=1&id_language=1&id_meta_type=1) in order to improve several grassland habitat types and to protect endangered bird and butterfly species dependent on these habitats. Management of these areas continues through the regular work of nature protection management authorities.

The Municipality of Ljubljana is financing the removal of selected invasive alien plant species on its properties (*Ailanthus altissima*, *Heracleum mantegazzianum*, *Ambrosia artemisiifolia*, *Lonicera japonica*, *Buddleja davidii*, *Amorpha fruticosa*, *Asclepias syriaca* and *Thuja orientalis*).

They are also financing research on best practices for removal of the knotweed species and are looking for innovative solutions for the use of the removed plant material. In 2016 they carried out a project where knotweed was removed by volunteers and paper was produced out of this material. In 2017, the municipal company Snaga (providing removal of waste and cleaning Ljubljana and its surrounding municipalities) raised awareness through a message, delivered to each household and offered its clients to collect removed knotweed plant material for free.

Activities for mechanical removal of *Heracleum mantegazzianum* in Ljubljana and its vicinity are taking place for five years. The removal started by volunteers, continued under the project Thuja and is now financed by the Municipality of Ljubljana and by the Ministry for the environment and spatial planning. All known sites are checked annually by the Institute of the RS for nature conservation and for now the spread of this species is under control and is declining. Information materials for identification and management were produced and are available on several webpages.

(http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/podrocja/invazivke/OrjaskiDezen_Symbiosis2016.pdf)

(<https://www.ljubljana.si/sl/moja-ljubljana/varstvo-okolja/invazivne-tujerodne-vrste/invazivne-tujerodne-rastline/orjaski-dezen/>)

Farmers that are included in the voluntary agri-environment measures under the Common Agricultural Policy are obliged to manage five selected IAS (*Ambrosia artemisifolia*, *Rudbeckia laciniata*, *Solidago canadensis*, *Solidago gigantea* and *Erigeron annuus*) from their properties. In order to inform farmers on the topic of IAS a brochure Invasive plant in agricultural areas has been published by the Ministry of Agriculture, Forestry and Food <https://www.program-podezelja.si/sl/knjiznica/101-invazivne-rastline-v-kmetijski-krajini/file/>.

Activities including management of IAS are supported in accordance with the national operational programmes prepared under the EU financial perspective for period 2014 - 2020. Sources are provided for nature conservation projects addressing IAS in accordance with the national Operational programme for ***European Maritime and Fisheries Fund (EMFF)*** and for the Cohesion policy. Several nature conservation projects that will be financed under the Cohesion policy are already in preparation. They will inter alia address alien fish species, pond slider and other alien turtle species in selected areas. Monitoring of marine alien species in most vulnerable areas will be financed Under the EMFF.

Scientific background document are in preparation for the establishment of management measures for 4 species of IAS of Union concern (*Trachemys scripta*, *Pseudorasbora parva*, *Pacifastacus leniusculus* and *Orconectes limosus*) that fall under the category of widely spread in Slovenia in accordance with the EU Regulation 1143/2014.

Identification keys were also prepared for three groups of IAS of Union concern (aquatic plants, squirrels and decapods) in order to provide support by the identification of IAS for enforcement authorities and other stakeholders (http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/podrocja/invazivke/obvescanje_o_invazivnih_tujerodnih_vrstah_4faza.pdf).

There is one ongoing LIFE project ARTEMIS (LIFE15 GIE/SI/000770) addressing IAS (<http://tujerodne-vrste.info/>). It aims to contribute to the reduction of the harmful impacts of IAS on biodiversity by increasing public awareness and by setting up an efficient early warning and rapid response (EWRR) system to manage their impacts on forests.

RAISING AWARENESS

The webpage of the Ministry of the environment and spatial planning dedicated for raising awareness on IAS is regularly updated. In the year 2016 additional information regarding the EU Regulation 1143/2014 and IAS of Union concern was added. Information sheets were produced for the majority of species from the EU list.

(http://www.mop.gov.si/si/delovna_področja/narava/invazivne_tujerodne_vrstne_rastlin_in_zivali/).

Ministry of the environment and spatial planning is co-financing three one year projects that are addressing nature protection and invasive alien species. Projects are managed by the NGO acting in public interest.

- In the project Ujemite naravo! (<http://ribiska-zveza.si/projekti/projekt-ujemite-naravo>) a Citizen Science platform was established where citizens can provide data on rare, endangered and alien freshwater fish, crayfish, bivalves and also other species (<http://www.ckff.si/projekt.php?pid=47>). The lead project partner is Slovenian Anglers Association which promotes this project amongst its 17.000 members.
- The aim of the project Invazivke nikoli ne počivajo (<http://invazivke.weebly.com/>) is to raise awareness on negative influence of IAS and to improve knowledge on threatened species in Europe. A part of the project is dedicated to collecting data on reptiles, amphibians and alien species using Citizen Science.

- The aim of the project Raznoživost pod vidrino streho na Goričkem is to promote nature conservation and to raise awareness among local inhabitants, farmers and visitors in a visitors centre Aqualutra through nature conservation activities, including removal of IAS and improvement of local ecosystems and Natura 2000 sites (<http://lutra.si/sl/tekoci-projekti/127-raznozivost>).

The Municipality of Ljubljana, that was the Green capital of Europe 2016, published a webpage dedicated to IAS (<https://www.ljubljana.si/sl/moja-ljubljana/varstvo-okolja/invazivne-tujerodne-vrste/>) where information can be found on invasive alien species found in the municipality and their localities. In an ongoing campaign Rokavice gor! that started in 2016 management of IAS is promoted amongst citizens (<http://www.rokavicegor.si/>). A publication on IAS plants in the Municipality of Ljubljana is also available (http://rokavicegor.si/invazivne_rastline_v_ljubljani_final_fpo.pdf).

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SPAIN / ESPAGNE



REPORT

FOR THE 12TH MEETING OF THE GROUP OF EXPERTS ON INVASIVE ALIEN SPECIES OF THE BERN CONVENTION

FUNCHAL (MADEIRA-PORTUGAL), 01-03 JUNE 2017

INTRODUCTION

In Spain, the Law on Natural Heritage and Biodiversity from 2007 creates the “Spanish Catalogue of Invasive Alien Species” dependent on the Ministry of Agriculture and Fisheries, Food and Environment. Chapter III of this legislation focuses on the growing problem of invasive alien species due to globalization. This National Catalogue was first published on November 2011 and modified afterwards by the publication of the Act 630/2013, 2nd August, which regulates the catalogue of invasive alien species.

In 2016 a ruling was issued by the Supreme Court (TS 637/2016-Resource Nº: 396/2013) modifying for the third time this regulation and including in the Spanish Catalogue of Invasive Exotic Species five new species: *Batrachocytrium dendrobatidis*, *Undaria pinnatifida*, *Helianthus tuberosus*, *Cyprinus carpio* and *Oncorhynchus mykiss*. The consolidated text has already been published in the Official State Journal: <https://www.boe.es/buscar/act.php?id=BOE-A-2013-8565>. Currently this catalogue (regulated by Act 630/2013, 2nd August) includes 185 species.

LEGAL FRAMEWORK

Law 42/2007, of 13th December, on Natural Heritage and Biodiversity sets the basic legal framework for the conservation, sustainable use and restoration of the Spanish natural heritage and biodiversity. This law incorporates standards and international recommendations, such as recommendations from the Council of Europe or the Convention on Biological Diversity, and transposes Directive 92/43/EEC of the Council of 21 May 1992 on the conservation of natural habitats and of wildlife and flora (Habitats Directive). The experience gained during years of implementation of this Law, has shown the need to improve certain aspects of its application, and therefore it has been modified for this purpose.

Law 33 / 2015, 21st September, modifying Law 42 / 2007, 13th December, includes some changes in relation to invasive alien species management. These modifications aim to:

- clarify the circumstances in which exceptions can be regarded for the prohibitions resulting from the inclusion of a species in the catalogue of invasive alien species.
- provide that the Ministry of Agriculture and Fisheries, Food and Environment will adopt strategies for marine alien invasive species.
- include a series of prohibitions for complying with the provisions established under *Regulation (EU) Nº 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species*.

In addition to these modifications, and with the aim of reinforcing prevention, before introducing new potentially invasive alien species, the amendment of Law 42/2007 has included the obligation to draw up a list of exotic species that should be subjected to risk analysis prior to their importation in Spain. This has been one of the main areas of work in which the Ministry of Agriculture and Fisheries, Food and Environment has been focused in 2016 and 2017. There is a draft version of this list? under internal discussion, which will be further presented to the procedure of public participation.

In addition, different species are being evaluated, mainly reptiles and mammals, as a preliminary step to their possible inclusion in the Spanish Catalogue of Invasive Alien Species.

Concerning the obligation to publish strategies of catalogued species, the Spanish Ministry has been working on the draft management strategies for the control and the possible eradication of: Water hyacinth and Snakes on islands.

As regards the compliance with the European Regulation, Spain has notified to the Commission the competent authorities in charge of applying this Regulation. Spain has also communicated to the Commission the provisions referred to penalties, which have been included in the national legislation in 2015. The structures to carry out the official controls are fully functioning since the Act 630/2013, 2nd August, regulated the authorities and the coordination system on this matter.

Information on invasive alien species and published strategies, as well as other information on awareness raising and dissemination can be found at the following link of the website of the Ministry of Agriculture and Fisheries, Food and Environment: <http://www.mapama.gob.es/es/biodiversidad/temas/conservacion-de-especies/especies-exoticas-invasoras/default.aspx>

AUTONOMOUS REGIONS

Due to the division of powers in Spain, the Ministry of Agriculture and Fisheries, Food and Environment is competent for the basic legislation and the coordination. On the other hand, the Autonomous Communities have the competence for managing invasive alien species. In relation to the work on this issue carried out by these regional authorities, from June 2015 to May 2017, we can highlight the following:

- **Galicia:** Monitoring and control program of *Vespa velutina* in Galicia http://mediorural.xunta.gal/areas/gandaria/apicultura/vespa_velutina/
- **Principado de Asturias:** Strategy for monitoring and control the Asian hornet (*Vespa velutina nigrithorax*) in Asturias. https://www.asturias.es/Asturias/descargas/PDF_TEMAS/Ganaderia/ESTRATEGIA_VESPA_VELUTINA_V5_21_11_14.pdf
- **Cantabria:** Exotic Invasive Species. Regional strategy for management and control. Draft version: http://dgmontes.org/c/document_library/get_file?uuid=ba1a5838-cddf-4bd8-82af-147c4df8af2f&groupId=16835 and Action Plan against *Cortaderia selloana* in Cantabria: http://dgmontes.org/detalle/-/jurnal_content/56_INSTANCE_DETALLE/16835/4153823
- **Basque Country:** Asian hornet control (http://www.ingurumena.ejgv.euskadi.eus/r49_u95/es/contenidos/informacion/vespa_velutina/es_bio/intro.html) and distribution maps.
- **Aragón:** Book publication about invasive alien species in Aragon http://www.aragon.es/estaticos/GobiernoAragon/Departamentos/AgriculturaGanaderiaMedioAmbiente/TEMAS_MEDIO_AMBIENTE/AREAS/BIODIVERSIDAD/01_Especies_Exoticas_Invasoras/LIBRO_ESPECIES_EXOTICAS_INVASORAS.pdf
- **La Rioja:** Following species are present in this region: *Corbicula fluminea*; *Dreissena polymorpha*, *Pacifastacus leniusculus*, *Procambarus clarkii*, *Trachemys scripta*, *Alburnus alburnus*, *Ameiurus melas*, *Esox lucius*, *Lepomis gibbosus*, *Micropterus salmoides*, Sander peccary, *Silurus glanis*,

Neovison vison, *Myiopsitta monachus*, *Leptoglossus occidentalis*, *Vespa velutina*, *Azolla spp.* *Cortaderia spp.*, *Opuntia maxima*, *Ailanthus altissima*, *Didymosphenia geminata*. This region has stepped up controls to minimize the presence of American mink in Rioja Rivers and protect the European mink.

- **Cataluña:** Protocol activities carried out to minimize damage caused by Asian hornet (*Vespa velutina*) towards beekeeping and biodiversity (2017) http://mediambient.gencat.cat/web/.content/home/ambits_dactuacio/patrimoni_natural/fauna_salvatge_autoctona/fauna_invasora_medi_natural/treballs/vespa_asiatica/PROTOCOL-vespa-velutina-2017def.pdf and control protocols for the following species: *Acacia dealbata*, *Agave americana*, *Baccharis halimifolia*, *Cortaderia selloana*, *Buddleja davidii*, *Opuntia ficus-indica*, *Carpobrotus edulis* and *Tradescantia sp.* http://mediambient.gencat.cat/es/05_ambits_dactuacio/patrimoni_natural/fauna-flora/especies_exotiques_invasores/especies_invasores_medi_natural/gestio_flora_invasora/protocols_de-control/
- **Comunidad Valenciana:** This region works on different species control and eradication. A summary (in Spanish) on their activity is available at: http://www.agroambient.gva.es/documents/91061501/162536532/IT08_2016+Actuaciones+de+control+de+especies+invasoras_Memoria+Anual+2015/fae93ca9-f874-47b5-84e8-c6feba5397c1;jsessionid=6A33E98B7275C5E4FBF6ADBC72FC7E0D.node1
- **Castilla La Mancha:** information available at <http://www.castillalamancha.es/gobierno/agrimedambydesrur/estructura/dgapfyen/actuaciones/especies-ex%C3%89ticas-invasoras>
- **Castilla y León:** information available at http://www.medioambiente.jcyl.es/web/jcyl/MedioAmbiente/es/Plantilla100Detalle/1246988359553/_/1284222753274/Comunicacion?plantillaObligatoria=PlantillaContenidoNoticiaHome
- **Madrid:** This region is working hardly on Procyon lotor control. In 2015 the captured raccoons number has risen to 73, total number of raccoons caught in the 9 campaigns carried out until December 2015 has been of 537 individuals. Controls on *Neovison vison*, *Myiopsitta monachus* and *Trachemys scripta* have been also carried out <http://www.madrid.org/bvirtual/BVCM003517.pdf>
- **Extremadura:** The Directorate General for the Environment of the Government of Extremadura is the coordinating beneficiary of the LIFE Project NAT/ES/000582 "Combating invasive species in the Tajo and Guadiana river basins in The Iberian Peninsula ". The project began in January 2012 and will end in March 2018. http://invasep.eu/el_proyecto.html
- **Murcia:** Awareness campaigns on exotic plants and amphibian http://www.murcianatural.carm.es/web/guest/usuario-general?p_p_id=20&p_p_lifecycle=1&p_p_state=exclusive&p_p_mode=view&_20_struts_action=%2Fdocument_library%2Fget_file&_20_folderId=388886&_20_name=DLFE-50025.pdf
- **Andalucía:** Control Plan of *Procambarus clarkii* in the Marshes of the Guadalquivir. <http://www.juntadeandalucia.es/boja/2016/152/8>
- **Canarias:** The Canary Islands Government is making an effort to locate and evaluate invasive species, and the effects of these species on island ecosystems. It works in areas related to Catalogue Invasive Species and Data Bank, control of the California kingsnake, vertebrate control and Good Practice Manuals. These manuals are available at: <http://www.gobiernodecanarias.org/medioambiente/piac/temas/biodiversidad/documentos-interes/especies-introducidas/manuales-viceconsejeria/>

- **Canary Islands** have also identify the species that should be included in the list of invasive alien species of concern for the outermost regions following the article 6 of Regulation (EU) No 1143/2014.
- **Baleares:** The Government of the Balearic Islands works in the control of different invasive alien species: *Nasua nasua*, *Aedes albopictus*, *Vespa velutina*. In recent years a great control effort has been made on the species of exotic snakes. It is foreseeable that the arrival of these exotic snakes could seriously affect the demographic stability of *Podarcis pityusensis* in Ibiza and Formentera⁴: https://www.caib.es/sites/proteccioespies/es/fauna_introducida-6872/

RIVER BASIN AUTHORITIES

These Authorities attached to the Ministry of Agriculture and Fisheries, Food and Environment have the competence on the Hydraulic Public Domain. On this area they carry out controls on invasive alien species.

- **Guadiana River Basin:** Is working mainly in *Eichhornia crassipes*, *Dreissena polymorpha*, *Azolla filiculoides* and *Corbicula fluminea*. <http://www.chguadiana.es/?url=la+cuenca+hidrogr%Elfica+biodiversidad+estado+ecol%F3gico+y+problem%Eltica+ambiental+de+la+cuenca+especies+al%F3ctonas+e+invasoras+la+almeja+asi%E1ica&corp=chguadiana&lang=es&mode=view>
- **Tajo River Basin:** Measures aimed at both the dissemination among users and the early detection of the possible presence of the zebra mussel. <http://www.chtajo.es/Informacion%20Ciudadano/Calidad/AguasSup/RedCEMAS/PotEcolEmbalses/Paginas/EspeciesInvasoras.aspx>
- **Ebro River Basin:** Control campaigns on *Dreissena polymorpha*, *Pomacea spp.* and *Potamopyrgus antipodarum*. <http://www.chebro.es/contenido.visualizar.do?idContenido=43681&idMenu=4585>
- **Guadalquivir River Basin:** *Dreissena polymorpha* controls <http://www.chguadalquivir.es/-/lucha-contra-las-especies-exoticas-invasor-1?platform=hootsuite>
- **Segura River Basin:** This river basin authority is beneficiary of the life project Ripisilvinatura. The project aims to control the expansion of the Invasive Exotic Species present on the banks of the Segura River and favour the colonization of the riparian forest by native species. <https://www.chsegura.es/chs/cuenca/seguraripisilvanatura>
- **Duero River Basin:** Some of the invasive exotic species with presence in this basin: *Didymosphenia geminata*, *Azolla filiculoides*, *Corbicula fluminea*, *Craspedacusta sowerbyi*, *Acacia dealbata*, *Pacifastacus leniusculus* <http://www.chduero.es/Inicio/Gesti%C3%B3ndelaCuenca/Conservaci%C3%B3nyrestauraci%C3%B3nB3nambiental/EspeciesExoticasInvasorasenaguascontinentales/tabid/604/Default.aspx>
- **Miño-Sil River Basin:** During 2017 they have published the following documents, Responsible Declaration for the exercise of navigation and flotation (Consult requirements against entry of invasive species) and the Protocol of disinfection against the zebra Mussel for the exercise of navigation and flotation in this Basin: <http://www.chminosil.es/es/chms/calidad-de-las-aguas/informacion-medioambiental>
- **Cantabrico River Basin:** Information related to invasive alien species is available at <https://www.chcantabrico.es/index.php/eu/actuaciones/dph/conservacionrestauraciondph/conservacionmantenimientocauces/eeimejilloncebra>
- **Jucar River Basin:** It is working on monitoring *Dreissena polymorpha* <http://www.chj.es/es-medioambiente/mejilloncebra/Paginas/PresenciaenEmbalses.aspx>

⁴ Álvarez C., Mateo J.A., Oliver & Mayol J. (2010). Los ofidios ibéricos de introducción reciente en las Islas Baleares. Boletín de la Asociación Herpetológica Española 21: 126-131.

SWEDEN / SUEDE



SWEDISH ENVIRONMENTAL PROTECTION AGENCY

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MEMO
 2017-05-19 Case number:
 NV-03699-17

SWEDISH NATIONAL REPORT TO THE BERN CONVENTION ON INVASIVE ALIEN SPECIES

With total land area of 450,295 km² stretching from the latitudes 55° N to 69° N, and four climate zones (Oceanic, Warm summer humid continental, Subarctic and Tundra), Sweden has a large number of suitable habitats for invasive alien species (figure 1). Until now climatic conditions have been a successful barrier to invasion and establishment of many invasive alien species (IAS). However, an increasing number of alien species that have been present in Sweden for some time without causing harm to biodiversity are now beginning to thrive and become invasive. At the same time, new invasive alien species are being introduced both intentionally and unintentionally (figure 2).

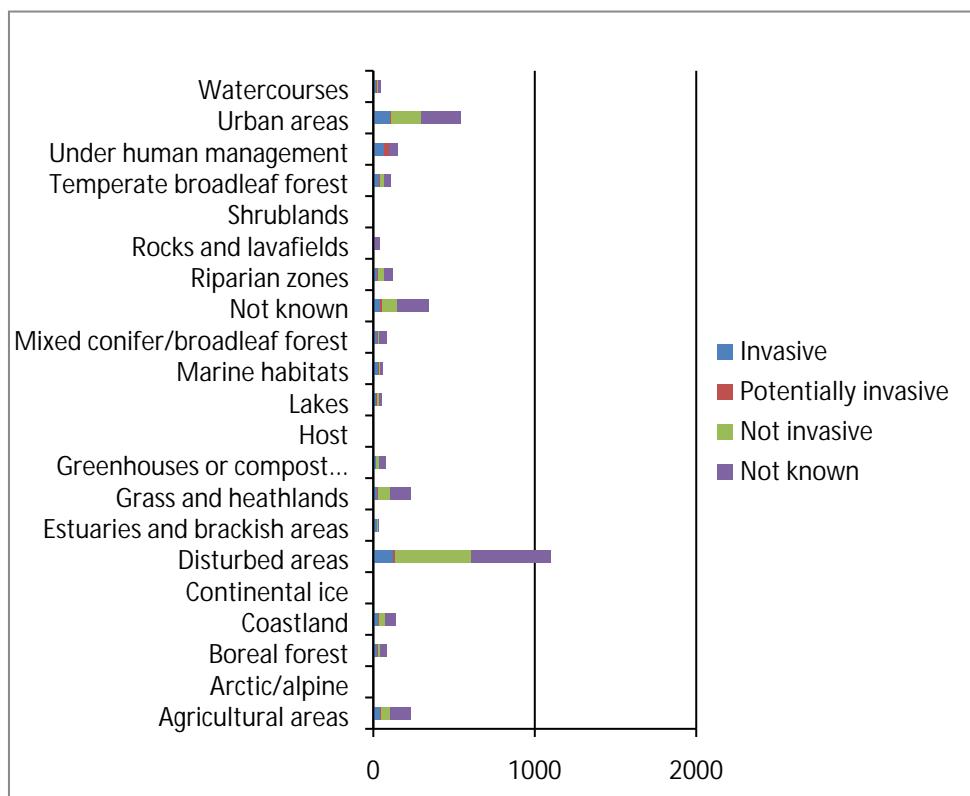


Figure 1. The number of alien species that are found in Swedish habitats. Source: Nobanis www.nobanis.org. Date of access: 2017-05-19

Today more than 2,200 alien species have been reported in Sweden with 388 considered invasive and 82 as potentially invasive (figure 3), based on literature studies. For a large number of alien species, we do not have information about their potential invasiveness in Sweden.

Number of organisms (and taxa) introduced by the pathway: Forestry in Sweden

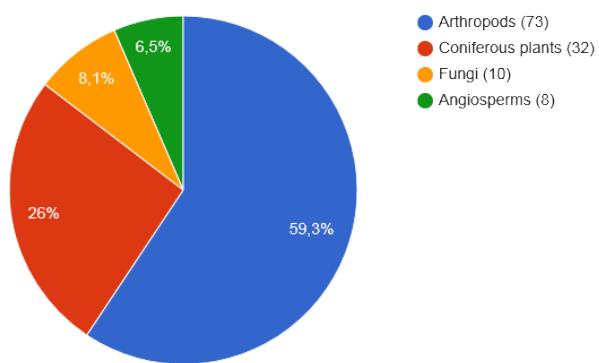


Figure 2. Number of organisms introduced through the forestry in Sweden. Although coniferous plants are the focus of intentional introductions of alien species, other organisms are introduced unintentionally as hitchhikers or contamination in the imported commodity. Source: Nobanis www.nobanis.org Date of access: 2017-05-19

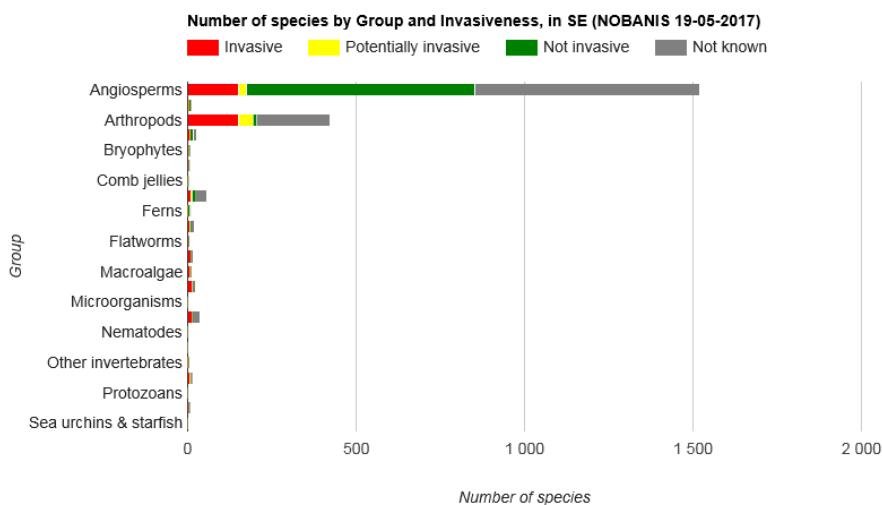


Figure 3. Number of species in each taxonomic group that have been identified as invasive, potentially invasive and not invasive. Note the large number of species for which information is lacking. A project has been initiated to systematically classify the invasiveness of all of the reported alien species in Sweden.

LEGISLATION AND STRATEGIC DOCUMENTS

The Environmental Objectives

Swedish environmental policy is steered by the Environmental Objectives, which set goals for how environmental quality should be in the year 2020. The overall goal of environmental policy is to hand over to the next generation a society in which the major environmental problems have been solved, without increasing environmental and health problems outside Sweden's borders. Of the 16 environmental quality objectives that describe the environmental quality to be achieved in the different environments (*i.e. Flourishing lakes and streams, A rich plant and animal life, Thriving wetlands*)⁷ contain a goal that introduction of invasive alien species that threaten biodiversity should not be allowed. The Milestone target for Invasive Alien Species states that the effects of IAS in Sweden on biodiversity and socioeconomic values including health, should be assessed and priority measures for eradication or control shall have started by 2015. This has not been achieved.

The EU IAS Regulation 1143/2014

The adoption of the EU IAS Regulation⁵ has revitalized and given the work with IAS in Sweden a higher priority. The Swedish Strategy and Action Plan for Alien Species and Populations⁶ from 2008 has been updated⁷. A national regulation on invasive alien species has been proposed and will come into effect in the latter part of 2017. The requirements of the implementation of the EU IAS Regulation has initiated comprehensive and challenging work on many aspects including surveillance, establishing early detection and rapid response mechanisms, establishing official control system for the IAS of Union Concern, establishing management plans, analyzing pathways of introduction and increasing cooperation with other national, regional and local authorities.

Capacity for assessing the risks of IAS today and the potential for future establishment and impact of the other IAS of Union Concern has also increased.

COLLECTING, MANAGING AND SHARING INFORMATION

Awareness of the risks to biological diversity, health and socioeconomic values has increased rapidly in the last few years. This is due to the increased media attention to IAS and exceptional voluntary work by gardening associations, fishing association and other nature interested groups in cooperation with national authorities. The adoption of the first list of IAS of Union Concern in 2016 has generated much positive interest in the issue of invasive alien species but has also initiated controversies between environmental protection and commercial interests for the American lobster (*Homarus americanus*) and the signal crayfish (*Pacifastacus leniusculus*).

A very important basis for the work with implementing the EU IAS Regulation is generating more knowledge and information about the distribution and impacts of the 6 IAS of Union Concern that are found in Sweden⁸, as well as other IAS that are proposed for listing. Information directed to the general public, to commercial actors and sectors has been developed and spread through the internet sites of the Swedish Environmental Protection Agency and the Swedish Water Management Agency. Brochures directed to garden pond owners and garden retailers about the risks with using IAS in garden ponds and

⁵ Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species

⁶ Naturvårdsverket. 2008. Nationell strategi och handlingsplan för främmande arter och genotyper, 2008. <http://www.naturvardsverket.se/Om-Naturvardsverket/Publikationer/ISBN/5900/978-91-620-5910-1/>

⁷ Naturvårdsverket. 2014. Invasive främmande arter. Redovisning av ett regeringsuppdrag.. Unpublished report in Swedish. <http://www.naturvardsverket.se/Miljoarbete-i-samhallet/Miljoarbete-i-Sverige/Regeringsuppdrag/Redovisade-2014/Invasiva-frammande-arter>

⁸ signal crayfish (*Pacifastacus leniusculus*), Chinese mitten crab (*Eriocheir sinensis*), Persian hogweed (*Heracleum persicum*), Yellow skunk cabbage (*Lysichiton americanus*), Cabomba (*Cabomba caroliniana*), and Red-eared slider (*Trachemys scripta*)

possible native replacement species was developed with the help of researchers from the Aqualians research project and modeled after the Code of Conduct for horticulture and a Dutch and Belgian brochures. They were spread in cooperation with FOR, the largest gardening association in Sweden at a garden fair in Stockholm in April 2017.

A method for verifying reports of invasive alien species in the Swedish Species Information System has been developed to provide distribution data for IAS of Union Concern to EASIN. This method involves the help of volunteers from local botanical associations as well as experts and will also be helpful for other IAS. The Swedish Species Information System⁹ is a Citizen Science based gateway for observations of all taxonomic groups and all environments. The information system also contains and makes available data from environmental monitoring, research data and data collected through inventories, including data required for reporting to EU directives. This reporting system is an invaluable tool for conservation, environmental monitoring and research. It contains more than 55 million reports which can be analyzed in the sister gateway the Analysis gateway¹⁰. It has recently been reprogrammed after being in operation for more than 20 years.

The European Network on Invasive Alien Species (Nobanis) continues to be the foremost system for storing and analyzing Swedish IAS information. The Nobanis gateway¹¹ was reprogrammed in 2015-2016 and allows greater functionality in charting data in the gateway. The Nobanis network has 20 participating countries. Sweden continues to provide technical support to the Nobanis gateway which is hosted at the Swedish Species Information Center. The Icelandic Institute of Natural History now hosts the Nobanis secretariat.

Sweden, participated in the Nobanis project “Invasive Alien Species, Pathway Analysis and Horizon Scanning for Countries in Northern Europe¹²” which was sponsored by the Nordic Council of Ministers and coordinated by the Danish Nature Agency. The project identified the most important pathways of introduction for IAS in the Nordic countries as being: 1. Horticulture 2, Transport and 3. Ballast water and sediment which differed somewhat from the results for the Baltic region and islands of the North Atlantic Ocean. 414 IAS “door knockers” (IAS expected to arrive in the near future) were assessed, of which 43 were identified as having the potential to become highly invasive.

Information and fact sheets on marine alien species are presented in the gateway for Alien Species in Swedish Seas and Coastal Areas¹³.

Surveillance, Monitoring and Rapid Response

Surveillance and reporting of IAS of Union Concern will be based on existing national environment monitoring programs for the EU bird, species and habitat directives, Water Framework and Marine Framework Directives as well as regional environmental monitoring programs. Information from the Swedish Species Information System is planned to also be a very important tool for surveillance and reporting of IAS in implementing the EU IAS Regulation. An important side effect of these developments for fulfilling the EU IAS Regulation, is that they will also be effective for surveillance of other IAS.

Monitoring and rapid response of the spread of the Raccoon dog (Nyctereutes procyonoides) continues to be funded nationally since the end of the LIFE+ project in 2013. Norway, Denmark, Finland and Sweden continue to monitor the raccoon dog and eradicate them when found. As a result, the numbers of raccoon dog in Northern Sweden has been kept at a very low number, despite recurrent influx of animals. An added value of the raccoon dog project is the detection of raccoon in Southern Sweden and subsequent removal in 2013. The methods used in the project, phototrails, tracking and either eradication

⁹ www.artportalen.se

¹⁰ <https://analysisportal.se/>

¹¹ www.nobanis.org

¹² Nobanis.2015. Invasive Alien Species. Pathway Analysis and Horizon Scanning for Countries in Northern Europe. Tema Nord 2015:517. http://www.nordic-ilibrary.org/environment/invasive-alien-species_tn2015-517

¹³ www.frammandearter.se

or sterilization and tagging with a radio sender in order to find other raccoon dogs have a great potential for use in monitoring of other invasive alien predators. The experience and scientific knowledge gained by researchers in this project is an invaluable resource for Swedish environmental protection.

Eradication and control

In November 2016 the Swamp stonecrop (*Crassula helmsii*) was discovered in Sweden for the first time in a drainage water pond in Helsingborg, Southern Sweden. It was quickly eradicated.

Mink (*Neovison vison*) populations in Sweden have decreased in the last few years for unknown reasons. Competition with otter and the growing population of fox or the spread of disease are suspected to contribute to the decrease. Local programs to eradicate mink continue in sensitive archipelago and insular areas to protect ground-nesting birds.

The ruddy duck (*Oxyura jamaicensis*) has not been observed in Sweden since 2009¹⁴. Some management of populations of the Canada goose (*Branta canadensis*) is carried out locally to improve sanitary conditions in adjacent parks and bathing areas.

The Blue lupine (*Lupinus polyphyllus*) has spread rapidly throughout Sweden in the last few years despite massive media interest, local eradication campaigns and efforts to control it by mowing along highways and railroads (figure 4). In the north of Sweden, the Blue lupine threatens species rich meadow environments in nature preserves and other areas valuable for biological diversity. Blue lupine seeds continue to be sold, although the largest seed companies have withdrawn it from their assortment.

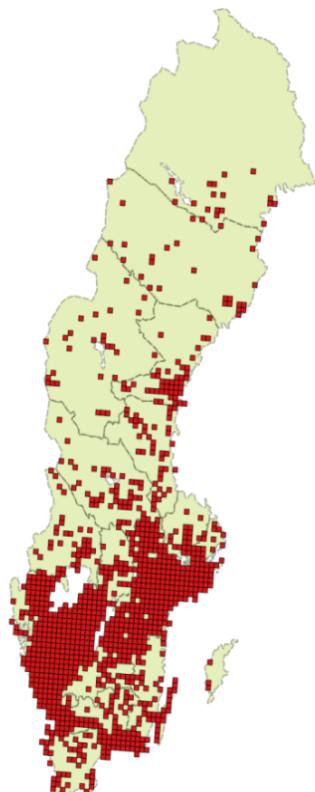


Figure 4. The Blue lupine's *Lupinus polyphyllus* present distribution in Sweden. Source: Swedish Species Reporting System, www.artportalen.se Date of access 2017-02-03

¹⁴ Swedish Species Information System (Artportalen). [www.artportalen](http://www.artportalen.se). Date of access 2017-05-19

Local programs continue to control invasive alien plant species especially in protected areas. The targeted species include the Japanese rose *Rosa rugosa* along beaches in Southern Sweden, the Giant hogweed *Heracleum mantegazzianum*, the Japanese knotweed *Reynoutria japonica* and the Fringed water lily *Nymphaoides peltata*.

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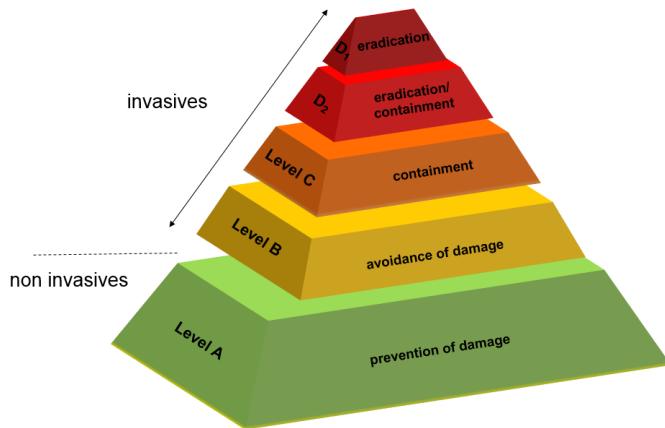
SWITZERLAND / SUISSE

OVERVIEW OF IAS WORK IN SWITZERLAND CONTRIBUTION TO THE MEETING OF THE GROUP OF EXPERTS ON IAS IN FUNCHAL, (PORTUGAL), JUNE 2017

By Dr. Gian-Reto Walther, Federal Office for the Environment, Switzerland

The [national strategy on invasive alien species in Switzerland*](#) was adopted by the Swiss Federal Council in May 2016. After adoption, the implementation of the 29 measures formulated in the strategy started. With highest priority, the work on the harmonisation and modification of the national law dealing with invasive alien species, the organisation of a strengthened national coordination and the update of the national inventory on [invasive alien species in Switzerland](#) has been taken up.

- The work on the legal instruments aims at implementing the prioritisation scheme (see figure below) presented in the strategy into the national law.



- For the national coordination, an appropriate form of organisation will be elaborated to include all the actors responsible for implementing the measures of the strategy.
- The national inventory on invasive alien species in Switzerland dates back to 2006. An update of the relevant information is necessary as well as the implementation of a national expert group keeping the information updated. An important role in this regard will be taken by the national species' data centres (www.infospecies.ch).

Several (research) projects are running in Switzerland, focusing on various alien species such as *Harmonia axyridis*, *Ponticola kessleri*, *Ailanthus altissima*, *Vespa velutina*, as well as a monitoring project on *Aedes albopictus*. The longterm project on mechanical and chemical treatments of *Reynoutria japonica* was finished by end of 2016 after eight years. It revealed that with neither of the tested methods an established knotweed stand could be eradicated, although the above ground biomass drastically declined.

* available in French, German and Italian only

UKRAINE / UKRAINE

REPORT

ON THE ACTIVITIES ON INVASIVE ALIEN SPECIES (IAS) IN UKRAINE FOR THE 12TH MEETING OF THE GROUP OF EXPERTS ON INVASIVE ALIEN SPECIES OF THE BERN CONVENTION (2015–2017)

Introduction

Invasive alien species (IAS) continue to be a significant factor for biological diversity in many countries including Ukraine. During 2015–2017 IAS related activities in Ukraine focused mostly on scientific research and public awareness.

Legal Framework

Detailed information on legal framework with regards to IAS in Ukraine is given in the document [T-PVS/Inf\(2011\)03E](#), presented on the 9th meeting of the Group of Experts on Invasive Alien Species held in Malta, 2011 with some additions presented in the documents T-PVS (2013) 5 and T-PVS/Inf (2015) 17.

IAS related activities

Upon a request of the Ministry of Ecology and Natural Resources of Ukraine the Ukrainian Research Institute of Ecological Problems had implemented in 2015 the project titled '*Assessment of a problem of invasive alien species (plants and animals) in Ukraine and development of recommendations concerning legal and organizational basis for regulation and establishment of control system for introduction and distribution of such organisms in the territory of Ukraine in accordance with the requirements of the Convention on Biological Diversity and resolutions of its governing bodies*'. The final report of the project was adopted on the meeting of the Scientific Council of the Institute on 19.11.2015.

The work under the project focused on the following issues:

- level of study of biological invasions mechanisms and methods to control and prevent such invasions;
- criteria for identification of IAS status;
- IAS distribution in the world and in Ukraine, their impact on environment;
- environmental factors facilitating IAS distribution and acclimatization.

The following outcomes have been obtained:

- IAS lists, both animals and plants, recognized in the world and Ukraine have been compiled, namely:
 - List of the most dangerous IAS of the world;
 - List of IAS pest species to be controlled;
 - "Black" list of macroinvertebrate and fish IAS in the Dnieper River basin;
 - List of higher aquatic plant IAS of the world flora;
 - List of IAS recommended to be included in the "black" list of Ukraine;
 - List of the most distributed IAS in protected areas of Ukraine;
- the results of some field research on effect of IAS on aquatic ecosystems (*Pistia stratiotes* L., *Vallisneria spiralis* L., *Dreissena polymorpha* Pallas, *Syngnathus nigrolineatus* Eichwald) have been summarized;
- the ways of solving IAS problems on legal and organizational levels have been analyzed;

- recommendations on IAS regulation and control on the territory of Ukraine according to the requirements of the Convention on Biological Diversity and other international treaties have been developed.

IAS issues are a matter of consideration in annual National Report of Ukraine on Environmental Protection.

Thus, according to the National Report of Ukraine on Environmental Protection for 2015 900 adventive plant species recorded in Ukraine. 83% of them are xenophytes. It was found that among such species around 90 species are believed to be threatened biodiversity and natural ecosystems. Within these groups 40 species are so called transformers.

It was noted in the Report that during last 10–15 years new data on the distribution and appearance of approximately 20 IAS mollusk species have been obtained for the Black Sea. *Rapana thomasiana*, *Mya arenaria*, *Anadara inaequivalvis* were mentioned among them.

Around 20 land mollusk IAS had been mentioned in the Report. *Inter alia*, *Deroceras caucasicum*, *Krynickillus melanocephalus*, *Arion lusitanicus* s.l. (synonym *Arion vulgari*) were indicated.

Using GIS-modelling it was established that there is an ecological niche in Ukraine for *Harmonia axyridis*.

In 2015 *Megabruchidius dorsalis* (Farhaeus), a new agricultural pest IAS, was recorded in Ukraine. Along with the pest a new ichneumon species *Eurytoma gleditsiae* Zerova et Fursov was found to which *Megabruchidius dorsalis* (Farhaeus) is a host.

In 2015 an invasive ant species *Tapinoma melanocephalum* (Fabricius, 1793) and an invasive phytophagous species *Phyllonorycter issikii* (Kumata) had also been found.

In ichthyofauna of Ukraine, according to different estimations, a number of invasive fish species can reach up to 16–20%. The most abundant fish is *Carassius auratus* although it had firstly been recorded in the Dnieper since 1960th only. The same refers to *Hypophthalmichthys molitrix* and *Ctenopharyngodon idella*. In the small rivers of the middle Dnieper their quantity can reach up to 70% of total fish species. Less abundant but considered to be also dangerous fish IAS are *Lepomis gibbosus*, *Ameiurus nebulosus* and *Ameiurus melas*.

In 2015 it was studied the current state and population structure of some invasive reptiles like *Darevskia (saxicola)* complex in the Teteriv River basin and a distribution of the mixed population system of parthenogenetic species (*D. armeniaca*, *D. Dahli*) was established.

As far as mammal species are concerned the numbers of *Ondatra zibethicus* remains stable, population of *Mustela vison* tends to increase and sporadic occurrence of golden jackal *Canis aureus* continues to be recorded.

IAS are mentioned or described in ecological passports (a kind of ecological profile of the specific region) of different administrative regions of Ukraine (oblasts) which are produced annually. For instance relevant information can be found in ecological passports of Vinnitsa, Dnipropetrovsk, Donetsk, Zaporizhzhya, Zakarpattyia and other oblasts.

There are some papers published in 2015–2017 on IAS. Some of them are presented below.

In the water bodies of Kyiv city high density of the invasive fish species *Lepomis gibbosus* (Linnaeus) was registered. The fish is characterized by high ecological flexibility, serve as a trophic competitor and thus can threaten aboriginal fishes (Afanashev, Gupalo, Manturova, 2017).

Olkovich et al. (2017) have studied heavy metal accumulation potential of IAS *Pistia stratiotes* L. It has been found that in the roots of *P. stratiotes* the content of various elements can be 2–10 times higher than that in its leaves. It has been shown that this plant selectively accumulates Li, Co, Ni, Sr, Cd, and Bi. The performed investigations suggest that *P. stratiotes* possesses a high remediation potential. At the same

time, it is characterized by a high potential for naturalization in natural water bodies, which can bring the threat to natural diversity and water resources of Ukraine.

Symbiotic assemblages of immigrant fish species have been analyzed in Ukrainian water bodies of different type (Zaichenko, 2016).

Burda et al. (2015) have debated a biological nature of the alien flora of the nature reserve fund in separate biomes of Ukraine. Factors of forming, composition, taxonomic and typological structures of the alien flora are evaluated. In detail the spatial distribution, the degree of overcoming migration barriers, impacts of invasive alien species on native species, biodiversity and the environment are discussed.

Peculiarities of settlement of different habitats in the water bodies of Ukraine by invasive mollusk species were analyzed (Son, 2016).

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UNITED KINGDOM / ROYAUME-UNI

UPDATE REPORT MAY 2017

Great Britain Non-native Species Strategy

In August 2015, we updated our invasive alien species strategy setting out 60 key actions, building on the original strategy published in 2008. The main changes to the strategy are:

- More emphasis on prevention, including:
 - Increasing the speed of the risk assessment process;
 - Analysis of pathways and action planning for high priority pathways;
- Further development of risk analysis to aid the prioritisation of resources;
- Greater focus on rapid response eradication;
- Enhanced role for NGOs in raising awareness;
- Development of a strategic plan to improve the co-ordination of research.

Risk Management

We have developed a risk management scheme to support the prioritisation of invasive alien species for eradication. The scheme works in combination with the UK's existing horizon scanning/ risk assessment schemes to identify species for which eradication should be prioritised based on an assessment of the feasibility and cost effectiveness of delivering a response. This has been used to inform current priorities for eradication, as well as the development of contingency plans for species likely to arrive in the near future.

Contingency Planning

Contingency plans have been drafted in principle in England (with similar plans in development in Wales and Scotland) for five generic groups: terrestrial vertebrates, terrestrial plants, freshwater animals, freshwater plants and marine species. We are currently in the process of developing a terrestrial invertebrates plan.

Rapid Response - Asian Hornet

The first sighting of Asian hornet (*Vespa velutina*) in the UK was confirmed in south-west England in September 2016. Our contingency plan was immediately put into effect, leading to the discovery and destruction of a nest. We have seen no further sightings in the area.

We remain vigilant and are raising awareness among bee keepers, pest controllers, NGOs and the general public to strengthen our capabilities in the detection of this species. We recently launched the Asian Hornet Watch mobile app to make it easier for suspected sightings to be reported and enable us to respond rapidly when sightings are confirmed.

On-going Eradication - Ruddy Duck

The UK Ruddy Duck Eradication Programme began in 2005. At the start of the Programme, 4,400 ruddy ducks were estimated to be in the wild within the UK. The estimated UK population is now around 20-25 birds, of which six are believed to be adult females. They remain widely scattered across the UK, in small regional populations which appear not to mix. Some regional populations seem to consist of only male birds, while no regional population is thought to have more than two adult females. It appears that the UK population is now slowly declining as a result of natural mortality alone. This can be hastened by continued control – two male adults were culled in 2016. It is likely that the UK population will soon cease to be viable if that point has not already been reached.

Pathway Action Plans

We have produced our first pathway action plan for zoos and aquaria, which is based partly on the Council of Europe's Code of Conduct. The plan is designed to deliver a series of measures to raise awareness among key actors in this sector and strengthen existing mechanisms, such as ensuring that escapes are dealt with quickly.

We are currently developing two further pathway action plans – recreational boating; and angling.

Invasive Species Week

In 2015, we launched the first Invasive Species Week to bring together a wide range of organisations to raise awareness of invasive alien species, highlight work going on to tackle them and inspire people to get involved and help prevent their spread. Following a successful first year, the campaign has been repeated annually since 2015, growing in profile each year.

Invasive Species Week 2017 took place in March and highlights included:

- 340 organisations involved (compared to 160 in 2016);
- 50 events held including four visits by the Government Minister Lord Gardiner, (compared to 21 in 2016);
- 23 print media items and 5 broadcast items, all positive.

Species Control Orders

In 2016, we introduced new legislative provisions, species control orders, in England and Wales to enable Government agencies to access land to carry out operations on invasive alien species where a landowner has refused to grant permission.

UK Overseas Territories Biosecurity projects

Invasive alien species are probably the greatest environmental threat to the 16 UK Overseas Territories. However, most of them have limited capacity and need support to develop measures to reduce the risk of future invasions as well as to manage existing ones. We have secured £2.75m funding over four years (2016-2020) for two projects.

The first project (£1m) to help the development of comprehensive biosecurity for the Overseas Territories by providing them with access to UK Government expertise on risk analysis, pathway management, pest identification, horizon scanning, contingency planning, rapid response capability and species management.

The second project (£1.75m) is a contribution to the RSPB-led eradication of mice from Gough Island in the Tristan da Cuhna territory in the South Atlantic. The mice kill approx. 800,000 seabird chicks per annum and are the main threat to the endangered Tristan albatross and Gough Island bunting. The eradication is planned for 2019.