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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Bern Convention Group of Experts
on Invasive Alien Species
/
Groupe d'experts de la Convention de Berne
sur les espèces exotiques envahissantes

St. Julians, Malta (18-20 May 2011)
/
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Implementation of recommendations on Invasive Alien Species
/
Mise en œuvre des recommandations sur les espèces exotiques envahissantes

National reports and contributions / Rapports nationaux et Contributions--

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1. ARMENIA / ARMENIE

FORECAST OF FURTHER DISTRIBUTION OF SOME INVASIVE AND EXPANSIVE PLANT SPECIES IN ARMENIA

Introduction

Armenia is a South Caucasian republic, bordering with Georgia, Azerbaijan, Turkey, and Iran. It is a landlocked country with a total area of 29,740 km^2, at a distance of about 145 km from the Black Sea, 175 km from the Caspian Sea, and 750 km from the Mediterranean Sea. It 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 (north-west to south-east). 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.

In Armenia practically all main climate types from dry subtropical to cold alpine are observed. Average annual air temperature is 5.5^0C. Meanwhile if in the lower parts (Megri, Alaverdi) it reaches 12-14^0C, on high altitudes over 2500 m above the sea level it goes below zero. The summer of the republic territory is very warm (July average temperature is 16.7^0C, in Ararat valley - 24-26^0C, maximum temperature is registered in Artashat - 43^0C and in Yerevan - 42^0C). The winter is usually cold, average temperature of January -6.7^0C (absolute minimum is registered in the North-West of Armenia in Lake Arpi surrounding - -42^0C). Precipitation in republic territory are distributed unevenly with average 592 mm, in Ararat valley and Meghri region it is only 200-250 mm, and more than 1000 mm in the high altitudes. The driest are the summer months; in Ararat valley: the precipitation within all summer is only 32-36 mm (second National report on Climate change, 2010)

Flora and vegetation of Armenia are very rich and diverse. Here in the territory of less than 30000 sq. km, more than 3600 species of vascular plants are present (123 of them are narrow local endemics of the republic) and all main vegetation types of the Caucasus are registered (excluding vegetation of wet subtropics). In the lower mountainous belt, on the altitude between 400 and 1200 meters above the sea level semidesert (or phryganoid) vegetation is presented in a large variety. Here also the main diversity of hypsophilous and halophilpus vegetation of the republic is concentrated. The zones of salt marshes are present and even the plot of unique sand desert. Here are presented very rich floristic communities of the spiny bushes (predominantly Christ's-thorn), so-called sibliak, and also deciduous and juniper open forests which go up to the medium and sometimes to the upper mountain belt. Medium and upper mountain belt (1200-2200 m above the sea) are characterized by various steppe and forest vegetation, meadow-steppes, communities of steppe shrubs and tragacants. The forest vegetation of the republic is represented mainly on the 500-2000 meter altitudes. With that, forests climb up to 2400 m above the sea level in certain regions and form so-called park forests. The majority of the forests in the country are located in northern and southern regions. The central part of Armenia is afforested much less. The forests of Armenia mainly consist of beech, oak trees, and partly hornbeam. From the floristic point of view the small areas of relict groves of yew-tree and plane are of a great interest. The most widespread type of the vegetation in Armenia in the recent past was evidently mountainous steppe. They occupied all mountain plateaus and forestless slopes in the middle mountain belt. The most interest and attention of the researchers was drawn by feather-grass steppe reminding by its appearance South Russia steppes very much. During the Soviet time most of the territories were plowed up and used in agriculture. Only small fragmented pieces have been preserved by nowadays on steeper stony slopes or small pieces between fields on the mountainous plateaus. Sub-alpine and alpine belts (2200-4000 m above the sea) are mainly occupied by meadows and carpets. Besides plant communities that are attributed strict enough to the altitudes of the concrete mountain belts the intrazonal vegetation is presented in the significant territories of the republic. It includes vegetation wetlands, of the very stony habitats and of the disturbed natural habitats (Fayvush, 2009).

We live in the quickly changing world. Often we have no time to conceive occurring changes. But these changes are seriously threatening both environment and accordingly human living conditions and the biodiversity including plant species and ecosystems as a whole.

The climate change forecast

The climate change in the territory of Armenia is mostly conditioned by the influence of Global climate change. Climatologists have estimated possible temperature changes and amount of precipitation in the republic territory for the case scenarios of the greenhouse gas A2 and B2 emission for the period of 2030, 2070 and 2100 using MAGICC/SCENGEN (5.3v2) and PRECIS softwares. It was shown that by the end of 21st century the average temperature depending on the scenario can increase from 4,8 to 5,7 ˚C. Moreover the highest increase of the temperature is expected to be in the spring-summer period in the Southern and Central regions of the republic; the temperature increase in the North and East will be mild. The precipitation change forecast remains greatly indefinite – its decrease is supposed to be 1-27%. Meantime greater decrease of precipitation is expected in summer period. In fall-winter-spring period precipitation decrease is expected in foothills, but slight increase is expected in mountains (Second National report on Climate Change, 2010).

Climate forecasts allow supposing the shift of the current ecological conditions up to 300-400 meters in the mountain profile and to the increase of the aridity both the whole republic territory and especially its foothills and lower regions. The climate change here will also allow disturbances in the sustainable natural ecosystems.

The forecast of change of the spread of invasive and expansive plant species

Degradation and transformation of the natural ecosystems due to the human activities are the most serious threat to the biodiversity of the Earth. The expansion of invasive species is considered to be the second most significant threat to the biodiversity; and in many cases it is linked to the first one. Disturbance of the natural ecosystems triggers intensification of the expansion of invasive species which as a result leads to the full change of those ecosystems.

All ecosystems of Armenia have been under anthropogenic influence for millennia, but in earlier times low human population and traditional regulated use of natural resources maintained the balance of ecosystems. Over the last 1000 years human impact on the land increased, mainly through deforestation and increased grazing pressure. The problems intensified since 1920 over recent years due to unprecedented population growth and urbanisation. The main consequence was loss of natural woodlands, grasslands and wetlands due to agriculture and overgrazing, urbanisation and road building, drainage and flooding, and afforestation. During last years (since 1992) the economic and energy crisis mainly endangered Armenia's forests. Poor forest management combined with illegal wood cutting for fuel and construction has damaged about 10 % of the total forest area. At the same time, overgrazing has destroyed the grasslands surrounding the villages and degraded the formerly unspoilt pastures of remote mountains.

Unfortunately, negative influence on the natural ecosystems continues to be the case nowadays. If at least some semblance of the order exists in Armenia in the forestry sector, the development of the mineral resource industry related to the open-cast mines of the natural mineral resources, infrastructure development and building of enormous number of accessory communications leads to degradation and full destroying of the natural ecosystems.

The Global climate change has its effect on occurring processes and also facilitates expansion of invasive and expansive species changing existing ecosystems and creating new ecological niches which are becoming easily occupied by the species with the large ecological amplitude. Meantime the threat for many plant species is the climate change itself – changed conditions will not allow them to find appropriate niches and will lead to their total disappearance. The new edition of the Red Book of Armenia (2010) includes 452 species of plants, which are under the threat due to the various reasons. For approximately one third of them climate change is the threat for their existence.

Regarding invasive and expansive species having large ecological amplitude and easily adjusting to the new conditions, climate change along with the change of the will enlarge the possible area of distribution for many thermophilic invasive and expansive plant species, which grow at present on

restricted territory of the lower mountain belt. Current preliminary list of invasive and expansive species involves around 100 taxa (Fayvush, 2008; Tamanyan, 2008). Using the software DIVA-GIS, we simulated possible changes in areas of distribution of 8 plant species according to different scenarios of climate change.

Ailanthus altissima is very aggressive invasive species. The map of Armenia on the figure 1 shows current natural habitat expansion of this species - white-colored territories. As we can see these territories are not too big yet. The black territories show possible expansion of this natural habitat. Fortunately, *Ailanthus* is quite hygrophilous, and forecasts of climate change suggest increase of precipitation amounts only in some alpine regions where expected temperature increase and will not create for it favorable conditions anyway. Supposed natural habitat will be relatively restricted, although forecasted change of the climatic conditions will allow this species to enlarge the area of distribution on humid habitats.

Astragalus galegiformis is expansive species, endemic of the Caucasus. Only two populations of this species were known before eighties of the last century (white triangles on the map of Armenia). Its natural habitat has been expanded largely in last years (black areas), new populations found and it is forming mono-dominant communities in the majority of newly occupied habitats, which is showing improvement of ecological conditions for this species. Climate change modeling shows that this species will expand its natural habitat even more (grey-shaped territory) and will occupy bigger areas. The conditions will become favorable for this species practically in the whole territory of the republic and in case of the spread of the seeds to bigger distance its natural habitat will appear to be much larger. It is necessary to point that our forecast has already started to be confirmed; during the field research of 2009 and 2010 new large populations of the species were found.

Silybum marianum was found in 1967 in the South Armenia. During the passed years its area of distribution was enlarged, and new populations were found in North Armenia. The further expansion of this species is forecasted. Current natural habitat of the species is highlighted on the map by white and forecasted by black.

Robinia pseudoacacia was used in artificial plantations in Armenia very broadly, especially along the roads. At present it shows weak invasive potential, growing along streams and on wetlands in North and South-East Armenia. Kikodze et al. (2009) forecast the spread of this species in Armenia including Ararat valley - the territory is highlighted white. We disagree with the forecast of our colleagues in this part since it is supposed that precipitation will decrease in the most of the republic territory and this species is relatively hygrophilous. With white triangles on the map current habitats of this species are shown in the natural ecosystems. Our forecast (black territory) supposes its distribution only in the North and South-East of the country where insignificant change of amount of precipitation is expected.

Clematis orientalis – was considered rare species (was even included in the Red book of Armenia, 1989). Currently spreads intensively in the central and southern parts of Armenia showing strong invasive potential. Its habitats known before 1990 are shown on the map by white triangles and by black triangles new habitats are shown. Our forecast supposes its distribution in much more large areas in the whole Armenia.

Tanacetum vulgare – invasive species in Europe, was known by small number of collections from Upper-Akhuryan, Shirak, Aparan and Sevan floristic regions (fig7; on the map the natural habitat is painted white). During the last years new big populations are revealed in the North and South of Armenia. Further expansion of natural habitat is forecasted (painted black on the map).

Echinocystis lobata and *Impatiens glandulifera*– dangerous invasive species in Europe. Currently there are not numerous habitats known predominantly in the North of Armenia. On the maps presented they are highlighted with white triangles. The forecast of climate change supposed the possibility of their intensive spread in Northern parts of Armenia where rather high amount of precipitation will remain.

The problem of invasive plant species in Armenia also used to be underestimated. It was considered that due to the mountainous and indented landscape and absence of big plain territories, invasive species could not harm natural ecosystems. By our efforts the attitude towards the problem

of invasive species has changed. Our research has shown that in Armenia one invasive species cannot occupy large territories. Actually, big number of invasive and expansive species distribute in suitable for them habitats, and occupy now relatively small areas, but as a whole the picture is rather dangerous. Preliminary estimation results of the threat of invasive plant species to the natural ecosystems and biodiversity in Armenia allowed us to prepare the list of species requiring immediate attention contains: invasive alien species, species known as invasive in other regions of the world that enlarge their area, but do not show their invasive potential in Armenia yet, aborigine plant species - in the last years have enlarged their areas a lot and show real threat to natural ecosystems and biodiversity nowadays. Investigation of distribution of these species in Armenia is started, trends in their distribution during last 40-50 years are evaluating, forecasts for their future distribution are processing. Estimation of threats from invasive alien species to some ecosystems is started. These investigations carry out in the Institute of Botany of Armenian National Academy of Sciences (G.Fayvush, K.Tamanyan).

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*), crucian, silver carp, white carp, sazan (*Cyprinus carpio*), rainbow trout, crayfish.

Conclusion

Preliminary results of the research of invasive and expansive species started in Armenia in last years emphasizes the importance of the problem raised, and urgent need of its continuation, expansion and deepening. First of all it is absolutely necessary to monitor the contemporary distribution and status of populations of investigated species, which will provide the basis for evaluation of their influence on the natural ecosystems and biodiversity.

The research carried out has sown the possibility of forecasting with quite high probability the changes of natural habitats of invasive and expansive species in relation to the climate change. These forecasts will also allow estimating the level of their threat to the natural ecosystems, to highlight priority species that need the measures to be designed and taken to decrease their number and/or their eradication.

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2. BELGIUM / BELGIQUE

ACTIONS TAKEN IN BELGIUM IN RESPONSE TO THE THREATS OF INVASIVE ALIEN SPECIES

PLANIFICATION

The National Biodiversity Strategy (adopted in October 2006 by the Interministerial Conference Environment) identifies the following strategic and operational objectives directly related to IAS:

Strategic objective n°3: Maintain or rehabilitate biodiversity in Belgium to a favourable conservation status (operational objective n°3.7.: "Avoid the introduction and mitigate the impact of invasive alien species on biodiversity")

Strategic objective n°5: Improve the integration of biodiversity concerns into all social and economic sectoral policies (operational objective n°5.7.: "Consider the potential impact on biodiversity, and in particular the invasiveness of species, in making import and export decisions").

The federal plan for the integration of biodiversity in 4 federal key sectors (economy, science policy, development cooperation and transport), adopted in 2009, addresses the issue of invasive alien species in:

- the economic sector: develop federal instruments to limit the introduction of IAS in Belgium (proposed actions : awareness raising activities towards key economic sectors / Broaden and update the legal framework at federal level)
- the science policy sector: Put in place an early warning system for the detection of IAS (proposed actions : Risk analysis and finalisation of IAS lists in Belgium)
- the transport sector: Take biodiversity into account in the marine transport by limiting introduction of IAS (proposed actions : control and manage ballast water, consider the risk of introduction of IAS in marine areas in the development of the federal marine policy)

PREVENTION

1. Legislation

Federal :

Measures related to importation, exportation and transit of non indigenous wild bird species are taken (excepted if the birds were bred in captivity) (26/10/2001. - Arrêté royal portant des mesures relatives à l'importation, à l'exportation et au transit de certaines espèces d'oiseaux sauvages non indigènes. : Art. 3. § 1). (Transposition of BD)

Law of 28/07/1981 related to CITES (interdiction of detention, sale, etc..of species listed in annex 1 of CITES). Measures related to commercialisation of species listed in annex A (excepted for specimens bred in captivity, with CITES certificate), (Arrêté royal du 9 avril 2003 relatif à la protection des espèces de faune et de flore sauvages par le contrôle de leur commerce (abrogeant l'Arrêté du 20/12/1983)).

Royal Decree of 19 November 1987 concerning measures against organisms harmful to plants and plant products (measures for brown rat, muskrat and grey squirrel) is currently under revision, in consultation with the 3 regions, but currently still in force.

A specific liability regime has been enacted for damages arising from the transport of IAS: federal legislation for prevention / remediation of damage resulting from transport by road, railway, navigable waterways or air of non-native animals, plants and parts thereof, following their import, export and transit into the country (Royal Decree of 8 November 2007). This regime provides i.a. for notification duties; the possibility of substitution by the competent authority; cost allocation; possible deposits and guarantees to support cost recovery; and a possible procedure for cost recovery linked to damage caused outside Belgian territory.

Ongoing: the Federal Public Service health, Food Chain Security and Environment – DG Environment has prepared a draft Royal Decree (May 2009) that provides for a ban on the import, export, transit and detention of 20 IAS of the black list (cf infra). It foresees an exemption if it can be proven that all reasonable steps are taken to avoid escape of listed IAS. The adoption of this Royal Decree is postponed due to ongoing political reorganization.

North sea:

The deliberate introduction of alien species in the marine environment is forbidden (Royal Decree on the protection of species in the marine waters under Belgian jurisdiction, 2001).

The Belgian law of 20 January 1999 on the protection of the marine environment in marine areas under Belgian jurisdiction (MMM law) forbids the intentional introduction of non indigenous species in the marine environment without special license (Art. 11, §1). This provision mirrors those included in international instruments like the CBD.

The unintentional introduction of non indigenous species via ballast water of ships can be prohibited by royal decree (Art. 11, §2). Belgium takes part to related IMO discussions/instruments (like the convention on ballast water) dealing with the issue of non indigenous species in ballast water of ships. For the protection of the marine biota, measures can be taken (by royal decree and after scientific consultation) for the extermination of non indigenous nuisance species (Art. 11, §3).

The new law also prohibits the intentional introduction of genetically modified organisms into marine areas (Art. 11, §4).

The Federal Public Service Health, Food Chain Security and Environment – DG Environment has also prepared the enforcement of the COUNCIL REGULATION (EC) No 708/2007 of 11 June 2007 concerning use of alien and locally absent species in aquaculture within the permit system for aquaculture activities in the Belgian part of the North Sea.

Flanders:

It is illegal to introduce any alien species in the wild in Flanders (article 17, Besluit van de Vlaamse Regering van 15 mei 2009 met betrekking tot soortenbescherming en soortenbeheer (BS: 13/08/2009), in short 'Soortenbesluit').

Some exceptions to this rule apply:

- specimens of plant species that are cultivated in the frame of Legal forestry, agriculture or horticultural activities or in the frame of garden or park management:
- specimens of fish reared in closed waters that guarantee that specimens can not move to open waters.

Precautions need be taken that the above exceptions do not result in introducing alien specimens in the wild.

In addition, separate fish legislation allows the introduction of alien species in open waters, in which case the 'Soortenbesluit' does not apply

Further, introductions in the wild are possible, but impact assessment has to be completed and has to confirm that there or no risks for unfavourable consequences for in Flanders native nature (Art. 21. §2).

To allow reducing negative impact on native biodiversity of IAS in the wild, to mitigate or to restore, the Flemish minister responsible for the Environment can take measures (articles 28, 29, 30 and 31 of the 'Soortenbesluit').

The following actions are possible:

- actions for increasing awareness including facilitating codes of conduct;
- doing, letting do, or enforcing of specific management and control;
- making agreements with local governments and/or organisations aiming at local actions; and

- limiting or prohibiting transport, trade and possession.

Brussels:

It is forbidden to introduce non indigenous species of birds into the wild. (25/10/1990. - Arrêté de l'Exécutif de la Région de Bruxelles-Capitale relatif à la protection des oiseaux. : Art. 6.).

The intentional introduction of non indigenous species is regulated in order to insure that no damage is caused to natural habitats and indigenous flora and fauna, otherwise the introduction is forbidden. (26/10/2000. - Arrêté du Gouvernement de la Région de Bruxelles-Capitale relatif à la conservation des habitats naturels ainsi que de la faune et de la flore sauvages, Art. 14.)

Since January 2007, legislation on species protection and conservation (flora & fauna) is in revision. The aspect of IAS will be an important issue.

Wallonia:

The introduction of non indigenous species or indigenous species of non indigenous origin in nature is forbidden excepted for species used for agriculture and forestry (Décret relatif à la conservation des sites Natura 2000 ainsi que de la faune et de la flore sauvage (published on 22 January 2002).

Guidelines have been produced to forbid intentional introduction of black and alert list species (see risk assessment) through public call for tenders in Wallonia. See: http://reflex.raadvst-consetat.be/reflex/pdf/Mbbs/2009/05/26/113093.pdf

Two decrees will be also modified in the coming months to help preventing secondary release of invasive alien species. The Soil Decree, wherein transport of soils contaminated by propagules of invasive plants like *Fallopia* spp., *Heracleum mantegazzianum*, *Solidago* spp. and *Spiraea* spp. will be forbidden. On top of that, trade and use of a limited number of species will be restricted based on a modification of the Nature Decree.

2. Codes of conduct

Best practices for preventing release and spread of invasive ornamental plants in the environment in Belgium are promoted through a Life+ information and communication project entitled AlterIAS (www.alterias.be). It aims namely at developing a sectorial engagement in a Belgian voluntary code of conduct (to be launched in September 2011), based on the general framework recently proposed by the European Plant Protection Organisation and the Bern Convention (Heywood & Brunel 2009). The final goal is to reduce voluntary introductions (propagule pressure) of invasive ornamental plants via gardening and landscaping activities.

3. Risk Assessment

A list system of non-native organisms established in Belgium has been developed at the initiative of scientists gathered within the Belgian Forum on Invasive Species (see: http://ias.biodiversity.be). It aims to help land managers and policy makers in the identification of species of most concern for preventive or mitigation actions, namely action plans, legislative tools and voluntary codes of conduct. Lists are built using a standardised assessment protocol, ISEIA (Invasive Species Environmental Impact Assessment), which allows assessing and categorising exotic species from any taxonomic group according to their invasion stage in Belgium and to their impact on native species and ecosystem functions. The ISEIA protocol is one of the first national standardised risk assessment tools developed for non-native species (Verbrugge et al. 2010) and it has been used as a model for the development of other comparable initiatives in Europe (e.g. Parrott et al. 2009).

The Belgian list system is based on three different categories as recommended in the European strategy on Invasive Alien Species (Genovesi & Shine 2004). They are defined according to the severity of impacts on the environment: no negative impact (white list), negative impact moderate or suspected (watch or grey list) and negative impact confirmed (black list). The assignment of a non-native species to one of those categories is assessed by four main criteria matching the last steps of the invasion process: 1) the potential for spread, 2) the colonisation of natural habitats and adverse ecological impacts on 3) native species and 4) ecosystems.

In addition, finalisation of a 2 year contractual research project 'Pest Risk Analysis (PRA) for harmful organisms (harmful alien plants included) in the plant sector' launched by the Federal Public Service Health, Food Chain Safety and Environment - DG animals, plants and foodstuffs. The project included 3 invasive alien species (Ambrosia artemisiifolia, Fallopia japonica and Impatiens glandulifera).

The MACROREG project (Belgian Federal Public Service Public Health, Foodchain Security and Environment, 2009 - 2012) aims at developing a methodology for risk analysis in view of a possible future registration process in Belgium for invertebrate natural enemies, mostly exotic species.

4. Monitoring and Early detection

Flanders:

Through the monitoring and inventory of fish occurring in inland waters, alien fish species are also being monitored.

Walloon Region:

The monitoring of invasive alien species is integrated into regional biodiversity surveys established in the framework of the Habitats and the Water Framework Directives.

Brussels:

Several research programmes includes monitoring e.g. on parakeets, naturalised waterbirds, mammals and plants.

MITIGATION

5. Population control measures

Identification of best practices

- Best practices have been investigated by Gembloux Agro-Bio Tech (Wallonia) to control the following plant species: *Acer rufinerve, Cotoneaster horizontalis, Crassula helmsii, Fallopia spp., Heracleum mantegazzianum, Hydrocotyle ranunculoides, Impatiens glandulifera* and *Spiraea* spp. See: http://www.fsagx.ac.be/ec/gestioninvasives/Pages/Accueil.htm
- Within the INVEXO project (European Interreg-project IV A) control and study of control occur for Floating Pennywort *(Hydrocotyle ranunculoides),* largeflower primrose willow *(Ludwigia grandifolia) and* parrot feather *(Myriophyllum aquaticum)* in waterways; for Black cherry (*Prunus serotina*), for bull frog and concerning summer geese (including Canada and Egyptian goose and in summer remaining wild and semi-domesticated goose).

Control actions

Different actions are undertaken to control some invasive alien species in the three regions of the country. Most actions are undertaken at local scale but a few eradication plans have been also launched (e.g. *Heracleum mantegazzianum* and *Oxyura jamaicensis*) (see table). The Giant Hogweed eradication plan is based on in-depth inventory of plant populations and management by both public and private owners in Wallonia (see: www.wallonie.be/berce).

Table 1 – Control measures undertaken against invasive alien species in the different regions of Belgium. Different categories : absent (species not established in region), no (no action), local

(actions undertaken to eradicate or decrease population density at local scale), mitigation (actions undertaken to decrease population density at the regional scale) and eradication (actions aiming to eradicate the species from the region).

	List	Brussels	Flanders	Wallonia
Aquatic plants				
Crassula helmsii	A1	Absent	No	Local
Hydrocotyle rancunculoides	A2	No	Mitigation	Mitigation
Ludwigia spp.	A2	Absent?	Mitigation	Mitigation
Myriophyllum aquaticum	A2	No	Mitigation	Mitigation
Myriophyllum heterophyllum	A1	Absent	No	Absent
Terrestrial plants				
Acer rufinerve	B1	No	No	Eradication
Ailanthus altissima	A2	No	No	Local
Baccharis halimifolia	A1	Absent	Eradication	Absent
Cotoneaster horizontalis	A2	No	Local	Local
Impatiens glandulifera	A3	Local	Local	Local
Fallopia spp.	A3	Local	Local	Local
Heracleum mantegazzianum	A3	Local	Local	Eradication
Mahonia aquifolium	A2	No	Local	Local
Prunus serotina	A3	Local	Local	Local
Rhododendron ponticum	A2	No	Local	No
Rosa rugosa	A2	No	Local	No
Spiraea spp.	A3	No	Local	Local
Batracians				
Lithobates catesbeiana	A2	Absent	Local	Local
Reptiles				
Trachemys scripta elegans		Local	Local	Local
Birds				
Alopochen aegyptiacus	A3	Local	Local	Local
Branta canadensis	A3	Local	Local	Local
Oxyura jamaicensis	A1	Eradication	Eradication	Eradication
Psittacula krameri	**B2**	Mitigation	No	No
Mammals				
Callosciurus erythraeus	A1	Absent	Eradication	Absent
Castor canadensis	B1	Absent	Absent	Eradication
Myocastor coypus	A1	Absent	Eradication	Eradication
Ondatra zibethicus	A3	Local	Eradication	Mitigation
Procyon lotor	A2	Absent	No	Local
Rattus norvegicus	A3	Local	Mitigation	Mitigation
Rattus rattus	-	Absent	Mitigation	Mitigation

SUPPORTING MEASURES

6. Communication, Education and Public awareness

- A European Life+ information and communication project entitled “AlterIAS” (ALTERnative to Invasive Alien Species) has been launched in 2010 to curb the introduction rate of invasive ornamental plants. It aims at raising awareness about the environmental risks of IOP amongst the whole ornamental horticulture supply chain in Belgium, including plant growers and retailers, garden contractors, public green managers, landscape architects, horticulture teachers and garden amateurs. Several communication campaigns are initiated, dealing with general information on invasive ornamental plants and the promotion of the code of conduct in order to encourage its

support and subscription from horticulture professionals. A variety of communication tools are produced to this purpose: website, DVD, TV and radio reportages, brochures, folders, posters, and articles in horticultural magazines. More information: http://www.alterias.be

- Other punctual communication actions are undertaken, with various taxa at target. Multiple papers and interviews were conducted on this topic during the last years in the press. Public awareness is systematically integrated in each large-scale project dealing with invasive alien species in Belgium (e.g. INVEXO).
- Several folders, brochures and posters have been edited, with the following species at target: invasive aquatic and terrestrial plants (e.g. *Fallopia japonica, Heracleum mantegazzianum, Impatiens glandulifera, Senecio inaequidens*), Asiatic ladybird, muskrat, presence of IAS in cities, etc.

Workshops and related events

- Belgium celebrated the 2009 International Day for Biological Diversity by organizing a press conference dedicated to the issue of invasive alien species in Belgium (19 May 2009 at the National Botanic Garden of Belgium). Two ministers and other speakers presented the subject and the actions taken to tackle the issue of IAS at federal and regional level. An elaborated press file was prepared containing several case studies on IAS in Belgium. The conference had mainly an impact in the written press and on the radio around the date of 22 May. TV records in the fields will be used for dedicated programmes (http://www.biodiv.be/implementation/ibd/ibd2009).
- The Belgian Biodiversity Research Platform organized a scientific conference entitled 'Science facing aliens' to assess the state of the art of scientific knowledge on invasive alien species in Belgium. It covered a broad range of topics, e.g. the mechanisms and evolution of species invasiveness, the environmental impacts of invasions together with the assessment and the management of risks. More information on this scientific conference can be found at http://ias.biodiversity.be/ias/outputs/200905_science_facing_aliens
- international conference (18-20 May 2009) and several press conferences on the DANAH LIFE-project for nature and forest restoration and management on military areas - a cooperation between the Agency for Nature and Forest (Flemish government) and the Ministry of Defence. An important action is the wide-spread removal of alien tree species. (http://www.danah.be).
- On 19 May 2009 the green areas managers of the 19 municipalities in Brussels-Capital Region were invited for a special training day on invasive alien species in urban areas and fight means available. The Nature, Water and Forest Section of the public body 'Brussels Environment' provided the training and focussed on the identification, ecology and management of the main invasive alien species of the Region: giant hogweed (Heracleum mantegazzianum), Japanese knotweed (Fallopia japonica), black cherry (Prunus serotina), Egyptian goose (Alopochen aegyptiacus), harlequin ladybird (Harmonia axyridis) and ring-necked parakeet (Psittacula krameri).

7. Research

An analysis of the research projects on biological invasions being conducted by Belgian scientists from 1990 to 2009 has been performed recently (Branquart et al. 2010). 56 research projects were identified. A rising interest in invasion ecology is manifest in the exponential growth of research projects related to invasive species since 1999. In addition to those projects, 22 more projects involve invasive species in a more incidental way. They are related either to biodiversity monitoring activities or to pest control studies.

Five main research avenues were identified: invasion patterns, mechanisms and evolution of invasive species, impacts, risk assessment and management. Today, Belgian research dedicated to biological invasions has been shown to enter in a maturity phase and reaches high quality standards. Some research topics are well developed by Belgian teams and can be considered as very competitive within the international arena, like the studies dedicated to the evolutionary and ecological mechanisms of plant invasions or to those focusing on the spatial dynamics of invasions.

More information: Branquart, E. et al. (2010) Research on biological invaions: a Belgian perspective. In: H. Segers & E. Branquart (Eds), proceedings of the Science Facing Aliens Conference, Brussels, May 11th 2009. http://ias.biodiversity.be/meetings/200905_science_facing_aliens/proceedings.pdf

- Inplanbel Project " Invasive plants in Belgium: patterns, processes and monitoring" (Project website: http://www.fsagx.ac.be/ec/inplanbel/): The project provides a multifunctional and multi-scale analysis of alien plant invasion in Belgium. The general aim is to give a framework for the evaluation of the threat, for the development of policies and management strategy and for the elaboration of further research programs. This project is the first multidisciplinary approach dealing with invasive plants topic in Belgium (*Fallopia japonica,Heracleum mantegazzianum, Impatiens glandulifera, Impatiens parviflora, Prunus serotina, Rosa rugosa, Senecio inaequidens, Solidago gigantea*).The specific aims are :

  (1) to provide a synthesis on plant invasion in Belgium in the form of a structured list of exotic species ;

  (2) identify universally valid principles of biological invasion through a combined analysis of ecophysiological species and community traits ;

  (3) provide a detailed analysis of the spreading of a set of invasive species at the landscape level linked to their dispersal capacities ;

  (4) analyze the consequences of a set of invasive species on ecosystems.

- The Nature, Forest and Woods Research Center is currently monitoring invasive species in the Walloon watercourses.

- Alien species are identified through inventories of species for some groups (e.g. mosses and liverworts, vascular plants, crustaceans, birds, mammals) in Wallonia.

- There is a program in which rare, colonial and introduced breeding bird species are being monitored in Flanders. Among them, alien breeding bird species as the lesser white-fronted goose (*Anser erythropus*), the Canada goose (*Branta canadensis*), the barnacle goose (*Branta leucopsis*), the Nile (Egyptian) goose (*Alopochen aegyptiacus*), the mandarin duck (*Aix galericulata*), the ring-necked parakeet (*Psittacula krameri*) and the monk parakeet (*Myiopsitta monachus*) are being monitored. This program is called the 'Bijzondere Broedvogels Vlaanderen Project' (Flemish Special Breeding Bird Project).

- In Flanders, counts of wintering waterfowl are conducted 6 times every winter; during these counts, non-native waterfowl species, including IAS, are also counted. These counts are organized by the Research Institute for Nature and Forest. The international coordination of these counts is in the hands of Wetlands International.

- Through the monitoring and inventory of fish occurring in the Flemish inland waters, alien fish species are also being monitored.

- Invasive bryophytes, their spread in Belgium and impact on the indigenous bryophytes , 1990-2010, National Botanical Garden of Belgium.

- Gathering of data on the current introduction and spread of alien species (e.g. C4-grasses (e.g. *Setaria macrocarpa, S. verticilliformis, Panicum dichotomiflorum*)), especially in and along maize fields in the area between Ghent and Bruges is being done by the National Botanical Garden of Belgium.

- Phylogeography, population and eco-genetics of European marine and terrestrial mollusks, ongoing, University of Antwerp

- Dispersion of several IAS populations encountered in Brussels is monitored in the framework of a study on the Brussels biodiversity.

- In Brussels Capital Region, special attention is given to exotic species in the monitoring program on flora and fauna. Particular interest is given and several detailed studies have been made on

some exotic birds (*Alopochen aegyptiacus, Branta canadensis, Psittacula krameri, Psittacula eupatria, Myiopsitta monachus*), exotic herpetofauna species (*Rana ridibunda*), some mammals *(Tamias sibericus*). Also the extension of exotic plant species is particularly followed.

- Federal Public Service Health, Food Chain Safety and Environment - DG animals, plants and foodstuffs: finalisation of a 2 year contractual research project 'Pest Risk Analysis (PRA) for harmful organisms (harmful alien plants included) in the plant sector'. The project includes 3 invasive alien species (*Ambrosia artemisiifolia*, *Fallopia japonica* and *Impatiens glandulifera*).
- A study is currently ongoing in the Walloon Region on how to manage invasive alien plant species along waterways: how to prevent their expansion, how to control them, and on the different possibilities for the administration to implement these tasks and to communicate the information to local and regional administrations.
- The next Walloon environment evaluation (Etat de l'Environnement Wallon) will have a chapter on the follow up of invasive alien species.
- Impacts of global warming on *Senecio inaequidens* life history traits, GxABT – Université de Liège, 2006-2010.
- Study of the dynamics of the populations of the invasive alien species *Fallopia* Adans. Polygonaceae. FUSAGx, 2002-2007.
- Evolutionary implications of hybridization in the invasive polyploid complex *Fallopia*, FUSAGx, 2006-2010.
- *Perinbel*: Public PERception of INvasive species in BELgium (Belspo cluster 2005-2007) FUSAGX - Research Analysis. This cluster aims: 1) at providing a framework for the evaluation of public perception of the invasive species problem in Belgium, 2) at identifying sociological constraints on the establishment of management strategies for invasive plant species including, 3) increasing communication skills of scientists and managers towards broad public on the matter of invasive species. Two target groups are considered: nature reserve managers and plant nurseries.
- Alien impact: Biodiversity impacts of highly invasive alien plants: mechanisms, enhancing factors and risk assessment. Belspo "Science for a sustainable development" research program 2007-2009.

  The proposal aims to provide a first integrated study of patterns and mechanisms of impact by alien invasive species in Belgium. It will consider different spatial scales and multiple levels of ecological organisation. The project will consider both terrestrial and fresh water ecosystems, though resolution is expected to be greater for terrestrial systems. The central aim is impact on biodiversity. We will focus on impact on native autotrophics, but also on soil and water fauna, as well as how eutrophication (soil and water) and climate warming (only terrestrial) modify impact. Both direct (via competition) and indirect (via pollination, soil modification, allelopathy) mechanisms of impact will be studied. The project will concentrate on highly invasive plant species (HIPS) in Belgium. Forecasting the impact of Belgian alien invasive plants, faces the challenge that detailed studies (by necessity limited to few species/sites) are needed to disentangle the coupling of response mechanisms at different ecological levels, whereas general trends can only be derived from assessments with simple measures over a large scale (many sites).
- Walloon region : DGRNE/DCNN : "Rongeurs et autres nuisibles inféodés aux cours d'eau: évaluation des nuisances et perspectives de lutte (01/05/04 - 30/11/06) » (renewing is ongoing)
- "Study on the ecology and environmental impact of the Asian multicoloured lady beetle *Harmonia axyridis* in Flanders, Ghent University, 2006-2009"
- In 2009, the two year research project EnSIS: "Ecosystem Sensitivity to Invasive Species", (2009 -2010), funded by the Belgian Science Policy Research programme "Science for a sustainable development" Targeted actions North Sea. It aims at (1) characterizing the ecological features of *E. directus* in Belgian waters, (2) evaluating the ecological impacts of *E. directus*' introduction and (3) assessing the impact of possible *E. directus*' fisheries.

- In January 2011, the research project 'MEMO: *Mnemiopsis* Ecology and Modeling: Observation of an invasive comb jelly in the North Sea' started. The MEMO project, framed in Interreg IV A '2 Seas', is a cross-border cooperation between ILVO (Institute for agricultural and fisheries research, Belgium), IFREMER (Institut français de recherche pour l'exploitation de la mer, France), ULCO-LOG (Université du Littoral Côte d'Opale-Laboratoire d'Océanologie et de Géosciences, France), CEFAS (Centre for Environment, Fisheries and Aquaculture Science, Great-Britain) and Deltares (the Netherlands

8. Web sites:

Invasive alien species in Belgium
http://ias.biodiversity.be

Invasive ornamental plants in Belgium
http://www.alterias.be

Invasive marine species in Belgium
http://www.mumm.ac.be/FR/Management/Nature/ExoticSpecies/index.php
http://www.vliz.be/NL/Cijfers_Beleid/Niet_inheemse

INTERREG projects
INVEXO: http://www.invexo.be
LUTANUIS: http://www.lutanuis.euro.st/

Regional/federal administrations
Brussels:
http://www.leefmilieubrussel.be
http://www.bruxellesenvironnement.be
http://www.bruxellesenvironnement.be/Templates/Particuliers/Niveau2.aspx?id=4576&langtype=2060
Flanders: http://www.natuurenbos.be/nl-BE/Thema/Soortenbeleid/Overlast_schade/Exoten.aspx
Wallonia: http://biodiversite.wallonie.be/fr/especes-invasives.html?IDC=809
Federal : www.health.fgov.be (environment/biodiversity/concept and actions/invasive species)

Giant Hogweed website
http://www.wallonie.be/berce

3. FRANCE / FRANCE

Activités menées par la France sur les espèces exotiques envahissantes

Avril 2011

UN CADRE LEGISLATIF ET REGLEMENTAIRE CONSTRUIT

Les principales dispositions concernant les espèces exotiques envahissantes sont intégrées dans deux codes : le code de l'environnement et le code rural.

- **Code de l'environnement :**

  - ***Protection de la faune et de la flore :***

L'article L.411-3 prévoit une réglementation visant à l'interdiction d'activités (introduction, commerce de certaines espèces…) portant sur des spécimens d'espèces de faune et de flore sauvages pouvant présenter un risque d'invasion avec un impact négatif sur la biodiversité.

Les articles R.411-1 et suivants du Code de l'environnement permettent à l'autorité administrative d'établir des listes d'espèces soumises à ces mesures. La rédaction de textes fixant les listes de ces espèces est en cours. Un premier arrêté relatif aux interdictions portant sur deux espèces de jussies est entré en vigueur en 2007. En 2010 est entré en vigueur un arrêté ministériel en date du 9 avril 2010 interdisant sur le territoire métropolitain l'introduction dans le milieu naturel de spécimens vivants de certaines espèces d'animaux vertébrés protégées en application des articles L. 411-1 et L. 411-2 du code de l'environnement.

Egalement pour la France métropolitaine, un arrêté interdira prochainement certaines activités (commercialisation, introduction dans la nature, ..) portant sur d'autres espèces envahissantes de flore sauvages.

Un dispositif spécifique est mis en œuvre pour l'Outre mer français et l'élaboration de dispositions spécifiques est en cours d'étude.

La réglementation relative à la faune sauvage captive prévoyant des restrictions de détention de spécimens d'espèces potentiellement envahissantes (deux arrêtés en date du 10 août 2004) a été complétée en 2010 avec la parution de l'arrêté du 30 juillet 2010 élargissant la liste des espèces animales envahissantes soumises à cette réglementation. Le principe général est de soumettre à autorisations administratives la détention de spécimens d'espèces non domestiques présentant des risques, en particulier pour l'environnement.

Le code de l'environnement prévoit également la possibilité d'intervenir sur le terrain pour des opérations de contrôle ou de destruction de spécimens de l'espèce introduite.

  - ***Chasse et espèces nuisibles :***

L'article L.427-8 du code de l'environnement prévoit la destruction d'animaux nuisibles. L'arrêté ministériel du 30 septembre 1988 modifié définit les espèces susceptibles d'être classées nuisibles par les préfets de département. Certaines espèces figurant sur cet arrêté sont des espèces exotiques envahissantes.

  - ***Pêche et protection du patrimoine piscicole :***

Le code de l'environnement interdit l'introduction de certaines espèces exotiques envahissantes dans les eaux concernées. Il s'agit par exemple du poisson chat ou de la grenouille taureau.

- Le code rural (article L251-1 et suivants et les articles réglementaires en découlant) comporte des dispositions phytosanitaires qui organisent la protection des végétaux et des produits végétaux contre les organismes qui leur sont nuisibles. Une très large partie de ces espèces est constituée d'espèces envahissantes. Le code rural comporte également les dispositions vétérinaires qui peuvent concerner des espèces exotiques envahissantes.

La loi du 12 juillet 2010 portant engagement national pour l'environnement a prévu de soumettre à autorisation l'entrée sur le territoire et l'introduction dans l'environnement des macro-organismes non indigènes utiles aux végétaux, notamment dans le cadre de la lutte biologique. Le décret d'application de cette nouvelle disposition législative est en cours d'élaboration. La procédure d'autorisation reposera sur une évaluation du risque phytosanitaire et environnemental que peut présenter l'introduction de ce macro-organisme dans l'environnement. Cette nouvelle autorisation permettra de s'assurer que seuls sont utilisés à des fins de lutte biologique des macro-organismes non indigènes qui ne présentent pas du fait de leur caractère envahissant en particulier, d'impacts négatifs sur les écosystèmes. Il est rappelé que les micro-organismes utilisés à des fins de lutte biologique font d'ores et déjà l'objet d'une procédure d'autorisation.

- Le code de la santé publique ne vise pas directement des espèces exotiques envahissantes, mais certaines dispositions peuvent être utilisées lorsque ces espèces sont vecteurs d'agents pathogènes (bactérie, virus ou parasite).

L'article L. 3114-5 du code de la santé publique permet de définir les mesures de lutte contre les insectes vecteurs d'agents pathogènes pour l'homme. L'article R3114-9 du code de la santé publique définit les mesures susceptibles d'être prises par le préfet en vue de lutter contre les maladies humaines transmises par l'intermédiaire d'insectes. Parmi ces dispositions, figurent notamment la surveillance entomologique des insectes vecteurs (dont la surveillance de la résistance de ceux-ci aux produits insecticides) ainsi que des mesures permettant de réduire la prolifération des insectes vecteurs (actions d'information et d'éducation sanitaire de la population). Lorsque ces insectes vecteurs sont des moustiques, le dispositif législatif est complété par la loi de 1964 modifiée relative à la lutte conter les moustiques qui permet la mise en œuvre de mesures de prospection, de traitement, de travaux et de contrôles des populations de moustiques.

STRATEGIE DE MISE EN ŒUVRE

La lutte contre les espèces exotiques envahissantes ayant un impact négatif sur la biodiversité représente une politique d'importance, qui s'est traduite par des engagements forts lors du Grenelle de l'Environnement ainsi qu'au sein même de la Stratégie nationale pour la biodiversité.

Plusieurs axes d'intervention sont actuellement développés :

- La constitution d'un réseau de surveillance des invasions biologiques représente un axe majeur, qui permet de définir les zones d'implantation de ces espèces envahissantes, d'informer les acteurs concernés et la population, de hiérarchiser, de coordonner et évaluer les actions mises en oeuvre. Le principe est de disposer d'un double réseau (l'un pour les espèces animales, l'autre pour les espèces végétales) mobilisant également les établissements publics.
- la prévention par la poursuite de l'élaboration de la réglementation : comme précisé ci-dessus, les arrêtés listant les espèces envahissantes vont être achevés.
- la police de la nature : les actions de police mises en œuvre par les services de l'Etat et ses établissements publics vont être renforcées afin de prévenir et de sanctionner les infractions aux réglementations liées aux espèces exotiques envahissantes ;
- la lutte contre les espèces envahissantes présentes sur le territoire : elle doit être opportune (évaluation des coûts/bénéfices) et reposer sur une détection rapide des nouvelles implantations d'espèces envahissantes ; cette action comporte donc à la fois la mobilisation d'une capacité d'expertise pour l'élaboration des mesures et la mobilisation des moyens pour mettre en œuvre les programmes de lutte . Une priorisation des actions de lutte selon une analyse coûts/avantages a été conduite ; ses résultats sont attendus en 2011. De plus, cette priorisation tiendra particulièrement compte du facteur « impact potentiel de l'EEE sur la santé humaine ». D'ores et déjà ont été entamés en 2011 la rédaction de deux plans d'actions organisant la lutte contre deux espèces : écureuil à ventre rouge ; herbe de la pampa. Un renforcement des actions de lutte contre l'ibis sacré et l'érismature rousse a également été à l'étude.

  S'agissant de la lutte contre *Aedes albopictus*, un plan antidissémination de la dengue et du chikungunya en France métropolitaine a été mis en place en 2006 et est régulièrement actualisé. Ce plan a pour objectif de détecter le plus précocement possible la présence du vecteur *Ae.*

albopictus et les patients potentiellement virémiques, afin de permettre la mise en œuvre rapide et coordonnée de mesures de contrôle du vecteur et de protection des personnes. La sensibilisation et la mobilisation du public est une composante essentielle de cette lutte dite intégrée. S'agissant de la lutte contre l'ambroisie à feuilles d'armoise (*Ambrosia artemisiifolia*), des mesures de lutte ont été mises en place localement. Il est prévu de les renforcer et de les coordonner pour une plus grande efficacité (notamment dans le cadre du Plan national santé environnement 2).

- la sensibilisation du public et l'animation de réseau.

Un programme particulier est développé pour les régions ultra-périphériques (Outre-Mer), du fait de la fragilité de leurs écosystèmes menacés par les invasions biologiques, surtout en milieu insulaire. Une stratégie spécifique est en cours d'application. Le département de la Réunion a en 2010 élaboré une stratégie de prévention sur son territoire. Un réseau d'expertise couvrant l'ensemble de l'outre mer français est organisé, en particulier grâce à une initiative du Comité français de l'UICN. Cette initiative prévoit chaque année la tenue d'un séminaire de plusieurs jours (en 2010, Nouvelle Calédonie) permettant d'échanger des expériences et de faire participer les pays voisins de l'Outre mer français afin d'établir une collaboration régionale sur le sujet des espèces exotiques envahissantes.

Une coordination européenne/internationale des actions de surveillance, de prévention et de lutte est nécessaire afin notamment de favoriser la synergie des actions entreprises par des pays voisins. La mise en place d'une stratégie européenne de gestion des espèces exotiques envahissantes conduira à une plus grande efficacité des mesures de lutte engagées contre les espèces portant atteinte à la biodiversité, à l'agriculture et à la santé humaine.

4. IRELAND / IRLANDE

NATIONAL REPORT - IRELAND

Bern Convention Group of Experts on Invasive Alien Species

Current Legislation

The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000 are the primary pieces of legislation containing provisions in relation to invasive alien species in Ireland. It is prohibited, without licence,

- to release, wilfully cause to escape or transfer within the State for the purpose of establishment in the wild any species of wild animal or spawn and any wild bird or the eggs thereof;
- to transfer any species of wild animal or wild bird or the eggs of such a wild bird from any place in the State to any other place in the State for the purpose of establishing it in a wild state in such other place
- to plant or otherwise cause to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores thereof.'

The Wildlife (Amendment) Act, 2000 strengthened the legal basis for controlling the introduction of potentially invasive alien species. The Minister for the Arts, Heritage and the Gaeltacht may issue regulations prohibiting possession or introduction of any species of wild bird, animal or flora, or part, product or derivative thereof that may be detrimental to native species. Where an alien species has been introduced, measures can be taken, as far as feasible and appropriate under the Wildlife Act, to ensure that such introductions do not pose a potential hazard to native species.

A review has been undertaken by the "Invasive Species in Ireland Project" of legislative provisions relating to invasive species in Ireland and their enforcement which has made recommendations for improvements. The review, which was published in 2008, evaluated legislation in the Republic of Ireland and Northern Ireland and recommended legislative changes in both jurisdictions in order to address the increasing threats of invasive species on the island of Ireland.

New legislation on Invasive Alien Species

The Department of the Arts, Heritage and the Gaeltacht intend to introduce new enhanced Regulations in 2011 which will provide for appropriate regulatory measures to be taken to control the possession and dispersal of ecologically harmful and invasive species of plants and animals in Ireland. The Regulations will include schedules of animals and plants which will be subject to restriction and these schedules will be updated on an ongoing basis to reflect the likely impact of new species in Ireland.

Policy:

A new National Biodiversity Plan for Ireland (2011-2016) is due to be published this year. A number of actions relating to invasive alen species will be included in the Plan as follows :-

- Prepare, by 2011, detailed species and pathway risk assessments and develop exclusion and contingency plans for priority pathways and high impact species that are likely to invade Ireland;
- Continue and enhance measures for eradication, where feasible, control and containment of invasive species;
- Examine options for rapid response when new invasive species are discovered;
- Increase awareness within the horticultural and constructed wetlands industries of native alternatives that can be used in place of invasive species;

- All public bodies will endeavour to use native species, landraces and breeds and the public will be encouraged to do so;
- Include in the Birds and Habitats Regulations measures to prevent the import, movement, sale, distribution or release of invasive alien species, while advising on species considered safe alternatives;
- Produce a strategy on Invasive Alien Species in co-operation with Northern Ireland to improve harmonisation of the policy framework;
- Further co-operation on and co-ordination of all-Island Species Protection Plans.

All Ireland Strategy on Invasive Species

Ireland is developing and implementing measures to tackle IAS in partnership with the Northern Ireland administration. Following a report which was published in 2004 both authorities agreed to work together and with others to tackle the invasive species problem. In response to the recommendations of this report the 'Invasive Species in Ireland' project started in May 2006 and ran until 2009. Both authorities decided to continue with the project and a new contract was signed for the project in 2010 for a further three years with the costs of £300,000 sterling shared equally between both administrations.

Full details of the project can be found on www.invasivespeciesireland.com.

The Invasive Species in Ireland project has the following aims:

1. Reducing the risks of invasions of new species

2. Developing contingency plans in conjunction with stakeholders

3. Producing management plans to help control and manage new and established invasive species and vectors

4. Engaging key stakeholders

5. Developing codes of good practise in conjunction with stakeholders

6. Raising public awareness

7. Recommending surveillance, monitoring and recording programmes

8. Reviewing legislation

A risk assessment protocol has been developed and over 600 risk assessments have been carried out on established and potential invasive species to identify those species that pose the greatest threat to biodiversity on the island of Ireland. Exclusion strategies, contingency plans and management strategies are being prepared for these species. The highest risk to biodiversity in Ireland is from freshwater invasive species, in particular ornamental pond plants and fish.

An Invasive Species Ireland Management Toolkit has recently been published which is intended to provide information to anyone wanting to learn more about how to manage invasive species. The tool kit contains information on management quick guide, Risk Assessment for non-native species recorded in Ireland and species that have not yet arrived, Invasive Species Action Plans for prioritised high impact invasive species and Best Practice Management of some widely establish invasive species.

Various exclusion strategies, contingency plans and action plans have been prepared for a variety of invasive species and these are all available on the project website. There are a number of widely established species for whom island wide eradication is impossible so best practice management guidelines have been prepared along with templates for the development of site specific management plans.

Codes of Practice are also being developed in conjunction with relevant sectors. Following the publication of the Horticulture COP, COPs for the aquaculture sector, recreational water users and marina operators have been published.

An extensive stakeholder engagement programme has been underway, one element of which is the All-Ireland Invasive Species Forum. This forum meets annually and has over 100 organisations involved including central and local Government, state agencies, industry, academia and the NGO sector. The fifth Annual Forum was held in Belfast in April, 2011. There are four technical working groups on marine, freshwater, terrestrial invasive species and education and awareness. Details on Forum membership and activities can be found on the Invasive Species in Ireland website. Education and awareness materials have been produced and are available for download from the site.

Invasive Alien Strategies for the island of Ireland

There is a commitment to produce strategies for the island of Ireland to address invasive alien species. The Northern Ireland authorities have produced a draft strategy which is now circulated for public consultation until September 2011. The Department of the Arts, Heritage and the Gaeltacht are developing an IAS Strategy which will compliment the Strategy which is been prepared in Northern Ireland.

Invasive Species Records

There are two main biological record centres on the island of Ireland. The National Biodiversity Data Centre and the Centre for Environmental Data and Recording (CEDaR).

The "Invasive Species Ireland" Project is working with both record centres and sharing information on the distribution of invasive species. The National Invasive Species Database contains up to date records on the distribution of invasive species on the island of Ireland which can be viewed as interactive maps. This Database has been developed as a resource to assist recording, monitoring and surveillance programmes, and provides the infrastructure for development of an early warning system for invasive species.

The National Biodiversity Data Centre is the national centre dedicated to the collation, management, analysis and dissemination of data and information on Ireland's biological diversity. It serves as a hub for the exchange of data between governmental organisations, NGOs, research institutions and volunteer recorders.

CEDaR, Centre for Environmental Data and Recording, is the Local Records Centre for Northern Ireland, and facilitates the collection, collation, management and dissemination of biodiversity and geodiversity information for Northern Ireland and its coastal waters. CEDaR is a partnership between National Museums Northern Ireland, and the recording community of Northern Ireland.

Eradication/control programmes

CAISIE (Control of Aquatic Invasive Species and Restoration of Natural Communities in Ireland) is an EU Life+ funded programme which will contribute to the understanding and control of aquatic invasive species in Ireland. CAISIE commenced in September 2009. The project is due for completion in the first quarter of 2013. The broad objective of the project is to contribute to the halting of biodiversity loss in Ireland by preventing further impacts on native biodiversity from high impact aquatic invasive species. This will be achieved through the development and demonstration of effective control methods, a programme of stakeholder engagement and awareness raising, the enactment of appropriate robust legislation, and policy development and dissemination.

Objectives of the project include the protection of the native biodiversity in Lough Corrib in County Galway by eradicating, controlling or containing *Lagarosiphon major* and preventing the further spread of high impact aquatic invasive species by implementing control measures in a key dispersal corridor (i.e. the canals and Barrow Navigation). The matching funding for this project, which cost in the region of €1.5 million, is been provided by the Department of the Arts, Heritage and the Gaeltacht.

The first evidence of the Asian Clam (*Corbicula fluminea)* in Ireland was recorded in April 2010. This species is considered extremely invasive and its presence in Ireland is a matter of considerable concern. The presence of dense and sustainable populations of *Corbicula* was confirmed in the River Barrow. The highest density recorded in this section of river was in excess of 9,000 individuals per sq

metre. The Department of the Arts, Heritage and the Gaeltacht provided funding of €10,000 in 2010 towards the control of this invasive species.

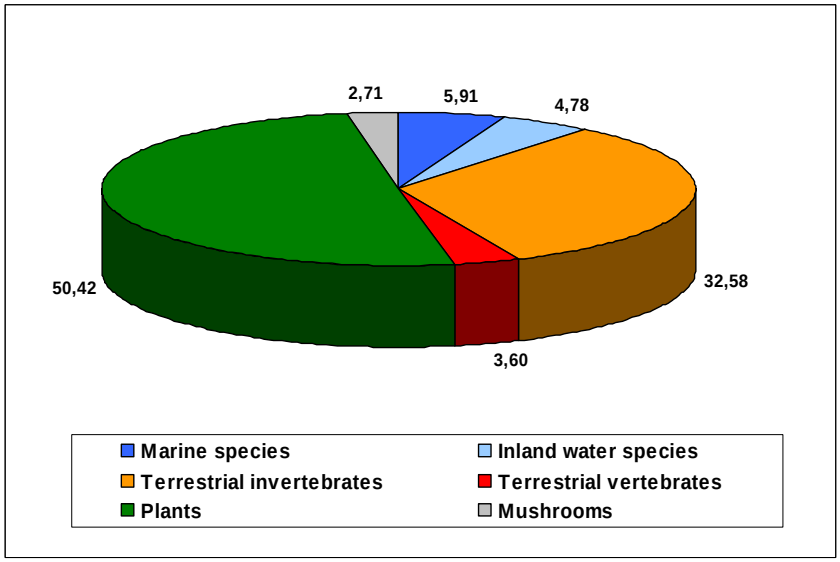
National Parks and Wildlife Service
Department of the Arts, Heritage and the Gaeltacht
7 Ely Place
Dublin 2
Ireland

5. ITALY / ITALIE

NATIONAL REPORT ON THE ACTIVITIES ON INVASIVE ALIEN SPECIES IN ITALY REFERRED TO THE PERIOD 2008-2010

Background

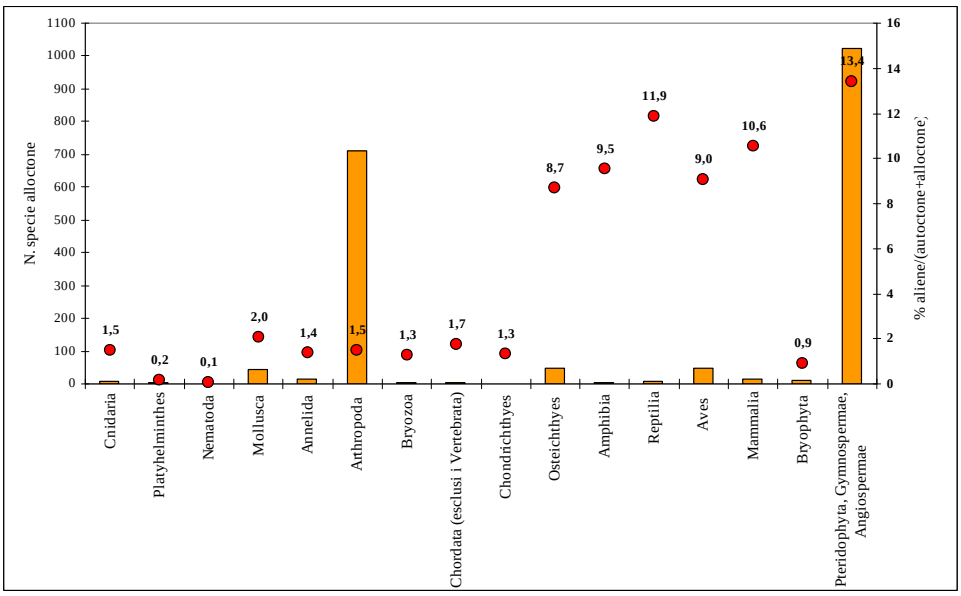
Invasive alien species pose a significant threat to biodiversity in Italy and in many cases the impacts are particularly evident, as in aquatic environments. A recent general representation of the presence of alien species of animals and plants in the Italian territory up to 2008, as well as their distribution in the taxonomic groups and trends has been reported by ISPRA – Institute for Environmental Protection and Research - in the Italian Environmental Data Yearbook (2009) (available in English version at the link: http://annuario.apat.it/annuarioDoc.php?lang=EN&idv=7&type=key). At 2008, the total number of documented alien species in Italy was 2029 (fig 1), with Plants accounting 50% of the total, followed by terrestrial invertebrates at 33%. The other groups register significantly lower percentages: marine species almost 6%, those of inland water 4.8%, terrestrial vertebrates 3.6% and mushrooms 2.7% (fig.1).



Source: ISPRA calculations on data from:
DAISIE European Invasive Alien Species Gateway (http://www.europe-aliens.org);
Celesti-Grapow, Pretto, Carli, Blasi (eds), 2009. Non-native flora of Italy. CD. MATTM-DPN, SBI, Interuniv. Res. Center "Biodiv., Phytosoc. & Landscape".

Fig.1 – Percentage among environmental-taxonomic groups of the 2029 alien species introduced into Italy since 1500.

The proportion of alien species over the total number of species present in Italy for taxonomic group has been also calculated (fig.2): vascular plants represent the taxonomic group with the highest proportion of alien species (13.4%) followed by vertebrate. Among these, reptiles amount to 11.9%, mammals to10.6%, amphibians to 9.5% and birds 9%.



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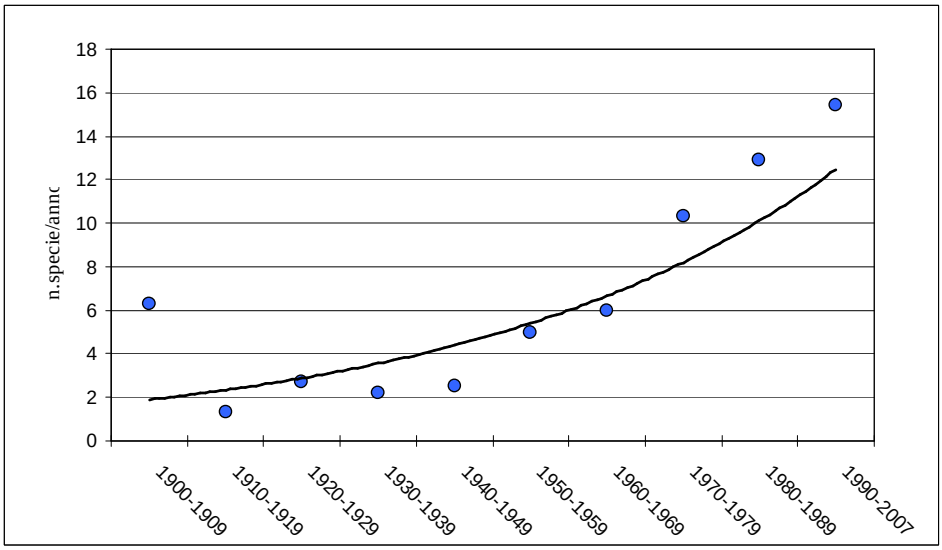
Minelli, Ruffo, La Posta (eds.), 1993-1995. Checklist of the species of Italian Fauna. Fascicoli 1-110. Edizioni Calderini, Bologna
Conti, Abbate, Alessandrini, Blasi, 2005. An annotated checklist of the italian vascular flora. MATTM-DPN; Univ. di Roma La Sapienza-Dip.Biol.Veg.

Fig. 2 Number of alien species for taxonomic group and their percentage over the total number of species.

The analysis of the introduction trend (fig. 3), calculated for alien species for which the year of introduction is known, shows that the number of new introductions has rapidly increased after the last post-war period.



Source: ISPRA calculations on data from DAISIE European Invasive Alien Species Gateway (http://www.europe-aliens.org)

Fig. 3 Trend in established alien species in Italy since 1900, calculated on 778 species for which the first record is precisely known.

A large proportion of known introductions have happened as escaped pets or ornamentals, through deliberate introductions or involuntary escapees.

A survey on the initiatives of Italian public administration on IAS was carried out by APAT (now ISPRA) in 2009 (available only in Italian version at the link: http://www.isprambiente.gov.it/site/_contentfiles/00003500/3599_Rapporto_ISPRA_91_2009.pdf). The study highlighted the lack of an effective prevention system in Italy. It also showed that the Italian institutions more involved in the issue of IAS were Protected Areas and Provincial administrations and Universities. In addition, more of 35% of the actions taken against IAS were mitigation interventions.

Institutional and legal framework:

The Ministero dell'Ambiente e della Tutela del Territorio e del Mare – MATTM (Italian Ministry for the Environment and Territory and Sea) is the National Focal Point for the Bern and CBD Conventions. Awaiting an European Legal Framework on the issue, the Decree of the President of the Republic D.P.R. no. 357 of 1997 and its amendments D.P.R. no. 120 of 2003, enforcing the Habitat Directive in Italy, represent the most effective legal instruments for habitat and species conservation. Art. 12 of the DPR 120/03 specifically prohibits any introduction, reintroduction and restocking of non native species and populations into the wild. In 2007 an interdisciplinary group realised, upon a request of the Ministry of Environment, guidelines for the application of this particular provision (AA.VV., 2007 . Linee guida per l'immissione di specie faunistiche. Quad. Cons. Natura, 27, Min. Ambiente – Ist. Naz. Fauna Selvatica).

Among other issues, these guidelines define general principles for the introduction of alien animal species. Every introduction of any alien animal species is subordinated to permission by the Ministry of Environment, taking into account a technical opinion of ISPRA or of other competent technical authority that must be based on a risk analysis. It should be noted that in 2009, a sentence of the Constitutional Court has confirmed this authorisation process that takes into account the State jurisdiction on this issue.

Activities carried out by Italian Ministry for the Environment and Territory and Sea (MATTM) at national scale:

MATTM has provided support to scientific research on the marine bioinvasion issue. The project "Identification and distribution of non indigenous species in Italian seas", started in 2002 and still active, has being carried out by the former ICRAM Institute (Central Institute for Marine Research), now ISPRA (Institute for Environmental Research and Protection) with the collaboration of several Italian Universities and other Research Institutes. Main objectives of the project are to provide comprehensive data on the status of alien species present in Italian seas and identify appropriate measures to limit and/or prevent their accidental or voluntary introductions.

On the basis of this project, a GIS on alien species present in Italian seas is developing (soon available at the link: http://www.tutelamare.it/cocoon/sa/app/it/index.html.)

Italy has a National Monitoring Programme on the quality of coastal waters since 1997, but such program does not provide information on biological assemblages in Ports.

For this reason, MATTM has also supported on 2006 the first national baseline port surveys for introduced species, which was carried out by the former ICRAM Institute (now ISPRA). The study was aimed at providing a feasible protocol for survey design, sampling and analysis to be applied to other Italian ports and baseline information on the species assemblages in two Italian ports. More baseline surveys are planned for spring 2010.

Lastly, it is ready to start, on a voluntary basis, the Introduction of the Ballast Water Reporting Form, as agreed in the frame of the Trilateral SubCommission (Croatia, Italy and Slovenia) for the risk assessment of Italian ports. The BWRF, together with the port surveys, will represent the first step in order to build an efficient and prompt early warning system.

Considering the terrestrial context, in the years 2005-2008 MATTM promoted, in collaboration with the "Biodiversity, Plant sociology and Landscape ecology Inter-university Centre" of La Sapienza University of Rome, the project "A survey of the non-native Italian flora". The study was aimed at gathering, using a standardized system, information on the non-native vascular flora growing spontaneously in Italy and identifying, among the high number of plant species present, the few that

may, owing to their invasiveness or negative impact potential, pose a threat to the environment, human health or economy.

Main products of the project have been comprehensive an integrated regional and national database and the specific report "Non native and invasive vascular flora in Italian Regions" that provide an overview of the distribution and invasive status of non-native species in the Italian flora across its administrative regions, bio geographic regions and main land use types, and a synthesis of current knowledge on the threats they pose within the country.

In addition the project made a contribution to the National Biodiversity strategy by the report "A thematic contribution to National Biodiversity Strategy: Plant invasions on Italy – an overview" published in 2009 and available in English version at the link: http://www.minambiente.it/export/sites/default/archivio/biblioteca/protezione_natura/dpn_plant_invasion_italy.pdf

A National Biodiversity Strategy has been implemented with the cooperation of MATTM, Regions and Autonomous Provinces and approved in 2010. The document identifies 3 main goals and 15 specific working areas in order to guarantee the stop of biodiversity loss in Italy through the integration of social and economic development of the country and biodiversity conservation.

In order to contribute to the National Biodiversity Strategy, eight thematic working groups have been established and one of these was focused on the threat posed by alien species to the biodiversity. The report "Alien species impact on ecosystem: management suggestions" (available in Italian at the link: http://www.minambiente.it/export/sites/default/archivio/allegati/biodiversita/Verso_la_strategia/TAVOLO_3_SPECIE_ALIENE_completo.pdf) has been implemented and provided technical suggestions to define the action priorities for the management of alien species in Italy.

The case of the Grey Squirrel (Sciurus carolinensis)

Following the Recommendation No. 114 on the control of the Grey squirrel (*Sciurus carolinensis*) and other alien squirrels in Europe and Recommendation No. 123 on limiting the dispersal of the Grey squirrel (*Sciurus carolinensis*) in Italy and other Contracting Parties, MATTM promoted and co-financed the LIFE+ project EC-SQUARE on "Eradication and control of Grey Squirrel: actions for preservation of biodiversity in forest ecosystems", started in September 2010. The regions involved on the project are Piemonte, Lombardia and Liguria, in the northern Italy.

The main objective of EC-SQUARE is to eliminate or, where eradication will be judged impracticable, to control the risks posed by the introduced alien species, the eastern Grey Squirrel to biodiversity, and in particular to the conservation of the native Red Squirrel (*Sciurus vulgaris*).

Methods to control and eradicate Grey Squirrels (*Sciurus carolinensis*) in different socio-ecological contexts are developed, integrating with societal assessments to investigate and shape public perceptions of the general problems posed by alien species and, in particular, by Grey Squirrel.

More information is available on the website: http://www.life-ecsquare.eu/en/homepage.

At now, the activities are focused on public meeting with the stakeholders to present the project. Monitoring activities are planning to define the status of grey squirrel populations.

Relevant activities carried out by regions at local scale:

Lazio Region

In 2007 the Regional Parks Agency of Latium (ARP) launched a regional project (PASAL: "Project for an Alien Species Atlas of Latium", carried out under the scientific supervision of ISPRA aimed to prevent or mitigate the impacts of alien wildlife species to the biodiversity of Latium.

The main topics of the integrated and coordinated project are:

1. implementing a geographically referenced inventory of alien wildlife species, including all existing information (excerpted from available literature, unpublished data provided by experts, review of museum collections, etc) and data collected during field surveys; the inventory allow data sharing with other existing European inventories (DAISIE);

2. defining a coordinated overall strategy aimed to prevent further introductions of unwanted alien wildlife species, and to control those already established; for this aim, several data will be considered, including location of risky activities (aquaculture, horticulture, airports, seaports, etc.), analysis of risks for main pathways and vectors, a "black list" containing invasive alien species not yet present but with a high likelihood of introduction;

3. defining and implementing detailed action plans for managing the most relevant invasive alien species, setting priorities, identifying key actions and defining operating.

Umbria Region

In 2003 the presence of Grey Squirrel in Perugia province (in central Italy) has been detected.

From March 2010 Umbria Region promoted, in collaboration with the cellular and environmental biology Department of Perugia University, a research project aimed to identify the range of the species and define a management plan for the conservation of the red squirrel.

Monitoring activities carried out in 2009 and 2010 suggest that the species are in strong expansion.

The project is aimed also to promote the communication to the general public about the threats posed by alien species to native ones.

6. POLAND / POLOGNE

STATUS OF WORK WITH IAS IN POLAND 2009-2010

REPORT TO THE BERN CONVENTION

This report describes progress made in work with IAS in Poland after 2009. Please consult previous reports to the Bern Convention on this issue for a more comprehensive image.

Building awareness and support

The level of public awareness of biological invasions and support continues to improve. The issue has been incorporated into biology-related education programmes of many high schools, and regularly appears in media.

Internet portals on biological invasions in Poland available at the Institute of Nature Conservation, Polish Academy of Sciences received over 160 000 visits over the past 3 years. Publication of a 2-volume book based on the portal information was postponed until 2011.

The "European Code of conduct on horticulture and invasive alien plants" and the "Invasiveness of biofuel crops and potential harm to natural habitats and native species" were translated into Polish and made available online on the Polish website devoted the Bern Convention (http://www.gdos.gov.pl/Articles/view/2329/).

Collecting, managing and sharing information

The online database "Alien species in Poland" (http://www.iop.krakow.pl/ias/default.aspx) has been continuously developed since 1999 at the Institute of Nature Conservation, Polish Academy of Sciences. Currently there are 1163 species in the database. The level of detail in species accounts in the database ranges from just speciesname, to comprehensive datasheets. The information is successively updated by invited experts and translated into English. The database contributes to regional exchange of information on biological invasions. It is included in the NOBANIS project.

There is an ongoing work in a number of academic centres to study the specific impact of different invasive alien species in Poland. Recent projects include research into testing the enemy release hypothesis, adverse effect of an Asiatic nematode *Asworthius sidemi* upon European bison *Bison bonasus*, impact of raccoon *Procyon lotor* upon native biodiversity,

testing the level of hybridisation between Asiatic sika deer *Cervus nippon* and native red deer *Cervus elaphus*, or assessing the threat from IAS in Polish national and landscape parks.

Strengthening national policy, legal and institutional frameworks

In 2009, the General Directorate for Environmental Protection started work on a legal act restricting importation, possession, breeding and trade of most invasive alien species. These restrictions will be put on about 60 alien species of plants and animals with high risk of intentional introduction and whose range in Poland is still restricted, or which were not recorded yet. The aim of this regulation is to prevent introductions of new invasive alien species into Poland and to restrict spread of species introduced in the past. The regulation is to come into force in 2011.

In 2009, the new decree of the Minister of Environment was issued allowing hunting American mink, Raccoon dog and Raccoon throughout the year. Previously these invasive alien species enjoyed closed season allowing them to breed.

In 2010 the Inland Fisheries Act was amended. It regulates introduction of alien fish species into freshwater. The new regulation took into consideration the Council Regulation (EC) No 708/2007 of 11 June 2007 concerning use of alien and locally absent species in aquaculture.

Regional cooperation and responsibility

Poland contributes to regional cooperation and responsibility in IAS-related issues, including participation in NOBANIS and DAISIE projects, and the Carpathian Convention and HELCOM.

Trans-border initiatives include cooperation with Germany on resolving IAS-issues in the lower Oder river basin.

IAS will be one of the key environment-related areas during the Polish EU Presidency starting in June 2011. Working group of IAS experts was created to support this.

Prevention

Recent progress in developing legal framework is aimed at reducing risks of new introductions. Cooperation between nature conservation and phytosanitary services is discussed.

Early Detection and Rapid Response

IAS were included into Natura 2000 monitoring system in 2010. Organizations of nature lovers, particularly birdwatchers, contribute to rapid detection and advertising new alien species with electronic listservers. Wider participation of phytosanitary sector in monitoring IAS threatening biodiversity is under discussion.

Mitigation of impacts

The number of local initiatives to mitigate impacts from IAs is increasing. The most frequent targets of control include e.g. chestnut leaf-miner *Cameraria ohridella,* Japanese knotweed *Fallopia japonica,* and Giant Hogweed *Heralcleum mantegazzianum.*

In 2011, a LIFE+ project started in five national parks with the aim to protect of water and marsh birds, including reconstruction of habitats and curbing the influence of invasive alien predators: American mink *Neovison vison*, raccoon *Procyon lotor* and raccoon dog *Nyctereutes procyonoides*. Expected results are: the establishment of safe nesting places to enhance breeding success of wetland bird species and a reduction in the number of invasive alien predatory species by using live traps to minimise their negative impact. The number of new mink farms will be also limited.

7. SLOVAKIA / SLOVAQUIE

IMPLEMENTATION OF SELECTED RECOMMENDATIONS RELATED TO INVASIVE ALIEN SPECIES IN SLOVAKIA (2009 – 2010)

1. Recommendation No. 99 (2003) on the European Strategy on Invasive Alien Species

National Strategy on invasive alien species (IAS) drawn in 2005 was updated in 2009, however, it has not been approved yet. In spite of that fact some activities can be mentioned to illustrate progress in work on IAS.

1. *Building awareness and support*

IAS issues already have stable place in study/ education programmes and research work. Media cover the issue just occasionally.

State Nature Conservancy of the SR cooperates in IAS management with stakeholders, mostly with local authorities and landowners.

2. *Collecting, managing and sharing information*

The List of alien and invasive alien vascular plant species of Slovakia is being updated. Project led by Botanical Institute of Slovak Academy of Sciences has started in 2010 and first outcomes will be presented in late summer 2011.

Mapping of IAS concentrates more on protected areas with strict level of protection. Quite a lot of work has been done on converting older mapping data into the database and distribution maps.

There is no special IAS dedicated website in Slovakia. State Nature Conservancy of SR included the issue of IAS on its website: www.sopsr.sk. On the link: http://www.sopsr.sk/publikacie/invazne/index.php one can find useful information and documents on IAS including pictures and distribution maps.

Those who would like to contribute to the mapping of IAS can download an electronic form developed for mapping and can also deliver mapping data into the database.

3. Strengthening national policy, legal and institutional frameworks

The IAS issues are still covered by the Act on Nature and Landscape Protection No. 543/2002 Coll. Some of its regulations require elimination of invasive alien species. However, the elimination applies only to the seven most problematic plant species. In 2010 the proposal was submitted to add two more problematic species (*Ambrosia artemisiifolia* and *Helianthus tuberosus*) to the list.

New Order of the Slovak Government No. 488/2010 Coll. *on the conditions of the support in agriculture within single area payment scheme* keeps the condition/subcondition for direct subsidies in agriculture requiring elimination of invasive alien plant species (good agricultural and environmental conditions).

4. Regional cooperation and responsibility

To illustrate good cooperation between neighbouring countries: Czech Republic, Poland, Hungary, and Austria one example can be mentioned: the project „*Developing and testing of sustainable habitat management technologies for the effective conservation of protected grasslands*" between Hungary (National Park Aggtelek) and Slovakia (East Slovakian Museum in Košice with the cooperation of National Park Slovak Karst/Slovenský kras) within ITERREG Programme implemented in 2009-2010. The project was focused on management (including technology development) of selected protected grassland areas with the aim to keep favourable conservation status of grassland habitats. Some practical activities within the project were aimed at eradication/control of alien plant species.

In 2010 official agreement on cooperation between Agency for Nature Protection of the Czech Republic and State Nature Conservancy of the Slovak Republic was signed. IAS issues (especially in transboundary areas) are in the official programme of cooperation.

In 2008 Slovakia became a member of the NOBANIS project and portal, however its contribution to the NOBANIS work is still small.

Slovakia also participates in European Commision work on IAS.

5. *Mitigation of impacts and restoration of native biodiversity*

Most of the IAS management activities (eradication, containment, control) are still mostly coordinated by State Nature Conservancy of SR and they are concentrated in protected areas.

To give an example: in 2010 control measures were applied on cca 100 sites covering about 80 hectars and focused mostly on control of *Heracleum mantegazzianum, Fallopia* and *Solidago* species. Administration of Protected Landscape Area Dunajské lúhy in cooperation with local hunters assosiation focused on mapping and control of *Myocaster coypus* .

Recently some NGOs have become more interested in IAS issues. As one example project of BROZ (Regional Association for Nature Coservation and Sustainable Development) Bratislava „ *Conservation of Danube floodplain forests as important European biodiversity centre* " can be mentiond. Project was implemented in 2009-2010 and one of its aims was to erradicate alien tree species on the area of 26 hectars of floodplain forests and grasslands. Restoration of native biodiversity followed erradication activities on selected sites.

2. Recommendation No. 114 (2005) on the control of the Grey squirrel and other alien squirrels

Occurrence of grey squirrel and other alien squirrels has not been recorded in Slovakia so far.

3. Recommendation No. 134 (2008) on the European Code of Conduct on Horticulture and Invasive Alien Plants

The European code of conduct on horticulture and IAS has not been translated in to the Slovak language so far and work on drawing up national code are just at the beginning.

4. Recommendation No. 141 (2009 on potentially invasive alien plants being used as biofuel

Slovakia as many other European countries is using some plant species as biofuel crops. Projects of using *Robinia pseudoacacia* and *Fallopia species* (considered as invasive alien species in Slovakia) as biofuel crops were not implemented.

Willow species introduced from Northern Europe are now mostly grown in southern parts of Slovakia. Species escape from cultivation and possible effect on the natural environment is monitored at sites in the Košická kotlina. Negative impacts have not been proved yet.

5. Recommendation No. 91 (2002) on Invasive Alien Plants that threaten biological diversity in Islands and geographically and evolutionary isolated ecosystems and other related recommendations

The geographic position of Slovakia in the heart of Europe and on the boundaries of the Carpathian mountain range and Pannonian lawlands allowed development of rich fauna and flora. Specific attention is given to endemic species. In the Carpatians number of endemic species grows towards the south. Territory of Slovakia belongs mostly to the Western Carpatians and from the occurrence of endemic species point of view to the area not so reach in endemic species. However, some regions of Slovakia host many important endemic species, e. g. *Daphne arbuscula* (paleondemic plant species) occurs only in the dolomitic part of the Muránska planina (plain); *Tatriella slovenica* and *Trichondrilus tatricus* (Molluscs) occur in the mountain lakes of Tatras. Two main areas of Slovakia are considered for centres of endemism: the highest mountaints (Vysoké Tatry, Nízke Tatry, Malá Fatra and Veľká Fatra) and Eastern part of the Volovské vrhy (including Muránska planina and Slovenský kras). All these areas are protected as national parks and sites with

highest biodiversity value are protected as core zones or nature reserves with the strictest level of protection. Mapping and monitoring of alien species/invasive alien species has not confirmed the occurrence of any species in these "biodiversity hot spots" so far. Special attention to these sites will be given also in the future.

May 2011
Ministry of Environment of SR
State Nature Conservancy of SR
(Report prepared by Ema Gojdičová, State Nature Conservancy of SR)

8. SPAIN / ESPAGNE

REPORT

For the 9th meeting of the Group of Experts on Invasive Alien Species of the Bern Convention
Malta, 18-20 April 2011

INTRODUCTION

Invasive Alien Species (IAS) represents one of the most important threats to biodiversity in the world, aggravating circumstance in special vulnerable areas as rivers and islands. There is a huge concern at international level because of the growing advance of these species. In 2008, the European Commission adopted the Communication *Towards an EU Strategy on Invasive Species* (COM (2008) 789 final) that identifies isolated islands with high biodiversity, including most of the EU's overseas entities, are exceptionally vulnerable to invasion, which can also have a disproportionate impact on local livelihoods, culture and economic opportunities. As announced during the stakeholder consultation on Invasive Alien Species, which was held in Brussels on September 2010, the Working Group on Invasive Alien Species (WGIAS) has been re-established. This working group will provide concrete input to the Commission to assist in the development of the forthcoming EU Strategy on Invasive Alien Species.

In relation to island biodiversity the Convention on Biological Diversity has welcomed in its decision X/38 the report of the workshop "*Helping Islands Adapt: A Workshop on Regional Action to Combat Invasive Alien Species on Islands to Preserve Biodiversity and Adapt to Climate Change*" held in Auckland, New Zealand, from 11 to 16 April 20101 and referred to in decisions IX/4 and IX/21

LEGAL FRAMEWORK

The absence of a legal support focusing on the global aspects of IAS has lead the Conference of the Parties in Nagoya to request the Executive Secretary to explore further ways and means to improve the capacity of Parties to address invasive alien species introduced as pets, aquarium and terrarium species, and as live bait and live food, including through consultation with secretariats of relevant biodiversity-related conventions and relevant international organizations such as the World Organisation for Animal Health (OIE), the Codex Alimentarius Commission, the International Plant Protection Convention (IPPC) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In paragraph 2 of its decision X/38, the Conference of the Parties established an ad hoc technical expert group to suggest ways and means, including, inter alia, providing scientific and technical information, advice and guidance, on the possible development of standards by appropriate bodies that can be used at an international level to avoid spread of invasive alien species that current international standards do not cover, to address the identified gaps and to prevent the impacts and minimize the risks associated with the introduction of invasive alien species as pets, aquarium and terrarium species, as live bait and live food with the present terms of reference; and expressed its appreciation to the Government of Spain for providing the financial assistance for the organization of the ad hoc technical expert group (AHTEG).

In Spain the Law on the Conservation of the Natural Heritage and Biodiversity from 2007, the major legal corpus in nature conservation, creates the "Catálogo Español de Especies Exóticas Invasoras" (*Spanish Catalogue of Invasive Alien Species*) dependent of the Ministry of Environment and Rural and Marine Affairs. This National Catalogue, in process of elaboration, will include specific considerations about the singularities of the island. Moreover, it will include some dangerous species or subspecies of IAS that represent a serious threat for native species, habitats, agriculture or economy only in the Baleares and Canary Islands.

The Autonomous region of Valencia published in 2009 its own legislation on invasive alien species. It has been a pioneer regulation on this issue in Spain and it approves the measures for the control of invasive alien species in the Comunitat Valenciana. It is the first regulation that bans the trade of some species because of its invasive character.

Some other regional governments have been elaborated or developed their own strategies on IAS. Most of the Autonomous Communities have also designed programs of control or eradication of the most problematic species of IAS.

PREVENTION AND CONTROL

In coordination with all the regional or local authorities, the Spanish Ministry of Environment and Rural and Marine Affairs continues with important national or local projects. The most important of these programs are:

- National control of Ruddy duck (*Oxyura jamaicensis*).
- Control of American mink (*Mustela vison*) in areas where the European mink, one of the most endangered carnivore species in the world, exists.

The main actions carried out by the Spanish Ministry of Environment and Rural and Marine Affairs through the Autonomous Authority for National Parks (OAPN) on islands, apart from Canary and Balearic Island that are explained below, are the rodent control in Chafarinas. The control of *Rattus rattus and Oryctolagus cuniculus* are some of the principal programs of works carried out in this national park. The exotic species control in Cíes Islands is carried out by the competent authority of the Regional Community. In Cíes Island the Ministry is supporting a volunteer program to collaborate in the elimination of exotic flora (mainly *Arctotheca calendula,* and also some other species).

Also the Autonomous Communities have important programs for the control of most harmful IAS present in its territory. In Andalucía exist the "Andalucian Program for the Control of IAS" focusing in 36 species of plants, 4 aquatic invertebrates and 8 vertebrates.

PREVENTION AND CONTROL ACTIONS IN THE CANARY ISLANDS

The Spanish Ministry of Environment and Rural and Marine Affairs has continued the programs of control or eradication under its responsibility. The most important actions are monitoring and control of exotic species in Teide (Tenerife), La Caldera de Taburiente (La Palma), Garajonay (La Gomera) and Timanfaya (Lanzarote) National Parks.

In the National Park Network, the Ministry has continued with the main IAS programs in the National Parks of Canary Islands as the control of rats, cats and dogs that threaten the coastal birds in Timanfaya National Park (island of Lanzarote) or laurel pigeons in Garajonay NP (island of La Gomera). Also there programs in the National Parks of the Canary Islands to eradicate the species that affect the indigenous plants, for example Barbary sheep (*Ammotragus lervia)* in Caldera de Taburiente NP (La Palma) or rabbits and mouflon (*Ovis orientalis*) in Teide NP (Tenerife).

Many other activities are developed by Autonomous Communities and local authorities. Some of the actions developed by the Canary Islands regional government can be summarized in:

1. Data Bases on introduction species in the Canary Islands.

1.1. Canary Biodiversity Databank (http://www.biodiversidadcanarias.es/)

A new web-page open to the general public has been created. This databank includes all the terrestrial species established in the Canary Islands. The summary chart shows an increase of the alien species richness in all the islands. This growth can be a consequence of a greater interest of the scientific community and the public administrations on IAS research and monitoring in recent years and not as consequence of an increase of the settlement of new alien species in the islands.

Island / Year	El Hierro	La Palma	La Gomera	Tenerife	Gran Canaria	Lanzarote	Fuerteventura
2005	314	576	492	1.064	886	364	336
2009	369	609	513	1181	903	380	358
Increase (%)	17,52	5,73	4,27	11,00	1,92	4,40	6,55

Data: number of exotic species

1.2. Introduced species in the Canary Islands Databank (http://www.interreg-bionatura.com/especies/index.php)

Around 100 new factsheets has been included or actualised. Also bibliography has been actualised, about 700 citations of invertebrates, amphibians, reptiles, birds and mammals founded freeranging but not established during the period 2000-2010. New awareness-raising contents have been included, the total investment was17.301, 75 €.

2. Workshop: "Strategy on prevention and control of IAS in the Canary Islands"

This workshop was held on the 2nd December 2010. The draft document of the Strategy was analysed by 25 technicians from national, regional and local administrations. Work has continued along the 2011 with a second workshop hold on 30th march 2010. In this time 22 scientists participated. Both workshops and document elaborations ascend to 8.042, 95 €.

3. Monitoring and control activities of alien fauna.

3.1 Control Program of the California king snake (Lampropeltis getula) in Gran Canaria

Since 2008, the General Direction for Nature Protection together with the Cabildo de Gran Canaria and the public enterprise GESPLAN S.A., develops a control program of *Lampropeltis getula* in an area of around 30 km2. The program includes 4 principal axes: specimen captures, delimiting area of distribution, increase of knowledge and public awareness. A total amount of 436 individuals have been captured (2008, 92; 2009, 132; y 2010, 212) and the cost of these actions is around 130.000 € per year.

In 2010, a co-financing proposal was submitted to EU to carry out a Life+ Project on "Control of the invasive specie *Lampropeltis getula californiae* in the Gran Canaria Island". With a budget of 1.025.863 € this project is pending on definitive approval. Since the beginning of 2011, a total of 73 individual have been captured.

3.2 Control of feral cats (Felis catus) in Gran Canaria.

During 2010 and within the framework of the conservation plan of the Blue Chaffinch (*Fringilla teydea polakzeki*) populations, control actions on feral cats have been carried out using tomakawk selective tramps. During this period 19 individuals have been captured in the Integral Natural Reserve of Inagua. The cost was: 19.047, 62 €.

3.3 Monitoring and control of alien birds in Fuerteventura.

Not any myna (*Acridotheres tristis*) was detected (in 2008, 28 were caught) but two Purple Glossy Starling (*Lamprotornis purpureus*) and seven Red-vented Bulbul (*Pycnonotus cafer*) were captured. The population of monk parakeet (*Myiopsitta monachus*) in the Morro Jable area has around 200 individuals. The presence of other alien birds was also verified. This action had a total cost of 3500 €.

3.4 Monitoring and control of monk parakeet (Myiopsitta monachus) populations in Agaete, Los the Palmitos-Ayagaures gully and Maspalomas-Faro, as well as other exotic birds in Gran Canaria .

Monitoring and control actions of monk parakeet (*Myiopsitta monachus*) finalised with a census of 103 individuals in the study area, furthermore daily movements of this specie and other psittacidae

from de roosting area to the feeding areas were studied. Control was focused on nest removal and palm (*Phoenix canariensis, Phoenix dactilifera*) treatment to avoid new nests, just as eliminate food sources like a complementary control measure. The following species were also registered: *Psittacula krameri, Poicephalus senegalus, Agapornis fischeri, Agapornis personatus.* The cost of this 3.4 action was 18234, 55 €.

3.5 Hybridization level assessment of common quail (Coturnix coturnix) and japanese quail (Coturnix japonica) in Gran Canaria.

Information from the field about distribution of common and japanese quail was gather together, taken genetic samples with the aim of probing its hybridization degree. Final results will be ready in 2011. This action was financing by 10082 €.

3.6 Zoos inspections.

In accordance with the national and European legislation about wild fauna conservation in zoological parks, 11 authorized zoos were inspected, with special attention to the presence and security conditions of invasive alien species or potentially invasive keeping in them.

4. Monitoring and control of exotic flora

The island councils (Cabildos) carry out daily actions and control programs of exotic flora, especially by implementing the guiding instruments of natural protected areas that are under they responsibility.

5. Legal analysis of exotic species internet trade

Legal analysis of the regulations that can be applied to exotic species internet trade in the Autonomous Region of Canary Islands has been carried out. The results points to need to develop different sectorial regulations. The cost of this analysis was 3169,75 €.

6. Education, information sharing and public awareness (http://www.interreg-bionatura.com/especies/index.php?opt=divulgacion)

A "*Code of good practices for a responsible holding and trade of reptile and amphibians*" has been published (9.736, 75 €). Also it was published two videos about invasive plants and animals in Canary Islands (2.418, 75 €) and a compilation of control experiences of invasive alien plants (3.363, 75 €).

Codes of conduct for a responsible holding and trade of plants (3.048, 43 €), birds (3.048, 43 €) and mammals (3.048, 43 €) have been produced to be published during 2011.

PREVENTION AND CONTROL ACTIONS IN THE BALEARIC ISLANDS

The actions taken in Balearic Islands by the regional government are focused in different species. The main actions related to invasive flora are:

1. *Pennisetum villosum* and *Pennisetum setaceum* control in Mallorca Island. The action is being really successful and it has been almost eradicated, since in Mallorca the percentage of control has reached 90%. In Menorca island 50% of the total individuals were removed, and in Ibiza the actions are in the very beginning. Cartography is been carried our as a previous step.

2. Actions on *Eichornia crassipes*. The Felanitx population in Mallorca Island was eradicated, but this year it was found in another area, in the Inca torrent. In has been eliminated an important area, the percentage of eradication could be reach 95% by these days.

3. *Cotula coronifolia*. Works have been carried out the last three years and the Regional community thinks it is completely eradicated.

4. Cartography of *Carpobrotus* sp. in Formentera and Ibiza islands. The General Direction for the Sustainability of Cost and Sea has eradicated an important area but it is not completely eradicated. It could be said that its population has been reduced by a 75%.

5. It was founded a small and probably the only one population of *Hydrocolite bonariense.* It has been eradicated.

6. There are some other actions in specific areas, i.e. biological critic area of *Limonium* sp. or Natural Protected Areas with specific eliminations.

The main actions related to invasive fauna are:

1. Rodent eradication in Sa Dragonera (260 hectares). *Rattus rattus* and *mus musculus* have been eradicated, and probably also rabbits. This program was planified during some years, and was made by helicopter. It is a pilot project that seems to be a success but it is still early to certify this point.

2. Controls on Common Waxbill (*Estrilda astrild*), Raccoon (*Procyon lotor*) and South American coati (*Nasua nasua*).

3. Monk parakeet (*Myiopsitta monachus*) actions. Around a 75% of the population has been eliminated. They were captured with folding nets and canon nets.

4. Italian wall lizard (*Podarcis simula*). A small population in the interpretation centre of Cabrera was eliminated.

5. Feral pigs and pigs hybridized with wild boar (*Sus scrofa*). There have been 300 of them captured in two years.

6. Feral goats. Population controls are trying to be carried out. It was eliminated in Ibiza Island because it was a small population. Miles of them are brought down every year in Mallorca and hundred of them in Menorca.

The control of invasive alien species is also developed in National Parks. The most important actions have been the rodent control in the Cabrera National Park, with a rodent eradication in La Conejera Island.

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9. SWITZERLAND / SUISSE

OVERVIEW OF IAS WORK IN SWITZERLAND
CONTRIBUTION TO THE MEETING OF THE GROUP OF EXPERTS ON IAS IN MALTA, MAY 2011

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

1. Legal framework

Since October 2008 the revised Ordinance on the Release of Organisms into the Environment (RO) is in force. Appendix 2 of the revised RO prohibits the handling with 14 invasive alien taxa, 11 plants and 3 animals, except measures for control. In addition, other federal ordinances such as the Ordinance on Hunting and the Protection of Wild Mammals and Birds (JSV; in the phase of revision) and the Ordinance on the Federal Act on Fish and Fishery (VBGF) include regulations for particular non-native species groups, such as birds, mammals, fish and crustacean. The meanwhile revised Ordinance on Plant Protection (PSV) requests that places with *Ambrosia artemisiifolia* have to be reported to local authorities and that the plant has to be removed. Other legal regulations (Nature and Cultural Heritage Protection Act , Environmental Protection Act) deal with non-indigenous species in a more general way.

2. Information

The black / watch list for vascular plants is supposed to be revised in the course of this year. A draft version of a black / watch list for animals has been elaborated, the according (scientific) publication is in preparation.

3. National Coordination

In the past two years, several meetings of the national IAS working group (AGIN) took place. In this AGIN representatives of the cantons, federal offices and different main stakeholders are involved.

The AGIN has four sub-groups:

- Group A deals with the handling of soil contaminated by invasive plants
- Group B tries to come up with plans to manage/control IAS (neophytes)
- Group C is responsible for surveillance (with particular focus on neophytes)
- Group D tackles the same topics as group B and C but for neozoa.

4. Monitoring

The final report of project evaluating national data for IAS has just been submitted. It has been the first step towards setting up a national monitoring system.

5. Research projects

Switzerland has several on-going research projects dealing with particular alien species, such as *Fallopia japonica, Aedes albopictus, Harmonia axyridis, Tadorna ferruginea*, *Torymus sinensis, Vespa velutina*, and others with a more general focus such as the influence of river revitalisation measures on the occurrence of neophytes and risk models for invasive species.

6. Strategy

The biodiversity strategy is presently in the phase of consultation. One part of this strategy deals with IAS. Furthermore, IAS have been recognized in the climate adaptation strategy of Switzerland as one of the main fields of action within the sectoral strategy of biodiversity management.

7. Current status analyses

For certain species (*Sciurus carolinensis, Tadorna ferruginea*, *Oxyura jamaicensis* etc.) analyses of the current status in and near Switzerland are regularly updated. A meeting with representatives of the European Squirrel Initiative took place in southern Switzerland earlier this year.

10. TUNISIA / TUNISIE

I. STATUT OF ALIEN SPECIES IN TUNISIA

***

Invasive alien species are becoming actually more important in Tunisia. In fact, due to lack of control for the moment, there is more and more new invasive alien species. Thus, after the strong invasion of *Solanum elignifolium*, there is now a high abundance of *Helianthus tuberosus*, a species belonging to the *Asteraceae* family that begins to invade large areas, especially north of the city of Sfax, and more precisely along the southern highway.

In another context, *Haloxylon persicum*, an introduced species in the region Kébili, is about to invade large areas of the Sahara. This species is now showing as being competitive with other local species.

The following table we present the bulk of invasive alien species, the most active in Tunisia, as well as their distribution method.Among the principal invasive plant species of the Tunisian territory we found:

species	French name	Geographical Origin	Distribution in Tunisia	Mode of multiplication
Helianthus tuberosus	Faux tournesol	Europa	North of Sfax, Kébili	Seeds & rhizome
Ailanthus altissima			Tunis & Cap Bon	seeds
Haloxylon persicum	Saxaoul	Centrral asia	Kébili	seeds
Solanum elaeagnifolium	Morelle jaune	Amérique latine	Sousse, Nabeul, Béja, Kef, Kairouan, Tunis, Sidi bouzid	seeds
Cuscuta australis	Cuscute du bident	Sud européenne	Everywhere in Tunisia	seeds
Oxalis floribunda	Oxalide de florifère	Amérique	Everywhere in Tunisia	seeds & bulb
Eleusine indica	Eleusine	Inde	Cap Bon	seeds
Galinsoga parviflora	Galinsoga à petite fleur	Néo tropicale	Cap Bon	seeds
Datura ferox	Datura	Asie	Cap Bon	seeds
Ipomoea stolonifera	Ipomée stolonifère	Amérique	Mahdia, Bekalta, Sousse	Seeds, stolons, & rhizomes & bulb
Cyperus bulbosa	Souchet bulbeux	inconnue	Sahel	Seeds & bulb
Carpobrotus edulis		Afrique du Sud	Everywhere in Tunisia	Propagate

With these species, other species were introduced voluntarily by the man. Among these species :

- -Heliotropium curassavicum
- -Conyza canadensis
- -Calotropis prostrata
- -Nicotianan glauca

Given this scale of development of invasive species, a program of study and eradication of these species will be realized in the near future.

II. LES RESSOURCES NATURELLES EN TUNISIE

1. LES RESSOURCES NATURELLES EN TUNISIE

1.1 Les ressources terrestres

L'extrême Nord se distingue par des sols hydromorphes et des sols bruns acides plus ou moins lessivés où se développe naturellement une végétation forestière à base de chêne vert, chêne liège et de pins. Il se distingue du haut Tell et de la Dorsale où la pédologie est dominée par la présence de calcaire donnant lieu à des sols peu évolués, des sols calcimagnésiques, des vertisols et des sols fersialitiques localisés aux environs des intrusions triasiques.

La Tunisie centrale, fief de l'arboriculture et du parcours, est couverte par des sols plus ou moins légers et calcaires dans les plaines (sols isohumiques) et des sols encroûtés peu fertiles sur les glacis. La présence de gypse apparaît principalement en Tunisie méridionale où se développent des sols gypseux et des sols halomorphes. Leur texture légère a favorisé l'érosion éolienne. La salinisation marque partout en Tunisie les zones dépressionnaires telles que les « Garaâs » et « Merjas » au Nord, les sebkhas du littoral et du kairouanais et les chotts au Sud.

1.2 Le couvert végétal et les ressources sylvo-pastorales

Avec 1,15 millions d'ha de formations forestières dans la situation actuelle (IFPN, 2007), maquis et garrigues inclus, le couvert forestier a pratiquement recouvré le niveau 1881 (Tableau 7).

Formations	Superficies (ha)
Formations forestières et para	1 151 218
Formations steppiques et pastorales	5 547 157

1.3 Les ressources marines

Les ressources marines d'importance économique ont fait objet d'évaluations exhaustives durant la période 1999-2002 et la période 2004-2006 par INSTM. Plus que 18 espèces démersales ont fait l'objet d'une réactualisation de l'état d'exploitation de leurs stocks.

Les résultats de ces évaluations révèlent trois niveaux des stocks :

- Les stocks sous-exploités pour lesquels le rendement actuel est en deçà du rendement optimal ; c'est le cas notamment des petits pélagiques dont le potentiel n'est exploité qu'à environ 56% et ce pour des raisons liées à l'exploitation des zones de pêche traditionnelles et à la faible efficacité de certains engins de pêche utilisés ;
- Les stocks pleinement exploités ou stocks à exploitation optimale dont les rendements actuels sont approximativement égaux aux rendements optimaux ;
- Les stocks surexploités dont le niveau de production actuelle est situé au-delà de l'optimum comme c'est le cas des ressources démersales.

Pour ce qui est des résultats de l'exploitation des ressources halieutiques, la production de la pêche en Tunisie a atteint 105128 tonnes en 2007 contre 90039 en 1998 soit une évolution de 17%, assurée essentiellement par les espèces pélagiques. Cette production est représentée par 53653 tonnes d'espèces pélagiques, 46595 tonnes d'espèces benthiques et 4880 tonnes de diverses autres espèces.

2. LA BIODIVERSITE TERRESTRE

2.1. Flore actuelle

La flore tunisienne, forte de 2162 espèces dont 2103 espèces réparties en 115 familles et 742 genres.

B. Endémisme

Espèces Endémiques présents en Tunisie en 1998 et 2008

Espèces		Sous-espèces		Variétés		Formes		Hybrides		Totaux	
1998	2008	1998	2008	1998	2008	1998	2008	1998	2008	1998	2008
131	187	23	33	20	6	3	1		1	177	228

C. Statut

101 espèces considérées comme très rares dont 69 vivaces,

239 espèces rares dont 39 vivaces,

24 espèces assez rares dont 11 vivaces.

A ces espèces s'ajoutent 3 autres nouvelles récemment trouvées [*Pilularia minuta Durieu, Crassula vaillantii* (Willd.) Roth, *Eleocharis uniglumis* (Link.) Schult;

D. Espèces invasives

L'existence ou l'introduction récente d'espèces dites invasives est un phénomène qui attire l'attention. Ces espèces sont soit autochtones soit exotiques.

Parmi les autochtones se distinguent *Avena sterilis, Cynodon dactylon, Cyperus rotondus, Hypericum perfoliatum, Lapsana communis, Silybum marianum, Foeniculum vulgare*. Les îles Kerkennah sont en voie d'être colonisées par *Lygeum spartum* et *Salsola kaIi*.

Parmi les exotiques existantes déjà, il y a *Oxalis pes-capre* (= *O. cernua*) et *Nicotiana glauca.*

Parmi les récentes il y a :

- *Oxalis articulata*, signalée en Kroumirie (El Feija, Tabarka);
- *Arctotheca calendula*, présente en Kroumirie et aux Mogods ;
- *Solanum elaeagnifolium*, présente à Sidi Bouzid, Sbikha, Kairouan, Monastir, Zaghouan, El Fahs, Bir Mcharga, environs de Tunis, Mateur;
- *Calotropis procera*, signalée dans la région de Ben Gardane.

2.2 Flore introduite

Les introductions anciennes pour la diversification des reboisements dans les arboreta (1956-1965), intéressent des résineux, des Acacias, des Eucalyptus et d'autres espèces.

Parmi les résineux introduits, on trouve au moins, une douzaine d'espèces de pins, 2 espèces de Sapins, 2 espèces de cèdre, 5 espèces de Cyprès, auxquelles on peut ajouter *Biota orientalis*.

Une vingtaine d'espèces d Acacias a été introduite à des fins diverses (reboisements et fixation des dunes, amélioration des parcours, haies vives…) dont la plus répandue est *Acacia saligna (= A. cyanophylla)*.

L'introduction de certaines espèces du genre *Eucalyptus* est ancienne. Elle date probablement d'avant 1874 pour *E. camaldulensis*. Au début de l'indépendance de la Tunisie prés de 120 autres espèces ont été introduites.

De nombreux autres exotiques ont été également introduites en Tunisie (*Casuarina sp., Ficus sp., Juglans sp. Prosopis sp. , Araucaria excelsa., Argania*, Jojoba, plusieurs variétés de peupliers euraméricains…).

Les plus intéressantes ligneuses fourragères introduites sont parmi les Atriplex : *[Atriplex nummularia, A.semi-baccata, A. canescens subsp canescens et subsp liniaris, A. amnicola (= A. rhagadioides), A. confertifolia, A.leucoclada]*. Viennent ensuite *Acacia salicina, Gleditschia triacanthos, Cassia stortii, Prosopis juliflora, Prosopis tamarugo.*

Parmi les herbacées, se trouvent : *Erharta calycina*, des variétés de trèfles et de luzernes annuelles.

Plus de 126 espèces d'arbres et d'arbustes d'ornement sont cultivées en Tunisie (Guillochon 1943, Krichen 2003). Beaucoup de ces espèces sont devenues communes et en particulier dans les régions du littoral. D'autres restent des sujets uniques.

2.3. Arbres à classer en tant que ''Patrimoine national''

Certains arbres méritent d'être classés comme patrimoine national (*Ficus elastica , Pistacia atlantica, Cupressus sempervirens, f. numidica ,Cupressus sempervirens, Ulmus campestris, Chamaecyparis lawsoniana, Cedrus atlantica , Eucalyptus camaldulensis , Ziziphus cf spina-christi, Ficus macrophylla, Araucaria excelsa*) .

2.4 Biodiversité de la faune sauvage des vertébrés

Classe	Ordres	Familles	Espèces	Observations
Mammifères	8	22	78	Une espèce n'est connue que par son squelette et une autre à statut incertain
Oiseaux	14	63	398	
Amphibiens	2	5	7	
Reptiles	Tortues	3	3	Dont deux tortues d'eau douce
	s/o Lézards	7	36	Deux espèces non signalées en 1998
	s/o Serpents	5	24	Deux espèces non retrouvées depuis les années 1950
	Sous total		63	

2.4.4 La biodiversité de la faune sauvage des invertébrés terrestres et d'eau douce

Trois groupes d'animaux terrestres et d'eau douce ont été pris en compte à savoir, les insectes, les acariens et les nématodes. Les études ont rapporté :

Au moins 671 espèces d'insectes appartenant à 14 ordres et 82 familles ;

61 espèces d'acariens appartenant à 14 familles ;

54 espèces de nématodes réparties en 29 familles.

2.4.5 Risques et menaces qui pèsent sur la biodiversité des animaux domestiques

Espèces	Race	Degré de menace	Causes
Bovines			
	Brune de l'Atlas	++++	• Croisements anarchiques, manque de programmes de protection ;
	Blonde du cap Bon	+++++	• Presque Abandonnée
	Montbéliarde	+++	• Concurrence de La Holstein pour le lait et de Shwitz pour la viande
	Tarentaise	+++	• Concurrence de La Holstein pour le lait et de la Shwitz pour la viande
Ovines			
	Noire de Thibar	+++	• Problème sanitaire (Mammite) ; consanguinité.
	Barbarine	++	• Concurrence de la queue fine de l'Ouest. • Changement dans les systèmes de conduite. • Gras caudal de moins en moins apprécié ; • S'adapte moins aux tendances d'intensification.
	Sicilo-sarde	++++	• Ne suscite plus l'intérêt des grandes unités de production; • N'est pas encore rentrée dans les programmes de développement chez les privés, où elle pose le problème de collecte et de transport de lait ; • Aucun programme de conservation ou d'amélioration génétique.

Espèces	Race	Degré de menace	Causes
Équines			
	Le Poney des Mogods	++++	• Croisements non contrôlés ; • Absence de programmes efficaces de protection.
	Le cheval Barbe	++	• Croisements non contrôlés. • Absence de programmes efficaces de protection
Caprins			
	La race Boer	++++	• Absence d'élevage en pure race pour le renouvellement du sang ; • Croisement non contrôlés ; • Forte concurrence de la race locale en élevage traditionnel.
	La race alpine	++	• Absence d'élevage en pure race pour le renouvellement du sang ; • Croisements non contrôlés ; • Forte concurrence de la race locale en élevage traditionnel.
	Race maltaise	+++++	• Concurrence de la vache laitière pour lait dans les zones urbaines et ses zones d'élevage.
Races canines			
	Sloughi	+++++	• Sédentarisation des nomades ; • Absence totale de programme de protection ; • Nouvelles maladies

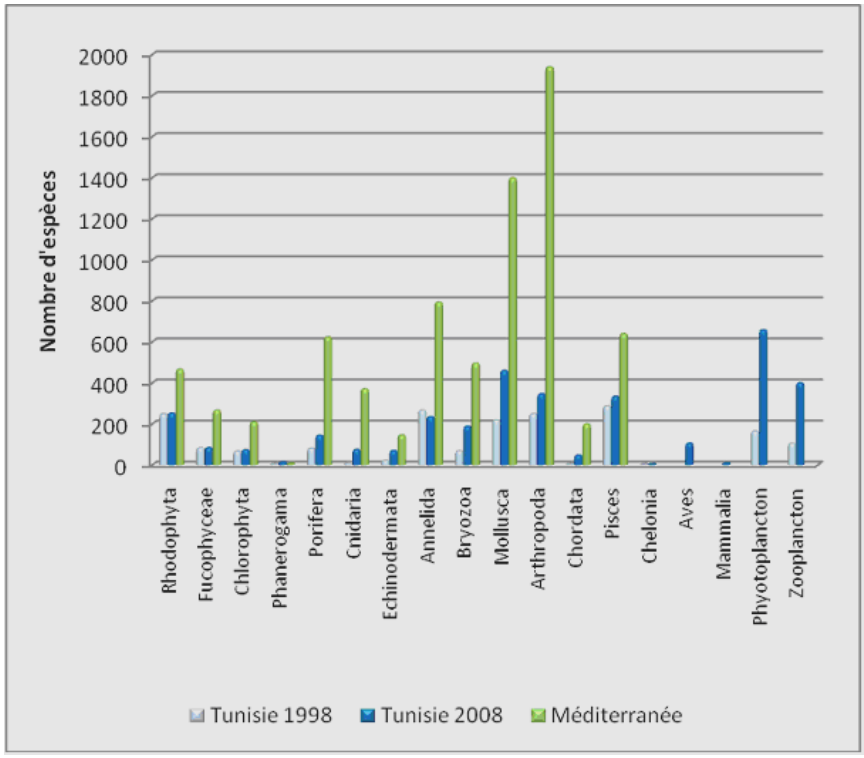
+++++ : En voie de disparition; ++++ : Très menacé ; +++ : Menacé ; ++ : Peu menacé

3. BILAN ET EVOLUTION DE LA BIODIVERSITE MARINE ET AQUATIQUES EN TUNISIE :

A.5.1 Diversité spécifique

La biodiversité marine et aquatique de Tunisie est representée par 3481 espèces reparties sur 19 principaux groupes, contre 1597 espèces inventoriés à travers l'étude nationale sur la biodiversité en Tunisie en 1998.

Fig. 9 : Evolution de l'inventaire de la biodiversité marine au cours de la décennie 1998-2008



5.2 Les espèces menacées :

En tenant compte des différents statuts de protection, plusieurs espèces végétales est animales figurent parmi les espèces menacés. Ces espèces sont :

- Pour les macrophytes, 23 espèces tunisiennes sont considérées comme menacées dont la *Posiodonia oceanica*, la *Zostère marina* et 10 Cystozeires.
- Parmi les spongiaires de Tunisie, au moins 6 espèces sont considérées en danger ou menacées à savoir : *Aplysina sp, Axinella cannabina, Axinella polypoides, Geodia cydonium, Ircinia foetida et Tethya sp.*
- Parmi les cnidaires de Tunisie, au moins une seule espèce est considérée en danger ou menacée, à savoir *Astroides calycularis,* et une espèce classée en exploitation réglementée, *Corallium rubrum.*
- La seule espèce d'échinoderme considérée comme menacée étant *Centrostephanus longispinus.*
- Pour les mollusques 9 taxons figurent parmis les espèces menacées : *Charonia lampas, Dendropoma lampas, Erosaria spurca, Lithophaga lithophaga, Luria lurida, Patella ferruginea, Pinna nobilis, Pinna rudis, Tonna galea.*
- Les crustacés objet de menaces sont le homard *Homarus gammarus*, le crabe araignée *Maja squinado*, la langouste *Palinurus elephas* et la cigale de mer *Scyllarides latus*.
- Quant aux poisons 16 espèces peuvent êtres considérées comme menacées dont des sélaciens (*Petromyzon marinus; Cethorinus maximus; Isurus oxyrinchus; Lamna nasus; Carcharodon carcharias; Mobula mobular; Raja alba*) et des téléostéens (*Acipenser sturio; Anguilla Anguilla; Alosa fallax; Aphanius fasciatus; Epinephelus marginatus, Syngnathus abaster, Hippocampus hippocampus, Hippocampus guttulatus, Xiphias gladius*.)

5.3 Espèces exotiques

Parmi les algues, 15 espèces seront ainsi classées dont *Caulerpa racemosa* et *Caulerpa taxifolia*, et une magnoliophyte *Halophila stipulacea*.

Le cnidaire *Oculina patagonica* est considerée comme espèce invasive. Parmi les Annélides exotiques on site *Ficopomatus enigmaticus, Hydroïdes dianthus Hydroïdes dirampha et Hydroïdes elegans* et parmi les bryozoaires exotiques, l'espèce *Tricellaria inopinata* vient d'être récemment signalée.

Quant aux mollusques, 14 espèces sont compteés comme exotiques, dont les gastéropodes (*Diodora ruppellii, Cerithium scabridum, Erosaria turdus, Acteocina mucronata, Bursatella leachi Discodoris lilacina, Chromodoris quadricolor, Favorinus ghanensis, Crepidula fornicata*) et les bivalves (*Musculista senhousia, Crassostrea gigas, Pinctada radiata, Fulvia fragilis Ruditapes philippinarum*).

Jusqu'en 2007, 14 espèces de crustacées exotiques ont été signalées : *Metapenaeus monoceros, Trachysalambria palaestinensis, Alpheus inopinatus; Alphaeus crassimanus, Trachypenaeus curvirostris, Eucrate crenata, Libinia dubia, Paradella dianae; Hemigrapsus sanguineus, Rhithropanopeus harrisii, Pilumnopeus vauquelini, Sphaeroma walkeri, Sphaeroma venustissimum, Paracereis sculpta.*

Parmi les Ascidies (Urocordés-Tuniciers) exotiques on cite les espèces *Microcosmus exasperatus* et *Melible viridis*.

Enfin chez les poissons, 34 espèces marines et d'eau douce sont signalées comme étant introduites et dont certaines ont atteint des proportions commerciales.

Tableau n°47 : Les espèces introduites signalées sur les côtes tunisiennes

Groupes	Nombre d'espèces
Macrophytes	16
Spongiaires	0
Cnidaires	1
Echinodermes	0
Annélides polychètes	4
Bryozoaires	1
Mollusques	14
Crustacés	14
Ascidies	2
Poissons	34

4 ETAT RECAPITULATIF DELA BIODIVERSITE EN TUNISIE

Les ressources de la biodiversité en Tunisie se trouvent localisés dans 69 ensembles d'écosystèmes naturels et 12 ensembles d'agrosystèmes. Elles totalisent :

7212 espèces dont 3749 espèces végétales et animales terrestres et 3463 espèces végétales et animales marines et aquatiques;

32 collections de microorganismes totalisant 22650 souches.

5. ESPECES INVASIVES

Beaucoup d'espèces parmi les plantes adventices, à la faveur du travail du sol ou d'un facteur écologique, prennent une extension considérable et envahissent les terrains de culture. C'est le cas des espèces autochtones telles que *Avena sterilis, Cynodon dactylon, Cyperus rotondus, Hypericum perforatum, Lapsana communis, Silybum marianum, Foeniculum vulgare,* qui salissent et/ou concurrencent les cultures. *Lygeum spartum* et *Salsola kaIi* sont entrain de coloniser les îles Kerkennah

A ces espèces autochtones s'ajoutent les espèces invasives exotiques suivantes :

Oxalis pes-capre (= *O. cernua*) dont la présence est déjà ancienne en Tunisie.

Nicotiana glauca, d'introduction ancienne se multiplie sur les décombres.

Oxalis articulata, espèce euro-asiatique signalée en Kroumirie (El Feija, Tabarka)

Arctotheca calendula, originaire d'Afrique du Sud, est présente en Kroumirie et aux Mogods.

Solanum elaeagnifolium, originaire du Mexique, est présente à Sidi Bouzid, Sbikha, Kairouan, Zaghouan, El Fahs, Bir Mcharga, environs de Tunis, Mateur.

Calotropis procera, espèce subtropicale, a été signalée dans la région de Ben Gardane.

Ces espèces invasives, tout comme les espèces introduites, font l'objet de suivi réguliers, dans le cadre des inventaires des éléments de la biodiversité et ne font l'objet d'actions ou programme spécifiques d'éradication.

11. UKRAINE / UKRAINE

REPORT
ON THE ACTIVITIES ON INVASIVE ALIEN SPECIES (IAS) IN UKRAINE

for the 9th meeting of the Group of Experts on Invasive Alien Species of the Bern Convention

Malta, 18-20 May 2011

INTRODUCTION

Invasive Alien Species (IAS) represents one of the most important threats to biodiversity on regional and global levels. Their effects can be viewed not only on the environment but on the economy and also on human health. Therefore proper IAS management should be an important part of the national ecological policy.

LEGAL FRAMEWORK

According to Article 8 of the Constitution of Ukraine the international treaties to which Parliament of Ukraine agreed to be bound is an integral part of national legislation of Ukraine.

A number of international treaties to which Ukraine is a Party contain provisions on IAS:

according to Article 8, paragraph h), of the *Convention of Biological Diversity* (ratification in 1994) each Contracting Party shall, as far as possible and as appropriate to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;

according to Article 11, paragraph 2a, of the *Bern Convention* (ratification in 1996), each Contracting Party undertakes to strictly control the introduction of non-native species;

according to Article 4, paragraph 3 of the *Framework Convention on the Protection and Sustainable Use of Carpathians (Carpathian Convention)* (ratification in 2004), the Parties should pursue a policy to prevent introduction of non-indigenous species and expansion of genetically modified organisms which threats ecosystems, habitats or species as well as to control or eradicate them;

according to Article 1, paragraph 3 a), of the *Protocol on the Conservation and Sustainable Use of Biological and Landscape Diversity* (ratification in 2009) to the Carpathian Convention, the Parties should cooperate especially to prevent introduction of IAS which threats Carpathian ecosystems, habitats or local species, to control or eradicate them;

according to Article 13 of the same *Protocol* each Party pursues a policy to prevent introduction or release of IAS and (or) genetically modified organisms which can have a negative impact on natural environment and affect biodiversity, ecosystems, habitats or species of Carpathians and early warning in case of appearance of new IAS on their territory (paragraph 1). Each Party shall take measures on its national territory to prevent introduction or release of species specified in paragraph 1 and if necessary to control or eradicate of such species;

according to Article III, paragraph g), of the *Agreement of the Conservation of African-Eurasian Migratory Waterbirds* (AEWA) (ratification in 2002) the Party shall prohibit the deliberate introduction of non-native waterbird species into the environment and take all appropriate measures to prevent the unintentional release of such species if this introduction or release would prejudice the conservation status of wild flora and fauna; when non-native waterbird species have already been introduced, the Parties shall take all appropriate measures to prevent these species from becoming a potential threat to indigenous species;

according to Article 5 of the *Protocol on the Conservation of Biodiversity and Landscapes of the Black Sea to the Bucharest Convention on the Protection of the Black Sea against Pollution*

(ratification in 2007), the Contracting Parties take every necessary measures to regulate intentional introduction and prevention of occasional introduction of non-local species or genetically modified species into wild flora and fauna and prohibit activities that can negatively affect ecosystems, habitats and species on the territory to which the Protocol is applied. The Contracting Parties endeavor to take all necessary measures to eradicate or decrease the numbers of already introduced species if appeared that such species are harmful or potentially harmful to ecosystems, landscape, habitats or species on the territory to which this Protocol is applied.

In 1999 *the Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea* was adopted in Bulgaria by the Black Sea countries including Ukraine. Among other purposes, this Action Plan addresses challenges caused by the IAS in the Black Sea.

Some national legal acts of Ukraine contain specific provisions with regards to IAS.

In accordance with Article 37 of Law of Ukraine *"On Fauna"* (2001), protection of animal kingdom is ensured by prevention of introduction of alien species of wild animals into the natural environment of Ukraine and taking measures on minimizing negative consequences if such species are occasionally introduced.

No introduction of new animal species is allowed without special permit which can be granted upon relevant scientific justification (Article 50). The same provision is applied to plant species pursuant to the Law of Ukraine *"On Flora"* (1999) (Article 33).

On 21 December 2010 the *Basic Principles (Strategy) on State Environmental Policy of Ukraine for the Period up to 2020* was adopted by the Parliament of Ukraine. One of the targets of this Strategy is establishment by 2015 of the system of preventive measures relevant to IAS and ensuring a control for introduction of such species to ecosystems including to marine one. To implement the Strategy an Action Plan development is now in progress.

Some provisions on IAS which classified as quarantine species are available in phytosanitary legislation e.g. Law of Ukraine *"On Plant Quarantine"* (1993).

STATE OF IAS IN UKRAINE

Flora

Invasion of plant IAS (phytoinvasions) is a direct threat to indigenous biodiversity because IAS is a factor of biological contamination of environment and worsening its state.

Ukrainian experts tend to prioritize bioinvasion according to its negative effect to biodiversity as second after direct destruction of natural habitats.

More then half of invasive plants have significant negative economic or ecological impact.

600–800 alien or adventitious plant species are known in Ukraine which is 14% of total plant diversity in the country (Protopopova, 1991; Burda, 1991). Among them about 100 plant species are considered by scientists and quarantine services as invasive species or as such which have a high invasive capacity (Protopopova, Mosyakin, Shevera, 2002), around 50 species are hazardous invasive plants. At least 20 alien plant species with substantial invasion capacity pose threat to forests of Ukraine, 20 – to aquatic and semiaquatic ecosystems, more then 80 species are harmful for agriculture and forestry or to the people health. According to V. V. Protopopova (1991), synanthropic flora and its habitats can be considered as balanced if a share of alien plant species in its composition is not higher then 16–17%. Further increasing of their portion in antropically transformed habitats can increase phytoinvasion influence on valuable cultural landscapes and natural habitats and landscapes in particular. In Europe this portion tends to increase and reaches up to 16–17% in many countries adjacent to Ukraine.

An average index of adventization, i.e. saturation of an area with adventitious plant species for Ukraine is 13%, deviating in different areas from 8.6–18.3% (Protopopova, 1991). Along the big rivers a portion of alien species is 8.6–18.3% (the highest index is for the Danube and the lowest – for the Pivdenny Bug river). Majority of alien plants which penetrated into the territory of Ukraine first of all grow in anthropically transformed habitats and landscapes becoming persistent weeds. For

instance, among 944 species of field weeds of Ukrainian flora 511 (or 54%) species are alien (Protopopova, 1991).

From the list of 100 the most globally dangerous invasive plants 4 species are known for Ukraine (in order of their invasion capacity decreasing): *Reynoutria japonica*, or *Fallopia japonica*, family Polygonaceae, *Clematis vitalba*, family Ranunculaceae, *Lonicera japonica*, family Caprifoliaceae, *Pueraria lobata*, or *Pueraria montana* var. *lobata*, family Fabaceae. The latter two species are known from culture so far.

It had been attempts to create "IAS black list" for plants of Ukraine which includes the most dangerous invasive species. The following criteria were used for establishment of such list:

1. Availability in the "black list" of Europe ("100 of the worst", DAISE);

2. Availability in the list of phytoinvasion of Ukraine (Protopopova, Mosyakin, Shevera, 2002);

3. Successful naturalization and expansion on new areas and new habitats;

4. Wide ecological amplitude.

53 species of flowering plant species were proposed to include in the above list. It includes *Acer negundo* L., *Acroptilon repens* (L.) DC., *Ailanthus altissima* (Mill.) Swingle, *Ambrosia artemisiifolia* L., *Bidens frondosa* L., *Solidago canadensis* L., *Elodea canadensis* Michx., *Amaranthus albus* L., *Robinia pseudoacacia* L., *Asclepias syriaca* L., *Conyza canadensis* (L.) Cronq., *Oenothera biennis* L. s.str. etc.

Fauna

According to DAISIE database 27 terrestrial vertebrates and 176 terrestrial invertebrate species can be treated as alien species for Ukraine. Some of invertebrate species are classified as quarantine organisms and controlled by State Phytosanitary Inspection.

A number of animal alien species can be found in aquatic ecosystems. Four Far East fish species from were introduced into the water bodies of Ukraine in the mid of the 20th century as commercial species (*Aristichtis nobilis, Hypophthalmichthys molitrix, Ctenopharyngodon idella, Mylopharyngodon piceus*) and used to be reproduced artificially in fish farms. *Pseudorasbora parva* has also been unintentionally introduced from Far East and considered to be aggressive alien species.

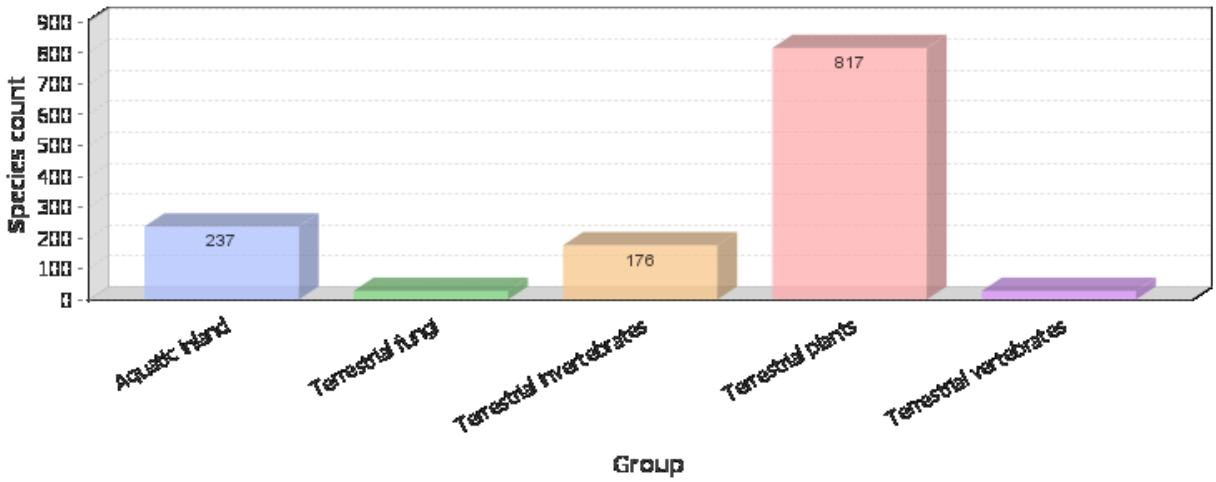
The largest number of invasive species in Ukraine is observed in Danube area. It can be explained that the Danube passes through 10 European countries and has active navigation which can be one of the ways of IAS appearance in the region. For example, mollusks *Sinanodonta woodiana* and *Corbicula fluminalis* were found in 1995 and in 2001 in Danube region respectively and which came to the region from the other parts of the world.

Introduction of invasive species to marine environment of Ukraine (the Black Sea and the Sea of Azov) resulted in serious ecological and economical problems. Thus, the invasion of *Mnemiopsis leidyi* (a comb jelly) contributed to a catastrophic decline in fish productivity in the late 1980s/early 1990s. The subsequent invasion of another comb jelly (*Beroe ovata*), which feeds on the original invader, means that opinions are now split as to whether *Mnemiopsis* still has a major impact on fish communities and catches.

Predator mollusk *Rapana venosa* caused a substantial decline of *Ostrea edulis*, *Mytilus galloprovincialis* and other local mollusk species populations in the Back Sea.

According M.O. Son's estimation (2009), about 40 species of both aquatic and terrestrial mollusks are exotic for Ukraine.

It was estimated that between 1996 and 2005 a total of 48 new alien species were recorded in the Black Sea, which represents over 22 % of all registered aliens. The majority belong to phytoplankton (16) and zoobenthos (15), followed by zooplankton (8), fish (5), macroalgae (3) and mammals (1). This increase in invasive aliens suggests a serious impact on the Black Sea native biological diversity, with negative consequences for human activities and economic interests (Strategic Action Plan…, 2009).



Number of IAS species in Ukraine (according to DAISIE, 2011)

FURTHER STEPS

In addition to legal and organization measures already been taken with relation to quarantine and pest species by phytosanitarian bodies more attention should be paid to the species that harm ecosystems.

All IAS species should be identified and studied and species specific recommendations and guidelines for IAS control should be elaborated and legislation be amended accordingly.

Development of databases of plant and animal species dwelling in Ukraine is now in progress within the relevant state programmes (State Cadastres of Plant and Animal Worlds). Specific sections of those databases are devoted to IAS.

Draft action plans for some IAS like *Ambrosia artemisiifolia* L. have been developed and about to be adopted.

It should be focused on practical implementation of decisions and recommendations of CBD, Bern Convention and other international treaties relevant to IAS.

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12. UNITED KINGDOM / ROYAUME-UNI

UNITED KINGDOM UPDATE

This report is a brief update on selected items of progress as regards action on Invasive Alien Species in the UK.

POLICY CO-ORDINATION

1. As previously explained, the UK has adopted two bio-geographical approaches comprised of strategic work on an all-Ireland basis[2] and a joint-GB approach involving the administrations of England, Scotland and Wales. The all-Ireland approach is overseen by the Invasive Species Ireland Steering Group. The latter is overseen by the GB Non-native Species Programme Board, supported by the GB Non-native Species Secretariat (NNSS)[3].

National strategy

2. The Invasive Non-native Species Framework Strategy for Great Britain[4] provides an overarching framework for all IAS activity and stakeholders and has been in its implementation phase since launch in May 2008. Progress is regularly reported at each meeting of the GB Non-native Species Programme Board. The current intention is to review the Strategy in 2013 but this may be influenced by the timing of any EU IAS Strategy. Northern Ireland is at present in the process of publicly consulting on an Invasive Alien Species Strategy for Northern Ireland[5].

IMPLEMENTATION ACTIVITY

Risk analysis:

3. Since its inception in December 2006, the GB Risk Analysis Panel has signed off 49 non-native species risk assessments, with 28 additional assessments in progress. These assessments go through a robust process, being completed by an expert on the species, peer reviewed, approved by the risk analysis panel, considered by the GB Programme Board for Non-native Species and placed on the Secretariat website for 3 months for stakeholders to comment on the evidence presented. A shortlist of further priority species for risk assessment is being developed as well as a process of rapid risk assessment to facilitate faster assessment of some species. A rapid risk assessment approach has been undertaken in Northern Ireland of over 300 potential and established species.

Rapid response:

4. All known populations of **South American water primrose (*Ludwigia spp*.)** are targeted for treatment as soon as possible after reporting and current effort appears to be successfully preventing its establishment in the wild. It has been estimated that current eradication costs of the known populations (c.14) is likely to cost somewhere in the region of £73,000 but eradication if widely established in suitable habitats could cost nearly £242,000,000. This rapid response is likely to be a "rolling" rapid response for some time yet and annual vigilance for new outbreaks or re-emergence is part of the approach. It remains on the GB alert list[6].

5. Work is in progress to attempt to eradicate the **sea-squirt *Didemnum vexillum*** from Holyhead harbour in North Wales. Rapid survey work following this discovery subsequently identified one population in Scotland and several on the south coast of England. Policy positions in respect of these are being developed under the GB Non-native Species Programme Board.

6. A small population of **monk parakeets (*Myiopsitta monachus*)**, approximately 100 birds, is located in several places in London. Based on the completed risk assessment, and following

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[2] http://www.invasivespeciesireland.com/
[3] http://www.nonnativespecies.org/
[4] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=55
[5] http://www.doeni.gov.uk/index/information/foi/recentreleases/publications-class-results.htm?category=Cat%204%20-%20How%20we%20make%20decisions&class=Public%20consultations
[6] https://secure.fera.defra.gov.uk/nonnativespecies/alerts/index.cfm

relevant research and feasibility trials into control methods and their effectiveness, a decision has been made to eradicate now. This work has involved trialling trapping techniques, nest removal, shooting in a sub-urban environment and also the development of bespoke ammunition that would further ensure humane control.

7. ***Dikerogammarus villosus*** – also known on the DAISIE database as the **"killer shrimp"** – was first discovered in the UK on 3 September 2010. Following the alert, 2 further populations were found. Rapid containment measures, accompanied by promotion of biosecurity amongst water users and targeted surveillance on the basis of risk, were deployed. The current state of knowledge will be reviewed shortly by the Task Group to consider feasible policy objectives.

8. Rapid response was undertaken following the discovery of **Floating Pennywort** (*Hydrocotyle ranunculoides*) in the River Lagan in Northern Ireland in October 2010 following its discovery only two days earlier. It is envisaged that follow up monitoring to prevent establishment will take place for several years.

Control/eradication:

9. Ruddy duck (*Oxyura jamaicensis*): Shooting of Ruddy Ducks has now taken place on 128 sites across Scotland, England and Wales since 2005. This includes eight new sites in the last 12 months. The UK Ruddy Duck population is now believed to be fewer than 100 birds, from an estimated 4,400 in September 2005. The eradication programme co-funded by EU LIFE-Nature and the UK Department for Environment, Food and Rural Affairs (Defra) ended on 31 March 2011. However, it is now clear that full eradication is feasible and Defra has agreed to fund additional work in 2011/12 which should result in further falls in the population. A third and final European workshop was held in Madrid in November 2010. This meeting was attended by representatives from Spain, France, the Netherlands, UK and Belgium. The other key countries in Europe (France, the Netherlands and Belgium) recognise that eradication is feasible and it has been agreed at the Standing Committee of the Bern Convention that Ruddy Ducks should be eradicated across Europe by 2015. Only one Ruddy Duck was recorded in Spain in 2010. This bird was eventually culled in February 2011.

10. The **Japanese psyllid *Aphalara itadori*** was released in April 2010 into Phase I sites as a bio-control agent for Japanese knotweed (*Fallopia japonica*). This is the first release of a classical bio-control agent against a general weed in Europe. These releases were closely monitored, with contingency measures in place, and regular reports were submitted to the regulator. Following consideration of the results by an expert panel, the project will progress to Phase II this spring with further releases at additional sites. More information will be available from the project website[7]. The total costs of this project will be in the region of £1,500,000. However, Japanese knotweed has been estimated to be costing the GB economy over £179,000,000/annum[8]. There are therefore good prospects for the project to prove very cost-effective in helping to control this plant.

11. Floating Pennywort (*Hydrocotyle ranunculoides*) has been eradicated from two known sites in Northern Ireland as part of a targeted All-Ireland wide eradication programme for this species. To date 8 sites have been recorded in Northern Ireland of which two have been eradicated and 5 have ongoing eradication / control projects. Works are planned for the remaining known site this year.

12. A successful InterReg 4a bid, led by Queens University Belfast, for catchment scale eradication of Riparian IAS commenced in early 2011. This project will aim to control and where possible eradicate the three main riparian IAS (Japanese knotweed, Giant Hogweed and Himalayan Balsam) from two river catchments in Northern Ireland. This project was part funded by the Departments of Environment in Northern Ireland and the Republic of Ireland.

[7] http://www.cabi.org/japaneseknotweedalliance/
[8] https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=487

Media and Communications:

13. In December 2009, the results of a public attitudes survey on IAS were published. The aim of this work was to provide a baseline against which a similar assessment can be made later to examine what progress has been achieved on the Strategy aim of raising awareness and influencing attitudes and behaviours towards IAS[9].

14. In February 2010, the "Be Plantwise" campaign[10] was launched with strong stakeholder and trade sector support. This campaign, aimed at users of aquatic plants and the retail trade sector, is designed to promote greater awareness and responsible behaviours by those using aquatic plants.

15. In March 2011, the "Stop the Spread - Check, Clean, Dry" campaign[11] was launched in GB to promote good bio-security practice amongst water users. On a similar vein, signage advising of the need for recreational water users to clean equipment and boats before moving to another water body, with the aim of preventing the introduction and further spread of IAS, has been placed at slipways and fishing stands on several water bodies across Northern Ireland.

16. An Invasive Non-native Species Stakeholders Forum is held in GB on an annual basis which alternates between the England, Wales and Scotland. Also on an annual basis, an All-Ireland Invasive Species Forum, which engages a wide range of stakeholders, is hosted by the Northern Ireland Environment Agency and the National Parks and Wildlife Service, Dublin. This forum alternates between being held in the Republic of Ireland and Northern Ireland.

17. The Northern Ireland Environment Agency continues to undertake an IAS identification and management training programme. Since 2007 over 60 organisations, including local district councils and NGOs, have received training on IAS identification and management. This has resulted in increased awareness as well as several local IAS control projects.

Data, Surveillance and Monitoring:

18. A three year project is almost complete and will have developed a GB information portal on non-native species. The portal, which will be launched later in 2010, will form a central source of information on IAS in GB and will also support public reporting of alert species detections. The front end of the portal will sit on the GB Non-native Species Secretariat website[12].

19. A public reporting tool for alert IAS has been developed and gradually expanded[13], this will in due course support reporting of detections to the GB portal. It enables key information to be reported online, including photographs and detailed locations using an interactive map-base.

20. A national Invasive Species database has been developed on an All-Ireland basis. This database is maintained by the National Biodiversity Data Centre in Waterford. The data held by the data centre is made publicly available via their website which incorporates an online interactive mapping facility[14]. A dedicated website on IAS, created in 2007 as part of the Invasive Species Ireland Project, enables the general public to browse images of IAS and report sightings[15].

Research and information projects:

21. Following launch of the joint CoE/EPPO Code of conduct on horticulture and invasive alien plants in 2009, we have reviewed our 2005 code of practice and re-issued it in 2011[16], with acknowledgment of the CoE/EPPO code.

22. In December 2010, a comprehensive report on the economic impacts of IAS in GB was published[17]. This provides costs broken down in many instances according to sectoral interests,

[9] https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=93
[10] http://beplantwise.direct.gov.uk/index.html
[11] http://www.direct.gov.uk/en/Environmentandgreenerliving/Thewiderenvironment/Protectingwildlife/DG_196114
[12] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=62
[13] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=81
[14] http://invasives.biodiversityireland.ie/
[15] http://www.invasivespeciesireland.com
[16] https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=328

each of the GB Administrations and total figures. There are also case studies to compare the relative cost-benefits of early action compared to late stage action. It estimated that IAS are costing the GB economy at least £1.7billion/annum.

23. UK has collaborated with the Plant Protection Service, Netherlands through the EUPHRESCO mechanism on a project called DeClaim – (**De**cision Support Systems for **C**ontro**L** of **A**lien **I**nvasive **M**acrophytes). The project will generate a prototype decision support system for optimal control measures for four representatives of the most troublesome growth forms of invasive aquatic alien weeds, Myriophyllids and Stratiotids; namely *Cabomba caroliniana, Hydrocotyle ranunculoides, Ludwigia grandiflora* and *Myriophyllum aquaticum.* The project will report in 2011.

24. Government is supporting a project to develop a field-guide book on invasive non-native species (similar to other species identification guide books). Target date for final product is now late 2011.

25. As part of the Invasive Species Ireland Project several educational materials and publications have been produced. These include the production of a Field Guide to Invasive Species in Ireland in 2009[18].

26. The Northern Ireland Environment Agency undertakes research through its partnership with *Quercus* at the Queens University Belfast (known as the Natural Heritage Research Partnership[19]). A key research theme of the partnership is IAS. Over the last 4 years several IAS research projects have been undertaken via the research partnership. These include projects focussing on Muntjac Deer (*Muntiacus reevesi*), the Bloody Red Shrimp (*Hemimysis anomala*), Common Cord Grass (*Spartina anglica*), European Brown Hare (*Lepus europaeus*) and the Slipper limpet (*Crepidula fornicata*).

Legislation:

27. In April 2010, the England and Wales lists of species prohibited from introduction into the wild without a licence were expanded by the addition of 24 animal species and 37 plant species.

28. In Scotland, new legislation creates a presumption of no release for animals and plants outwith their native range. The new legislation defines 'invasive' as an animal or plant which would be likely to have a significant adverse impact on biodiversity, other environmental interests, or social or economic interests. There are powers for Scottish Ministers to prohibit the keeping and sale of IAS and to require notification of the presence of particular IAS. In addition there are new powers for the control of non-native species to support rapid response to IAS threats. Species control orders can be made by relevant authorities to order that control be undertaken by named persons by particular dates. If the owner or occupier does not agree to the terms of this order, action can be taken by the relevant authority to undertake the necessary control and recover costs. Relevant authorities can also take emergency action in certain circumstances.

29. In Northern Ireland, as part of the review of the Wildlife Order (NI) 1985, an additional 13 animal species and 23 plant species have been added to Schedule 9 which prohibits their introduction into the wild without licence. Article 15 which directly relates to the introduction of non-native species has also been revised. Revisions include the addition of new powers which will enable the Department of Environment (NI) to introduce an Order to ban the sale of high risk IAS.

Miscellaneous:

30. Many county based initiatives and local partnership projects focussed on local IAS issues have continued to support implementation of the Strategy and to promote awareness and local

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[17] https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=487

[18] http://invasivespeciesireland.com/wp-content/uploads/2010/11/Field_guide_to_invasive_species_in_Ireland_booklet.pdf

[19] http://www.qub.ac.uk/sites/Quercus/NaturalHeritageResearchPartnership/

management activity. Several have registered on the GB Secretariat website[20] and there have been some notable successes in engaging volunteers from many walks of life. These projects are valuable in raising awareness and embedding understanding within local communities, they mobilise resources to tackle local environmental pressures from IAS (mainly plants) but also support national priorities by increasing capacity for surveillance and detection. A similar approach to encouraging and working with local community groups to take action on IAS has been undertaken in NI.

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[20] https://secure.fera.defra.gov.uk/nonnativespecies/maps/index.cfm