Please provide the following details on the origin of this thematic report on Alien Species.

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Submission	
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Date of submission:	

Please provide summary information on the process by which this report has been prepared, including information on the types of stakeholders who have been actively involved in its preparation and on material which was used as a basis for the report

This report was compiled by the national focal point for the Convention on Biological Diversity in Ireland.

As part of the process of preparing this report, a range of stakeholders comprising Government Departments and Agencies, Conservation NGOs and individual experts on alien species were consulted/(Annex 1). These bodies or individuals were invited to provide information on alien species in response to the questions set out in the questionnaire or otherwise.

Responses were received from 8 of the 19 bodies or individuals contacted.

Annex II contains information on alien species in Ireland which has been derived from the material submitted.

Article 8h Alien species

1. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	
2. To what extent are the resources available adequate for meeting the obligations and recommendations made?					
a) Good		b) Adequate		c) Limiting	X
d) Severely limiting					

3. Has your country identified alien species introduced?	
a) no	
b) only major species of concern	X
c) a comprehensive system tracks introductions	
4. Has your country developed national policies for addressing issues related to alien invasive species?	
a) no	
b) yes – as part of a national biodiversity strategy (please give details below)	X – in preparation
c) yes – as a separate strategy (please give details below)	X – as a separate strategy
5. Has your country assessed the risks posed to ecosystems, habitats or species by the introduction of these alien species?	
a) no	
b) only some alien species of concern have been assessed	X
c) most alien species have been assessed	
6. Has your country undertaken measures to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	

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7. Is your country collaborating in the development of projects at national, regional, sub-regional and international levels to address the issue of alien species?	
a) little or no action	X
b) discussion on potential projects under way	
c) active development of new projects	X

8. Does your national strategy and action plan address the issue of alien species?	
a) no	
b) yes – limited extent	
c) yes – significant extent	X – in preparation

Case-studies

9. Has your country submitted case-studies on the prevention of introduction, control, and eradication of alien species that threaten ecosystems, habitats or species, in response to the call by the fourth meeting of SBSTTA?	
a) no – please indicate below whether this is due to a lack of available case-studies or for other reasons	X
b) yes – please give below any views you may have on the usefulness of the preparation of case-studies for developing a better biological understanding of the problem and/or better management responses.	
10. How many case-studies are available that could be used to gain a better understanding of the issues surrounding alien species in your country?	
a) none	
b) 1-2 – limited understanding	X
c) >2 – significant information available	

Transboundary issues

11. Are known alien invasive species in your country also a problem in neighbouring or biogeographically-similar countries?	
a) not known	
b) none	
c) a few – but in general alien invasive species problems are specific	X
d) more than a few - in general we share common problems with other countries	
12. Is your country collaborating in the development of policies and programmes at regional, sub-regional or international levels to harmonise measures for prevention and control of alien invasive species?	
a) little or no action	
b) discussion on potential collaboration underway	X
c) development of collaborative approaches for a limited number of species	
d) consistent approach and strategy used for all common problems	

Further comments

General

- Alien Species are recognised as posing a threat to various sectors
- The priority and approach adopted in relation to alien species differs somewhat depending on the sector concerned.
- A draft national Biodiversity Plan, which is expected to be adopted by Government in 2001, contains a commitment to develop a specific strategy on alien species.
- Recent amendments to the primary wildlife legislation (Wildlife (Amendment) Act, 2000) include new and improved provisions to enable the regulation of certain aspects of alien species (e.g. import, introduction into or establishment in the wild), particularly as regards wild fauna and flora.

Specific questions contained in report

1. The priority is rated as "medium". However, this is an overall rating – it is considered that the priority varies from high to low depending on the sector or aspect of alien species involved.
2. Resources are generally considered to be limiting.
4. No single overall policy on alien species exists as yet. The draft national Biodiversity Plan contains a commitment to review the issue of alien species and to prepare a comprehensive strategy.

   Specific policies relating to aspects of alien species exist in some cases (e.g. in relation to the control of alien insects and diseases relevant to forestry.)

7. The situation varies depending on the sector concerned.
8. Please refer to (4) above.
12. In the context of ongoing consultation with Northern Ireland on the development of our respective biodiversity plans, the issue of alien species has been specifically identified as being suitable for joint north-south work.

ANNEX II Information on Alien Species derived from submissions.

Acknowledgements. Thanks are due to all of the Organisations and individuals who provided input to the preparation of this thematic report. Particular thanks are due to Mrs.Sylvia Reynolds and Dr.Dan Minchin who provided key submissions.

Alien Plant Species

Much of the following information has been extracted from a paper titled 'Recent higher plant introductions into Ireland' presented by Sylvia Reynolds at the Royal Irish Academy seminar in February 1999 on 'Biological invaders: the impact of exotic species'; this paper will be published in the Proceedings of that seminar by the Academy, edited by Dr. Declan Murray.

Some 800 alien plants, including a clubmoss, ferns, conifers and predominantly flowering plants, have been found growing in the wild in Ireland over the last 200 years or so. Well over half of the alien plants ever recorded in Ireland are casuals (i.e. species which tend not to persist unless reintroduced). Approximately a third of the 800 alien plant species are now considered part of the established Irish flora. Of those considered established, relatively few pose a threat to the native vegetation. However, those that become invasive can have a very significant impact, as have *Rhododendron ponticum, Heracleum mantegazzianum* and *Prunus laurocerasus*.

It has been recommended that an up-to-date catalogue of alien plant species be developed. Such a catalogue could be used to develop suitable measures to combat the spread of potentially invasive species and to provide a baseline against which changes in the alien flora could be monitored. Such an annotated catalogue of alien plant species is in an advanced stage of preparation by Mrs. Sylvia Reynolds and should be completed by the end of the year.

Sources of alien plant species

The largest groups of aliens are of cultivated origin, whether initially introduced as ornamental or as crop plants. Foodstuffs are the other main source. The categories overlap to some extent. A species may have arrived in Ireland or into the wild by several means, and, in some cases, the means of arrival is not known.

Aliens of cultivated origin include garden escapes and discards (e.g., *Fallopia japonica*), greenhouse escapes, (e.g., *Selaginella kraussiana*), relics of cultivation (e.g., *Vinca major*) and deliberate introductions of plants into natural or semi-natural habitats (e.g. *Spartina*). Seeds of crop plants may be spilt or discarded, or self-sown away from cultivated land, and seed impurities may be introduced with grass seed mixtures. Foodstuff sources include imported animal feed and cereals for domestic use, and both may also contain seed impurities. Two categories of aliens, grain aliens and arable weeds, are no longer as important in Ireland as formerly, due to cleaner imported seed and changes in agricultural practices including the use of herbicides. Some of the plants in the arable weed category are considered to have been introduced into Ireland by neolithic farmers and have been reintroduced with agricultural seed since then.

Examples of aliens of cultivated origin

Some new roadside verges and medians have been reseeded with foreign mixes. These mixes may contain 'native' species such as *Trifolium repens* (White Clover), *Lolium perenne* (Perennial Rye-Grass) and *Lotus corniculatus* (Common Bird's-foot-trefoil), but the foreign strains of these species in the mixes could compete with the native strains, and also affect the native gene pool should interbreeding occur.

In the mid-1990s *Avena fatua* (Wild-oat), more usually a weed of arable land, grew luxuriantly among planted shrubs and young trees on banks along new roads. In succeeding years *A.fatua* has become less abundant- the origin of seed is not clear. Almost certainly introduced with the grass seed, *Cichorium intybus* (Chicory) was an odd plant to find in a new suburban grass verge in Dublin City.

The giant hogweed *(Heracleum mantegazzianum)* was introduced in the 19th Century. A nationally co-ordinated control and ultimately eradication strategy has been recommended for this invasive alien. At present this is only a minor weed problem in certain areas, usually of waste ground around rivers. However, this species grows exceptionally well in Ireland, and is probably on the cusp of becoming a highly invasive weed. The potential economic cost, on health grounds alone, will become a major burden in the future. If an active programme was undertaken now to exterminate the species it could probably still be stopped.

Unlikely to have been deliberately planted, the grass *Lagurus ovatus* (Hare's-tail) is now well established on the sandy shore at Rosslare Harbour, Co. Wexford. It grows on sand dunes on the north-west coast of France and was probably transported accidentally from there to Ireland via cars or trucks on the ferry. It is also cultivated as an ornamental grass and is sometimes seen away from gardens.

Examples of alien aquatic plants

There are only a few alien aquatic plants naturalised in Ireland. One of the best known and most widespread in both still and flowing waters is the long-established *Elodea canadensis* (Canadian Waterweed).

Crassula helmsii was first recorded in Ireland in the mid-1980s. This plant is being sold in garden centres throughout the country. It is an extremely invasive aquatic weed from New Zealand. The EPA in the UK has advised that it should not be sold, because of its ability to reproduce by vegetative fragmentation and to displace native vegetation. Ireland has an internationally important subset of flora in the form of hyper-Atlantic species such as *anunculus tripartitus*. Aquatic weeds such as this *Crassula* could cause the displacement of this species.

Gunnera tinctoria (Gunnera): On Achill island this species is spreading fast, mostly it is found in drains around roadsides. Because it is a nitrogen fixer, however, it is able to invade sphagnum bog and has the potential to become as dangerous to these habitats as *Rhododendron*. Other aquatic weeds of potential threat are *Myriophyllum aquaticum, Azolla filiculoides* and *Hydrocotyle ranunculoides*. All these plants are sold at garden centres specialising in aquatic plants. Their ecological impact in Ireland, especially in the west could be profound.

Examples of port aliens

Most of the plants found at ports probably arrived as seeds with imported grain and animal feed, and only occur as casuals in small numbers. They cannot survive for long in a climate very different from their native one and their new habitats tend to be temporary- shallow soil between paving stones or active landfill. However, some plants produce abundant seed and may persist for several years.

So far, there are no reports of the sorts of aliens found at ports occurring among native vegetation or as weeds of cultivation. However, *Amaranthus retroflexus*,
which seeds freely in Ireland, is already known as a sporadic and often abundant

weed of cultivated land in Britain.

An alien grass *Phalaris minor* (Lesser Canary grass), related to *P. canariensis* (Canary grass) commonly used in bird-seed mixes, could have implications for agriculture as a weed of tilled land. This annual grass was noticed in 1993 in barley fields near Nobber, Co. Meath, but was not identified until 1995. Problems arose when the grass became entangled in farm machinery during harvesting. Routine use of pre-emergence sprays was not as effective, as *Phalaris minor* germinated at the same time as the barley crop. Oil-seed Rape was then planted in an attempt to clear the fields of this grass, but it only caused a temporary decrease in quantity, and in 1998, *Phalaris minor* was as vigorous as ever. The source of *Phalaris minor* was probably high protein cattle feed. Most of the resulting slurry was put onto grassland where the alien grass would not be able to compete or flourish. Some, however, was spread on the barley fields. *Phalaris minor*, which was observed to produce seed prolifically in the Nobber fields and which seems very persistent there, has the potential to become a troublesome weed should it be introduced elsewhere in Ireland.

Forests

Conifer plantations now form a distinctive vegetation type in Ireland, and commonly planted species such as *Picea sitchensis* (Sitka Spruce) and *Pinus contorta* (Lodgepole Pine) seed freely. Conifers, which comprise some 84% of the national forest estate, are alien species (Scots pine in this instance is deemed to be an alien species) and the broadleaf estates includes alien species such as beech and sycamore. All species normally planted have been on the island since at least the nineteenth century. These species are non-invasive for the most part- perhaps sycamore and beech are the most invasive. The reliance on non-native conifer species has had negative implications for biodiversity.

Rhododendron ponticum and laurel to a lesser extent are possibly the most invasive alien species in Irish forests. *Rhododendron ponticum* continues to spread through semi-natural woodlands. Controls are undertaken in Killarney and Glenveagh National Parks. This species suppresses the growth of indigenous vegetation. While control is feasible the species is expensive to eradicate and there is no national plan to do so.

Grants are available from the Forest Service under the Woodland improvement scheme for improvement of broadleaf woodland. This may include eradication of *Rhododendron ponticum* from the specific woodland. The grant at present is considerably less than the cost of eradication in may cases. However, there are proposals to increase this grant. The grant is targeted at woodland that has the potential to produce a commercial tree crop.

A Native Woodland Forest Scheme is in the course of preparation, which will provide grant aid for ecological enhancement of native woodlands, which would include eradication of these weed species from the grant aided area. Forest Service, Department of Marine and Natural Resources and the Department of Agriculture, Food and Rural Development operate controls in respect of alien insect pests of commercial forest trees and farm crops. So far, these controls appear to be reasonably effective. Alien pests and diseases are the primary focus of the Forest Service in relation to the control of the introduction of alien species.

Controls such as Guidelines *i.e. Water Quality, Archaeology, Landscape, Biodiversity and Harvesting*, Code of Best Forest Practice, Irish National Forest Standard, consultation procedures and inspection procedures are in place to ensure that sensitive ecosystems, habitats or species are not endangered by afforestation (new planting) or other forest

operations. There is a greater emphasis than heretofore on increasing broadleaf afforestation in general and on increasing the availability transplants of native genotypes of native species. This applies to oak in particular.

Under the EU Plant Health Directive strict regulatory controls are in place to prevent the entry of alien insect pests and diseases which could seriously damage Irish forests. This includes ports inspections, plant passports to accompany the transport of forest trees and forest produce and monitoring of designated forest plots. The Forest Services has also devised a contingency plan to be put in place in the event of a significant outbreak of insect damage to, or disease of, trees.

The EU has adopted a number of directives on the marketing of forest reproductive material such as seed transplants and cuttings. It is a condition of grant aid that Certificates of Provenance which are, essentially, certificates of plant origin are required for all tree species.

Alien Animal Species

Terrestrial ecosystems

One relatively high profile alien species is the American Mink *(Mustela vison).* This species have spread widely and private control is undertaken by some landowners and hunting organizations. Many believe it now poses a serious threat to wildlife and to fisheries and game. The full ecological impact of mink on ground nesting birds and fish is unknown. There have been calls for many years from hunting, conservation and fishery interests for the Government to formulate a national strategy for dealing with the problems associated with this species and the rate at which it is spreading throughout the country.

Sika deer have interbred with the native Red Deer population. Some control measures have been undertaken by Dúchas in Killarney National Park. Grey squirrel and the bank vole have reached pest status in some localities but eradication is not feasible at this stage. Deer can be a forest pest and no forester would encourage the introduction of any more species such as roe deer or muntjac.

Inland aquatic ecosystems and fisheries

With regard to inland aquatic ecosystems and fisheries, alien species pose a number of problems - these relate to aquatic and riparian vegetation, macro-invertebrates and fish. With the removal of internal boundaries ("relaxation" of customs) within the EU and modern roll-on/roll-off facilities it is becoming more difficult to intercept illegal importation of non-native species. There is a continuing threat from ill-informed anglers bringing in non-native species to stock their "favourite" water. In addition to new introductions into Ireland, previously introduced species are still spreading, including through illegal translocations to new lake systems. Some unique indigenous aquatic systems are under particular threat from alien species.

The zebra mussel *(Dreissena polymorpha)* was first recorded in the Shannon Catchment in the 1990s, but has since spread into the Erne catchment – a case of transboundary invasion by the species to Northern Ireland (UK). The species was probably introduced into Ireland in the first instance through the transportation of a second hand pleasure craft from canals in Britain. An international workshop to consider the economic and ecological impact of zebra mussels and their control was held in Galway in 1998. While the mussel can cause extensive changes

to the ecology of an area, it is difficult to anticipate exactly what impact the species will have on Irish ecosystems.

Alien marine species

Alien Species are often difficult to determine and there may be many more present in the environment than is currently recognised. Those that can not be ascribed as being negative or alien are termed cryptogenic. Alien species increase biodiversity, and are seldom known to reduce biodiversity. Alien organisms can modify their new environment and cause significant changes, such modifications are deemed by most as being harmful. However, following the recent glaciation species almost certainly continue to arrive by natural means but anthropogenic induced introductions are perceived as being solely responsible for new species establishments. Although the great majority of alien species are benign some have the capability of causing economic hardship by modifying aquaculture, fisheries and tourism and some such as toxic dinoflagellates may pose problems for health. Impacts in each of these areas occur in Ireland.

Trade is expanding and this increases the risk of transmission of exotic species. Although prevention of an introduction may not be possible, some practical steps, if undertaken, will certainly reduce overall risk. Ireland has acquired species *via* trade. The EU Free Trade Agreement enabled some species to gain entry to Ireland since January 1993. Notably a copepod parasite of oysters *Mytilicola orientalis* now established in Dungarvan Bay and the zebra mussel *Dreissena polymorpha* a species that causes extensive changes to the ecology of, in particular, lakes (Shannon and Erne navigations). A further recent introduction thought to have been introduced from activities arising from trade is the nematode *Angullicola crassa* that infests the air bladder of eels.

Ships are the most frequent means for introducing species in ballast water or by hull fouling. Many shipping ports are expanding and moving farther downstream (for example the development of Ringaskiddy Port in Cork Harbour) to more marine conditions and this together with rapid turnaround times of vessels and new trading patterns provide increased opportunities for unwanted species to become established. There is one main method practiced to reduce the risk from ballast water and this is by exchanging the water while in mid-ocean as recommended by the International Maritime Organisation. Although re-ballasting can reduce the risk of introductions they will not prevent biota from becoming established on every occasion. For this reason continued investigations to find a practical method for sterilisation of ballast water is needed. The number of species introduced by hull fouling is probably understated. Many exotic species, attributed to hull fouling in Ireland, were introduced prior to the usage of tri-butyl-tin (TBT) paint coatings. Although fouling of vessels still takes place the use of TBT has made many port regions sufficiently toxic so as to reduce or exclude some negative populations. Once TBT is banned in favour of less toxic coatings, port regions, such as Cork Harbour, are likely to receive a wider range of exotic species because improvements of water quality will provide more suitable conditions for invasion.
It is important to control the movements of species over great distances (primary inoculations) otherwise once they become established secondary introductions will almost inevitably follow. Control of secondary introductions is more difficult to achieve and may not even be possible. The great majority of species are introduced unintentionally. When deliberate introductions for culture are made the International Council for the Exploration of the Sea's Code of Practice, in part developed and actively supported by Ireland, is a means, if followed, that can greatly reduce risks. It takes into account possible movements of pests, parasites and diseases and ecological and genetic conditions in advance of the introduction before the species enters quarantine. Unfortunately disease-free stock, that has passed through quarantine, can be compromised by trade with those countries that did not take these precautions.

Biogeographical barriers do not normally conform to the political geography of trading countries. Within trading blocks veterinarians may impose restrictions based on known diseases, but undescribed or little known pathogen species are not covered, and veterinarians seldom consider pests in their management advice. Unless an internationally researched investigation into exotic species management is undertaken we may expect to see more unexplained events, with serious losses to aquaculture and fisheries and impacts on human health. A healthy scientific forum exists to undertake the work but the funding is presently inadequate to practically solve these problems.

The Priorities

The International Council for the Exploration of the Sea has an expert group: The Introductions and Transfers of Marine Organisms Working Group and there are also other unaffiliated experts. This expertise needs to be harnessed in managing exotic species problems and it needs to be a truly international forum that takes account of all maritime trading nations. The problem is one region of the world may become a European problem in the future and there may be species that will become invasive outside of their native range and the consequences of these may be difficult to predict.

The main areas where progress can be made in the marine environment include the following:

- ***Investigate practical means for the management of ballast water in port regions and undertake port profiles.***
- ***International study on the efficacy of sterilisation methods for ballast water to provide practical solutions for different constructions of ballast tanks in different ships.***
- ***Examine non-toxic coatings for ship hulls.***
- ***Conform to ICES Code of Practice when introducing species for culture or in trade.***
- ***Develop a contingency plan to control alien species following new introductions.***
- ***Develop an international alien species forum of managers and scientists that can provide practical solutions, to incorporate ships' architects, engineers, port managers and other specialists when required.***

	Type of Organisation	**Submission made**
NPW Dúchas	Government	No
National Botanic Gardens	Government	Yes
Natural History Museum	Government	No
Heritage Council	Statutory Body	No
Environment Protection Agency	Statutory Body	Yes
Coillte (State Forestry Body)	Statutory Body	No
Central Fisheries Board	Statutory Body	Yes
Department of Marine and Natural		

Resources (Marine Division)	Government	No
Department of Marine and Natural Resources (Forest Service)	Government	Yes
Department of Agriculture, Food and Rural Development	Government	No
Birdwatch Ireland	Conservation NGO	No
Irish Wildlife Trust	Conservation NGO	No
Irish Peatland Conservation Council	Conservation NGO	No
Irish Seed Savers Association	Conservation NGO	No
N.A.R.G.C.	Hunting and Conservation NGO	Yes
An Taisce/David Hickie –Expert	Conservation NGO	Yes
Dan Minchin	Alien Species Expert	Yes
Sylvia Reynolds	Expert	Yes
One other individual	Expert	No