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Unit B.2 Bio-diversity

A COMPARATIVE ASSESSMENT OF EXISTING POLICIES ON INVASIVE SPECIES IN THE EU MEMBER STATES AND IN SELECTED OECD COUNTRIES

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Gateway to information on Invasive Alien species in North and Central Europe

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1. CRITERIA FOR THE ASSESSMENT

Table 1: Criteria used for the assessment

Group	Code	Title
Definition of Invasive Species	A1	Definition/classification of Invasive species/Invasive alien species/other terminology
	A2	Scope of coverage (e.g. live species, seeds, propagules, etc.)
	A3	Species risk assessments according to standardised protocol (e.g. EFSA)
	A4	Species risk assessments during emergencies (e.g. after sudden breakout)
	A5	Identification of black lists, grey lists, white lists
	A6	Transition measures after above lists enter into force (for users of restricted IAS)
	A7	Horizon scanning tool, quick screening tool
	A8	Identification of alert lists
	A9	Pathway/vector/area risk assessments according to standardised protocol
	A10	Identification of key pathways, vectors and high risk areas
	A11	Prioritisation tool for risk assessments
	A12	Declassification system
	A13	Joint information system
Prevention (intentional + unintentional introduction of IAS)	B1	Restrictions/licences for import/export or for transfers in the internal EU market
	B2	Restrictions/licences for trade (cf. CITES)
	B3	Restrictions/licences for transport
	B4	Restrictions/licences for possession into captivity/containment
	B5	Restrictions/licences for release into the wild
	B6	Border control/quarantine services with procedures to target IAS or risky species (according to RA)
	B7	Inspection and compliance frameworks for Ias or risky species (according to RA)
	B8	Measures to prevent IAS-spread through contaminated commodities, packages and transport vectors or through waste disposal
	B9	Measures to prevent IAS-spread through man-made corridors
	B10	Schemes for labelling and certification of products/sources and accreditation of industries (cf. Ballast Water Convention)
	B11	Greening the supply chain (IAS-sensitive public procurement)
	B12	Voluntary codes of conducts or agreements for different economic sectors
Early warning and rapid response	C1	Mandatory surveillance to establish presence of IS according to standardised protocol
	C2	Targeted monitoring around key entry points and high risk areas
	C3	Dedicated early warning and information dissemination system
	C4	Mandatory rapid response according to standardised protocol
	C5	Eradication planning
	C6	Agreements with neighbouring countries on alert procedures
Control, management and ecological	D1	National or regional mandatory requirement to control or eradicate
	D2	Definition of eradication/ containment/control end point, i.e. definition of success of eradication or control actions
	D3	Mandatory monitoring of spread according to standardised protocol

Group	Code	Title
restoration	D4	Mandatory monitoring of eradication or containment actions
	D5	Ex-post monitoring obligations, i.e. long term monitoring to ensure success of eradication or containment actions
	D6	Mandatory reporting to authorities according to standardised protocol
	D7	Mandatory requirements to restore the damaged ecosystems and/or address other environmental damage
Financing instruments	E1	Cost-recovery for intentional introduction: - import / border control frameworks (import permit fees, inspections, quarantine); - biosecurity levies based on volume or risk level of commodities; - paying for risk assessment directly or covering the competent authority's costs; - permit, registration and inspection systems for facilities holding alien species in captivity or containment; - fees on disposal of vector material e.g. contaminated soil, landfill charges; - monitoring and contingency planning; - emergency response; - control and management.
	E2	Charging system for vectors of unintentional introduction: - vector fees or a tax based on risk categorisation; - levies on specific commodities or cargo containers; - insurance (linked to contingency planning and monitoring); - revenues recovered from fines.
Strategy development	F1	National or regional strategy or action plan on IS
	F2	Mandatory integration of IS into SEA/EIA
	F3	Streamlining of IAS into other policies, e.g. land and resource management, adaptation to climate change, biofuels
	F4	Identification of harmful subsidies favouring the introduction/establishment of IS
	F5	Full integration of overseas territories, where applicable
	F6	Liability mechanism to establish responsibility, accountability and negligence
	F7	Definition of enforcement practices, including designation and definition of roles and responsibilities of agencies/personnel responsible for enforcement
Capacity building	G1	Dedicated agency
	G2	Dedicated website/centralised information sharing system
	G3	Nation-wide network of experts
	G4	Training programmes for target groups at national or regional level
	G5	Technical guidelines and codes of conduct
	G6	Organised and systematic exchange of best practices at national or regional level
	G7	Level of coordination/integration with animal and plant health
Awareness-raising and engagement	H1	Educational material and information campaigns for target groups (e.g. travellers, gardeners, pet shops)
	H2	Voluntary observation networks – e.g. birdwatchers, hunters, volunteer groups
International cooperation	I1	Mandatory requirement to systematically screen development programmes for IAS impact
	I2	Development policy include a mechanism to include in programmes a dedicated component of capacity building and cooperation for the management of IAS in developing countries

2. ABBREVIATIONS

AFEDA – French Association for the Study of Ambrosia

ALARM - Assessing large-scale risks to biodiversity using tested methods (FP6 project)

AQIS - Australian Quarantine and Inspection Service

AQUAVETPLAN - Australian Aquatic Veterinary Emergency Plan

BGN – Bulgarian lev

BLRB - Biosecurity Law Reform Bill (New Zealand)

BNZ – Biosecurity New Zealand

CAISN - Canadian Aquatic Invasive Species Network

CAP – Common Agricultural Policy

CBD – Convention on Biological Diversity

CFIA – Canadian Food Inspection Agency

CITES – Convention on International Trade in Endangered Species

COP – Conference of Parties

DAISIE - Delivering Alien Invasive Species In Europe

DKK – Danish krone

EADRA - Emergency Animal Disease Response Agreement (Australia)

EEA – European Environment Agency

EFSA – European Food Safety Agency

EFT – equivalent full-time

EIA – environmental impact assessment

EMPPLAN - Australian Emergency Marine Pest Plan

ELNAIS – Ellenic Network on Aquatic Invasive Species

EPPO – European Plant Protection Organisation

ERDC-IRO – Engineer Research and Development Centre – International Research Office

EU – European Union

EW – early-warning

FP – Framework Programmes

GABLIS – German-Austrian Black List Information System

GAEC – good agricultural and environmental condition

GB – Great Britain

GEIB - Grupo Especialista en Invasiones Biológicas

GIS – geographical information system

GMO – genetically-modified organism

GPS – global positioning system

HACCP - Hazard Analysis and Critical Control Points

HD – Habitats Directive

IAS – Invasive alien species

IAST – Invasive Alien Species Team 'Team Invasieve Exoten'

IMO – International Maritime Organisation

IPPC - International Plant Protection Convention

IRA – Import Risk Assessment

IS – Invasive Species

ISEIA – Invasive Species Environmental Impact Assessment

ISSG - Invasive Species Specialist Group (IUCN)

IUCN – International Union for the Conservation of Nature

LVL – Latvian lats

MAF - Ministry of Agriculture and Forestry (New Zealand)

MAFBNZ – Ministry of Agriculture and Forestry Biosecurity New Zealand

MEPA - Malta Environment and Planning Authority

MNHN - National Museum for Natural History (France)

MNHNL - National Museum for Natural History (Luxembourg)

MoU – memorandum of understanding

MS – Member State (of EU)

NGO – non-governmental organisation

NI – Northern Ireland

NISMP – National Invasive Species Management Plan (US)

NOBANIS – Northern European and Baltic Network on Invasive Alien Species, which includes Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, Faroe Islands,

Germany, Greenland, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Slovakia, Sweden and the European part of Russia (i.e. 14 EU MS).

NZ – New Zealand

NSERC - Natural Sciences and Engineering Research Council of Canada

OECD – Organisation for Economic Co-operation and Development

OPAN – Autonomous Organisation of National Parks (Spain)

PLANTPLAN - Australian Emergency Plant Pest Response Plan

PRA - Pest risk assessment

RA – risk assessment

SEBI - Streamlining European 2010 Biodiversity Indicators

SSIC – Swedish Species Information Centre

UK – United Kingdom

USA – United States of America

WRA - Weed risk assessment

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3. INTRODUCTION

The European Union (EU) declared its commitment 'to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss'[1]. Invasive alien species (IAS) are recognised as one of the major threats to biodiversity by the Convention on Biological Diversity[2] (CBD). The EU, having failed to meet its 2010 biodiversity target, adopted its new strategy[3], which states that '*The Commission will fill policy gaps in combating IAS by developing a dedicated legislative instrument by 2012* (Action 16)*'. The aim is that IAS pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS'* (Target 5). The Commission has in fact been active on this issue for a few years, and already adopted a Communication presenting policy options for an EU Strategy on Invasive Species[4] in December 2008. The present study is contributing evidence to inform the impact assessment of an IAS legislation to be developed by the Commission.

Member States are also aware of the importance of IAS in the context of biodiversity loss, as well as through the significant economic impacts they may cause. All have regulations or initiatives in place to deal, at least in part, with IAS, whether for preventing, responding rapidly, or eradicating IAS. Those steps represent the three-stage hierarchical approach proposed by the parties to the CBD at COP VI/23:

- Prevention is generally far more cost-effective and environmentally desirable than measures taken following introduction and establishment of an invasive alien species. Priority should be given to preventing the introduction of invasive alien species, between and within States.

- If an invasive alien species has been introduced, early detection and rapid action are crucial to prevent its establishment. The preferred response is often to eradicate the organisms as soon as possible (principle 13).

- In the event that eradication is not feasible or resources are not available for its eradication, containment (principle 14) and long-term control measures (principle 15) should be implemented. Any examination of

[1] See the Information note from the Council of the European Union 'Biodiversity: Post-2010 - EU and global vision and targets and international ABS regime – council conclusions', available from: register.consilium.europa.eu/pdf/en/10/st07st07536.en10.pdf

[2] See the Global Biodiversity Outlook 3 publication (2010), gbo3.cbd.int/the-outlook/gbo3/executive-summary.aspx

[3] EC, 2011. Our life insurance, our natural capital: an EU biodiversity strategy to 2020. Available from: ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7%5B1%5D.pdf [Accessed 18/7/2011]

[4] See ec.europa.eu/environment/nature/invasivealien/docs/1_EN_ACT_part1_v6.pdf

benefits and costs (environmental, economic and social) should be done on a long-term basis.

The objective of this project was to assess the regulations, policies, and other initiatives in place or under development in the 27 Member States (MS) and in four selected OECD countries, namely Australia, Canada, New Zealand and the United States. While IAS as such are usually targeted by environmental regulations (IAS are generally under the responsibility of Ministries for Environment, and for example the national IAS strategies in place in the EU are led/approved by those Ministries), other sectors, such as agriculture, forestry, fisheries and customs may also target specific aspects of IAS, that are a particular issue in their area. The sectoral regulations are amongst the driving forces in the frameworks that are implemented today at national and international levels.

The common core on which EU Member States build to deal with the issue of IAS is framed by a number of existing EU regulations.

The main text that specifically refers to IAS is Council Regulation 708/2007 on the use of alien and locally absent species in aquaculture, which provides for assessment of risks associated with intentional introductions of aquaculture organisms and associated non-target species.

In the framework of nature and biodiversity, the Habitats Directive, Birds Directive and EU implementation of the CITES Directive (*Council Regulation (EC) No. 338/1997*) are important:

- The Habitats Directive, in its Art. 22, requires that in implementing the provisions of this Directive, Member States shall: (b) ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction. The results of the assessment undertaken shall be forwarded to the committee for information;

- The Birds Directive states in Art.11 that Member States shall see that any introduction of species of bird which do not occur naturally in the wild state in the European territory of the Member States does not prejudice the local flora and fauna. In this connection they shall consult the Commission.

- Four IAS are included in the Annexes of the EU Wildlife trade regulations (the Red-eared Slider Turtle (*Trachemys scripta elegans*), the American Bullfrog (*Rana catesbeiana*), the painted turtle (*Chrysemys picta*), and the American ruddy duck (*Oxyura jamaicensis*)) and thus are regulated for import and trade, through the need of permits of imports and exports.

The plant health regime and veterinary health regulations implemented in the EU also provide a strong framework to combat harmful organisms and diseases in the EU. Regulations about wood products are also in place to limit the introduction and spread

of forest pests in the EU territory. The most important EU texts regulating animal and plant health include (non-exhaustive):

- Controls for plant protection are governed by Council Directive 2000/29/EC[5]. The goal of this Directive is to prevent introduction into the EU of organisms harmful to plants or plant products or their spread within the Community. In order to meet this aim, rights and obligations are placed upon Member States to regulate the movement of plants or plant products within their territory and to regulate the introduction of plants or plant products into the Community from third countries. Obligations are placed upon third countries which want to export plants or plant products to the Community. A list of quarantine organisms is in place. The Directive also includes requirements for imports of wood packaging materials. The EU Plant Health Regulatory System is currently subjected to a major evaluation process in which a clearer inclusion of invasive alien species into the system is one of the strategic discussions (Schrader 2010[6])

- Sanitary controls to prevent the introduction of animal diseases by veterinary controls is governed by *inter alia* Directive 97/78/EC[7] and Decision 2007/275/EC[8]. The goal of those texts is not to prevent the introduction of species that may be harmful to the environment, but to prevent the introduction of diseases or vectors/vehicles of diseases, by requiring a sanitary certificate, including disinfection requirements. Animal health is a complex legislative area and these two pieces of legislation are not the only relevant ones. They are mentioned here as examples of what exists.

Another important framework is the European Strategy on Invasive Alien Species, adopted under the Bern Convention in 2003[9].

The European and Mediterranean Plant Protection Organisation (EPPO) works to protect plants, to develop international strategies against the introduction and spread of dangerous pests and to promote safe and effective control methods. It also includes a Panel on Invasive Alien Species, and has published a list of invasive alien plants[10].

In addition, the FP6 projects ALARM and DAISIE investigated IAS issues in the EU. 'Delivering Alien Invasive Species Inventories for Europe' (DAISIE)[11] provides the first

[5] Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community

[6] Schrader G., Unger J-G and Starfinger U. (2010) Invasive alien plants in plant health: a review of the past ten years Bulletin OEPP/EPPO Bulletin 40, 239–247

[7] Council Directive 97/78/EC of 18 December 1997 laying down the principles governing the organisation of veterinary checks on products entering the Community from third countries

[8] 2007/275/EC: Commission Decision of 17 April 2007 concerning lists of animals and products to be subject to controls at border inspection posts under Council Directives 91/496/EEC and 97/78/EC (notified under document number C(2007) 1547) (Text with EEA relevance)

[9] Genovesi and Shine (2004) European strategy on invasive alien species, Coucil of Europe, available from: www.cbd.int/doc/external/cop-09/bern-01-en.pdf

[10] www.eppo.org/INVASIVE_PLANTS/ias_plants.htm

[11] funded by the European Commission under the Sixth Framework Programme (Contract Number: SSPI-CT-2003-511202), www.europe-aliens.org

compilation of the history of invasion of IAS in Europe as well as information on the spread of IAS in the EU and on their impacts. Assessing Large-scale Risks for Biodiversity with tested Methods (ALARM)[12] included a module aiming to develop and test comprehensive, systematic protocols to help preventing the introduction and spread of invasive species to European ecosystems. At international level, the IUCN Invasive Species Specialist Group (ISSG) developed the Global Invasive Species Database to facilitate effective prevention and management activities related to IAS.

The aim of this study was to screen the existing policies, measures and initiatives systematically, by presenting what each of the MS have in place to deal with IAS, going beyond regulations that are common to all MS (i.e. implementing EU texts), against a set of criteria (see Table 1 above). The first section of the report provides a comparative analysis of the development of IAS policies and initiatives in the different MS. The second section provides an overview of the cost-benefit assessment survey and highlights best practices. The accompanying document includes the more detailed screening of information in the 31 countries. The Annexes provide excerpts of the regulations in the original language of the MS.

3.1. SCOPE OF THE ASSESSMENT

The geographical scope was broad, covering the 27 Member States as well as four OECD countries (Australia, Canada, New Zealand and the USA).

The sectoral scope was also wide, as many sectors as possible were considered, including agriculture, forestry, fisheries, trade, etc. However, EU regulations were not the focus of the study, so some of the regulations implementing strictly EU regulations may not appear, as they would not be a differentiating factor between MS. Plant and animal health, also were excluded from the scope, as much information is already available to the Commission on these topics. Due to the nature of the search process, animal and plant health legislation and policies may have been identified in some countries. Where this was the case, such policies may appear in the country assessment, but were not included in the analysis.

3.2. SCREENING CRITERIA

The methodology used to screen the policies, regulations and other initiatives involved the use of criteria, which are listed in Table 1. These criteria are linked to the issues underlined in the Communication of the Commission “Towards an EU Strategy on Invasive Species”. The screening criteria allow to compare MS as objectively and rigorously as possible and to identify strengths and gaps in the national frameworks

[12] Project funded by the European Commission under the Sixth Framework Programme (Contract number: GOCE-CT-2003-506675), www.alarmproject.net/alarm

dealing with invasive alien species. Additionally, it allows the evaluation of what is already implemented in each MS and what new measures will be.

3.3. METHODOLOGY

The comparative analysis of regulations and initiatives in the different MS was implemented in three sequential steps. In the first step the identification of the regulations, policies and initiatives in each MS was done through a search based on keywords, mostly by native speakers, between January and April 2011. This was needed to ensure that the relevant information was found effectively and so as to minimise the risk of any possible misinterpretations.

The texts identified were then categorised by Member State, according to the type of legal text (code, law, regulation, decree, etc.), its legal status (whether it is legally-binding and implemented) and whether it has national or regional relevance. The key used to label the different pieces of information assessed is detailed in Box 1 below.

Regarding the coding of regional texts, one exception was made for the UK, where Great Britain (GB) and Northern Ireland (NI) regions were always specified. The regional coding (R) was used where texts apply to countries inside GB. There are two reasons for this. As Northern Ireland is part of the UK, it is assessed with that country. However, the UK and Ireland are working together to address the issue of IAS on an island basis. Thus the regulations are quite different between Northern Ireland (NI) and Great Britain (GB), and they were thus considered separately (see Annex). Further, this allowed to keep the regional coding (R) to specify texts that apply in the different regions within GB (Wales, Scotland, England).

The second step was to prepare country assessments for each MS. Each MS assessment starts with a short summary of the articulation of the main policy instruments, followed by a presentation in English of the the subset of relevant texts for each of the criteria presented in Table 1. All the MS assessments were performed in English and proof-read by the same person to ensure consistency across assessments. As a form of quality control, the summary of the articulation of the main policy instruments was submitted for review to MS experts, along with the list of all the regulations identified in the MS,. Responses were obtained for more than half of the MS (with good geographical representativeness: AT, BE, BG, CY, CZ, DE, DK, EE, FI, FR, HU, IT, PL, LT, LV, LU, NL, SI, SK, UK), generally confirming that the summaries were accurate and that the list of regulations identified was mostly complete, but sometimes refining a few specific issues, e.g. regional specificities.

Box 1: Codes of the legislation, regulation, policies and initiatives assessed

For each piece of information assessed, a code was given, that allows to quickly identify to which country it applies and what type of text it is. The coding follows the rule:

- The first two letters are the country code
- The number for hundreds means:
  - 1 – legally binding and implemented
  - 2 - legally binding but not (yet) implemented
  - 3 – not legally binding and implemented
  - 4 – not legally binding and not (yet) implemented
  - 5 – other type of initiative
- The number for tens describes:
  - 00 – conventions, plans and strategies
  - 10 – codes
  - 20 – laws or acts
  - 30 and 40 – ordinances (includes Ordonnance in French, Verordnung in Germany and Förordning in Sweden)
  - 50 – regulations
  - 60 and 70 decree, orders and statutory orders
  - 80 circular, decisions and other texts

The third step consisted in the assessment of each MS for each of the criteria. The assessment was performed using a rating system, and following a two-tiered approach. First, as a preliminary screening, each of the regulations, policies and initiatives that were identified as relevant for a criterion in the country assessment (see step 2) were rated (see Excel table in Annex). The rating was performed by a single person, the same that did the proof-reading, so as to reduce interpretation biases as much as possible. The rating followed a hierarchical approach, from full to no coverage of the criterion:

- Y – the criterion is fulfilled (the definition of full coverage, beyond the common core that applies to all MS, is specified for each criterion)
- P – the criterion is partly covered

- S – something similar to the criterion is present
- N – the criterion is not fulfilled

The text/subset of texts (e.g. if several regional text apply) that best cover the criterion then form the basis for the rating of the MS. These were identified following a hierarchical approach, whereby, if any text fully covered the criterion, then this text was considered for the country rating. If not, then only texts that partly covered the criterion were considered, etc. In other words, the final MS rating was only based on the most relevant pieces of legislation/information for a given criterion, and all other relevant texts (identified in step 2) were not considered any further for the assessment or analysis.

The **Y rating (full coverage) was assigned when the country was considered to fully cover the criterion.** Full coverage is defined for each criterion. For many criteria, full coverage requires a legally-binding rule. For A1 and A2, strategies/action plans were taken into account as they are the overarching text defining IAS, and are adopted by the country, even if they are not legally-binding[13]. The legally-binding aspect was considered irrelevant for the critieria G and H, related to capacity-building, and awareness-raising, as well as for B10, B11, B12, schemes for labelling and certification, greening the supply chain, voluntary codes). The **P rating (partial coverage) was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.** Reasons for which a P score was given include:

- The requirement is not legally-binding (when relevant, see full coverage explanation for each criterion)
- only some taxa are covered, for example animal IAS are fully covered but plants are not (or vice versa);
- the policy does not appear to be (fully) implemented;
- coverage only occurs at regional scale and not national; or
- the text assessed is not an official or legally-binding document.

The **S rating (similar coverage) was assigned when a country was considered to include some provisions that overlap or may be interpreted as covering the criterion**. Else, for OECD countries, for which the common core does not apply, provisions similar to the common core were rated S.

The **N rating was assigned when no text/initiative went beyond the common core** for that criterion.

[13] No reference to the strategy/action plan was found in legal texts of any of the countries that have implemented an IAS strategy/action plan. The strategies are also in general more recent than the legal texts, and this shows that (for the moment) no update of the legal texts was made in that direction.

Several limits may be highlighted in this methodology. The fact that native languages were needed introduces a source of variability in the assessments, by having different persons working on the assessment. However, the use of a standard set of keywords and the screening criteria, as well as the fact that the proof-reading and rating were done by the same person, is expected to have minimised this bias. Another issue that can be highlighted is the fact that when a dedicated website is implemented, it is much easier to find information related to invasive species. Thus in countries that do not have such websites, some actions may have been overlooked. For those MS where fewer information was found through the policy search, reports (e.g. 4th national report to CBD) or information from stakeholders active in the issue of IAS, outside of the official channels, may have been used, to better understand who is active on the issue and what activities are on-going. Lastly, in the rating of the countries, strategies or action plans that are under development or still in draft form were highlighted and assessed, while they are not necessarily endorsed yet.

4. INVASIVE SPECIES POLICIES IN THE SELECTED COUNTRIES

4.1. OVERVIEW OF THE SITUATION IN EU MEMBER STATES

Currently, no comprehensive framework for dealing with invasive alien species exists at EU level. The 2020 Biodiversity Strategy sets a target within a relatively short timeframe (2012) for developing a legislative instrument on the topic. Some MS are more advanced than others in their initiatives to deal with IAS, and approaches to the IAS issue differ. Currently, the frameworks for tackling IAS in the MS are frequently primarily governed by EU-level legislation, especially targeting invasive and/or alien species covered by the plant and animal health regimes. Plant/animal health was excluded from the scope of this work, which explains why such information is mostly not described here.

4.2. CRITERIA A: DEFINITION OF INVASIVE SPECIES

Criteria in part A look at definitions linked to IAS, and at ways to classify and list them, e.g. through risk assessments.

4.2.1. DEFINING "ALIEN" AND "INVASIVE" SPECIES (CRITERION A.1)

The terminology regarding invasive and alien species may vary, both in its use and in its meaning, internationally and at EU level. The CBD definitions from COP VI/23 state that an 'invasive alien species' (IAS) is an alien species whose introduction and/or spread threaten biological diversity. 'Alien species' refers to a species, sub-species or lower taxon, introduced outside its natural past or present distribution and includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce. Other definitions are provided in Council Regulation 708/2007 concerning the use of alien and locally absent species in aquaculture, including definitions of 'alien species', 'locally-absent species', 'introduction' and 'pilot release'; and in the Plant Health Regime, including the definition of 'harmful organisms'.

In order to fully cover the criterion, the MS were expected to include in their definitions of invasive alien species the four key ideas present in decision VI/23 of the CBD COP, in a legally-binding document or in a strategy/action plan[14]. The first three

[14] This is not considered as a common definition that all countries should necessarily use as it is not in the CBD original text, but an addition through the COP.

ideas relate to the definition of alien species, while the last idea relates to the definition of invasive species. The definition should include:

- All lifecycle forms (and implicitly, all taxa)
- Idea of 'outside past or present range'
- Idea of 'surviving and spreading'
- Idea of 'threatening biological diversity'

All the texts that define one of the terms "alien species" or "invasive alien species" are considered for this assessment. When several definitions are given in different texts in one MS, the one that most closely follows the CBD COP decision definition is assessed.

Definitions in the EU Member States

The conformity of the MS definitions of alien, invasive or invasive alien species with the definition of the CBD COP is assessed in Table 2. Synonyms of "alien species" were also considered, since this term has many synonyms that can encompass the meaning of CBD COP definition of "alien species". For example, "alien species" are defined as "non-native" in CZ, DE, EE, HU, IT, LT, SK and the UK. FI also refers to them as "non-native", but does not define the term (a definition is provided in FI400). The term "non-indigenous" is used in BE, PT and UK (both GB and NI), and is also used but not defined in France. "Introduced species" is defined in HU and in NI; LV, LT and ES use the term without defining it. For example, Lithuania defines "invasive species" as "an introduced (synonyms: non-indigenous, non-native, alien, exotic) species which becomes established [...]" rather than using the term "alien species" as in the CBD COP definition. Other terms defined include "non-naturally-occurring" in EE and FI; "new" species in another text in the UK; "non-natural" species in DK; "allochthonous" in ES; "exotic" in ES, GR and IT; and "neophytes" in LU. German-speaking countries also refer to archaeophytes and archaeozoans as well as to neophytes, neozoans and neomycetes, to distinguish between species introduced before and after 1500AD. It should be kept in mind however that there may be difficulties in the direct translation of the different terms used in the original languages[15].

Full coverage

Four MS (AT, BG, DK, LT) follow the CBD definitions for both the terms "alien" and "invasive alien" species in a legally-binding document (BG, LT) or in their IAS strategy/action plan[16] (AT, DK) by including all four key ideas of decision VI/23 of the CBD COP definition.

[15] For instance in the Portuguese law dedicated to non-indigenous species, two terms are used to specify the nature of the introduction, that are difficult to translate. "Evadidos" are individuals or descendents of individuals that have been legally imported and detained but accidentally or intentionally released without deliberate intent to make an introduction. "Clandestinos" (clandestine individuals) have been accidentally imported, associated with a specimen of a non-indigenous but legally imported or detained species, or their products and packaging.

[16] For further details on the strategies/action plans in place in the EU, please refer to criterion F1.

Table 2: Conformity of the MS definitions of "alien species" and "invasive alien species" (or synonyms) with the the CBD definitions.

Ticks indicate when the idea is covered in the MS/regional definition, the text in brackets next to the tick specifies when the scope is restricted to certain kinds of organisms. Potential deviations from the CBD definitions are explained in the column "Other". "na" means not applicable.

MS	Definition of alien species	Definition of invasive alien species	Lifecycle forms included	Idea of 'outside past or present range'	Idea of 'surviving and spreading'	Idea of 'threatening biological diversity'	Other
AT	Yes (AT300)	Yes (AT300)	✓	✓	✓	✓	
BE	Yes (BE164)		✓ (marine)	✓ (marine)			Restricted to marine areas; human intervention
	Yes (BE171R)	Yes (BE171R)		✓	✓	✓	Flemish region only
		Yes (BE180R)		✓	✓		Wallonia region only Same definition for alien species and IAS Human intervention Mentions significant environmental impacts, not necessarily biodiversity threats
BG	Yes (BG120)			✓	✓		
		Yes (BG121)	✓	✓	✓	✓	
	Yes (BG150)			✓			
CY	Not found	Not found	na	na	Na	na	
CZ	Yes (CZ120)			✓			
		Yes (CZ123)	✓ (harmful organisms)	✓ (harmful organisms)	✓ (harmful organisms)	✓ (harmful organisms)	Restricted scope to invasive harmful organisms
DE	Yes (DE120)	Yes (DE120)	✓	✓		✓	Timeframe
DK	Yes (DK300)	Yes (DK300)	✓	✓	✓	✓	
EE		EE302	✓ (plants)	✓ (plants)	✓ (plants)		Spread potential mentioned for IAS. Restricted taxonomic scope (plants only)

MS	Definition of alien species	Definition of invasive alien species	Lifecycle forms included	Idea of 'outside past or present range'	Idea of 'surviving and spreading'	Idea of 'threatening biological diversity'	Other
ES	Yes (ES120)			✓	✓	✓	Alien species are not defined separately, but the definition of IAS includes all ideas Includes species just introduced
	Yes (ES124R)			✓	✓	✓	Balearic islands only, human intervention Refers to possible predation, competition or physical modification of the environment
		Yes (ES300*R)		✓ (plants)	✓ (plants)	✓ (plants)	Restricted taxonomic scope (plants only), Galicia region
FI	Yes (FI400)			✓		✓	Human intervention The threat to biological diversity is included in the definition of harmful species rather than IAS Refers to damages in space and time, and to ecological, economic, social or health effects
FR	Not found	Not found	na	na	na	na	
GR	Not found		na	na	na	na	
		Yes (GR220)		✓	✓	✓	
HU	Yes (HU120)	Yes (HU120)		✓	✓	✓	Human intervention The idea of threat to biological diversity is included in the definition of harmful introduced species rather than in the definition of IAS
		Yes (HU500)		✓	✓	✓	
IE	Not found	Not found	na	na	na	na	
IT	Yes (IT160)		✓	✓			
		Yes (IT125R)		✓	✓		Human intervention
LT	Yes (LT160A)	Yes (LT160A)	✓	✓	✓	✓	Impacts on the economy or human health

MS	Definition of alien species	Definition of invasive alien species	Lifecycle forms included	Idea of 'outside past or present range'	Idea of 'surviving and spreading'	Idea of 'threatening biological diversity'	Other
		Yes (LT160B)	✓	✓	✓	✓	Impacts on the economy or human health
LU	Yes (LU500)			✓ (plants)			Human intervention, timeframe Restricted taxonomic scope (Plants only)
LV		Yes (LV121)	✓ (plants)	✓ (plants)		✓ (plants)	Impact on the environment, economy or human health Restricted taxonomic scope (plants only)
		Yes (LV150)				✓ (plants)	Impact on the economy, human health, and the quality of recreational resources Restricted taxonomic scope (plants only)
MT	Yes (MT150)			✓	✓	✓	Timeframe
NL	Yes (NL301)	Yes (NL301)		✓	✓	✓	Explosive growth, human intervention
PL	Yes (PL500)		✓	✓	✓		
		Yes PL250				✓	
PT	Yes (PT150)	Yes (PT150)		✓	✓	✓	Specific formulation[17]
		Yes (PT152)				✓	Refers to significant changes to ecosystems Idea of excess occupation of a territory (in terms of area of numbers of individuals)
	Yes (PT160)	Yes (PT160)		✓	✓ (plants)	✓ (plants)	Human intervention
RO	Yes (RO130)	Yes (RO130)		✓	✓	✓	Human intervention, adds impacts[18] in alien species definition Refers to ecosystem as a whole for IAS

[17] States that alien species are species that do not originate from a particular biogeographic area and have never been recorded as occurring there naturally in self-sustaining populations in historic times

[18] Refers to the fact that such species can compete, dominate, have a negative impact on native species and can even replace them

MS	Definition of alien species	Definition of invasive alien species	Lifecycle forms included	Idea of 'outside past or present range'	Idea of 'surviving and spreading'	Idea of 'threatening biological diversity'	Other
		Yes (RO121)		✓	✓	✓	In the definition of alien species all ideas are covered but the scope
SE	Yes		✓	✓	✓	✓	in preparatory work for strategy
SI	Yes (SI120)		✓	✓			Human intervention
SK	Yes (SK160)	Yes (SK160)		✓	✓	✓	Question of hybrids[19] and eradicated species[20] issues are considered
UK	Yes (GB300*)	Yes (GB300*)		✓	✓	✓	Includes species just introduced Restricted scope: excludes genetically-modified organisms, bacteria and viruses Considers economic, environmental and social impacts
	Yes (NI400*)	Yes (NI400*)	✓	✓	✓	✓	Restricted scope: excludes genetically-modified organisms, bacteria and viruses
	GB126			✓	✓		Timeframe
	GB132R and GB122		✓	✓			Scope: Hybrids are included
	GB130R			✓ (freshwater organisms)		✓ (freshwater organisms)	Restricted taxonomic scope (freshwater fish, shellfish or salmon)

[19] A hybrid of a native and non-native species is also considered a non-native species

[20] If species were eradicated, they are considered alien when natural/biological conditions of the ecosystem that was typical for their presence, no longer exist

Lithuania even goes beyond the requirements of the CBD by including economic and health impacts in its definition. Four further countries (FI, LT, LV, UK) also go beyond this definition, but are rated P for other reasons, see below.

- **Partial coverage**

Nineteen MS were rated P (BE, CZ, DE, EE, ES, FI, GR, HU, IT, LV, MT, NL, PL, PT, RO, SE, SI, SK, UK). In most cases, this was because the life-cycle and taxonomic scope of the definition was restricted, but other ideas may also have been missing. In some cases, the definitions were not legally-binding or applied only at regional level.

One or more of the four key ideas is missing

Fifteen MS do not refer to all taxa or to all lifecycle forms of the species in their definition of alien and/or invasive alien species (BE, CZ, EE, ES, FI, GR, HU, LU, LV, MT, NL, PT, RO, SK, UK). These MS are further described in criterion A2 that deals with scope. Amongst these, six MS/regions consider impacts that can go beyond the requirements of the CBD COP definition (BE, FI, LV, PT, RO, UK). Finland, Lithuania, Latvia and Great Britain (UK) have extended their definition of IAS to include wider impacts, beyond biodiversity impacts, such as health, social or economic impacts (see Table 2). Wallonia (Belgium) also deviates from the CBD definition by considering all significant environmental impacts, rather than strictly threats to biodiversity. Portugal and Romania also refer to impacts on the entire ecosystem.

Four MS do not include one or more of the other ideas in their definitions (DE, IT, LV, SI). Slovenia does not include the ideas of survival and spread, nor that of threat to biodiversity (SI120). In Italy the idea of threat to biodiversity is not mentioned in the texts with a definition (IT160 and IT125R). In both Germany and Latvia the idea of survival and spread is not mentioned in the definitions (DE120, LV121 and LV150).

Definition in non legally-binding documents

Poland defines both terms matching the CBD definitions but only does so in its national IAS database (PL500). Sweden also defines both terms matching the CBD definitions, but only in the preparatory work for its IAS strategy.

In Estonia, the terms are ‘invasive’ and ‘alien’ are referred to in legally-binding documents but are not defined (EE120, EE121, EE123), or the definition only applies to plants in a non legally-binding document (EE302).

Finland and Greece include definitions in texts that are not adopted yet (FI400 and GR220).

Definition for a limited area or region

In Belgium, BE164 only covers two ideas of the CBD definition and only applies to marine ecosystems. Regional texts (BE171R, BE180R) are more conform to the CBD definition, but also miss some ideas (see Table 2). It can also be noted that in Wallonia (Belgium), invasive and alien invasive species are not distinguished (the text states: ‘an invasive alien species, or invasive species, is defined as [...]’ (BE180R)).

- **Similar coverage**

Three MS (FR, IE, LU) do not define the terms "alien" and "invasive" (or their synonyms) in legal documents, although similar terms are in use without being defined. France refers to non-indigenous species, to non domestic/non cultivated species, or to harmful species and uses lists rather than a definition.

Luxembourg refers in its legislation to non-autochthonous invasive species (LU152 and LU121), without defining them, or in other, non legally-binding documents/website to neophytes (alien plants, whose definition includes the idea of 'outside past or present range'). In Ireland, the only definition found referring to IAS is the term 'noxious weed' (IE125). The three MS were rated S.

- **No coverage**

Cyprus was rated N as no definition could be found relative to IAS. Cyprus distinguishes in a report (CY500) between "regulated pests" (harmful organisms controlled by phytosanitary regulations) and "non-regulated pests" (organisms that cause "quality" problems but not phytosanitary problems), as this does not target IAS directly, CY was rated N.

- **Adding specifications to the CBD definition**

In twelve MS (AT, BE, DE, ES, FI, HU, IT, LU, NL, PT, RO, SI) definitions may bring new ideas that are not included in the four key ideas of the CBD COP definition.

- **Specification of the timeframe in the definition of alien or IAS** (AT, BE, DE, ES): Some MS/regions definitions aim to standardise the definition of alien or invasive alien species according to the history of introduction, by declaring that only those species that appeared after a specific timeframe can be considered alien. Germany considers as alien any species introduced in the last 100 years, whereas Austria considers as alien a species introduced after 1492 (and uses the exact CBD terminology elsewhere in the text AT300). The region of Wallonia (Belgium) considers alien those species introduced after 1500. Spain makes an implicit reference to timeframes in the Balearic Hunting and Fishing Act (ES124R), by introducing the concept of "naturalised" species, which are species introduced "in ancient times" that are now part of the current natural ecosystem.

- **Specification related to the introduction process**: In ten MS (BE, ES, FI, HU, IT, LU, NL, PT, RO, SI), definitions specify that IAS or alien species are those species introduced by human intervention.

- **Specification related to types of threats:** The Balearic Islands (Spain) also specify the definition of threats to biodiversity caused by IAS, mentionning the behaviour of invasive species (such as predation) and the risk of genetic pollution or disease as examples of such threats (ES124R).

- **Defining other terms related to IAS**

Definitions of other terms relevant to IAS were investigated: introduction, release into the wild, establishment and potential IAS.

The terms "introduction" and "establishment" are defined by the CBD as respectively being "*the movement by human agency, indirect or direct, of an alien species outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction*"; and "the process of an alien species in a new habitat successfully producing viable offspring with the likelihood of continued survival"[21].

"Introduction" is defined according to the COP decision of the CBD in Italy, Poland, Lithuania, Romania, Spain and Sweden (preparatory work). In Italy it is defined as the admittance of native or invasive species outside of their historically-documented geographical area. Poland also defines introduction as the direct or indirect movement by human agents of an alien species outside its past or present natural range. This movement can be either within or between countries or areas beyond national jurisdiction. Lithuania states that introductions must involve the intention or possibility of the species becoming established. In Romania, species introduction means a voluntary or accidental action to establish a viable population of a species coming from outside of the natural habitat (RO160). Three definitions are used in Spain: ES500*: The movement, by human agency, of a species, subspecies or lower taxon (including any part, gametes or propagule of such species that can survive and reproduce) outside its natural range (past or present). This movement may occur within a country or between countries. It can be intentional or non-intentional introduction. In another part it refers to the fact and effect of the transportation of an organism by humans across a geographical barrier. ES128R: The release into the ecosystem of any species of flora or fauna, in any life stage in water bodies where the species is not naturally present and that its members could not reach themselves. All definitions are very close or reflect the idea of the definitions introduced in COP VI/23 of the CBD. In Sweden, introduction is the direct or indirect transfer of an alien species to a location outside of its current or historic range by human action. Intentional and accidental introductions are also defined.

"Release into the wild" was not found to be defined by any MS. Turner (2008[22]) notes that the term 'wild' is not well defined and is problematic when referring to releases into the wild. It can also be underlined that 'introduction into the wild', the terms used in the Habitats Directive, are not defined in the Directive either.

"Establishment" is defined in Spain (ES500*), Sweden and Austria (AT300*), using the CBD definition of COP VI/23. In Greece, an invasive species is considered established

[21] This is not considered as a common definition that all countries should necessarily use as it is not in the CBD original text, but an addition through the COP.

[22] Turner S. (2008) The control of Invasive Alien Species - a review of legislation & governance for Ireland and Northern Ireland

when no measures have been taken in order to eliminate this species in an area or when attempts have been made but with no results for the last two years.

"Potential IAS" is a concept that emerges e.g. from EPPO[23] and which can be used for two reasons: it can relate to (1) species that are known to be invasive elsewhere but are not yet invasive in the respective country; or (2) species, where there is no clear scientific evidence of being invasive, but there is some reason to believe that they are. Austria takes a forward-looking approach by defining "potentially invasive alien species" as those whose introduction and/or spread has the potential to threaten biodiversity (AT300*). Such species may already be rapidly spreading or already occur in neighbouring MS. Belgium (inventory of species, BE171R), Germany (neoflora website), Ireland (Invasive Species Ireland and NI400*), Finland (FI400), Luxembourg (LU500) Slovakia (SK500), Spain (in the context of zoos or fishing ES123, ES124R), UK (GB300*) also refer to potentially invasive species. Estonia (EE123) refers to organisms potentially hazardous to the natural environment or/and human health. Malta talks about alien species that have the potential to become invasive (MT150). Therefore, in these MS, the concept of potential IAS is included in policies to manage IAS, even if the precise term is not specifically defined.

- **Definitions in the selected OECD countries**

The four selected OECD countries were rated Y for this criterion. All four countries go beyond the CBD definitions, by including threats from IAS to the environment, economy, agriculture, society and/or human health.

- **Full coverage**

Canada and the USA define both invasive species and alien species following the same ideas as in the CBD definitions, although both countries go further. In the Canadian IAS Strategy, the definition of alien species is exactly the same as in the CBD. On the other hand, the definition of invasive alien species is broader than that of the CBD; it states that IAS are those whose "introduction or spread threatens the environment, the economy or society, including human health".

Similarly, in the US Executive Order 13112 (1999) on invasive species, the definition of invasive species given is "invasive species are those alien species whose introduction is or is likely to cause economic or environmental harm or harm to human health". Thus this definition is broader than that used in the CBD, by considering wider impacts than simply on biodiversity. The alien species definition is broadly similar to that of the CBD however: "alien species are defined with respect to a particular ecosystem as being those that are not native to that ecosystem".

Australia and New Zealand both provide definitions of IAS that differs from the CBD one, but encompass all of its key ideas. Australia refers differently to IAS than EU MS: all species that are foreign/alien to Australia are considered potentially invasive[24],

[23] See the EPPO "Guidelines for the management of invasive alien plants or potentially invasive alien plants which are intended for import or have been intentionally imported"
[24] Here the term is used in a dfferent way than 'potential IAS' used above.

unless a risk assessment has declared them not harmful. Additionally, invasive species are defined: *An invasive species is a species occurring, as a result of human activities, beyond its accepted normal distribution and which threatens valued environmental, agricultural or other social resources by the damage it causes*. In Australia, regional statuses may apply to species, following a RA, because species native to one region may be alien in another and become invasive in that last region.

New Zealand does not define invasive species; it instead provides a definition for "new organisms" and "unwanted organisms", terms that can apply in a number of different circumstances. The definition of "new organisms" includes a number of different aspects, one of which is broadly equivalent to the CBD definition of "alien species", in terms of the idea of such a species not being native to the country. The precise definition is "an organism belonging to a species that was not present in New Zealand before 29 July 1998". The term "new organism" can also apply to other types of organisms, including GMOs, organisms that have been eradicated from New Zealand, designated risk organisms that were not in New Zealand at the time of the risk status being ascribed, and organisms for which containment approval has been given. The term "unwanted organism" is broadly equivalent to the CBD definition of invasive species, although it goes further by referring to broadly to harm to physical resources, i.e. not limited to harm to biodiversity, and also includes harm to human health. The precise definition is: "an organism that a chief technical officer believes is capable or potentially capable of causing unwanted harm to any natural and physical resources or human health".

4.2.2. SCOPE OF COVERAGE (CRITERION A.2)

A comprehensive definition of the coverage is necessary to ensure that introduction of material/taxa not covered in the definition does not result in the introduction of an IAS. Criterion A2 aims to identify whether the regulations, policies and initiatives thus cover all taxa and lifecycle stages (implicitly or explicitly), or whether they include restrictions. The texts rated for A2 either include a definition (see Table 2 in criterion A1), or refer to a scope (e.g. some texts that refer to a certain species may not include a definition, but still specify which lifecycle stages are covered).

In order to fully cover the criterion, the scope should be clearly delimited in a legally-binding text and implicitly or explicitlycover both all taxa and all lifecycle stagesAs an illustration, the scope of the CBD COP definition of alien species implicitly applies to all taxa and explicitly includes all life cycle stages so as to cover any propagating material of an IAS ("any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce"). Thus a country using the CBD definition would be rated Y. It follows that all the countries rated Y in A1 were rated Y in A2.

However, countries rated P in A1, can be rated Y in A2 if their definition covers all taxa and all lifecycle stages, or P if it only covers certain species/lifecycle stages. The scope

may also be specified further through including references to a timeframe, human intervention, or specific impacts (see A1).

- **EU Member States**

- **Full coverage**

Twelve MS were rated as fully covering A2 (AT, BG, DE, DK, ES, HU, IT, LT, MT, RO, SI, SK).

Lifecycle stages defined, and all taxa covered

The four MS rated with full coverage in A1, were also rated Y in A2 (AT, BG, DK, LT) for fully delimiting a scope including a definition of all lifecycle stages, and implicitly encompassing all taxa.

Another three MS (DE, IT, SI) also define a scope that explicitly covers all lifecycle stages and implicitly covers all taxa, even these MS did not include all four ideas of the CBD definition.

Lifecycle forms are not described, but the definition implicitly includes them all

In four MS (ES, MT, RO, SK) the definitions do not specifically refer to lifecycle stages nor to taxa, thereby not excluding any life form nor taxa.

Similarly, Hungary does not define the life cycle stages but defines a broad taxonomic coverage that can implicitly apply them. It refers to "any organism" (HU120) and to "the living organisms (their communities), and the inanimate components of the environment, as well as the natural and man-made environment" (HU500).

- **Partial coverage**

Fourteen MS (BE, CZ, EE, FI, FR, GR, IE, LU, LV, NL, PT, PL, SE, UK) were considered to partially cover the criterion.

Life cycle stages defined, but restricted taxonomic coverage

All lifecycle stages are referred to in seven MS (BE, CZ, EE, FR, LT, LV, SK, UK) in the texts dedicated to IAS (but not necessarily defining IAS, such as texts that target water primrose specifically). However, all these definitions have a restricted taxonomic coverage. These MS were thus rated P, except LT which was rated Y for LT160 (see Table 2).

- **Taxonomic coverage restricted by specifying certain taxa/reigns:** In the UK, GB122 and GB132R refer to "listed animal and plant species, their hybrids, and anything from which the species can be reproduced or propagated", thus covering all lifecycle stages explicitely, but only for animals and plants.
- **Taxonomic coverage restricted to plants:** Certain invasive plants are covered by specific texts, in which the lifecycle stages are included. This applies for water primrose in France (FR160), Estonia, Lithuania, Latvia and Slovakia also refer to a scope for plants only in certain texts (resp. EE302, LT121, LV121 and SK121).

- **Taxonomic coverage restricted to some animal species:** Slovakia refers to lifecycle forms for game non-native to the country (SK125).
- **Some taxa excluded**: in the UK, the lifecycle stages are referred to, but some reigns are excluded. Both UK strategies (GB300* and NI400*) exclude GMOs, bacteria and viruses from the scope of their definitions, but GB refers directly to the CBD COP definition and NI refers to the CBD lifecycle stages too.
- **Other species restrictions**: In Belgium, BE164 defines alien species, but specifically refers to marine species, including a reference to their lifecycle forms. In the Czech Republic, lifecycle forms are defined for invasive harmful organisms (CZ123).

Life cycle stages not explicitly defined, and restricted taxonomic coverage

- **Taxonomic coverage restricted by specifying certain taxa/reigns:** Five MS refer to some taxa/reigns (CZ, LU, NL, PT, UK). This is the case in the Netherlands, where the text refers to a "plant, animal or micro-organism" (NL301). Czech Republic, Luxembourg (while no definition of IAS applies, the text refers to "non-autochtonous species of flora and fauna"), Portugal and Great Britain include flora and fauna (CZ120, LU120, PT150, GB300*). These texts thus could be interpreted as excluding e.g. mushrooms.
- **Taxonomic coverage restricted to plants:** LV153 lists invasive plants. Estonia has a list of alien tree species (EE182). The Galicia region in Spain has a text specifically for invasive plants (ES300*R). Ireland refers to noxious weeds (IE125).
- **Taxonomic coverage restricted to some animal species:** France has a list covering alien vertebrates that may not be introduced into the wild (FR161). LV155 applies to wild animals not characteristic to the nature of Latvia. Fish species are targeted in certain countries. In Sweden, the culture of invasive species of fish is not allowed (SE150) and in Finland, fish or crayfish species that can be imported freely are regulated (FI122). In the UK, non native fish, shellfish and salmon are targeted in GB130R and in Czech republic CZ122 refers to non-native fish or water organism. Czech Republic and Luxembourg refer to IAS through a reference to game "alien" or "non-native" to the country (CZ124, LU121).
- **Specific plant species are covered:** The giant hogweed is covered by LV151 and LV160. In the UK, GB128 targets the Japanese knotweed and the Giant hogweed through soil and other waste containing viable propagules of these plants. In Slovenia, a decree targets ragweed (SI163).

- **Specific animal species are covered[25]:** Denmark has specific texts for muskrat (*Ondatra zibethica*) and the raccoon dog (DK167 and DK301). Estonia has specific texts for farmed minks and raccoon dogs (EE180).

All lifecycle stages and taxa covered, in non legally-binding documents

In Poland the lifecycle stages are referred to, and all taxa are covered implicitly, in the IAS database (PL500). In Sweden, the lifecycle stages are referred to, and all taxa are covered implicitly, in the preparatory work for the strategy.

In Greece, the text refers to "a type of plant, animal or other organism" (GR220), and implicitly does not exclude any lifecycle form.

In Finland, the draft strategy (FI400) fully covers implicitly both taxa and lifecycle stages, but is not yet in place, same for the biodiversity law in Greece (GR220).

No coverage

One MS (CY) was rated N as no policy/regulation/initiative applies for the moment that refers to specific taxa/lifecycle stages.

Selected OECD countries

Full coverage

In both NZ and the USA, the coverage of relevant legislation focuses on the reproductive capacity of plant or animal material, and includes implicitly all taxa. In New Zealand, organism is defined as any entity, other than a human being capable of replicating itself, including a micro-organism, a reproductive cell and a prion. In the USA, the definition of invasive species covers seeds, eggs, spores or other biological material that is capable of reproducing that species. In the USA, specific texts also refer to specific taxa/species, such as salt cedar and Russian olive, sudden oak death, noxious weeds, brown tree snake, nutria, non-indigenous aquatic nuisance species.

In Australia, discussion of invasive species has traditionally been segmented into a number of categories: diseases, fungi and parasites; feral animals; insects and other invertebrates; introduced marine pests; and weeds. However, the definition of invasive species by the Australian Goverment implicitly covers any taxa and lifecycle stage. Definition of lifecycle stages has only been found to occur explicitly at regional level, specifically the Australian Capital Territory and applies to pest only. Here legislation covers parts of plants and ova, sperm and animal products in addition to the whole organism. At regional level, some texts also restrict the definition to certain taxa, e.g. in Queensland and Western Australia invasive species cover weeds and pest animals, in New South Wales invasive species exclude pathogens, blue-green algae and listed species, etc. Response plans also are segmented: PLANTPLAN for plant species, AQUAVETPLAN for aquatic animals.

[25] Individual texts targeting specific species are not exhaustive for all species nor all countries, as no search for specific species was performed, and the list presented is thus not exhaustive.

- **Partial coverage**

In Canada, the alien species strategy covers plants, animals (including fish), and micro-organisms, thus restricting the scope by specifying certain taxa only.

4.2.3. RISK ASSESSMENT PROCEDURES FOR IAS (CRITERION A.3)

Risk assessments (RA) evaluate scientific and economic evidence to determine whether an organism is an IAS whether it should be regulated and the strength of any measures that should be taken. RAs are used to prioritise the IAS for which action should be taken, be it prevention, control or eradication, depending on their level of environmental, economic and/or health impacts. At EU level, no risk assessment procedure specifically targeting IAS exists. EFSA has standardised protocols for assessing risks, but not related to IAS[26], and EPPO provides Pest Risk Assessments which were also used for IAS plants recently[27]. These are not rated here as they are performed in the framework of supranational organisations.

There are two aspects that must be considered when assessing this criterion: 1) the obligation to conduct risk assessments for IAS in defined circumstances; and 2) the existence of a standardised methodology for conducting such assessments.

Full coverage of this criterion simply requires the presence of a legally-binding requirement to conduct a risk assessment, regardless of whether a standard methodology has been defined or not. Note that risk assessments that are specific to emergencies are covered in criterion A4.

- **Risk assessments in EU Member States**

- **Full coverage**

In four MS (FR, HU, LT, SI) a risk assessment is obligatory in certain cases before release into the wild (see criterion B5). Slovenia has both an obligation to conduct a risk assessment and a defined procedure for doing so, although it is not specifically focused on IAS. A risk assessment procedure is defined for granting permission for introductions (SI180), and is carried out by an authorised organisation. This can be used to introduce species for hunting or fishing purposes. The procedure for the risk assessment is defined in the 'Rules on the carrying-out of the risk assessment to nature and on granting an authorisation'. In the other MS, no defined procedures for conducting the assessment have been identified. These four MS received a Y as their risk assessments are legally binding.

- **Partial coverage**

Ten MS partially covered the criterion, receiving a P in the assessment (AT, BE, DE, ES, FI, IE, LV, NL, SE, UK). A variety of reasons explain this rating, as detailed below.

[26] EFSA produced however scientific opinions on analysis made by EPPO or by MS on invasive plants using PRA.
[27] see www.eppo.org/INVASIVE_PLANTS/ias_plants.htm

Defined risk assessment methodologies but no legally binding obligation to conduct a risk assessment

Five MS (AT, BE, DE, IE, UK) have in place a formal RA approach specifically targeting IAS where the methodology and the information needed are strictly defined. However, there is no legal obligation to conduct assessments using these approaches and therefore they were rated P.

The common features of the approaches are as follows:

- the method can be applied to all taxa (although GABLIS has only been tested for vascular plants and fish);
- the outcomes of the assessment are used to allocate the species to lists according to degree of risk, although the terminology and classification used for such lists varies;
- the assessment analyses ecological risks (i.e. risks to biodiversity and ecosystems);
- the assessment is based on a set of questions or criteria to analyse a number of different issues.

There are also differences between the approaches for risk assessment developed by the different MS. In particular, the GB assessment also looks at economic and health impacts, in addition to environmental impacts. The Irish system has two separate risk assessment methodologies for potential and established IAS; the other systems use the same methodology for both types of IAS.

The approaches are further defined below on the basis of the report by Verbrugge et al. (2010) unless otherwise indicated. Belgium has developed the Invasive Species Environment Impact Assessment protocol, which is facilitated by the Belgian Biodiversity Platform. The protocol can be used for any species and looks at four different issues: 1) the potential for spread, 2) the potential for establishment, 3) adverse impacts on native species, and 4) adverse impacts on ecosystems. The scores for each area are determined on the basis of the species' spread, establishment and impact in other neighbouring areas, and their ecological characteristics. According to their scores, species are allocated to a risk category. The three possible categories are black list (high environmental risk), watch list (moderate environmental risk) and no threat (for further details on lists, see criterion A5). There is also an alert list for species that are invasive in neighbouring areas. The system is based on the European Plant Protection Organisation (EPPO) pest risk assessment scheme.

A risk assessment process is shared between Germany and Austria, called GABLIS (German-Austrian Black List Information System). The system assesses ecological impacts of any species, although it has only been tested for vascular plants and fish. Assessments of other groups (e.g. mammals, birds) and on species not yet present in Germany (Warning List) are in preparation. The assessment is carried out using a

number of biological and ecological criteria, including five basic and six complementary criteria. There are three lists – black, grey and white – to which the species can be assigned based on whether the species poses a threat and on the extent to which evidence for the threat is scientifically sound. The black and grey lists are further subdivided into sub-lists, based on the level of uncertainty in the assessment.

In Great Britain, the need to develop risk assessment processes and black lists of the most threatening invasive species is emphasised in the Non-Native Species Framework Strategy for Great Britain. In response, the GB has developed a Risk Assessment Scheme for all Non-Native Species, which was adapted from the EPPO, to assess the risks posed to GB species, habitats and ecosystems by any non-native species. It is divided into two stages, the first preliminary stage determines if a second and more detailed stage is needed. The assessments consist in answering a number of questions related to the potential for entry, establishment and spread, the pathways (intentional or not) and the potential impacts. Modules allow to include relative importance of pathways, vulnerability of receptors and consequences of policies to be assessed, and appropriate risk management options to be selected (Baker et al., 2008[28]). The impacts assessed include social, economic and health impacts as well as environmental impacts. The final aggregated score is used to assign the species to a low, medium or high category of risk. There are also methods for identifying invasive attributes, evaluating pathways of introduction, determining the vulnerability of receiving ecosystems, quantifying economic impacts, assessing risks and uncertainties, and selecting options for risk management.

As part of the Invasive Species Ireland project (IE and NI), a system for assessing risk that can be used for all species has been developed. It is structured in a similar way to the GB system, with a rapid preliminary phase, followed by a more detailed phase, and uses a number of the same questions. However, it also includes different systems for potential and established invasive species. In similarity with the GB methodology, it uses an aggregate score from the questions to assign species to low, medium or high risk categories.

UK was rated P as together, the GB and Invasive Species Ireland projects cover the whole of the UK.

Risk assessments not systematic or well-defined

In Latvia, the State Plant Protection Service carries out risk assessments of plant species. The species is placed on the list of invasive alien plant species (LV153) if the outcome of the risk assessment recognises it as being an IAS in Latvia and if the species is included on one of the lists of the EPPO.

In Spain, the Ministry's manual (ES501*) describes the principles of risk assessment, its purpose, and the general steps that should be taken. However, it does not provide a

[28] Baker et al. (2007) The UK risk assessment scheme for all non-native species, In: Rabitsch, W., F. Essl & F. Klingenstein (Eds.): Biological Invasions – from Ecology to Conservation. NEOBIOTA 7 (2007): 46-57

detailed methodology which can be used to assess any species (comparable to that used in the UK, for example).

In the Netherlands, no uniform, standardised protocol is in place and nothing was found as legally-binding requirements. However, risks were assessed by experts for certain specific species[29].

Risk assessments not yet implemented

Lastly, two MS (SE, FI) were rated P as they are in the process of proposing a RA, in strategies that have not yet been adopted and the RA are thus not used yet. Sweden is in the process of proposing a risk assessment method in the framework of the IAS strategy, which is not yet adopted. Finland also included the development of a RA in its future proposed strategy.

- **Similar coverage**

Three MS (EE, PL, BG) were considered to cover the criteria even less (and rated S), as they are mentioning risks, without any systematic process or they are using RA for other purposes.

In Poland, IAS are listed in a database which includes explanations on the impacts of many of these species, and therefore of the risks they may pose. However, no obligation to conduct a risk assessment nor a defined methodology are in place.

Bulgaria also has no obligation to conduct RA nor a defined methodology to do so. However, a project funded by the US Army ERDC-IRO assessed the infestation risk of the zebra mussel (*Dreissena polymorpha*)[30]. Therefore, Bulgaria received an S because there has been some effort to assess risk for a particular species.

Estonia's risk assessment for GMOs involves an assessment of their invasiveness (EE122).

- **No coverage**

No RA process was found for ten MS (CY, CZ, DK, GR, IT, LU, MT, PT, RO, SK). In Slovakia, SK400 specifically states that no complex assessment of non native plants has been done yet, no information was found for animals. In the Czech Republic (CZ300 states that criteria have not been established for assessing applications for permits from the prohibition of invasive alien introduction.

Specifically for plant risk assessments, the EPPO mechanism is used in many countries, but not as a legally-binding tool. As such assessments are performed in the framework of a supranational organisation, these MS were rated N.

[29] Risk assessments are published on the following webpage: www.vwa.nl/onderwerpen/gevaren/dossier/invasieve-exoten/risicoanalyses-consultatie/risicoanalyserapporten

[30] See www.icais.org/pdf/07abstracts/Trichkova.pdf [Accessed 27/7/2011]

- **Selected OECD countries**

The OECD states tend to have a greater emphasis on risk assessment than the MS (2Y, 2P).

- **Full coverage**

Both Australia and New Zealand were rated Y. Risk assessment procedures in Australia and New Zealand are formal and well-defined, and are linked to biosecurity measures. All species that are foreign/alien to Australia are regarded by the Australian government as potentially invasive unless a risk assessment has declared them not harmful. The Australian risk assessment measures are focused on plant or animal health, or on pest control. Pest risk assessments (PRA) are performed before a species can be imported. An import risk analysis (IRA) is required where there is no quarantine policy or a significant change in existing quarantine policy is to be considered. A weed risk assessment (WRA) is carried out for new plants. The WRA considers the historical, biogeographical, biological and ecological traits of each species to produce a score related to its potential to be weeds of agriculture and/or the environment[31].

The Biosecurity NZ Risk Analysis Procedures guide provides detailed guidelines including hazard identification; prioritising risk analysis; methods of risk analysis; monitoring and review of risk analysis; agents responsible for decision-making; and review, consultation and reporting processes. Furthermore, the procedures are not limited to assessment of risk from species. They can also be used for commodities being imported; pathways or modes of transportation, such as passengers, shipping and packaging; pests; and consequences of already-established organisms/diseases. There is provision for declaring a biosecurity emergency if an organism has the potential to cause significant environmental or economic damage. Therefore, economic damages are assessed, as in the UK, but impacts on human health are not considered.

- **Partial coverage**

The USA was rated P. No formal RA was found, but the National Invasive Species Management Plan (NISMP) includes related objectives and actions. For example, it aims to develop screening processes to evaluate the invasiveness of plants that are intended for planting or are being traded, and for non-native wildlife that is being traded. Other aims are to revise the 1996 Aquatic Nuisance Species Task Force Risk Analysis Process and to develop and test protocols for evaluating and mapping IAS risks. In May 2011, a new part of Q37 regulations was published: "Importation of Plants for Planting : a Category of Plants for Planting Not Authorized for Importation Pending Pest Risk Analysis". Work at species or site level is also ongoing and a quick assessment tool under elaboration.

[31] NWRAS Review Group, 2006. Review of the national weed risk assessment system. Available from: www.weeds.org.au/docs/Review_of_the_National_Weed_Risk_Assessmt_System_2005.pdf [Accessed 27/7/2011]

Guidelines on a trinational risk assessment are shared between the USA, Mexico and Canada for aquatic alien invasive species[32]. As these are not legally-binding, both Canada and the USA were rated P.

4.2.4. SPECIES RISK ASSESSMENTS DURING EMERGENCIES (CRITERION A.4)

Risk assessments can be required specifically in emergency situations, for instance when a new alien species is identified on the territory of a MS, to determine the risk that it will become invasive. Provisions apply at EU level in case of emergency related to plant or animal health: the Commission may take emergency measures in cases of outbreaks of plant or animal diseases. However, even in that case no formal emergency risk assessment seem to be available other than pest risk assessments carried out outside of emergency situations.

Full coverage of this criterion means that a risk assessment is required and implemented during emergencies.

- **EU Member States.**

- **Full coverage**

No MS was considered to fully cover the criterion.

- **Partial coverage**

One country was rated P (SE), where a common plan for IAS risk assessments after sudden breakouts has been proposed in the preparations for the Swedish IAS Strategy, but it is not implemented[33].

- **Similar coverage**

One country was rated S (BE). Indeed, in Belgium, a reverse type of approach applies: a system suspends authorisations of introduction, specifically in marine areas, if new risks or harmful impacts are identified. Within 45 days of the suspension, the Ministry either cancels the authorisation or lifts the suspension.

- **No coverage**

No information on species risk assessments during emergencies was found in the other 25 MS, other than the common procedures for plant/animal health issues (AT, BG, CY, CZ, DK, EE, FI, FR, DE, HU, GR, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, ES, UK).

[32] http://www.cec.org/Storage/62/5516_07-64-CEC%20invasives%20risk%20guidelines-full-report_en.pdf, see also Verbrugge et al. 2010.

[33] Swedish Environmental Protection Agency, Rapport 5694 Informationsflöde och rapporteringssystem för främmande arter (Information flow and reporting system for alien species), March 2010

- **Selected OECD countries**

Partial coverage

As for A3, Australia and NZ were considered to partially cover the criterion. Both countries have measures in place for emergency situations, but no risk assessment procedures in case of emergency as such were identified.

In Australia, PLANTPLAN, AQUAVETPLAN, MPPlan and EADRA guide the management of species risk assessment during emergencies for plant health, aquatic diseases, marine pests and animal diseases respectively. The plans are formally endorsed, but not legally-binding. For example, PLANTPLAN outlines procedures for four phases of response to a plant pest emergency. During the initial investigation phase, the process of identification commences, and the relevant people and organisations are notified of the suspected detection. The likelihood of a detrimental impact occurring is determined.

In New Zealand, the criterion was considered partly covered as a biosecurity emergency can be declared. Declaration occurs if the head of government is "satisfied on reasonable grounds after having regard to all available information that an organism not previously known to be established in New Zealand has potential to cause significant economic or environmental loss if it becomes established".

Similar coverage

Canada was rated S, since it only has plant or animal health provisions, equivalent to the EU common core. In Canada, defined risk assessment procedures do not appear to be in place in cases of emergency (see A3). However, the CFIA regularly updates its knowledge-base relating to emerging IAS risks. The CFIA recognises an emergency as an exceptional circumstance for which, in order to minimise harm to human health, property or the environment, the Agency quickly deploys necessary resources to limit potential damage. It has been found that much action has been taken regarding plant health issues but little documentation is available regarding other emergency situations, including animal health.

No coverage

No information was found for the USA on this criterion.

4.2.5. LISTING AND RANKING ALIEN OR INVASIVE SPECIES (CRITERION A.5)

Member States may decide to list alien and/or invasive alien species (whether they are already present on their territory, or expected to be present soon). These lists can differ with regards to their nature (whether they are legally-binding or not) and their type (whether and how they rank species).

Lists can be legally-binding and either require or prohibit certain actions for the species on the list, ranging from strict prohibition of the species to precautionary measures. Alternatively, restrictions may apply to all species except those appearing on the list.

Three main types of IAS lists exist, black, grey and white lists. When such lists are available in a MS, they can either be the result of an assessment performed in a research framework and generally not legally-binding or the result of an assessment performed in the context of a regulation and legally-binding. Some lists initially developed by scientists may also be used as legally-binding lists later on (eg. Harmonia black list in Belgium used in Wallonia (BE181R)). Black lists are usually used to define species which must be kept out or eradicated, due to the significant damage that they cause, and which may not yet be present in the country, and are known to be invasive elsewhere. Grey lists usually represent those species that have the potential to cause significant damage. White lists are for alien species that are not considered to cause damage and which can thus be used for specific purposes.

A fourth type of list, alert lists may also be developed and is covered under criterion A8. These lists are used to identify those species that should be watched to ensure that they do not enter or spread in the MS, as they are expected to cause damage.

Ireland also developed 'amber' lists, that identify species that, in the right ecological conditions, may have an impact on the conservation goals of a site or impact on a water body achieving good/high ecological status under the Water Framework Directive. Two amber lists were developed, of established and potential species.

Besides using IAS lists ranking species according to their level of risks, MS can simply make inventories of the IAS present or likely to enter soon on their territory. At international and European level, there are a number of different lists available:

- Global Invasive Species Database (which actually uses mostly DAISIE data for the EU);
- DAISIE project, with a database of all alien species in the 27 MS, and a list of "100 of the worst IAS" and their distribution in MS (chosen to represent a diversity of taxa and types of environmental, economic and health impacts);
- EEA SEBI list of 100 Worst invasive alien species threatening biodiversity in Europe, defined by an expert work group of the EEA;
- NOBANIS, with a database of all alien species in the 14 participating MS and species factsheets (not necessarily covering the "worst invasive species" of the whole region).

These lists do not have any legal basis, as their aim is to identify IAS and provide information on them. However, they can be used as the basis for a legally-binding list at national level (see Romania, for example).

Full coverage of this criterion means that there is a legally-binding list in place, regardless of its nature. Thus, full coverage of this criterion identifies those countries which ban certain species from being imported/traded/transported/kept/released into the country's wild environment. Countries were not assessed on whether they had a white list in place. Thus the analysis of white lists is provided for informational

purposes only. Similarly, the existence of legally-binding alert lists was not covered here, since it is covered in A8. List of pests are considered common core and thus not considered either.

- **EU Member States**

Table 3 describes the lists of IAS that are in place in each of the MS.

Table 3: List in place in the MS

MS	RA (see A3)	Non legally-binding lists and inventories	Legally-binding lists
AT	P-GABLIS	Lists of invasive and potentially invasive animals and plants on the website. Survey of alien species classified as invasive, potentially invasive and not invasive.	
BE	P - ISEIA	"Black", "watch" and "alert" lists produced using Harmonia.	BE180R – black list
BG	S	-	-
CY	N	CY500 –list of priority harmful organisms to watch	
CZ	N	Catalogue of alien plants in scientific journal	
DE	P -GABLIS	Fish species have been assessed for "black", "grey" and "white" lists in scientific publication List of invasive and potentially invasive plants on a website "Black" list of plant species on a website	DE130 lists four species that are not allowed to be held or traded
DK	N	DK300 – "black" list and "observation" list	DK171 – white list of fish and crustacea
EE	S		EE120 – requires a black list to be established EE181 – black list EE182 – white list of alien tree species permitted for use in reforestation
ES	P – general protocol	Inventory of IAS Atlas of invasive alien plants	ES120 requires a black list to be established (the list is under construction[34])
FI	P	FI400 – inventories of harmful established and potential IAS Lists of recorded and potential alien invertebrate pests in	

[34] The list was under public consultation in June-July 2011, at www.marm.es/es/biodiversidad/participacion-publica/real_decreto_especies_exoticas_inv.aspx

MS	RA (see A3)	Non legally-binding lists and inventories	Legally-binding lists
		scientific journal	
FR	Y for exemptions	-	FR161 – black list of vertebrate species FR162 FR163&FR164 – list of species for which authorisation is needed for leisure breeding FR165 – list of harmful organisms for which intervention is required
GR	N	Lists of IAS are expected to be categorised according to level of danger (draft legislation GR220)	
HU	Y for exemptions	"Dangerous" and "extremely dangerous" IAS listed in National Biodiversity Monitoring System Lists of invasive plants in communication materials	List of invasive plant species that must be controlled in Natura 2000 areas (HU163) List of animal species that cannot be kept (HU165)
IE	P	Categories of high, medium and low risk species, and "amber" lists of potential and established invasive species following RA Catalogue of alien plants	
IT	N	List of Italian invasive flora List of invasive vascular plants CIESM Atlas of Exotic Species	IT125R – black lists of plant and animal IAS
LT	Y for exemptions		LT121 – list of plants and fungi for eradication LT164 – list of invasive species
LU	N	List of new plant species classified according to level of problem they cause List of priority species for action plans	
LV	P		LV153 – national list of invasive plant species, used by LV121
MT	N		MT150 – the Competent Authority shall make a black list of invasive species in Malta
NL	P	List of alien species in Dutch Species Catalogue Database of invasive plants	NL120 – black list of animal IAS (prohibits trade) NL120 – list of other animal species whose population can be limited
PL	S	PL250 – list of potential IAS PL500 –inventory of IAS in Poland	
PT	N		PT152 – black list
RO	N		RO160 - DAISIE list to be used. The

MS	RA (see A3)	Non legally-binding lists and inventories	Legally-binding lists
			legislation simply provides the DAISIE website[35] when indicating which list to use.
SE	P	List of coastal and marine alien species	
SI	Y - To grant introduction permits		SI181 – white list (in terms of breeding permits) SI121 – black list (harmful organisms) SI150 – list of alien fish and crab species to prevent their introduction in other waters
SK	No	SK400 and SK401 – some lists and assessments of non-native plant species	
UK	P	Inventory of non-native species	GB122 – black list

- **Full coverage**

Fourteen MS (BE, DE, EE, ES, FR, HU, IT, LT, LV, NL, PT, RO, SI, UK) were found to have some form of legally-binding list and thus to fully cover the criterion.

The black lists in place in BE, DE, EE, ES, FR, HU, IT, LT, LV, NL, PT, RO, SI and UK are specifically focused on IAS, and the relevant piece of legislation introduces specific restrictions on the listed species. Of these, the lists in Italy, Belgium and the UK are only relevant at regional level (Lombardy, Wallonia and GB respectively) and in Hungary the list only applies in Natura 2000 areas or to certain taxa (see below).

A number of the black lists only apply to specific taxa:

- FR – only *Ludwigia* species and vertebrates covered;
- HU – plants are covered regarding forbidding their introduction into Natura 2000 areas and animals that may not be kept are listed;
- LV – only plants covered
- NL – only animals covered.

It is not always clear from legislative and policy documents on which basis the lists are developed, and whether a formal risk assessment is used or not. The existence of IAS risk assessment procedures in the MS (see criteria A3) does not imply that these are used to develop the lists. For example, neither the inventory of non-native species in GB[36] not the black list in GB122 are based on the risk assessment process that is also in

[35] i.e. www.europe-aliens.org
[36] See secure.fera.defra.gov.uk/nonnativespecies/factsheet/index.cfm [Accessed 21/7/2011]

place. Similarly, in Germany, GABLIS was not used to prioritise the species in the existing regulation[37]. Four species are however listed with legal requirements attached (DE130). If no RA is in place the lists/inventories are based on expert scientific judgement (information provided from Denmark, France, Luxembourg and Poland).

- **Partial coverage**

Eleven MS were rated P (AT, CZ, DK, FI, GR, IE, LU, MT, PL, SE, SK).

In Malta, the Malta Environment and Planning Authority is responsible for listing all species that are already invasive or deemed to be invasive. The list will be legally-binding, but as it is not yet in place Malta was rated P.

Non legally-binding lists or inventories are frequently in place as scientific exercises performed by experts. Ten MS (AT, CZ, DK, FI, GR, IE, LU, PL, SE, SK) were rated P as they have some form of non legally-binding list or inventory, or an aim to develop a (legally-binding) list. A further six MS (BE, ES, HU, IT, NL, UK), which were rated Y as they have legally-binding lists, also have non-legally binding lists or an aim to develop lists. The lists are published in strategies, websites, communication materials or scientific publications.

Of these 16 MS, the species on the non legally-binding lists are classified by level of risk in eight MS (AT, BE, DK, FI, GR, HU, IE, LU). In some of these MS, such as Belgium, the term “black list” is used to describe the species with the highest level of risk.

The MS participating in NOBANIS (AT, BE, CZ, DK, EE, FI, DE, IE, LV, LT, NL, PL, SK, SE) each have a database of the alien species present in their country. Several MS also have national databases of alien species (eg. BE, DK, EE, ES, PL, LT, LV, SE identified through the various initiatives, but more may exist).

In four MS (AT, CZ, SK, UK), development of lists or inventories of IAS is an objective of the IAS/biodiversity strategies. In the Czech Republic, the aim is to develop a legally-binding black list. In Slovakia the aim is to develop an inventory of IAS, in Austria to develop black/grey/white lists (not mentioning whether they would be legally-binding or not) and in the UK the aim is to use risk assessments to list alien species as high, medium or low risk.

- **No coverage**

No lists or inventories of IAS were found in Bulgaria and Cyprus. However, through the DAISIE project, alien species inventories in each of the 27 MS were performed (not necessarily updated since 2008).

- **White lists**

White lists (i.e. list of the species (alien or not) that are not considered to pose a risk) have been found in Denmark and Estonia. Denmark has a white list for fish and crustaceans. Release into the wild of fish is regulated in the Protection of Nature Act,

[37] Note also that GABLIS was used to set up a black list for fishes, which is not legally-binding but rather a scientific exercise.

but another statutory order includes a white list of fish and crustaceans. The list includes the species deemed to be native that are not regulated by the Protection of Nature Act, as well as three non-native species which have been included because they are considered to be very common. Estonia has a legally binding white list of alien tree species which can be used in reforestation without further assessments or permits. Slovenia has a list of species that do not need a permit to be bred. Finland is discussing the possibility of implementing a white list for IAS in the context of the strategy to be adopted.

In a slightly different approach, promoting certain species over other, and thus ensuring that IAS are not used, in Wallonia (Belgium), only certain species are allowed for rehabilitation of quarries (BE176R). In Luxembourg, subsidies may be granted for conservation of natural and semi-natural habitats; the regulation of such subsidies favours the use of indigenous species, listed in annex (LU151).

- **Lists in the selected OECD countries**

- **Full coverage**

In Australia, alien species are listed into five categories for quarantine purposes, and a separate category for "threatening processes" threatening native species or ecological communities. The function of these categories is similar to that of a black list. Weeds are also classified into different categories, with various restrictions attached; this process is carried out at state level, and thus classifications vary between states.

In New Zealand, a list of prohibited organisms is in place as well as several other lists, e.g. covering pests, diseases, weeds, plant pests and diseases, etc. A white list for aquaria is also in place.

In the USA, a list of injurious wildlife species is available from the FWS website, www.fws.gov/fisheries/ans/Current_Listed_IW.pdf, for which a permit is required for imports. Additionally, the Q37 Regulations, which were published in May 2011, will add a new category to the risk assessment process of "Not Authorised Pending Pest Risk Assessment". This will essentially act as a grey list. Profiles of invasive species are available from the invasivespeciesinfo.gov website (see for aquatic species e.g. www.invasivespeciesinfo.gov/aquatics/main.shtml, which specifies however that no list is in place).

- **Similar coverage**

There are no lists of IAS in place in Canada. However, the CFIA publishes a list of pests regulated in Canada. As this is common core in the EU, the country was rated S.

4.2.6. TRANSITION MEASURES (CRITERION A.6)

Criterion A6 aims to identify, when lists are introduced, whether the MS considers transition measures for holders of the listed species or other stakeholders dealing with

species that have been listed. Countries that have no lists in place are necessarily not covering this criterion.

Full coverage of the criterion means that specific transition procedures are in place following the introduction of legally-binding lists of IAS or other relevant lists. The procedures define the action that must be taken by holders of newly listed species in the period between the list being introduced and it becoming fully operational. This time period is specifically defined.

- **Full coverage**

No MS was rated as covering the criterion fully.

- **Partial coverage**

Only two MS were rated as partly covering the criterion (FR and DK).

In France transition measures were found, although they apply only to certain taxa/texts/authorisations. A 6-month delay is required to apply for a new authorisation to hold certain species (FR110) and while *Cervus nippon* is now listed as an IAS, exemptions apply until 2012 for introductions of *Cervus nippon* in enclosures (FR161). In Denmark, new requirements include a period of exemption. Action plans on hogweed published before the order remain valid until the end of their life span (DK160), and a period of one-year is given to meet new requirements for commercial trade with animals (DK165).

- **No coverage**

No transition measures were found for any of the other MS (AT, BE, BG, CY, CZ, EE, FI, DE, HU, GR, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SK, SI, ES, SE, UK).

- **Selected OECD countries**

- **Full coverage**

In Australia, once the status is declared, restrictions apply immediately. However, the status follows a period of consultation, which equals a transition period.

- **Partial coverage**

In New Zealand, the Biosecurity Act 1993 empowers the Government allows to introduce a transition period and for organisms subject to the HASNO act conditions apply on a case-by-case basis. As the transition period is not required, NZ was rated P.

- **No coverage**

No information on transition measures was found for Canada or the USA.

4.2.7. HORIZON SCANNING TOOL, QUICK SCREENING TOOL (CRITERION A.7)

Criterion A7 aims to identify horizon scanning tools or quick screening tools, which are instruments to identify quickly whether a country should prepare to the arrival of an IAS, e.g. because it has shown invasive properties in similar bioclimatic conditions.

Full coverage of the criterion requires that a formal and complete tool which allows the identification of emerging IAS is in place, used, and regularly updated. The tool should be legally-binding.

- **EU Member States**

- **Full coverage**

No legally-binding tool was found in the MS, thus none was rated Y.

- **Partial coverage**

The non-legally-binding Belgian Harmonia system includes a screening of new IAS (see A5), and Belgian scientists regularly add new species to the database following assessment through the ISEIA protocol (see A3).

In the UK, both for GB and NI horizon scanning tool exercises are foreseen or were implemented, but are not legally-binding.

The Northern Ireland Strategy (NI400*), which is currently under consultation, states that a horizon scanning exercise will be carried out in collaboration with the Republic of Ireland and the horizon scanning exercises taking place in Great Britain. The need for horizon scanning is also recognised in the Great Britain Strategy (GB300*). Two horizon scanning exercises have already been carried out for Natural England (one on plants in January 2011[38], the other on animals in May 2009[39]) using a methodology that could be reused in the future. The report on plants recommends that the screening process can be further developed into a tool. The UK was rated P because horizon scanning is not done at regular intervals in GB and is not yet in place in NI.

- **Similar coverage**

IE was rated S as no specific information could be found on horizon scanning, but the Northern Irish strategy explicitely states that the future exercises will be carried out with the Republic of Ireland.

- **No coverage**

No horizon scanning tool or quick screening tool could be found in 24 MS (AT, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IT, LU, LV, LT, MT, NL, PL, PT, RO, SK, SI, SE). The Swedish assessment provides an illustration of implementation of scanning of plants for certain species, covered by plant health legislation, and thus rated as common core:

[38] Available from: http://naturalengland.etraderstores.com/NaturalEnglandShop/NECR053
[39] Available from: http://naturalengland.etraderstores.com/NaturalEnglandShop/NECR009

the Swedish Board of Agriculture scans plant schools regularly to make sure certain IAS (*Bursaphelenchus xylophilus*, *Gibberella circinata* and *Phytophthora ramorum* do not appear on plants.

- **Selected OECD countries**

- **Full coverage**

In New Zealand, entry assessment procedures are in place to assess the likelihood of movement of a potentially hazardous organism from its country or origin to the risk analysis area via an imported commodity, pathway or means of transportation. For plants, the National Plant Pest Accord is an agreement between several relevant institutions and stakeholders, and includes criteria for identifying weedy species that should be included in the accord.

- **Partial coverage**

In the USA, horizon scanning tools have been developed at regional level, such as by the Mississippi River Basin Regional Panel on Aquatic Nuisance Species. Such tools are currently being assessed for possible use at national level. Thus it was rated P due to action only being taken at regional level.

- **Similar coverage**

In Australia, no specific tool for horizon scanning was found. Invasions from 'outside' are under the control from AQIS and public participation is an important part of the scanning (see criterion H2). As this is not directly horizon scanning, but useful for the process, Australia was rated S.

- **No coverage**

No such tool was found in Canada.

4.2.8. ALERT LISTS (CRITERION A.8)

An alert list is a type of species list that is used to report the presence of "potential IAS" on a territory, ie. those species which have a high probability of being invasive on the territory, and are already present or likely to enter soon. Alert lists are already in place in the EU for sanitary or phytosanitary purposes, and alert systems are in place, and thus apply in all MS.

Full coverage of ths criterion, means that countries must have a legally-binding alert list in place, so that legal restrictions apply to the species listed. Contrary to black lists (see A5), these lists do not aim to ban certain IAS (from being imported, released, or other) but rather entail requirements of reporting if the IAS is sighted so as to ensure further actions are taken.

- **EU Member States**

- **Full coverage**

No countries were found to have a legally-binding alert list.

- **Partial coverage**

Seven MS (AT, BE, DE, DK, FI, SE, UK) were considered to partly meet the criterion, because while fully developed legally-binding alert lists do not yet exist, preliminary and preparatory work is underway.

Non legally-binding alert lists

Four MS have full alert lists in place but they are not legally binding, and were thus rated P.

The Belgian Harmonia system includes an alert list (of IAS that are currently absent from Belgium) and an "observation list" (of IAS that currently have a moderate impact in Belgium). The Danish action plan for invasive species (DK300) includes a mix of a grey and an alert list, that both records species which are known to be invasive in the region, and species which are present in Denmark in small numbers but are considered to be able to act invasively in the longer term. Similarly, a list of 128 potential IAS exists in Finland (FI400). These include established alien species that may be locally harmful and IAS not yet established within the national borders but considered harmful at European or global level, with a high probability to arrive in Finland. In the UK, an alert list is available[40] and the reports mentioned in A6 also classify species in alert lists.

Alert lists in preparation

In Germany a watch list of IAS is in preparation (pers. comm.).

In Sweden, ArtPortalen, a website collecting species sightings, including IAS, could be one step in building an Early-Warning System for alien species. Furthermore, an alert list of marine and coastal alien plant and animal species that have not yet been recorded in Swedish waters but are currently established close to the borders or are considered to be very invasive is available[41].

Alert list for informational purposes

The website from the Austrian Ministry includes identification of species that cause problems and of potentially invasive species. This is for informational or awareness-raising purposes rather than policy or legislative purposes, and was thus rated P.

- **Similar coverage**

Nine MS (CZ, EE, FR, IE, LV, LT, NL, PL, SK) were rated S for this criterion.

All MS participating in NOBANIS were rated S (unless rated Y or P on the basis of other initiatives in place, see above), meaning that nine MS were rated S (AT, CZ, EE, IE, LV,

[40] https://secure.fera.defra.gov.uk/nonnativespecies/alerts/index.cfm
[41] See www.frammandearter.se [Accessed 20/7/2011]

LT, NL, PL, SK). This is because the NOBANIS inventories of alien species identify in which countries a species is potentially invasive, and therefore can be used to make a national alert list.

In Latvia, LV150 refers to the EPPO lists of "species that create a possible invasion risk in the Member States". While EPPO applies to all MS, not all specifically refer to EPPO for invasive plants species in a legally-binding document.

France was rated S as it has an alert list focused on human health (FR112), which may cover IAS that have human health impacts (e.g. about alien mosquitoes transmitting diseases).

An alert list was not found for Ireland, but as can be seen from the RA above (criterion A3), there are specific provisions for rating potential vs. established species. But lists of species with high/medium/low risks will be developed rather than strict alert lists. Furthermore, a mechanism to alert about the arrival of a species is available on the website from Invasive species Ireland[42].

- **No coverage**

No information on either of these criteria was found for the remaining 11 MS (BG, CY, ES, GR, HU, IT, LU, MT, PT, RO, SI). Many MS however have alert lists focused on plant protection (see as an illustration CY500).

  - **Selected OECD countries**

- **Partial coverage**

Both in Australia and New Zealand, lists can be interpreted as alert lists, as they determine species that are not allowed to enter the territory. In Australia, five categories apply (see A5), including species for which entry and keeping is prohibited, that are restricted to high security collections, and other collections, related to alert lists. Additionally, a project to develop an alert list for alien mammals and reptiles is under way[43]. In New Zealand, the lists in A5 can be used for alerts, as they include information about the nature of the hazard associated with each species. They include both organisms that are not yet present in New Zealand and those that may be present.

In Canada, at province level, an alert list on weeds is available for British Columbia, see www.geog.ubc.ca/biodiversity/eflora/AlienAlertListforBC.html. In the USA, a list of weeds can be found in Colorado and the Idaho'plan for noxious and invasive weeds foresees to develop an alert list. As these are at State level, Canada and the USA were rated P.

[42] see invasivespeciesireland.com/species-alerts/

[43] see www.environment.gov.au/biodiversity/invasive/publications/threat-abatement-projects/23902-mammal-reptile-alert.html

4.2.9. PATHWAY/VECTOR/AREA RISK ASSESSMENTS ACCORDING TO STANDARDISED PROTOCOL (CRITERIA A.9)

The term ”pathway”, in relation to IAS and according to the European Strategy on invasive alien species (Council of Europe, 2004) means, as applicable:

- the geographic route by which a species moves outside its natural range (past or present);
- the corridor of introduction (e.g. road, canal, tunnel); and/or
- the human activity that gives rise to an intentional or unintentional introduction.

A vector (Council of Europe, 2004) is the physical means or agent (i.e. airplane, ship) in or on which a species moves or is moved outside its natural range (past or present). Area assessment was taken to mean whether a specific area was more risky than another (e.g. a seaport).

In order to fully cover the criterion, the countries were expected to have a legally-binding risk assessment of pathways, vectors or areas through a formalised process. For pathways this involves identifying which pathways introduce which IAS (e.g. tractor wheels may introduce seed-producing weeds), rather than assessing which pathways a specific IAS can use (e.g. Japanese knotweed spreads through composting). The latter type of assessment is carried out by NOBANIS in the factsheets on the worst IAS in the region (see A10).

EU Member States

Full coverage

No MS were considered to have fully covered this criterion, even amongst the countries that have a formal risk assessment procedure in place (see criterion A4).

Partial coverage

Two MS (ES, UK) were considered to have partially covered this criterion.

Assessments of individual pathways for introduction/spread of IAS is mentioned in the GB risk assessment scheme (see criterion A3). Additionally, a key action of the GB IAS strategy is that the risk assessment process is used to identify the pathways of highest risk for the entry of non-native species into GB (GB300*, not legally-binding). The UK was rated P because while the need is identified in the GB Strategy, it does not appear that any risk assessments of pathways have yet been conducted and because it is only addressed in the GB strategy (and does not apply to NI).

While no standard protocol is in place, Spain considers pathways and vectors in non legally-binding documents (ES500* and ES501*), mainly for plants. However, no standard protocol is yet in place, and thus Spain was rated P.

- **Similar coverage**

Belgium was rated S for this criterion, because pathways are only considered in very limited circumstances (micro-organisms and biosecurity).

- **No coverage**

No information on pathways risk assessments was identified for criterion A9 in 24 MS (AT, BG, CY, CZ, DK, EE, FI, FR, DE, HU, GR, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SE, SI).

  - **Selected OECD countries**

The OECD countries perform better than the MS for this criterion. However, the shift from a species-based approach to a pathway-based approach to risk assessment and management is recent in the OECD countries. Specifically, a shift of approach is taking place in New Zealand with the introduction of the Biosecurity Law Reform Bill (BLRB) 2010 (see below).

- **Full coverage**

The four OECD countries were rated Y for this criterion.

In Australia, Identification of pathways and vectors is part of the strategic plans for controlling IAS. Pathways and vectors are not formally distinguished in Australia. Both are considered simultaneously in standard risk assessments for IAS. Pathways and vectors are also specifically controlled by the Quarantine Service and are included in strategic plans for IAS control. In New Zealand RA applies to pathways and the BLRB'10 encourages a significant shift from risk management of species to risk management of pathways, including domestic pathways within and between New Zealand. In the USA, NISMP requires a process for identifying and ranking pathways. For aquatic organisms, a RA for pathways is in place, and other initiatives are in place for assessing risks from pathways (on aquatic species and through the pathway group from NISC). In Canada, risk assessments include pathway analysis.

4.2.10. IDENTIFICATION OF KEY PATHWAYS, VECTORS AND HIGH RISK AREAS (CRITERION A.10)

Identification of pathways for harmful organisms is required in the framework of plant health and monitoring and implemented e.g. at customs for animal health. For forest pests and pathogens, an initiative is also ongoing by the International Union of Forest Research Organisations[44]. For IAS, pathways, vectors or areas may be identified for specific species (see NOBANIS factsheets in A9). Full coverage of this criterion however implied a prioritisation of pathways, vectors and areas that identifies those that are key or high risk. The identification/prioritisation may be made through use of the risk

[44] http://www.forestry.gov.uk/fr/INFD-6YUJRD

assessment in A9 or through other means (e.g. expert advice). Note that the identification of pathways is not taken as a way to (even partly) cover A9.

EU Member States

Full coverage

No MS was found to have fully covered this criterion.

Partial coverage

Six MS were rated as having partly covered the criterion (AT, BE, HU, IE, PL, UK).

Some countries (BE, HU and UK) identify pathways, without identifying those that are key/more important than others. Belgium considers pathways in the context of preventing and repairing environmental damages, by regulating transports per road, railway, navigable routes or air of non indigenous species (BE160), without identifying those that are more risky than others. In Hungary pathways were identified based on monitoring studies (HU500 and HU501 and expert advice, e.g. HU501 provides maps of invasions per type of habitats[45]). The UK was rated as partially covering the criterion because the GB strategy mentions the need to reduce the risk from all pathways and vectors, including transport of agricultural products, freight, trade in commodities and goods by post and courier services, repatriation of military and aid vehicles, aquaculture, ships' ballast water, and movement of travellers by sea, air and land (via the Channel Tunnel). However, these pathways are not prioritised.

Strategies or action plans may also include an aim to identify pathways. This is the case in Austria, where the action plan (AT300*) foresees the scientific examination of pathways in the short and medium terms, although this action is of low priority. In Ireland also the Plan includes an objective to prepare detailed pathway risk assessments (IE300).

In Poland some pathways, for IAS in wetlands are identified (PL302).

Similar coverage

Ten MS (CZ, DE, DK, EE, FI, LT, LV, NL, SE, SK) were rated S for this criterion.

All MS participating in NOBANIS but AT, BE, IE, PL that were rated P above (CZ, DE, DK, EE, FI, LV, LT, NL, SE, SK) were rated S (see A9) as key pathways are only identified for a limited number of IAS. Furthermore, the key pathways/vector/high risk areas are not prioritised.

In the Netherlands, according to answers to the questionnaire, a pathway analysis is performed, but no information was found on whether all pathways/vectors/areas are taken into account, who organises the analysis orhow systematic the assessment is.

No coverage

No information on identification of pathways could be found in the following eleven MS: BG, CY, FR, GR, IT, LU, MT, PT, RO, SI, ES (no further information than A9).

[45] See www.novenyzetiterkep.hu/?q=en/catalog/node/86

- **Selected OECD countries**

- **Full coverage**

See A9 for Australia.

- **Partial coverage**

The three other countries were rated P, as the text applies to certain aims only, or pathways/vectors are identified for certain taxa only and not hierarchised.

In Canada, the strategy calls for action in surveying high-risk areas for invasion. Therefore, Canada was rated P because this is only an objective of a strategy.

In New Zealand, pathways and vectors are identified for providing permits (health certificates).

In the USA, key pathways for specific IAS are the focus of individual pieces of legislation. Military transport is identified as a key vector for spread of the brown tree snake in the National Defence Authorisation Act for Fiscal Year 2008. The Non-Indigenous Aquatic Nuisance Prevention and Control Act 1990 puts the Aquatic Species Taskforce in charge of identifying key pathways for aquatic nuisance species.

4.2.11. PRIORITISATION TOOL FOR RISK ASSESSMENTS AND DECLASSIFICATION SYSTEMS (CRITERIA A.11 AND A.12)

- **EU Member States**

Prioritisation tools for risk assessments (criterion A.11) and declassification systems (criterion A.12) can be applied to identify which species are most in need of a risk assessment, or to ensure that if a species is found not to be an IAS, or to be in a low risk category, the lists can be modified based on the new evidence.

The full coverage of the criteria is defined as having a tool available that allows for prioritisation or a system to declassify species for A11 and A12 respectively.

- **Full coverage**

No MS were considered to have fully covered either of these criteria.

- **Partial coverage**

Three MS (BE, ES, NL) were found to have partially covered criterion A11. No MS were rated P for criterion A12.

Information on systems for prioritisation for RA was found only based on answers to the questionnaire. Responses to this part of the questionnaire were received from eight MS (AT, BE, DK, EE, ES, IT, LV, NL,).

According to the Dutch experts, prioritisation occurs within the annual plan for the Invasive Alien Species Team. The Netherlands was rated P as no information on whether a formal tool is in place was found.

Prioritisation of risk assessment was found to occur at regional level in Spain (in Valencia and Andalucia). As this was reported to take place only at regional level, Spain was rated P.

Prioritisation of species for risk assessment in Belgium occurs within the Harmonia system.

The remainder of the MS that responded to this part of the questionnaire either confirmed that no such tool was in place (AT, DK, IT, LV) or that the tool related to implementation of the EU common core (EE) and were rated N (see below).

- **No coverage**

No prioritisation tools for risk assessment was found for the remaining 24 MS for A11 (AT, BG, CY, CZ, DK, EE, FI, FR, DE, HU, GR, IE, IT, LV, LT, LU, MT, PL, PT, RO, SK, SI, SE, UK) and no MS were found to have any declassification system (A12).

  - **Selected OECD countries**

- **Full coverage**

One country (NZ) was rated Y for criterion A11.

Risk Analysis Procedures in NZ also cover prioritisation for risk assessments, through prioritisation criteria, including technical aspects, practicality and benefit-cost (A11).

One country (AU) was rated Y for criterion A12.

In Australia the status of a species may be changed following the same process as the one used for the classification in lists (see A5).

- **Partial coverage**

One country (CA) was rated P for criterion A11.

In Canada, the development of a formal risk-based process to establish priorities for pest surveying was recommended. However, a later audit determined that the CFIA had not done so. Therefore, the system was rated P as it did not cover all taxa and is not in place anymore.

No countries were rated P for criterion A12.

- **No coverage**

Two countries (AU, US) were rated N for criterion A11.

Australia was rated N as it takes a blanket approach to risk assessments, by declaring that a species is deemed invasive unless the RA states the contrary. Import risk assessments are carried out for every case in which there is no quarantine policy or when a significant change in quarantine policy is to be considered. Therefore, the assessments are carried out systematically and not according to a perceived or assessed level of priority.

In the USA no prioritisation tool was found (A11).

Three countries (CA, NZ, US) were rated N for criterion A12 as no declassification systems were found. In practice in NZ, an invasive alien organism may cease to be subject to prevention or control if its presence and distribution has become impossible to effectively control.

4.2.12. JOINT INFORMATION SYSTEM (CRITERION A.13)

Joint information systems can either provide common information for several countries, or provide common information across different Departments/Ministries within a country.

The full coverage of the criterion means having a system in place that allows the formal exchange of information specifically on IAS between different countries and/or between different Ministries or stakeholders. Websites that simply provide information for the public and do not offer a mechanism to share information were considered out of the scope of this criterion. They were addressed in criterion G2 instead. Similarly, catalogues of IAS were not considered to be within the scope unless they included a mechanism for information exchange.

- **EU Member States**

Both types of information systems are in place for plant and animal health in the EU, see as an illustration the electronic veterinary system in Austria (AT122) which allows the monitoring of animal diseases and zoonoses.

- **Full coverage**

Fourteen MS were rated Y for this criterion. These fourteen MS are those that are involved in NOBANIS (AT, BE, CZ, DK, DE, EE, FI, IE, LV, LT, NL, PL, SK, SE).

All MS participating in NOBANIS were rated Y because NOBANIS is by definition a joint information system between countries, which provides common information to participating countries. Denmark specifically mentions NOBANIS in DK300.

- **Partial coverage**

One country (UK) was rated as partially covering the criterion.

A key action in the UK, covering GB (GB300*), is to establish a mechanism for recording interceptions on significant introduction pathways and to establish (and publicise) a means for capturing information on non-native species from any source. The UK therefore received a P because while the need for a mechanism is acknowledged, it is not yet in place and NI is not covered.

- **Similar coverage**

Three MS (CY, HU and SI) were highlighted as having systems to share information on biodiversity in general with specific information applying for IAS. They were therefore rated S because a joint information system exists, but not dedicated to IAS.

Slovakia's Information System for Taxa and Biotopes also allows information on IAS to be shared between state agencies and NGOs, although it is not specifically for IAS. However, Slovakia was rated Y as it participates in NOBANIS (see above).

- **No coverage**

No specific information on this topic was found for nine MS (BG, FR, GR, IT, LU, MT, PT, RO, ES). In Luxembourg an aim is to develop a biodiversity monitoring system (LU300).

- **Selected OECD countries**

- **Full coverage**

In the USA, the National Invasive Species Information Center (NISIC) was established in 2005 at the National Agricultural Library to meet the information needs of users. The website serves as a reference gateway to information, organizations, and services about invasive species[46].

- **Partial coverage**

Australia Canada and New Zealand were rated P because an information system was found to cover some taxa of IAS.

In Australia, there is an information system on alien marine pests: the National Introduced Marine Pest Information System[47]. However no joint information system was identified for other taxa, and Australia was thus rated P.

The USA, Canada and Mexico share the North American Forest Commission Exotic Forest Pest Information System[48]. As this is covering one type of IAS only Canada was rated P (USA rated Y above).

Canada's invasive species strategy also aims to develop a mechanism for coordination between different provinces, territories, departments and agencies. As it does not seem to be in place yet, CA was rated P.

It is also noted that there are frameworks for cooperation between relevant agencies in Australia, Canada and the USA. For example, in Canada the CFIA and CBSA signed a Memorandum of Understanding to exchange information on imports. However, an audit in 2008 revealed that few measures had been put in place. In Australia, there are many committees at differet levels that meet both informally (such as in conferences) and informally (in Pest Committees). In the USA, a Memorandum of Agreement is also in place formalising the cooperation between authorities[49]. The three countries were rated P (see above).

In New Zealand, cooperation on the issue exists between different agencies, with many groups in place. A biosecurity database is foreseen in the Biosecurity Law Reform Bill

[46] Information available from : www.invasivespeciesinfo.gov/about.shtml
[47] Available from: adl.brs.gov.au/marinepests [Accessed 29/7/2011]
[48] Available from: spfnic.fs.fed.us/exfor [Accessed 29/7/2011]
[49] Available from : www.mnrg.gov/accomplishments/invasive-species-moa-signed.pdf

and a plants biosecurity index is available from www1.maf.govt.nz/cgi-bin/bioindex/bioindex.pl .

4.2.13. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
A1	1	3	19	4	0	0	0	4
A2	1	0	14	12	0	2	0	2
A3	10	3	10	4	0	0	2	2
A4	25	1	1	0	0	1	3	0
A5	2	0	11	14	0	1	0	3
A6	25	0	2	0	2	0	1	1
A7	24	1	2	0	1	1	1	1
A8	11	9	7	0	0	0	4	0
A9	24	1	2	0	0	0	0	4
A10	11	10	6	0	0	0	3	1
A11	24	0	3	0	2	0	1	1
A12	27	0	0	0	3	0	0	1
A13	9	3	1	14	0	0	3	1

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

The A criterion is unevenly covered across the EU. Most MS have definitions for alien and invasive alien species (A1) though not necessarily matching the CBD COP decision definitions, with a defined scope (A2), as well as a form of listing of those species (A5). All MS but one (CY) have at least partially defined alien or invasive species or related terms (criterion A1), making this one of the most comprehensively covered criteria assessed in the analysis. Similarly, only two MS (BG and CY) do not have a form of list that covers IAS. Fourteen of these MS (rated Y) have a legally-binding black list specifically targeting IAS that results in some degree of regulation/restriction on the species listed. This is in line with the results of the JRC study on the Water Framework Directive[50] which also addressed the existence of IAS lists in MS. On the other hand, alert lists (A8) are not yet frequently developed (0Y and 7P).

[50] Venderkerkhove and Cardoso (2010) Alien species and the Water Framework Directive, Questionnaire results, JRC Scientific and Technical report EUR 24257 EN – 2010.

Legally-binding risk assessments for IAS are in place in few MS (four MS rated Y for criterion A3). However, a further thirteen MS had some type of risk assessment approach in place (10 P, 3S). These MS may have risk assessment procedures for specific aspects of the IAS problem, or for other purposes which may overlap with IAS.

Criterion A13, on joint information systems is also well-covered (14Y, 1P, 3S), largely as a result of the NOBANIS network in which 14 MS take part. Although the DAISIE network would have the potential to cover all 27MS, it has not been actively maintained after the initial project funding ran out in 2008. Like the NOBANIS network, it could however provide a sound basis for a future EU-wide joint information system (Hulme et al 2011). A few MS also have national information systems in place.

The main gaps identified regarding the definitions are under:

- A4 (Species risk assessments during emergencies (e.g. after sudden breakout));
- A6 (Transition measures after above lists enter into force (for users of restricted IAS));
- A7 (Horizon scanning tool, quick screening tool);
- A8 (Identification of alert lists)
- A9 (Pathway/vector/area risk assessments according to standardised protocol)
- A10 (Identification of key pathways, vectors and high risk areas);
- A11 (Prioritisation tool for risk assessments) and A12 (Declassification system).

These gaps are largely linked to the incomplete coverage of other criteria and to the fact that some of these tools or methods are still relatively new. For example, as few formal risk assessments are in place for IAS in general (4 MS were rated Y for criterion A3), it is to be expected that there are also few risk assessments for specific circumstances, such as in emergencies (criterion A4). Similarly, transition measures (A6) and declassification systems (A12) rely on lists of IAS being in place. Despite legally-binding lists (criterion A5) being in place for thirteen MS (rated Y), they may not always apply nationally or cover all taxa, which may partly explain the poor coverage of A6 and A12.

Additionally, risk assessments and pathway analyses are still relatively recent approaches. Risk assessmentmethodologies are still under development (Baker, 2009[51]), and it is thus not surprising that species risk assessments during emergencies

[51] Baker et al. (2009) PRATIQUE: a research project to enhance pest risk analysis techniques in the European Union, OEPP/EPPO Bulletin 39, 87–93.

(A4), horizon scanning and quick screening tools (A7); pathway/vector risk assessments (A9, prioritisation tools for risk assessments (A11) are poorly covered.

The OECD countries generally cover the A criteria well, and better than the EU countries. Differences include the fact that Australia and New Zealand use a biosecurity framework which treats IAS, pathogens, pests, etc. equally within the same system. Therefore, the terminology used in these countries is broader in order to capture all the biosecurity threats together, i.e. they refer to "new" or "unwanted" species for example rather than the CBD definitions of alien species or IAS. Australia also considers all alien species as invasive unless a RA determines that they are not.

In particular, the OECD countries have instruments in place where EU countries have gaps. Risk assessments are more commonly in place in the selected OECD countries, especially in Australia and New Zealand. In Australia, Import risk assessments, Pest risk assessments and Weed risk assessments are in place. In New Zealand, a risk analysis procedure guides the RA. The procedure is not limited to assessing the risks from species, but also covers risks linked to commodities, pathways and modes of transports. This kind of pathways/vector risk assessments are in place in all four OECD countries (A9). Alert lists (A8), identification of key pathways (A10), joint-information systems (A13) and risk assessments during emergencies (A4) are all either fully or partly covered.

4.3. CRITERIA B: PREVENTION (INTENTIONAL + UNINTENTIONAL INTRODUCTION OF IAS)

Prevention approaches apply in the EU for plant health (i.a. through plant phytosanitary passports) and veterinary issues (i.a. through quarantine measures). Prevention is for instance pointed out as an important way to ensure plant health in the EU, and the set-up of the European Network of Plant Health Information Systems[52] was implemented in response to this. Additionally, import controls apply through the CITES requirements, implemented in the EU by Council Regulation (EC) No. 338/1997.

The assessment covers each stage of prevention separately, although they are often dealt with in the same texts (e.g. FR, PL, SE).

4.3.1. RESTRICTIONS/LICENCES FOR IMPORT/EXPORT OR FOR TRANSFERS IN THE INTERNAL EU MARKET (CRITERION B.1)

Restriction of import/export or internal transfers is a common approach to preventing both intentional and unintentional introductions of species and diseases in a country. This includes any movement across borders, into or out of the EU, or internally

[52] ec.europa.eu/idabc/en/document/2267/5926.html

between MS (or into and out of OECD countries). In all MS, restrictions apply for phytosanitary and veterinary reasons, including restricting the spread of pests (e.g. harmful insects in wood products[53]). The EU Plant Health Regime restricts imports, exports and internal transfers of listed harmful organisms. If a non-listed organism is found in the territory of an MS for the first time, a pest risk analysis (PRA) must be carried out. Both the outcomes of the PRA and the control measures in place must be notified to the Commission, whereupon a decision is taken as to whether the measures should be expanded across the EU or withdrawn. This approach, which is an open system (i.e. the banned organisms are listed) is different from that taken in third countries, and which is more restrictive, such as Canada, the USA and Australia, where imports are prohibited unless a licence has been issued on the basis of a risk assessment[54].

Under CITES, permits are required for all imports, exports re-exports or introduction from the sea[55] of species covered by the Convention. Under the Common Agricultural Policy, permits are required for importing some agricultural goods into the EU.

Full coverage of this criterion was considered to involve legally-binding restrictions on import/export/internal transfer targeting IAS specifically, beyond the requirements described in the EU common core (see above). This criterion covers all imports/exports/international transfers, whether involving a commercial aspect (trade) or not. Trade measures are covered in criterion A2.

- **EU Member States**

- **Full coverage**

Eighteen MS (BE, CZ, DK, EE, ES, FI, FR, HU, IE, LT, LV, MT, PL, PT, RO, SE, SK, UK) were found to fully cover the criterion. These MS all have legal restrictions (either outright bans or requirement for authorisation) on imports/exports of IAS, based on identification or prioritisation of such species. However, as explained below, the restrictions are not always comprehensive

Restrictions may apply to any taxon

Eight MS (EE, ES, MT, PL, RO, SK, SE) have restricted import/export of any relevant taxa based on a process of prioritisation.

In Poland and Sweden, there is no specific black list listing species which are banned from import. However, in Poland, permission from the Ministry of the Environment is required for import of any alien plants, animals or fungi that could threaten native species (PL121). In Sweden, SE156 contains regulations on import, keeping and sales of

[53] see Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community

[54] Food Chain Evaluation Consortium, 2010. Evaluation of the Community Plant Health Regime. Report for DG SANCO. Available from: ec.europa.eu/food/plant/strategy/docs/final_report_eval_en.pdf [Accessed 22/7/2011]

[55] The term "introduction from the sea" means transportation into a State of speciments of any species which were taken in the marine environment not under the jurisdiction of any State.

alien species and genotypes. In addition, SE155 contains rules for the import of fish, crustaceans and molluscs.

In other MS, a list approach prioritising the species which are restriced is used.In Estonia, live specimens of organisms listed on the list of alien species are prohibited from being brought into the country (EE181). In Malta, regulation MT150 states that the Competent Authority may restrict import/export of any species if it is thought that so doing would harm or endanger Maltese biodiversity. The import of species on the list of IAS that is to be compiled by the Competent Authority is banned. However, this list has not yet been produced. Additionally, the Competent Authority may issue permits for the import/export of any species if there is no threat to Maltese biodiversity.

The import of IAS into Romania is forbidden under RO160 for listed species. Currently, the DAISIE list of IAS is being used until a national black list can be developed (the regulation refers directly to the website of DAISIE). However there are some exceptions to the prohibition; for example IAS can be introduced into the country for the purpose of research into IAS control or ecological restoration of habitats.

In Slovakia, it is forbidden to import invasive species or their parts or products which could cause proliferation of invasive species (SK160); for game, permits can be issued (SK125, including lists of species covered).

In Spain, the introduction of all species listed in the National Catalogue of Alien Invasive Species without administrative approval is forbidden (ES120). The Catalogue is still under preparation but a preliminary black list is available.

It should be noted that there may be exemptions to import restrictions for specific industries. The import of minks and raccoon dogs, species reared for fur, is regulated in Estonia and Denmark. However, the species may be imported into Estonia only on the basis of a permit from the Environmental Board for the purposes of gene pool renewal and as long as imports do not exceed by more than 20 percent the breeding stock per farm within two years (EE120). See also the exemption in Denmark for fur farming in criterion B2.

Restrictions on certain taxa only

A further eight MS (BE, FI, FR, IE, LT, LV, PT, UK) have legal restrictions in imports/exports in place but only for certain taxa, i.e. prioritisation or listing has only considered plants, for example, and not animals. In Belgium, BE165 forbids the import and export of specimens of non-indigenous species of birds. In Finland, fish species are regulated. The import of a fish or crayfish species not occurring naturally in Finland, or of their stock or gametes, is allowed only by permission of the Ministry concerned, and according to the terms and conditions it specifies. Permission must be denied if the measure may cause significant harm to nature or wild animals. Provisions on fish or crayfish species that can be imported freely shall be given by decree as necessary (FI122).

In France, an authorisation for import/export of certain non-domestic animals and non-crop plants species is required. The list of such species is to be fixed by decree, but there is no information on whether the list is in place yet (FR110). In addition, import of non-domestic bird species is forbidden (FR169) and import of *Procambarus clarkii* requires a license (FR170).

In Ireland prohibitions on imports of wild species may be applied (IE120), as well as for fishes (IE122), or bees (IE160). The Irish plan (IE300) also has an objective to include in Birds and Habitats Regulations measures for the prevention of import, movement, sale, distribution or release of IAS, while advising on species considered safe alternatives.

In Latvia requirements apply only to plant species. Imports of plants on the list of invasive plant species into Latvia are forbidden (LV121, LV150, list in LV153[56]).

In Lithuania, imports of crops and wild animals must be authorised (LT160A). Lithuania is thus rated P because the restrictions on import of plants are limited to crops and do not apply to wild plants.

In Portugal, the import or export of fish or other aquaculture species must be authorised by the Authority responsible for the fishing area (PT120). This is done for both animal health and ecological reasons.

In the UK, restrictions for reasons of plant/animal health, aquaculture regulation or CITES applies. In Great Britain, imports of *Ondatra zibethica* (muskrat or musquash) can be banned or only permitted under licence following orders from ministers (GB126). An aim of the Northern Irish strategy is the consideration of mechanisms to control import of high-risk invasive alien species (NI400*). In NI, Ministers may also make orders to prohibit the importation of muskrats (NI123).

Restrictions only for specific circumstances

Four MS (BE, CZ, DK, HU) only introduce restrictions in specific circumstances.

In Belgium, BE180R (Wallonia) states that terms of reference for public contracts will ban the intentional introduction of IAS listed on the black and alert lists of Harmonia. Apart from bird species, which are restricted under BE165, this is the only regulation to restrict import/export of IAS in Belgium. Belgium also includes an aim to develop federal instruments to restrict the introduction of IAS into Belgium in its strategy (BE302).

In the Czech Republic, CZ124 prohibits the import and export of game unless under a permission from the State Agency for Hunting. The import of alien game species also requires prior agreement by the nature conservation authority.

In Denmark, rules may be made by the Ministry for Environment if a species can pose a risk to humans (DK120, but this text was not implemented for IAS) or may introduce diseases (DK124, which was implemented for muskrats (*Fiber zibethicus*[57]) and Eastern

[56] This list for the moment only includes one species
[57] This species name is used in this particular legislation; it is a synonym of *Ondatra zibethica.*

gray squirrel (*Sciurus carolinensis*), in DK164). The only text that was used and forbids imports of IAS to date is primarily targeting animal health, not IAS directly.

In Hungary the export and import of wild organisms is governed by the conditions and methods described in the Government Decree (HU120).

- **No coverage**

No information could be found specifically about import/export or transfers of IAS in nine MS (AT, BG, CY, DE, GR, IT, LU, NL and SI).

  - **Selected OECD countries**

- **Full coverage**

In Australia, strong requirements relative to import/export are in place, depending on the quarantine status of the species (see A5). Additionally, regional actions are in place and the States have controls in place for cross-border movements. In New Zealand, MAFBNZ regulates all incoming goods that may constitute a risk of alien species in the framework of biosecurity measures; BRLB specifies the conditions to obtain an import health standard which may be required for management of risks associated with the import of goods.

In the USA, under the Lacey act, injurious species are restricted from being imported. The species covered include those that are listed in the Act and those for which the Secretary of the Interior prescribes regulation. In the USA, a list of injurious wildlife species is available from the FWS website, www.fws.gov/fisheries/ans/Current_Listed_IW.pdf, for which a permit is required for imports.

In Canada, the *Canadian Environmental Protection Act* aims to prevent the intentional introduction of potentially invasive alien species through imports.

4.3.2. RESTRICTIONS/LICENCES FOR TRADE (CF. CITES) (CRITERION B.2)

This criterion refers to trade in IAS, i.e. intentional commercial exchanges that can be into/out of the EU or within the internal market (or into and out of OECD countries).

CITES is implemented in the EU through Council Regulation (EC) No. 338/97, to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The regulation also covers trade of species that are known to pose an ecological threat to indigenous species (Art. 3.2(d)). Currently there are four animal taxa listed for these reasons: the red-eared slider turtle (*Trachemys scripta elegans*), the American bullfrog (*Rana catesbeiana*), the painted turtle (*Chrysemys picta*), and the American ruddy duck (*Oxyura jamaicensis*). An illustration of how this legislation is implemented in Denmark (DK150) can be found in the country assessment. Trade is also regulated in the plant health, animal health and forest health regime. EU aquaculture legislation also controls trade in aquaculture products. For example, Directive 2006/88/EC requires that placing aquaculture animals and products on the

market must not jeopardise the health status of aquatic animals at the place of destination.

Full coverage of this criterion involves having legally-binding restrictions on the commercial trade of IAS beyond the requirements of the EU common core. It is more restricted than criterion A1 as it covers specifically trade, while A1 covers all types (commercial and non-commercial) imports/exports.

- **EU Member States**

- **Full coverage**

Sixteen MS (BE, DE, DK, EE, ES, FR, IE, IT, LT, LV, MT, NL, PT, SE, SK, UK) fully covered the criterion. These MS all have legally-binding restrictions (either outright bans or requirement for authorisation) on trade of IAS, based on identification or prioritisation of such species.

Restrictions may apply to any taxon

In Sweden, SE156 contains regulations on sales of alien species and genotypes.

Some MS implement regulations for listed species only (DE, ES, FR, PT, SK, UK). In Spain, trade (domestic and international) of all species listed in the National Catalogue of Alien Invasive Species is forbidden (ES120). The Catalogue is still under development, although a preliminary black list is available. In the UK, it is illegal to sell or offer for sale those species of animals or plants that are on the black list of IAS provided in GB122 and birds and plants are targeted in NI (NI260). In France, trade is forbidden for certain listed animal and plant species unless under authorisation, in order to preserve the biological heritage, natural environment and associated uses. The list of such species is to be fixed by decree, and is implemented for water primrose *Ludwigia* (FR160). In Germany, trade bans can apply to animals and plants (DE120); and the Ministry for Nature protection can decide which IAS cannot be placed on the market, so as to prevent/avoid risks to ecosystems, biotopes or species. This law was implemented in DE130 for North American beaver *Castor canadensis*, common snapping turtle *Chelydra serpentina*, alligator snapping turtle *Macroclemys temminckii*, Eastern gray squirrel *Sciurus carolinensis.* In Slovakia, it is forbidden to sell protected, dangerous or invasive plants and dangerous animals in a market place (SK123). In Portugal a black list is in place in PT152 (Annexes I and III). The purchase, sale or offer for sale is restricted to parts of non-living specimens without viable propagules of those invasive species listed in Annex I and is prohibited for those species listed in Annex III (PT152). Additionally, the sale of any protected plant or animal species is prohibited (PT151). PT151 and PT152 do not mention import/export (criterion B.1).

In Estonia, EE120 states that trade of live specimens of species on the black list of non-native species likely to disrupt the natural ecosystems in Estonia is not permitted. The list is implemented in EE181.

Restrictions on certain taxa only

Seven MS cover only certain taxa in their requirements (BE, DK, IE, LT, LV, MT, NL). This is distinct from a prioritisation of harmful species or genera (as described above); in this case either prioritisation has only occurred within certain broad taxa, or individual species have been restricted without any prior prioritisation.

In Belgium, trade of specimens of non-indigenous wild bird species is forbidden (BE165). In Denmark, rules can be established for game (DK121), spread of unwanted plant species (DK123, used once for hogweed in DK160). However, the sale of raccoons *Procyon spp.,* raccon dogs *Nyctereutes procyonoides* and domestic forms of the American mink *Mustela vison* is exempted from the ban on sale for fur farming purposes (DK165). In Ireland, there is an aim to include trade restrictions in HD and BD (IE300). In Lithuania, trade of live animals is prohibited if the species is likely to have adverse ecological, economic impact, or can cause or transmit diseases (LT163). In the Netherlands, NL120 prohibits the import/export of protected species, including non-indigenous species, unless authorised. In Malta, forestry species cannot be sold (MT151).

Only plants are covered in one country (LV). In Latvia, plants are regulated (see B1).

Restrictions at regional level only

In Italy, only a regional text regulates trade of alien species into captivity (IT124R, Piemonte).

Furthermore, in Flanders (Belgium, BE171R) a Ministerial management obligation can be established for certain species or groups of species, including IAS. Those obligations may include trade restrictions. The first such obligation on three aquatic IAS has not yet been approved.

- **Similar coverage**

One country was rated as S (LU) as it is not targeting IAS specifically. In Luxembourg, the provenance of the species must be proved for trading (LU120).

- **No coverage**

Ten MS (AT, BG, CY, CZ, ,FI, GR, HU, PL, RO, SI) were considered as not covering the criterion further than EU or international requirements, as they mentioned only CITES regulations, aquaculture controls, plant health or forest health, which are common to all MS.

  - **Selected OECD countries**

- **Full coverage**

In Australia, requirements depend on the quarantine status. Furthermore, restrictions on trade between Australian states are specified in the declared/proclaimed status of the species in questions. They are not uniform across Australia; since the large

geographic and climatic variations in Australia imply that a species which is invasive in one region may not be invasive in another.

In New Zealand MAFBNZ regulates all incoming goods that may constitute a risk of alien species, including for trade.

In the USA, trade is regulated for species conservation reasons (see the Lacey act in B1). Additionally, only organisms registered for biological control, can be traded. Additionally, there is a list of exotic bird species for which trade is authorised. Further to this, the USA also commits itself to periodically reviewing trade in non-CITES species.

- **Similar coverage**

In Canada, restrictions apply for agricultural products and endangered wildlife. These restrictions are focused on CITES and phytosanitary requirements (similar to the EU common core), and thus Canada was rated S.

4.3.3. RESTRICTIONS/LICENCES FOR TRANSPORT (CRITERION B.3)

Transport may be regulated in the EU, especially for phytosanitary and sanitary reasons (including for aquaculture), or for protected species trade. For example, Directive 2006/88/EC introduces requirements for transport of aquaculture products, such as forbidding water exchanges to avoid spreading diseases.

Full coverage of this criterion was considered to involve legally-binding restrictions on the transport of IAS, whether based on a blanket approach or a listing approach, beyond the requirements of the EU and international instruments described above.

- **Full coverage**

Eight MS (DK, ES, FR, IE, LT, PL, PT, UK) were found to fully cover the criterion, by legally restricting transport of specified IAS based on a process of listing species, and the process took into account all relevant taxa.

Restrictions may apply to any taxon

Five MS have considered any taxa in their process of listing those IAS to which measures apply (i.e. the restrictions are not limited to just birds or just animals).

In Poland, the movement of any non-native plants, animals or fungi or their reproductive forms requires special authorisation (PL121). However, there is no specific black list of species for which transport is banned. In Portugal the transport of those IAS listed in Annex I is only permitted for parts of non-living specimens without viable propagules (PT152). In Spain, transport of all species listed in the National Catalogue of Alien Invasive Species (under development, although a preliminary list is available) is forbidden (ES120).

In GB, it is illegal to transport restricted animals or plants (GB122), and regulations on containers to transport muskrats can be implemented (GB126). Furthermore, introduction of any live animal or plant whose natural range does not include any area

of Great Britain from a ship is an offence in England and Wales (GB151R). While the provisions do not apply in NI (and for GB151R Scotland), the UK was rated Y because it is legally-binding.

Restrictions on certain taxa only

Four MS (DK, FR, IE, LT) only introduced legally-binding restrictions on certain taxa. This approach differs fundamentally from a prioritisation of all harmful species or genera (as described above); here the prioritisation either only occurred within certain taxon, or individual species have been restricted without any prior prioritisation. Denmark has transport restrictions that only cover the transport of certain plants. According to DK123 the Minister for Environment may establish rules for transportation on public roads of goods and products containing unwanted species. This is applied in the statutory order on the eradication of the giant hogweed (DK160). In France, transport is forbidden for listed species to protect the biological heritage (FR110, article L.411-3) The regulation was implemented for water primrose and certain fishes (article R432-7) also may not be transported. Ireland and Lithuania only regulate the transport of animals. In Ireland, it is prohibited to transfer any species of wild animals, its spawn, or any species of wild bird or eggs, from one place in the State to another with the purpose of establishing it in the wild in the other place, unless under licence (IE120). In Lithuania it is prohibited to transport, capture or move live invasive animals (LT160B), and wild animals can be transferred/transported only with a permit (LT122).

- **Partial coverage**

Two MS (BE, RO, SE) were rated P for this criterion.

In Flanders, a management plan can apply to any species (BE171R) and the government can take measures to regulate or ban transport of plants and animals, dead or alive (BE169R). A decree (BE160) specifically regulates environmental damages caused by the transport of non-indigenous animal or plant species. Belgium was thus rated P because environmental damage is only one aspect of the impacts caused by IAS.

In Sweden, transport of animals and plants can be regulated by governmental bodies (SE110) and protected species cannot be tranported (SE130). Sweden was rated P because the issue may be regulated, but no implementation was found for the moment.

In Romania, users of IAS must prevent their dissemination during transportation on site or off site.As this applies only for the specific case of use in contained conditions for research-development, Romania was rated P.

- **Similar coverage**

One MS was rated S (SI).

In Slovenia it is forbidden to transport fish from the Adriatic basin to the Danube basin and vice versa (SI120). Slovenia thus received an S because as for Hungary, the restriction may apply to IAS but is not specifically designed for IAS prevention.

- **No coverage**

No information on transport beyond the common core was found for the other 15 MS (AT, BG, CY, CZ, DE, EE, FI, GR, HU, IT, LU, LV, MT, NL, SK).

  - **Selected OECD countries**

- **Full coverage**

Both Australia and New-Zealand were considered to fully cover this criteria and rated Y. In Australia, permits specify controls on the transportation of species, according to their quarantine status. Management strategies for declared IAS may also involve limitations on transportation, such as requirements for wash down of vehicles that have been in infested areas. New Zealand goes even slightly further by requiring all aircraft and ships to take biosecurity measures before, during and after arrival in the country.

- **Similar coverage**

Canada and the USA were rated S as they have restrictions that are primarily focused on plant/animal health, which are equivalent to the measures in place in the EU common core. In Canada, a permit is required for the transport of animals, fishes, and plants or their parts. In the USA, transport is restricted for plant protection purposes.

4.3.4. RESTRICTIONS/LICENCES FOR POSSESSION INTO CAPTIVITY/CONTAINMENT (CRITERION B.4)

At EU level, the possession and holding of IAS, whether for private or commercial purposes, may be (indirectly) regulated through two instruments. The EU regulations on animal welfare, and veterinary and phytosanitary issues are relevant for the possession or holding of IAS, although they are not specifically designed for this purpose. Rules apply to the conditions in which animals can be held and to certificates/health requirements for animals and plants. The Zoos Directive (Council Directive 1999/22/EC) requires preventing the escape of animals in order to avoid possible ecological threats to indigenous species (Art. 3).

The criterion was considered to be fully covered when restrictions targeting the possession and containment of IAS beyond the requirements introduced by the EU instruments described above. Restrictions may be using a list approach or other approaches, but must be legally-binding.

  - **EU Member States**

- **Full coverage**

Twenty MS (AT, BE, BG, DE, DK, EE, ES, FR, HU, IT, LU, LV, MT, NL, PT, RO, SE, SI, SK, UK) were found to fully cover the criterion by having legally-binding restrictions on the possession and containment of listed IAS in place.

Restrictions may apply to any taxon

Eight MS (BG, DE, MT, NL, PT, ES, SK, UK) were found to have restrictions in place specifically for the possession of IAS.

In Germany, DE120 provides the possibility of banning the possession and containment of certain IAS. For the moment, the Ministry for Nature protection has applied its provisions to four species only (DE130, North American beaver *Castor canadensis*, common snapping turtle *Chelydra serpentina*, alligator snapping turtle *Macroclemys temminckii*, Eastern gray squirrel *Sciurus carolinensis*).

In Malta, it is forbidden to keep any species on the list of invasive alien species that will be compiled by the Competent Authority (MT150). In addition, the keeping of any species can be restricted if it is thought that so doing would harm or endanger Maltese biodiversity (MT150, similar provisions in MT152).

In the Netherlands, the possession of protected indigenous/non-indigenous species and other species (including some IAS) that are listed in NL181 and NL182 is prohibited unless there is a license (NL120).

In Portugal the cultivation, rearing, keeping in a confined space or keeping as a pet of the invasive alien species listed (in Annex I) is prohibited (PT152).

In Spain, possession, transport and trade (domestic and international trade) of all species listed in the National Catalogue of Alien Invasive Species (still under development) is forbidden (ES120).

In Slovakia it is forbidden to hold, grow, reproduce IAS or their parts or products which could cause proliferation of IAS (SK160, including lists of species covered).

In GB it is prohibited to introduce (and thus possess) any restricted animal or plant (GB122 refers to new species) or to possess IAS for the purpose of sale (GB131R refers to invasive non-native animals or plants). Licenses are required for holding species (e.g. zoos GB137, pet shop license, GB133, to keep dangerous animals, GB124) and holding muskrats can be regulated (GB126). In Northern Ireland, for the moment the strategy aims to consider measures to control the possession of high-risk invasive alien species (NI400*) but is still under consultation.

In Bulgaria, restrictions apply for opening an institution holding non-domestic animals (BG125, with prescriptions to prevent escape that may cause ecological dangers for indigenous species) and to introduce new agricultural species (BG124).

Restrictions on certain taxa only

In nine MS only animals are targeted (AT, BE, EE, FR, HU, IT, LU, SE, SI). This approach is distinct from the prioritisation and listing approach taken by those MS that fully covered the criterion, as in these six MS plants have not been prioritised or assessed in the context of keeping/holding IAS. In Belgium the regulation targets animals. Non-native bird species cannot be held unless they were captively bred (BE165) and an authorisation is needed for establishments holding animals (including IAS, but not only)

and trading these animals (BE166). In Estonia, a permit is required to keep minks and raccoon dogs, as well as to relocate non-native species (EE120, requirements detailed in EE180). In Sweden, an EIA is required for aquaculture (SE110) and the culture of invasive species of fish is not allowed (SE150). A permit is also required for keeping wild species (SE134). In France, breeding/holding listed species of animals requires an authorisation. The species are listed in FR163 and FR164 (amended in 2010 to list additional IAS). In Luxembourg, mammals and birds classified as game cannot be kept in captivity, whether or not native, unless an authorisation is granted (LU150). Capturing and holding in captivity any species of the wild fauna, regardless of whether it is native or not, and of its provenance (including species resulting from crossbreeding of wild and domestic animals) is forbidden, unless an authorisation is granted (LU120). In Italy, restrictions apply to exotic animals (IT124R, but similar texts apply in several regions). In Hungary listed species that are harmful to native species cannot be kept (HU165). In Slovenia a permit is required to keep native and alien animals in captivity (SI120). In Austria, it is prohibited to hold a number of non-native species outside zoos or specific scientific institutions. Note that the raccoon dog (*Nyctereutes procyonoides*) is exempt from this restriction (AT140).

Two MS (LV and DK) apply legal restrictions on the possession of IAS only to plants. According to LV121, it is prohibited to grow plant species listed as IAS (LV121). A permit may be granted to grw IAS, but in that case escape of invasive alien plant species from holding or growing site must be prevented. In Denmark there are several regulations which restrict the possession of species, although the majority of these do not specifically target IAS. However, under DK123, the Minister may establish rules for the handling and treatment of goods and products containing unwanted species. This has been implemented in the statutory order on eradication of the giant hogweed (DK160).

In Romania use of IAS in containment is only allowed following a certain procedure (RO160).

- **No coverage**

No relevant restriction on possession of IAS were found for the other seven MS (CY, CZ, FI, GR, IE, PL, LT)

  - **Selected OECD countries**

- **Full coverage**

In Australia, restrictions on possession depend on the quarantine status of a species (as determined by risk assessment) and are specified in its permit. Therefore, Australia received full coverage because the requirements for possession are assessed on a case-by-case basis. Instead of compiling a list of IAS for which possession is prohibited, the permit for each individual species states all its individual restrictions.

- **Similar coverage**

New Zealand sets standards for zoos and quarantine/containment facilities similar to what is done in the EU common core, and was rated S. In the USA, the Public Health, Security and Bioterrorism Preparedness and Response Act requires regulations to be made to govern the possession of listed agents and toxins, including IAS. The Act is not focused on IAS thus the USA was rated S.

- **No coverage**

No information was found in Canada for this criterion.

4.3.5. RESTRICTIONS/LICENCES FOR RELEASE INTO THE WILD (CRITERION B.5)

Alien species may pose risks to the environment if they are released into the wild. Council Regulation 708/2007 states, for aquatic species, that 'Member States shall ensure that all appropriate measures are taken to avoid adverse effects to biodiversity, and especially to species, habitats and ecosystem functions which may be expected to arise from the introduction or translocation of aquatic organisms and non-target species in aquaculture and from the spreading of these species into the wild'. Permits are required for introductions of alien species or translocations of locally-absent species in certain cases.

The Habitats Directive requires from the MS that deliberate introduction into the wild of any species which is not native to their territory is regulated. The Birds Directive includes similar provisions.

Full coverage of this criterion implied that the countries had legally-binding restrictions on introductions of IAS aimed at protecting biodiversity.

- **EU Member States**

- **Full coverage**

Twenty-six MS were found to fully cover this criterion (AT, BE, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, SE, SI, SK, UK). Different approaches were used in the different MS.

In thirteen MS, a general prohibition applies (BG121, BG150, BG151, BG123 for protected areas, CY120, EE120, IE120, IT160, LV120, LT121 for new plants and fungi, LT123 and LT160D, LU120, LU150 for game, NL120, PT152, SI120, ES120, GB122 and NI160). However, exemptions may allow the release of the species, either on governmental decision (generally the Ministry for the Environment, CY120, LV155, LU120, LU150 for game, NL120, PT152), and/or if the introduction of new species does not endanger the stability of ecosystems and species or community safety (LT123, SI120).

In Lithuania a specific system of pilot projet applies. When a species is to be introduced/ reintroduced into the wild, a mandatory introduction/ reintroduction pilot project must be carried out, including assessment of the likely impact on the ecosystem. Monitoring programmes must also be an integral part of the project. If there are doubts about the introduction, the Invasive Species Control Board has the right to require experimental introduction of a few individuals in a controlled environment. If the introduced / reintroduced individuals behave in the environment in an unexpected way, and damages to the environment are noted, the Invasive Species Control Board can order all individuals to be eradicated from the pilot introduction / re-introduction project during or after its completion. Control or damage costs shall be borne by persons involved in the introduction / reintroduction (LT160A).

Five MS have, instead of a general prohibition of release into the wild, a prohibition restricted to IAS or to alien species: AT, CZ, DE, FI, HU, PL (AT123R and AT146R, CZ120, DE120, FI121 and FI129, HU120, PL121). In some cases, this prohibition can be lifted by an authorisation or an exemption. In Austria, such prohibition is made at state level. The nine federal states forbid the introduction of non native species into the wild (AT123R and AT146R illustrate this for Vorarlberg). In the Czech Republic CZ120 prohibits outright the introduction of alien species in protected areas (e.g. national parks), and forbids introductions elsewhere, unless an authorisation has been received. Release of game is considered specifically in CZ124 and forests in CZ161. In Finland, FI129 allows to regulate alien species introductions. There is an exemption for forestry as FI129 shall not apply to the planting or sowing of trees for the purpose of forestry. In Belgium, different approaches are taken in the different regions. BE168R in Brussels and BE175R in Wallonia regulate the intentional introduction of alien species, thus being similar to the approaches taken in AT, CZ, DE, HU and PL described in this paragraph. BE171R in Flanders forbids the voluntary introduction of both protected and alien species, thus applying the same general approach as Bulgaria and the twelve other MS described above.

France and Malta prioritise which species cannot be released into the wild through the use of lists of IAS to which restrictions apply (black lists). In France the release into the wild of listed species is forbidden, whether voluntarily, by negligence or by imprudence (FR110). The implementation lists cover only vertebrates and water primroses for the moment. Introductions in water ecosystems are also forbidden. However, in certain cases an authorisation may be granted, provided a risk assessment is performed. FR111 covers the entrance on the territory and introduction in the environment of a non-indigenous macro-organism useful for plants, notably for biological control, which must be authorised. In Malta, species on the list of IAS to be compiled by the Competent Authority cannot be released or allowed to escape (MT150). For the moment no list has been found to implement this text. In Greece, a similar situation applies (GR220).

Restrictions on certain taxa only

In three MS (SE, SK and DK), restrictions only apply to certain taxa.

In Slovakia, only certain taxa are covered. Animal species that are not native to Slovakia but are considered to be game species by the International Council for Game and Wildlife Conservation cannot be released into the wild in Slovakia without a permit (SK125). Similarly game species cannot be released without a permit in Sweden.

In Denmark, animals not living naturally in Denmark may not be released without permission from the Minister (DK120), and crayfish other than the European crayfish *Astacus astacus* may not be released (DK169). For plants, DK125 only allows to regulate/prohibit planting certain plants and sowing or planting certain areas. A white list of fish and crustaceans applies (DK171).

Restrictions only in certain areas

In one country, release into the wild is only forbidden in protected areas (SK (with the exception of game species, see above)). In Slovakia, it is forbidden to release any alien plant or animal species in protected areas (SK120 and SK160). Introductions of alien animal and plant species in protected areas and/or forests is prohibited in Slovenia (SI120, SI162, SI187). The Czech Republic also prohibits the introduction of alien species into protected areas, on top of generally restricting the release of IAS (see above).

- **Similar coverage**

In Romania, introduction on the territory is forbidden, which would also forbid introduction into the wild, but this is not explicitly specified. The regulation also introduces an exemption from this general prohibition. Introduction of IAS for the purpose of research-development for ecological restoration of habitats, not included in the national protected natural area network and irreparably damaged by climate change or anthropogenic factors is permitted (RO160). As introduction into the wild is not specifically mentioned and this exemption may introduce IAS, it was rated S.

- **No coverage**

No MS was found to not have covered the criterion in some way.

  - **Selected OECD countries**

- **Full coverage**

In Australia, restrictions on release to the wild depend on the quarantine status of a species (as determined by risk assessment) and are specified in its permit. Therefore, Australia received full coverage because the requirements for release are assessed on a case-by-case basis. Instead of compiling a list of IAS for which possession is prohibited, the permit for each individual species states all its individual restrictions.

In New Zealand, release of wild animals is forbidden, although they can be authorised on the basis of risk assessment and approval by the Environmental Risk Management

Authority. Both these countries thus restrict releases based on some form of risk assessment (see above, this is also done in some MS e.g. France or Lithuania).

In the USA, the Executive Order on invasive species (1999) requires federal agencies to use relevant programmes and authorities to prevent the introduction of IAS. Thus the release into the wild is delegated to the State level, but required. Under other specific pieces of legislation, such as the Brown Tree Snake Eradication and Control Act 2004 and the Farm Security and Rural Investment Act 2002, measures to prevent or reduce the risk of IAS release can be supported.

- **No coverage**

In Canada, no restrictions were found.

4.3.6. BORDER CONTROL/QUARANTINE SERVICES WITH PROCEDURES TO TARGET IAS OR RISKY SPECIES (ACCORDING TO RA) (CRITERION B.6)

Full coverage of this criterion involves having legally-binding border control or quarantine procedures in place that target IAS (or other high-risk species that have been determined by a RA). Border control/quarantine services are in place at EU borders, linked to EU requirements on animal and plant health or CITES. They regulate most border controls and quarantines performed on plants and animals, or on goods (e.g. in the case of wood packaging). As part of the common core, these requirements are not considered here.

- **EU Member States**

- **Full coverage**

Only two MS (RO, PT) were found to cover the criterion as they have legally-binding border controls/quarantine requirements targeted on IAS in place.

Romania regulates the crossing of its border by IAS, which should only be made in compliance with specific legislation concerning quarantine period (RO160). This could however not be linked to a risk assessment (RO was rated N for criterion A3).

In Portugal a procedure applies to stop accidental introductions of species through "clandestinos": specimens of flora and fauna to be introduced into nature must be subject to a period of quarantine. Those quarantines are often made to ensure that insects on wood or diseases on plants and animals do not enter the territory, but e.g. invasive alien reptiles or mammals are generally not covered. Indeed for example the red-eared slider *Trachemys scripta elegans* or the coypu *Myocastor coypus* would for instance not be covered by such a regulation on quarantine.

- **Similar coverage**

Four MS (ES, NL, FR, UK) were found to have similar requirements.

In the Netherlands, border control/quarantine requirements only apply in relation to protected indigenous/non-indigenous species. In France, non-domestic animal species

may be submitted to a transit centre where they can be controlled (FR110). However, this does not appear to represent a specific obligation to do so and does not necessarily target IAS or risky species.

Two MS include information on pathway inspections that are likely to include border inspections. In Spain through the questionnaire inspection of pathways, which may include border controls (but this was not specified) was reported. As no further information was found the country was rated S. In the UK strategy for GB (GB300*) foresees key actions related to pathways, which may include border controls. As this is not specified and is only foreseen in the non-legally binding strategy, the country was rated S.

- **No coverage**

No information on procedures targeting specifically IAS were found in the other MS (AT, BE, BG, CY, CZ, DE, DK, EE, FI, HU, GR, IE, IT, LV, LT, LU, MT, PL, SK, SE, SI).

  - **Selected OECD countries**

- **Full coverage**

In Australia the requirements depend on the import risk assessment (IRA) which is conducted for species to which no quarantine applies orwhere a significant change in existing quarantine policy is being considered. The outcomes of the IRA are then used to determine whether an import permit should be granted and what conditions should be attached in order to reduce the risk. Species can also be submitted to post-entry evaluation of their risks under appropriate quarantine conditions, if it is not clear whether they should be permitted or rejected for import. Furthermore, a system is in place so that the Biosecurity Australia alerts the Australian Quarantine Inspection Service (AQIS) to potential vectors at the border, and incorporates this knowledge in its routine border inspections.

In Canada, the Canadian Food Inspection Agency and the Canada Border Services Agency coordinate border control services. The CFIA is responsible for providing expert knowledge and inspecting and evaluating high-risk consignments. Furthermore, the Canadian IAS strategy also addresses specific procedures for the inspection and quarantine of IAS.

In New Zealand all goods and people are subject to inspection at the border to ensure compliance with the Biosecurity Act 1993. To achieve this, there is a system of regular or random inspections in line with risk profiling that are carried out within the joint border management system (which involves customs, biosecurity and immigration).

- **Partial coverage**

In the USA, border controls are established for plant protection. The Plant Protection Act 2000 allows the Secretary to hold, seize, quarantine, treat, destroy or dispose of plants, plant pests, noxious weeds, biological control organisms or plant products. The Secretary can do so if necessary to prevent the spread of a plant pest or noxious weed. The Plant Quarantine Act of 1912 also allowed the quarantine of any geographical area

to prevent the spread of an insect infestation. However, this Act has now been repealed.

Finally, the National Invasive Species Management Plan (2008-2012) aims to revise the rules on quarantine of plants for planting. In May 2011, new rules have been published (see A3 above).

Border controls are also established in the Brown Tree Snake Control and Eradication Act of 2004. A system of pre-departure quarantine will be established for cargo and other items shipped from Guam to any locations in the USA where the brown tree snake may become established.

4.3.7. INSPECTION AND COMPLIANCE FRAMEWORKS FOR IAS OR RISKY SPECIES (ACCORDING TO RA) (CRITERION B.7)

Full coverage of this criterion involves having legally-binding inspection and compliance frameworks in place that target IAS (or other high-risk species that have been determined by a RA). These can include powers of inspectors related to IAS inspections at customs, for trade, for transport, to verify possession requirements, or release requirements. Compared to B6, this criterion includes all types of inspections (B6 covers border controls only) and specifies what type of inspections are performed. Inspection and compliance frameworks linked to EU requirements on animal and plant health or CITES are not considered here.

- **EU Member States**

- **Full coverage**

One country was found to fully cover the criterion (UK): powers of inspectors specifically related to IAS were found. The powers of inspectors are described in GB122, GB123R and GB132R (Scotland), stating that wildlife inspectors can enter premises to determine if an offence related to IAS is being or has been committed. GB126 also allows the eradication of muskrats if the conditions for possession, trade, transport are not met. A similar text applies in NI (NI123).

- **Partial coverage**

The powers of inspectors, compliance frameworks or responsibilities are covered in four MS (ES, IE, NL, RO), but comprise responsibilities not directly targeting IAS, or targeting a specific activity only.

Powers of inspectors are described in three texts for Ireland. The most relevant to IAS is IE125 (Inspectors may enter land to ascertain if noxious weeds are growing there), which does not apply to all IAS.

A compliance framework, with identified responsibilities is in place in the Netherlands for illegal entrances, which is not targeted towards IAS specifically and NL was thus rated P. The Minister of the department of Economic Affairs, Agriculture and Innovation has the power to return animals/plants which are brought within the

territory of the Netherlands without compliance with import restrictions. The owner/transporter/importer will pay for these costs (NL120). Responsibilities are clearly given through the Flora and Fauna Act, which is enforced by the Algemene Inspectiedienst[58] and regulates release of IAS into the wild. A special team for IAS has also been set up, but specific inspections tasks were not found (see G1).

In Romania a compliance framework is in place for research-development purposes only (RO160).

In Spain, it was reported through the questionnaire that inspections were carried out, specifically targeting entrance pathways or presence and security conditions of IAS or potentially invasive species in zoos. However no mandatory inspection was found in the policies.

- **Similar coverage**

The responsibilities of civil rangers are described in HU120. The rangers are an environmental police force. In protected natural areas, the rangers can warn any person who endangers or damages natural values that their act is illegal and demand that they leave. It is not completely clear however how this relates to IAS, thus the country was rated S.

- **No coverage**

No inspection and compliance frameworks targeted on IAS or risky species could be found in the other MS (AT, BE, BG, CY , CZ, DK, EE, FI, FR, DE, GR, IT, LT, LU, LV, MT, PL, PT, SE, SK, SI). Requirements were found for health, welfare, species trade, plant and animal health, which are outside of the scope of this study.

Selected OECD countries

- **Full coverage**

In Australia and New Zealand the same provisions apply as in B6. In Australia, the inspection framework is led by AQIS, which carries out routine border inspections. In particular, Biosecurity Australia alerts AQIS to potential vectors at the border, the knowledge of which can be incorporated into the inspections.

In New Zealand, all goods and people are subject to inspection at the border to ensure compliance with the Biosecurity Act 1993. This is part of a joint border management system which involves customs, biosecurity and immigration.

In the USA inspection authority resides within the Department of Homeland Security – Customs and Border Protection, USDA – Animal and Plant Health Inspection Services (APHIS) and Dept of Interior – Fish and Wildlife Service (FWS). For brown tree snake and plant protection, specific provisions apply.

[58] General Inspection Authority; www.aid.nl/home.htm

- **Partial coverage**

In Canada, a leading goal of the IAS strategy is prevention, including a surveillance strategy which covers pre-border and border inspection. However, no implementation of this compliance framework is known yet. Some other provisions allow inspection and enforcement of key regulations, but these are not expressly targetting IAS. For example, inspectors are authorised to inspect ships under the Canada Shipping Act. Environmental protection compliance orders can be issued under the Environmental Protection Act to cease any activity constituting an infringement of the Act. Canada was rated P because the only aspect specifically targeted at IAS is only an aim of the strategy.

4.3.8. MEASURES TO PREVENT IAS-SPREAD THROUGH CONTAMINATED COMMODITIES, PACKAGES AND TRANSPORT VECTORS OR THROUGH WASTE DISPOSAL (CRITERION B.8)

Contaminated commodities are an important vector of IAS spread. Such commodities may includewood (e.g. spreading the Asian long-horned beetle *Anoplophora glabripennis*), people (e.g. spreading seeds or weeds, such as the ragweed, *Ambrosia artemisiifolia*), ships or planes (e.g. alien insects), waste (e.g. Japanese knotweed *Reynoutria japonica*). In terms of waste disposal, there are two aspects to consider:

- disposal of IAS waste (such as plant waste or aquarium water); and
- disposal of waste as a vector for the spread of IAS.

Covering contaminated water transported in ships, the Ballast Water Convention[59] aims to prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments. It has only been ratified by four of the 27 MS, France, the Netherlands, Spain and Sweden so far. The Convention will enter into force 12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage. These numbers have not been reached yet. Guidelines on the management of ballast water are available that aim to prevent the spread of IAS[60].

Within the EU, these commodities are inspected according to the plant health regime and import requirements for wood and wood products to ensure that pests do not spread. In particular, import requirements may be decided for EPPO listed-pests (based on a risk assessment). These import requirements may include activities to be carried out in the exporting country (eg. prohibition of imports or commodity production requirements), in transit (eg. phytosanitary treatment, containment), or upon entry into the EU (eg. post-entry treatment or quarantine)

[59] The International Convention for the Control and Management of Ships Ballast Water & Sediments was adopted at the International Maritime Organisation in 2004.

[60] 'Guidelines for control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens', available from globallast.imo.org/868%20english.pdf

The full coverage of the criterion means that a country takes legally-binding measures to ensure that commodities, packages and transport vectors are considered specifically to prevent the spread of IAS.

- **EU Member States**

- **Full coverage**

No MS was found to fully cover the criterion, as only a few vectors were considered in the MS.

- **Partial coverage**

Eight MS were assessed as partly covering the criterion, either because they had a framework which was not yet implemented (UK, NL), or only specific vectors or species were considered (BE, DK, GR, IE, PT, RO, UK).

Framework in place but not yet implemented

The GB strategy (GB300*) includes key actions related to pathways and high-risk species, such as drawing up action plans for specific pathways to minimise risks, and establishing a mechanism for recording interceptions on significant introduction pathways.

An example of a measure to prevent IAS-spread through contaminated commodities can be found in NL for the lucky bamboo case. The tiger mosquito travelled along with bamboo trees. Tiger mosquitoes can be dangerous for human health because they have the capability to spread multiple viruses). In order to stop the introduction of the mosquito, the Commodities Act (NL124) articles 18 and 14 were used. Art. 18 prohibits the trade in commodities (not edible or drinkable) of which it is presumed that its use leads to serious health risks for human beings, Art 14 makes it possible for the minister to intervene quickly via a Ministerial Decree. The Temporary Commodities Act Regulation on Product Requirements for Lucky Bamboo (NL127) prohibits the trade of bamboo trees with Tiger mosquitoes. Although the regulation was not enforced in any way, it is an example how IAS-spread through contaminated commodities can be prevented (in theory) using the Commodities Act.

Waste pathway

In Belgium, measures control the transport of waste derived from IAS, but do not address waste disposal as a vector for spread of IAS. Under BE160, necessary measures to prevent or repair environmental damages must be taken for transport of non-indigenous species waste.

Waste disposal as a vector of IAS is addressed in three MS (IE, RO, UK). In Romania, RO160 states that proper waste management procedures must be taken before plant or invertebrate wastes are introduced to the organic waste stream. In a similar way,waste regulations in Ireland (IE121, IE150) can be interpreted as including the prevention of IAS spread, as “ecotoxic” waste is controlled (IE121). The same applies in Great Britain where GB128 refers specifically to Japanese knotweed and giant hogweed

and NI156 refers to risks of waste disposal. As these MS only target waste, they were rated P.

Plants

In Denmark, the Minister may establish rules for eradication and prevention of spread of unwanted plant species, including rules for cleaning of vehicles, machines, tools, packaging and premises that have been used for transport, treatment, handling and storage of goods containing unwanted plant species (DK123). This is applied in the statutory order on eradication of the giant hogweed (DK160) and several policies on plant health. In England and Wales, measures to prevent spread of injurious weeds can be taken (GB139R), possibly including prevention of spreading by commodities. As in DK it is only in place for one species and in the UK no implementation was found, both MS were rated P.

Ballast water

While Portugal has not ratified the Convention on Ballast Water[61], it was rated as partially covering the criterion, as filling and dumping of ballast water from ships is governed (legally-binding requirement) by the guidelines of the International Maritime Organisation and the International Council for the Exploration of the Sea (PT152). In Greece, specific terms of management may be drawn up by joint decision of the Ministry or Environment, Energy and Climate Change and the Ministry of Economy and Finance for ballast water. Portugal and Greece were the only MS found to specifically mention these guidelines in the legislations/policies assessed (although the Greek law is a draft legislation at this stage).

- **Similar coverage**

In Sweden, SE120 offers a framework that could be used to regulate vectors of some IAS, since it includes the potential to require permission or impose other conditions for any activities involving the moving, breeding or release of fish.

Similarly, in Cyprus, an unofficial document recommends that periodic controls of the local commodities which may spread IAS should be carried out in targeted places such as flower shops and plant nurseries, zoos, pisciculture premises, research institutes, circuses and petshops. The controls should aim to eradicate or return to their former country any IAS species that are kept without authorisation (CY502). However, this is currently only a recommendation

Ballast water

France, the Netherlands (rated P above), Spain and Sweden have ratified the Convention on Ballast Water, although this convention is not yet implemented. As no specific measures implementing the convention were found in these MS, they were rated S.

[61] As of 31/05/2011

- **No coverage**

No information on restrictions on commodities, packages or waste could be found for the other 15 MS (AT, BG, CZ, DE, EE, FI, HU, IT, LV, LT, LU, MT, PL, SK, SI).

It was noted that in Denmark, the Convention on Ballast Water has not yet been ratified, but it is recommended that Denmark works towards ratifying the convention within the period 2010-2013 (DK300), while Finland has signed and is preparing ratification of the convention. Sweden has ratified the Ballast Water Convention. However, SE125 which implements it only applies to discharges of oil and other harmful substances and not living organisms.

- **Selected OECD countries**

- **Full coverage**

In Australia, vectors and pathways are analysed on a species-by-species basis. No formal difference is made between vectors and pathways. They are examined simultaneously. Waste disposal protocols apply to government-sponsored invasive species strategies where waste is known as a possible vector for the spread of IAS, or where control methods have themselves created a hazard in the waste. Therefore, both aspects of waste disposal are considered. Furthermore, transportation is a major vector for IAS spread, and therefore management strategies for individual species consider how the vector can be eliminated. Permits for individual species also specify controls on transportation.

- **Partial coverage**

In the USA, research on ballast water, wood, recreational activities, mail, etc. to prevent spread through those vectors is on-going. Additionally, a ballast water management programme is to be developed. At the same time, the Environmental Protection Agency is developing regulations to manage the release of ballast water from ships via a Vessel General Permit.

In Canada, voluntary guidelines are controlling and managing ballast water, which were introduced into the Canada Shipping Act in 2006. The *Transportation of Dangerous Goods Act* sets standards for modes of transportation, packaging, labelling, etc., to promote safety in organism transportation into, from, or within Canada by Canadian vehicles.

- **Similar coverage**

In New Zealand, biosecurity inspectors have powers to inspect and eradicate organisms. When risk goods are intercepted at air or sea ports, they are treated by fumigation or heat to remove the risk. However there is, as yet, no integrated or coordinated management of vector pathways within the country.

4.3.9. MEASURES TO PREVENT IAS-SPREAD THROUGH MAN-MADE CORRIDORS (CRITERION B.9)

In this criterion, man-made corridors refer to any man-made structure that links previously-isolated ecosystems, thus overcoming natural ecological barriers. For example, a canal may connect two natural water bodies that were previously separated. This therefore allows organisms, including IAS, to move between them.

Full coverage of this criterion involves the presence of legally-binding measures to avoid spread of IAS via man-made corridors.

- **EU Member States**

- **Full coverage**

No MS was found to fully cover the criterion, as only a few examples of measures aiming to prevent spread via man-made corridors could be found.

- **Similar coverage**

Three MS (BE, ES, HU) were rated S because the impacts of man-made infrastructure are controlled or considered. However, man-made corridors linking previously isolated ecosystems are not specifically addressed, as the texts refer to ponds or other closed waters (BE, ES) and deals with the issue of IAS spreading through green corridors (HU), which are not strictly what the criterion refeers to.

Another man-made corridor can be artificial ponds implemented for example on agricultural fields. Plants and animals planted or introduced in these ponds by humans may be IAS that will then spread further into the environment. In Belgium, a slight addition to Good Environmental and Agricultural Conditions (GAEC, conditions applying in the Common Agricultural Policy)[62] has been made, to include IAS issues (thus rated S). In Belgium, farmers that declare (voluntarily) ponds in their agricultural plots, thus benefitting biodiversity, can be granted a regional subvention, under specific conditions. One of these conditions includes that exotic animal or plant or any palmiped or fish may not be introduced in the ponds.

In Extremadura, Spain, new ponds and other areas where water is artificially caught (artificial lakes, etc.) must have drainage elements to eliminate invasive species that could settle in these water bodies (ES125R).

In Hungary, HU300 states that the ecological importance of green corridors must be identified for the most important ones, including recognition of their role in disseminating IAS.

[62] Good agricultural and environmental condition (GAEC) includes the maintenance of ponds, but invasive species are not directly mentioned in the Common Agricultural Policy (CAP).

- **No coverage**

No information on this criterion was found for the other MS (AT, BG, CY, CZ, DK, EE, FI, FR, DE, GR, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, SE, UK)

  - **Selected OECD countries**

- **Full coverage**

In the USA, a number of agencies take action to control the spread of IAS through man-made corridors. Such agencies include the US Army Corps of Engineers, the Department of Transport, Bureau of Land Management, Bureau of Reclamation and the Department of Defense. For example, under the US Army Corps of Engineers Invasive Species Policy (2009)[63], civil works planning documents will address invasive species issues in their analysis of project impacts.

- **Similar coverage**

In Canada, species risk assessments includes man-made corridors, but only covers plant pests and plant health. However, measures to prevent spread through man-made corridors were not found. Measures found in NZ are reactive rather than proactive, considering ways to control spread of an organism. Proactive measures are expected to be put in place with the implementation of the Biosecurity Law Reform Bill, Ss. 77 to 94, which is why NZ was rated S.

- **No coverage**

In Australia no measures to prevent spread of IAS via man-made corridors was found other than the measures for transport outlined in B3.

4.3.10. SCHEMES FOR LABELLING AND CERTIFICATION OF PRODUCTS/SOURCES AND ACCREDITATION OF INDUSTRIES (CF. BALLAST WATER CONVENTION) (CRITERION B.10)

Full coverage of this criterion implied the existence of a scheme for labelling or certifying products/sources that involved declaring a product free of IAS or confirming that an organism is not an IAS.

At international level, the Roundtable on Sustainable Biofuels (RSB) has developed standards and a certification system that apply to biofuels. Amongst the criteria covered, Criterion 7.e covers IAS. The criterion states: 'Biofuel operations shall prevent invasive species from invading areas outside the operation site.' On July 19th 2011, the European Union recognized the standards and certification system[64].

[63] Available from: www.nae.usace.army.mil/reg/invasivespeciespolicy.pdf [Accessed 25/7/2011]

[64] http://rsb.epfl.ch/

- **EU Member States**

Full coverage

No relevant labelling or certification schemes were found to fully cover this criterion in any MS.

No coverage

No MS was found to cover this criterion of labelling/certification (AT, BE, BG, CY, CZ, DE, DK, EE, FI, FR, DE, HU, GR, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, ES, UK).

- **Selected OECD countries**

No coverage

None of the OECD countries were found to have certification or labelling schemes that include IAS issues. It is worth mentioning that in Australia a discussion paper was produced in 2005 on 'The Costs and Benefits of a Proposed Mandatory Invasive Species Labelling Scheme'[65].

As an explanation to the lack of certification or labelling scheme, it can be argued that many schemes for labelling and certification are actually organised at a level that is not the country level. Examples (covering biodiversity aspects, but not IAS) include the above-mentioned certification system for biofuels, the Forest Stewardship Council, Marine Stewardship Council, Rainforest alliance, etc. All these are developed at supra-national levels, often by NGOs, or other associations, not by a specific country.

4.3.11. GREENING THE SUPPLY CHAIN (IAS-SENSITIVE PUBLIC PROCUREMENT) (CRITERION B.11)

Full coverage of this criterion involves use of measures which ensure that IAS are banned from products and services purchased or used by public authorities. A legally-binding requirement should apply.

- **EU Member States**

Full coverage

No MS were found to fully cover this criterion.

Partial coverage

This criterion was only covered in two regions of Belgium and the UK (Wallonia and Northern Ireland respectively), which were thus rated P. The Northern Irish strategy states that 'Invasive alien species will be integrated into relevant industry standards which will be adopted by government in procurement'. In Wallonia (Belgium), the

[65] Martin, P., Verbeek, M., Thomson, S., Martin, J. 2005. *The Costs and Benefits of a Proposed Mandatory Invasive Species Labelling Scheme,* A Discussion Paper Prepared for WWFAustralia by the Australian Centre for Agriculture and Law, University of New England. WWF-Australia, Sydney.

terms of reference of public contracts will ban any intentional introduction of IAS listed on the black and alert lists of Harmonia (BE180R).

- **No coverage**

In the 25 other MS no information was found (AT, BG, CY, CZ, DK, EE, ES, FI, FR, DE, HU, IE, GR, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, SE).

  - **Selected OECD countries**

- **Similar coverage**

In Australia, some discussions are on-going regarding prioritising suppliers who manage their entities to reduce IAS risk in government procurement but no agreement was reached. Some best practices or codes for purchaser require standards related to the environmental branding programmes of the major retailers/wholesalers. These standards often require management of IAS but do not specifically certify the extent to which IAS management is achieved. As this refers to the criterion, but is not directly implementing it, the country was rated S.

- **No coverage**

None of the three other OECD countries were found to cover this criterion with IAS schemes. Other environmentally-friendly schemes are numerous, but do not include IAS-related measures.

4.3.12. VOLUNTARY CODES OF CONDUCTS OR AGREEMENTS FOR DIFFERENT ECONOMIC SECTORS (CRITERION B.12)

Outside from legally-binding regulations, a way to achieve environmental targets in general is to negotiate voluntary agreements with economics sectors. As an example, in the field of carbon emissions the motor ndustry has agreed with the European Union emission reduction targets. In the voluntary codes of conducts/agreements, the economic sectors commit to follow certain requirements. Such codes may include provisions on IAS, in particular in those economic sectors that are directly concerned by the issue, such as forestry, aquaculture, fisheries, horticulture, botanical and zoological gardens, research, pet trade, tourism, waste management, marina operators, water users, etc. The signing of such codes involves a (voluntary) commitment to implement the agreements. Such codes are different from codes of conduct that give guidelines on good practices and where no commitment is taken. There are many initiatives that are called codes of practices, or codes of conduct developed in the EU by different stakeholders (including industry associations) or by international bodies (e.g; Council of Europe, FAO) that are however only providing guidelines on best practices and do not require a commitment by economic sectors. These initiatives are described in criterion G5.

Full coverage of this criterion was considered when at least one economic sector had developed agreements dedicated or including commitments linked to IAS.

- **EU Member States**

- **Full coverage**

Only the Netherlands fully covered this criterion, for the aquatic industry. In the Netherlands the aquatic plant code of conduct[66]is a voluntary agreement between the Department of economic affairs, agriculture and innovation and multiple aquatic plant producing/importing industries to fight invasive alien plant species in the Netherlands. The industries that signed up the code will not sell certain invasive plants to consumers anymore.

- **No coverage**

No specific IAS codes could be found for other MS (AT, BE, BG, CY, CZ, DE, DK, EE, FI, FR, GR, HU, IE, IT, LV, LT, LU, MT, PT, PL, RO, SK, SI, ES, SE, UK).

- **Selected OECD countries**

- **Full coverage**

In Australia, a code of conduct for the Nursery and Garden Industry is in place, and efforts for other sectors are on-going.

In New Zealand, the National Plant Pest Accord is the main agreement related to IAS. It is a cooperative agreement between the Nursery and Garden Industry Association, regional councils and government departments with biosecurity responsibilities, banning certain plants from being sold, propagated and distributed[67].

In the USA, a range of voluntary codes of conduct have been developed, generally driven by civil society and industry. Examples include those for botanic gardens and arboreta[68], nursery professionals, landscape architects, the gardening public, and government (with regard to plant introductions). On the animals/pets side, some initiatives also exist, but involving communication rather than commitments (Habitattitude, the National Reptile Improvement Plan[69] and Bd-Free 'Phibs Campaign, see H1) involve both industry and consumers in reducing the risk of pet introductions and associated diseases. Finally, there are increasing efforts to work with the boating, fishing/angling and outdoor recreational companies to identify best practices for the industry and its customers (including awareness raising and outreach). For Hawaii, a voluntary code of conduct for plant industries was found and seems to be signed by some industries. Additionally, in NorthEast Illinois a MoU is in place for collaborative work between governmental and non-governmental organisations on the issue of invasive plants[70].

[66] See www.vwa.nl/txmpub/files/?p_file_id=2001100
[67] See www.biosecurity.govt.nz/nppa
[68] See http://www.centerforplantconservation.org/invasives/endorsementN.asp
[69] http://www.pijac.org/projects/project.asp?p=28
[70] See niipp.net/wp-content/uploads/2011/01/NIIPP-MOU-Final-Version-14-February-2011.pdf

- **Partial coverage**

In Canada, codes of practices are left to the Ministry of Environment to develop (no codes of practices were found at this stage, other than references to the St Louis declaration on invasive plant species).

4.3.13. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
B1	9	0	0	18	0	0	0	4
B2	10	1	0	16	0	1	0	3
B3	14	3	2	8	0	2	0	2
B4	7	0	0	20	1	2	0	1
B5	0	1	0	26	1	0	0	3
B6	21	4	0	2	0	0	1	3
B7	21	1	4	1	0	0	1	3
B8	15	4	8	0	0	1	2	1
B9	24	3	0	0	1	2	0	1
B10	27	0	0	0	4	0	0	0
B11	25	0	2	0	3	1	0	0
B12	26	0	0	1	0	0	1	3

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

By far the best covered criterion is B5, regulating release of IAS into the wild (26Y, 1S). This may be because it is one of the easiest means by which the threat of IAS can be reduced. However, in certain MS only release into particularly sensitive areas is regulated, i.e. protected areas. This good coverage may be explained by the fact that this is a requirement of the Habitats Directive.

Criteria B1 (18Y, 0P, 0S), B2 (16Y, 0P, 1S) and B4 (20Y, 0P, 0S) are also well-covered on average. Coverage of these criteria usually involves legal restrictions or prohibitions in order to prevent introduction of IAS. A given regulations often covers several of the different aspects (eg. imports, trade, transport, possession, introduction), but not always all. A common approach in EU MS to regulate prevention is to list species to which the regulations apply, on the basis of some listing (e.g. risk assessment or expert judgement). This method is consistent with the EU Biodiversity Strategy's aim to

prioritise species. Another approach is to apply regulation to all species (including non-IAS species) but this is not an approach that was identified in the EU.

In contrast to the other criteria on restrictions, legally-binding transport restrictions for priority species apply in only eight MS (Criterion B3; 8Y, 3P, 1S). This might be because as import and trade are already regulated, specific measures for transport may be considered some sort of overlap.

There are many gaps in the B criteria that are not currently well-covered by EU MS (21N to 27N). These include:

- B6: Border control/quarantine services with procedures to target IAS or risky species (according to RA);
- B7: Inspection and compliance frameworks for IAS or risky species (according to RA);
- B.9: measures to prevent IAS spread through man-made corridors;
- B.10: schemes for labelling and certification of products/sources and accreditation of industries;
- B.11: greening the supply chain; and
- B.12: voluntary codes of conduct or agreements for different economic sectors. However, this criterion should also be linked to G5, on voluntary codes of conducts (as opposed to B.12 covering economic sectors and specific commitments) which was relatively well-covered.

Labelling and certification schemes, or measures to green the supply chain were almost never found. This might be because these schemes tend to be supra-national and thus did not fall directly in the scope of this assessment. For instance, the biofuels certification scheme from the Sustainable Roundtable on Sustainable Biofuels, includes certification related to the use of IAS and has recently been recognised by the EU[71]. It has been developed at supranational level.

In the OECD countries, B1 to B5 are relatively well-covered, as is the case in the EU MS. OECD countries however were found to better cover criteria related to border control and quarantine procedures (B6; 3Y, 1P), with the biosecurity framework applying in both Australia and New Zealand, and the CFIA coordinating border controls in Canada, inspections (B7; 3Y, 1P), and prevention of spread through contaminated commodities (B8; 1Y, 2P) than the EU MS. They also had voluntary agreements in place in some economic sectors (B12; 3Y, 1P), whereas in the EU such agreements were only identified in NL. Whether in OECD countries or in the Netherlands, the gardening industry is pioneer for such agreements. But like the EU MS, they poorly covered certification and labelling schemes (B10; 4N), green procurement (B11; 3N, 1S).

[71] See e.g. the guidelines from IUCN on biofuels and invasive species cmsdata.iucn.org/downloads/iucn_guidelines_on_biofuels_and_invasive_species_.pdf or the discussions at the Council of Europe www.coe.int/t/dg4/cultureheritage/nature/bern/ias/inftpvs(2009)06_en.pdf

4.4. CRITERIA C: EARLY-WARNING AND RAPID RESPONSE

Early-warning and rapid responses are common in the EU for plant and animal health related issues. In particular, the Animal Disease Notification System is in place for surveillance purposes and rapid veterinary responses, targeted towards specific diseases also are mandatory. Alerts for specific pests threatening plant health are also in place in the EU.

4.4.1. MANDATORY SURVEILLANCE TO ESTABLISH PRESENCE OF IAS ACCORDING TO STANDARDISED PROTOCOL (CRITERION C.1)

At EU level, mandatory surveillance occurs mainly through the plant and animal health and the aquaculture regulations. In all MS, mandatory surveillance to establish the presence of certain species, under the plant health regime, aquaculture regulations and veterinary regulations apply. In particular, MS have an obligation to notify the Commission and other Member States of the presence within their territory of these harmful organisms and are obliged to take measures to eradicate or, if this is not possible, prevent the spread of the harmful organism concerned[72]. For aquaculture, monitoring of disease spread is also common.

In order to fully cover the criterion MS should have legally-binding systems in place with standard protocols to survey IAS at national level, beyond what is required under the animal of plant health regimes and the aquaculture regimes.

- **EU Member States**

- **Full coverage**

Two MS (DE and ES) were found to fully cover the criterion, as they have systems to monitor IAS specifically. In Germany, mandatory surveillance of the environment should be performed, including the survey of those species that are invasive (DE120). In Spain, ES120, a national level Act, states that the Autonomous Communities[73] must monitor potential IAS, which can then be suggested for inclusion in the National Catalogue of Invasive Species. For example, in Andalucia, monitoring of IAS is carried out by teams that are also in charge of their control and management.

- **Partial coverage**

The criterion was partly covered in seven MS (EE, LU, LV, MT, NL, SE, UK).

Aim of strategies

Both the UK (both GB and NI) and Estonia were rated P because their (regional) strategies include aims to enhance existing surveillance programmes in order to better

[72] ec.europa.eu/food/plant/organisms/emergency/index_en.htm

[73] The 17 autonomous communities (Comunidades Autónomas) and two autonomous cities are the political divisions of Spain.

assess IAS, but these aims are not yet implemented. In Northern Ireland, the IAS strategy states that the potential of ongoing surveillance programmes for IAS in NI will be maximised. This will be done by identifying which species can be integrated into other programmes, developing materials and carrying out training for staff. Key actions of GB300* are to maximise the use of existing information sources and develop suitable surveillance/monitoring schemes for known and potentially IAS; to work closely with relevant bodies to maximise detection, surveillance and monitoring capacity; and to develop and agree on protocols for surveillance and monitoring of potentially invasive species. Improvements to the Estonian system are also described in EE300; currently some activities with organisms that may be harmful are monitored by the Environmental Inspectorate, and can be terminated in case of negative impacts (EE123).

Unclear requirements/no legal obligations

In the Netherlands the IAST is responsible for surveillance (NL301*) but no specific information on how this is done was found.

In Malta the need for surveillance is also recognised but the regulation for the moment merely implies that systems can be put in place. Thus while monitoring may be implemented for alien species with the potential to become invasive (MT150), there is currently no legal obligation to do so.

In Luxemboury and Latvia, monitoring of IAS is implemented in certain areas only: in Luxembourg, the answer to the questionnaire mentioned monitoring for IAS in forests; or for certain taxa only. In Latvia the State Plant Protection Service monitors and maps invasive plant species (LV121, LV153, LV151, LV150).

Regional monitoring of specific species

In Sweden, some municipalities have started surveillance programmes (country boards of Skane and Norrbotten for the Raccoon dog[74]). Thus, Sweden was rated P because surveillance is only in place in certain locations.

- **No coverage**

18 MS were rated N, as no monitoring system specifically targeting IAS was found (AT, BE, BG, CY, CZ, DK, FI, FR, GR, HU, IE, IT, LT, PL, PT, RO, SK, SI). In many MS biodiversity monitoring can however be found, that may include IAS monitoring, but is not legally-binding, and is in place in most MS.

  - **Selected OECD countries**

- **Partial coverage**

In Australia, surveillance depends on the quarantine status, and emergency plans may include provisions for monitoring. As this does not necessarily cover new emerging species, the country was rated P. In New Zealand, the focus is on border control, but a

[74] See www.lansstyrelsen.se/skane/sv/djur-och-natur/hotade-vaxter-och-djur/frammande-arter/Pages/Svenska_mardhundsprojektet.aspx [Accessed online 23032011]

general duty to inform is in place too. As the focus is not directly on surveillance, the country was rated P. In the USA, some alien species are targeted by surveillance, such as aquatic species, salt ceddar and russian olive. Some provisions for noxious weed also apply.

- **Similar coverage**

In Canada, surveillance for plant health and animal diseases is in place. As the EU framework for plant and animal health (i.e. the common core for EU MS) does not apply in Canada, it was rated S.

4.4.2. TARGETED MONITORING AROUND KEY ENTRY POINTS AND HIGH RISK AREAS (CRITERION C.2)

Key entry points and high risk areas are defined for the EU plant and animal health regimes. Import of agricultural goods is only allowed in specific entry points (see the country assessment of Slovenia under criterion C2 which identifies these points).

In order to fully cover the criterion, the country needs to have clear legally-binding targeted monitoring around key entry points or high risk areas (e.g. near areas where IAS can be found and could escape, or near protected areas) targeted at IAS, i.e. going beyond the plant or animal health requirements.

- **EU Member States**

- **Full coverage**

No MS was found to fully cover the criterion.

- **Partial coverage**

Six MS were found to have partially covered the criteria (DK, EE, HU, RO, SK).

In two MS (DK, EE), specific, IAS monitoring systems have been set up that survey key entry points/high risk areas for the species.These systems are non legally-binding and represent isolated efforts, thus the MS were rated P

In Denmark, cameras have been set up along the Danish-German border and in high-risk specific areas to monitor key entry points for raccoon dogs (DK301 and as part of a LIFE+ project). In Estonia some areas are specifically monitored for IAS, such as the Muuga harbour which is the largest harbour in the Baltic see and a key entry point for IAS (questionnaire answers).

In two MS (HU, SK), relevant initiatives/aims exist but are not yet implemented (or no information on implementation could be found). In Hungary, targeted monitoring is recognised as necessary, and entry points were determined through studies (HU500 and HU501)., but no information is available on implementation. In Slovakia, an aim of the future strategy is to implement a monitoring system for high-risk areas (SK400).

The Romanian CBD report (RO500) mentions that some monitoring of key entry points/areas are in place, but they are limited in scope (ballast water in entry ports, laboratories specialised in the identification of certain IAS, especially forest pests entering the territory).

- **No coverage**

No information was found for the other MS (AT, BE, BG, CZ, DE, ES, FI, FR, GR, IE, IT, LV, LT, LU, MT, NL, PL, PT, SE, SI, UK).

- **Selected OECD countries**

- **Partial coverage**

In the USA, the National Invasive Species Management Plan 2008-2012 (NISMP) includes a target to identify key locations, and the same applies for aquatic species. On-going efforts are primarily species-based and specific efforts are under way by the Aquatic Nuisance Species (ANS) Task Force. Similarly, in Canada, targeted monitoring around high-risk points of entry and in specific locations and ecosystems is an aim of the strategy. However, these objectives have not yet been found to be carried out, and thus the USA and Canada were rated P.

No formal targeted monitoring towards IAS was found in New Zealand, but biosecurity inspectors (covering IAS, including but not limited to plant pests and animal diseases) are located at border points and surveillance officers at major airports and ports. In NZ biosecurity includes all types of IAS (including but not limited to plant pests and diseases). Thus the country was rated P.

- **No coverage**

Systems related to monitoring were not found for Australia.

4.4.3. DEDICATED EARLY-WARNING AND INFORMATION DISSEMINATION SYSTEM (CRITERION C.3)

Early-warning systems are in place in the framework of plant and animal health regimes in the EU. For example when a plant pest is identified in a MS, it has to warn the Commission and provide information on the measures taken. Phytosanitary/animal disease emergency systems could possibly be used for early-warning on other IAS species than plant pests/animal diseases.

In order to fully cover the criterion, the countries were expected to have an early-warning system in place dedicated to IAS, and that may cover all taxa. Systems covering alert species are not covered in this criterion as they are covered in A8.

- **EU Member States**

- **Full coverage**

No MS was found to fully cover the criterion.

- **Partial coverage**

Sixteen MS (AT, BE, CZ, DE, DK, EE, ES, FI, IE, LV, LT, NL, PL, SE, SK, UK) were found to partially cover the criterion. These include all the MS participating in NOBANIS, which are involved in a pilot project on early-warning, plus seven other MS.

Regional systems

In Spain, two early-warning systems dedicated to IAS were identified at regional level, through the questionnaire, for the regions of Valencia and Andalucía (so rated P). As detailed above (criterion C1), monitoring is organised at regional level in Spain; the Autonomous Communities are responsible for implementing prevention systems and warning the national government. In Valencia, the early-warning system has two features. Firstly, once a new IAS species is located, an alert is sent via email to subscribers in which available data on the species is summarised. Secondly, forest wardens and personnel of natural parks have been specifically trained so as to be able to identify IAS in the field. They regularly send their data to the biodiversity office. Their observations are reviewed and eventually lead to control actions in the field. In Andalucia, field technicians notify the regional biodiversity office when they find a new species or population.

Aim of strategies

Early-warning is a goal of the strategies (published or in development) in six MS (AT, BE, DK, IE, SK, UK). In Austria, an early-warning system is a high priority of the action plan (AT300*) and in Belgium, implementation of early detection is an aim of BE302. Denmark's action plan (DK300) includes a recommendation to give high priority to international cooperation on early-warning. On the island of Ireland, a system is in place through Invasive Species Ireland (a joint venture between NI and IE) and the National Invasive Species Database (NISD) (IE) for reporting and issuing species alerts. According to the Northern Irish strategy (under consultation), which has been developed in cooperation with the Republic of Ireland, an early-warning system is under development (NI400*). In Slovakia, early-warning is a goal of the future strategy (SK400), and according to the GB strategy (GB300*) an early-warning system will be developed for flora and fauna, similar to that operated by the European and Mediterranean Plant Protection Organisation. Species alerts can be found here: secure.fera.defra.gov.uk/nonnativespecies/alerts/index.cfm

- **No coverage**

No information on coverage of this criterion was found in the other eleven MS (BG, CY, FR, HU, GR, IT, LU, MT, PT, RO, SI). The French assessment however provides examples of early-warning type systems for agricultural and health issues (FR111 and FR112). which could be used for IAS emergencies. Similar systems are in place in the other MS as this is part of animal, plant and human health measures.

- **Selected OECD countries**

- **Partial coverage**

In Australia, each plan for risk assessment during emergencies (PLANTPLAN, AQUAVETPLAN, MPPLAN; see criterion A4) has an information system, but as those are not coordinated, it was rated P.

New Zealand, information systems exist but are not integrated. An aim of the Biosecurity NZ Biosecurity Surveillance Strategy is to develop a system-wide information sharing system, although there is no target date for when this should be in place. There is also an ongoing programme to integrate the electronic database information of Biosecurity NZ and customs.

In Canada, this criterion is a part of early-detection goals of the strategy, but no information onimplementation was found.

In the USA, no system as such was found. However, guidelines for the 'Establishment & Evaluation of Invasive Species Early Detection & Rapid Response Systems' are available from NISC, published in 2003.[75]

At State/regional level, initiatives are in place for aquatic nuisance species, e.g. in the Northeast a workshop on prevention and early detection was convened [76]; In the West a model rapid response plan is available[77]; in Maryland a document on rapid response planning for aquatic invasive species is available[78]; a rapid response plan is also available for the Gulf of Mexico[79].

4.4.4. MANDATORY RAPID RESPONSE ACCORDING TO STANDARDISED PROTOCOL (CRITERION C.4)

At EU level, rapid response is implemented in the EU for phytosanitary and/or veterinary issues. For example, specific measures apply for a list of diseases that the EU aims to eradicate from its territory, with rapid responses. In particular for avian influenza H5N1 virus, the European Commission required all MS to step up their surveillance to enable early-detection and rapid response in the event of an outbreak[80]. Emergency measures are also on-going against *Phytophtora ramorum* (exotic fungus), *Diabrotica virgifera* (alien insect) and other species in the framework of the Plant Health regime. Illustrations of phytosanitary systems are available from the Estonian and Slovenian assessments (EE126 and SI121), for rapid response to pests in

[75] See www.invasivespecies.gov/global/EDRR/EDRR_documents/Guidelines%20for%20Early%20Detection%20&%20Rapid%20Response.pdf more information is also available from: www.invasivespeciesinfo.gov/toolkit/detection.shtml and www.nbii.gov/portal/server.pt/community/early_detection,_rapid_response_%28edrr%29/701

[76] www.northeastans.org/docs/neanspanel.ped.workshop.summary.5.2008.pdf

[77] www.fws.gov/answest/Docs/WRP%20RRP%20Final.pdf

[78] www.midatlanticpanel.org/resources/documents/MarylandPlanFinal.pdf

[79] www.gsarp.org/pubs/Regional%20Rapid%20Response%20Plan.pdf

[80] ec.europa.eu/food/animal/diseases/controlmeasures/avian/eu_resp_surveillance_en.htm

the German and Austrian country assessment (AT142) and for aquaculture diseases in the Belgian and Austrian country assessments (BE161 and 141).

The criterion was considered fully covered if a rapid response specifically targeting IAS is mandatory, and goes beyond the EU common core measures related to plant and animal health.

- **EU Member States**

- **Full coverage**

Estonia was the only country that fully covered this criterion . Indeed, if the results of scientific monitoring show negative impacts caused by a certain species, an official plan of action will be developed in order to avoid environmental hazard and/or threats to human health (EE120). The action plan must include set actions, e.g. control options and budgets (implemented for hogweed with EE302). The control of the abundance of a non-native species accidentally released in the wild is organised by the Environmental Board.

- **Partial coverage**

Four MS were rated as partially covering the criterion (CZ, DK, ES, UK).

Some requirements on rapid response apply for certain species only in Denmark and the Czech Republic. For example, observed or suspected presence of muskrat (*Ondatra zibethicus*) in Denmark must be reported, and subsequently eradicated under instruction form the Danish Pest Infestation Laboratory (DK167). In the Czech Republic, emergency phytosanitary measures are called upon if listed IAS occur or are suspected to occur (CZ123). In Spain, rapid response mechanisms were only identified in the region of Valencia; through the questionnaire.

Strategies aim to develop rapid responses in Northern Ireland and in the UK (NI400* and GB300*), but no information on implementation could be found.

- **No coverage**

No information was found regarding 22 MS (AT, BE, BG, CY, DE, FI, FR, HU, GR, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, SE).

- **Selected OECD countries**

- **Full coverage**

In the USA, detection and rapid response to populations of IAS are mandatory under the Executive Order 13112 (1999) on invasive species and the National Invasive Species Management Plan 2008-2012. However a system as such was only identified at State level (see C3).

In Australia, the emergency plans (AQUAVETPLAN, PLANTPLAN, MPPLAN and AUSVETPLAN; see criterion A4) define which responses need to be taken. The plans aim to target all taxa.

- **Partial coverage**

In Canada, no formal rapid response fror IAS is coordinated by the Canadian Food Inspection Agency (CFIA), which is the lead agency for invasive alien plants and plant pests in Canada, and whose role includes preparedness for protection of human, animal and plant health. However, the Canadian IAS Strategy includes rapid response as the third step of a four-step hierarchical approach. It lists both "critical" and "high priority" actions. The critical actions are to develop contingency and emergency response plans and to develop systems and networks for rapid decision-making, communication and implementation of the plans. Thus, Canada receives a P because these actions are goals of the strategy and have not yet necessarily been implemented.

In New Zealand, regulations can be made during biosecurity emergencies (BSA'93), but no obligation for rapid response is in place. However, a response to risk organisms is foreseen with a specific procedure in the *Policy for MAF's Responses to Risk Organisms*. The country was rated P as no obligation is in place.

4.4.5. ERADICATION PLANNING (CRITERION C.5)

Planning eradications is implemented in the EU for phytosanitary and sanitary issues. As explained above (criterion C4), certain diseases have for instance been declared as those that the EU aims to eradicate within its territory. Eradication measures must also be taken in the framework of the plant health regime to eradicate harmful organisms[81], which are classified in different categories: 1) Harmful organisms which are found within the Community for the first time[82]; 2) Harmful organisms which are found in Member States' territory where their presence was previously unknown[83]; or 3) Other harmful organisms previously unknown to occur in the Community[84]. Control planning was also taken into account in this criterion as no other criterion covers control planning, but control is a step that can be preferred to eradication in certain cases and for certain species, because it is more cost- or resource-effective. For this criterion, obligations under those regulations are not covered as they are part of the common core for all EU MS.

To fully cover the criterion, the countries should have legal obligations imposing eradication (or control in case more relevant) planning when a new species enters that is likely to become invasive or to cause damage. The requirements of this eradicaton plan should go beyond those of the Plant and Animal health regimes. The plan for eradication does not need to apply in the same way to all species as it should be flexible enough to meet emerging risks and include species-specific approaches to eradication.

[81] See ec.europa.eu/food/plant/organisms/emergency/index_en.htm
[82] listed in Annexes I and II (Part A, Section I) to Directive 2000/29/EC
[83] listed in Annexes I and II (Part A, Section II) to Directive 2000/29/EC
[84] which are not listed specifically in Directive 2000/29/EC but which are of potential economic importance

EU Member States

Full coverage

Eradication planning measures were found in two MS (BG and CZ). In the Czech Republic, the nature protection authority can decide to eradicate of alien species (CZ120). A publication describes 13 plant species and suggests methods for their eradication (CZ500). In Bulgaria, action plans may be set up to control IAS, if it is established that their introduction into nature harms natural habitats or the status of fauna or flora native species (BG121).

Partial coverage

Twelve MS were found to partially cover the criterion (DK, EE, ES, FR, HU, IE, MT, NL, RO, SE, SK, UK).

Requirements may be ordered, but are not necessarily implemented

The possibility to implement plans may be foreseen in texts, but for the moment no implementation was found, as is the case in Malta (MT150); or in Romania where control or eradication of IAS can be allowed (RO160). In Hungary eradication of forest plantations can be ordered, e.g. if the growing stock was planted without permission or is not in compliance with the exemption requirements and could cause harm to surrounding habitats/forests (HU124). EE120 also allows an action plan against IAS to be implemented.

No clear legally-binding requirement

Similarly in the Netherlands responsibilities are organised, as the IAST is in charge of advising the Ministry on eradication issues (NL301*). For example, an action was put in place for eradication of the bullfrog from a pond, but it is not clear whether that action was mandatory or not, thus NL was rated P.

Specific species are targeted

In some cases, only specific species are targeted by eradication. In France, this is the case for listed species (FR110), harmful organisms (FR110), coypu and muskrat (FR111). In Ireland, measures apply for fishes (IE123, see also IE300 below) and in the UK for specific pests (not necessarily harmful organisms as designated in the EU, as GB129 targets rabbits, hares or vermin and GB134 pests, see also GB300* below). In Slovakia eradication methods for plants are being developed (SK500), and action plans are in place for harmful species (SK121). Also related to plants, in Spain, ES500* lists recommended actions for prevention, control, management and eradication of listed invasive species of plants.

In Sweden, while no generic/mandatory rules are in place targeting IAS, EPPO standards are generally applied. Additionally, voluntary efforts for eradication at county level, e.g. in the case of Giant hogweed (*Heracleum mantegazzianum* in Jätteloka).

Aims of strategies

Strategies can also aim to cover this criterion. This is the case in the Irish action plan, Northern Irish strategy and UK strategy (IE300, NI400* and GB300*).

Hunting IAS

Specific hunting rules can also apply to some invasive alien game species, that play a role in the control of those species. This is the case in Denmark, where several IAS can be regulated through hunting throughout the year according to DK161 and DK163 (regulations of hunting are framed by DK121). Similarly, in Sweden, hunting of certain non-native species is permitted year-round. As permitting hunting is slightly different from organised and systematic eradication of IAS, Denmark and Sweden were rated P.

- **No coverage**

No information was found for thirteen MS (AT, BE, CY, DE, FI, GR, IT, LV, LT, LU, PL, PT, SI).

Some measures may be a potential barrier to eradication, as eradication of species is generally forbidden or can only be done for certain species: in Slovenia eradication of species is generally forbidden (SI120, but see D1) ; in Austria killing animals should only occur with reasonable reasons, but this does not apply to fighting pests (AT121).

  - **Selected OECD countries**

- **Full coverage**

In Australia eradication plans are undertaken if feasible and after cost-benefit assessment.

- **Partial coverage**

In Canada, animal and plant health requirements apply, and the IAS strategy includes a systematic approach to eradication, once an IAS has established. Canada was rated P as this is an objective of the strategy, which is not legally binding.

In New Zealand, procedures are in place only on ad-hoc basis and for certain species, thus rated P.

In the USA, species specific efforts are ongoing, including eradication and control efforts around quarantine species. On the wildlife side there are a number of examples of localized eradication efforts frequently involving USDA APHIS Wildlife Services, the property managers (e.g., National Park Service), relevant state and local agencies, and NGOs with relevant expertise (e.g., The Nature Conservancy, Island Conservation). Additionally, the Salit cedar and Russian olive control demonstration act, National Plan for Control and Management of Sudden Oak Death refer to control/management plans, while the Noxious Weed Control and Eradication Act directly mentions eradication planning. As this is species-specific, the USA was rated P.

4.4.6. AGREEMENTS WITH NEIGHBOURING COUNTRIES ON ALERT PROCEDURES (CRITERION C.6)

EU Member States

NOBANIS includes a number of non-EU European countries, including Iceland, Norway and the European part of Russia. The Carpathian Convention also provides a framework for cooperation between the Czech Republic, Hungary, Poland, Romania and Slovakia, and with Ukraine and Serbia. Specifically, the Strategic Action Plan for the implementation of the Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity under the Convention contains an objective for the prevention of introduction, control or eradication of alien invasive species[85].

Full coverage for this criterion implied that a formal channel for alerting neighbouring countries of IAS spread was in place in the country.

Full coverage

No MS was found to formally have an organised way to alert neighbouring countries in case of IAS spread.

Partial coverage

Seventeen MS (AT, BE, CZ, DE, DK, EE, FI, HU, IE, LV, LT, NL, PL, RO (see RO121), SK, SE, UK) were rated P for this criterion.

NOBANIS provides a framework for exchanging information and includes specific alerts (www.nobanis.org/species%20alert.asp) in the framework of a pilot project initiated recently. All NOBANIS participating MS were thus rated P (AT, BE, CZ, DE, DK, EE, FI, IE, LV, LT, NL, PL, SK, SE). As this is a pilot project and only in the process of being implemented, it was rated P.

Additionally, those MS collaborating in the framework of the Carpathian convention were rated P (CZ, HU, PL, RO (see RO121), SK). Indeed IAS are mentioned in that framework (article 4.3 states that 'The Parties shall pursue policies aiming at the prevention of introduction of alien invasive species and release of genetically modified organisms threatening ecosystems, habitats or species, their control or eradication'). However, no alert procedures were identified.

In Ireland and the UK (GB and NI) strategies include objectives to work with neighbouring countries and to emphasise cross-border cooperation (respectively IE300 and GB300* and NI400*).

Similar coverage

Some projects are also organised between MS, such as the Invexo project between the Netherlands and Belgium that aims to control several IAS, the Interreg programme between Luxembourg and Belgium to remove resinous trees and plant indigenous

[85] Available from : www.carpathianconvention.org/NR/rdonlyres/6400B2D5-A0D3-4E28-8D14-99912E00045C/0/DraftStrategicActionPlan.pdf [Accessed 2/5/2011]

trees instead, or the Interreg programme between France and Belgium on muskrat control, but do not set alert procedures at all (thus LU rated S, others were rated P as part of Nobanis).

- **No coverage**

No specific cooperation agreement was found in nine MS (BG, CY, ES, FR, GR, IT, MT, PT, SI).

  - **Selected OECD countries**

- **Partial coverage**

In the USA, International cooperation is one of the tasks of the US Invasive Species Council. In particular, an agreement is in place with Canada on Great Lakes fisheries and with Mexico through the American Plant Protection Organisation. Cooperation between Canada and USA and between Canada and Mexico occur in the same frameworks. As these affect specific taxa, the countries were rated P.

- **No coverage**

In Australia it was mentioned that cooperation occurs as party to international conventions, but no specific agreements were found with neighbouring countries. In New Zealand, the only relevant information is that agreements with trade partners include phytosanitary issues. As both Australia and New Zealand are islands, the criterion is not necessarily applicable.

4.4.7. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
C1	18	0	7	2	0	1	3	0
C2	22	0	5	0	1	0	3	0
C3	11	0	16	0	0	0	4	0
C4	23	0	4	0	0	0	3	1
C5	13	0	12	2	0	0	2	2
C6	9	1	17	0	2N/A	0	2	0

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

Overall, criteria on early-warning and rapid responses were not well covered in the EU, with each criterion receiving two or fewer Ys. Particular gaps are C2 (targeted monitoring around key entry points) and C4 (mandatory rapid response), with respectively 22 and 23 MS not having anything in place for either criterion. C1 is better covered than both C2 and C4, but there are still a relatively large number of MS with no system in place (18N). This means that few mechanisms for detection or response are in place, and thus there is a risk that IAS spread rapidly unnoticed in a new environment.

C6 (agreements with neighbouring countries on alert procedures) is one of the best covered of the C criteria, with 17 MS being rated P. This is due to NOBANIS which includes a pilot project on alerts. Similarly, 16 MS were rated either P for C3 (Dedicated early-warning and information dissemination system) because NOBANIS serves as an information dissemination system and has a pilot project on alerts in place. At EU level, the creation of such a system has already been investigated by EEA[86].

OECD countries cover those criteria better than the EU, but only partially. This is due to the fact that many measures are either not legally-binding or State/species-specific. In particular, the Australian plans (AQUAVETPLAN, PLANTPLAN, MPPLAN and AUSVETPLAN) include requirements in terms of surveillance (C.1), and rapid-responses. (C.4). Rapid responses are implemented at State-level in the USA. Species-based responses are also implemented in the USA for surveillance (C.1), in the USA and Canada in terms of alert procedures (C.6) and in Canada, the USA and New Zealand for eradication planning (C.5). In Australia eradication planning depends on an assessment of feasibility and cost-benefits. The early-warning systems (C.3) are not integrated across taxa in Australia. They remain one of the aims of the strategies for Canada and New Zealand, while guidelines for implementation were identified in the USA.

[86] Towards an early-warning and information system for invasive alien species (IAS) threatening biodiversity in Europe Technical report No 5/2010, available from: www.eea.europa.eu/publications/information-system-invasive-alien-species

4.5. CRITERIA D: CONTROL, MANAGEMENT AND ECOLOGICAL RESTORATION

4.5.1. NATIONAL OR REGIONAL MANDATORY REQUIREMENT TO CONTROL OR ERADICATE (CRITERION D.1)

According to the EU Common Plant Health Regime, MS are obliged to take measures to eradicate or, if this is not possible, prevent the spread of harmful organisms. Such a requirement could also be implemented to ensure that an IAS is not spreading across the EU. This criterion is considered fulfilled if the control or eradication measure is mandatory beyond the requirements of the Plant Health Regime or eradication of specific diseases for animal health.

- **EU Member States**

- **Full coverage**

Two MS (DE, LT) fully covered the criterion.

In Germany the national and "Länder" authorities are required to take measures to eradicate or control the spread of any newly arrived IAS (DE120). Furthermore, the authorities can require the eradication of unintentionally introduced animals or plants. Good practices must be taken for plant protection, including the prevention of pests and their control and eradication (DE121).

In Lithuania, individual species of wild plants and their abundance must be regulated under the Law on Natural Vegetation so that they do not harm the environment and other wild plant and animal species (LT121). Legislation on IAS in general, LT160B, describes the procedures for control and destruction of IAS.

- **Partial coverage**

Nineteen MS (BE, CZ, DK, EE, ES, FR, FI, GR, HU, IT, LV, LU, NL, PL, PT, SE, SI, SK, UK) partially covered the criterion, receiving a P in the assessment.

These MS were rated P because they cover only some taxa or areas (e.g. forestry), their regulations only allow for control, without requiring it, or because control/eradication is an aim of strategies but not yet implemented. Control/eradication measures can also be included as conditions to receive public funding.

Provisions may be restricted to certain species or groups of species. For example, landowners in Latvia are required to eradicate invasive plant species (LV121), and control of *Heracleum sosnowskyi* is mandatory (LV151), but there are no provisions for animal species. In Slovenia, a specific procedure has been established for plants from the genus Ambrosia, especially *Ambrosia artemisiifolia* (SI163). In Estonia, a management plan for hogweed is in place (EE302). In Spain, control measures of specific IAS (American mink, ruddy duck) are included in action plans protecting the

species they threaten (European mink, White-headed duck) and an action plan against the zebra mussel is in place.

In several MS (CZ, DK, ES, FI, GR, HU, SI, SK), there are opportunities and frameworks within which mandatory requirements can be introduced although such requirements do not currently exist or are restricted to specific areas. For example, in the Czech Republic, the nature protection authority can decide to require the eradication of non-native animal species (CZ120). In Hungary the Directorate may initiate an order for population control or eradication of non-native or non-naturalised species (HU120). Some specific control requirements also exist for Natura 2000 areas (HU163) or for tree species (HU164). The Finnish Ministry of the Environment has the opportunity to introduce regulations for preventing the spread of certain non-native species (FI129). Similarly, the Ministry of Forestry can impose the removal of trees if there is widespread damage caused by insects or fungi, or a risk of such damage occurring (FI127). In Spain, control and eradication measures will be initiated in particular circumstances. For example, authorised and appropriate control measures will be initiated following accidental or illegal introductions of alien species.(ES120). In Slovenia, the government will order procedures for the removal of alien plants or animals that endanger indigenous species (SI120). In Slovakia, the Central Controlling and Testing Institute in Agriculture can instruct the eradication of IAS on farmland (SK121). In Greece, the draft law on biodiversity protection foresees that management plans may be drawn up for IAS (GR220).

In other MS (BE, DK, ES, PT), management plans may be used as a means to control specific IAS, to reduce their impacts. For example, in Flanders, management plans may be developed to reduce negative ecological or economic impacts of non-indigenous species (BE171R). The Danish Action plan against raccoon dogs (DK301) includes a toolbox of eradication measures. Municipalities can also require land owners or users to eradicate Giant hogweed, according to local action plan in the municipality addressing Giant hogweed (DK160). In Spain, plans for the use and management of natural resources in Natural Parks must contain at least the criteria for the removal of exotic vegetation present within the National Park and for the control of IAS (ES122). In Portugal, non-indigenous invasive species that have already been introduced into the wild are the subject of a national plan that aims to control or eradicate them (PT152). In Sweden, the Hunting Law (SE121) may be used to introduce protective hunting of certain species which may be invasive.

The Netherlands takes a different approach: the province can designate individuals or groups to control species listed in ministerial or governmental decrees (NL120), but no control is mandatory.

Requirements for control or eradication may be an objective of a strategy or action plan for IAS or biodiversity (UK, PL, PT). For example, the Invasive Alien Species Strategy for Northern Ireland (NI400*, under consultation) states that protocols for eradication, control and containment will be developed for high-risk species. Less relevant measures also apply in GB, where provisions to improve the environmental

conditions of an area, which could include removal of IAS (GB138 and GB139R, England and Wales) are in place. Portugal's National Strategy for the Conservation of Nature and Biodiversity (PT100) includes an objective to develop and implement a national plan to control or eradicate alien species classified as weeds. The Polish biodiversity strategy aims to implement regulations, principles and programmes for IAS (PL300).

Spain also has a number of relevant provisions at regional level. In Extremadura, species classified as invasive may be subject to management measures to facilitate their control (ES125R).

A number of relevant provisions relate only to forestry (ES, HU, LU, PL, SI, SK). For example, in Luxembourg (LU301 and LU300) non-indigenous species in public and private forests should be replaced. In Poland, forest owners have the responsibility to eradicate harmful species if they become invasive (PL122). In Slovenia, eradication of alien species is mentioned in connection with care for forests but no measures or procedures are listed (SI163). In Slovakia, forest managers are required to act immediately if a forest is threatened or damaged by harmful agents (SK126).

In some MS (LU, PT), eradication or control is a requirement for the receipt of subsidies for forestry or agriculture. For example, forest managers in Luxembourg are required to eliminate non-indigenous vegetation in certain conditions to receive subsidies (LU153).

There are also several examples (BE, FR, IT, PL) of projects for control or eradication that are not a mandatory requirement, and thus rated P. For example, an INTERREG III programme is organised between France and Belgium. A LIFE+ project (EC-SQUARE) was initiated in 2010 in Italy for the eradication and control of the grey squirrel (see also Box 2).

- **No coverage**

Six MS were not found to have a national or regional mandatory requirement to control or eradicate IAS (AT, BG, CY, IE, MT, RO). This does not mean that nothing is done. Phytosanitary and veterinary issues were not in the scope of the assessment, but all MS implement the EU regulations, but do not target specifically IAS or have specific national provisions.

  - **Mandatory requirements to control or eradicate in selected OECD countries**

- **Full coverage**

Australia was rated Y because specific control or eradication requirements are integrated into both systems for quarantine and for land management/biosecurity. The requirements are imposed according to the category of quarantine to which exotic animal species are assigned or the classification to which weed species are assigned (see sub-section A5). The classifications are based not only on the risks the species pose, but also on how far the species has already spread. For example, in New South Wales, weeds that are classified as Class 1 (*"Plants that pose a potentially serious threat to primary production or the environment and are not present in the state or are*

present only to a limited extent") must be eradicated and the land must be kept free of the plant. By contrast, those in Class 3 (*"Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area"*) must be fully and continuously suppressed and destroyed.

In Australia, control and eradication are also linked with broader land management and biodiversity conservation systems, and with the land management practices of farmers and other landowners. Therefore, there are provisions for facilitating the control and eradication of IAS under institutional procedures for land management. These include the treatment of environmental and production management expenditures under the Income Tax Assessment Act (notably s51), special investment allowances for conservation investments, and the various government supports for regional natural resource management (notably a national system of Catchment Management organisations) and voluntary conservation.

The US (rated Y) takes a different approach to that of the other selected OECD countries. There are many pieces of legislation that require control or eradication of particular species or groups of species in particular circumstances. The Executive Order 13112 (1999) on Invasive Species requires that federal agencies must use relevant programmes and authorities to control invasive species. Other pieces of legislation, such as the Water Resources Development Act, allow for projects that are focused on control or eradication to be supported.

- **Partial coverage**

In New Zealand (rated P) there is no mandatory requirement to control or eradicate invasive species, although there are provisions in the Wild Animal Control Act 1977 for example, which enables the Department of Conservation to control or eradicate animals defined by the Act. Pest management strategies may also be developed under the Biosecurity Act 1993.

- **Similar coverage**

In Canada (rated S), requirements for control and eradication are linked to plant and animal health obligations, and thus are included in the Plant Protection Act and the Health of Animals Act. These acts are operated and enforced by the CFIA. As this would be a common core requirement for EU MS, the country was rated S.

4.5.2. DEFINITION OF ERADICATION OR CONTAINMENT/CONTROL END POINT, I.E. DEFINITION OF SUCCESS OF ERADICATION OR CONTROL ACTIONS (CRITERION D.2)

In order to ensure that the eradication/containment/control measures are successful in the longer term, it is necessary to define what the target of the measure is, and how success will be assessed. For control or containment it can be the number of

individuals left in the population, or the area in which the IAS is spread; for eradication, indicators linked to reproduction can be used. Full coverage of this criterion implies that the point to which no more actions will be taken against a species and it will be considered eradicated is precisely defined, and covers all taxa.

- **Definition of eradication/containment/control end point in EU Member States**

- **Full coverage**

No MS were found to have fully covered the criterion.

- **Partial coverage**

Three MS (DK, EE, LV) received a P in the assessment, as they define end points for a few target species only (raccoon dogs, *Heracleum sosnowskyi* and *Heracleum mantegazzianum*).

Denmark defines end points in two texts (DK301 and DK160): the definition of eradication is that there is no breeding population of raccoon dogs left in Denmark by 2015; and the eradication of the giant hogweed must lead to its extinction in the area in question and must prevent its reproduction.

In Estonia, the Environmental Board should carry out annual surveys of colonies under eradication to determine if all plants have been eradicated (EE302).

In Latvia, the regulation states that eradication must be continued until the plants are eliminated (LV151).

- **Similar coverage**

One country (RO) does not refer to IAS as such, but have some control points that include organisms that are IAS, is was rated S.

Romania received an S in the assessment because RO160 describes the general principles of containment but does not provide a precise definition of successful eradication.

- **No coverage**

Twenty-three MS were not found to have covered the criterion (AT, BE, BG, CY, CZ, DE, ES, FI, FR, GR, HU, IE, IT, LT, LU, MT, NL, PT, PL, SE, SI, SK, UK). It can be mentioned that pest control measures are illustrated in AT and NI, but rated N as they refer to plant health and would apply in all EU MS: Austria defines the eradication end point for plant pests (AT142). Measures must be taken until it can be assumed that the targeted pest is dead, at which point a new control is performed to ensure that the plants are free from pests. In Northern Ireland, the end point is considered to be when procedures for the long-term management of the pest/plant health risk have been implemented, a final report completed, and the handling of the incident reviewed

- **Definition of eradication/containment/control end point in selected OECD countries**

■ **Full coverage**

New Zealand received a Y because the policy from the Ministry of Agriculture and Forestry Biosecurity New Zealand (MAFBNZ Policy) for Responses to Risk Organisms (2008) defines eradication as *"the removal of every individual and propagule of a species from New Zealand so that only reintroduction from beyond New Zealand's borders would enable the re-emergence of the species. Achievement of eradication should be demonstrated by surveillance".*

■ **Partial coverage**

In Australia, endpoints for eradication, containment and control may be included in strategic plans for declared IAS. Thus it received a P because there is no overarching definition for all circumstances. Depending on the strategy and species in question, 'eradication' may in practice refer to a desire to ensure the species does not exist in a certain region. 'Control' is also specified by the management objectives. The level of control and region of control is guided by a management plan/strategic plan/threat abatement plan.

In Canada and the USA, end points may be defined on a species-by-species basis and are thus rated P. In Canada, see the Sea lamprey programme and in the USA the acts on control of salt cedar, muskrat, etc.

4.5.3. MANDATORY MONITORING OF SPREAD ACCORDING TO STANDARDISED PROTOCOL (CRITERION D.3)

IAS by definition are new species not necessarily known in the country in which they are introduced. Monitoring their spread may have different goals: (1) assessing whether the species indeed is invasive, or (2) identifying the pathways it uses. In EU regulation, Council Regulation 708/2007 states that alien species should be monitored after their release into open aquaculture. This allows monitoring whether an alien species becomes invasive. Under the Plant Health Regime, monitoring the spread of harmful organisms is also mandatory.

Full coverage required that a standardised protocol is in place for monitoring the spread of IAS, for different types of IAS.

- **Mandatory monitoring of spread in EU Member States**

■ **Full coverage**

No MS were found to have fully covered the criterion.

- **Partial coverage**

Six MS (EE, UK (for NI), IT, LT, LV, SK) received a P in the assessment.

Three MS (EE, LT and LV), monitor the spread or impacts of IAS to establish their invasiveness, but no standard protocols appear to have been defined. In Estonia, action will be taken if scientific monitoring shows negative impacts are being caused by certain species(EE120). Therefore, there is mention of monitoring taking place, but there no mention of a defined standardised protocol for this. Similarly, Latvia has requirements for monitoring introduced populations (LV120), but also does not appear to have a defined and standardised protocol. The results shall be submitted to the Nature Protection Board. For a specific species however, a system for mandatory reporting of the spread of Sosnowsky's Hogweed (*Heracleum sosnowskyi*) on a yearly basis is in place (LV151). In Lithuania, there must be permanent species monitoring for five years after introductions of species outside their natural range limits (LT160A). After this, monitoring shall be undertaken every five years. The monitoring must be carried out by qualified specialists and the costs associated with the monitoring shall be borne by those who carry out the introduction / reintroduction.

In two MS mandatory monitoring of spread is planned as part of their IAS or biodiversity strategy (UK for NI and IT), but not yet implemented. In Northern Ireland, the development of monitoring protocols is one objective of the strategy (under consultation, NI400*). The protocols will be supported by a toolkit to ensure a consistent and coordinated approach to monitoring. Similarly, the Italian National Strategy on Biodiversity (IT300) recommends that information is collected, monitored, managed and shared.

While the Slovakian draft IAS strategy does not include requirements for monitoring either, Slovakia has a standardised protocol in place for reporting occurrences of IAS[87], although such reporting does not appear to be mandatory.

- **Similar coverage**

Two MS were rated S (NL and IE). The Netherlands Policy Plan on Invasive Species (NL301*) mentions which agency is responsible for monitoring, but monitoring is not mandatory. The 2010 JRC report on IAS and the Water Framework Directive[88] report on 17 IAS monitored through programmes in Ireland, but it is not clear in what context the programmes are in place.

- **No coverage**

Nineteen MS did not appear to have mandatory monitoring of IAS spread according to a standardised protocol (AT, BE, BG, CY, CZ, DE, DK, ES, FI, FR, GR, HU, LU, MT, PT, PL, RO, SE, SI). This includes six MS that have IAS strategies in place or in development, but which do not include any requirements for monitoring (AT, DK, ES, FI, SK and UK for

[87] Available from: www.sopsr.sk/publikacie/invazne/doc/Ev_list_2009_new.doc [Accessed 13/6/2011]
[88] Available from: publications.jrc.ec.europa.eu/repository/bitstream/111111111/13564/1/alien%20species%20questionnaire%20report%20%28jrc%20s%26tr%29.pdf

GB). However, specific monitoring of IAS in the framework of the Water Framework Directive is in place in some of the MS rated N, although it is not clear which ones in particular (JRC report 2010). According to this report, most of the monitoring systems are not mandatory and targeting certain species only, which would in any case not lead to a Y for those MS.

- **Mandatory monitoring of spread in selected OECD countries**

Approaches for covering this criterion in the four OECD countries are varied.

- **Full coverage**

In Australia (rated Y) the coverage of this criterion depends largely on the species in question and the objectives of its threat abatement plan. For example, when eradication is the objective, then vectors and the region in question are strictly monitored for signs of re-infestation. Where control is the objective, the level of infestation is monitored. Individual threat abatement plans may state that monitoring protocols need to be developed. For example, the plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands[89] mentions that "*adequate monitoring protocols for sustained control options need to be formulated and tested*".

There are protocols for monitoring the spread of individual IAS in Canada (rated Y), with data on each species being maintained by the CFIA. The protocols exist under the CFIA's Program Activity Architecture and Performance Measurement Framework, two framework approaches that guide operations and practices.

As for criterion D.1 in the USA (rated Y), there are many pieces of legislation that either require monitoring of spread or allow projects carrying out such monitoring to be supported.

- **No coverage**

There is no mandatory requirement for monitoring spread in New Zealand (rated N).

4.5.4. MANDATORY MONITORING OF ERADICATION OR CONTAINMENT ACTIONS (CRITERION D.4)

Once the actions of control/eradication/containment are underway, regular monitoring is needed to assess their success (see D3) and to check that the IAS does not spread again. The full coverage of this criterion implied some eradication or containment actions were taken in the country (see D1 and D2), and that monitoring their efficiency was mandatory. The criterion can thus only be fulfilled in those countries that were rated Y or P in criterion D1.

[89] Australian Government, 2009. Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares. Available from: www.environment.gov.au/biodiversity/threatened/publications/tap/pubs/exotic-rodents.pdf [Accessed 21/6/2011]

- **EU Member States**

- **Full coverage**

No MS were found to fully cover this criterion.

- **Partial coverage**

Two MS (EE, LV) were found to partially cover the criterion.

In Estonia, a single species is concerned by the mandatory monitoring of eradication or containment actions. The Environmental Board should carry out annual surveys of colonies of hogweed under eradication to determine if all plants have been eradicated. Also, scientific surveys should be carried out in 5% of the colonies, including before and after eradication work (EE302).Similarly, in Latvia the monitoring concentrates on the giant hogweed only (LV120, LV121).

- **No coverage**

Twenty-five MS were not found to include mandatory monitoring of eradication or containment actions (AT, BE, BG, CY, CZ, DE, DK, ES, FI, FR, GR, HU, IE, IT, LT, LU, MT, NL, PT, PL, RO, SE, SI, SK, UK).

- **Mandatory monitoring of eradication or containment actions in selected OECD countries**

This criterion is not well covered in the four OECD countries. New Zealand and the USA were rated N, Canada was rated P and only Australia was rated Y.

- **Full coverage**

As above, the monitoring of eradication and containment actions in Australia is a part of the requirements for managing IAS depending on their declaration status (see A5). The monitoring of actions may also be included in threat abatement plans. For example, the plan for tramp ants[90] includes an action to develop monitoring protocols for follow-up of control technologies.

- **Partial coverage**

In Canada, mandatory monitoring of eradication and containment actions is a high-priority goal of the Strategy.

- **No coverage**

New Zealand and the USA were not found to cover this criterion.

[90]Available from : www.environment.gov.au/biodiversity/threatened/publications/tap/trampants.html [Accessed 20/6/2011]

4.5.5. EX-POST MONITORING OBLIGATIONS, I.E. LONG TERM MONITORING TO ENSURE SUCCESS OF ERADICATION OR CONTAINMENT ACTIONS (CRITERION D.5)

Even after monitoring requirements apply, long-term monitoring, after the measures have been terminated can be implemented to ensure the success of the action. Again, if no eradication was in place (see D1), or if no end point was defined (see D2), such criterion cannot be covered.

Full coverage of this criterion implies mandatory monitoring after the species is deemed eradicated and coverage of all taxa.

- **Ex-post monitoring obligations in EU Member States**

- **Full coverage**

No MS were found to fully cover this criterion.

- **Partial coverage**

Four MS (DK, EE, LT, LV) partially covered the criterion, receiving a P in the assessment.

In Estonia, in addition to monitoring mentioned in D4 (on a single species only, thus rated P), scientific surveys should be carried out in 5% of colonies, including before and after eradication work (EE302). In Lithuania, for a period of five years permanent species monitoring must be implemented, then monitoring must occur every five years (LT160A). In Latvia, for all methods against *Heracleum sosnowskyi* it says eradication must be continued until the plants are eliminated; the timeframe is dependent on the method, but up till "at least 6-8 years" is mentioned. Also, data about control results must be submitted (LV151). In Denmark also *Heracleum* eradication includes specific monitoring measures, without mention of a timeframe (DK160).

- **No coverage**

Twenty-three MS were not found to have any ex-post monitoring obligations (AT, BE, BG, CY, CZ, DE, ES, FI, FR, GR, HU, IE, IT, LU, MT, NL, PT, PL, RO, SE, SI, SK, UK).

- **Ex-post monitoring obligations in selected OECD countries**

- **Full coverage**

Australia is the only one of the four OECD countries to be rated Y for this assessment. As above, the Australian ex-post monitoring obligations are part of the requirements for managing IAS depending on their declaration status (see A5).

- **Similar coverage**

The USA (rated S) has provision for covering this criterion in one specific circumstance. The Non-Indigenous Aquatic Nuisance Prevention and Control Act requires that the taskforce evaluate measures for preventing introductions are effective and environmentally sound.

- **No coverage**

Ex-post monitoring obligations in Canada (rated N) have not been found. However, there are measures in place to prevent re-invasion following eradication. These obligations were also not found in New Zealand (rated N).

4.5.6. MANDATORY REPORTING TO AUTHORITIES ACCORDING TO STANDARDISED PROTOCOL (CRITERION D.6)

According to the Plant Health Regime, MS have an obligation to notify the Commission and other MS of the presence within their territory of harmful organisms.

Full coverage of this criterion implies an obligation of reporting is in place, based on a standard protocol, and with clear responsibilities. The reporting must be able to cover any IAS.

- **Mandatory reporting in EU Member States**

- **Full coverage**

No MS was found to fully cover the criterion.

- **Partial coverage**

Three MS (DK, EE, UK) were found to partially cover the criterion, receiving a P in the assessment.

In Denmark, the Minister may establish rules for reporting obligations, but this opportunity is currently limited to unwanted plant species and only implemented for the hogweed (DK160).

In Estonia, the Environmental Board already manages the surveys and databases, thus short-circuiting the need for reporting requirements. However, this arrangement appears to be restricted to *Heracleum* management (EE302).

In Northern Ireland, this issue is addressed by the Invasive Alien Species Strategy for Northern Ireland (under consultation, NI400*). The Strategy does not lay out any objectives for making reporting mandatory, but it does state that a mechanism for reporting invasive alien species will be developed to inform the response to threats.

- **No coverage**

Twenty-four MS were not found to have requirements for mandatory reporting to authorities according to a standardised protocol for IAS (AT, BE, BG, CY, CZ, DE, ES, FI, FR, GR, HU, IE, IT, LT, LU, LV, MT, NL, PT, PL, RO, SE, SI, SK).

- **Mandatory reporting in selected OECD countries**

- **Full coverage**

There are only requirements for reporting in Australia and New Zealand (both rated Y). As for many other D criteria, reporting of IAS in Australia is also part of the

requirements for managing IAS according to their declaration. Furthermore, plans for this management include deeds/agreements that are aimed at removing disincentives for reporting IAS. In New Zealand there is a requirement to report sightings of species that are suspected to risks. There is also an obligation to report notifiable organisms, as declared by the Governor-General.

- **Partial coverage**

There does not appear to be a protocol for mandatory reporting in Canada, although it was rated P because the Environmental Protection Act does allow such a protocol to be created.

- **No coverage**

A reporting requirement was not identified for the USA (rated N).

4.5.7. MANDATORY REQUIREMENTS TO RESTORE THE DAMAGED ECOSYSTEMS AND/OR ADDRESS OTHER ENVIRONMENTAL DAMAGE (CRITERION D.7)

After invasions have been controlled/contained/eradicated, the ecosystem may need to be restored to its state prior to the invasion. Restoration activities may also be needed to minimise the impacts of ecosystem disturbance caused by the control/eradication of IAS, that could make the ecosystem vulnerable to other invasions or disturbances[91]. In the EU, the Environmental Liability Directive[92] establishes liability with the aim to prevent and remedy environmental damage, based on the "polluter-pays" principle. The ELD requires restoration measures to be taken in case environmental damage has occurred.

Full coverage of this criterion involves mandatory restoration or reduction of environmental damage caused by IAS.

- **Restoration requirements in EU Member States**

- **Full coverage**

One country was found to fully cover the criterion related to mandatory requirements to restore environmental damage.

In Spain, when environmental damage has occurred, including via IAS, the natural resources must be restored to their primary state in the location in which the damage occurred (ES160). The regulation identifies three types of reparations: primary, compensatory or complementary. During primary reparation, which aims to restore or approximate as far as possible the natural resources and services to their initial state, an action is included to avoid the effect of IAS.

[91] D'Antonio, C. and Meyerson, L.A., 2002. Exotic plant species as problems and solutions in ecological restoration: a synthesis. *Restoration Ecology*, **10** (4): 703-713.

[92] **Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage**

- **Partial coverage**

Two MS (LT, PT) were found to partially cover this criterion, receiving a P in the assessment.

Restoration of environmental damage caused by IAS is required in Lithuania, but only for plants. If IAS are planted without a permit, through negligence or ignorance, the persons responsible must restore the habitat to its former state (LT160A).

In Portugal, restoration of natural habitats in areas particularly infested with invasive species of vegetation, through eliminating or reducing populations of IAS is encouraged (PT150)[93]. However, this is not currently a requirement/obligation, and furthermore the text focuses specifically on invasive plant species in forests.

- **No coverage**

Twenty-four MS were not found to have mandatory requirements in place for restoration of environmental damage (AT, BE, BG, CY, CZ, DE, DK, EE, FI, FR, GR, HU, IE, IT, LU, LV, MT, NL, PL, RO, SE, SI, SK, UK).

Among these MS, some apply the ELD to require restoration after invasions, as illustrated for the cases of Hungary and Ireland. Hungary has requirements for restoration in the context of legislation on nature conservation and environmental protection (HU120 and HU121 respectively), although restoration following damage from IAS is not specifically mentioned. Natural and legal persons are required to cooperate in restoring ecosystems to the state prior to the damage (HU120). Similarly, "users of the environment" are required to restore damage to the environment caused by use of the land (HU121). The National Strategy and Action Plan on Conservation of Biodiversity (HU300) also has guidance for restoration, which mentions IAS as a potential cause of habitat damage but does not directly refer to restoration following IAS damage. The Irish Local Government Act (IE126) states that local governments can take measures to restore land to promote environmental development. Therefore, although there is scope for using these powers to restore damage from IAS, the text does not introduce a legal obligation and does not specifically mention restoration of damage caused by IAS[94].

- **Restoration requirements in selected OECD countries**

- **Full coverage**

Australia and the USA received a Y for this criterion. As for many of the other D criteria, Australia's requirements for restoration are introduced on a species-by-species basis. Threat abatement plans developed for individual species emphasise restoration of damaged ecosystems to the level at which it is no longer considered to be under threat. It is possible for orders to be given under the Environment Planning and

[93] This regulation is an example of the type of regulation introduced for planning other natural parks.

[94] Turner, S., 2008. The control of invasive alien species. A review of legislation and governance for Ireland and Northern Ireland. Queen's University Belfast, 2008.

Biodiversity Conservation Act to remediate habitats, but this is not a conventional component of IAS management.

There are many pieces of legislation in the USA that either require restoration to be carried out or allow projects undertaking restoration to be supported. The Executive Order 13112 on invasive species is again of note, and again requires that federal agencies use relevant programmes and authorities to restore native species and habitats within ecosystems that have been invaded.

- **Partial coverage**

Restoration is also emphasised in Canada (rated P) but is not formally planned on a species-by-species basis. It is conducted by the CFIA as a consequence of the provisions of the Environmental Protection Act.

- **Similar coverage**

In New Zealand, no mandatory requirement for restoration has been foundafter invasion. However, similarly to the ELD in the EU, the Resource Management Act enables restoration works to be carried out and environmental damages to be addressed. As this would fall under common core for the MS, NZ was rated S.

4.5.8. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
D1	6	0	19	2	0	1	1	2
D2	23	1	3	0	0	0	3	1
D3	19	2	6	0	1	0	0	3
D4	25	0	2	0	2	0	1	1
D5	23	0	4	0	2	1	0	1
D6	24	0	3	0	1	0	1	2
D7	24	0	2	1	0	1	1	2

Note: the P rating was assigned for a variety of reasons explained in the text, and therefore the countries receiving a P for any given criterion are not comparable.

Overall, the D criteria are poorly covered by EU MS.

Mandatory requirements for the control or eradication of IAS (criterion D1) that go beyond the requirements of the EU Plant Health Regime are lacking in the EU; only two MS were rated Y for this criterion. However, the criterion is partially covered by many MS. This means that there are partial requirements in place, i.e. for specific taxa or

land uses, commitments in strategies or management plans, or frameworks within which requirements can be introduced. These could potentially be expanded to fully cover the criterion.

The remainder of the D criteria are not covered by the majority of EU MS (19N to 25N):

- definition of eradication or containment/control end point (D.2)
- mandatory monitoring of spread according to standardised protocol (D.3)
- mandatory monitoring of eradication or containment actions (D.4)
- ex-post monitoring obligations (D.5)
- mandatory reporting to authorities following standardised protocol (D.6)
- mandatory requirements to restore damaged ecosystems (D.7)

There are examples of EU MS that have requirements which would meet criteria D.1, D.2, D.4, and D.5-D.7, but which are limited in scope to specific taxa/groups of taxa or sectors (e.g. forestry). Thus there is scope for these requirements to be expanded to cover all IAS as relevant. The same possibility to expand applies to situations where strategies or action plans for managing IAS identify the need for action or measures which would meet D.1, D.3, D.4 and D.6. For three of the criteria (D3, D4, D6, D7) some initiatives exist but are not made mandatory, thus the MS were rated P.

The coverage of the D criteria by the selected OECD countries is relatively varied. All OECD countries at least partially cover criterion D.1 on having a mandatory or regional requirement to control or eradicate, with legally-binding requirements in the USA and Australia. Those requirements leave space for further decision, so that measures are taken for relevant species, in relevant circumstances. Of notable contrast to the situation in the EU, there is mandatory monitoring of spread (criterion D3) in three of the four OECD countries (rated Y). In Australia and Canada, the monitoring requirements are outlined for individual species under overarching frameworks. In the USA, monitoring is required by a number of specific pieces of legislation referring to certain species. OECD countries also define eradication endpoints (criterion D2) at least on species by species basis. However, criteria D4 and D5 are much less often fully covered, similarly to EU MS.

4.6. CRITERIA E: FINANCING INSTRUMENTS

4.6.1. COST-RECOVERY FOR INTENTIONAL INTRODUCTION (CRITERION E.1)

This criterion was further subdivided into the following items:

- import / border control frameworks (import permit fees, inspections, quarantine);
- biosecurity levies based on volume or risk level of commodities;
- paying for risk assessment directly or covering the competent authority's costs;
- permit, registration and inspection systems for facilities holding alien species in captivity or containment;
- fees on disposal of vector material e.g. contaminated soil, landfill charges;
- monitoring and contingency planning;
- emergency response;
- control and management.

Mechanisms in EU Member States

The main permits and documents that are relevant to import, transport and trade of species are CITES permits, veterinary documents and plant passports. Risk assessments prior to approval of these documents must be paid for.

Full coverage

When all the items listed above are taken together, no MS fully covered the criterion (i.e. covered each one of the individual items above).

Partial coverage

Twenty-two MS (AT, BE, BG, CY, CZ, DE, DK, ES, FI, FR, GR, IE, IT, LT, LV, NL, PL, RO, SE, SI, SK, UK) partially covered the criterion, meaning that one or more of the items above were covered (see Table 4). In the case of Finland, developing new financial instruments is an objective of the proposed National Strategy on Invasive Alien Species (FI400).

Table 4: MS covering each item under this criterion

Item	MS covering this item
Import / border control frameworks (import permit fees, inspections, quarantine)	AT, BG, CY, CZ, GR, LT, NL, SE, SI, UK (10)
Biosecurity levies based on volume or risk level of commodities	0
Paying for risk assessment directly or covering the competent authority's costs	AT, IE, LV, NL, SE, SI, UK (7)
Permit, registration and inspection systems for facilities holding alien species in captivity or containment	DE, IT, SE, UK (4)
Fees on disposal of vector material e.g. contaminated soil, landfill charges	UK (1)
Monitoring and contingency planning	SE (1)
Emergency response	CZ (1)
Control and management	BE, BG, DK, ES, FR, LT, LV, PL, RO, SE, SK, UK (11)

The most common approaches are to recover costs via import/border control frameworks (10 MS) and control and management (11 MS).

In some MS (AT, BG, CZ), costs are recovered through payment of fees for inspection and border control. For example, under the Austrian Regulation on Plant Protection (AT143) and Law on Animal Diseases (AT122) charges for inspections or control at the border are introduced.

Other MS use fees for permits to import (NL, CZ, SE, UK). In the Netherlands the Minister may request that costs be reimbursed when an import permit is requested. The Czech Republic also charges potential importers for all the services provided by the phytosanitary administration in relation to imports of harmful organisms. Under the Swedish Law on plant protection (SE132), the Board of Agriculture may decide on fees for registering, permits, or animal/plant passports (according to EC Regulation no 998/2003). In GB (GB134), fees may have to be paid for applications and issuing licenses or certificates for imports or exports. Similarly, in Northern Ireland there is provision for the Minister to make regulations to specify the fees charged for licences to import particular types of species (NI123 and NI124).

Some MS (CY, LT, NL) recover costs from returning organisms that are being imported or for destroying them. Cyprus achieves cost recovery by charging the importer for the return, destruction or spraying of harmful organisms that the importer is attempting to introduce (CY500). Similarly, in Lithuania, under legislation on introductions and reintroductions, plants contaminated with harmful organisms may be returned to the exporting country or destroyed (LT160A). The costs of these actions will be borne by the owner. In Greece, the draft law foresees that a centre for confiscated alien fauna will be set up, and that previous owners will bear the costs of hosting the animals (GR220).

The other common approach taken (AT, BG) is to punish the known introduction of certain species with fines. For example, costs can be recovered from those who contravene the legislation (AT120).

Slovenia requires a tax to be paid for the issuance of a health certificate (SI121).

A common approach to **control and management** is similar to that taken for border control – in cases where an organism has to be returned or destroyed the costs of the action will be borne by the importer or owner (UK, DK, RO, SK). In Denmark, if a deadline for eradication or prevention of unwanted species has not been met, the Minister can decide that the owner/user must finance the eradication (although this had not directly applied to IAS) (DK123). The local council can charge the relevant property the costs of local rodent control (DK128). In Romania, those responsible for the deliberate or accidental release of IAS on the national territory are responsible for paying the correspondent damage until complete eradication, in accordance with current national legislation (RO160). In Belgium, the cost of remedying environmental damage is supported by the operator or recovered by the authority (BE131R and BE160). This applies to the voluntary release of IAS in the environment or to transport of IAS. The case is the same in Lithuania, where persons planting IAS without a permit by negligence or ignorance, must pay the costs of the eradication of these species and restore habitats to the former state (LT160A).

In Bulgaria there are fines for infringements related to restrictions and licenses (BG120) and the uncategorized eradication or personal usage of medicinal plants (BG122). Slovakia also has the framework for charging fines for allowing introduction or outbreak of a harmful species or did not implement the phytosanitary measures ordered by the controlling administration. In France also fines may be charged to persons not respecting the interdiction to introduce species. Note that in France CITES permits are not charged, unlike in other countries.

Other approaches taken are that in Sweden, hunters of any species must pay fees. In Poland, cost of permission for introduction, as part of restocking, of foreign species of fish are also defined (PL126).

Among the other items, **paying for risk assessment directly or covering the competent authorities' costs** is another common approach (AT, IE, LV, NL, SE, SI, UK). For example, Ireland fees can be charged for licences such as for waste disposal facilities (IE121), to

ensure that no risks to the environment occurs, possibly covering IAS risks. In Slovenia, all costs of examinations relative to plant health ordered by an inspector must be paid by the owner if the results are unfavourable for him (SI121).

Permit, registration and inspection systems for facilities holding alien species in captivity or containment is a cost-recovery mechanism that is covered by 4 MS (DE, IT, SE, UK). For example, in Germany licenses can be required for holding pests (DE121).

Three other items related to cost recovery for intentional introduction were covered by one country each: **fees on disposal of vector material** e.g. contaminated soil, landfill charges (GB); **monitoring and contingency planning** (SE); and **emergency response** (CZ). In GB, costs incurred in removing illegally deposited waste or in reducing the damage associated with the disposal can be recovered (GB128, referring specifically to Japanese knotweed and giant hogweed). In Sweden, the cost coverage by businesses dealing with chemical products or biotechnical products/material (e.g. biological pesticides, which may include IAS) for monitoring and analysis needed for permission is regulated by the authorities (SE141). In the Czech Republic, proven harm on plants, plant products and other objects caused by emergency phytosanitary measures can be compensated (CZ123).

- **No coverage**

Five MS were not found to cover any of the items listed above (EE, HU, LU, MT, PT).

  - **Mechanisms in selected OECD countries**

- **Partial coverage**

All four of the selected OECD countries were rated P for this criterion.

In Australia, the administration of non-compliance measures undertaken by government departments is addressed in either of the following ways:

- Investigation / prosecution / infringement notice activities: these activities are primarily funded through administered funds (i.e. not via cost recovered mechanisms).
- Stakeholder education and awareness / system administration activities: these activities are primarily funded through cost recovered mechanisms.

Australia also has a system of cost-sharing on the basis of a cost-benefit analysis. The outcomes of the analysis are presented during a stakeholder conference and used to apportion the costs of control of IAS, according to who will derive the greatest benefit from control:

- Category 1 – very high public benefits, 100% government funding;
- Category 2 – high public benefits, 80% public funding, 20% private funding;
- Category 3 – moderate public benefits, 50% public funding, 50% private funding; and

- Category 4 – mostly if not wholly private benefits, 20% public funding, 80% private funding.

This approach of dividing costs between public and private sources does not appear to be used in any of the other three OECD countries.

In Canada, fees are charged by the Government of Canada for issuance, renewal or amendment of permits, certificates or other means of approval. As specified in the Plant Protection Act and the Health of Animals Act, the Government of Canada reserves the right to recover costs of any costs associated with forfeiture, detention or disposal of any substance injurious or potentially injurious to plant or animal resources. This would be similar to EU requirements.

New Zealand's Biosecurity Act 1993 allows the government to create regulations to determine which costs are recoverable. The Ministry of Agriculture and Forestry recovers costs for services it delivers, with the cost being dependent on the type of service (as specified in schedules of fees). The fees are applied to the services by levies and regulations. Fees are charged for applications to the Environmental Risk Management Authority for introducing new organisms.

A range of user fees are applied for border inspection and quarantine purposes in the USA. Efforts are underway to harmonize the application and collection of these fees, however they do not currently provide for full cost recovery of expenditures. Permits are required for the import of injurious wildlife species.

4.6.2. CHARGING SYSTEM FOR VECTORS OF UNINTENTIONAL INTRODUCTION (CRITERION E.2)

This criterion was further subdivided in the following items:

- vector fees or a tax based on risk categorisation;
- levies on specific commodities or cargo containers;
- insurance (linked to contingency planning and monitoring);
- revenues recovered from fines.

Charging systems in EU Member States

Full coverage

No MS fully covered the criterion, i.e. covered each one of the individual items above.

Partial coverage

Thirteen MS (AT, DK, EE, FR, HU, IE, LV, MT, NL, PL, PT, SI, UK) partially covered the criterion, receiving a P in the assessment.

All of these MS only covered the item regarding recovering revenue from fines; none of the other three items are covered by any country. Therefore, under many pieces of legislation in these MS, fines may be imposed on those who break the law. Additionally, France has a financial instrument for insurance against pest risk that could be applied to vectors of unintentional introductions. Solidarity mechanisms, or insurance, can be held for insuring against harmful species (FR111). Under the same code there is also the possibility for the government to recover costs of destroying harmful organisms if the land owner or user fails to destroy them him/herself.

- **Similar coverage**

One country (SE) received an S in the assessment, since they have regulatory frameworks that could be used for charging vectors of unintentional introductions. In Sweden, the Board of Agriculture may regulate on conditions which must be fulfilled before import of animals, animal products, pests (or organisms generating pests), hay, straw, or other material used for handling animals (SE132). Therefore, there is the potential for introducing vector fees or levies on specific commodities.

- **No coverage**

Thirteen MS were not found to cover any of the items listed above (BE, BG, CY, CZ, DE, ES, FI, GR, IT, LT, LU, RO, SK).

- **Charging systems in selected OECD countries**

- **Partial coverage**

All four of the selected OECD countries were rated P for this criterion.

In Australia, AQIS has a complex system of charges for categories of imports including containers.

Fines for contravention of the relevant laws in Canada are specified in the Agriculture and Agri-Food Administrative Monetary Penalties Act. However, the Act does not specify how the enforcement of fines should be interpreted for people or organisations contravening IAS rules and/or regulations.

In New Zealand the system of Import Health Standards requires permits for importing risk goods for particular categories or points of origin. Applications for Import Health standards are cost-recoverable and any extra time required to make a risk assessment of a new commodity will be charged as a rate specified in the regulations. New Zealand also has a sea container levy for recovering the costs of biosecurity clearance of all sea containers that are brought into New Zealand.

In the USA, contravention of some pieces of legislation, such as the Plant Protection Act and the Plant Quarantine Act may result in a fine.

4.6.3. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
E1	5	0	22	0	0	0	4	0
E2	13	1	13	0	0	0	4	0

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

Both of the E criteria are partially covered by many of the MS. However, there are some clear gaps in the coverage of the individual items listed under the criteria. Specifically, the following items are only covered by one or no MS:

- biosecurity levies based on volume or risk level of commodities (criterion E.1);
- fees on disposal of vector material (criterion E.1);
- monitoring and contingency planning (criterion E.1);
- emergency response (criterion E.1);
- vector fees or a tax based on risk categorisation (criterion E.2);
- levies on specific commodities or cargo containers (criterion E.2); and
- insurance (linked to contingency planning and monitoring) (criterion E.2).

None of the MS fully covered the E criteria, primarily because those that did have financing instruments in place did not cover all of the items listed under each criterion. The particular items that were partly covered by the MS are listed in sub-section 4.6.3. above.

Many of the MS were rated P in the assessment, because although they had frameworks in place, they did not cover all of the items under the E criteria. However, several common approaches that are in place can be identified:

- payment of fees for inspections and border controls;
- payment of fees for permits and licences;
- recovery of costs incurred in returning organisms or destroying them; and
- imposing fines for contraventions of legislation.

Even when MS partially covered the criterion, many of the requirements do not directly target IAS, but rather are performed for plant or veterinary health reasons, but could usefully be integrated to include IAS issues.

All four of the selected OECD countries were rated P for the two E criteria because, as for the MS, none had covered all of the items listed under each criterion. The types of financing instruments that are in place are relatively similar to those in use in the EU: fees for approval of permits, cost recovery for relevant services provided by the authority, and fines for contravention of legislation.

The system of cost-sharing according to which actors will derive the greatest benefit from control of IAS that is in place in Australia is different to any of the approaches used in the other OECD countries or the MS.

4.7. CRITERIA F: STRATEGY DEVELOPMENT

4.7.1. NATIONAL OR REGIONAL STRATEGY OR ACTION PLAN ON IS (CRITERION F.1)

In December 2008 the EU adopted a communication 'Towards an EU strategy on invasive species' and many MS developed around that time their own IAS strategies or began preparing IAS strategies (Austria had developed an action plan as early as 2004). With the adoption in May 2011 of the new biodiversity strategy, the EU sets itself a target of developing a dedicated legislative instrument by 2012.

Full coverage is defined as having a strategy developed and adopted/published in the country, dedicated to IAS issues.

- **Strategies in EU Member States**

Strategies in place or being prepared in the EU

Table 5 shows the number of criteria covered by the strategy and those covered **only** by the strategy (i.e. not covered by any of the other policies assessed). In the MS which have strategies in place, the strategies address many of the gaps in the legislative framework (about half or more of the criteria covered by the strategy are only covered by it in AT, FI, NL, UK (both GB and NI)). The table includes all those strategies that are published and in place (AT, DK, ES, NL and GB, rated Y), and those under development for which a draft is available for assessment (FI, NI and SK, rated P).

Table 5: No. of criteria covered (as Y, P or S) by the IAS strategies in place and under development in the EU. Strategies not yet published highlighted in italic green

MS	No. of criteria covered by strategy	No. covered only by the strategy	State of development
AT	13	6	Published 2004
DK	13	3	Published, and evaluated in 2009
ES	5	1	Published 2006
FI	*17*	*11*	*Proposal presented to Minister 2011*
UK (NI)	*27*	*14*	*Under consultation*
NL	9	5	Published 2007
SK	*7*	*2*	*Draft*
UK (GB)	24	19	Published 2008

The strategies that have been published or are under development in the EU all cover less than 50% of the criteria. The strategies in place in Northern Ireland and Great Britain cover the most criteria. The Great Britain strategy in particular is the one covering the most criteria that are not covered in any other policy in the UK, which was also an aim when developing the strategy. For example, the UK strategy aims to develop a joint information system, a dedicated early-warning system, protocols for monitoring, integration of overseas territories, the development of a dedicated agency, training programmes and educational material, and systematic exchanges of best practice, criteria that are not covered by any other policy. This still leaves a number of criteria unaddressed however, including: risk assessment in emergencies, a declassification system, measures to prevent IAS spread through manmade corridors, greening the supply chain, mandatory monitoring of spread, mandatory restoration, integration of IAS into EIA/SEA and including mechanisms for capacity building in development policies.

Figure 1 illustrates the average percentage of criteria (A-I) covered per strategy (rated P or Y). Criterion H (awareness raising and engagement) is the best-covered by strategies. However, strategies appear particularly useful for the coverage of criteria groups A (definitions of IAS), C (early-warning and rapid response), F (strategy development) and G (capacity building) which are most frequently only covered by strategies. In contrast, the criteria under B (prevention) are frequently already covered by legislation in the MS on IAS (B1 to B5 are well covered by legally-binding texts, see

the analysis), and thus there is little requirement for a strategic document to specify requirements for further action. Criteria groups D (control, management and restoration), E (financing instruments) and I (international cooperation) are generally not well-covered by the strategies.

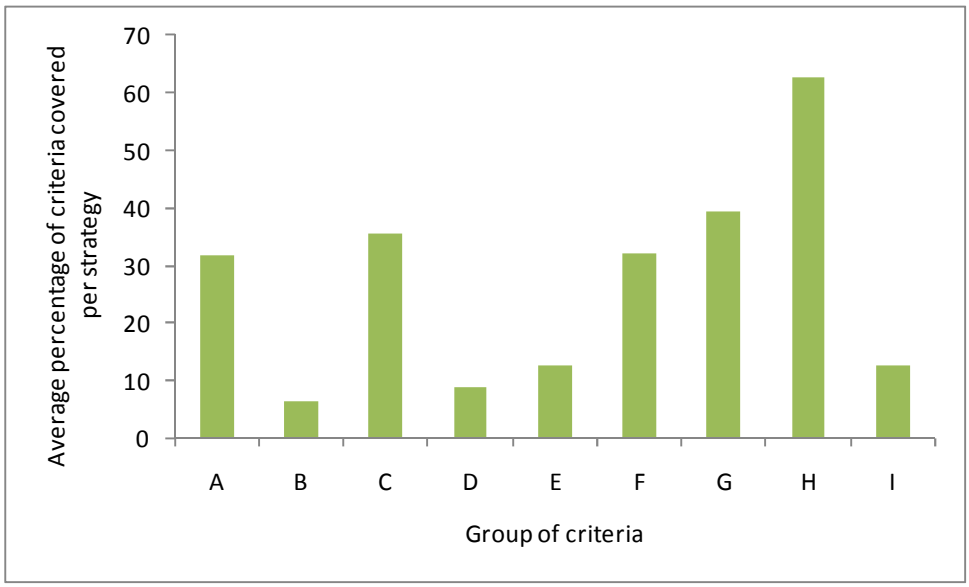

Figure 1: Total number of criteria covered by the eight IAS strategies (receiving Y or P) in place and under development in the EU in each main group of criteria

The development of strategies for IAS may provide an opportunity for cross-border cooperation following ecological or geographical boundaries. In particular, the Northern Irish strategy has been developed in conjunction with that of the Republic of Ireland. While relevant links are made with the Strategy for the rest of the UK (the Great Britain Invasive Species Framework Strategy), Northern Ireland's Strategy is more closely aligned with the Republic of Ireland's. Those are however also the countries for which such approach is the most relevant, as they cover each an island.

- **Full coverage**

Five MS (AT, DK, ES, NL and UK) have developed and published strategies or action plans dedicated to IAS. Strategies are never legally-binding texts, but are expected and usually lead to implement regulations, which is also the case for IAS.

The five established strategies/action plans are described below.

Austrian Action Plan on Invasive Alien Species

The Austrian Action Plan was published in 2004, is non-binding and has been developed by national experts, with approval from the national commission for biodiversity and with support from the Ministry for Environment. It was developed following the evaluation of the Austrian Biodiversity Strategy in 2003 as a means to further develop the Biodiversity Strategy and put it into more concrete terms.

It begins by describing the current situation regarding alien species, and the ecological, economic and health impacts that they may cause. As for many of the other strategies, its scope applies to all taxonomic groups, but excludes genetically-modified organisms (GMOs).

The Plan addresses four main issues:

- education and awareness-raising;
- capacity building;
- research and monitoring; and
- legal and organisational implementation.

Under each of these fields, the following aspects are provided:

- objectives;
- measures required to meet the objectives;
- time periods within which the measures must be initiated (short, medium or long term);
- degree of priority with which the measures should be implemented; and
- actors that may be important for implementing the measures.

It therefore gives a clear indication of which actions should be carried out when and by whom. There are a large number of measures provided in different areas under the four main issues. However, there are no measures for the direct prevention, control or eradication of invasive alien species, unlike other strategies, such as that in place in Great Britain.

Denmark – Action Plan for Invasive Species

In similarity with the other strategies, the non legally-binding Danish Action Plan includes an assessment of the current situation and the environmental, economic and social impacts of invasive alien species. The Action plan for invasive species was developped by the Ministry of Environment in close collaboration with other relevant mininsteries; and with experts to build for example the lists. The plan was approved by the Minister.

It also points out that the prevention of invasive alien species is more efficient and less costly than their management or eradication post-entry.

The Action Plan presents recommendations under the following main areas:

- prevention;

- IAS control/management;
- information and capacity building;
- research;
- administration and regulation; and
- evaluation of the Action Plan.

Issues such as information provision, reporting, incorporation of the public and voluntary organisations, and international cooperation are also included under some of the above main areas. Like many of the other strategies, but unlike the Austrian action plan, there is no clear division of responsibilities, assessment of priority or assessment of the timing for implementation of the recommendations.

Between 2008 and 2010, ten million DKK (approx. 1.3 million Euros) were to be allocated for the purpose of implementing the plan. It was to be evaluated for the first time in autumn 2009.

Netherlands Policy Document on Invasive Species

The non-legally binding Netherlands Policy Document on Invasive Species (action plan) states that prevention is often preferable to control, due to the difficulty in removing species that have spread and established throughout the country, and possible negative effects of the method of control. These points are made in the explanation of the principles of the policy.

Risk analysis and cost-benefit analysis shall be carried out on a case-by-case basis. Therefore, decisions on whether to control alien species will depend on the outcome of this assessment and hence the extent of the threat/impact. However, as noted in A3, no formal tool to implement RA was found.

The plan describes the prevention and control of the alien species that pose a significant threat to biodiversity, based on the assessment of risk, within the limits of acceptable use of capacity and funding. It states that a consequence of this decision to only take action when alien species pose real risks to biodiversity is that action will not be taken against the majority of alien species in the Netherlands. It is highlighted that a more radical policy for managing alien species will require higher-cost measures and stricter measures that may be a barrier to trade. More radical policy may also have the potential to harm indigenous species as well. It describes the actions needed in a number of areas:

- prevention;
- signalling and elimination;
- isolation and management of populations;
- knowledge, information and monitoring;

- the use of a coordinating body; and
- enforcement and liability.

For each area, the main responsibilities of the government and other key stakeholders are described.

Spain – Invasive Alien Species: Diagnosis and basis for prevention and management

In 2006, Spain produced a non legally-binding guidance manual for the methods of prevention and control of IAS. It is intended to be the scientific basis for a national strategy with guidelines for different stakeholder groups. The document includes an analysis of the current situation regarding IAS in Spain, their pathways of entry, and the ecological and economic problems that they cause. This analysis is based on literature review, results of LIFE projects and research projects financed by the Autonomous Organisation of National Parks (OAPN).

It also discusses methods of prevention, control and eradication of IAS, and describes possible approaches to risk assessment. The methods discussed are based on the CBD COP decision VI/23 (2002) and the European Strategy on Invasive Alien Species (2003) adopted by the Bern Convention. Two particular guiding principles are therefore precautionary principle and the hierarchical approach to IAS management recommended by the CBD. Furthermore, key actions that are needed to adhere to the guiding principles are identified, based on analysis of the current situation and supported by some literature.

It does not include any measures or actions that are not directly related to IAS prevention, control, eradication or risk assessment, such as institutional and legislative arrangements, or international cooperation. It is a much more scientific document than other strategies, but aims to describe the scientific basis for future actions.

UK - Invasive Non-Native Species Framework Strategy for Great Britain

The Invasive Non-Native Species Framework Strategy for Great Britain was published in 2008 (non-legally binding), which built on a comprehensive policy review from 2003. It is intended to provide guidance for governmental action and provide the framework for local and regional measures. It is only focused on the island of Great Britain (i.e. England, Wales and Scotland) although links and correspondences will be made with the approach taken by Northern Ireland and the Republic of Ireland. This is logical to ensure a coordinated approach both within and between the two islands. Furthermore, being islands it is easier to reduce the risk of introduction and spread, at least of terrestrial IAS.

The Strategy aims to create a balance between prevention and management in response to specific threats. It adheres to the hierarchical approach taken in the CBD of prevention, detection/surveillance and IAS control/eradication. The strategy provides key actions, in a number of areas:

- prevention;

- early detection, surveillance, monitoring and rapid response;
- mitigation, control and eradication of IAS;
- building awareness and understanding;
- legislative framework;
- research; and
- information exchange and integration.

The need for review of its implementation is also highlighted; the strategy will be evaluated every five years.

The GB Non-Native Species Mechanism, which includes a Programme Board, Secretariat, Risk Analysis Panel, Stakeholder Sounding Board, Stakeholder Forum and relevant working groups, is responsible for developing and implementing the strategy.

The Strategy is reasonably thorough, and as it has been based on a policy review, it seeks to explicitly cover a number of gaps in the legislative framework. However, it does not identify the priority of each action, on which timescale it should be implemented and by whom.

Northern Ireland's strategy is currently under consultation (as it is in the last stages of approval and combined with the GB strategy, the UK was rated Y).

Partial coverage

Seventeen MS (BE, BG, CZ, DE, EE, FI, FR, GR, HU, IE, IT, LT, LU, LV, PL, SE, SK) partially covered this criterion and received a P in the assessment.

Eight of these MS (BG, DE, FI, FR, GR, IE, SE, SK) received a P in the assessment because their strategies for IAS are under development. For example, Finland's National Strategy on Invasive Alien Species has been proposed and given to the minister, but it has not been accepted politically yet – and therefore none of the measures suggested in it have been implemented. Slovakia has made a draft available online[95]. The Northern Irish and Irish strategies have been developed in tandem, but the Irish strategy has not yet been published (expected around autumn 2011).

The approach taken by nine of the MS rated P (BE, CZ, EE, FR (also developing its IAS strategy), GR (*idem*), HU, IT, LV, PL) is to use other strategic documents, particularly biodiversity strategies, to provide some degree of strategic direction or overarching approach. For example, the Belgian Federal Sustainable Development Plan 2004-2008 (BE300) and its National Biodiversity Strategy 2006-2016 (BE301) both refer to IAS. Similarly, the French National Biodiversity Strategy (FR300) mentions IAS as a threat to biodiversity and outlines some actions to reduce the threat, as does the Polish National Strategy and Management Plan for Protection and Sustainable Use of Biodiversity

[95] Available from: www.sopsr.sk/publikacie/invazne/index.php?id=navrh [Accessed 9/6/2011]

(PL300) and the Italian National Strategy on Biodiversity (IT300). The Latvian National Programme on Biological Diversity (LV300) identifies specific threats to biodiversity protection. It includes an objective to prevent the expansion of introduced species. The Hungarian National Strategy and Action Plan on Conservation of Biodiversity (HU300) also mentions IAS. The Estonian Environmental Strategy 2030 (EE300) includes measures for alien species and the National Environmental Action Plan of Estonia 2007-2013 (EE301) estimates costs and describes responsibilities for implementing the measures in the Environmental Strategy. Although such strategies provide less detail than a strategy dedicated to IAS, they can still trigger important action for tackling IAS. For example, the Irish Biodiversity Action Plan includes an objective to alter the Birds and Habitats Regulations to prevent the import, movement, sale, distribution or release of invasive alien species, while advising on species considered safe alternatives.

Some strategic documents restrict the scope to only certain taxa of IAS. For example, in the Czech Republic, the National Forestry Programme (CZ301) includes a measure on invasive plant species in forests and other introduced species in protected areas. In Greece, the ELNAIS Fishery Code (GR500) mentions that the Ministry of Environment develops a strategic plan to manage IAS according to its category of danger.

A different approach taken by Luxembourg (rated P) is to develop action plans against specific IAS, such as the giant hogweed (*Heracleum mantegazzianum*). The priority species for which action plans should be developed are listed in the Action Plan for Nature Protection (LU300).

Lithuania's Order on Introduction, Reintroduction and Transfer Programme No. 81-3505 no 352 (LT160d) included an action plan for 2002-2007, which has since expired. The action plan included several main tasks to reduce the introduction, spread and damage caused by IAS.

- **No coverage**

Five MS (CY, MT, PT, RO, SI) were not found to have a strategy or action plan in place for IAS.

  - **Selected OECD countries**

- **Full coverage**

All four selected OECD countries were rated Y.

The USA have a National Invasive Species Management Plan (for 2008-2012). Other pieces of legislation in the USA require plans and strategies to be developed in other relevant contexts. For example, the Hawaii Tropical Forestry Recovery Act 1992 requires a tropical forestry plan to be developed for Hawaii, which includes biological control of non-native species that degrade or destroy native forest ecosystems. The Federal Noxious Weeds Act 1974 requires each federal agency to develop an integrated management system for the control of undesirable plant species in cooperative agreement with State agencies. The Aquatic Nuisance Species Task Force also develops a strategic plan.

Canada has a strategy dedicated to IAS, for which the Government of Canada has approved a first 5 years funding (2005-2010) to start implementing the Strategy. The funding was renewed in June 2010 on an on-going basis to continue the implementation of the federal component of the IAS Strategy. The strategy focuses on prevention, detection, response and management. A considerable proportion of the financial resources were invested in the CFIA as it is the leading agency for IAS issues.

New Zealand was also rated Y in the assessment due to the Statements of Intent by MAFBNZ which refer to biosecurity issues, a pest management plan of action is in place and a biosecurity surveillance strategy is in place. IAS issues may also be included in the general policies of the Department of Conservation. Similarly, Australia has various strategies and action plans in place in Australia, including both overarching strategies (such as the Australian Weeds Strategy and the Australian Pest Animal Strategy) and for specific threats (i.e. threat abatement plans). Specific strategies for IAS are in place at regional level, such as the New South Wales Invasive Species Plan.

4.7.2. MANDATORY INTEGRATION OF IS INTO SEA/EIA (CRITERION F.2)

Under Article 3 of the EIA Directive, the direct and indirect effects of a project on *inter alia* human beings, fauna and flora must be assessed.

To fully cover the criterion, explicit mention of IAS in EIA/SEA should be made.

- **EU Member States**

- **Full coverage**

None of the MS fully cover this criterion (i.e. received a Y in the assessment).

- **Partial coverage**

None of the MS partially cover this criterion (i.e. received a P in the assessment).

- **Similar coverage**

Northern Ireland (part of the UK) does not directly cover the criterion but includes a similar provision. In the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) (NI159), the deterioration or disturbance of habitats or species listed in the Habitats Directive must be covered. Therefore, IAS are not referred to directly, but their impacts are implied here due to IAS being a major cause of disturbance to habitats/species.

- **No coverage**

Twenty-six of the 27 MS were not found to cover this criterion at all. It can be noted that the country assessments from Estonia and Sweden (both rated N) include some information about SEA/EIA, although neither fully integrate IAS issues. In Estonia, a preliminary assessment of whether proposed activities have a significant environmental impact (including IAS) is required (Environmental Impact Assessment and Environmental Management System Act, EE127). In Sweden, the regulation

requires EIA for aquaculture, including the protection of certain species, that may be relevant to IAS.

- **Selected OECD countries**

- **Similar coverage**

All countries were rated S as the regulation makes the assessment of IAS impacts possible, but this is not a requirement. This is similar to what applies in the EU for the EIA directive.

In the USA (rated S), it is stated that actions which threaten endangered or threatened species or their habitat must be assessed. Whether this requirement includes assessment of damage from IAS is not explicitly defined.

Similarly in Australia the various EIA legislations of the states and Commonwealth require that impacts as specified in relevant legislation must be accounted for, not mentioning specifically IAS. However, in fact, IAS are often included in the assessments performed.

The New Zealand Resource Management Act also may be interpreted as requiring to assess impacts from IAS, but does not explicitely cover IAS.

In Canada, no explicit mention is made, but it was reported to be a common practice to include impacts from IAS when relevant in performing EIAs.

4.7.3. STREAMLINING OF IAS INTO OTHER POLICIES, E.G. LAND AND RESOURCE MANAGEMENT, ADAPTATION TO CLIMATE CHANGE, BIOFUELS (CRITERION F.3)

Streamlining IAS into other policies means to insert requirements relative to IAS in sectoral policies that are confronted to the issue of IAS. Typically, IAS are regulated by environmental policies, while many sectors either may introduce IAS (e.g. shipping companies may transport IAS in ballast water) or be impacted by their consequences (e.g. forests that are damaged by IAS). In addition, IAS in other sectors are often referred to by other names. For instance, currently, IAS that are harmful for agriculture are referred to as pests and covered under EU regulations. However, those regulations were put in place to protect a sector and not as a way to streamline issues related to IAS in other policies.

Full coverage implied that IAS were explicitly mentionned in at least one area of legislation.

- **Streamlining in EU Member States**

- **Full coverage**

None of the MS fully covered this criterion (i.e. received a Y in the assessment).

- **Partial coverage**

Seven MS (AT, CZ, FI, LV, PT, SK and UK) partially cover the criterion. In three MS (AT, FI, UK) streamlining was included as a goal of an action plan/strategy without concrete action yet taking place. For example, the integration of invasive alien species into sectoral policies is mentioned in the Austrian Action Plan on Invasive Alien Species 2004 (AT300*). In particular, the Plan includes an objective to examine and streamline existing laws on nature conservation, forestry and hunting, and to incorporate the issue of IAS more strongly in expert committees. It also urges all institutions and organisations to address the Plan's objectives within their activities and responsibilities. Similarly, the Invasive Alien Species Strategy for Northern Ireland (NI300*) which is currently under consultation states that measures to integrate invasive alien species into the work of other government departments and agencies, as well as other stakeholders, will be identified and implemented. Part of the preparation for developing Finland's proposed national IAS strategy (FI400) included a study of the interactions between climate change and IAS. The conclusions of this study state that climate interactions have to be considered when working with IAS. Finland also includes streamlining IAS issues into climate changes issues in its National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity, running for the period 2006-2016 (FI300).

In a small number of MS, IAS issues have been directly integrated into legislation, although for a limited number of sectors. Latvia, Portugal and Slovakia integrate IAS considerations into requirements for receiving subsidies for agriculture, forestry or aquaculture. Latvia specifically integrates IAS (although limited to invasive hogweed species) into the procedures by which it grants agricultural support payments (LV156). Similarly, Portugal requires recipients of agro-environmental payments for maintenance of terraces to eliminate woody exotic species from Mediterranean woods (PT160). Slovakia also considers IAS issues in the allocation of subsidies for fish farming and agriculture (SK163 and SK164).

In one piece of Slovakian legislation, subsidies can be allocated from the Slovakian Ministry of Defence in order to allow the control or eradication of IAS in military districts or areas serving the purpose of defence (SK122). This is therefore different from the approach described above whereby managing IAS is a condition of receiving subsidies for other purposes. In the Czech Republic, non-native wood species are addressed in regional forestry management plans (CZ121).

The Czech Republic is unusual in addressing alien and invasive species in biofuels policy (CZ160). Alien and invasive species of plants that have been removed from an affected site can be used as biomass for electricity generation.

- **Similar coverage**

Diverse approaches are taken in the three MS receiving an S for this criterion (BE, GR, NL).

Belgium aims to integrate biodiversity issues in general into sectoral policies, rather than IAS specifically. In Belgium, the need for integration of IAS is recognised in the Federal Sectoral Plan for Biodiversity Integration (BE302). As a first step, integration is focused on four sectors: economy, development cooperation, scientific policy, and transport. It is acknowledged in the Plan however that integration in further sectors is needed in the future.

In Greece, IAS are not specifically integrated into other policies either. However, the ELNAIS Fishery Code (GR500) states that particular attention should be given to the impacts of climate change on the propagation of aquatic species.

In the Netherlands, integration of IAS issues is not mentioned in any policy. However, in 2012 the three major inspection authorities (Food and Consumer Product Safety Authority; General Inspection Authority; Institution for Plant Diseases) will merge into one authority. This is expected to effectively streamline the enforcement of the IAS policy, but as the streamlining is not a fact, NL was rated S.

- **No coverage**

Seventeen MS (BG, CY, DE, DK, EE, ES, FR, HU, IE, IT, LT, LU, MT, PL, RO, SE, SI) do not cover this criterion. It can be noted that in Cyprus, IAS are not specifically integrated into sectoral policies, but biodiversity is. The country's fourth National Report to the CBD (CY501) mentions that biodiversity-related strategies are divided into a number of workstreams to address sectoral and cross-sectoral issues. The sectors covered include agriculture, forestry, water and wetlands, town planning, coastal management, marine policy, climate change adaptation, and education and public awareness.

  - **Selected OECD countries**

- **Full coverage**

The USA considers integration of invasive species issues into more policy areas than was found in the other OECD countries. For example, invasive species are integrated into the following policies:

- The Farm Security and Rural Investment Act of 2002. This includes a number of programmes in which IAS issues are integrated, including the Environmental Quality Incentives Programme, the Forest Land Enhancement Programme and the Conservation Security Programme. IS are also mentioned in the provision for enhanced community fire protection.
- The Food Security Act of 1985.
- The Federal Agriculture Improvement and Reform Act of 1996.
- The Endangered Species Act of 1973.

Furthermore, it is also an objective of the National Invasive Species Management Plan to incorporate invasive species issues into the environmental cooperation mechanisms developed in connection with free trade agreements.

- **Partial coverage**

The only policy area for which integration of IAS issues in Canada (rated P) has been found is that of ballast water management.

- **Similar coverage**

Australia was rated S because there are strategies that deal with the issue and reviews are available, but no specific information was found on any explicit integration of other policy areas. A 2004 review of legislation in Australia recommended means by which the regulation and management of IAS could be better achieved through amendments to the EPBC Act. Furthermore, the specific strategies for IAS at national and regional level, such as threat abatement plans, also take into account streamlining of IAS into other policies. For example, the Australian Weeds Strategy includes a strategic action to "identify and address weed issues in natural resource, environmental, industry and development planning at all levels and implement action".

In New Zealand, there is opportunity to combine IAS policies and resources management, but it is unclear to what extent this is done, thus NZ was rated S.

4.7.4. IDENTIFICATION OF HARMFUL SUBSIDIES FAVOURING THE INTRODUCTION/ESTABLISHMENT OF IS (CRITERION F.4)

Harmful subsidies are subsidies that are intended to help a sector and which indirectly have a negative impact in another sector. For instance, subsidies for environmental works may not require that IAS are not used, thus leading to a risk of introduction/spread.

Formal identification of subsidies, through an official document is needed to get full coverage for this criterion.

- **Identification of harmful subsidies in EU Member States**

- **Full coverage**

No MS were found to identify harmful subsidies which favour the introduction/establishment of IAS.

- **Partial coverage**

One MS received a P (FI) for this criterion.

In Finland, harmful subsidies were considered during the preparation of the national IAS strategy (FI400). Some proposals were made to alter the subsidies or their legal basis in order to reduce activities which promote the introduction of IAS. Finland therefore received a P for this criterion because no concrete action has yet been taken.

- **Similar coverage**

One MS received an S (LU).

In Luxembourg, while harmful subsidies are not identified, measures are taken to avoid existing subsidies promoting harm (rated S). Two pieces of legislation apply certain restrictions to the granting of subsidies:

- Regulation on Subsidies for Improving the Natural Environment (LU151) makes the receipt of subsidies dependent on the use of certain species or varieties during habitat restoration; and
- Law on Hunting (LU121) states that compensation for reductions in yield in forests will only be available for forests composed of indigenous trees or otherwise adapted to the area.

Luxembourg therefore receives an S for this criterion because while harmful subsidies are not identified, measures are taken to avoid existing subsidies promoting harm.

- **No coverage**

Twenty-five (AT, BE, BG, CY, CZ, DE, DK, EE, ES, FR, GR, HU, IE, IT, LT, LV, MT, NL, PL, PT, RO, SE, SI, SK, UK) of the MS have not been found to identify harmful subsidies which favour the introduction/establishment of IAS.

- **Selected OECD countries**

This criterion is not extensively covered in the four OECD countries.

- **Similar coverage**

Australia was rated S because environmentally-perverse subsidies have been extensively discussed, although not specifically related to the issue of IAS.

In New Zealand (rated S) there is a tension between reducing the risks from IAS and developing international trade. This is manifested in regulatory texts by a focus on IAS that cause threats to primary industry rather than on those IAS that threaten native species.

There is no assessment of harmful subsidies at a general level in the USA. However, the USA was rated S because the Brown Tree Snake Technical Working Group will assess regulatory limitations that hinder federal, State, territorial and local government efforts to control, interdict, eradicate or conduct research on the brown tree snake.

- **No coverage**

Such subsidies do not appear to have been identified in Canada (rated N), according to the ongoing programmes in the departments and agencies that were reviewed.

4.7.5. FULL INTEGRATION OF OVERSEAS TERRITORIES (WHERE APPLICABLE) (CRITERION F.5)

- **EU Member States**

Four MS have overseas countries and territories: Denmark, France, the Netherlands and the UK[96]. Therefore, this criterion is not applicable to the majority of the MS.

- **Full coverage**

No MS fully integrates overseas territories (i.e. received a Y in the assessment).

- **Partial coverage**

France, Denmark and the UK partially cover this criterion (rated P).

In France a specific initiative is in place for overseas territories by the IUCN and the La Réunion island has a strategy for IAS. However, no such strong framework was found for other territories. Faroe Islands and Greenland have self governing systems and are included in NOBANIS as participating countries. The Danish cooperation is thus through NOBANIS.

The GB non-native species strategy (GB300*) includes an objective to ensure that UK Overseas Territories and Crown Dependencies are kept informed of developments in Great Britain. However, although overseas territories are recognised, they are not directly included in action being taken within the UK.

- **No coverage**

Of the four MS with overseas countries and territories (DK, FR, NL, UK), one does not cover this criterion (NL).

The other 23 MS (AT, BE, BG, CY, CZ, DE, EE, ES, FI, GR, HU, IE, IT, LT, LU, LV, MT, PL, PT, RO, SE, SI, SK) do not cover the criterion as it is not applicable.

- **Selected OECD countries**

- **Full coverage**

Australia and the USA were rated Y in the assessment. Legislation, policies, strategies and plans in place at the Commonwealth level in Australia also apply to overseas territories. Similarly, USA legislation includes a definition of the United States which includes overseas territories. Some policies, such as the Executive Order on invasive species, legislation on the brown tree snake[97] and the Lacey Act, also explicitly state that the overseas territories are covered.

[96] EU Overseas Countries and Territories. Available from: europa.eu/legislation_summaries/development/overseas_countries_territories/index_en.htm [Accessed 8/6/2011]

[97] Brown Tree Snake Control and Eradication Act of 2004

- **No coverage**

This criterion was not found for New Zealand (rated N) and is not applicable to Canada.

4.7.6. LIABILITY MECHANISM TO ESTABLISH RESPONSIBILITY, ACCOUNTABILITY AND NEGLIGENCE (CRITERION F.6)

In order to fully cover the criterion, a liability mechanism must be defined. This involves, both cases of voluntary introduction of an IAS into the country and cases of involuntary introduction. A stakeholder/individual must be identified as the source of the introduction. Responsibility, accountability and negligence determine different levels of liability. In the EU, the Environmental Liability Directive provides a framework for defining responsibilities, based on the "polluter-pays" principle.

- **Liability mechanisms in EU Member States**

- **Full coverage**

No MS were found to fully define liability mechanisms for establishing responsibility, accountability and negligence.

- **Partial coverage**

Five MS received a P (AT, BE, NL, LV, SK) in the assessment.

An approach taken by AT and SK is to consider this issue in strategies/action plans for IS/IAS. For example, the Austrian Action Plan on Invasive Alien Species (AT300*) aims to settle the issue of liability concerning alien species. Similarly, the draft National Invasive Species Strategy for Slovakia (SK400) aims to update current legislative norms and enforce current legislative decrees. These MS thus were designated a P in the assessment due to action being an objective of the action plan/strategy but not yet resulting in tangible action.

Belgium only defines responsibility in a limited set of circumstances, and does not define accountability or negligence (rated P). Responsibility is defined in texts focused on environmental responsibility (Ordinance on environmental responsibility 2008 (BE131R) and Decree on environmental damages caused by the transport of non-indigenous animal or plant species 2007 (BE160). While both texts implement the EU Environmental Liability Directive[98] (ELD), they explicitly include IAS related damages, beyond the common core. Thus Belgium was rated P.

In the Netherlands responsibilities refer to the ELD in the policy note specifically on IAS (NL301*)

In Latvia, responsibility is only defined for IAS plants (LV121 and LV150).

[98] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage

- **Similar coverage**

One country received as S in the assessment.

The UK was rated S as it only identifies responsibility and liability in one piece of legislation focused on animal health rather than IAS, regarding attempts to land prohibited animals (GB120).

- **No coverage**

Twenty-one MS (BG, CY, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LT, LU, MT, PL, PT, RO, SE, SI) were not found to include liability mechanisms to establish responsibility, accountability and negligence.

  - **Selected OECD countries**

- **Partial coverage**

Liability mechanisms are specified under the declaration status of IAS in Australia. However, Australia was rated P because issues of civil liability have remained as academic discussions.

- **Similar coverage**

Liability provisions are found in the BSA'93 in NZ, describing offences. Similarly, the different acts applying in Canada or the USA describe offences and fines. However, as no real definitions however of accountability or negligence are available, the three countries were rated S.

4.7.7. DEFINITION OF ENFORCEMENT PRACTICES (CRITERION F.7)

Enforcement practices need to explain who is responsible for issues related to IAS, and how and by whom relevant legislations is enforced.

  - **Enforcement practices in EU Member States**

- **Full coverage**

Enforcement practices need to explain who is responsible for issues related to IAS, and how and by whom relevant legislations is enforced. No MS were found to have fully defined enforcement practices (received a Y in the assessment).

- **Partial coverage**

Nine MS (AT, BG, EE, FI, LT, NL, PL, SK, UK) partially covered the criterion (i.e. received a P in the assessment).

The approach most commonly taken (AT, BG, EE, LT, SK, UK) is to define the lead agencies responsible for implementation and/or enforcement of certain pieces of legislation. These MS received a P because there is not a defined process of enforcement. In Austria, the stakeholders responsible are defined in AT300*. In Bulgaria, Regional Inspectorates for Environment and Water are defined as being

responsible for the implementation of a number of pieces of legislation on environment and nature protection (BG120-BG125). In Estonia, the responsibility for controlling abundance of non-native species accidentally released into the wild, and for carrying out inspections and imposing fines is defined in the Nature Conservation Act (EE120). In Lithuania, the Order on Invasive Species Control and Eradication Procedures (LT160B) defines the agencies responsible for various types of organism/species. In Slovakia, the Protection of Nature and Landscape Act (SK160) define responsibilities of various agencies, as well as of forest managers and individual persons. In the UK, the Wildlife and Countryside Act 1981 (GB122) defines that wildlife inspectors are responsible for enforcement; additionally, in the Northern Irish Contingency Plan for Serious Pest/Plant Health Incidents (NI180), the roles of agencies and personnel are designated. In the context of the Invasive Alien Species Strategy for Northern Ireland (NI300*), which is currently under consultation, contingency and eradication plans for high-risk species will be developed which will identify the lead agencies.

The other, less common approach (FI, NL, PL) is to use strategies on IS/IAS or biodiversity in general to outline responsibilities, or to define an objective to clarify responsibilities. The Finnish proposal for a National Strategy on Invasive Alien Species (FI400) outlines the responsibilities of the various actors, which the existing legal bases will govern (including for example the Ministry of Environment and the Ministry of Agriculture and Forestry). The Polish biodiversity strategy defines the Ministry responsible for coordination of the strategy, which is addressed to different authorities on different levels (from Ministry to local authorities). Similarly, in the Netherlands (receives an S in the assessment), the Action Plan on Invasive Species (NL301*) required the formation of a coordinating committee on IAS (Team Invasieve Exoten) which will define other responsibilities.

- **Similar coverage**

In Luxembourg (rated S), the Law for Protection of Nature and Natural Resources (LU120) requires those holding, transporting, exchanging or selling species to prove the species provenance to agents in charge of finding violations of the law. The Regulation on Fisheries with Electricity (LU154) states that fishing with electricity can only be exercised by officers of the Administration of Forestry and Nature for particular purposes, one of which is the eradication of non-native fish species.

- **No coverage**

Seventeen MS (BE, CY, CZ, DE, DK, ES, FR, GR, HU, IE, IT, LV, MT, PT, RO, SE, SI) did not cover this criterion.

  - **Enforcement practices in selected OECD countries**

- **Full coverage**

Australia and the USA both received a Y for this criterion. Enforcement practices in Australia are specified under the declaration status of IAS and thus occur on a species-by-basis. Similarly, the USA agencies responsible for implementation and enforcement

depend on the specific requirements of the policies and legislation. Therefore, in these two countries practices are defined but are not necessarily consistent.

- **Partial coverage**

Approaches in New Zealand and Canada are more consistent, reflecting that New Zealand has a very small number of pieces of legislation relevant to IAS, and that Canada has a single body in charge of these issues: the Canadian Food Inspection Agency (CFIA).

New Zealand received a P in the assessment because enforcement measures are identified in the Biosecurity Act 1993 and in Biosecurity Law Reform Bill 2010 (BLRB). The Biosecurity Act 1993 identifies enforcement, offences and penalties, and therefore enforcement measures are identified at an overall level and do not vary by species. The BLRB also enables inspectors to issue compliance orders, which may require a person to cease doing something, prohibit them from starting something, prohibit them from repeating something, or require them to do something.

In Canada (rated P), the Canadian Food Inspection Agency (CFIA) is responsible for enforcing regulation related to movement of plant and animal resources, although particular definitions of practices have not been found.

4.7.8. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
F1	4	0	18	5	0	0	1	3
F2	26	1	0	0	3	1	0	0
F3	17	3	7	0	1	1	1	1
F4	25	1	1	0	1	3	0	0
F5	1 (23N/A)	0	3	0	2N/A	0	0	2
F6	21	1	5	0	3	0	1	0
F7	17	1	9	0	0	0	2	2

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

Many of the F criteria were rarely covered by the MS. Of particular note are:

- criterion F.2: the mandatory integration of IAS into SEA/EIA;
- criterion F.4: identification of harmful subsidies; and

- criterion F.6: liability mechanisms.

The most comprehensively covered of the F criteria is criterion F.1 on the development of national/regional strategies or action plans for IAS. Five MS have published strategies or action plans dedicated to IAS (rated Y), with a further seventeen having partial approaches in place to provide strategic direction for the management of IAS.

For many of the other criteria (F.3, F.5, F.6), coverage is a goal of strategies or action plans, and therefore it can be anticipated that once the plan is fully implemented, the criterion will be fully covered. Identification of harmful subsidies (criterion F.4) was also considered in the development of the proposed Finnish IAS strategy, even if their identification was not included as a specific goal.

For criterion F.7 on definition of enforcement practices, there are two main approaches that achieve partial coverage of the criterion. The first is to define the lead agencies responsible for enforcing the relevant legislation. This provides the first step in ensuring that enforcement practices are defined completely. The second approach is to use outline general approaches for enforcement in strategies or action plans for IAS or biodiversity. Therefore, there is already a general framework within which specific practices can be defined.

The coverage of the F criteria in the selected OECD countries is relatively similar to that in the MS. As for the MS, criterion F.1 is the best covered, with three of the countries being rated Y and one being rated P. But policies tend to be better streamlined in OECD countries, facilitating enforcement practices. There are also gaps amongst the OECD countries in the coverage of criterion F.2 and F.4. Similar to the EU situation, in EIA/SEA do not require explicitely the inclusion of IAS into the assessment, but may include them.

4.8. CRITERIA G: CAPACITY BUILDING

4.8.1. DEDICATED AGENCY (CRITERION G.1)

No legally-binding requirements for establishing an agency dedicated to IAS have been found at EU or national level in the Member States. However, several dedicated agencies have been identified and are in place in the Member States and in the selected OECD countries.

The criterion is considered fully covered where a dedicated agency is in place, with clear responsibilities for IAS issues. The USA is the only country in which a dedicated agency is established in an executive order.

EU Member States

Full coverage

Five MS (DK, IE, LT, NL and UK) fully cover the criterion by having an agency dedicated to IAS. Although it does not have a dedicated agency for IAS, Denmark has established a network with representatives from different governmental agencies that can coordinate and strengthen the work on IAS. Lithuania has an Invasive Species Control Board dedicated to IAS, which includes representatives of the Ministry of Environment, the State Plant Protection Service, the State Food and Veterinary Service, the National Public Health Service and education and training institutions. Board members may also be other ministries, local authorities and public and non-governmental organisations. The Netherlands has a dedicated team to inform the Minister of Economic Affairs, Agriculture and Innovation on Invasive Alien Species ('Team Invasieve Exoten'), which also monitors several IAS. The UK's Non-Native Species Secretariat was established under the Non-Native Species Framework Strategy for Great Britain 2008 (GB300*). And on the island of Ireland, Invasive Species Ireland is the joint organisation between the Northern Ireland Environment Agency and the National Parks and Wildlife Service (from the Republic of Ireland) in charge of IAS issues. Together, both agencies fully cover IE and the UK.

Partial coverage

Eleven MS (AT, CZ, DE, EE, ES, IT, LV, PT, RO, SI, SK) received a P for this criterion in the assessment.

In those MS in which the criterion was partially covered, the most common approach was for agencies responsible for biodiversity/nature protection (AT, DE, EE, PT, SK) or plant/animal health to also take responsibility for some/all IAS issues (CZ, LV, SE, SI). Austria's National Biodiversity Commission approved its IAS Action Plan but the Commission is not dedicated solely to IAS issues. In Estonia the Environmental Board has responsibilities for IAS. Similarly, Portugal's Institute for Nature Conservation and Biodiversity is responsible for the implementation of the Decree-Law 565/99 on Non-Indigenous Species of Flora and Fauna (PT152). The same is true in Slovakia, where the State Nature Conservancy conducts mapping of invasive plant species. The Romanian Ministry of Environment and the National and Regional Agencies for Environmental Protection deal with IAS but not exclusively. In Germany the Agency for Nature Conservation is responsible and has dedicated staff for IAS.

Other MS use agencies dedicated to phytosanitary issues (CZ, SI, SE, LV). For example, for Latvia it is only specified that the State Plant Protection Service shall perform the supervision and control of the spread of invasive alien plant species. Responsibility for invasive alien species issues in Slovenia is shared between the Institute of the Republic of Slovenia for Nature Conservation and the Phytosanitary Administration of the Republic of Slovenia.

Finally, the need for a dedicated agency may be mentioned in action plans/ strategies, but may not have been put in place yet. For example, the Austrian Action Plan on

Invasive Alien Species 2004 (AT300*) includes an objective to develop a focal point for alien species. Similarly, Italy's National Biodiversity Strategy includes an invasive species board (IT300).

- **Similar coverage**

Five MS (BE, BG, FR, GR, SE) received an S in the assessment because while they do not give direct responsibility for IAS issues to any one agency, they do have related agencies that manage some aspects of the problem. For example, Belgium has a biosecurity agency, Bulgaria and France have defined responsibilities for public and animal health and a person in France is in charge of IAS issues at the Ministry for Ecology; according to the questionnaire, dedicated staff also work on the issue (at national level part-time) in Belgium. Those were rated differently than the agencies rated P because the role of the agencies rated P is formalised as including IAS issues and because a person that has responsibilities regarding IAS in a Ministry is not seen as an agency in charge of IAS (see discussion under 'no coverage').

Other MS, also rated S in the assessment, have a different approach and use other forms of institutions, organisations or networks to take responsibility rather than governmental agencies or ministries (ES, GR, DK, LT). For example, Spain has a National IAS Catalogue Platform which was set up by researchers and which collaborates with the relevant ministries, however this is rather a network of scientists (see also G3) rather than an agency. Greece, also does not have an agency in charge of IAS but does have a number of different institutions and organisations taking initiatives, such as ELNAIS (Ellenic Network on aquatic invasive species), the Weed Scientific Society of Greece, and indirectly some other agencies and societies, research centres and museums.

- **No coverage**

There are six MS (CY, FI, HU, LU, MT, PL) in which there is no agency dedicated to or taking official responsibility for the problem of IAS. This does not mean however that no one is taking responsibility for IAS. As identified in Table 7 (section 5.1.2.), in most MS, specific persons are identified as having responsibilities in relation to IAS. Similarly, for NOBANIS participating MS, the national focal contact point is having responsibilities related to IAS.

In some cases, there may be active communication and information exchange between relevant parties that is not documented in legislation, even when there is no dedicated agency to coordinate it. For example, this occurs in Estonia between the Ministry of Environment (responsible for legislation, contact with international expert groups, e.g. NOBANIS, Bern Convention IAS group, and EPPO IAS group) and the Environmental Board (responsible for nature conservation actions and hands on work).

- **Selected OECD countries**

- **Full coverage**

The USA (rated Y) is the only country to have a body dedicated to invasive species, although it is not an agency per se. The Invasive Species Council is the primary body for invasive species, established under the Executive Order 13112 on invasive species. Other specific working groups have been set up to coordinate governmental efforts at all spatial scales and for specific IAS, such as the Brown Tree Snake Technical Working Group. New Zealand was also rated Y because Biosecurity New Zealand is the main agency, and there are other agencies as support (16 regional councils have pest management staff, Environmental Risk Management Authority)

Canada has a single body responsible for IAS issues, although it is focused on plant and animal health (CFIA).

- **Similar coverage**

Australia was rated S because responsibilities for IAS issues are shared between a number of agencies. As responsibilities are clearly outlined, but no dedicated agency is in place, AU was rated S.

4.8.2. DEDICATED WEBSITE/CENTRALISED INFORMATION SHARING SYSTEM (CRITERION G.2)

At EU level, there is a website operated by the European Commission that is dedicated to IAS[99].

Regional and EU level websites, particularly the NOBANIS and DAISIE sites are also important source of information on invasive alien species in Europe, and provide a tool for coordination between participating countries. The website[100] of the DAISIE project collates information on biological invasions in Europe up to 2008. The NOBANIS website is an important source of information on IAS, and provides a tool for coordination between participating countries. Nineteen countries in the North and Central Europe are participating in NOBANIS (European Network on Invasive Alien Species). Within the network there is regular information exchange through newsletters, meetings and through generally good contact between the involved countries. There are also other databases in place at EU level and within regions of the EU, which also often include national data.

Full coverage of the criteria supposed the existence of a dedicated website on IAS, that allows information sharing, and which aims to centralise/coordinate all the information on IAS at national level. It can be noted that the websites are sometimes used to encourage public involvement and cooperation (see criterion H2).

[99] Available from: ec.europa.eu/environment/nature/invasivealien/index_en.htm [Accessed 9/6/2011]
[100] Available from: www.europe-aliens.org [Accessed 25/4/2011]

EU Member States

Full coverage

Six MS (BE, DK, IE, PL, LT and UK) fully cover the criterion regarding websites and information systems.

Belgium, Denmark and Poland have already established websites that include more functions than simple provision of information. Belgium has a website for its risk assessment system (Harmonia) that provides information on IAS in Belgium more generally e.g. including an alert list of IAS based on the outcome of risk assessments. The Belgian Forum on Invasive Species is linked to the Harmonia website. Denmark has a nationwide electronic IAS reporting system for citizens[101], established under the Action Plan for Invasive Species (DK300). Ireland also has the Invasive Species Ireland website. Poland has a web-portal and database on IAS, which includes information on 1 169 alien species of plants, animals and fungi. The needs and methods for IAS control and management are also assessed. Lithuania has a similar database, with a bit less information.

The UK has a dedicated website in place[102], and a key action of the Non-Native Species Framework Strategy for Great Britain (GB300*) was to create a central repository for holding data on the distribution of alien species, which is considered to be completed[103].

Partial coverage

Nineteen MS (AT, BG, CZ, DE, EE, ES, FI, FR, GR, HU, IT, LV, LU, NL, PT, RO, SE, SI, SK) partially cover the criterion, receiving a P in the assessment.

Estonia has a website that includes an invasive species database, but it does not provide much general information on Estonian initiatives relative to IAS.

In thirteen of these MS (AT, BG, ES, FI, FR, GR, HU, LV, LU, PT, RO, SI, SK), there is no website dedicated to IAS (i.e. not only focused on specific taxa or groups of taxa), but relevant information is provided on other websites. For example, Austria has relevant information on the website of the Environment Agency Austria[104], and also has information on two other websites[105]. Similarly, Bulgaria has information about IAS on the websites of its regional environmental agencies. Spain has some information available on the website of the environmental Ministry and the Fundación Biodiversidad (Biodiversity Foundation). Finland has some information on the website of its environmental administration. Italy has two dedicated webpages set up by the

[101] Available from: www.naturstyrelsen.dk/Naturbeskyttelse/invasivearter/Indberetning [Accessed 8/6/2011]
[102] Available from: www.nonnativespecies.org [Accessed 8/6/2011]
[103] According to the GB strategy implementation plan, which can be downloaded from https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=55
[104] Available from: www.umweltbundesamt.at/umweltschutz/naturschutz/artenschutz/aliens [Accessed 8/6/2011]
[105] Available from: www.biologischevielfalt.at/hot-topics/nicht-heimische-arten/ and www.neophyten.net/index.php [Accessed 8/6/2011]

WWF and the University of Trieste). As they are not coordinating official information on IAS, they were rated P. The Netherlands also has multiple websites that provide information. Romania has information on the website of a research project on monitoring and rapid detection of IAS.

Websites may also be dedicated to specific IAS or groups of species. For example, there are separate websites dedicated to invasive aquatic species and invasive plant species in Germany. Bulgaria also has a website dedicated to the *Dreissena* genus (zebra mussels). Similarly, Portugal has a website for invasive plants. Sweden has a website focusing on marine alien species.

Austria received a P because setting up a dedicated information centre is a high priority goal of the action plan for invasive alien species, in the short-term (no information was found on when it is expected to be implemented). The strategy also includes several aims to provide/spread information e.g. on the portal www.biodiv.at).

- **Similar coverage**

Cyprus and Malta received an S in the assessment because information on IAS is still to be developed on the websites of the Ministry on Agriculture, Natural Resources and Environment and the Malta Environment and Planning Authority (specifically a database on IAS will be developed). No information was found on by when these actions will be implemented.

- **No coverage**

No MS was found to not have information at all on any website about IAS.

  - **Selected OECD countries**

- **Full coverage**

In terms of websites, the USA (rated Y) has a dedicated website run by the National Invasive Species Council. Developing a single information sharing system in the USA is an objective of the National Invasive Species Management Plan 2008-2012. Significant discussions took place in terms of focus and scope. The current aim is, instead of promoting a single system, to ensure that data is shared across existing information systems (e.g. USDA, USGS, Smithsonian). Other systems or requirements to share information will be set up in specific circumstances. For example, a National Ballast Information Clearinghouse shall be set up, but no information on a time frame was found.

New Zealand was also rated Y because a dedicated website for biosecurity exists. There is no information sharing system coordinated at national level, although there are separate systems at regional and national level, and for separate central government departments.

Canada was also rated Y as a website provides information on invasive species in Canada[106]. It can be noted that the advent of a centralised information sharing system

[106] www.invasivespecies.gc.ca/English/view.asp?x=1

was recommended by the Strategy, but the 2008 audit by the Office of the Auditor General report on the CFIA's performance suggests that, at the time of the audit, insufficient efforts had been made to realise that goal.

- **Partial coverage**

Australia received a P because there are three websites dedicated to different aspects of IAS: weeds, marine pests and vertebrate pests, but these websites do not cover all taxa of potential IAS. The websites were set up as a result of national strategic plans. No information system was identified in Australia.

4.8.3. NATIONWIDE NETWORK OF EXPERTS (CRITERION G.3)

In order to fulfil the criterion, the country should have a formalised network of experts that deal with IAS issues, covering the different taxa.

- **EU Member States**

- **Full coverage**

Twelve MS (BE, DK, ES, GR, HU, IE, IT, LT, LU, NL, PL, UK) covered this criterion fully, by having an organised network of experts (which can be defined as the experts that are clearly identified as such) dealing with the issue of IAS, of either scientific experts or governmental experts.

In Belgium the Harmonia website was initially implemented by experts and only then used by policy-makers. Denmark has both a network of representatives of government agencies to coordinate and strengthen the work on IAS, and an advisory group comprised of representatives of research institutes, NGOs and other stakeholders. Lithuania has an advisory board made up of all relevant governmental institutions, including the Ministry of Environment, the State Plant Protection Service, the State Food and Veterinary Service, the National Public Health Service, as well as education and training institutions, other ministries, local authorities, and public and non-governmental organisations. The Board advises the Ministry of the Environment on IAS prevention and management.

In other MS (ES, GR, HU, LU, NL, PL), experts involved in key studies are national experts on IAS. For example, the persons involved in the Hungarian Biodiversity Monitoring System (HU500) and the META Programme (HU501) are considered experts. The Institute of Nature Conservation, Polish Academy of Sciences in Krakow (a major scientific advisory body in Poland), developed the database on IAS in Poland. In the Netherlands, experts were responsible for producing the Dutch Species Catalogue and IAST, the team responsible for IAS issues, is in charge of sharing knowledge, advising experts, etc. In Spain the National IAS Catalogue Platform (Plataforma sobre el Catálogo Español de Especies Exóticas Invasoras) was created by a nationwide group of experts specialised in biological invasions, the "GEIB Grupo Especialista en Invasiones Biológicas". In Greece two key organisations, ELNAIS and the Weed Scientific Society of Greece, are made up of experts in IAS issues. In Luxembourg, scientists of the MNHNL

are involved in IAS research. In France the experts from the National Botanic Conservatoires and from the MNHN are collaborating with the Ministry for Ecology on the issue of IAS.

In Italy, a Board on Invasive species was implemented in the framework of the National strategy on Biodiversity. Additionally, in Sicily a list of contact persons or agencies for each region has been established for several southern regions[107]. A different approach is taken by Portugal, where a technical-scientific body made of experts and chaired by Instituto da Conservação da Natureza e da Biodiversidade (ICNB - Institute for Nature Conservation and Biodiversity) has been established for general environmental issues, including IAS.

In the UK and Ireland, experts are involved in the work concerning IAS. For example in Ireland a stakeholder network of over 80 organisations has been set up.

- **Partial coverage**

Seven MS (AT, FI, FR, LV, PT, RO, SK) partially covered the criterion and received a P in the assessment.

Three of the MS (AT, FI, LV) received a P in the assessment because the establishment of a network of experts is an objective of a strategy or action plan for IAS, that has yet to materialise. For example, the Austrian Action Plan on Invasive Alien Species (2004) (AT300*) calls for the establishment of a national "Neobiota" working group in the Austrian Biodiversity Commission. The Finnish Strategy (not approved yet) recommends the establishment of a national IAS board to oversee the implementation of the strategy. The Latvian Control Programme for Giant Hogweed 2006-2012 (LV160) recommends that a board of experts be created to coordinate the scientific activities on hogweed.

Slovakia received a P because there is an expert group established, but only for invasive plants.

In France experts are identified by the Ministry for both plants and animal IAS species, but no formalised network of experts is in place, thus it was rated P.

- **Similar coverage**

Sweden received an S as no formal network of experts could be identified. However, several experts do work on the issue of IAS, for instance the website Främmande arter was a cooperation between experts.

- **No coverage**

Seven MS (BG, CY, CZ, DE, EE, MT, SI) were not found to have covered this criterion. Experts from across the EU were involved in the DAISIE project and can be identified through the website, but they do not constitute a formalised network of experts.

[107] Text available from: www.arpa.sicilia.it/UploadDocs/29_Elenco_contatti_Specie_Aliene_Invasive.pdf [Accessed 9/6/2011]

- **Networks in OECD countries**

Networks are commonly in place in the four OECD countries.

- **Full coverage**

Canada was rated Y as there are several networks in place at North American or national level. There is a North American Invasive Species Network, which is a group of IS experts that aims to further scientific understanding of and effective responses to IS in North America. From 2006 to 2011 there has also been a Canadian Aquatic Invasive Species Network, which provided insight into the problem of aquatic invasive species. The NSERC Canadian Aquatic Invasive Species Network II (CAISN II 2011 - 2016) will address remaining information gaps by focusing on four new core themes: Early Detection, Rapid Response, AIS as Part of Multiple Stressors, and Reducing Uncertainty in Prediction and Management.

The USA was also rated Y. It is a requirement of Executive Order 13112 (1999) on invasive species that the National IS Council must facilitate a network of federal agencies for documenting, evaluating and monitoring impacts of IS. It is also required that a database of taxonomic experts be set up. A list of Taxonomic Experts for Insects, Mites, and Plant Pathogens is available on the website[108]. Several groups work on the issue of IAS (e.g. Aquatic Nuisance Species Taskforce, NECIS) and as noted above, there are also networks in place at North American level. The database for searching aquatic nuisance species experts is available from www.anstaskforce.gov/experts/search.php, where experts can be searched by State.

Similarly, there is a nationwide network of experts in New Zealand (rated Y), which includes Crown Research Agencies, universities and departmental officers (e.g. from MAF and the Department of Conservation).

- **Partial coverage**

Australia (rated P) has a number of nationwide committees that were set up to deal with the issue of IAS, including the Vertebrate Pests Committee, the Australian Weeds Committee and the National Introduced Marine Pests Coordination Group. However, these do not cover all taxa of potential IAS.

4.8.4. TRAINING PROGRAMMES FOR TARGET GROUPS AT REGIONAL OR NATIONAL LEVEL (CRITERION G.4)

Training programmes allow raising awareness in different groups, that can then be better informed e.g. about how to not unwillingly introduce IAS or which species are IAS and involve the groups in control efforts/monitoring actions.

To fully cover the criterion at least one target group was expected to be targeted with training programmes in place.

[108] see www.invasivespeciesinfo.gov/toolkit/expertisetax.shtml

- **EU Member States**

- **Full coverage**

Four MS (EE, ES, HU, LV) fully covered the criterion. These MS do not have official training programmes but have carried out some form of training events. For example, seminars for targeted groups such as customs officers have been carried out in Estonia. Similarly, a workshop was held in Spain in 2010 to analyse the draft document of Spain's strategy, with a follow-up being held in 2011. IAS issues can also be incorporated into wider training on biodiversity or environmental themes. For example, Hungary's National Park Directorates and Civil Organisations often organise training or open-air schools focused on biodiversity and nature protection but include topics on IAS. In Spain, actions are only taken at regional level. For example, Galicia has requirements for environmental and technical training of administration staff, and awareness programmes on IAS under the Galician River Protection and Conservation Act (ES131R). Latvia's Control Programme for Giant Hogweed 2006-2012 (LV160) recommends that training programmes be initiated. Some training has already taken place.

- **Partial coverage**

Four of the MS (DK, FI, LT, UK) received a P because development of training programmes was a recommendation or an aim of a strategy or action plan, but the programmes have not yet been put in place. For example, it is a recommendation of the Danish Action Plan for Invasive Species (DK300) that specific and targeted capacity building among key actors in sectoral authorities, sectors and interest groups be promoted, but no concrete actions have yet been taken. Similarly, under Finland's Proposal for a National Strategy on Invasive Alien Species (FI400), it is recommended that communication and training actions on IAS be initiated. Under the Invasive Alien Species Strategy for Northern Ireland (NI400*), training for local authorities will be developed and delivered. In the UK's Non-Native Species Framework Strategy for Great Britain states that the need for investment in training will be considered, but the work has not started yet. Lithuania's Order on Introduction, Reintroduction and Transfer Programme (LT160d) recommends that specific interest groups are identified to which training and information are then given.

- **No coverage**

Nineteen MS were not found to have training programmes in place for target groups at regional or national level (AT, BE, BG, CY, CZ, DE, FR, GR, IE, IT, LU, MT, NL, PL, PT, RO, SE, SI, SK).

- **Selected OECD countries**

- **Full coverage**

A variety of programmes are in place in the four OECD countries for training. Australia appeared to have the most extensive variety of programmes. All strategies in place at national, state and regional level include sections on training and capacity building.

Furthermore, most state governments have a group for education services, which may run communication, training and education programmes in partnership with relevant groups. For example, the New South Wales Industry and Investment Department works with the Noxious Weed Advisory Committee and Noxious Weed Grants to support a communication, training and extension programme.

Canada was also rated Y because there are training programmes in place. The CFIA is required to train border services officers to carry out inspections of imported goods, including for high-risk plants and animals.

The USA was rated Y because the National Invasive Species Plan aims to provide training in Hazard Analysis and Critical Control Points (HACCP) and other risk-based methods to minimise introduction of IAS.

Training programmes for biosecurity awareness and for inspectors are in place in New Zealand by various organisations.

4.8.5. TECHNICAL GUIDELINES AND CODES OF CONDUCT (CRITERION G.5)

A 'Code of conduct on horticulture and invasive alien plants' was drafted by the Bern Convention in 2009, which was translated in certain countries (e.g. Poland, PL501). Two other codes are also being drafted by the Council of Europe 'Code of conduct on companion animals and invasive alien species (including ornamental fish) in Europe'[109] and 'Code of conduct on zoological gardens and aquaria and invasive alien species in Europe'[110]. This is not considered to be common to all MS as no requirement to develop such code for the national level exists.

Other initiatives at international level are the EIFAC Code of practice for recreational fisheries[111] and the ICES Code of Practice on the Introductions and Transfers of Marine Organisms 2005[112].

The criterion was considered fully covered if if at least one code of conduct is fully in place for a specific sector. Such codes describe good practices and are different from engagements taken by economic sectors, see criterion B12. In this criterion no commitment by firms to abide by the code of conduct is made, contrary to what happens in the agreements included in B12.

[109] See the working draft dated April 2011 available from https://wcd.coe.int/wcd/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=1833355&SecMode=1&DocId=1731536&Usage=2

[110] See the working draft dated April 2011 available from https://wcd.coe.int/wcd/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=1834873&SecMode=1&DocId=1734382&Usage=2

[111] Available from: ftp://ftp.fao.org/docrep/fao/011/i0363e/i0363e00.pdf

[112] http://www.ices.dk/reports/general/2004/ices%20code%20of%20practice%202005.pdf

- **EU Member States**

- **Full coverage**

Ten MS were considered as fully covering the criterion (AT, BE, DE, DK, EE, ES, FR, IE, PL, UK).

Five MS (AT, BE, DE, DK, FR, PL) include codes of conduct for horticulture. For example, Austria's Association of Gardening has developed voluntary codes of conduct for horticulture in relation to IAS. Vienna University has also published guidelines for alternatives to invasive plants. In Belgium, the LIFE project AlterIAS was dedicated to invasive alien plants and preventing their use in horticulture, thus providing information on what other plants could be used, targeting the same objective as a code of conduct. In France, codes of conduct were identified at regional level, e.g. in Quiberon, and Picardie. In Denmark (on-going work) and Poland (published code), a code of conduct based on the horticulture code of the European Council was also developed according to the questionnaire.

In the UK and Ireland, the development of codes of conduct is a key aim of the strategies, which have been implemented. A key aim of the Northern Ireland Invasive Alien Species Strategy (NI400*), which is currently under consultation, is to develop codes of practice with key sectors and integration of IAS into industry standards. Codes of conduct were already implemented for a number of areas: the Invasive Species Ireland website provides codes of practice for aquaculture, marina operators, water users and horticulture[113] (covering both IE and NI). As well as being a key aim of the Non-Native Species Framework Strategy (GB300*), several other pieces of legislation allow the possibility for Ministers to develop codes of practices or guidance. For example the Secretary of State can issue a code of practice related to new animal species or listed plant or animal species (see criteria A1 and A2). Several guidance documents are in place and available on the GB dedicated website[114], a code for horticulture is available in Scotland[115], etc. A code of practices to explain the requirements of the regulation relative to IAS is also available in draft version in Scotland[116]. Failure to comply with a code does not make a person liable for criminal proceedings.

Several guidelines are also available in Spain. Guidelines are developed in national publications such as the manual on "IAS: Diagnosis and Basis for Prevention and Management" (ES501*) and "Atlas of Alien Invasive Plant Species in Spain" (ES500*), but these are not formally codes of conduct. Galicia's regional strategy on invasive plants (ES300R*) also includes guidelines. Furthermore, codes of good practices for responsible holding and trade of different taxa are being developed at regional level (responsible holding and trade of reptile and amphibians in the Canary islands, a

[113] Available from: invasivespeciesireland.com/cops
[114] See https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=41
[115] See www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/InvasiveSpecies/HCOP
[116] The draft document is under consultation since March 17, 2011, see www.scotland.gov.uk/Publications/2011/03/17115253/0

manual on management of invasive vertebrates on Spanish and Portuguese islands, codes of conduct on plants, birds and mammals will be released in 2011).

In Estonia there is a code of conduct for terrestrial alien species, and it describes the problems with IAS and gives suggestions for solutions. In 2011, a similar book will be published for marine and freshwater species

- **Partial coverage**

Two MS (FI, SE) received a P in the assessment.

In Sweden, there is some guidance on specific species, developed on a case-by-case basis.

In Finland, the development of codes of conduct is a recommendation or aim of a strategy or action plan, which has not yet been met. For example, the development of codes of conduct for animal and plant trade is a recommendation of Finland's proposal for a National Strategy on Invasive Alien Species (FI400).

- **Similar coverage**

The four MS (CY, GR, SK, SI) that received an S took diverse approaches. The Report on IAS in Cyprus (CY502) produced by the Ministry of Agriculture, Natural Resources and Environment recognises the importance of informing the public of the dangers that can cause illegal importing, detention and giving freedom to IAS in the local environment. However, no concrete guidelines or codes have been identified.

In Greece there were no specific codes for IAS. However, there are codes for agriculture, which include means of dealing with invasive alien plants. Slovakia has produced a Guidance for Removal of Invasive Plant Species. In Slovenia, the forestry act provides for forest management plans to define guidelines for conservation or restoration of autochthonous forest communities (SI124).

- **No coverage**

Eleven MS were not found to have technical guidelines or codes of conduct in place (BG, CZ, HU, IT, LV, LT, LU, MT, NL, PT, RO).

  - **Technical guidelines in OECD countries**

- **Full coverage**

The USA was rated Y because there are a number of pieces of legislation in place under which guidance will be provided. The Executive Order 13112 specifically devoted to IAS requires that the National IS Council develop guidance for federal agencies. Similarly, the Brown Tree Snake Control and Eradication Act require that technical assistance is provided to states on issues related to the brown tree snake.

Technical guidelines are also in place in New Zealand; examples include the MAF Biosecurity manual for Risk Analysis Procedures and the Department of Conservation Standard Operating Code for Weed Surveillance.

Australia was rated Y because there have been efforts to achieve an agreed-upon code of conduct for the control of pest animals. However none were identified for plants. Codes of practice have been developed for the control of pests: cats, goats, horses, pigs, foxes, rabbits and wild dogs. As well, standard operating procedures have been developed for shooting, trapping, baiting and habitat destruction for a range of pest animals.

In Canada, a national code on Introductions and Transfers of Aquatic Organisms is available from Fisheries and Oceans Canada. No other codes were found for other taxa/ecosystems.

4.8.6. ORGANISED AND SYSTEMATIC EXCHANGE OF BEST PRACTICES (CRITERION G.6)

Full coverage of this criterion involved exchanges of best practices related to the management of IAS between stakeholders (experts, practitioners). These exchanges can occur at local or national level (international exchange e.g. through NOBANIS is not considered full coverage), but should be organised and regular.

- **EU Member States**

- **Full coverage**

No MS fully covered this criterion, as in no MS a systematic exchange of best practices, whether at national or international level, was identified.

- **Partial coverage**

Fifteen MS (AT, BE, CZ, DE, DK, EE, FI, IE, LT, LV, NL, PL, SE, SK, UK) received a P in the assessment, 14 of which at least partly through their involvement in the NOBANIS network.

The best illustration of best practices sharing is probably through the Nobanis network, where exchanges between the 14 member MS are organised (AT, BE, CZ, DE, DK, EE, FI, IE, LT, LV, NL, PL, SE, SK). However, these MS were not considered to have fully fulfilled the criterion because the exchange of best practices is not systematic and no exchange was identified within the MS.

Additionally to NOBANIS, in some MS (EE, DE, DK), exchanges of best practices occur without formalised frameworks. For example, in Estonia there is active information exchange between the Ministry of Environment and the Environmental Board. In Denmark, the web page of the Nature Agency has a lot of information about IAS, including best practices. In Germany the neophyte website also allows to exchange best practices.

Setting up systems for information exchange may also be an objective of IAS strategies or action plans (in the UK, both GB and NI). For example, the Invasive Alien Species Strategy for Northern Ireland (NI400*) includes an objective to produce an online toolkit of methods with case studies and relevant contact details. The Non-Native

Species Framework Strategy for Great Britain (GB300*) includes relevant key actions to encourage effective partnerships and to develop a database of projects to facilitate information sharing;

- **Similar coverage**

Two MS were rated S (IT and ES).

A different approach was taken in Sicily (Italy) where a list of contact persons or agencies was established for southern regions[117], allowing for exchanges, but no requirement was found.

Spain has the IAS Catalogue Platform[118], which does not specifically include a systematic exchange of best practice but does provide an opportunity and network for sharing information.

- **No coverage**

Ten MS were not found to have any means of organised and systematic exchange of best practices (BG, CY, FR, GR, HU, LU, MT, PT, RO, SI).

- **Selected OECD countries**

- **Full coverage**

Australia was rated Y because several manuals have been developed to ensure that best practice for management and control options for Weeds of National Significance. The establishment of Cooperative Research Centres focused upon invasive and pest species has been instrumental in the development and exchange of best practice.

In New Zealand, an annual education and training seminar is held by the New Zealand Biosecurity Institute, providing insights into invasive species management, open to all members. Membership is open to anyone interested in biosecurity issues.

- **Partial coverage**

In the USA (rated P), there is currently no organised and systematic exchange of best practices, but demonstration projects and development of best practices are encouraged. For example, demonstration projects for management and control of salt cedar and Russian olive will be set up. In addition, an objective of the IS Management Plan is to support efforts by non-federal stakeholders to develop best management practices and share such practices among NISC members.

A key goal of the Canadian Strategy (rated P) is to develop a national database for information for handling IAS at different stages of the invasion process and any associated risk and a website has been developed (see G.2). In the framework of the Invasive Alien Species Partnership Program several projects are financed that include

[117] Text available from: www.arpa.sicilia.it/UploadDocs/29_Elenco_contatti_Specie_Aliene_Invasive.pdf [Accessed 9/6/2011]
[118] sites.google.com/site/plataformacatalogoespanoldeeei/home [Accessed 9/6/2011]

demonstration or pilot projects. No systematic exchange of best practices has however been noted.

4.8.7. LEVEL OF COORDINATION/INTEGRATION WITH ANIMAL AND PLANT HEALTH (CRITERION G.7)

- **EU Member States**

This criterion was very difficult to assess, as clearly IAS and animal and plant health issues are interlinked, but only very few documents provide information on how close the links are, and these links can also vary in time.

Full coverage of this criterion involved any degree of coordination between animal and plant health organisations and IAS-related organisations

- **Full coverage**

One country (FI) fully covered this criterion. The animal and plant health organisations were reported to have played a key role in the preparation of the new Finnish proposal for a national strategy on IAS (FI400). Hence, animal and plant health considerations are well-integrated.

- **Partial coverage**

Two MS (DK, LT) received a P in the assessment. In both these MS, integration is achieved by including the relevant agencies in advisory groups or boards. Denmark's advisory group includes relevant stakeholders and a network with representatives of the relevant governmental agencies. This should therefore ensure that there animal and plant health aspects are taken into account. Similarly, in Lithuania, the Invasive Species Control Board includes the State Plant Protection Service and the State Food and Veterinary Service.

- **Similar coverage**

The Czech Republic received an S in the assessment because here integration occurs via coordination between the Ministry of Agriculture and the Ministry of the Environment. Therefore, there was no direct or formal system for integration but there was a degree of informal cooperation.

- **No coverage**

Twenty-three MS did not cover the criterion, probably more because of a lack of information, i.e. that informal information exchange take place in many MS without being formally specified, than because the issues are not integrated.

- **Selected OECD countries**

In all of the four countries there is some degree of coordination with animal and plant health.

- **Full coverage**

Australia, Canada and New Zealand were all rated Y. In Canada, the agency responsible for IAS issues, the CFIA, is also the leading agency of policies and related measures regarding the protection and health of animal and plant safety. Therefore, it welcomes the collaborating efforts of other federal departments/agencies as well as communicating and cooperating with provincial authorities in programs aimed at reducing the impacts of plant pests, disease and other unwanted organisms.

There is also a high degree of coordination/integration with animal and plant health through high level committees in Australia. Similarly, in New Zealand, there is no distinction between IAS that threaten animal/plant health and those that threaten environmental/ecological health in terms of the systems for prevention, control, etc.

- **Partial coverage**

In the USA (rated P), there is some degree of coordination with plant and animal health, but less than in Canada or other countries in which the primary body for IAS issues is also concerned with plant and animal health issues. However, an objective of the IAS Management Plan is to approve and implement sanitary and phytosanitary standards developed in the appropriate international fora (International Plant Protection Convention, Office International des Epizooties).

4.8.8. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
G1	6	5	11	5	0	1	0	3
G2	0	2	19	6	0	0	1	3
G3	7	1	7	12	0	0	1	3
G4	19	0	4	4	0	0	0	4
G5	11	4	2	10	0	0	0	4
G6	10	2	15	0	0	0	2	2
G7	23	1	2	1	0	0	1	3

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

For all of the G criteria, there are at least some EU MS in which there are partial requirements/systems in place that have the potential to be extended or adapted to cover all IAS with G1 (5Y, 11P), G2 (5Y, 9P), G3 (11Y, 7P) and G5 (5Y, 19P) being relatively well-covered by a small number of MS. G1, G2 and G3 relate to flow of

information, through the implementation of a centralised agency, websites and organising networks of experts. Initiatives are in place in that area, and knowledge is available to improve information flows. G5 relates to the existence of technical guidelines and good practices, and the initiatives identified suggest that there is already a sound basis on which to develop capacity-building activities in the EU.

Many of the G criteria (G1, G2, G3, G4, G5, G6) are the subject of a recommendation or aim of strategies/action plans for IAS. Therefore, it can be assumed that once the strategies are fully implemented, these criteria will be more fully covered by the countries concerned. Given that many of the G criteria involve coordination and cooperation between countries, many of the EU MS use the opportunity provided by NOBANIS to partially meet criterion G.6.

G4 and G7 are least covered and relate to the existence of tools for capacity-building, which is organised by different stakeholders and target only specific groups.

The most obvious gap in the G criteria, is the criterion on the level of coordination or integration with animal and plant health (criterion G.7). This criterion was very difficult to assess, since cooperation very probably occurs, but is not formalised in documents and needs to be explicitly reported to be able to be identified in this report.

This group of criteria is covered through many informal approaches, with various stakeholders. Thus actions are in place, but would benefit from coordination at a higher level to maximise synergies and target all relevant stakeholders as well as taxa and sectors.

In contrast with the EU countries, criteria G2 to G5 were very frequently fully covered by the selected OECD countries. Canada, the USA and New Zealand all have dedicated websites (G2) and expert networks (G3). In Australia, no centralised websites or networks exist for all IAS, but rather distinct ones covering separate taxa. Similarly, under criterion G.4, in Australia, Canada and the USA formal training programmes are required. All OECD countries had some technical guidelines and codes of practice in place to share best practices, however these did not seem abundant (G5). Overall, the selected OECD countries seemed to have a much better level of coordination and integration with plant and animal health than the EU countries (G7). This can be explained in part because no distinction is made between IAS that threaten animal and plant health and others (AU, NZ) and because the responsibilities for IAS and plant and animal health are streamlined within a single agency (Canada). It may also reflect the fact that no formalised integration of responsibilities exist in the EU, while cooperation is in place in practice informally. The remainder of the G criteria were variably covered by the four selected OECD countries, as is the case in the EU MS.

4.9. CRITERIA H: AWARENESS RAISING AND ENGAGEMENT

4.9.1. EDUCATIONAL MATERIAL AND INFORMATION CAMPAIGNS FOR TARGET GROUPS (E.G. TRAVELLERS, GARDENERS, PET SHOPS) (CRITERION H.1)

The criterion was considered fully covered if at least a few different target groups were targeted by educational or information campaigns on IAS.

- **EU Member States**

- **Full coverage**

No MS were found to fully cover this criterion.

- **Partial coverage**

Seventeen MS (AT, CZ, DK, EE, ES, FI, FR, GR, HU, IE, IT, LV, NL, PL, SI, SK, UK) were found to partially cover this criterion (rated P).

In some MS (AT, CZ, DK, FI, IT, UK (for NI)), developing such materials and campaigns is an objective of strategies or action plans for IAS, or of biodiversity strategies. For example, the Austrian Action Plan on Invasive Alien Species (AT300*) proposes a number of measures, including seminars and brochures, and key target groups are mentioned. Similarly, the Danish Action Plan for Invasive Species (DK300) recommends that NGOs, industry organisations and landowners are involved in efforts to manage selected IAS. Objectives of the Invasive Alien Species Strategy for Northern Ireland (NI400*, under consultation) include to provide information to the public, develop a communications plan to produce consistent and targeted messages, and to build effective stakeholder partnerships. Additionally, a range of education and awareness materials have also been developed and are available for download from the Invasive Species Ireland website (covering both IE and NI). The Czech National Biodiversity Strategy (CZ300) mentions that educational programmes should be prepared and the general public should be informed. The Italian National Strategy on Biodiversity (IT300) recommends providing appropriate information to the public, interested parties and decision-makers.

The Alien Species in Poland database (PL500) lists recommendations for managing biological invasions in Poland, including awareness-raising and educational programmes.

In Hungary, public participation in nature conservation is encouraged under Act No. LIII. of 1996 on Nature Conservation in Hungary (HU120) by ensuring that it is part of the national curriculum. However, this is not specifically focused on IAS.

In other MS (AT, CZ, DK, EE, ES, FR, HU, NL, SI, SK), information and educational material is produced but not as part of a formalised programme or campaign. The Czech Union for Nature Conservation has conducted awareness-raising activities for

IAS. In France, such materials appear to only be in place at regional level (Picardie, Corsica and Brittany). The Slovenian Ministry of the Environment and Spatial Planning offers some information regarding IAS.

At regional level, Spain's Galician River Protection and Conservation Act (ES131R) require environmental education for administrative staff and awareness-raising programmes on IAS.

According to the Greek ELNAIS Fishery Code (GR500), lists of IAS in Greece are to be given to all stakeholders.

- **Similar coverage**

One country (SE) received an S in the assessment. Websites of the relevant authorities provide information. For example, the Board of Agriculture provides information about imports of plant material.

- **No coverage**

Nine MS (BE, BG, CY, DE, LU, LT, MT, PT, RO) were not found to have developed educational material or information campaigns that are widely publicised.

  - **Selected OECD countries**

- **Full coverage**

This criterion is well-covered in the four OECD countries, with all four countries being rated Y. There are diverse programmes already in place, or implementation of such programmes is a key objective of plans and strategies.

As has been mentioned for criterion G4, there are many programmes for training and education in Australia. Furthermore, an information campaign 'Grow me instead' is in place by the Nursery and Garden Industry Australia (NGIA) promoting a positive change in the attitude of both industry and consumers toward invasive plants[119]. The main strategies include a section on awareness-raising. Similarly, there are numerous examples of multimedia information materials and other programmes in place in New Zealand, produced by the MAF. For example, a manual for plants considered pests, magazines and information/communication resources are in place.

A key part of the Canadian Strategy is to engage Canadians in actions to prevent, detect, and respond rapidly to invasive alien species in order to minimise the risk the species pose to the environment, economy and society. Many departments are involved in awareness programmes and material is available from different sources.

In the USA, all the many policies require implementation of education and awareness-raising programmes for either IAS in general or in particular circumstances such as ballast water. Information campaigns targeting IAS pets/animals are also in place by the industry, such as Habitattitude, the National Reptile Improvement Plan[120] and Bd-Free 'Phibs Campaign. Such programmes may be directed at the general public, States,

[119] www.growmeinstead.com.au/
[120] www.pijac.org/projects/project.asp?p=28

and recreational or industrial users of IAS. For example, in the State of Washington a programme Garden Wise provides information for gardeners regarding alternative non-invasive species that can be planted[121].

4.9.2. VOLUNTARY OBSERVATION NETWORKS – E.G. BIRDWATCHERS, HUNTERS, VOLUNTEER GROUPS (CRITERION H.2)

Full coverage of this criteria involves voluntary national networks for reporting the presence of IAS. These can involve voluntary initiatives related to the management of IAS, citizen science initiatives or other initiatives, targeted to IAS sightings, The initiatives may be organised by the authorities or other stakeholders.

Policies at EU or international level to address this criterion have not been identified. However, there are many associations that are involved in voluntary initiatives to control/eradicate IAS, some of them being exclusively dedicated to IAS (e.g. AFEDA in France on Ambrosia, in Austria the Enok website collects information on raccoon and raccoon dogs).

- **EU Member States**

- **Full coverage**

Four MS (DK, EE, IE and MT) fully cover the criterion, as they have national networks that allow the reporting of any IAS.

Denmark, Estonia, Ireland and Malta have websites where observations of IAS can be entered based on personal observations or sightings. In Denmark, a nationwide electronic reporting system for citizen sightings of IAS has been established[122]. In 2011, the Estonian website/database is holding a competition for the most sightings of alien species by different age groups. In Ireland an alien watch page is available and in Malta IAS can be reported by e-mail or phone to the Malta Environment and Planning Authority. In Ireland sightings can be reported on the Invasive Species Ireland website.

- **Partial coverage**

Twelve MS (AT, BE, BG, CZ, FI, FR, HU, LV, LT, NL, SE, UK) received a P in the assessment.

In two MS (BG, HU), such networks are in place but concern biodiversity conservation as a whole rather than IAS. In Bulgaria, a voluntary network has been coordinated by the different agencies responsible for flora and fauna protection[123]. However, this network is focused on biodiversity monitoring and not specifically on IAS. The Hungarian Biodiversity Monitoring System (HU500) is in place, which is financed and supported by the government.

[121] Available from : www.nwcb.wa.gov/education/Eastern_Garden_Wise_Web.pdf
[122] www.naturstyrelsen.dk/Naturbeskyttelse/invasivearter/Indberetning/
[123] see www.bspb.org; www.slrb.org; www.hydrobiology-bg.com

Similarly, websites for recording observations may include provision for reporting IAS but not be focused on IAS (LV, LT, NL, SE). For example, the Latvian Fund for Nature and Latvian Ornithological Society organise a website for voluntary observations[124], although it is not focused on IAS. There is a similar situation in Lithuania. In the Netherlands, sightings of IAS can be reported via several websites that are not focused on IAS[125]. IAST, the organisation responsible for IAS issues, is in contact with multiple voluntary monitoring associations. A network exists in connection with the Swedish Species Information Centre[126] for voluntary surveillance of any threats to a habitat for specific species, though this is not aimed primarily for observation of IAS. A website to report forest disturbances, including by IAS (insects and fungi, but also mammals) is also in place in Sweden[127].

In the Czech Republic, voluntary initiatives are in place at local level, including some focused on IAS, but a national voluntary observation network has not been identified. There are many groups and organisations active in IAS issues in Finland, particularly for awareness-raising.

In four MS (AT, BE, FR, LV), there are voluntary observation networks, but only for specific species. For example, in France there is a voluntary network coordinated by the MNHN (National Museum of Natural History) for the Asian hornet (*Vespa velutina*). The Latvian Nature Conservation Board organises public voluntary monitoring[128], including programmes for hogweed and signal crayfish. Latvia also has an online form, where citizens or land owners can submit information about an area infested with Giant hogweed. In Belgium a system is in place to monitor hogweed. In Austria, invasive alien plants can be reported as well as raccons and raccoon dogs.

In the UK, the Non-Native Species Framework Strategy for Great Britain (GB300*) includes key actions for identifying the role the public can play in detection, surveillance and monitoring. The Invasive Alien Species Strategy for Northern Ireland (NI400*, under consultation) includes an objective to develop capacity for management through a programme to involve the voluntary sector, naturalists, field clubs, farmers and landowners. Citizen-science initiatives such as ISpot[129] that allow to identify species may also be useful for IAS detection purposes.

- **Similar coverage**

Slovenia received an S in the assessment. This is because the management of free-living animals is undertaken via concessions to NGOs, birdwatchers, hunters, fishermen, etc. Those receiving concessions must protect habitat and indigenous species, and therefore can act as an observation network.

[124] See www.dabasdati.lv
[125] waarneming.nl/index.php and www.telmee.nl/
[126] Swedish Species Information Centre, flauna guards: www.artdata.slu.se/faunavaktare2.asp
[127] www-skogsskada.slu.se/SkSkPub/MiPub/Sida/SkSk/SkogsSkada.jsp
[128] See 84.237.218.196/IS/bio_information.nsf/
[129] See www.ispot.org.uk/

- **No coverage**

Ten MS were not found to cover the criterion (CY, DE, ES, GR, IT, LU, PL, PT, RO, SK).

- **Selected OECD countries**

Voluntary groups are highly involved in the management of IAS in the selected OECD countries, although their contribution is not always formalised in legislation or strategic documents.

- **Full coverage**

Australia and the USA were rated Y. Voluntary groups in Australia are often listed as stakeholders in strategy plans and various groups contribute to management of IAS. In Australia, educational/extension material and encouragement of the public to participate in managing and reporting of IAS can be noted, including targeted programmes, which may help to ensure detection of new species. Similarly, the recruitment and training of volunteers for early detection and rapid response, making use of existing programmes and infrastructure is a key objective of the USA National Invasive Species Management Plan 2008-2012. Two citizen-based networks to detect and monitor new IS will also be developed. These programmes do not appear to yet be in place. Invasive species occurrence and infestations can be reported through www.invasive.org/report.cfm. In addition, a voluntary network for observation, mapping and control of invasive species as well as habitat restoration is an important part of the approach taken by the National Wildlife Refuge System[130].

- **Partial coverage**

There is a particularly interesting programme in place in New Zealand called Weed Busters. This is an interagency education programme which aims to, among other things, increase the number of people involved in weed management. However, New Zealand was rated P because no programmes targeting animals were identified.

There are many voluntary and community-based organisations involved in IAS management in Canada but there is no formal recognition of their capacity in strategic documents. If invasive species are spotted, anyone can contact the Government, but for the moment no dedicated line/e-mail address is available, thus Canada was rated P.

[130] Available from: www.refugenet.org/new-invasives/vimp.html [Accessed 8/4/2011]

4.9.3. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
H1	9	1	17	0	0	0	0	4
H2	10	1	12	4	0	0	2	2

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

The two H criteria are either partially or fully covered by the majority of EU MS. Criterion H.1 was not rated as fully covered by any EU MS since none target various groups for information campaigns and awareness-raising, but many programmes are in place. Criterion H.2 is only fully covered by four MS, as few formal networks targeting all IAS were identified. Many initiatives are however on-going locally, or targeting specific taxa. A common approach to partially meeting criterion H.1 is to provide educational and information material on an ad-hoc basis without being part of a formalised campaign. Similarly, under criterion H.2, voluntary observation networks are used at local level but are not integrated into formal networks at national level.

There is a contrast between the selected OECD countries and the EU MS for criterion H.1; all four of the OECD countries were rated Y. This occurs because in all the countries there are many programmes in place for education and provision of information.

For criterion H.2, the situation in the four selected OECD countries is more similar to that in the EU MS; with the criterion being fully covered by two countries, partially by one and not all by the fourth. New Zealand, rated P, was not considered to fully cover the criterion because no programme addressing invasive alien animal species was identified. It was noted that in Canada there are many voluntary and community-based organisations active in addressing the issue of IAS, but they are not formally recognised or incorporated into a formal network.

4.10. CRITERIA I: INTERNATIONAL COOPERATION

4.10.1. MANDATORY REQUIREMENT TO SYSTEMATICALLY SCREEN DEVELOPMENT PROGRAMMES FOR IAS IMPACTS (CRITERION I.1)

Mandatory requirements to systematically screen development programmes for IAS impacts have not been identified at EU or international level.

- **EU Member States**

- **Full coverage**

No MS were found to fully cover the criterion, as no information on any formal requirement to screen development programmes of IAS impacts was found.

- **Partial coverage**

One MS (FI) was found to partially cover the criterion, receiving a P in the assessment. Finland included this action in its new proposal for a National Strategy on Invasive Alien Species (FI400) which is currently awaiting approval.

- **Similar coverage**

No MS received an S in the assessment.

- **No coverage**

Twenty-six MS were not found to have a requirement to screen development programmes for IAS impacts.

- **Selected OECD countries**

- **Partial coverage**

In Australia (rated P), it is required that funding applications for development projects indicate that the project will not have an impact on the environment, including through IAS.

- **No coverage**

This criterion was not covered in Canada, New Zealand or the USA (rated N).

4.10.2. DEVELOPMENT POLICIES INCLUDE A MECHANISM TO INCLUDE IN PROGRAMMES A DEDICATED COMPONENT OF CAPACITY BUILDING AND COOPERATION FOR THE MANAGEMENT OF IAS IN DEVELOPING COUNTRIES (CRITERION I.2)

The CBD includes a requirement that each Contracting Party, as far as possible and appropriate, shall cooperate in providing financial and other support for in-situ conservation in developing countries (Art. 8(m)). This includes preventing the introduction of, controlling or eradicating those alien species that threaten ecosystems, habitats or species (Art. 8(h)). Cooperation with developing countries is also mentioned in terms of research (Art. 12(b)), technical and scientific cooperation (Art. 18(2)) and financial resources (Art. 20).

As has been noted in criterion F1, the development of strategies has provided an opportunity, notably for the UK and Ireland, to cooperate across borders where appropriate ecologically as well as institutionally.

- **EU Member States**

- **Full coverage**

No initiatives were identified to integrate capacity building and cooperation for the management of IAS in developing countries into development policies. Thus no MS was found to fully cover the criterion

- **Partial coverage**

Finland included this action in its proposal for a National Strategy on Invasive Alien Species (FI400) which is currently awaiting approval.

- **Similar coverage**

No MS received an S in the assessment.

- **No coverage**

The remaining twenty-six MS were not found to have a mechanism to include capacity building and cooperation for IAS management in development policies.

- **Selected OECD countries**

- **Partial coverage**

In the USA (rated P), the need for training and capacity building in developing nations is recognised in the 2008 National Invasive Species Management Plan, making the USA unusual in considering this point. As has been mentioned in criterion C6, the USA also emphasises international cooperation, particularly with its neighbours Canada and Mexico. However, the policies mentioned therein do not specifically refer to capacity building in developing countries or integration of IAS issues in development policies.

- **No coverage**

This criterion was not covered in Australia, New Zealand or Canada (rated N), apart from through cooperation with developing countries in the context of international agreements including the CBD and CITES.

4.10.3. GAPS AND CONCLUSIONS

Criterion	EU MS				Selected OECD countries			
	N	S	P	Y	N	S	P	Y
I1	26	0	1	0	3	0	1	0
I2	26	0	1	0	3	0	1	0

Note: the P rating was assigned for a variety of different reasons, and therefore the countries receiving a P for any given criterion are not comparable.

Criterion I.1 on a mandatory requirement to systematically screen development programmes was partially covered by one MS, and was not found to be covered at all by the other 26 MS. Criterion I.2 on including capacity building for IAS in development policies was also partially covered by one MS and not at all by the other 26. Therefore, both criteria I can be considered to be gaps.

Both I criteria were only partially covered by Finland, which has included them as objectives of its proposed strategy for IAS.

There is a similar situation in the selected OECD countries. Criterion I was not covered by three of the four countries, and was partially covered by Australia, in which funding applications for development projects must state that the project will not have a negative impact on the environment, including IAS. Likewise, criterion I.2 is not covered by three of the countries and is partially covered by the USA. The need for capacity building in developing nations is recognised in the IAS management plan.

5. COST-BENEFITS ASSESSMENT

5.1. CBA IN THE EU MEMBER STATES

5.1.1. METHODOLOGY

In order to gather information about costs related to IAS policies, a questionnaire was drafted and sent to experts from all Member States. The objective of this questionnaire was not to evaluate the costs caused by IAS, but to identify those costs linked to drafting and implementing policies to regulate IAS in the MS. Seventeen MS answered the questionnaire, providing a good geographical coverage, including Scandinavian and Baltic countries (DK, EE, LT, LV), Mediterranean countries (CY, ES, IT), Central and Eastern European countries (SI, SK, BG, PL) and Western European countries (AT, BE, DE, LU, IE, NL).

The following analysis is based strictly on questionnaire responses, with the exception of the UK (Great Britain), for which information was gathered from Williams et al. (2010)[131]. The figures presented are thus those provided in the questionnaire responses or derived from Williams et al. (2010) in the case of the UK.

The data for the assessment of costs in Great Britain by Williams et al. (2010) was collected via three main means:

- compilation of list of 523 IAS from sources such as the Joint Nature Conservation Committee (JNCC), the Non-Native Species Secretariat (NNSS), the CBD, CABI's Crop Compendium, Google searches, etc.;
- collection of incurred costs from scientific and grey literature, such as government or other reports that are not published in academic or commercial literature.;
- distribution of questionnaire to 730 people and organisations in various sectors, and phone interviews of 250 scientific experts, policy makers, land owners and managers.

Costs were then calculated from the information gathered by these means was combined to estimate total direct costs for each of the three countries in Great Britain. They therefore include costs incurred directly by stakeholders working in affected sectors, and do not only reflect the work carried out or funded by government.

[131] Williams et al., 2010. The economic cost of invasive non-native species on Great Britain. CABI UK.

The direct costs of IAS to each sector were calculated from combining the costs of individual species. Some costs affect multiple sectors, and thus the sum of the costs of all sectors is greater to the sum of the cost to the British economy. Double-counting between sectors was removed when calculating the overall cost of IAS to the British economy.

5.1.2. INSTITUTIONS AND STAKEHOLDERS INVOLVED IN THE 27 MS

Consistent with the disparate nature of the legislation operating in the field of IAS, responsibility for IAS policy-making, prevention, control and management in the 27 MS is also fragmented. The main actors include Ministries, local/regional governments, plant and forest services, or food and sanitary border control services. For example, in Austria responsibility for policy-making on IAS is principally split between the Ministry of Environment, the federal forest offices in each state, as well as the Austrian Agency for Health and Food safety. Similarly in Cyprus, responsibilities are split between a number of government departments, including the Department of the Environment, the Department of Veterinary Services, the Department of Fisheries and Marine Research, the Forestry Department, the Game Fund (Ministry of the Interior) and the Department of Customs.

- **Dedicated budget line and EFT**

Dedicated budget lines for IAS were identified in nine out of the 17 Member States that responded, although the information given by Cyprus relate to budget dedicated to biodiversity, even if a number of actions specifically target IAS. This budget line is mostly for use by relevant governmental ministries, although in Luxembourg a dedicated budget line is available for the National Museum for Natural History.

The sum allocated to IAS in the dedicated budget line ranges from 6000 € in Estonia to 1,3 million € in Denmark. However, the uses of the sum in the dedicated budget vary widely (see Table 6). For example, the 6000€ in Estonia are used for reports and awareness raising, whereas the much larger budget in Denmark is used for eradication activities. Staff costs are also commonly reported (CY, ES, NL).

Table 6: Dedicated budget lines for IAS issues at national level in EU MS ('n.a.' means that no information is available)

MS	Dedicated budget line?	Amount	Agency/Ministry	Uses
AT	No	-	-	-
BE	No	-	-	-
BG	No	-	-	-

MS	Dedicated budget line?	Amount	Agency/Ministry	Uses
CY	Yes	n.a.	n.a.	A budget is dedicated to follow-up actions to manage IAS and a part of budget for N2K is used for IAS
DE	No	-	-	-
DK	Yes	10 million DKK (1.3 million €)	Danish Nature Agency of the Ministry of the Environment	Eradication activities
EE	Yes	6 000 €	Ministry of Environment	Reports and awareness raising related to IAS
ES	Yes	60 000 €/yr	Ministry of Environment, Rural and Marine Affairs	Personnel investment
		60 000 €/yr	Ministry of Environment, Rural and Marine Affairs	Field monitoring and management
		150 000 €/yr	Ministry of Environment, Rural and Marine Affairs	Restoration by national parks
		300 000 €/yr	Ministry of Environment, Rural and Marine Affairs	National hydrography confederations[132]
FI	No	-	-	-
IE	Yes	53 000€	n.a.	n.a.
IT	No	-	-	-
LU	Yes	15 000€/yr	National Museum for Natural History	n.a.
LV	Yes (2008-2010)	No information is available on the amount or the situation in 2011	n.a.	n.a.

[132] Spanish river basin management authorities.

MS	Dedicated budget line?	Amount	Agency/Ministry	Uses
NL	Yes	1 million €	Ministry of Economic Affairs, Agriculture and Innovation	Funding the Invasive Alien Species Team in the Food and Consumer Product Safety Authority, monitoring, risk assessment and communication campaigns. There is no dedicated annual budget for eradication and control.
PL	Yes	975 000 € (as defined in the Polish Biodiversity Strategy for 2007-2013)	n.a.	2009 expenditure used for expertise to define the list of IAS that are subject to legal restrictions
SI	No	-	-	-
SK	No	-	-	-

Regional governments may also have dedicated budget lines. For instance in Spain, Andalucía has had a dedicated budget since 2004, which varies between 500 000 € and 800 000 €/yr. A programme for controlling IAS is in place in that region, initiated in 2004, which aims to identify, localise, eliminate and/or control IAS in Andalusia[133]. The Canary Islands fund invasive alien species control through the budgets for natural parks, habitat restoration and gully cleaning. Work on IAS control is also carried out in Valencia and Castilla la Mancha although they have no specific budget line.

Although some MS currently report no dedicated budget lines, these may be planned in the coming years. For instance in Finland, which has developed a draft strategy on IAS that has not yet been adopted, the budget for IAS issues is yet to be defined by the next government. The national strategy proposal gave a rough cost estimate of 23-43,5 million € for costs of actions for eradication, control, etc. Additionally, it was estimated that actions by different stakeholders (NGOs, research institutes, etc.) in the process was 7,04-10 million €. The implementation of the strategy is expected to help with funding issues, since cost sharing and responsibilities of the different actors are given.

[133] Information about the programme can be found from: www.juntadeandalucia.es/medioambiente/site/web/menuitem.a5664a214f73c3df81d8899661525ea0/?vgnextoid=209cb06b3905c110VgnVCM1000001325e50aRCRD&vgnextchannel=9b80fe1a2c9c6010VgnVCM1000000624e50aRCRD&lr=lang_es

One of the goals when drafting the proposed strategy was also to propose cost-effective ways to deal with IAS (pers. comm).

Regardless of whether MS have a dedicated budget line for IAS or not, alternative sources of funding are available for IAS. Projects focused on invasive alien species can be funded from financing sources intended for broader issues of biodiversity or environmental protection. For example, in Bulgaria, on top of EU funding and donations, there is a national instrument that can be used to fund invasive alien species projects: the Enterprise for Management of Environmental Protection Activities (of the Ministry of Environment and Water). Other sources include the National Science Fund, which granted the research project "Biology, Ecology and Control of the Invasive Alien Species in the Bulgarian Flora" 310 300 BGN (approximately 158 650 EUR) for the period 2009-2012.

Box 2 LIFE+ programme and other EU funding related to IAS

A number of IAS projects are also co-funded through the European LIFE+ programme. Cyprus for instance mentioned the following LIFE+ projects:

- Action C7 of the LIFE+ project ICOSTACY aims to assess and consequently control or remove local populations of invasive alien species. It started in March 2011 and will finish by March 2014. The total cost of action C7 will be 45 500 €. The action will be continued after the end of the project by the Forestry Department.
- There have been some efforts to remove acacia species from a sensitive area of a salt lake under a LIFE project. The efforts are continued by the Forestry Department.

A report on EU funding for management and research of invasive alien species in Europe was released in 2008 by R. Scalera. The findings of that study is that over the 15 years preceding the report, despite the lack of a specific strategy or a dedicated financial instrument to deal with invasive alien species (IAS), the EC has contributed to financing almost 300 projects addressing this issue, for a total budget exceeding 132 million EUR. The trend was towards increasing the annual budget from about 10 million €/yr to about 15 million €/yr in 2004-2006.

Reference: Scalera R. (2008) EU funding for management and research of invasive alien species in Europe, Support for a pilot project on 'Streamlining European 2010 Biodiversity Indicators (SEBI2010)' Contract number – 3603/B2007.EEA.53070

- **Dedicated staff**

Table 7 presents the Equivalent Full Time (EFT) that could be identified in 15 MS as having responsibilities linked to invasive alien species issues. Most MS employ between 1 to 10 EFT, although these are distributed between different affiliations (1.8 on average[134]) and often correspond to part-time occupations.

In most MS (BE, BG, CY, DK, EE, ES, IT, LU, NL, PL, SI), at least some of the EFT work within governmental ministries, ranging from 0.3 EFT in Luxembourg to 6 EFT in the Netherlands (or 11 part-time staff in Cyprus) working on IAS issues. Up to 6 different ministries per MS can have staff dedicated to IAS, including dealing with issues related to the environment, veterinary issues, fisheries, forestry, game and customs. Different departments will have different responsibilities, targeting different IAS, such as *Phytophtora ramorum* by the forestry department, tikka deer by hunting, etc.

However, in some MS (DE, IE, LV, SK) all EFT are in governmental agencies other than ministries, with a dedicated responsibility on IAS or biodiversity issues, The numbers are similar overall to those employed in ministries ranging from 0,5 to 1, suggesting these organisations are small-scale. This is with the exception of Slovakia where 250 EFT worked on IAS mapping and management in 2010.

Many MS also specified the number of EFT involved in research into IAS issues. These ranged from 0,1 EFT in Luxembourg to twenty in the Netherlands. The numbers given may not reflect the true numbers of EFT working in research, as it was noted that in Estonia there is virtually no long-term funding for IAS issues so scientists may work on the subject on a voluntary basis.

Aside from people working on IAS issues in official institutions, many people are involved in IAS fight on the ground, through NGOs, other local organisations or voluntary work. Latvia mentioned the fact that a lot of people work on the eradication of the hogweed during the summer. A recent survey in France highlighted that most of the 175 local actions to fight IAS identified were based at least in part on voluntary work (BIOIS, 2011). NGOs are particularly involved in management and control of IAS. But the number of people involved is often difficult to estimate as records are often not kept of how many volunteers are involved and how long they spend in the field.

Table 7: Number of EFT working on IAS issues

MS	EFT	Affiliation	Role / comments
National level			
BE (regional level below)	0,6	Federal level administration	
	0,5	Federal level research	
BG	2 days/	Ministry of	

[134] The calculation of the average excluded SK (which declared 250 EFT) and took as hypothesis, when no specification was given, of 30% part-time work.

MS	EFT	Affiliation	Role / comments
	month	Environment and Water	
	2		Research project entitled "Biology, Ecology and Control of the Invasive Alien Species in the Bulgarian Flora"
CY	2 part-time	Department of the Environment	1 of the part-time staff is involved in research
	2 part-time	Department of Veterinary Services	1 of the part-time staff is involved in research
	2 part-time	Department of Fisheries and Marine Research	1 of the part-time staff is involved in research
	2 part-time	Forestry Department	1 of the part-time staff is involved in research
	2 part-time	Game Fund	1 of the part-time staff is involved in research
	1 part-time	Department of Customs	
DK	1	Ministry of the Environment Nature Agency	
	1	Ministry of Food, Agriculture and Fisheries	
	5	PhDs	
	6	General research	
	1	NOBANIS secretariat	
DE	0,5	Federal Agency for Nature Conservation	Working on the topic of "IAS and nature conservation"
EE	0,75	Ministry of Environment	
	2,4	Environmental Board	
	0,1	Environmental Inspectorate	There may be more in the Inspectorate when specific cases arise
	0,5	Estonian University of Life Sciences (research)	In research there is virtually no long-term funding, and thus scientists may work on IAS issues on a voluntary basis
	0,4	University of Tartu (research)	
ES (regional	2	Spanish Ministry of Environment, Rural and	Staff are technicians

MS	EFT	Affiliation	Role / comments
level below)		Marine Affairs	
	3	Doñana Biological Station – Spanish National Research Council:	Staff are researchers
	2	Specialist Group on Biological Invasions	
IE	1	National Biodiversity Centre	
	0,75	Invasive Species Ireland	
IT	-		No dedicated staff but public officers in ISPRA, Ministries and regional administrations are involved part-time in IAS issues
LV	1	State Plant Protection Service	
LU	0,3	administration	
	0,1	Research	
	0,3	Stakeholders working on IAS topics	
NL	~6	Ministry of Economic Affairs, Agriculture and Innovation and the Ministry of Infrastructure and the Environment	
	~20		IAS research
PL	1	Ministry of Environment, General Directorate for Environmental Protection and Ministry of Agriculture	
SI	0,8	Ministry of the Environment and Spatial Planning	
	0,2	Other institutions and agencies	
SK	250	State Nature Conservancy	Work on IAS mapping and management (since 2010)
Regional level			

MS	EFT	Affiliation	Role / comments
ES	3	Andalucía Regional Government	
	6 staff, less than 15% of the time	Castilla la Mancha Regional Government	6 technicians, working on IAS less than 15% of the time;
	1	Comunidad Valenciana Regional Government	
	1	Canarias Regional Government	
BE	3	Wallonia administration	
	3	Wallonia research	For identification of best practices against invasive plants and rats
	0.4	Flanders administration	
	1	Flanders research	

5.1.3. PREVENTIVE ACTIONS

- **IAS inventory and surveillance**

The costs for the development/maintenance of IAS inventories and databases, surveillance, and mapping, are very heterogeneous among MS (see Table 8). They may concern any taxonomic group.

The costs for the development of inventories or databases of IAS ranged from a one-off costs of 5 815 € in 2001 in Estonia (for the development of the Estonian alien species database) to 100 000 € in Austria. The costs for development and maintenance of these inventories was 60 000 € in Spain (one-off cost). When surveillance activities are included, the costs range between 9 715 €/yr and 230 000 €/yr in the Netherlands. The cost in the UK is much higher (19,9 million €) but this figure also includes the cost of providing quarantine services and import control, as well as surveillance.

Slovakia's budget for mapping was 3 300 € in 2005, the last year for which information was available. No other MS provided specific costs on IAS mapping.

Table 8: Costs of preventive actions
(The column * describes: I – inventories, M – mapping, O – others, P – identification of pathways, R – research, S – surveillance)

MS	Cost	*	Description	Implementing institution and other elements
National level				
AT	100 000 € (2002)	I	Inventory of IAS	
BE	2 man months	I	Development of giant hogweed website	For inventory of giant hogweed populations in Wallonia
BG	10 000 € /yr for 2 years (2005-2007)	I P	Inventory of invasive alien animal species (includes identification of key pathways)	Funding of two projects by the Ministry of Environment and Water
	19 000 BGN/yr (approx. 9 715 €/yr)	I P S	IAS inventory and surveillance (includes identification of key pathways)	Project "Biology, ecology and Control of the Invasive Alien Species in the Bulgarian Flora"
DK	~270 270 € to develop and 10 400€ to run (2 my to develop 100 mh to run)[135]	I	Inventory of alien species	
EE	5 815 € (2001)	I	Preparation of the Estonian alien species database	
ES	60 000 € (one-off cost)	I	Development of the Spanish National Catalogue of IAS	Conducted at national level by the Ministry of Environment, Rural and Marine Affairs
IE	53 000€/yr	I	For the National Invasive Species Database including collation of	Varies slightly from year to year

[135] Costs were calculated on the basis of manhours that were identified in the questionnaire, through a standard calculation used in Denmark: a manyear = 1 300 manhours = 1 000 000 DKK= 135 135 € (including an overhead of 68%)

MS	Cost	*	Description	Implementing institution and other elements
		O	species occurrence data, internet portal, verification of ad-hoc reporting, participation in NOBANIS, project consultation, early-warning system, workshops, overheads, and IT	
LU	7 500 €	I R	Neophyte inventories and MIGRAGE project[136]	Performed by the National Museum for Natural History with existing staff
LV	n.a.	R	Several studies[137]	
NL	230 000 €/yr	I S	IAS inventory and surveillance[138]	Ministry of Economic Affairs, Agriculture and Innovation and associated organisations
	85 000 €/yr	I O	Development of an IAS database, participation as a curator in the Q-bank/invasive plants database and participation in NOBANIS	
PL	Voluntary basis	I	Development and running of Polish database of alien species	
SK	5 000€ SNC + 10 000€ other (2002) 6 600 € SNC (2003) 8 700€ other	M	IAS mapping	State Nature Conservancy, other funds come from the Ministry of Environment[139]

[136] IAS determined and recorded, and aquatic flora and fauna monitored

[137] A number of fragmented studies occurred in Latvia, but attached costs could not be identified. The different fragmentary studies on IAS (distribution, ecology etc.) are usually not linked to implementation of control programmes at national level. Examples of studies include studies in 2001-2004 on the distribution, ecology, opportunities to control and prevent spreading of giant hogweed (*Heracleum sosnowskyi*); a country-scale inventory of giant hogweed (the only 'official IAS' since 2008), a partial inventory of coastal invasive plants in 2003-2005; and a PhD study that prepared an inventory and database for 14 invasive plant species.

[138] used for surveying areas at risk and responding to reported sightings if IAS (in collaboration with other partners), a number of IAS monitoring projects and involving the public in IAS surveillance

[139] Action Plan for Implementation of the National Biodiversity Strategy (2002) and Structural Funds (2004)

MS	Cost	*	Description	Implementing institution and other elements
	(2004) 3 300 € (2005)			
UK	£17 766 000 (approx 19,9 million €)	S O	Annual quarantine and surveillance of non-native species and non-native pathogens that affect plant health and forestry, including import restrictions, inspections, treatments, surveys and publicity (GB). **Note:** as this figure includes quarantine and surveillance related to plant health (e.g. for non-native pathogens), it has a broader scope than the figures quoted for other countries. This is likely to be the reason for the much higher magnitude of the costs.	
Regional level				
ES Valencia	n/a	I	Inventory	
ES Andalucía	60 000 € per year	I S	IAS inventory and surveillance	

- **Information and early-warning system**

Costs related to information and early-warning systems are presented in Table 4. The main information and early-warning system that was identified across the MS that responded to the questionnaire was NOBANIS. The yearly cost of participating in NOBANIS was 1 800 €/yr in Estonia and 4 000 €/yr in Austria. Estonia also provided the initial one-off cost of developing the database for NOBANIS; this cost 2 500 € in 2002. The development of early-warning systems range between 5 200 € in Denmark to 88 000 € in Andalucia (Spain). The development and maintenance of dedicated websites remained below 5 000 € in Bulgaria.

Table 9: Costs of information and early-warning systems

MS	Cost	Description	Implementing institution and other elements
Participation in NOBANIS			
AT	4 000 €/yr	Participation in NOBANIS	
EE	1 800 €/yr (800 for wages and 1000 for participation in meetings	Participation in NOBANIS	
	2 550 € (2002)	One-off cost of preparing the initial database for NOBANIS	
IE	part of the 53 000€/yr mentioned above		
LV	Staff cost	Participation in NOBANIS	1 person working as national focal point, time spent dedicated to NOBANIS adds to the normal full-time work, not related to IAS
NL	Included in the 85 000 €/yr mentioned above	includes participation in NOBANIS	
Early-warning systems			
DK	5 200€/yr (50 mh/yr)	Danish information and early warning system	
DE	20 000 € (one-off cost)	Project (2008-2009) "Development of an expert-based IAS early warning system for fishes and plants in Germany"	
ES (Andalucia)	88 000 €/yr	This system involves warnings from field technicians when they encounter a new invasive alien species or population, a bibliography and email warnings	
BG	17 075,69 €	Proposal in 2010 for	

MS	Cost	Description	Implementing institution and other elements
		updating the geographical database in the early-warning network for zebra mussels (*Dreissena polymorpha*)	
Website and species-specific information			
BG	5 000 €/yr for 3 years	Website and online GIS database[140] for the *Dreissena* genus	Funded by the National Science Fund
	2 000 BGN/yr (approx. 1 023 €/yr)	Maintenance and update of its website on invasive alien plants[141].	"Biology, Ecology and Control of the Invasive Alien Species in the Bulgarian Flora" project

- **Prioritisation of IAS for risk assessment**

Only Estonia, Belgium, Germany and the Netherlands provided information on the costs of prioritising IAS for risk assessment at national level (Table 10). The prioritisation process amounted to 2100 € for Estonia and 50 000 €/yr for Germany. However, the figure for Germany is provided for a three-year project to develop a risk assessment tool. Therefore it is likely that this project, and hence the costs, includes more than prioritisation. At regional level, the Andalucía Regional Government in Spain estimated the costs of selecting for which species risk assessments should be developed and of producing tools for evaluating suitable actions to 14 000 €/yr.

Table 10: Costs of prioritisation of IAS for risk assessment

MS	Cost	Description	Implementing institution and other elements
National level			
BE	½ EFT for coordination. 6 man months for development of Harmonia website.	Part of Harmonia system. No remuneration of experts.	
DE	50 000€ (one-off cost)	Project (2006-2009) "Development of a risk assessment tool for invasive alien species"	

[140] Available from: www.dreissena.info [Accessed 6/5/2011]

[141] Available from www.ltu-research-bg.org/index.php?option=com_content&view=article&id=424&Itemid=131&lang=en

MS	Cost	Description	Implementing institution and other elements
EE	Total 2 100 € Incl. 400 € in wages and 1700 € for participation in meetings	Project on pest risk analysis (PRATIQUE), testing of the prioritisation process for alien plants (EPPO), and risk mapping for 100 non native species (NOBANIS)	-
NL	10 000 €/yr	Prioritising within the annual plan for the Invasive Alien Species Team and participation in the EPPO IAS panel	
Regional level			
ES Andalucia	8 000 €/yr	Consultation and checking of bibliographies and online networks; selection of species to develop risk assessments	Supervised by the Andalucía Regional Government
	6 000 €/yr	Development of tools for evaluating suitable actions, taking into account the criteria for costs vs. eco-benefits	Supervised by the Andalucía Regional Government

- **IAS Risk assessment**

Formal procedures for assessing risks of IAS are not yet commonplace in EU MS (see criterion A3). Out of the five MS that have formal RA in place, two MS provided information on costs related to IAS risk assessments. In Austria, the costs for developing a methodology is estimated at 60 000 €, while in Belgium, estimations are that it takes half an EFT for coordination and 6 man months for the development of the website. However, this is an underestimate, since the system relies importantly on experts, who are not remunerated.

Additionally, Bulgaria indicated costs of assessing risks of a particular species, which is estimated at 15 000 €/yr and Andalusia in Spain indicated that 55 000€/yr are spent on risk analyses.

Table 11: Costs of IAS risk assessments

MS	Cost	Description	Implementing institution and other elements
Development of methodology			
AT	60 000 € (one-off)	German-Austrian black list methodology	
BE	½ EFT for coordination. 6 man months for development of	Part of Harmonia system. No remuneration of experts.	

MS	Cost	Description	Implementing institution and other elements
	Harmonia website.		
Risk of certain species			
BG	15 000 €/yr	Assessment of the infestation risk of the zebra mussel (*Dreissena polymorpha*) using GIS	Funded by the US Army ERDC-IRO
Regional risk assessments			
ES Andalucia	55 000 €/yr	Risk analyses, including the design and development of analysis tools	

Other more informal risk assessment processes receive funding. Advice on which management actions are needed in the Netherlands based on these risk assessment processes is estimated to cost 100 000 €/yr. The outcomes of ad-hoc research projects conducted by the Ministry for Economic Affairs, Agriculture and Innovation in collaboration with universities and water boards are also used for risk assessments.

- **Listing of IAS in black/grey/white list**

Lists of IAS corresponding to different levels of risk (black/grey/white) are produced either as a result of risk assessments or through expert advice. These lists differ from the inventories/databases described above, which do not attach an assessment of the level of risk of each species.

Clear costs were not commonly identified for developing these lists at national level. This may be explained by the fact that experts often list the species as part of other activities or on a voluntary basis. An exception is Germany, for which there are clear costs for three projects to develop black lists for specific taxa and a warning list of IAS.

Table 12: Costs of listing IAS

MS	Cost	Description	Implementing institution and other elements
European level			
EU	Unknown: factsheets written by expert on a voluntary basis	59 fact sheets on the worst alien invasive species in the region as a proxy for a black list	NOBANIS
National level			

MS	Cost	Description	Implementing institution and other elements
BE	Part of Harmonia system. No remuneration of experts. ½ EFT for coordination. 6 man months for development of Harmonia website.		
DE	40 000 € (one-off cost) 50 000 € (one-off cost) 160 000 € (one-off cost)	Project (2006-2009) "Black list of invasive alien fishes in Germany" Project (2011) "Black list - Warn list of invasive alien species for Germany" Project (2011-2012) "Black lists of invasive alien plants, mammals, birds, amphibians and reptiles in Germany"	
DK	20 800 € (200 mh) for the set up of the lists 10 400 €/yr (100 mh/yr) for the maintenance	Lists of IAS	
ES	60 000 € (one-off cost), already mentioned in Table 8	Spanish National Catalogue of IAS	See Table 8
FR	Unknown	Lists based on expert advice (pers;comm..)	
LV	-	Preliminary black list	Suggested in the first national biodiversity monitoring program (2002), but not implemented
Regional level			
ES	Not available	Black list	Drafted by the Valencia Regional Government
	6 000 €/yr	Technical work to support public administration in drafting lists	Supported by Andalucía Regional Government

- **Horizon scanning**

In Belgium, horizon scanning is part of the Harmonia system. This system requires ½ EFT for coordination, and required 6 man months for the development of the website. Experts are not remunerated. The Netherlands also provided costs for horizon scanning, which were estimated to cost 50 000 €/yr.

- **Quick screening tool**

In the Netherlands, use of a quick screening tool is an ad-hoc component of regular tasks, estimated to cost 6000 €/yr.

- **Monitoring programmes**

Programmes to monitor IAS provide information on whether IAS are present on the territory and how they spread. Monitoring programmes are often focused on specific taxa or species, e.g. alien animals in Italy or invasive alien plant species in Latvia.

The cost of national-level monitoring programmes varies between MS and according to the scope. The lowest monitoring costs were reported in Estonia (7 000 €/yr), for the monitoring of a single species, the signal crayfish. The more general Spanish monitoring programme, which is neither restricted to a particular geographic area, nor to a particular taxonomic group, is estimated to cost 50 000 €/yr. The work is conducted by Natural Parks and Hydrography Confederations.

The costs of general monitoring programmes at regional level are similar to the national ones, ranging from 20 000 €/yr in the Muuga harbour area of Estonia to 50 000 €/yr spent by the Andalucía Regional Government, Spain.

Table 13: Costs of monitoring programmes

MS	Cost	Description	Implementing institution and other elements
Monitoring of alien animals at national level			
EE	7 000 €/y	Monitoring of signal crayfish	
Monitoring of alien animals at regional level			
IT	33 000	Monitoring programme dealing with alien animals in the Lazio region	
Monitoring of invasive alien plant species at national level			
LV	n.a.	Monitoring of giant hogweed (invasive alien plant species *Heracleum sosnovskyi*)[142]: survey in	Latvian State Plant Protection Service, with the help of Global positioning system

[142] National monitoring program for invasive plant species (2002), was partly implemented during one year then abandoned for financial reasons. In 2006, the national monitoring programme emphasised the need for IAS monitoring and an early warning system, but for the moment lack of financial resources prevent an implementation.

MS	Cost	Description	Implementing institution and other elements
		the known invaded territories reaching a total of 10 230 ha[143]	receivers (GPS)
General monitoring of IAS at national level			
BE	Unknown	Integrated within monitoring for Water Framework and Habitats Directives.	
DK	0,1 EFT	Danish monitoring programmes	
NL	33 000 €	Code of Conduct on aquatic plants in trade	
ES	50 000 €/yr	Monitoring of IAS	Conducted by the national parks and hydrography confederations
General monitoring of IAS at regional level			
LV	Unknown	Monitoring of certain species or in certain areas (mainly based on private interests, not supported or only partly supported by funds).	Carried out by researchers
EE	20 000 €/yr	Monitoring of alien species in the Muuga harbour area	
ES	50 000 €/yr	Locating and analysing invasive alien populations, and evaluating the efficiency of the actions	Andalucia Regional Government
	Unknown	Part of the work of the officers	Valencia Regional Government

- **Identification of key pathways**

Few MS identify pathways (see criteria A9 and A10). Some information on pathways is reported in the factsheets from NOBANIS, but these are the work of voluntary experts. No costs could thus be linked to this information.

In Andalucia (Spain) the identification of key pathways was estimated to cost 45 000 €/yr (Table 14). Pathway identification was also a part of the activities undertaken for prevention, see Table 8.

[143] Processed data is available to the broad public (cartographic information mapping invaded territories and a search tool)[143] and information about hogweed eradication is provided for local governments in order to help eradication planning.

Table 14: Costs of identifying pathways

MS	Cost	Description	Implementing institution and other elements
European level			
EU	Unknown: experts' voluntary contribution	Information on pathways reported in factsheets	NOBANIS
Regional level			
ES Andalucia	45 000 €/yr	Identification of the key pathways for IAS	Andalucía Regional Government

- **Inspection of IAS pathways**

Inspections are usually targeted at plant and animal health prevention and performed by phytosanitary and veterinary services, which are outside of the scope of this study. Costs for inspecting IAS pathways were only identified in the Andalucía region of Spain (20 000 €/yr), see Table 15.

Table 15: Costs of IAS pathway inspection

MS	Cost	Description	Implementing institution and other elements
Regional level			
ES	20 000 €/yr	Inspection of IAS pathways: analysis of entrance pathways, monitoring and management with the sectors responsible	Andalucía Regional Government
	24 working days (2010)	Inspection of IAS pathways	civil servants of the Valencia Regional Government

5.1.4. RAPID RESPONSE ACTIONS

- **Contingency planning**

Contingency planning is addressed in the Netherlands as part of rapid response actions (see next section). . The preparation of the Netherlands contingency plan and consultation with stakeholders costs 80 000 €/yr (Table 16). Costs were also identified for the Andalucía region of Spain for the preparation of plans for the coordinated and intersectoral management of specific taxa of IAS, and estimated at 45 000 €/yr (Table 16).

Table 16: Costs of contingency planning

MS	Cost	Description	Implementing institution and other elements
National level			
NL	80 000 €/yr	Preparing the contingency plan and consulting with stakeholders (as part of rapid response actions; see below)	
Regional level			
ES Andalucia	45 000 €/yr	Documents for the coordinated and intersectoral management of selected taxa of invasive alien species	Andalucía Regional Government

- **Rapid response actions**

At national level, costs could only be identified for the Netherlands, where rapid response actions amount to 40 000 €/yr

5.1.5. IAS CONTROL, MANAGEMENT AND RESTORATION

- **IAS management actions or IAS management projects**

The activities undertaken for IAS management and thus their costs are highly variable, and often relate to taxon-specific, time-limited projects rather than to ongoing actions with annual costs.

Overall, the setting up of management actions, including management, control, containment or eradication can cost between 2000 € and 3.5 million €. Within a given MS, the budgets for IAS control or containment measures can be split across different organisations, such as in Slovakia where the State Nature Conservancy allocate between 2 000 €/yr to 23 000 €/yr to the control of IAS, which can be complemented by other sources (see Table 17). The costs depend on the type and scale of the actions. Thus eradication costs for *Heracleum* can reach up to 472 000 €/yr in Estonia. It has been estimated that *Heracleum* covered 1300 ha in Estonia in 2010[144]. Thus, if it is assumed that all of the affected areas are being targeted for eradication, costs are 363 €/ha. Specific containment actions of *Heracleum* are estimated between 25 €/ha and 280 €/ha in Latvia, thus costs are cheaper in Latvia than Estonia.

[144] Kabuce, N. and Priede, N. (2010): NOBANIS – Invasive Alien Species Fact Sheet – ***Heracleum sosnowskyi.*** – From: Online Database of the North European and Baltic Network on Invasive Alien Species – NOBANIS www.nobanis.org, [Accessed 18/7/2011]

The costs for the UK include costs of control by all relevant actors (local authorities, land owners, households), divided by taxon or land use/economic sector, and are thus not limited to the budgets of governmental departments or agencies.

Many IAS management programmes are coordinated at regional level, and exhibit a similar range and variability of costs as those at national level (Table 17).

Table 17: Costs of management actions and projects (The column *describes: M – monitoring, G – Management, C – control, E – eradication)

MS	Cost	*	Description	Implementing institution and other elements
National level				
DK	426 400 €/yr (4100 mh/yr in 2009)	E	Running of eradication projects in place in 2009	
EE	2 700 (2010)	G	Development of management plan for *Heracleum*	
	472 000 €/yr	E	Eradication of *Heracleum* according to the management plan	
	15 000 €/yr	M	Monitoring of the eradication of *Heracleum*	
	5 100 €/yr	G	Development of a management plan for the raccoon dog	
ES	250 000 €/yr	G	Project for the management of *Dreissena polymorpha*, *Eichornia crassipes*, *Procambarus clarkii* and alien fish species and subsequent restoration by the Hydrographic Confederations	Carried out by the Ministry of Environment, Rural and Marine Affairs
	150 000 €/yr	G	Projects for the management of rats, feral cats and other IAS in Spanish national parks and subsequent restoration costs	Carried out by the Ministry of Environment, Rural and Marine Affairs
	60 000 €/yr	G	Project for the conservation of European mink (*Musteal lutreola*) and management of American mink (*Neovison vison*) populations	Carried out by the Ministry of Environment, Rural and Marine Affairs
IE	15 000 €/yr	C	*Gunnera* and *Carpobrotus* control	National Botanic Garden of Ireland
LV	15 million LVL (approx. 21	C	National control programme for giant hogweed.	

MS	Cost	*	Description	Implementing institution and other elements
	million €) for 6 years, i.e. approx 3,5 million €/yr			
	70 000 LVL (approx. 99 000 €) in 2007-2008	C	Support for approx. 12 local municipalities for control of giant hogweed	From Latvian Environmental Fund
	Unknown	G	For specific species in Latvian protected nature areas (e.g. hogweed in Gauja National Park; hogweed, some invasive alien shrubs, and American mink in Kemeri National Park; American mink in Engure Nature Park, signal crayfish in Ziemelvidzeme Biosphere Reserve), actions may be undertaken by the administration with funds from their own budget or in the framework of particular short-term projects.	
	111 721 LVL (Approx 16 500 €) in 2006	E	Subsidies provided to 91 land owners for actions to eradicate hogweed.	
	60 LVL (85 €) per hectare	C	Estimated cost of containment of *Heracleum sosnowskyi* via cutting with heavy machinery.	
	200 LVL/ha (280 €/ha)	C	Estimated cost of containment of *Heracleum sosnowskyi* via other means, e.g. cutting with trimmers or tractors, or using chemical treatment	
NL	50 000 €	O	For in-kind contributions, advice and participation, as management actions are principally carried out and paid for by land owners	Costs borne by Ministry of Economic Affairs, Agriculture and Innovation and associated organisations
	35 000 € for each of two ponds	E	Project to eradicate the American bullfrog from two large private ponds. Includes the costs of restoring the damaged ponds and gardens afterwards.	
PL	516 278 €/yr (2011-2014)	C	LIFE project (NAT/PL/000263) on the "protection of water and marsh birds in five national parks – reconstructing habitats and curbing the influence of invasive species"	

MS	Cost	*	Description	Implementing institution and other elements
SK	Between 2000 € in 2008 and 22 888 € in 2005, 2 500 € in 2010	C	Budget for IAS control measures, extremely variable between years	State Nature Conservancy
	72 000 € (2008)	C	Budget for IAS control measures. In this year, the State Nature Conservancy was supplied with materials and equipment for IAS control.	From other sources than the State Nature Conservancy
UK[145]	£90,6 million/yr (101,7 million € /yr)	C	Control of agricultural and horticultural non-native weeds with herbicides	
	£26 million/yr (29,2 million €/yr)	C	Control of invasive non-native invertebrates on agricultural crops	
	£4,4 million/yr (5,0 million €/yr)	C	Control costs of varroa mite	
	£23 million/yr (25,9 million €/yr)	C	Control of vertebrate pests (geese, deer, rabbit)	
	£15 000/yr (16 830 €/yr)	C	Control of wire weed	
	£32 000/yr (35 904 €/yr)	C	Control of non-native insects in forestry (GB)	
	£8,6 million/yr (9,7 million €/yr)	C	Rhododendron control	
	£8,4 million/yr (9,4 million €/yr)	C	IAS control on golf courses	
	£21,86 million/yr (24,5 million €/yr)	C	Control of IAS in waterways	
	£964 995 (1,1 million €/yr)	C	Giant hogweed control	
	£4,1 million/yr (approx 4,6 million €/yr)	C	Pest control (e.g. mink) to protect game species	
	£151,9 million/yr (173,9 million €/yr)	C	Control of invasive plants on development sites by the construction sector(including Japanese knotweed) – survey, treatment,	

[145] See the Methodology section above for details of how the costs were obtained during the review by Williams et al., 2010. As is noted, some of the costs affect more than one sector, thus the some of these costs cannot be taken to be the total cost of control of IAS to the British economy. Details of how each individual cost is calculated can be found in Williams et al.

MS	Cost	*	Description	Implementing institution and other elements
			waste disposal	
	£16,3 million/yr (18,3 million €/yr)	C	IAS control on the road network	
	£25 million/yr (28,1 million €/yr)	C	Non-native vegetation control on the rail network	
	£58 159/yr (65 255 €/yr)	C	Habitat management in major airports for IAS (e.g. for reducing risk of bird strikes)	
	£4,7 million/yr (5,3 million €/yr)	C	IAS control by water utility industry	
	£5,2 million/yr (5,9 million €/yr)	C	Aquatic IAS control by power stations	
	£20,7 million/yr (23,2 million €/yr)	C	Controlling IAS for purposes of biodiversity protection	
Regional level				
BE - Flanders	1 million €/yr (estimation)	C	Control of invasive alien aquatic plants	IAS management actions are integrated within other land and water management actions, and thus there is no separate budget dedicated to IAS.
BE - Wallonia	0,7 million €/yr (estimated) ,,,.	G	control of the muskrat	IAS management actions are integrated within other land and water management actions, and thus there is no separate budget dedicated to IAS.
	0.5 million €/yr (estimated)		control of giant hogweed	
ES – Anda-lucía	35 000 €/yr	C E	Control, contention and eradication of populations of IAS, including analysis, tests of methodologies and implementation of indicators	Andalucía Regional Government
	500 000 €	E	Specific urgent project for eradication	
	400 000 €	E	Specific urgent project for eradication	

MS	Cost	*	Description	Implementing institution and other elements
ES – Canary Islands	130 000 €/yr	C	Control of the California king snake (*Lampropeltis getula*) in Gran Canaria	Canary Islands Regional Council
	19 047,62 € (2010)	C	Control of feral cats (*Felis catus*) in Gran Canaria	
	3 500 €	M C	Monitoring and control of alien birds in Fuerteventura	
	18 234,55 €	M C	Monitoring and control of monk parakeet (*Myiopsitta monachus*) and other exotic birds in Gran Canaria	
ES – Castilla La Mancha	60 000 € (2010-2011)	C	Control of the signal crayfish (*Pacifastacus leniusculus*)	Castilla la Mancha Regional Government
	48 144,27 € for 2010	E	Eradication of *Opuntia tunicata* in the municipality of Tobarra	
ES - Valencia	145 520 € (2010)	C	Control of plants (29 species)	Valencia Regional Government
	48 110 (2010)	C	Control of animals (9 species)	
IT – Lazio region	33 000 €	E	Action plan for the eradication of American mink in Lazio	Carried out by the Mammal Research Institute of the Polish Academy of Science
UK	£1,93 million in 2008 (2,2 million €)	C	Control, management and disposal of floating pennywort (England & Wales)	

Ecosystem restoration

Ecosystem restoration is considered in very few MS (see criterion D7), and costs have only been identified for some Spanish regions and for the UK, ranging from 12 000€ for restoration and reinforcement of threatened species[146] to 224 402€/yr for river bank restoration.

[146] This was a cost identifid in the questionnaire, but it is not clear whether those costs include restoration related to IAS damages.

Table 18: Costs of ecosystem restoration

MS	Cost	Description	Implementing institution and other elements
National level			
UK	£200 000 (224 402 €/yr)	River bank restoration following damage from signal crayfish burrowing	
Regional level			
ES - Valencia	187 000 € for three years	Project for the eradication of the giant cane (*Arundo donax*) and subsequent restoration of riparian communities	Valencia Regional Government
	12 000 €	Restoration and reinforcement of threatened species[146]	Andalucía

5.1.6. KEY HORIZONTAL MEASURES

- **IAS policy development, including administration and coordination of IAS policy**

In order to ensure policy development, experts or national focal points must be designated or hired. The costs of policy development are primarily allocated to wages, to employ the personnel working on IAS policy development, or to support their activities (e.g. attendance to conferences) (Table 19). Such costs range from 800 €/yr in Estonia to approximately 100 000 €/yr in Austria (although this sum is not necessarily provided every year).

Table 19: Costs of IAS policy development, administration and coordination

MS	Cost	Description	Implementing institution and other elements
National level			
AT	~100 000 €/yr[147]	National Focal Point on IAS	At the Environment Agency Austria, commissioned and financed by the Ministry
BE	Approx. 20 000 € in 2006	Gap analysis of (federal) legal framework	
	Approx. 10 000 € in 2008	Legal support at federal level	
DK	0,5 EFT	Running of IAS policy	

[147] This amount was reported 'however to not be provided each year and to not necessarily reflect what is needed or desired, but it allows certain measures to be taken'.

MS	Cost	Description	Implementing institution and other elements
		development	
EE	800 €/yr	Wages for the update of the Estonian Nature Conservation Act and its sub-acts on IAS-related topics	
IE	3 000 €/yr	Attendance at national and European policy development meetings	
NL	40 000 €	General policy development and policy development in specific areas such as codes of conduct and IAS coastal water policy	Ministry of Economic Affairs, Agriculture and Innovation
Sl	30 000 €	Wages for personnel involved in IAS policy development	
Regional level			
BE	Approx 20 000 €	Adaptation of the legal framework	In the Walloon region of Belgium
ES	3 169,75 €	Legal analysis of internet trade in exotic species	Conducted by the Canary Islands Regional Council

- **Training, communication and awareness raising**

A number of actions related to training, communication and awareness-raising have been implemented (see criterion H1). These include the development of webpages, the organisation of seminars, workshops and training sessions for various stakeholders, the elaboration of awareness-raising campaigns, the development of communication materials including brochures, leaflets, magazines, guidelines, factsheets, etc.

Within MS, the costs are often divided between specific training activities. The total spent on communication and training per country varies between 2 000 €/yr in Ireland for a relatively targeted communication to 185 000 €/yr in the Netherlands, for a fully developed awareness-raising campaign. Specific communication actions, such as setting up of website or dissemination activities are often inexpensive and below 10 000 €/yr (Table 20).

In Spain, the costs of training and communication activities at regional level are significant, and on the same scale as costs at national level. The range of spending on communication actions between the Spanish regional governments for which information was provided is 15 000 € from the Valencia Regional Government to 100 000 € by the Andalucía Regional Government.

Table 20: Costs of training, communication and awareness-raising

MS	Cost	Description	Implementing institution and other elements
National level			
BE	0.5 million € over 4 years (2010-2013)	National contribution to the AlterIAS LIFE+ Communication project. It includes the development of codes of conduct for horticulture.	
	3.1 million € for 2009-2012	Total project budget for Invexo, an Interreg project between Flanders and Netherlands to control a number of IAS. Includes a focus on communication.	
BG	4 000 €	Amongst the measures for training and communication, short course on management of the zebra mussel (*Dreissena polymorpha*) (2005)	Funded by the US Army ERDC-IRO, the Ministry of Environment and Water and the Bulgarian Academy of Sciences
	~1 023 €	Production of leaflets and placards on invasive alien plants	
	6 000 €	National workshop on IAS (2008)	Organised by the Ministry of Environment and Water and the Bern Convention (Council of Europe)
EE	700 €	Training for customs	
	10 038 €	Publication of books (2011)	
	~10 000 €/yr	Awareness-raising on alien crayfish	
IE	2000 €/yr	Delivery of workshops in identification training, communication and awareness raising. Delivery of conference/forum presentations and workshops.	
LU	Unknown	Information and organisation of training on *Heracleum m.* for administrations, communes and the general public Design of a poster in German,	MNHNL

MS	Cost	Description	Implementing institution and other elements
		French, English and Dutch	
	Unknown	Dissemination of information through communication and publications in national gardening magazine and nature protection magazine	Nature parks
LV	Unknown	Development of a webpage about hogweed	Developed by the State Plant Protection Service
	Unknown	Seminars on practical issues related to hogweed control (2007 – 2008)	
	5 500 €	Informative materials about giant hogweed	Funded by the Latvian Environmental Protection Fund
NL	185 000 €/yr	Training and communication, including targeted awareness-raising campaigns, information sheets on particular species, articles, press releases, a field guide on aquatic plants, and the Q-bank website	Ministry of Economic Affairs, Agriculture and Innovation
Sl	5 000 €/yr	Workshops for managers of green spaces, webpage and publications	
Regional level			
ES	15 000 €	Design and printing of brochures (2011)	Valencia Regional Government
	100 000 €	Conferences, communication materials, presentations, webpage and audiovisual material	Andalucia Regional Government
	5 071,64 €	Mobile units for public awareness about IAS control measures (2010)	Castilla la Mancha Regional Government
	18 877,76 €	Awareness-raising materials about IAS (2010)	Castilla la Mancha Regional Government
	14 500 €	Study to carry out environmental volunteer activities to raise awareness about IAS in the fisheries sector (2010)	Castilla la Mancha Regional Government

MS	Cost	Description	Implementing institution and other elements
	8 042,95 €	Workshop on the Canary Islands' IAS strategy and accompanying documents	Canary Islands Regional Council
	24 664,54 €	Project for education, information sharing and public awareness, including codes of conduct	Canary Islands

- **Research dedicated to IAS**

Many research actions were mentioned by the MS but few costs could be directly identified linked to the research programmes. The costs provided generally correspond to specific research projects focused on IAS, rather than to a dedicated budget-line available at national level for research into IAS. The budget for research on IAS projects ranged between 100 000 € for two research projects in Slovenia to approximately 1,1 million € in Denmark on 5 PhD projects. In the UK, the costs of research funding on IAS were estimated at 18.9 million €. Regional governments may also subsidise research into IAS, although this will often be focused on more practical, smaller scale issues than the projects funded at national level (see Table 21).

Table 21: Costs of research dedicated to IAS

MS	Cost	Description	Implementing institution and other elements
National level			
BG	22 500 €/yr from 2005 to 2012	Research on freshwater IAS including biology, ecology, risk assessment and management, and networking	
	10 175 € from 2004 and 2006	Research on IAS	Ministry of Environment and Water
	158 660 € for 2009-2012	Project "Biology, Ecology and Control of the Invasive Alien Species in the Bulgarian Flora"	
DK	8 million DKK total (1,6 million DKK each). Approx. 1,1 million € total (214 619 € each)	5 relevant PhD projects	
DE	40 000 € (one-off cost) 30 000 € (one-off cost)	Project (2006-2009) "Modelling invasive alien plants under different climate change scenarios" Project (2006-2009) "Alien fishes and climate change"	

MS	Cost	Description	Implementing institution and other elements
LV	Unknown	Recommendations based on studies on giant hogweed, Phd studies on invasive alien plants, study about *Trachemys scripta*, studies about *Gyposphila paniculata* in coastal areas and signal crayfish and fishes	Research institutes: University of agriculture, University of Latvia, Daugavpils University, Daugavpils Zoo
Sl	100 000 €	Two research projects into IAS: one project is focused on an overview of the alien species recorded or present in Slovenia and the other is on the management of a number of selected species	
UK	£16,8 million/yr (18,9 million €/yr)	Research projects in which IAS are the main part of the study	
Regional level			
BE	200 000 €/yr	Research to identify best practices for prevention and management, and ad-hoc research costs at universities (costs vary between years).	Wallonia
ES	28 000 € (respectively 10 000 € and 18 000 €)	Two one-off studies conducted in 2007 on a herbicide protocol for control of *Carpobrotus* and establishment of the effects of *Dactylopius coccus* and *D. opuntiae* on *Opuntia ficus-indica*	Valencia regional government
	30 000 €/yr	Project on analysis of methods and management actions for selected species	Andalucia Regional Government

- **Other actions**

The code of conduct that was developed in Denmark took 100 manhours (mh) to set up. The Danish Ministry of the Environment also has a portal for reporting sightings of IAS. This portal cost 250 000 DKK (33 525 €) to develop and requires 100 mh/yr to operate.

5.1.7. LIABILITY SYSTEMS, COST RECOVERY AND LABELLING SCHEMES

- **Setting-up permit/registration systems or licences**

The costs for setting-up these systems have only been documented in two MS (see Table 22)

Table 22: Costs of permits

MS	Cost	Description	Implementing institution and other elements
National level			
DK	15 600 €/yr (150 mh/yr)	Administration of permits for releasing non-native species	
EE	~200 €/yr	Wages for developing a system of giving permits for use of black-listed alien species	Environmental Board

- **Fines**

In many MS, fines are foreseen in cases where regulations relative to invasive alien species are not respected (see criteria E). For instance, in Latvia, in the case of failure to undertake measures to prevent the spread of invasive alien plant species a warning or a fine shall be issued. A fine ranging from LVL 70 and up to LVL 250 (~100 to 350€) can be imposed on a natural person, and from LVL 200 and up to LVL 1000 (~280 to 1410€) on a legal person. If the same violation is committed again within a year after the imposition of an administrative sanction, a fine ranging between LVL 250 and up to LVL 500 (~350 to 700€) shall be imposed on a natural person, and between LVL 400 and LVL 2000 (~560 to 2820€) on a legal person (from Administrative Violation Code).

Table 23: Fines

MS	Cost	Description	Implementing institution and other elements
National level			
LV	Amount of fine: LVL 70 – LVL 250 (~100 to 350€) for natural person and LVL 200 – LVL 1000 (~280 to 1410€) for a legal person. Increases to LVL 250 – LVL 500 (~350 to 700€) and LVL 400 – LVL 2000 (~560 to 2820€) respectively if same offence committed again within a year.	In the case of failure to undertake measures to prevent the spread of invasive alien plant species a warning shall be issued or a fine imposed	From Administrative Violation Code

5.2. OECD COUNTRIES

Considerable work has been carried out in the US in order to determine the federal budget directly allocated to invasive species issues. The proposed spending across US agencies and departments for activities and budget lines that are specifically dedicated to invasive species was $1229 million in 2007, and is currently estimated to be between $1200 and 1300 million per year. These figures do not include other activities that do not fall under a specific budget line for IS. They also do not include spending by States, tribal and local governments, businesses or NGOs.

This budget is divided between a number of agencies and departments:

- US Department for Agriculture;
- US Army Corps of Engineers;
- Department of the Interior;
- Departmentof State;
- Department of Commerce;
- Department of Homeland Security;
- NASA; and
- Environmental Protection Agency.

The budget is also broken down by different types of activity. As can be seen in Figure 2, control of IS receives the largest proportion (36%). Early warning and rapid response activities also receive a relatively large proportion (22%). Of note is the small allocation received by restoration activities.

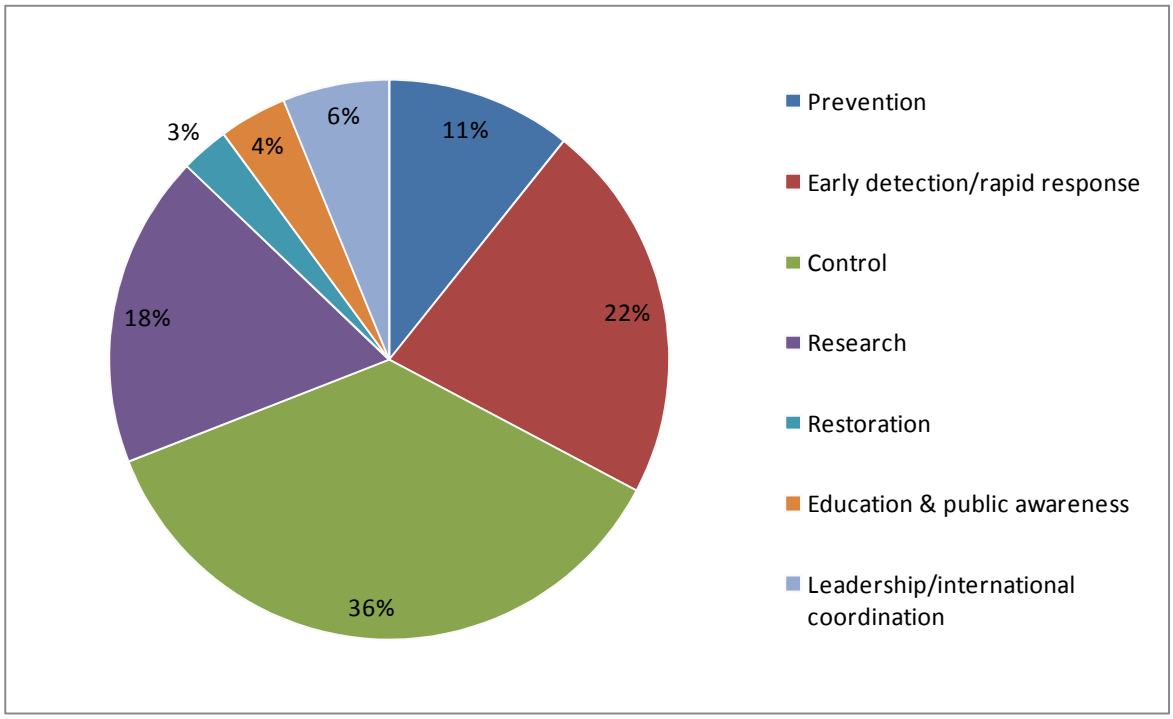

Figure 2: Proportion of US president's fiscal year 2007 budget by different types of activity (Source: NISC, unknown date).

Costs related to IAS control or eradication that have been identified in recent literature are presented in **Table 24**. The most comprehensive estimate of costs is that produced by Pimentel et al. (2002), of $120 billion per year. However, this figure includes both the costs of losses and damages, as well as the costs of control, and also includes microbes in its analysis. Therefore, costs of control for the invasive alien plants and animals for which figures were available are provided separately in the table below.

Table 24: Costs of invasive species control and eradication in the USA

Taxa	Cost	Description	Reference
Alien plants, animals and microbes	$120 billion per year	Losses and damaged and control costs	Pimentel et al., 2005
Alien plants	$9603-9605 million per year	Control costs	
Feral pigs	$0.5 million per year	Control costs	
Brown tree snake	$11 million per year	Control costs	
Alien	$2411	Control costs	

Taxa	Cost	Description	Reference
arthropods	million per year		
Invasive weeds	$34.1 billion per year	Cost of reduced output and of weed control	Dewit, Marcia. 2001. " Economic Impact of Invasive Weeds." In Noxious Weeds 4, no 1. California Interagency Noxious Weed Coordinating Committee. p. 8-11.
Aquatic weeds	$50-100 million per year	Costs of treating inland water surfaces for weeds with chemicals	Rockwell, H.W., 2003. Summary of a survey of the literature on the economic impact of aquatic weeds. Report for the Aquatic Ecosystem Restoration Foundation. Available from: www.aquatics.org/pubs/economic_impact.pdf -[Accessed 24/6/2011]
Giant reed and salt cedar	$1.2 million over 5 years	Control at a military camp in southern California	Westbrook, C., K. Ramos, and M. La. 2005. Under Siege: Invasive Species on Military Bases. Reston, VA National Wildlife Federation. 50.
Seaweed *Caulerpa taxifolia*	$5 million in first three years	Eradication programme in two Californian lagoon	Lodge et al., 2006. Biological invasions: recommendations for US policy and management. *Ecological Applications*, **16** (6): 2035-2054.

Environment Canada has a set up a programme specifically for invasive species (the Invasive Alien Species Partnership Program). It is focused on engaging citizens in prevention, detection and response, and has an annual budget of $1 million. The management costs of this programme are $130, 000 per year, which includes one EFT. For each dollar that is provided by the IASPP, an extra $1.19 of matching funding is leveraged. For these two reasons (the low management cost and the leveraging of matching funding) delivery of the programme is deemed to be cost-efficient (Environment Canada, 2009).

A number of IAS programmes have been evaluated separately in Australia. Measures for the biocontrol of weeds have been estimated to have greater benefits than costs; $23.10 are generated for every $1 invested in the efforts. The benefits were derived by the agriculture sector through savings in costs of control and increased productivity, the government through savings in the costs of control, and to society through health

benefits. The budget allocated to biocontrol of weeds $4.3 million per year between 1980 and 2000 (Page and Lacey, 2006).

The cost-benefits of the Invasive Plants Cooperative Research Centre (IPCRC) have also been evaluated. The Centre was also found to derive greater benefits than the costs, with a benefit-cost ration of 55:1. Government investment in the Centre leveraged more than double the original amount in matched funding. Again, a large proportion of the benefits are derived by agriculture through transferring results of research, including technology, to the industry (Jones et al., 2006).

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6. CONCLUSION

This study feeds into the preparatory work for the development of an EU legislative instrument to combat IAS (section 3.4, linked to target 5). It aims to identify what EU MS have already developed and regulated regarding IAS, and for what costs and benefits, and to compare this with approaches used in four selected OECD countries (AU, CA, NZ, US).

The report identifies and assesses policies and initiatives related to IAS in the 27 EU MS and in four selected OECD countries, aside from plant and animal health or aquaculture regulations, which are already well-reviewed elsewhere. The policies and initiatives considered were either already implemented or still under development at the time of the assessment (April 2011), and were not necessarily legally-binding. The compilation of policies/initiatives aimed to be exhaustive, although as this is a fast-developing and broad field, complete exhaustion could not be guaranteed (in particular, species-specific texts were not targeted). The assessment was performed systematically, by evaluating each policy/initiative against a set list of criteria. Furthermore, the costs of implementing IAS policies were identified via a questionnaire to the MS.

- **A fragmented policy field**

It is clear from this review that a considerable amount of policies/initiatives related to IAS already exist in the 27 EU MS. However, these tend to be highly fragmented, ranging across numerous texts and sectors. For instance, many texts exist to tackle the economic impacts caused by IAS plants in the forestry or agriculture sector. Some of these may be very comprehensive, but they are often not generalised to other taxa/sectors, and developed independently of what is done in other sectors. Further, seldom any single policy tackles all the different elements of the introduction pathway (import, trade, transport, containment, etc.). Together, this leads to potential policy gaps and to a multiplication of texts. This fragmentation can make the enforcement of those legislations complicated and uncertain, particularly when it leads to inconsistent approaches. For instance, two texts in the same MS may define IAS differently.

Consistent with the disparate nature of the legislation operating in the field of IAS, responsibility for IAS policy-making, prevention, control and management in the 27 MS is also fragmented. The main actors include Ministries, local/regional governments, plant and forest services, or food and sanitary border control services. On average one to ten equivalent full-time work on IAS issues, but these correspond to part-time occupations, spread over different affiliations. The costs of prevention, control, management and restoration of IAS are highly heterogeneous among MS, and no

generalisations can be made. The MS questioned almost all mentioned the difficulty of evaluating these costs.

The selected OECD countries highlight different approaches to IAS prevention and control. Both Australia and New-Zealand approach IAS from a biosecurity perspective. This is a strategic and integrated approach that encompasses the policy and regulatory frameworks to analyse and manage IAS risks. Thus the policies/initiatives tend to be better streamlined than in the EU, with better awareness of the different stakeholders (e.g. inspectors). In the USA, a central agency dedicated to IAS is in place, but most IAS policies/initiatives are decentralised at State level. In Canada, an overarching strategy is in place.

Scoping for the development of a coherent IAS policy framework at EU level

Overall, the state of IAS policies and initiatives in the EU is characterised by one of the best pools of IAS information and experts worldwide[148] and by a precautionary approach to IAS. The common framework that can be consided in place across most MS is relatively thin, as a consequence of the disparate nature of the legislations/initiatives. But a side-effect of this is that several areas are developed or under development in MS, but with a great heterogeneity of approaches. Considerable policy gaps also remain, in particular regarding early-warning, identification of risks and management and control of IAS. We discuss these different aspects below in more details.

Common framework in place across MS

It is clear that a continental framework on IAS is needed, as IAS can cross borders and actions benefit from being coordinated. Such continental approaches already exist in New-Zealand and Australia and have proven quite successful. These two countries were the most advanced on almost all criteria assessed.

In that regard, EU MS already have some shared resources and approaches. Two main platforms already exist that centralise IAS information at EU level, and that could be further developed. NOBANIS is a joint-information system dedicated to IAS in place in 14 MS in North and Central Europe, and in another four non-EU countries and the European part of Russia. This network is a driving force in Europe, pushing to the development of pioneering measures in the participating countries, such as pathway identification and IAS alert systems. In contrast, the DAISIE initiative, which arguably turned Europe from one of the regions with the poorest coverage of IAS information to one of the best, is not fully functional anymore. It was a three-year FP6 project, covering all 27 MS, and work has continued post-funding through various ad-hoc arrangements in some MS only[145]. However, the expert networks and data collected could provide a scientifically sound basis on which to develop further initiatives.

[148] Hulme and Weser, 2011, Diversity and Distributions, 1-9.

Most MS have a legally-binding definition of IAS, and opt for a list-approach to manage IAS risks. This can be considered the common framework in place in the great majority of MS. However, there is great variability in the way IAS are defined, both across and within MS. Only four MS strictly follow the CBD definition of IAS. The other MS actually use more restrictive definitions, although these may in some cases also include elements that go beyond the CBD definitions (e.g. by including threats beyond the biodiversity ones).

Most MS, in line with the CBD and the EU Biodiversity Strategy, adopt a precautionary approach to the control of IAS, by prioritising species through list approaches, and by prohibiting release into the wild or possession of those species. However, only 14 MS have legally-binding black lists in place specifically targeting IAS. There seems to be no common methodology for defining which species are (black-)listed in an MS, resulting in great variability in terms of taxonomic coverage and in the scientific validity of those lists across MS. Release into the wild is regulated in most MS probably in part because it is a requirement of the Habitats Directive. But in fact few countries define the wild and/or what release into the wild means, and the liabilities related to release into the wild are often not well-defined in the texts.

- **Areas that could be improved across MS**

A number of other aspects are partially covered in the majority of MS, but not always with very consistent approaches. They represent the areas that could benefit from a streamlining at EU-level, for potentially little effort, since elements are already in place in most MS that could be extended or adapted.

Awareness of IAS and of the need to streamline national policies and fill policy gaps seems to be developing across the EU. A growing number of MS have established or are in the process of establishing over-arching strategies on IAS. These strategies often fill legislative and regulatory gaps in terms of definitions, early-warning and rapid response, and capacity-building. Some MS are also waiting for the EU IAS legal instrument before developing their own strategy, so as to ensure consistency with it (pers. comm.).

Most MS also have mandatory requirements to control or eradicate IAS, as emphasised by the EU biodiversity strategy. However the approaches used are very inconsistent and incomplete across MS, being restricted to some taxa or sectors, or not being legally-binding. This can in large part be explained by the fact that management actions are species-specific, since they are typically undertaken in response to an identified problem. Further, such actions are commonly undertaken by NGOs, and several non-legally binding, regional/local, actions may thus have been overlooked in this assessment.

Similarly, most MS have IAS relevant websites, often hosted by the national environmental agencies or ministries, but few MS have dedicated websites, centralising all IAS information. When such websites are in place, they can also include

alert functions, such as alert lists or participative reporting systems. Citizen science is an increasingly used means to report species distributions over wide spatio-temporal scales, with demonstrated success for early-warning (eg. Skogs skada information and early-warning system for forest pests in Sweden[149], or various systems in place in several states in the USA[150]).

Some forms of cost-recovery mechanisms for intentional introductions are also in place in most MS, such as payment of fees for inspections, permits and licences, fines for contravening the legislation, and recovery costs for returning or destroying organisms. These mechanisms can provide financial incentives for implementing IAS regulations on introduction/release/spread. These tools are likely under-exploited currently, as the cost-recovery mechanisms identified are often not dedicated to IAS.

- **Frequent gaps across MS**

Overall, tools for assessing IAS risk are still relatively new and poorly developed in the MS. Formal, legally-binding risk assessments are only in place in four MS, but may in fact only apply to obtain exemptions rather than for identifying any established or potential IAS. Methods for pathway/vector risk assessment are mostly inexistent. No common method for performing RA was used across MS. The most commonly used methods for performing dedicated IAS RA are to assess ecological risks based on a set of criteria (eg. potential for spread, establishment, etc.). However, no MS were seen to include potential positive impacts of IAS in their risk assessments, but a few did consider economic or health impacts (UK, IE) and the quality of the source data on which the assessment is based. Lessons could be learnt in this area from the OECD countries. All four selected OECD countries have risks assessment and/or pathway risks assessments in place. In Australia, pathways and vectors are considered simultaneously in standard risk assessments for IAS.

Early-warning and alert measures appear to be largely missing in most MS, whether in terms of detection, by defining tools for early-warning, such as horizon scanning, early-warning systems, surveillance and targeted monitoring, or in terms of any rapid response action or protocol (eg. risk assessment in emergency, transition measures). However, NOBANIS is currently developing a pilot project on IAS alerts that could provide a working basis or lessons for future developments. Recognising this gap, a recent EEA report assessed the needs for developing an EU-wide early-warning system to detect and react to invasions (EEA 2010[151]). It compared five different options for developing such a system, including using DAISIE/NOBANIS, developing a European observatory (similar to NISC in the US) or a biosecurity approach (similar to NZ). While a future EU-wide system may not be modelled along any of these lines, inspiration could be taken from from the selected OECD countries in terms of alert and early-warning, in particular regarding rapid response procedures. Such procedures are in

[149] www-skogsskada.slu.se/SkSkPub/MiPub/Sida/SkSk/About/About.jsp
[150] Noxious weeds: www.nps.gov/glac/naturescience/ccrlc-citizen-science_weeds.htm; ebird: ebird.org/content/ebird ;
[151] EEA Technical report No5/2010

place in all four selected OECD countries, although they are often State- or species-specific.

Another major gap concerns the control and management of IAS, with little mandatory follow-up and assessment of the actions undertaken. This is a concern, since control and eradication actions are not always desirable and known to often backlash[152]. Furthermore, no standard methodology can apply to all IAS, and case-specific approaches are needed to account for site and species-specific context. One barrier to the development of long-term monitoring of management/control/eradication measures is the financing of such actions. In this regard, the Australian approach to divide the costs according to who will benefit the most from the eradication/control/management of the species could be interesting.

Surprisingly, although the awareness of IAS has been rising in the past years, capacity-building and awareness initiatives are not very well-developed in the MS. Very few MS have a dedicated agency for IAS, and overall, capacity-building initiatives are disparate and very disorganised. One reason could be that some of these initiatives have been missed in our search, as they are often NGO-lead. It is also possible that the existence of regional and European information systems and networks NOBANIS and DAISIE has hindered the development of national initiatives related to capacity-building. Given the large IAS expert and information basis in the EU, this should be an area that could be easily improved, with cascading downstream benefits on other aspects of IAS management. Similarly, other uncommon measures, that could be driven and implemented at industry-level, involve measures linked to labelling and greening the supply chain. Such measures could have a snowballing effect on IAS awareness.

Another two areas that were almost completely neglected by MS, but where improvements could easily be made, are the prevention of spread through man-made corridors and international cooperation. Many MS already regulate different aspects of IAS prevention and may just never have considered regulating man-made corridors. Similarly, international cooperation is common place in many other policy areas, and its absence for IAS is probably more a reflection of the lack of awareness of this relatively recent issue.

Finally, streamlining of IAS policies into other policy areas, such as in impact assessments, border controls or to avoid harmful subsidies, is largely missing in MS. Only two MS have dedicated IAS policies on border control, possibly because within the single market it is more the scope of an EU-level legislation than of an MS-level one to fill the gaps not already covered by the plant and animal health regime and CITES. As for many environmental regulations, an EU-level leadership would help give the impetus and direction for national governments, and several MS are waiting for this before taking action (pers. comm.).

[152] Strubbe et al, 2011, Biological invasions, 144; Parkes and Panetta, 2009, Invasive species management, and handbook of principles and techniques, Oxford University Press; Genovesi, 2005, Biological invasions

7. ANNEX: LIST OF REGULATIONS

Codes given to the regulation follow the rule:

- The first two letters are the country code
- The number for hundreds means:
  - 1 – legally binding and implemented
  - 2 - legally binding but not implemented
  - 3 – not legally binding and implemented
  - 4 – not legally binding and not implemented
- The number for tens describes:
  - 00 – conventions, plans and strategies
  - 10 – codes
  - 20 – laws or acts
  - 30 and 40 – ordinances (includes Ordonnance in French, Verordnung in Germany and Förordning in Sweden)
  - 50 – regulations
  - 60 and 70 decree, orders and statutory orders
  - 80 circular, decisions and other texts
- * relate to central IAS texts
- R means that the text applies regionally

Code	Original name	Translated name
Austria		
AT120	Artenhandelsgesetz	Law on animal trade
AT121	Tierschutzgesetz	Law on animal protection
AT122	Tierseuchengesetz	Law on animal diseases
AT140	2. Tierhaltungsverordnung	2. Regulation on keeping animals
AT141	Aquakultur-Seuchenverordnung	Aquaculture - diseases regulation
AT142	Pflanzenschutz-Maßnahmen-Verordnung	Regulation on measures for plant protection

Code	Original name	Translated name
AT143	Pflanzenschutzverordnung	Regulation on plant protection
AT144	Tierhaltungs-Gewerbeverordnung	Animal keeping - commercial regulation
AT145	Zoo-Verordnung	Regulation of zoos
AT123 R	Land Vorarlberg - Gesetz über Naturschutz und Landschaftsentwicklung	Regional Law for Vorarlberg on nature protection*
AT146 R	Verordnung der Landesregierung zur Durchführung des Gesetzes über Naturschutz und Landschaftsentwicklung	Regional regulation for Vorarlberg on implementation of the nature protection law*
AT300 *	Österreichischer Aktionsplan zu gebietsfremden Arten (Neobiota)	Austrian Action Plan on Invasive Alien Species (2004)
Belgium		
BE110	Code rural	Rural code
BE130 R	Ordonnance relative à la sauvegarde et à la protection de la nature 27/04/1995	Ordinance for nature protection 27/04/1995 (Bruxelles)
BE131 R	Ordonnance relative à la responsabilité environnementale en ce qui concerne la prévention et la réparation des dommages environnementaux 13/11/2008 (Bruxelles capitale)	Ordinance on environmental responsibility 13/11/2008 (Bruxelles)
BE160	Arrêté royal concernant la prévention et la réparation des dommages environnementaux dus au transport par la route, la voie ferrée, par voie navigable ou par les airs : d'espèces végétales non indigènes et d'espèces animales non	Decree on environmental damages caused by the transport of non indigenous animal or plant species 08/11/2007

Code	Original name	Translated name
	indigènes, ainsi que les dépouilles de ces derniers suite à leur import, export et transit; ainsi que de déchets lors de leur transit	
BE161	Arrêté royal relatif aux conditions de police sanitaire applicables aux animaux et aux produits d'aquaculture, et relatif à la prévention de certaines maladies chez les animaux aquatiques et aux mesures de lutte contre ces maladies 09/11/2009	Decree on sanitary conditions for animals and aquaculture products 09/11/2009
BE162	Arrêté royal portant des mesures de police sanitaire relatives à la lutte contre certaines maladies exotiques des animaux 03/10/1997	Decree on sanitary measures against exotic animal diseases 03/10/1997
BE163	Arrêté royal relatif à la conservation, à la mise sur le marché et à l'utilisation des pesticides à usage agricole 28/02/1994	Decree on pesticides 28/02/1994
BE164	Arrêté royal visant la protection des espèces dans les espaces marins sous juridiction de la Belgique 21/12/2001	Decree on marine areas protection 21/12/2001
BE165	Arrêté royal portant des mesures relatives à l'importation, à l'exportation et au transit de certaines espèces d'oiseaux sauvages non indigènes 26/10/2001	Decree on non indigenous wild birds imports, exports and transit 26/10/2001
BE166	Arrêté royal du 27 avril 2007 portant les conditions d'agrément des établissements pour animaux	Decree on authorisation conditions for establishments holding animals 27/04/2007 (modified on 14/09/2007 and 18/03/2009)

Code	Original name	Translated name
	et portant les conditions de commercialisation des animaux modifié par l'arrêté royal du 14 septembre 2007 et par l'arrêté royal du 18 mars 2009	
BE167	Arrêté ministériel modifiant l'arrêté ministériel du 27 juin 1994 établissant les règles vétérinaires et sanitaires relatives aux échanges et aux importations de certains produits 25/09/1998	Decree on veterinary and sanitary rules relative to exchanges of certain products 25/09/1998
BE168 R	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 26/10/2000	Decree on habitat and wild species conservation 26/10/2000 (Bruxelles)
BE169 R	Decreet betreffende het natuurbehoud en het natuurlijk milieu	Decree on nature protection 21/10/1997 (Flanders)
BE170 R	Besluit van de Vlaamse regering tot wijziging van het besluit van de Vlaamse regering van 6 februari 1991 houdende vaststelling van het Vlaams reglement betreffende de milieuvergunning, en van het besluit van de Vlaamse regering van 1 juni 1995 houdende algemene en sectorale bepalingen inzake milieuhygiëne. 06/02/2004	Decree on ecologic authorisations 06/02/2004 (Flanders)
BE171 R	Besluit van de Vlaamse Regering met betrekking tot soortenbescherming en soortenbeheer (aangehaald	Decree on species 15/05/2009 (Flanders)

Code	Original name	Translated name
	als : het Soortenbesluit)	
BE172 R	Besluit van de Vlaamse regering tot vaststelling van de criteria voor duurzaam bosbeheer voor bossen gelegen in het Vlaamse Gewest 27/06/2003	Decree for forest sustainability criteria 27/06/2003 (Flanders)
BE173 R	Arrêté du Gouvernement wallon relatif à l'octroi de subventions agro-environnementales. 24/08/2008	Decree on agro-environmental subsidies 24/08/2008 (Wallonia)
BE174 R	Arrêté du Gouvernement wallon déterminant les conditions sectorielles [et intégrales] relatives aux utilisations confinées d'organismes génétiquement modifiés ou pathogènes. 04/07/2002	Decree on GMO conditions 04/07/2002 (Wallonia)
BE175 R	Décret relatif à la conservation des sites [Natura] 2000 ainsi que de la faune et de la flore sauvages 06/12/2001 (Wallonie)	Decree on sites and wild species conservation 06/12/2001 (Wallonia)
BE176 R	Arrêté du Gouvernement wallon portant conditions sectorielles relatives aux carrières et à leurs dépendances 17/07/2003	Decree on quarries 17/07/2003 (Wallonia)
BE180 R	Circulaire relative aux EEE 23/04/2009 (Wallonie)	Circular on IAS (Wallonia) 23/04/2009
BE181 R	Circulaire n° 2688 relative à la régulation d'espèces animales non indigènes 23/01/2007 (Wallonie)	Circular on non indigenous animal species 23/01/2007 (Wallonia)
BE300	Plan stratégique 2004-2008	Federal Sustainable development Plan 2004-2008 (see also BE10)

Code	Original name	Translated name
BE301	Stratégie nationale pour la Biodiversité/Nationale Biodiversiteitsstrategie 2006-2016	National Biodiversity Strategy 2006-2016
BE302	Plan fédéral d'intégration sectorielle de la biodiversité	Federal sectorial plan for biodiversity integration
Bulgaria		
BG120	ЗАКОН ЗА ОПАЗВАНЕ НА ОКОЛНАТА СРЕДА	Environmental Protection Act
BG121	ЗАКОН ЗА БИОЛОГИЧНОТО РАЗНООБРАЗИЕ	Biological Diversity Act (implementing the Birds and Habitat Directive)
BG123	ЗАКОН ЗА ЗАЩИТЕНИТЕ ТЕРИТОРИИ	Protected Areas Act
BG124	ЗАКОН ЗА ЗАЩИТА НА РАСТЕНИЯТА	Plant Protection Act
BG125	ЗАКОН ЗА ЗАЩИТА НА ЖИВОТНИТЕ	Animal Protection Act
BG150	НАРЕДБА № 4 от 8.07.2003 г. за условията и реда за издаване на разрешителни за въвеждане на неместни или повторно въвеждане на местни животински и растителни видове в природата	Regulation № 4/2003 on the terms and conditions for issuing permits for introduction of alien or reintroduction of local flora and fauna species and Regulation № 14/2003 on the terms and conditions for issuing permits for introduction of non-native or reintroduction of native trees, bush and game species and public opinion requirements
BG151	НАРЕДБА № 5 от 1.08.2003 г. за условията и реда за разработване на планове за действие за растителни и животински видове	Regulation № 5 from 1.08.2003 on the arrangements for developing action plans for plant and animal species
BG300	НАЦИОНАЛНА СТРАТЕГИЯ ЗА БИОЛОГИЧНОТО РАЗНООБРАЗИЕ	National Strategy for Biodiversity Conservation
BG301	Национален план за опазване на биологичното разнообразие	National Action Plan for Biodiversity Conservation

Code	Original name	Translated name
Cyprus		
CY120	Νόμος πού προνοεί για προστασία και διαχείριση της φύσης και της άγριας ζωής Αριθμός 153(I) του 2003	Law on protection of wild species
CY501		Fourth National Report to the United Nations Convention on Biological Diversity
CY500	Επιβλαβείς οργανισμοί φυτών και φυτικών προιοντων, Εκδοση 2007, Λευκωσία ΥΠΟΥΡΓΕΙΟ ΓΕΩΡΓΙΑΣ, ΦΥΣΙΚΩΝ ΠΟΡΩΝ ΚΑΙ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΥΠΗΡΕΣΙΑ ΠΕΡΙΒΑΛΛΟΝΤΟΣ	Report on harmful organisms on plants and vegetal products
CY502	Ξενικα ειδη χλωριδας και πανιδας ΥΠΟΥΡΓΕΙΟ ΓΕΩΡΓΙΑΣ, ΦΥΣΙΚΩΝ ΠΟΡΩΝ ΚΑΙ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΥΠΗΡΕΣΙΑ ΠΕΡΙΒΑΛΛΟΝΤΟΣ	Report on IAS in Cyprus
Czech Republic		
CZ120	114/1992 Sb. o ochraně přírody a krajiny	Protection of Nature and Landscape Act No. 114/1992 Coll.
CZ121	289/1995 Sb. lesní zákon	Forests Act No. 289/1995 Coll
CZ122	99/2004 Sb. o rybářství	Fish Farming Act No. 99/2004 Coll
CZ123	326/2004 Sb. o rostlinolékařské péči a o změně některých souvisejících zákonů	Phytosanitary Care Act No. 326/2004 Coll.*
CZ124	449/2001 Sb. o myslivosti	Hunting Act No. 449/2001 Coll.
CZ125	254/2001 Sb.vodní zákon	Water Act No. 254/2001 Coll
CZ160	482/2005 Sb. o druzích a způsobech využití biomasy při podpoře výroby elektřiny	Biomass use for electricity generation Decree No. 482/2005 Coll.*
CZ161	83/1996 Sb. o zpracování	Regional forest management plans Decree

Code	Original name	Translated name
	oblastních plánů rozvoje lesů	No. 83/1996 Coll
CZ162	330/2004 Sb. O opatřeních proti zavlékání a rozšiřování škodlivých organismů rostlin a rostlinných produktů	Protection against introduction of harmful organisms through import; export of plants, plant products and other items Decree No. 330/2004 Coll.
CZ163	215/2008 Sb. o opatřeních proti zavlékání a rozšiřování škodlivých organism	Measures against introduction and spreading of harmful species Decree No. 215/2008 Coll.*
CZ164	453/2009 Sb. nakažlivé lidské nemoci, nemoci zvířat a rostlin	Contagious diseaess of human, animals, plants and pests of useful plants - definition for the criminal Act Cabinet Decree453/2009 Coll.
CZ165	382/2003 Sb. veterinární požadavky na obchodování se zvířaty § 73	Veterinary measures for animals Decree 382/2003 Coll.*
CZ166	53/2009 Sb. podm. pro poskytování dotací na lesnicko-environmentální opatření	Conditions of agro-environmental measures Decree 53/2009 Coll.*
CZ167	441/2009 Sb. úplné znění zákona o obchodování s ohroženými druhy	Trade of wild and endangered species Decree 441/2009 Coll. *
CZ180	/ 200/1998 Sb. Protokol o sanitárních a fytosanitárních opatřeních s ES	Protocol on sanitary and phytosanitary measures with EU 200/1998*
CZ300	Strategie ochrany biologické rozmanitosti	National Biodiversity Strategy
CZ301	**Národní lesnický program pro období do roku 2013**	National Forestry Programme till 2013
CZ500	Stručná charakteristika regulovaných druhů invazních rostlin	Brief characteristics of regulated invasive plant species (publication)
CZ501	Fourth National report to the CBD	
Denmark		
DK120	Bekendtgørelse af lov om	Protection of Nature Act, Act no. 933 of

Code	Original name	Translated name
	naturbeskyttelse 24.09.2009/933	24/09/2009
DK121	Bekendtgørelse af lov om jagt og vildtforvaltning 24.09.2009/930	Hunting Act, Act no. 930 of 24/09/2009
DK122	Bekendtgørelse af lov om fiskeri og fiskeopdræt 26.09.2008/978	Fishing Act. Act no. 978 of 26/09/2008
DK123	Bekendtgørelse af lov om drift af landbrugsjorder 12.03.2009/191	Act on Management of Agricultural Areas, Act no. 191 of 12/03/2009
DK124	Lov om hold af dyr 09.06.2004/432	Act on the keeping of livestock, Act no. 432 of 09/06/2004
DK125	Bekendtgørelse af lov om planteskadegørere 12.03.2009	Act on plant pests (revised), no. 198 of 12/03/2009
DK126	Bekendtgørelse af lov om mark- og vejfred 19.01.2007/61	Act on access to nature (revised), no. 61 of 19/01/2007
DK127	Bekendtgørelse af lov om biavl 12.03.2009/197	Act on beekeeping (revised), no. 197 of 12/03/2009
DK128	Miljøbeskyttelsesloven 879/26.06.2010	Environmental Protection Act, no. 879 of 26/06/2010
DK150		Control of Trade in Endangered Species Enforcement Regulations 1997 (CITES)
DK160	Bekendtgørelse om bekæmpelse af kæmpebjørneklo 10.09.2009/862	Statutory order on eradication of Giant hogweed, no. 862 of 10/09/2009
DK161	Bekendtgørelse om vildtskader 15.12.2009/1453	Statutory order on damages caused by game species, no. 1453 of 15/12/2009
DK162	Bekendtgørelse om udsætning af vildt, jagtmåder og jagtredskaber 04.07.2007/870	Statutory order on release of game, and hunting methods and hunting gear, no. 870 of 04/07/2007
DK163	Bekendtgørelse om jagttid for	Statutory order on hunting seasons for

Code	Original name	Translated name
	visse pattedyr og fugle m.v. 18.11.2010/1404	certain mammals and birds etc., no. 1404 of 18/11/2010
DK164	Bekendtgørelse om pelsdyrhold samt indførsel og transit 16.02.1987/78	Statutory order on fur farming and import and transit of furred animals, no. 78 of 16/02/1987
DK165	Bekendtgørelse om erhvervsmæssig handel med dyr (dyrehandlere) 12.12.2002/1022	Statutory order on commercial trade with animals (pet shops), no. 1022 of 12/12/2002
DK166	Bekendtgørelse om privates hold af særlige dyr m.v. 12.12.2002/1021	Statutory order on private persons keeping of certain animals etc., no. 1021 of 12/12/2002
DK167	Bekendtgørelse om bekæmpelse af bisamrotter 11.12.1987/819	Statutory order on eradication of Ondatra zibethicus, no. 819 of 11/12/1987
DK168	Bekendtgørelse om indberetning af oplysninger om dansk akvakultur 15.12.2009	Statutory order on reporting of information regarding Danish aquaculture, no. 1445 of 15/12/2009
DK169	Bekendtgørelse om udsætning af krebs i ferske vande 26.05.1999/334	Statutory order on release of crayfish in freshwaters, no. 334 of 26/05/1999
DK170	Bekendtgørelse om import af planter og planteprodukter m.m. 23.01.2009/33	Statutory order on import of plants and plant products etc., no. 33 of 23/01/2009
DK171	Bekendtgørelse om beskyttede naturtyper 1172/20.11.2006	Statutory order on protected habitats, no. 1172 of 20/11/2006
DK172	Bekendtgørelse om fredning af visse dyre- og plantearter mv., indfangning af og handel med vildt og pleje af tilskadekommet veldt 901/11.07.2007	Statutory order on the protection of certain animal and plant species, and capture and trade of wildlife and care of injured wild animal species, no. 901 of 11/07/2007
DK300	Handlingsplan for invasive arter	Action plan for invasive species
DK301	Indsatsplan mod mårhund I	Action plan against Raccoon dogs in

Code	Original name	Translated name
	Danmark	Denmark
Estonia		
EE120	Looduskatitseseadus;	Nature Conservation Act
EE121	Kalapüügiseadus	Fisheries Act
EE122	Geneetiliselt muundatud organismide keskkonda viimise seadus	Release into the Environment of Genetically Modified Organisms Act
EE123	Keskkonnajärelevalve seadus	Environmental Surveillance Act
EE124	Loomakaitseseadus	Animal Protection Act
EE125	Metsaseadus	Forest Act
EE126	Taimekaitseseadus	Plant Protection Act
EE127	KESKKONNAMÕJU HINDAMISE JA KESKKONNAJUHTIMISSÜSTEEMI SEADUS	Environmental Impact Assessment and Environmental Management System Act
EE180	Mingi ja kähriku tehistingimustes pidamisele esitatavad nõuded ja loa andmise kord	Farmed mink and raccoon dog keeping requirements and licensing procedures
EE181	Looduslikku tasakaalu ohustavate võõrliikide nimekiri	List of Invasive Alien Species
EE182	Metsa uuendamisel kasutada lubatud võõrpuuliikide loetelu	List of alien tree species permitted to use in reforestation
EE300	Eesti Keskkonnastrateegia aastani 2030	Estonian Environmental Strategy 2030
EE301	Eesti Keskkonnategevuskava aastateks 2007-2013	The National Environmental Action Plan of Estonia 2007-2013
EE302	Karuputke (Heracleum) võõrliikide ohjamiskava perioodiks 2011-2015	Heracleum management plan for 2011-2015
EE500	Taismaa Võõrliikide Käsiraamat	Code of conduct for terrestrial alien species
Finland		

Code	Original name	Translated name
FI120	Laki metsänviljelyaineiston kaupasta (241/2002)	Law on trade in forest reproductive material (241/2002)
FI121	Metsästyslaki 28.6.1993/615	Hunting Act (615/1993, amended 1268/1993)
FI122	Kalastuslaki 16.4.1982/286	Fishing Act (286/1982, amended 252/1998)
FI123	Eläintautilaki 18.1.1980/55	Animal Diseases Act (55/1980)
FI124	Laki kasvinterveyden suojelemisesta (702/2003)	Plant Health Protection Act (702/2003)
FI125	Taimiaineistolaki 1205/1994	Seedlings Material Act (1205/1994)
FI126	Siemenkauppalaki (728/2000)	Seed Trading Act (728/2000
FI127	Laki metsän hyönteis- ja sienituhojen torjunnasta 8.2.1991/263	Act on Combating Insect and Fungus Destruction in Forests (263/1991)
FI128	Metsälaki 12.12.1996/1093	Forest Act (1093/1996)
FI129	L uonnonsuojelulaki 20.12.1996/1096	Nature Conservation Act (1096/1996)
FI300	Suomen luonnon monimuotoisuuden suojelun ja kestävän käytön strategia ja toimintaohjelma 2006–2016	National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland for the period 2006-2016
FI400	Ehdotus kansalliseksi vieraslajistrategiaksi	Proposal for a National Strategy on Invasive Alien Species, Working group memorandum, MMM 2011:2
France		
FR110	Code de l'environnement	Environmental Code
FR111	Code rural et de la pêche maritime	Rural and Maritime Fisheries Code
FR112	Code de la santé publique	Public Health Code
FR113	Code forestier	Forestry Code
FR120	Loi n° 2009-967 du 3 août 2009 de programmation relative à la mise en œuvre du Grenelle de l'environnement	Grenelle law 2009
FR160	Arrêté du 2 mai 2007	Decree on Ludwigia 2007

Code	Original name	Translated name
	interdisant la commercialisation, l'utilisation et l'introduction dans le milieu naturel de Ludwigia grandiflora et Ludwigia peploides	
FR161	Arrêté du 30 juillet 2010 interdisant sur le territoire métropolitain l'introduction dans le milieu naturel de certaines espèces d'animaux vertébrés	Decree on vertebrates 2010
FR162	Arrêté du 13 juillet 2010 relatif aux règles de bonnes conditions agricoles et environnementales (BCAE)	Decree on conditionality for 2010
FR163	Arrêté ministériel du 10 août 2004 fixant les règles générales de fonctionnement des installations d'élevage d'agrément d'animaux d'espèces non domestiques	Decree setting up rules for leisure breeding of non domestic species 2004
FR164	Arrêté ministériel du 10 août 2004 fixant les conditions d'autorisation de détention d'animaux de certaines espèces non domestiques dans les établissements d'élevage, de vente, de location, de transit ou de présentation au public d'animaux d'espèces non domestiques	Decree setting up rules for authorisation of detention for selling (and other) establishments of non domestic animals 2004
FR165	Arrêté ministériel modifié du 31 juillet 2000 établissant la liste des organismes nuisibles aux végétaux, produits végétaux et autres objets soumis à des mesures de lutte obligatoire	Decree establishing harmful organisms with obligatory control 2000

Code	Original name	Translated name
FR166	Arrêté du 30 septembre 1988 fixant la liste des animaux susceptibles d'être classés nuisibles	Decree on harmful organisms 1988
FR167	Décret n°2000-1165 du 27 novembre 2000 relatif à la commercialisation des matériels de multiplication des plantes ornementales	Decree on ornamental plants 2000
FR168	Arrêté du 24 mai 2006 relatif aux exigences sanitaires des végétaux, produits végétaux et autres objets	Decree on sanitary requirements for plants, parts of plants and other objects
FR169	Arrêté du 20 décembre 1983 relatif à la commercialisation de certaines espèces d'oiseaux	Decree on sale of certain bird species
FR170	Arrêté du 21 juillet 1983 relatif à la protection des écrevisses autochtones	Decree on protection of indigenous crayfish
FR171	Arrêté du 30 juin 1998 fixant les modalités d'application de la convention sur le commerce international des espèces de faune et de flore sauvages menacées d'extinction et des règlements (CE) n° 338/97 du Conseil européen et (CE) n° 939/97 de la Commission européenne	Decree applying CITES and relevant EU regulations
FR300	Stratégie nationale pour la biodiversité et plans d'action	Biodiversity strategy and action plans
FR301	Plans nationaux de lutte	National action plans against certain species
FR400	Stratégie nationale contre les espèces exotiques envahissantes (en cours de développement)	National IAS strategy - under elaboration

Code	Original name	Translated name
Germany		
DE120	Bundesnaturschutzgesetz (BNatSchG) 2009	Nature Protection Law
DE121	Pflanzenschutzgesetz (PflSchG)	Plant Protection Law
DE122	Tierseuchengesetz (TierSG)	Animal Disease Law
DE123	Bundesjagdgesetz (BJagdG)	Hunting Law -
DE124	Tierschutzgesetz (TierSchG)	Animal Protection Law
DE130	Bundesartenschutzverordnung (BArtSchV)	Species Protection Act
DE131	Fischseuchenverordnung (FiSeV)	Fish Disease Act
DE132	Tierseuchenverordnung (TierSV)	Animal Disease Act
Greece		
GR110	Νομος που τροποποιεί τον περί δασών νόμο, αριθμός 87(I) 2010	Forestry Code
GR160	Προεδρικό διάταγμα υπ΄αριθ. 365/2002	Decrees on harmful organisms trade and transfer
GR220	Σχέδιο νόμου για την προστασία της βιοποικιλότητας	Draft law on protection of biodiversity
GR301 *	ΕΘΝΙΚΗ ΣΤΡΑΤΗΓΙΚΗ ΓΙΑ ΤΗ ΒΙΟΠΟΙΚΙΛΟΤΗΤΑ ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΧΩΡΟΤΑΞΙΑΣ & ΔΗΜΟΣΙΩΝ ΕΡΓΩΝ ΚΕΙΜΕΝΟ ΠΡΟΣ ΔΙΑΒΟΥΛΕΥΣΗ Φεβρουαριος 2009	National biodiversity strategy and action plans 2009
GR500		ELNAIS Fishery code
GR501		CIESM Mediterranean Science Commission

Code	Original name	Translated name
GR502	Μουσείο Γουλανδρή Φυσικής Ιστορίας - Ελληνικό Κέντρο Βιοτόπων - Υγροτόπων (ΕΚΒΥ)	Goulandris Natural History Museum – Hellenic Centre of biotopes and marshlands
GR503	Ελληνική Ζιζανιολογική εταιρεία	Weed science society of Greece
Hungary		
HU120	1996. évi LIII. Törvény a természet védelméről	Act No. LIII. of 1996 on Nature Conservation
HU121	1995. évi LIII. Törvény a környezet védelmének általános szabályairól	Act LIII of 1995 on the General Rules of Environmental Protection
HU122	1995. évi XCI. Törvény az állategészségügyről	Act No. XCI. of 1995 on Veterinary Hygiene
HU123	1996. évi LV. Törvény a vad védelméről, a vadgazdálkodásról, valamint a vadászatról	Act No. LV of 1996 on the Protection of Game, Game Management and Hunting
HU124	2009. évi XXXVII. Törvény az erőről, az erdő védelméről és az erdő gazdálkodásról	Act No. LIV of 1996 on Forests, Protection of Forests and Management of Forests
HU126	2000. évi XXXV. Törvény a növényvédelemről	Act No. XXXV. of 2000 on Plant Protection
HU127	2008. évi XLVI. Törvény az élelmiszerláncról és hatósági felügyeletéről	Act No. XLVI. of 2008 on Foodchain and Authorities Control
HU128	2009. évi CXLV. Törvény az állatok védelméről és kíméletéről szóló 1998. évi XXVIII. törvény módosításáról	Act No. CXLV. of 2009. on Modification of Act No. XXVIII. of 1998. on Animal Protection and Tolerance of Animal
HU160	348/2006. (XII. 23.) Kormányrendelet a védett állatfajok védelmére, tartására, hasznosítására és bemutatására vonatkozó részletes szabályokról	348/2006 (XII.23) Governmental Order on trading, keeping or utilizing endangered species

Code	Original name	Translated name
HU161	67/1998. (IV. 3.) Kormányrendelet a védett és fokozottan védett életközösségekre vonatkozó korlátozásokról és tilalmakról	67/1998. (IV. 3.) Governmental Order on restriction and prohibition of protected and strictly protected communities
HU162	91/2007. (IV. 26.) Kormányrendelet a természetben okozott károsodás mértékének megállapításáról, valamint a kármentesítés szabályairól	91/2007. (IV. 26.) Governmental Order on impairment's degree in nature and rule of environmental remediation
HU163	269/2007. (X. 18.) Kormányrendelet a NATURA 2000 gyepterületek fenntartásának földhasználati szabályairól	269/2007. (X. 18.) Governmental Order on land use prescriptions of the Natura 2000 grassland areas
HU164	346/2008. (XII. 30.) Kormányrendelet a fás szárú növények védelméről	346/2008. (XII. 30.) Governmental Order on woody plant protection
HU165	41/2010. (II. 26.) Kormányrendelet a kedvtelésből tartott állatok tartásáról és forgalmazásáról	41/2010. (II. 26.) Governmental Order on keeping and trading of pet animals
HU180	96/2009. (XII. 9.) OGY határozat a 2009-2014 közötti időszakra szóló Nemzeti Környezetvédelmi Programról (Melléklet a 96/2009. (XII. 9.) OGY határozathoz Nemzeti Környezetvédelmi Program 2009-2014)	96/2009. (XII. 9.) Parliamentary Resolution on National Environmental Program between 2009-2014
HU300	Biológiai Sokféleség Megőrzéséről szóló Stratégia és Cselekvési Terv Alapvetései	National Action Strategy and Action Plan on Conservation of Biodiversity
HU500	Nemzeti Biodiverzitás Monitorozó Rendszer (www.termeszetvedelem.hu/nbmr)	Hungarian Biodiversity Monitoring System

Code	Original name	Translated name
HU501	Méta Program (www.novenyzetiterkep.hu)	MÉTA Programme (www.novenyzetiterkep.hu/?q=en/english/node/55)
Ireland		
IE120	Wildlife (Amendment) Act, 200	
IE121	Irish Waste Management Acts 1996	
IE122	Irish Fisheries (Consolidation) Acts 1959	
IE123	Foyle Fisheries Act 1952	
IE124	Destructive Insects and Pests (Consolidation) Act 1958	
IE125	Irish Noxious Weeds Act 1936	
IE126	Local Government Act 2001	
IE150	Statutory Instrument (SI) 395/2004 Waste Management (Licensing) Regulations 2004	
IE151	SI 821/2007 Waste Management (Facility Permit and Registration) Regulations 2007	
IE160	SI 161/1980 Bees (Regulation of Import) Order 1980	
IE300	National Biodiversity Plan 2010-2015	
IE301	North South Ministerial Council Proposal for an All-Island Animal Health and Welfare Strategy	
Italy		
IT120	Legge 14 febbraio 1994, n. 124 -Ratifica ed esecuzione della convenzione sulla	Law of the 14th of february 1994, n.124-Implementation and execution of the Convention on Biodiversity

Code	Original name	Translated name
	biodiversità	
IT121	Legge n. 443/2001 - 1° programma delle opere strategiche. Asse viario Marche-Umbria (Deliberazione n. 13/2004).	Law n.443/2001- First programme on strategic works. Road axis Marche-Umbria (Deliberation 13/2004)
IT122	Legge 150 del 7 febbraio 1992 modificata con legge 59 del 13 febbraio 1993 Disciplina dei reati relativi all'applicazione in Italia della convenzione sul commercio internazionale delle specie animali e vegetali in via di estinzione	Law 150 of the 7th February 1992 modified by the Law 59 of the 13th february 1993 - Regulations of crimes related to the application of the International Trade Convention on endangered animal and plant species
IT123	Legge Quadro Sulle Aree Protette (Legge 6 dicembre 1991, n. 394)	Framework Law n.394 (1991) for protected areas
IT124R	Piemonte-Legge regionale 28 ottobre 1986, n. 43 - Norme sulla detenzione, l'allevamento ed il commercio di animali esotici	Piemonte-Regional Law of the 28th October 1986, n. 43 -Provisions on detention, breeding and trade of exotic animals
IT125R	Legge Regionale (Lombardia) 31 marzo 2008, n.10- Disposizioni per la tutela e la conservazione della piccola fauna, della flora e della vegetazione spontanea	Regional Law (Lombardia) of the 31st March 2008, n.10- Provisions for the conservation of the small fauna, flora and wild vegetation.
IT126R	Legge regionale (Toscana) 6 aprile 2000 n. 56, Norme per la conservazione e la tutela degli habitat naturali e seminaturali, della flora e della fauna selvatiche - modifiche alla legge regionale 23 gennaio 1998, n.7 - modifiche alla legge regionale 11 aprile 1995, n.49	Regional Law (Toscana) of the 6th April 2000 n. 56, provisions for the protection and conservation of natural and semi-natural habitats, of wild flora and fauna - revisions to the regional law of the 23rd January 1998, n. 7 -revisions to the regional law of the 11th april 1995, n. 49

Code	Original name	Translated name
IT127R	Legge Forestale della Toscana	Forestry law for Tuscany
IT150	Decreto Legislativo 18 maggio 2001, n. 227 Orientamento e modernizzazione del settore forestale, a norma dell'articolo 7 della legge 5 marzo 2001, n. 57	Decree Law of the 18th of May 2001, n.227 - Trends and innovation in forestry according to the Law of 5th March 2001, n. 57, art. 7
IT151	Decreto Legislativo 10 novembre 2003, n. 386 - Attuazione della direttiva 1999/105/CE relativa alla commercializzazione dei materiali forestali di moltiplicazione	Law Decree of the 10th November 2003 n.386 - implementation of the Directive 1999/105/CE on the commercialisation of forest material
IT160	Decreto del Presidente della Repubblica del 8 settembre 1997 n. 357 (1) -Testo aggiornato e coordinato al Decreto del Presidente della Repubblica 12 marzo 2003 n. 120 (2)	Decree of the President of the Republic of the 8th September 1997 n. 357 (1)- revised by the Decree of the President of the Republic of the 12th March 2003 n.120(2)
IT161	Decreto 16 giugno 2005 - Ministero dell'Ambiente e della Tutela del Territorio, Linee guida di programmazione forestale	Decree of the 16th June 2005 from the Ministry of the Environment, Guidelines on forestry planning
IT162	Decreto Ministero Ambiente e Tutela del Territorio del 8 gennaio 2002 - Istituzione del registro di detenzione delle specie animali e vegetali.	Decree of the Ministry of the Environment, 8th of January 2002 -Institution of the register for the possession of animal and plant species
IT180	Deliberazione nazionale n. 57 del 02 Agosto 2002- Strategia d'azione ambientale per lo sviluppo sostenibile in Italia	National Deliberation n.57 of the 2nd August 2002- Environmental Action Strategy for the Sustainable Development in Italy
IT181	Sentenza della Corte Costituzionale N. 30, 2009	Sentence of the Constitutional Court n.30 - 2009

Code	Original name	Translated name
IT182R	Delibera regionale (Veneto) n. 438 Ulteriori criteri per le immissioni di specie ittiche nelle acque interne regionali.	Regional deliberation (Veneto) n.438 - Additional criteria for the immission of fish species in regional water ecosystems
IT300	Strategia Nazionale per la Biodiversità	National Biodiversity strategy – including Invasive Species
Latvia		
LV110	Latvijas Administratīvo pārkāpumu kodekss	Administrative Violations Code, 25 October 2001
LV120	Sugu un biotopu aizsardzības likums	Law on the Conservation of Species and Biotopes, 16 March 2000
LV121	Augu aizsardzības likums	Plant Protection Law, 17 December 1998
LV122	Dzīvnieku aizsardzības likums	Animal Protection Law
LV150	Invazīvo augu sugu izplatības ierobežošanas noteikumi	Regulations Regarding Restriction of the Distribution of Invasive Alien Plant Species, Cabinet Regulation No. 467, 30 June 2008
LV151		Regulations Regarding Restricting the Spread of the Invasive Plant Species Heracleum sosnowskyi Manden, Cabinet Regulation No. 559, 14 July 2008
LV152	Īpaši aizsargājamo dabas teritoriju vispārējie aizsardzības un izmantošanas noteikumi	General Regulations on Protection and Use of Specially Protected Nature Territories, Cabinet Regulation No. 264 of 16 Mar 2010
LV153	Invazīvo augu sugu saraksts	List of invasive plant species, Cabinet Regulation No. 468, 30 June 2008
LV154	Ģenētiski modificēto organismu riska novērtēšanas metodoloģija	Methodology for the Risk Assessment of Genetically Modified Organisms, Cabinet Regulation No. 1078, 22 December 2008
LV155	Kārtība, kādā izsniedz atļaujas nemedījamo sugu indivīdu iegūšanai, ievieš Latvijas dabai neraksturīgas savvaļas sugas	Procedure for issuing permits for individuals of non-game wild animals, introduction of wild animals not characteristic to the nature of Latvia as well as reintroduction of species

Code	Original name	Translated name
	(introdukcija) un atjauno sugu populāciju dabā (reintrodukcija)	populations in nature, Cabinet Regulation No.1165, 21 Dec 2010
LV156	Kārtība, kādā tiek piešķirts valsts un Eiropas Savienības atbalsts lauksaimniecībai tiešā atbalsta shēmu ietvaros	Procedures by which State and European Union Support is Granted to Agriculture in the Framework of Direct Support Schemes, Cabinet Regulation No. 173, 1 March 2011, Previously Cabinet Regulation No. 269
LV157	Kārtība, kādā tiek nodrošināta starptautiskā tirdzniecība ar apdraudētajiem savvaļas dzīvnieku un augu sugu īpatņiem	Procedures for ensuring international trade in endangered species of wild animals and plants, Cabinet Regulation No. 133, 6 April 1999
LV160	Latvāņu izplatības ierobežošanas programma 2006. -2012. Gadam	Control programme for giant hogweed Heracleum sosnowskyi 2006 – 2012, approved by the Order No. 426 by the Cabinet of Ministers
LV300	Bioloģiskās daudzveidības nacionālā programma	National Programme on Biological Diversity (non-binding document)
Lithuania		
LT120	Zuvininkystės Įstatymas	Law on fisheries, 27 June 2000, No VIII-1756
LT121	Laukinės Augalµos Įstatymas	Law on natural vegetation, 15 June 1999, No. VIII-1226
LT122	Laukinės gyvūnijos Įstatymas	Law on wildlife
LT123	Saugomµ gyvūnµ, augalµ, grybµ, rūsiµ ir bendrijµ Įstatymas	Protected animals, plants and fungi species and communities, 6 November 1997, No. VIII-499
LT160 A	Introdukcijos, reintrodukcijos ir perkėlimo tvarka	The introduction, reintroduction and enforcement regime, 08.22.2002, No. 81-3505, no 352
LT160B	Invazinių rūšių organizmų kontrolės ir naikinimo tvarka	Invasive species control and eradication procedures, 08.22.2002, No. 81-3505, no 352
LT160C	INVAZINIŲ RŪŠIŲ ORGANIZMŲ KONTROLĖS TARYBOS NUOSTATAI	Invasive Species Control Board rules, 08.22.2002, No. 81-3505, no 352

Code	Original name	Translated name
LT160 D	INTRODUKCIJOS, REINTRODUKCIJOS IR PERKĖLIMO PROGRAMA	Introduction, reintroduction and transfer program, 08.22.2002, No. 81-3505, no 352
LT161	DĖL ŽUVIVAISOS VALSTYBINIUOSE ŽUVININKYSTĖS VANDENS TELKINIUOSE TAISYKLIŲ BEI MINIMALIŲ ŽUVŲ IR VĖŽIŲ ĮVEISIMO NORMŲ SĄRAŠO PATVIRTINIMO	Order on fish release
LT162	DĖL LAUKINIŲ GYVŪNŲ NAUDOJIMO MOKSLO, KULTŪROS, ŠVIETIMO, AUKLĖJIMO IR ESTETIKOS TIKSLAMS TAISYKLIŲ PATVIRTINIMO	The use of wild animals in science, culture and education, 03.28.2009, No. 34-1322
LT163	DĖL PREKYBOS LAUKINIAIS GYVŪNAIS TAISYKLIŲ PATVIRTINIMO	Wildlife trade rules, 2004, No. 85-3097
LT164	INVAZINIŲ LIETUVOJE ORGANIZMŲ RŪŠIŲ SĄRAŠAS	Order in invasive species list in Lithuania and approval of certain changes, 9 November 2009, No. D1-663
Luxembourg		
LU120	Loi du 19 janvier 2004 concernant la protection de la nature et des ressources naturelles; modifiant la loi modifiée du 12 juin 1937 concernant l'aménagement des villes et autres agglomérations importantes; complétant la loi modifiée du 31 mai 1999 portant institution d'un fonds pour la protection de l'environnement	Law for protection of nature and natural resources
LU121	Loi du 25 mai 2011 relative à la chasse	Law on hunting

Code	Original name	Translated name
LU150	Règlement grand-ducal du 9 janvier 2009 concernant la protection intégrale et partielle de certaines espèces animales de la faune sauvage Règlement grand-ducal du 8 janvier 2010 concernant la protection intégrale et partielle de certaines espèces de la flore sauvage (pas de références explicites aux espèces exotiques envahissantes)	Regulation on integral and partial protection of certain animal species of wild fauna (a parallel law applies for plants, but does not explicitely refers to IAS)
LU151	Règlement grand-ducal du 18 mars 2008 abrogeant et remplaçant le règlement grand-ducal du 22 octobre 1990 concernant les aides pour l'amélioration de l'environnement naturel	Regulation on subsidies for improving the natural environment
LU152	Règlement grand-ducal du 30 novembre 2005 portant exécution de certaines dispositions de la loi du 30 novembre 2005 concernant la production et la commercialisation des matériels forestiers de reproduction	Regulation for production and sale of forest reproductive material
LU153	Règlement grand-ducal du 22 mars 2002 instituant un ensemble de régimes d'aides pour la sauvegarde de la diversité biologique	Regulation installing a number of subsidies for safeguarding biological diversity
LU154	Règlement grand-ducal du 27 mai 1994 portant réglementation de la pêche à l'aide de l'électricité dans les	Regulation on fisheries with electricity

Code	Original name	Translated name
	deux catégories d'eaux intérieures	
LU300	Plan d'action national pour la protection de la nature (2007-2011)	Action plan for nature protection
LU301	Ein nachhaltiges Luxemburg für mehr Lebensqualität - PNDD Luxembourg (26. November 2010)	Sustainable development plan
LU500	Site internet du MNHNL, neophytes	Website from the National Museum for Natural History, neophytes
Malta		
MT150	The Flora, Fauna and Natural Habitats Protection Regulations 2006 (LN 311 of 2006)	
MT151	Trees and Woodland Protection Regulations 2001 (LN 12 of 2001)	
MT152	Trade in Species of Fauna and Flora Regulations 2004 (LN 236 of 2004)	
MT153	Importation Control Regulations 2004 (LN 242 of 2004)	
MT154	Plant Quarantine (Harmful Organisms) Regulations 2004 (LN 97 of 2004)*	
Netherlands		
NL120	Flora en Faunawet	Flora and Fauna Act
NL121	Natuurbeschermingswet	Nature Conservation Act
NL122	Visserijwet	Fishery Act
NL123	Plantenziektenwet	Plant Diseases Act
NL124	Warenwet	Commodities Act
NL125	Wet Milieubeheer	Environmental Management Act

Code	Original name	Translated name
NL126	Gezondheids- en Welzijnswet voor Dieren	Animal Health and Welfare Act
NL127	Tijdelijke warenwetregeling productvoorschriften Lucky Bamboo	Temporary Commodities Act Regulating Product requirements for Lucky Bamboo
NL150	Regeling Beheer en Schadebestrijding Dieren	Animal Management and Damage Control Regulation
NL151	Uitvoeringsregeling Visserij	Implementation Regulation Fisheries
NL152	Regeling invoer, uitvoer en verkeer planten	Regulation for export, import and transport of plants
NL153	Regeling vrijstelling beschermde dier- en plantsoorten Flora en Faunawet	Regulation for exemption of protected animal and plantspecies under the Flora and Fauna Act
NL154	Regeling aanwijzing Douanekantoren beschermde dier en plantensoorten	Regulation designating Customs offices handling protected animal and plant species
NL180	Besluit Glastuinbouw	Decision on Greenhouses
NL181	Besluit aanwijzing dier- en plantsoorten Flora en Faunawet	Decision concerning appointment of animal and plant species under the Flora and Fauna Act
NL182	Besluit bestrijding schadelijke organismen	Decision concerning combatting harmful organisms
NL300	Policy plan for Biodiversity 2008-2011	Beleidsprogramma biodiversiteit 2008-2011
NL301 *	Policy plan on Invasive species	Beleidsnota Invasieve Exoten 2007
NL500	Waterplant Convenant	Aquatic Plant code of conduct
Poland		
PL102	KONWENCJA o różnorodności biologicznej Dz.U. 2002 Nr 184, poz. 1532	Convention on Biological Diversity of 5 June 1992 transposition in Polish law in 2002
PL120	USTAWA z dnia 27 kwietnia 2001 r. Prawo ochrony środowiska	Environmental Law of 27 April 2001

Code	Original name	Translated name
PL121	USTAWA z dnia 16 kwietnia 2004 r. o ochronie przyrody	Act on Nature Conservation of 16 April 2004
PL122	USTAWA z dnia 28 września 1991 r. o lasach	Forestry Act of 1991
PL123	USTAWA z dnia 21 sierpnia 1997 r. o ochronie zwierząt (znowelizowana w maju 2010)	Act on Animal Protection of 21 August 1997 (amended May 2010)
PL124	USTAWA z dnia 13 października 1995 r. Prawo łowieckie	Act on hunting of 13 October 1995
PL125	USTAWA z dnia 19 lutego 2004 r. o rybołówstwie	Act on fishery of 19 February 2004
PL126	USTAWA z dnia 18 kwietnia 1985 r. o rybactwie śródlądowym	Act on inland fishing of 18 April 1985 (amended 10 December 2010)
PL127	USTAWA z dnia 18 grudnia 2003 r. o ochronie roślin	Act on plant protection of 18 December 2003
PL150	ROZPORZĄDZENIE MINISTRA ROLNICTWA I ROZWOJU WSI z dnia 12 listopada 2001 r. w sprawie połowu ryb oraz warunków chowu, hodowli i połowu innych organizmów Śyjących w wodzie.	Ministry of Agriculture Regulation of 12 November 2001 on fishing, breeding condition and fishing of other organisms living in water
PL250	Projekt ROZPORZĄDZENIA MINISTRA ŚRODOWISKA z dnia 2009 r. w sprawie listy roślin, zwierząt i grzybów gatunków obcych, które w przypadku uwolnienia do środowiska przyrodniczego mogą zagrozić gatunkom	Project of regulation on the list of plant, animal and fungi alien species which after introduction to the environment can threaten indigenous species or natural habitats (Ministry of the Environment 2009)

Code	Original name	Translated name
	rodzimym lub siedliskom przyrodniczym	
PL300	Krajowa strategia ochrony i zrównoważonego użytkowania różnorodności biologicznej oraz Program działań na lata 2007-2013	National Strategy for Conservation and Sustainable Use of Biological Diversity and Action Plan 2007-2013
PL301	POLITYKA EKOLOGICZNA PAŃSTWA NA LATA 2007-2010 Z UWZGLĘDNIENIEM PERSPEKTYWY NA LATA 2011-2014 (grudzień 2006)	Country Environmental policy 2007-2010 considering 2011-2014 perspective (December 2006)
PL302	STRATEGIA OCHRONY OBSZARÓW WODNO-BŁOTNYCH W POLSCE WRAZ Z PLANEM DZIAŁAŃ (NA LATA 2006 - 2013)	Strategy and action plan 2006-2013 for conservation of wetlands
PL500	Gatunki Obce w Polsce - baza danych o gatunkach introdukowanych w Polsce (Instytut Ochrony Przyrody PAN w Krakowie, Ministerstwo Środowiska) od 1999	Alien Species in Poland - database on species introduced into Poland (Institute of Nature Conservation, Polish Academy of Sciences in Krakow for the Ministry of the Environment) started in 1999
Portugal		
PT100	Resolução do Conselho de Ministros n.º 152/2001 de 11 de Outubro Estratégia nacional de conservação da Natureza e da biodiversidade	Resolution 152/2001 National Strategy for the Conservation of Nature and Biodiversity
PT101	Resolução do Conselho de Minsitros No 114/2006 Estratégia Nacional para as Florestas	Resolution 114/2006 National Strategy for Forests
PT120	Lei No 7/2008 Lei da pesca nas águas interiores	Law No. 7/2008 Low of fisheries in inland waters
PT150	Resolução do Conselho de	Resolution 78/2009 Regulation for planning

Code	Original name	Translated name
	Ministros no 78/2009 REGULAMENTO DO PLANO DE ORDENAMENTO DO PARQUE NATURAL DA RIA FORMOSA	Ria Formosa Natural Park
PT151	Decreto-Lei No. 142/2008. Regime juridico da conservação da natureza e da biodiversidade	Decree-Law No 142/2008 Legal regime for nature conservation and biodiversity
PT152	Decreto-Lei No. 565/99 de 21 de Dezembro Espécies não indigenas da flora e da fauna	Decree-Law No. 565/99 Non-indigenous species of flora and fauna
PT160	Portaria No 232- A/2008 Aplicação das componentes agro-ambientais e silvo-ambientais do PRODER	Portaria No 232-1/2008 Application of the agro-environmental and forest environment components of PRODER (Programme for the Rural Development of Mainland Portugal)
Romania		
RO120	LEGE Nr. 49/2011 pentru aprobarea Ordonanței de urgență a Guvernului nr. 57/2007 privind regimul ariilor naturale protejate, conservarea habitatelor naturale, a florei şi faunei sălbatice	Law no. 49/2011 for the approval of Government Emergency Ordinance no. 57/2007 on the regime of natural protected areas, natural habitats, wild flora and fauna (Published in Monitorul Oficial no. 262 of 13 April 2011).
RO121	LEGE pentru ratificarea Protocolului privind conservarea si utilizarea durabilă a diversitătii biologice si a diversitătii peisajelor, adoptat si semnat la Bucuresti la 19 iunie 2008, la Conventia-cadru privind protectia si dezvoltarea durabilă a Carpatilor, adoptată la Kiev la 22 mai 2003	Law on Ratification of the Protocol on the conservation and sustainable use of biological diversity and landscape diversity, adopted and signed at Bucharest on 19 June 2008, at the Framework Convention on the protection and sustainable development of the Carpathians, adopted in Kiev on 22 May 2003 (Published in Monitorul Oficial no. 477 of July 12, 2010).
RO130	Ordonanța de urgență a Guvernului nr. 57/2007	Government Emergency Ordinance no. 57/2007 on the regime of natural protected areas, conservation of natural habitats, wild

Code	Original name	Translated name
		flora and fauna (Published in Monitorul Oficial no. 442 of 29 June 2007).
RO160	Ordin 979/2009 privind introducerea de specii alohtone, interventiile asupra speciilor invazive, precum si reintroducerea speciilor indigene prevazute în anexele nr. 4A si 4B la Ordonanta de urgenta a Guvernului nr. 57/2007 privind regimul ariilor naturale protejate, conservarea habitatelor naturale, a florei si faunei salbatice, pe teritoriul national	Ministerial Order no. 979/2009 on the introduction of alien species, interventions on invasive species, as well as reintroduction of native species specified in Annexes nr. 4A and 4B of the Government Emergency Ordinance no. 57/2007 on the regime of natural protected areas, conservation of natural habitats, wild flora and fauna on the national territory (Published in Monitorul Oficial no. 500 of July 20, 2009).
RO500	Third national report of the CBD 2005	Third national report of the CBD 2005
RO501	SMDRSI - Sistem de Monitorizare şi Detectare Rapidă a Speciilor Invazive	"Monitoring and Detection System for Invasive Species" project's webpage available at www.specii-invazive.ro, consulted on 16/04/2011
Slovakia		
SK100		FRAMEWORK CONVENTION on the Protection and Sustainable Development of the Carpathians
SK120	Zákon č. 364/2004 Z.z.o vodách	Water Act No. 364/2004 Coll.
SK121	Zákon 193/2005 Z.z. o rastlinolekárskej starostlivosti	Phytosanitary care Act No. 193/2005 Coll.
SK122	Predpis č. 435/2010 Z.z.; o poskytovaní dotácií v pôsobnosti Ministerstva obrany Slovenskej republiky	Subsidies in the field of activity of the Ministry of Defense Act. No. 435/2010 Coll.

Code	Original name	Translated name
SK123	Zákon 524/2005 Z.z., ktorým sa mení a dopĺňa zákon č. 178/1998 Z. z. o podmienkach predaja výrobkov a poskytovania služieb na trhových miestach a o zmene a doplnení zákona	Sales conditions in town markets, Act No. 178/1998 Coll., update 524/2005 Coll.
SK124	Zákon 138/2010 Z.z., o lesnom reprodukčnom materiáli	Forest reproduction material, Act No. 138/2010 Coll.
SK125	Zákon 274/2009 Z.z. o poľovníctve a o zmene a doplnení niektorých zákonov	Hunting Act. No. 274/2009 Coll.
SK126	Zákon 326/2005 Z.z., o lesoch	Forests, Act No. 326/2005 Coll.
SK127	Zákon 139/2002 Z.z. o rybárstve	Fisheries Act. No. 139/2002 Coll.
SK128	Zákon č. 223/2001 Z.z. o odpadoch	Waste Act No. 223/2001 Coll.
SK129	Zákon č. 24/2006 Z.z.o posudzovaní vplyvov na životné prostredie a o zmene a doplnení niektorých zákonov	EIA Act, No. 24/2006 Coll.
SK130	Zákon č. 220/2004 Z.z. o ochrane a využívaní poľnohospodárskej pôdy	Agricultural land protection and use Act No. 220/2004 Z.z.
SK160	Zákon 543/2002 Z.z. o ochrane prírody a krajiny; vyhláška. 24/2003 Z.z.,	Protection of Nature and Landscape, Act. No. 543/2002 Coll., Decree No. 24/2003 Coll
SK161	Zákon 151/2002 Z.z. o používaní genetických	Use of genetic technologies and GMOs, Act No. 151/2002 Coll. Decree No. 399/2005

Code	Original name	Translated name
	technológií a GMO; vyhláška. 399/2005 Z.z.,	Coll.
SK162	Vyhláška 17/2008 Z.z,. ktorou sa vyhlasuje Chránené vtáčie územie Tribeč	Decree Bird Protected Area (Special Area of Conservation) Tribeč , Decree No. 17/2008 Coll.
SK163	Nariadenie vlády 264/2009 Z.z., o podporných opatreniach v pôdohospodárstve	Subsidies in Agriculture Cabinet Decree No. 264/2009 Coll.
SK164	Nariadenie vlády 488/2010Z.z. o podmienkach poskytovania podpory v poľnohospodárstve formou priamych platieb	Conditions of direct subsidies in Agriculture, Cabinet Decree 488/2010Coll.
SK165	Nariadenie vlády, ktorým sa dopĺňa nariadenie vlády 499/2008 Z.z. o podmienkach poskytovania podpory podľa programu rozvoja vidieka v znení nariadenia vlády 121/2009	Additions to Cabinet Decree No. 499/2008 Coll. About subventions according to the programme for rural development, Cabinet Decree 121/2009 Coll.
SK166	Vyhláška 83/1993 Z.z. o štátnych prírodných rezerváciách	State nature reserves Decree No. 83/1993 Coll.
SK300	Národná stratégia ochrany biodiverzity	National biodiversity strategy and action plan.
SK400	Národná stratégia pre invázne nepôvodné druhy	National Invasive Species Strategy – Draft
SK500		The Fourth National Report on the implementation of the Convention on biological diversity in the Slovak Republic
Slovenia		

Code	Original name	Translated name
SI120	Zakon o ohranjanju narave, uradno prečiščeno besedilo	Nature Conservation Act
SI121	Zakon o zdravstvenem varstvu rastlin, uradno prečiščeno besedilo	Plant Health Act - officially consolidated text (including Act Amending the Plant Health Act)
SI122	Zakon o sladkovodnem ribištvu	Freshwater Fishery Act
SI150	Uredba o ribjih vrstah, ki so predmet ribolova v celinskih vodah	Regulation on fishing species caught in inland waters
SI160	Uredba o ravnanju in načinih varstva pri trgovini z živalskimi in rastlinskimi vrstami	Decree on the course of conduct and protection measures in the trade in animal and plant species
SI161	Uredba o posebnih varstvenih območjih (območjih Natura 2000)	Decree on special protection areas (Natura 2000 areas)
SI162	Uredba o Krajinskem parku Ljubljansko barje	Decree on the Ljubljansko barje Landscape Park
SI163	Odredba o ukrepih za zatiranje škodljivih rastlin iz rodu Ambrosia	Decree on measures to suppress harmful plants of genus Ambrosia
SI164	Uredba o določitvi divjadi in lovnih dob	Decree specifying the wild game and hunting periods
SI180	Pravilnik o izvedbi presoje tveganja za naravo in o pridobitvi pooblastila	Rules on the carrying-out of the assessment of risk to nature and on the obtaining of authorisation
SI181	Pravilnik o prosto živečih živalskih vrstah, za katere ni treba pridobiti dovoljenja za gojitev	Rules on wild animal species not requiring a permit for captive breeding
SI182	Pravilnik o ukrepih in postopkih za preprečevanje vnosa in širjenja škodljivih organizmov rastlin, rastlinskih proizvodov in nadzorovanih predmetov	Rules on measures and methods with regard to introduction and spread of harmful organisms to plants, plant products and other regulated articles

Code	Original name	Translated name
SI182a	Pravilnik o spremembah in dopolnitvah Pravilnika o ukrepih in postopkih za preprečevanje vnosa in širjenja škodljivih organizmov rastlin, rastlinskih proizvodov in nadzorovanih predmetov	Rules on measures and methods with regard to introduction and spread of harmful organisms to plants, plant products and other regulated articles (a)
SI182b	Pravilnik o spremembah in dopolnitvah Pravilnika o ukrepih in postopkih za preprečevanje vnosa in širjenja škodljivih organizmov rastlin, rastlinskih proizvodov in nadzorovanih predmetov	Rules amending rules on protective measures with regard to the introduction and spread of harmful organisms in plants, plant products and other regulated objects (b)
SI182c	Pravilnik o spremembah in dopolnitvah Pravilnika o ukrepih in postopkih za preprečevanje vnosa in širjenja škodljivih organizmov rastlin, rastlinskih proizvodov in nadzorovanih predmetov	Rules amending rules on protective measures with regard to the introduction and spread of harmful organisms in plants, plant products and other regulated objects (c)
SI182d	Pravilnik o spremembi Pravilnika o ukrepih in postopkih za preprečevanje vnosa in širjenja škodljivih organizmov rastlin, rastlinskih proizvodov in nadzorovanih predmetov	Rules amending rules on protective measures with regard to the introduction and spread of harmful organisms in plants, plant products and other regulated objects (d)
SI183	Pravilnik o ribolovnem režimu v ribolovnih vodah	Rules on fishing regime
SI184	Pravilnik o spremembah in dopolnitvah Pravilnika o ribolovnem režimu v ribolovnih vodah	Rules amending Rules on fishing regime
SI185	Pravilnik o komercialnih ribnikih	Rules on commercial ponds
SI186	Pravilnik o varstvu gozdov	Rules on the protection of forests
SI187	Pravilnik o spremembah in	Rules on changes and amendments to rules

Code	Original name	Translated name
	dopolnitvah Pravilnika	on forest protection
Spain		
ES120	Ley 42/2007 de Patrimonio Natural y Biodiversidad	Natural Heritage and Biodiversity Act
ES121	Ley 26/2007 de Responsabilidad medioambiental	Environmental responsibility Act 2007
ES122	Ley 5/2007 de la Red de Parques Naturales	Natural Parks Network Act 2007
ES123	LEY 31/2003, de conservación de la fauna silvestre en los parques zoologicos	Zoologic Parks Act
ES124 R	LEY 6/2006, de 12 de abril, balear de caza y pesca fluvial (Comunidad Autonoma de Baleares)	Balearic hunting and river fishing Act
ES125 R	LEY 11/2010, de 16 de Noviembre, de pesca y acuicultura de Extremadura	Extremaduran fishing, fish farms and aquaculture Act
ES126 R	Ley 9/2008, de 9 de diciembre, de modificación de la Ley 6/1992, de 18 de diciembre, de protección de los ecosistemas acuáticos y de regulación de la pesca en Castilla y León	Aquatic ecosystems protection and fishing Act from Castilla y Leon
ES127 R	Ley 4/2006, de 19 de mayo de Conservacion de la Naturaleza de Cantabria	Cantabrian Nature Conservation Act
ES128 R	Ley 22/2009, de 23 de diciembre, de ordenación sostenible de la pesca en aguas continentales de Cataluña	Catalonian sustainable fishing in continental waters Act
ES129 R	LEY 3/2004, de 23 de noviembre, de montes y ordenación forestal de	Asturian Forestry Act

Code	Original name	Translated name
	Asturias	
ES130 R	Ley 13/2004, de 27 de diciembre, de caza de la Comunidad Valenciana.	Valencian hunting Act
ES131 R	LEY 5/2006, de 30 de junio, para la protección, la conservación y la mejora de los ríos gallegos.	Galician River protection and conservation Act
ES160	RD 2090/2008 de aprobacion de la Ley 26/2007 de Responsabilidad medioambiental	Decree for the Environmental Responsibility Act approval 2008
ES161	Real decreto 1739/1997, de 20 de noviembre, sobre medidas de aplicacion del Convenio sobre Comercio Internacional de Especies Amnazadas de Fauna y Flora Silvestres (CITES)	Decree implementing CITES 1739/1997
ES162	REAL DECRETO 1431/1992 Plan de ordenacion de los recursos naturales del parque nacional maritimo-terrestre de Cabrera	Cabrera National Park
ES163	ORDEN MAM/2484/2002, ayudas a la investigación en materias relacionadas con la Red de Parques Nacionales (y otros especificos)	Funds for research in National Parks (plus site-specific laws)
ES180	Resolución de 2 de febrero de 2011, de la Dirección General de la Agencia Estatal de Administración Tributaria, por la que se aprueban las Directrices Generales del Plan General de Control Tributario de 2011	Resolution on tax control plan
ES300	Plantas invasoras de Galicia	Invasive Plants of Galicia (regional strategy)

Code	Original name	Translated name
R*		
ES500*	Atlas of alien invasive plant species in Spain	Atlas de las plantas aloctonas invasoras de España
ES501*	Especies Exóticas Invasoras: Diagnóstico y bases para la prevención y el manejo	IAS: Diagnosis and basis for prevention and management (Manual from the Environmental Ministry)
Sweden		
SE110	Miljöbalken (1998:808) + ändringar (2003:232)	Environmental Code SFS 1998:808
SE120	Fiskelag (1993:787) + komplettering (1994:327) + ändringar (2003:251)	Fisheries Law Number of act SFS 1993:787
SE121	Jaktlagen SFS 1987:259	Hunting Law SFS 1987:259
SE122	Skogsvårdslag (1979:429)	Forestry Law 1979:429
SE123	Växtskyddslagen 1972:318	Law on plant protection SFS 1972:318*
SE124	Lag med bemyndigande att meddela föreskrifter om in- och utförsel av varor	Law (1975:85) authorizing the issuing of regulations on the import or export of goods
SE125	Lag om åtgärder mot förorening från fartyg	Law (1980:424) on Prevention of Pollution from Ships
SE130	Artskyddsförordning (2007:845) (previously 1998:179)	Species Protection Ordinance Number of act SFS 1998:179
SE131	Förordning om fisket, vattenbruket och fiskerinäringen SFS 1994:1716	Ordinance on fishing, aquaculture and the fishing industry SFS 1994:1716
SE132	Förordning om införsel av levande djur m.m. (1994:1830) + ändringar (2000:1275)	Ordinance on import of living animals SFS 1994:1830
SE133	Förordning om miljöfarlig verksamhet och hälsoskydd (1998:899) + ändringar (2003:1052)	Ordinance on environmentally dangerous activities and health protection SFS 1998:899
SE134	Jaktförordning SFS 1987:905	Ordinance on hunting SFS 1987:905

Code	Original name	Translated name
SE135	Förordning om utsättning av genetiskt modifierade organismer i miljön	Ordinance (2002:1086) on the release of GMO into the environment*
SE136	Förordning om innesluten användning av genetiskt modifierade organismer	Ordinance (2000:271) on the contained use of genetically modified organisms*
SE137	Förordning (2008:245) om kemiska produkter och biotekniska organismer	Ordinance (2008:245) on chemical products and biotechnical organisms*
SE138	Förordning om bekämpningsmedel	Ordinance (1998:947) on pesticides*
SE139	Skogsvårdsförordning (1993:1096)	Ordinance on forest care (1993:1096)*
SE140	Förordning om växtskydd (2006:817)	Ordinance on plant protection 2006:817*
SE141	Förordning (1998:940) om avgifter för prövning och tillsyn enligt miljöbalken	Ordinance on fees for examination and monitoring according to the Environmental Code (1998:940)
SE150	Föreskrifter om odling, utplantering och flyttning av fisk (FIFS 2001:3) + ändringar (FIFS 2003:34)	The Swedish Board of Fisheries regulations on the culture, stocking and moving of fish FIFS 2001:3
SE151	Kemikalieinspektionens föreskrifter (KIFS 2008:2) om kemiska produkter och biotekniska organismer; Senast ändrad genom KIFS 2010:6	The Swedish Chemical Inspections regulations on chemical products and biotechnical organisms*
SE152	Skogsstyrelsens föreskrifter och allmänna råd till skogsvårdslagen (1979:429) SKSFS 1993:2	The Swedish Board of Forestry's regulations and advice pertaining to the Forest Care Law
SE153	SKSFS 2002:2 Bilaga 1 FÖRTECKNING ÖVER TRÄDARTER OCH ARTIFICIELLA HYBRIDER	The Swedish Board of Forestry's regulations, list of wood species and artificial hybrids SKSFS 2002:2

Code	Original name	Translated name
SE154	Statens jordbruksverks föreskrifter (SJVFS 1995:94) om skyddsåtgärder mot spridning av växtskadegörare	Regulations on plant protection and measures against the spread of plant pests. SFS 1995:94*
SE155	Föreskrifter om ändring i Statens jordbruksverks föreskrifter (SJVFS 1995:125) om införsel av fisk, kräftdjur och blötdjur och produkter därav	Provisions amending the Agriculture Boards regulations (SJVFS 1995:125) on the importation of fish, crustaceans and molluscs and products thereof*
SE156	Föreskrifter om artskydd, NFS 2009:10	Environmental Protection Agency regulations for species protection*
SE157	Naturvardsverkets föreskrifter om artskydd (NFS 2009:10)	The Swedish Environmental Protection Agency regulations for species protection (NFS 2009:10)*
UK		
UK120	Endangered Species Import and Export Act 1976	
UK121	Animals Scientific Procedures Act 1986	
UK122	Food and Environment Protection Act 1985	
UK150	Control of Trade in Endangered Species Enforcement Regulations 1997	
GB120	Animal Health Act 1981 (England, Wales, Scotland)	
GB121	Bees Act 1980	
GB122	Wildlife and Countryside Act 1981	
GB123 R	Countryside and Rights of Way Act 2000 (strengthens enforcement of the Wildlife and Countryside Act 1981 for E+W)	

Code	Original name	Translated name
GB124	Dangerous Wild Animals Act 1976	
GB125	Deer Act 1991 (This Act is not specifically concerned with non-native species but regulates when non-native species (sika deer and fallow deer) can be killed). Similar provisions are included in the Deer (Scotland) Act 1996.	
GB126	Destructive Imported Animals Act 1932	
GB127	Diseases of Fish Act 1937	
GB128	Environmental Protection Act 1990	
GB129	Forestry Act 1967	
GB130 R	Import of Live Fish (England and Wales) Act 1980	
GB131 R	Natural Environment and Rural Communities Act 2006 (amends GB122 for E+W)	
GB132 R	Nature and Conservation (Scotland) Act 2004	
GB133	Pet Animals Act 1951	
GB134	Plant Health Act 1967	
GB135	Salmon Act 1986	
GB136 R	Salmon and Freshwater Fisheries Act 1975	
GB137	Zoos Licensing Act	
GB138	Town and Country Planning Act 1990 and Town and Country Planning (Scotland) Act 1997	
GB139	Local Government Act 2000	

Code	Original name	Translated name
R	(E+W)	
GB150	Fish Health Regulations 1997	
GB151	Conservation (Natural Habitats) (Amendment) Regulations 2007 (E+W)	
GB300 *	Great Britain Invasive Non-native Species Framework Strategy 2008	
Northern Ireland		
NI120	Diseases of Fish Act (NI) 1967	
NI121	Fisheries (NI) Act 1966	
NI122	Foyle Fisheries Act (NI) 1952	
NI123	Destructive Imported Animals Act (NI) 1933	
NI124	Forestry Act (NI) 2010	
NI150	Animals and Animal Products (Import and Export) Regulations (NI) 2006	
NI151	Zoonoses (Monitoring) Regulations (NI) 2008	
NI152	Fish Health Regulations (as amended) (NI) 1998	
NI153	Diseases of Fish (Control) Regulations (NI) 1996	
NI154	Plant Protection Products Regulations (Northern Ireland) 2005	
NI155	Forest Reproductive Material Regulations (Northern Ireland) 2002	
NI156	Waste Management Licensing Regulations (NI) 2003	
NI156b	Controlled Waste (Duty of Care) Regulations (Northern Ireland) 2002	

Code	Original name	Translated name
NI157	Zoo Licensing Regulations (NI) 2003	
NI158	Aquatic Animal Health Regulations (Northern Ireland) 2009	
NI159	Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004	
NI160	Wildlife (Northern Ireland) Order 1985	
NI161	Environment (Northern Ireland) Order 2002	
NI162	Foyle and Carlingford Fisheries (NI) Order 2007 No. 915	
NI180	Contingency Plan for Serious Pest/Plant Health Incidents	
NI400*	An Invasive Alien Species Strategy for Northern Ireland (consultation on draft strategy published on 24th March 2011).	