



TECHNICAL SUPPORT TO EU STRATEGY ON INVASIVE ALIEN SPECIES (IAS)

SERVICE CONTRACT NO 070307/2007/483544/MAR/B2

Policy options to minimise the negative impacts of IAS on biodiversity in Europe and the EU

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Annex 1 UPDATED INFORMATION ON INTERNATIONAL AND REGIONAL POLICY PROCESSES SINCE 2006

Part I: Binding international instruments

Binding Instrument	Relevant Provisions	COP Decision(s) since 2006	Ongoing or proposed work programme(s)
<p>1. Convention on Biological Diversity (Rio de Janeiro, 1992)</p> <p>http://www.cbd.int</p>	<p>Article 8 In-situ Conservation: Each Contracting Party shall, as far as possible and as appropriate: (g) Establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health; (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.</p> <p>Also relevant: Article 14. Impact Assessment and Minimizing Adverse Impacts</p>	<p>Decision IX/4 (COP9, Bonn 19-31 May 2008) on 'In-depth review of ongoing work on alien species that threaten ecosystems, habitats and species' supports:</p> <ul style="list-style-type: none"> • wider use by Parties of available risk assessment guidance; expansion of IAS coverage, consistent with mandate, by IPPC, OIE and FAO Committee on Fisheries, and stronger liaison with WTO; • stronger regional/subregional support for national strategy development, action and capacity-building, including for islands; improved cross-sectoral coordination, synergy and awareness-raising; • stronger pathway management mechanisms for inland water, marine and coastal ecosystems, including ratification of Ballast Water Convention; voluntary prevention schemes to be developed with stakeholders; • support IAS information networks and ensure inter-operability and facilitated access to data; • further research on climate change, land use change and other IAS drivers. <p>As a CBD cross-cutting issue, IAS are, when appropriate, addressed by Decisions on other thematic programmes of work/cross-cutting issues. Recent decisions include:</p> <ul style="list-style-type: none"> • IX/2 (Agricultural biodiversity: biofuels and biodiversity): calls for development of sound policy frameworks for sustainable production and use of biofuels, making use of available CBD tools including the Guiding Principles on IAS (adopted under Decision VI/23 in 2002); • IX/5 (Forest Biodiversity) identifies IAS as a major human-induced threat to forest biodiversity; • IX/21 (Island biodiversity) includes IAS and climate change adaptation and mitigation as priorities for programme of work; • IX/22 (Global Taxonomy Initiative): Operational Objectives in Annex 1 provide for development for assessment and monitoring of indicator species for island biodiversity, prioritising projects on impacts of climate change and IAS by 2012. Planned Activity 16 lists extensive measures for IAS taxonomic information-gathering: <p><i>Output 5.16.1:</i> Provide IAS lists/information for all countries by 2010. <i>Output 5.16.2:</i> Provide relevant taxonomic information (ID tools including keys and DNA-barcodes) for customs and quarantine services on IAS at national and regional levels by 2012. <i>Output 5.16.3:</i> Identify species with high potential to become IAS and prepare customs/quarantine information by 2012. <i>Output 5.16.4:</i> Complete the online information system for actual and potential invasive species for each continent and assess threats by future potential invasive species by 2010. <i>Output 5.16.8:</i> Correlate and manage updated taxonomy for all known invasive species following the call in the Global Invasive Species Programme (GISP) Global Strategy by 2010. <i>Output 5.16.9:</i> Develop protocols (including precision and rapidity) for IAS identification, preferably building on relevant standards under the IPPC already in place and being developed, to be agreed by 2010. <i>Output 5.16.10:</i> Produce and disseminate working identification keys for known IAS associated with at least one key invasion pathways by 2010.</p>	<p>Decision IX/4 mandates continued liaison between international organisations/other stakeholders pre COP-10 to:</p> <ul style="list-style-type: none"> • meet identified capacity gaps, exchange best practices and develop practical tools; • develop international guidance for pathways (civil aviation, tourism, hull fouling, development aid) and continue gap-filling analysis, including options for guidance for non-plant pest animals; • support development and implementation of voluntary schemes, certification systems and codes of conducts for relevant industries and stakeholder groups, including specific guidelines for potentially invasive commercially important species (e.g., plants, pets, invertebrates, fish, terrarium/aquarium species); • continue collating information and consider (at SBSTTA) establishment of ad hoc technical expert group for guidance on pets, aquarium/terrarium species, live bait and food; • provide adequate and timely financial support to enable the Global Invasive Species Programme to fulfil its tasks. <p>The CBD Secretariat co-convened (with GISP, IUCN ISSG) an expert workshop on Preventing Biological Invasions: Best Practices in Pre-Import Risk Screening for Species of Live Animals in International Trade (Notre Dame, USA, 9-11 April 2008: see UNEP/CBD/COP/9/INF/32/Add.1).</p> <p>Decision IX/4 contains multiple requests for development of practical tools: the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) may consider establishing an ad hoc technical expert group to develop practical guidance on tackling risks associated with introductions of alien species as pets, aquarium and terrarium species and as live bait and live food</p> <p>Technical meeting on regional cooperation for IAS in islands to be hosted by New Zealand.</p> <p>Mandate for continued collaboration between the scientific bodies of the biodiversity-related conventions and the Liaison Group of Biodiversity-related Conventions to address options for enhanced cooperation on cross-cutting issues, such as climate change and IAS (Decision IX/27).</p>
<p>2. Cartagena Protocol on Biosafety to the CBD (Montreal, 2000)</p> <p>http://www.cbd.int/biosafety/</p>	<p>Objective is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.</p> <p>Articles 15 and 16. Risk Assessment Article 18: addresses the issue of handling, transport, packaging and identification of living modified</p>	<p>At MOP4 (Bonn, 12-16 May 2008):</p> <p>Decisions BS-IV/8-10 all address Handling, transport, packaging and identification of living modified organisms. BS-IV/9 supports use and development of internationally standardised approaches, including for sampling and detection, and information exchange via the Biosafety Clearing-House.</p> <p>Decision BS-IV/11: Risk assessment and risk management. Take account of findings of four regional and subregional capacity building workshops and the Norway-Canada Workshop on Risk Assessment for Emerging Applications of LMOs (UNEP/CBD/BS/COP-MOP/4/INF/13), extend the mandate of the (retitled) Ad Hoc Technical</p>	<p>Actions scheduled prior to MOP5:</p> <p>Online conference to identify relevant standards for LMO handling, transport, packaging and identification; identify gaps and options to fill them. Implementation of Art.18. 2(b-c) to be reviewed at MOP 6 following 2nd national reports.</p> <p>Ad Hoc Technical Expert Group on Risk Assessment and Risk Management to meet twice, supported by one real-time online conference per region, to develop road map and action plan pre MOP 5. Regional/subregional training courses in RA to be held.</p>

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	organisms (LMOs). Article 27. Liability and Redress for damage resulting from transboundary movements of LMOs.	Expert Group on Risk Assessment and Risk Management. Specific tasks include development of further guidance on specific aspects, including for LMOs that are fish, trees, pharmacrops and viruses ; review of existing guidance documents; and training on the practical use of risk assessment and risk management in relation to LMOs. Decision BS-IV/12: Liability and redress under the Biosafety Protocol. No consensus reached on this mechanism despite significant progress (draft text developed by the Technical Expert Group is annexed to decision BS-IV/12).	Ad Hoc Working Group of legal and technical experts on liability and redress (5th meeting held May 2008); Group of the Friends of the Co-Chairs to reconvene in 2009 and 2010 to reach agreement on binding instrument for response mechanism to redress LMO damage to conservation and sustainable use of biodiversity.
3. United Nations Convention on the Law of the Sea (Montego Bay, 1982) http://www.un.org/depts/los/index.htm	Article 196 States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from... the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes.	None found.	None found.
4. Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 1971) http://www.ramsar.org	No explicit provision but IAS are addressed as a cross-cutting issue under several Ramsar Resolutions and guidelines and Ramsar Parties are encouraged to apply CBD Guiding principles to wetland ecosystems.	Resolutions adopted at COP10 (Korea, 28 October-4 November 2008) provide: <ul style="list-style-type: none">• X.21 (Guidance on responding to the continued spread of highly pathogenic avian influenza H5N1): guidance in annex covers risk assessment;• X.24 (Climate change and wetlands): nothing specific on IAS but guidance for increasing wetland resilience to climate change covers watershed protection and restoration and maintenance of ecological character of wetlands;• X.25 (Wetlands and biofuels): calls for assessment of potential impacts, benefits and trade-offs of proposed biofuel crop production schemes affecting Ramsar and sites and other wetlands; notes that potential impacts include differences between genotypes of the same crop type; recommends avoidance of biofuel crops that risk direct or indirect damage to wetlands.	Continued cooperation between AEWA-CMS-Ramsar eg Guidance on responding to H5NI (see under CMS below). No specific work on IAS currently proposed for 2009-2011. Ramsar Scientific & Technical Review Panel (14th meeting, Jan 2008, http://www.ramsar.org/strp/strp14_report.pdf) noted IAS as significant drivers of change in wetlands (site-level as well as regional/global impacts) and potential impact of climate change on invasive species. 36th Steering Committee noted importance of future IAS work under Ramsar: IAS added to Panel's agenda for next cycle.
5. Convention on the Conservation of Migratory Species of Wild Animals (CMS) (Bonn, 1979) http://www.cms.int	Article III (4) (c) Range State Parties of a migratory species listed in Appendix 1 shall endeavour: to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species. Article V (5) (e) Where appropriate and feasible, each agreement (for Annex II) should provide for, but not be limited to protection of such habitats from disturbances, including strict control of the introduction of, or control of already introduced, exotic species detrimental to the migratory species.	Resolution 8.27 Migratory Species and Highly Pathogenic Avian Influenza. Resolution 9.8 Responding to the Challenge of Emerging and Re-emerging Diseases in Migratory Species, including Highly Pathogenic Avian Influenza H5N1(Dec.2008) supports: <ul style="list-style-type: none">- fully integrated approaches, at both national and international levels, to address HPAI and other animal-borne diseases by bringing ornithological, wildlife and wetland management expertise together with those traditionally responsible for public health and zoonoses, including veterinary, agricultural, virological, epidemiological, and medical expertise; and- coordinated, well-structured and long-term monitoring and surveillance programmes for migratory birds to assess current and new disease risks, making best use of, and building on existing schemes, including those developed since 2005;- and calls on the CMS Secretariat and the FAO Animal Health Service to co-convene a new Scientific Task Force on Wildlife Disease, which should work with the Ramsar Scientific and Technical Review Panel in its guidance on responding to wildlife diseases of importance to people, domestic animals and wildlife that are dependent on wetlands.	Scientific Task Force on Avian Influenza and Wild Birds convened in 2005 (liaison mechanism for 14 organisations, chaired by CMS and FAO); held International Workshop (Aviemoore, 26-28 June 2007) on Practical Lessons learned from HPAI outbreaks which developed guidance for response personnel, wildlife experts and protected area managers (http://www.aiweb.info/documents/Aviemoore%20conclusions.pdf). Review of IAS threats to migratory species (2007) pursuant to Scientific Council Strategy Implementation Plan, to be published in CMS Technical Series.
6. Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) (The Hague, 1995) http://www.unep-awea.org/	Article III(2)(g) Parties shall prohibit the deliberate introduction of alien waterbird species into the environment and take all appropriate measures to prevent the unintentional release of such species if this introduction or release would prejudice the conservation status of wild fauna and flora; when non-native waterbird species have already been introduced, the Parties shall take all appropriate measures to prevent these species from becoming a potential threat to indigenous species. Annex 3 Action Plan 2.5 Parties shall, if they consider it necessary, prohibit the introduction of non-native species of animals and plants which may be detrimental to the populations listed in Table 1. Parties shall, if they consider it necessary, require the taking of appropriate precautions to avoid the accidental escape of captive birds belonging to non-native species. Parties shall take measures to the extent feasible and appropriate,	Resolution 4.5 (Introduced Non-Native Waterbird Species In The Agreement Area) adopted at MOP 4 (Antananarivo, Madagascar, 15-19 September 2008) supports: <ul style="list-style-type: none">• strengthening precautionary measures in order to prevent introductions, escapes and deliberate release of non-native waterbird species and, as appropriate, enforcement and improvement of national legislation for this purpose;• inclusion of non-native and hybrid waterbirds in existing waterbird censuses; regular reporting;• promotion of research, assessment of feasibility of control schemes and definition of priorities for action;• better regulation of the introduction of non-native populations of native waterbird species (for example for hunting purposes) in order to avoid the introduction of inappropriate genetic material;• internationally coordinated control and eradication for non-native waterbird species;• involvement of hunters in monitoring and control;• better monitoring and regulation of aviaries, pens and zoos, including ringing of captive birds.• restriction or prohibition on keeping and trade in species posing particular risks to native biodiversity.	The AEWA Conservation Guideline on Avoidance of introduction of Non-native Species (Resolution 2.3) was re-examined in the light of the Review of the Status of Introduced Non-Native Waterbird Species in the AEWA Area: 2007 Update (Banks et al., 2008). All but 5 European States participated in the survey. The Review notes that most bird introductions have occurred in northern and western Europe, with fewer in other parts of the AEWA range. The vast majority of introduced waterbird populations derive from escapes from ornamental collections or deliberate introductions for ornamental reasons, therefore such introductions have occurred largely in affluent countries. The review's recommendations form the basis for Resolution 4.5.

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	including taking, to ensure that when non-native species or hybrids thereof have already been introduced into their territory, those species or their hybrids do not pose a potential hazard to the populations listed in Table I.		
7. Convention on the Law of the Non-navigational Uses of International Watercourses (New York, 1997) http://untreaty.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf	Article 22: Watercourse States shall take all measures necessary to prevent the introduction of species, alien or new, into an international watercourse, which may have effects detrimental to the ecosystem of the watercourse resulting in significant harm to other watercourse States.	Still not in force.	Not applicable.
8. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Washington, 1973) http://www.cites.org	Permits and certificates granted under the provisions of Article III, IV and V are required for the trade in specimens of species included in Appendix I, II and III. Represents alternate model for regulating invasive species not already covered by the IPPC or other agreements. Convention intended to prevent harm in exporting country; however, can only be applied when species is endangered in exporting country and considered an invasive in importing country. Regulates only intentional movements.	COP14 (The Hague, 3-15 June 2007) amended Resolution 13.10 on trade in alien invasive species to eliminate the mandate to the CITES Secretariat to cooperate on specific IAS issues with the CBD Secretariat. The amended Resolution recommends that the Parties: a) consider the problems of invasive species when developing national legislation and regulations that deal with the trade in live animals or plants; b) consult with the Management Authority of a proposed country of import, when possible and when applicable, when considering exports of potentially invasive species, to determine whether there are domestic measures regulating such imports; and c) consider the opportunities for synergy between CITES and the Convention on Biological Diversity (CBD) and explore appropriate cooperation and collaboration between the two Conventions on the issue of introductions of alien species that are potentially invasive.	There is not longer a mandate for active cooperation between CITES and CBD Secretariats as CITES' ability to address threats from IAS and the practical utility of further work is considered limited (see eg report of Plant Committee 16/Animals Committee 22, July 2006). The CITES Secretariat recognises that a number currently included in the CITES Appendixes have been identified as invasive or potentially invasive eg the long-tailed macaque (<i>Macaca fascicularis</i>), the small Indian mongoose (<i>Herpestes javanicus auropunctatus</i>) and the monk parakeet (<i>Myiopsitta monachus</i>) (presentation by J.Barzdo, European Conference on IAS, Madrid 15-16 January 2008).
9. United Nations Framework Convention on Climate Change (UNFCCC) (New-York, 1992) http://www.unfccc.de	No specific provisions.	Decision 19/C.P.9 on 'Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol' recognises that Parties evaluate risks associated with the use of potentially invasive alien species by afforestation and reforestation project activities. and that Parties included in Annex I evaluate, in accordance with their national laws, the use of temporary certified emission reductions and/or long-term certified emission reductions generated from afforestation and reforestation project activities that make use of potentially invasive alien species (Report of the COP on its Ninth Session, Milan, 1-12 December 2003 FCCC/CP/2003/6/Add.2)	IAS may be addressed through the joint liaison group composed of UNFCCC, CBD, UNCCD and the Collaborative Partnership on Forests. Currently, interlinkages between IAS and climate change are primarily addressed under CBD Decisions (see IX/4 above). See also under Ramsar Convention above (Resolutions X.24 and X.25 addressing climate change and biofuels).
10. United Nations Convention to Combat Desertification (UNCCD) www.unccd.int	No specific provisions.	No specific references found.	IAS may be addressed through the joint liaison group composed of UNFCCC, CBD, UNCCD and the Collaborative Partnership on Forests.
11. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (Washington, London and Moscow 1972) http://disarmament2.un.org/wmd/bwc/index.html	Article I prohibits parties from developing, producing, stockpiling, acquiring or retaining microbial or other biological agents which are not justified by exclusively peaceful purpose. Article II requires parties to destroy or divert to peaceful purpose all such agents within 9 months of entry into force of the Convention.	None found.	None found.
12. International Plant Protection Convention (IPPC) (Rome, 1951, Revised in 1997 by the FAO Conference) https://www.ippc.int/IPP/En/default.jsp	IPPC applies primarily to quarantine plant pests in international trade. Creates an international regime to prevent spread and introduction of pests of plants and plant products through the use of sanitary and phytosanitary measures. Parties have established national plant protection organisations with authority in relation to quarantine control, risk analysis and other measures required to prevent the establishment and spread of pests that, directly or indirectly, are pests of plants and plant products or that impact unmanaged systems.	The Third session of the Commission on Phytosanitary Measures (Rome, 7-11 April 2008) specifically considered Climate Change and IAS (keynote address). The CPM: • adopted <i>Procedure and criteria for identifying topics for inclusion in the IPPC standard setting work programme</i> : environmental criteria include 'utility in the management of non indigenous species which are pests of plants (such as some IAS)' and 'contribution to the protection of the environment, through the protection of wild flora, and their habitats and ecosystems, and of agricultural biodiversity; • adopted or amended 4 International Standards for Phytosanitary Measures (ISPMs) and approved an IPPC Standard Setting Work Programme for new standards, including: (high priority) <i>Minimizing pest movement by air containers and aircrafts</i> and <i>Minimizing pest movement by sea containers and conveyances</i> ; and (normal priority) <i>Guidelines for the movement of used machinery and equipment, Handling and disposal of garbage moved</i>	Continuing tripartite cooperation under 2004 Memorandum of cooperation between secretariats of IPPC, CBD and Cartagena Protocol on Biosafety. Close IPPC-CBD liaison during in-depth review prior to CBD COP9. Creation of International Phytosanitary Portal (IPP) through which national reporting conducted; includes Help Desk facility and Pest Risk Analysis training material applicable to IAS. Creation of Open-ended working group on Building National Phytosanitary Capacity. May 2008: IPPC Standards Committee Working Group approved seven draft International Phytosanitary Measures (ISPMs) for member consultation which are particularly relevant to the CBD's programme of work on IAS. These draft ISPMs were posted on CBD website for consultation

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		<p><i>internationally and International movement of grain.</i></p> <p>The CPM also approved modified recommendations of independent evaluation of IPPC to:</p> <ul style="list-style-type: none"> • keep issues of linkage/consistency with the environment under review; • promote responsibility among Parties to implement IPPC standards and objectives, including reference to phytosanitary environment matters; • all Standards to include a statement regarding biodiversity considerations; when new ISPMs are being specified, or existing ones revised; • consideration of environmental and biodiversity concerns should be included in the specification, where appropriate. <p>The CPM rejected a recommendation to establish a specific work programme to protect the environment and/or biodiversity. This is due partly to budgetary constraints. However, the role of IPPC is to be kept under review.</p>	<p>(20 June–30 September 2008).</p> <p>ISPMs in force include:</p> <ul style="list-style-type: none"> • Principles of Plant Quarantine as Related to International Trade • Guidelines for Pest Risk Analysis • Code of Conduct for the Import and Release of Exotic Biological Control Agents • Requirements for the Establishment of Pest Free Areas • Glossary of Phytosanitary Terms (amended 2008) • Guidelines for Surveillance • Export Certification System • Determination of Pest Status in an Area • Guidelines for Pest Eradication Programmes • Requirements For The Establishment Of Pest Free Places Of Production And Pest Free Production Sites • Pest Risk Analysis For Quarantine Pests • Guidelines For Phytosanitary Certificates • Guidelines For The Notification Of Non-Compliance And Emergency Action • The Use Of Integrated Measures In A Systems Approach For Pest Risk Management • Guidelines For Regulating Wood Packaging Material In International Trade • Regulated Non-Quarantine Pests: Concept And Application • Pest Reporting • Guidelines For The Use Of Irradiation As A Phytosanitary Measure • Guidelines On Lists Of Regulated Pests.
<p>13. Convention for the Establishment of the European and Mediterranean Plant Protection Organisation (EPPO) (Paris, 1951)</p> <p>http://www.eppo.org/</p>	<p>Under the International Plant Protection Convention (IPPC), EPPO is the regional plant protection organization (RPPO) for Europe. EPPO is an intergovernmental organization responsible for European cooperation in plant protection in the European and Mediterranean region.</p>	<p>EPPO Council recommendations include:</p> <p><i>2006: Guidelines for the management of invasive alien plants (IAPs) or potentially invasive alien plants which are intended for import or have been intentionally imported (EPPO Standard PM 3/67)</i></p> <ul style="list-style-type: none"> • provides guidance on internal management measures such as publicity, surveillance, restrictions and/or codes of conducts on import, sale, holding, transport, etc. <p><i>2007: Council Recommendation on Plants for renewable energy and IAPs (September 2007)</i></p> <ul style="list-style-type: none"> • as part of energy strategies, several EPPO countries recommend planting bioenergy crops, including plants included in the EPPO List of IAPs; • NPPOs should liaise with the Departments/Ministries concerned in their countries to make them aware of risks posed by IAPs and warn them against such practices. The planting of IAPs for energy production should not be recommended. If IAS are planted as bioenergy crops, a risk-based approach to avoid the spread into unintended habitats should be adopted. <p>Six invasive alien plants (from the EPPO IAP list of 34 plants) have been formally recommended for regulation due to their inclusion in the EPPO A2 list as Quarantine Pests locally present in the EPPO region. These are <i>Crassula helmsii</i>; <i>Hydrocotyle ranunculoides</i>; <i>Lysichiton americanus</i>, <i>Pueraria lobata</i>, <i>Solanum elaeagnifolium</i> and, since September 2008, <i>Eichhornia crassipes</i>). Countries endangered by these species should take measures to prevent further introduction/spread or manage unwanted populations (e.g. publicity, restriction on sale and planting, control).</p>	<p>Continued work of Ad hoc Panel on Invasive Alien Species:</p> <ul style="list-style-type: none"> • EPPO's advisory List of IAPs (plants posing important threat to plant health, environment and biodiversity in EPPO region) currently includes 34 species. • EPPO Alert List for IAPs lists 13 species still absent/of limited distribution in EPPO Region to support early warning; • joint EPPO/Council of Europe Workshop on How to manage Invasive Alien Plants: case studies of <i>Eichhornia crassipes</i> (Mérida, Spain, 2-4 June 2008): participant recommendations for regulation as a quarantine pest (EPPO A2 List) and preparation of an EPPO Standard on National Regulatory Control Measures adopted by EPPO Council, September 2008. • joint EPPO/Council of Europe Code of Conduct on Horticulture and Invasive Alien Plants (completed 2008: joint Workshop on the Code held in Oslo, 4-5 June 2009 (full proceedings available at www.eppo.org); • database on 369 species of aquatic plants includes identification of origin and status of species; • EPPO reporting service has addressed certain IAS pathways (eg bird seed, see Reporting Service, June 2007); • PRA training course to be held in November 2008; • EPPO climate change prediction tool enables classification of areas by risk. <p>A simplified version of the EPPO PRA Decision-Support Scheme is currently being revised and should be adopted in 2009.</p>
<p>14. Agreement concerning Co-operation in the Quarantine of Plants and their Protection against Pests and Diseases (Sofia, 1959)</p> <p>http://sedac.ciesin.org/entri/texts/quarantine.of.plants.1959.html</p>	<p>Article VI: Parties undertake to apply measures to prevent the introduction from one country into another, in exported consignments of goods or by any other means, of quarantinable plant pests and diseases and weeds specified in lists to be drawn up by agreement between the parties concerned. Annex contains List of the Principal Quarantinable Pests, Diseases and Noxious Weeds</p>	<p>None found.</p>	<p>None found.</p>
<p>15. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (Marrakech, 1995)</p>	<p>Supplementary agreement to the World Trade Organisation Agreement, provides uniform framework for measures governing 'sanitary/ phytosanitary measure' for human, plant and animal life or health (defined as any measure applied a) to protect human,</p>	<p>April 2008: WTO-SPS Committee adopted new transparency procedures encouraging members to notify all new or modified measures, including those based on international standards: aim is to provide further predictability to the trading system and help to monitor implementation of international standards globally.</p>	<p>WTO-World Bank Standards and Trade Development Facility (STDF) supports capacity-building for implementation of international standards (IPPC CPM/NPPOs may apply for support for PRA training (http://www.standardsfacility.org/).</p> <p>International Portal on Food Safety, Animal and Plant Health (http://www.ipfsaph.org/En/default.jsp)</p>

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http://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm	<p>animal or plant life or health (within the Member's Territory) from the entry, establishment or spread of pests, diseases, disease carrying organisms; b) to prevent or limit other damage (within the Member's Territory) from the entry, establishment or spread of pests.</p> <p>WTO does not itself develop standards under the SPS Agreement. The Agreement encourages countries to use international standards, guidelines and recommendations where they exist, eg those developed by IPPC and OIE.</p>		<p>supports access to official information relevant to SPS Agreement.</p>
<p>16. International Convention for the Control and Management of Ships' Ballast Water and Sediments</p> <p>Adopted under the auspices of the International Maritime Organisation (IMO) on 13 February 2004: still not in force.</p> <p>http://www.imo.org/home.asp</p>	<p>Under Article 2 General Obligations Parties undertake to give full and complete effect to the provisions of the Convention and the Annex in order 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.</p>	<p>The Convention needs 30 countries and 35 % tonnage to enter into force. 18 countries have ratified the Convention to date. The Convention applies to some EU Member States (but not to the EC itself). To date, Spain and France are the only MS to have ratified, though several other MS are undertaking preparatory studies.</p> <p>See also under International Maritime Organization below for progress on GloBallast Partnerships project.</p>	<p>IMO's Marine Environment Protection Committee at its 58th session (5-10 October 2008):</p> <ul style="list-style-type: none"> • approved all guidelines to support the Convention, agreed on the Compliance Control Sampling Guideline (G2) and edited the Guideline on Approval of Ballast Water Management Systems (G8); • followed all recommendations of the GESAMP Ballast Water Group regarding Basic and Final Approvals of Ballast Water Management Systems that make use of active substances. <p>In October 2008, the situation on Basic and Final Approvals of Ballast Water Management Systems was as follows:</p> <ul style="list-style-type: none"> • there were three certified systems, of which two follow the IMO requirements and one got a national certificate (Liberia); • two more systems had Final Approval and were due to be certified by their competent authorities by end 2008; • eight Ballast Water Management Systems had basic approval and were working towards final approval.
<p>17. International Health Regulations (IHR)</p> <p>Initially adopted by the 22nd World Health Assembly in 1969. Latest amended IHR (IHR2005) adopted by the World Health Assembly on 23.05.2005)</p> <p>http://www.who.int/csr/ihr/</p>	<p>The purpose and scope of the IHR (2005) are to prevent, protect against, control and provide a public health response to the international spread of disease and which avoid unnecessary interference with international traffic and trade.</p>	<p>New IHR entered into force on 15 June 2007: provide a new framework to coordinate management of events that may constitute a public health emergency of international concerns and improve the capacity of all countries to detect, assess, notify and respond to public health threats.</p> <p>States Parties to the Regulations have two years to assess their capacity and develop national action plans followed by three years to meet the requirements of the Regulations regarding their national surveillance and response systems as well as the requirements at designated airports, ports and certain ground crossings.</p>	<p>Current WHO work on biorisk reduction seeks to ensure that current scientific knowledge regarding viral hemorrhagic fevers, epidemic-prone orthopox viruses, and emerging severe zoonotic diseases affecting humans, is maintained in order to apply the most appropriate guidance for treatment, control, and safety to mitigate risks regardless of the source of the disease event (http://www.who.int/csr/bioriskreduction/en/).</p>
<p>18. Convention on the Protection of the Marine Environment of the Baltic (HELCOM)</p> <p>http://www.helcom.fi/</p>	<p>HELCOM works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental co-operation.</p> <p>The Convention uses a definition of pollution that enables it also to deal with alien species: 'Pollution means introduction by man, directly or indirectly, of substances or energy into the sea, including estuaries, which are liable to create hazards to human health, to harm living resources and marine ecosystems, to cause hindrance to legitimate uses of the sea including fishing, to impair the quality for use of sea water, and to lead to a reduction of amenities'.</p>	<p>Baltic Sea Action Plan (goals and objectives based on ecosystem approach) approved 9.3.2006 and Task Force created to identify detailed actions to meet priority objectives, including halting habitat destruction and decline in biodiversity.</p> <p>1 April 2008: Joint Notice to shipping from the Contracting Parties of HELCOM and OSPAR on General Guidance on the Voluntary Interim application of the D1 Ballast Water Exchange Standard (see IMO Ballast Water Management Convention above) in the North-East Atlantic and the Baltic Sea (developed pursuant to Article 13(3) BWM which requires "Parties with common interests to protect the environment, human health, property and resources in a given geographical area, in particular, those parties bordering enclosed and semi-enclosed seas, (to) endeavour, taking into account characteristic regional features, to enhance regional co-operation, including through the conclusion of regional arrangements consistent with this Convention. Parties shall seek to co-operate with the Parties to regional agreements to develop harmonized procedures".</p>	<p>Baltic Sea Action Plan will provide pilot project in the subregion for implementation of the EU Marine Strategy</p> <p>This voluntary guidance will become binding on Parties once the BWM Convention enters into force.</p>
<p>19. Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)</p>	<p>2003 Strategy of the OSPAR Commission for the 'Protection of the Marine Environment of the North-East Atlantic': Alien species is listed as one of the candidates of human activities for further analysis as regards actual or potential adverse effect on species and habitats or on ecological processes.</p>	<p>1 April 2008: Joint Notice to shipping from the Contracting Parties of HELCOM and OSPAR on General Guidance on the Voluntary Interim application of the D1 Ballast Water Exchange Standard (see IMO Ballast Water Management Convention above) in the North-East Atlantic and the Baltic Sea (see HELCOM above).</p>	<p>This voluntary guidance will become binding on Parties once the BWM Convention enters into force.</p>

Binding Instrument	Relevant Provisions	COP Decision(s) since 2006	Ongoing or proposed work programme(s)
	The Convention uses a definition of pollution, that enables the OSPAR to also deal with alien species: 'Pollution means the introduction by man, directly or indirectly, of substances or energy into the maritime area which results, or is likely to result, in hazards to human health, harm to living resources and marine ecosystems, damage to amenities or interference with other legitimate uses of the sea.'		
20. Convention Concerning Fishing in the Waters of the Danube (Bucharest 1958)	Annex Part V Article 10 The acclimatization and breeding of new species of fish and other animals and of aquatic plants in the waters of the Danube to which this Convention applies may not be carried out save with the consent of the Commission.	None found.	None found.
21. Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979) http://www.coe.int/t/dg4/culture/heritage/conventions/Bern/	Article 11(2)(b) Each Contracting Party undertakes: to strictly control the introduction of non-native species.	Recent Recommendations adopted by Standing Committee to the Convention: <ul style="list-style-type: none"> • Recommendation No. 126 (2007) on the eradication of some invasive alien plant species; • Recommendation No. 125 (2007) on trade in invasive and potentially invasive alien species in Europe; • Recommendation No. 124 (2007) on progress in the eradication of the Ruddy duck (<i>Oxyura jamaicensis</i>); • Recommendation No. 123 (2007) on limiting the dispersal of the Grey squirrel (<i>Sciurus carolinensis</i>) in Italy and other Contracting Parties; • Recommendation No.134 (2008) on the Code of Conduct for Horticulture and Invasive Alien Plants Recommendation No. 133 (2008) on the Control of Water Hyacinth <i>Eichhornia crassipes</i>) invites Parties to: <ul style="list-style-type: none"> • prohibit its deliberate introduction, import, sale, trade, planting, possession and transport; • monitor introduced populations and share information with other countries, EEA and EPPO to facilitate preventive measures, early detection and rapid response in all European and Mediterranean states; and • for Parties where the species is present, urgently draft a national action plan to control and, if feasible, eradicate the plant, taking account of guidance annexed to this Recommendation as well as the draft EPPO standard on National regulatory control systems for <i>Eichhornia crassipes</i>; and • encourages Spain, Portugal and other affected Parties are invited to meet annually to discuss the problem in the appropriate framework. The Secretariat is considering a case relating to the introduction of the zebra mussel in the Ebro River, Spain (brought by the Spanish NGO Ebro Vivo-Coagret, see document T-PVS (2007) 4 - 4).	Continued operation of Group of Experts on Invasive Alien Species; support for national workshops on IAS (e.g. Bulgaria, 2008; Croatia and Ukraine, 2006), biennial meeting held in Croatia (May 2009). Expansion of cross-cutting work on IAS, eg by Bern Group of Experts on Biodiversity and Climate Change (Seville, 13-15 March 2008). Following joint development with European and Mediterranean Plant Protection Organisation (EPPO) of the Code of Conduct, joint <i>Workshop on the Code of Conduct on Horticulture and Invasive Alien Plants</i> held in Oslo, 4-5 June 2009: proceedings available at www.eppo.org .
22. Benelux Convention on Nature Conservation and Landscape Protection (Brussels, 1982) http://sedac.ciesin.columbia.edu/entri/texts/benelux.landscape.protection.1982.html	Article 1 The present Convention aims to regulate the concentration and the cooperation between the three Governments in the field of the conservation, the management and the restoration of nature and landscapes. Note: on 17 June 2008, signature of new Treaty revising the Treaty establishing the Benelux Economic Union (3 February 1958). New Art.2.1 provides that "the purpose of the Benelux Union is to deepen and expand the cooperation between the High Contracting Parties so that it can continue its role as precursor within the European Union and strengthen and improve cross-border cooperation at every level."	Benelux Council of Ministers Decision 17.10.83. (Parties to prohibit the introduction of non-native animal species into the wild without authorisation from the competent national authority; pre-introduction assessment required; communications between parties about planned introductions) currently under review.	Preliminary discussions under way to revise 1983 IAS Decision. Early draft currently under review by Parties (Belgium, Netherlands, Luxembourg) to identify common positions and potential added value of joint action. Options under consideration could include requirement for Parties to review national legislation to prevent the introduction on their territory of non-native species that may become invasive and have adverse environmental impacts as indicated by risk assessment. Progress expected by mid-2009.
23. Protocol for the Implementation of the Alpine Convention in the Field of Nature Protection and Landscape Conservation	Article 17 The Parties ... , taking into account the characteristics of each protected area, shall ... progressively take the measures required, which may include the prohibition on ... the introduction of exotic species; (and) the regulation of any act likely to harm or	None found.	None found.

Binding Instrument	Relevant Provisions	COP Decision(s) since 2006	Ongoing or proposed work programme(s)
(Chambery, 1994) http://www.convenzionedellealpi.org/page1_fr.htm	disturb the fauna or flora, including the introduction of indigenous zoological or botanical species.		
24. Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (under the Barcelona Convention) (Barcelona, 1995) http://www.racspa.org/dl/invasive.pdf	Article 6 The Parties ... taking into account the characteristics of each specially protected area (SPA) shall take the protection measures required, in particular: the regulation of the introduction of any species not indigenous to the SPA in question, or of genetically modified species, as well as the introduction or reintroduction of species which are or have been present in the SPA. Article 13 The Parties shall take all appropriate measures to regulate the intentional or accidental introduction of non-indigenous or genetically modified species to the wild and prohibit those that may have harmful impacts on the ecosystems, habitats or species in the area to which this Protocol applies. The Parties shall endeavour to implement all possible measures to eradicate species that have already been introduced when, after scientific assessment, it appears that such species cause or are likely to cause damage to ecosystems, habitats or species in the area to which this Protocol applies.	Revised implementation timetable for the Action Plan Concerning Species Introductions And Invasive Species in The Mediterranean Sea (2003) adopted at Barcelona Convention COP15 (Almería, 15-18 January 2008) Decision IG 17/11 (Annex 3) provides for the following actions: 2008: preparation of national reports; creation of coordination mechanism, pathways inventory, experts' directory and education materials. 2009: creation of awareness-raising programmes for general public and target groups, including decision-makers; expert risk assessment group; inventory of marine IAS and public/private stakeholders whose activities may introduce alien marine species; Regional IAS information collection and exchange mechanism. 2010: launching procedures to enact or strengthen national legislation for control of alien species introductions. 2011: development of data collection and monitoring programmes; strengthening/setting up systems to control intentional import and export of alien marine species. 2012: developing and implementing risk assessment techniques; elaborating National Plans.	Revisions to Action Plan timetable were based on Progress Report compiled for MOP8 of Focal Points to the Protocol (Palermo, 6-9 June 2007), which noted severe delays due to budget constraints and too-tight timetable (UNEP(DEPI)/MED WG.308/Inf.9 dated 22 May 2007). All Parties invited to participate in the establishment of the Mediterranean Task Force (see under International Maritime Organisation below). The RAC/SPA Secretariat and REMPEC will act as joint Coordinating Unit for this 5-year project. Technical guidance on managing marine pathways adopted in 2008 (UNEP/MAP-RAC/SPA. 2008. Guidelines for Controlling the Vectors of Introduction into the Mediterranean of Non-indigenous Species and Invasive Marine Species. Ed. RAC/SPA, Tunis. 18 pp.)
25. Framework Convention on the Protection and Sustainable Development of the Carpathians http://www.carpathianconvention.org/index.htm	Article 4.3 states that the Parties shall pursue policies aiming at the prevention of introduction of IAS and release of genetically modified organisms threatening ecosystems, habitats or species, their control or eradication.	The Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity (adopted at COP2 (Bucharest, 17-19 June 2008): <ul style="list-style-type: none"> mandates cooperation between Parties on prevention of introduction of IAS which might threaten ecosystems, habitats or species native to the Carpathians, their control or eradication (Art.1.3.b); requires Parties to pursue policies aiming at the prevention of introduction or release of IAS/GMOs likely to have adverse environmental impacts that could affect the Carpathian biodiversity, ecosystems, habitats or species, including early warning on occurrence of new IAS on its territory ; and to take measures on national territory to prevent such introductions/release and, if need be, control or eradication of such species (Art.13). IAS defined as "non-native species introduced deliberately or unintentionally outside their natural habitats, where they become established, proliferate and spread in ways that cause damage to their receiving environment (Art.3.k); IAS listed as contributing factor to "degraded habitat" (habitat reduced in quality or value of ecological functions) (Art 3.f). 	Decision 2/1 (2008) requests the interim Secretariat to coordinate preparation of a Strategic Action Plan to implement the Protocol. The first draft Plan prepared by a working group (accessed on 15 September) provides for: <ul style="list-style-type: none"> development of national policies consistent with Article 22(b) of the habitats Directive or, if policies/strategies are already in place, evaluation of their effectiveness and implementation up to date (draft Art.10.1); elaboration of suggestions/guidelines on necessary measures to be undertaken for prevention of introduction or release of species non-native to the Carpathians and/or GMOs considered as having the adverse environmental impacts, and, if need be, for control or eradication of such species in the Carpathians within each Party's national territory.

Part II: Non-binding international instruments and programmes

Institution/programme	Instruments/activities since 2006	Ongoing or proposed work programme(s)
1. IUCN - The World Conservation Union http://www.iucn.org	Continued operation of IUCN/SSC Invasive Species Specialist Group (http://www.issg.org/): <ul style="list-style-type: none"> co-organised <i>Expert workshop on best practices for pre-import screening of live animals</i> (UNEP/CBD/COP/9/INF/32/Add.1) (Indiana, USA, 9-11 April 2008) with GISP and CBD Secretariat; maintenance and expansion of Global Invasive Species Database http://www.issg.org/database/welcome/ Cooperative Initiative on Invasive Alien Species on Islands http://www.issg.org/cii/ <p>Hewitt, C.L., Campbell, M.L. and Gollasch, S. (2006). <i>Alien Species in Aquaculture. Considerations for responsible use</i> (IUCN Mediterranean Office).</p> <p>Dedicated IAS workshop at IUCN-organised <i>Conference on The European Union and its Overseas Entities: Strategies to counter Climate Change and Biodiversity Loss</i> (Réunion, 7-11 July 2008), organised with EC support.</p> <p>IAS thematic activities at IUCN World Conservation Congress (Barcelona, 6-10 October 2008); avoidance of species introductions identified as one of sustainability criteria for the Congress.</p>	ISSG to organise two IAS Conferences in New Zealand in 2010: <ul style="list-style-type: none"> Ecology of Insular Biotas II (Wellington, NZ, 1-5 January 2010); Island Invasives: Eradication and Management (Auckland, NZ, 8-12 February 2008). <p>Currently developing Global Register of Invasive Species (GRIS) which is intended to provide a one-stop reliable source of information about invasive species that may help States required to justify, using science, any restrictions imposed in movement of plants and animals that affect trade. Will be interlinked to GISIN (see http://www.issg.org/database/welcome/aboutGISD.asp).</p>

Institution/programme	Instruments/activities since 2006	Ongoing or proposed work programme(s)
2. Global Invasive Species Programme (GISP) http://www.gisp.org/	GISP established as legal entity in April 2005 (founding members are IUCN, CAB International, The Nature Conservancy and the South African National Biodiversity Institute). Secretariat relocated to Nairobi, Kenya in 2007. Continued production of technical toolkits and training materials and organisation of training courses, including on: <ul style="list-style-type: none"> • Evaluation of Economic Impacts of Invasive Species Problems; • Drafting Legal & Institutional Frameworks for the management of invasive species. • Taxonomic needs in the management of invasive species. Active role at CBD COP9 eg issued guidance on <i>Biofuel Crops and the Use of Non-Native Species</i> (http://www.gisp.org/publications/briefing/index.asp).	Developing 'Biological Indicators for Invasive Species' under 2010 BIP project, funded by the Global Environmental Facility and executed by UNEP-WCMC.GISP. Extensive support tasks assigned to GISP under CBD IX.4, subject to funding, including <ul style="list-style-type: none"> • identifying information management networks, expertise and opportunities to enhance the work of regional organizations at the national level; • development of practical tools to facilitate COP decisions taking into account the Guiding Principles, existing tools and information submitted by Parties; • support for development and implementation of voluntary schemes, certification systems and codes of conducts for relevant industries and stakeholder groups, including specific guidelines for potentially invasives, commercially important species (e.g., plants, pets, invertebrates, fish, terrarium/aquarium species); • development of training materials in support of awareness-raising, organisation of practical workshops to strengthen capacity for the implementation of the Guiding Principles. CBD IX.4 reiterated invitation to the GEF, governments and other funding organisations to provide adequate and timely financial support to enable GISP to fulfil the tasks outlined in COP decisions. GISP collaborates with ICAO on development of best practice guidance for aviation pathways but this work is currently on hold due to lack of funding.
3. Global Invasive Species Information Network http://www.gisinetnetwork.org/	Continues to provide a platform for sharing invasive species information at a global level, via the Internet and other digital means; offer a central place for the reporting and tracking of new alien species sightings via email listserv; develop and share electronic information management tools to better identify, map, and predict the spread of invasive species at regional and global levels; build the capacity of network members in the development and use of information tools to integrate IAS databases. CBD IX.4 recognises GISIN role together with other information initiatives (IABIN I3N, ISSG – GRIS and GISD, CABI Invasives Compendium, NOBANIS, DAISIE).	Two technical data providers' workshops for first adopters of the GISIN System held (summer 2008) to discuss the data sharing models and improve the GISIN search prototype. Summaries available for download at http://www.gisinetnetwork.org/ .
4. International Maritime Organisation http://www.imo.org See also International Convention for the Control and Management of Ships' Ballast Water and Sediments	GEF/UNDP/IMO GloBallast Partnerships project (Building Partnerships to Assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water) operational since 2007 to assist vulnerable countries and/or regions to enact legal and policy reforms to meet the BWM Convention's objectives. First GloBallast Regional Task Force Meeting, in cooperation with the UNEP/MAP's Specially Protected Areas/Regional Activity Centre (RAC/SPA) held 11-12 September 2008 (hosted by Croatia as 'Lead Partnering Country' for the Mediterranean) to form Task Force and agree on main elements to be included in a Mediterranean strategy on ship's ballast water management. All Contracting Parties to the Barcelona Convention are invited.	Having addressed the toxic side-effect of tributyl-containing antifouling paints (Antifouling Systems (AFS) Convention, open for ratification), the IMO has set up an intersessional discussion group to address biofouling pathways (species transport via hull-fouling of vessels) and discuss potential avoidance measures, management strategies and the format for any possible instrument (guideline, annex to existing conventions, new convention etc.). A written report will be presented to IMO's Bulk Liquid and Gases Sub-committee at its 13th Session (1st Quarter 2009).
5. United Nations Commission on Sustainable Development (http://www.un.org/esa/sustdev/csd/review.htm) United Nations Conference on Environment and Development (UNCED)	Oversees delivery of goals set by the Johannesburg Plan of Implementation of the World Summit on Sustainable Development (Johannesburg 2002) which made IAS recommendations on IAS in relation to: <ul style="list-style-type: none"> • Maritime safety and protection of the marine environment from pollution, eg IAS (Chapter 34(b)). • Biodiversity conservation, IAS control (Chapter 44(i)). World Summit 2005 has no specific recommendation on IAS, but reiterated support for implementation of the CBD and the Johannesburg commitment for a significant reduction in the rate of loss of biodiversity by 2010.	Biodiversity selected as key theme for discussion in the 2012/2013 two-year CSD cycle.
6. Small Island Developing States (SIDS) Network http://www.sidsnet.org/	Mauritius Strategy for further implementation (MSI) of the 1994 Barbados Programme of Action (2005) includes "controlling major pathways for potential alien invasive species in SIDS" as a necessary measure to achieve MSI targets within agreed time frames, with necessary support from the international Community (§ 49(f)).	MSI currently being mainstreamed within the United Nations system (expert meeting held (New York, 27-28 April 2007), work in progress includes harmonisation with Millennium Development Goals.
7. International Council for the Exploration of the Sea (ICES) and the European Inland Fisheries Advisory Commission (EIFAC) http://www.ices.dk/indexfla.asp	Code of Practice on the Introductions and Transfers of Marine Organisms (2005) recommends practices and procedures to diminish risks of detrimental effects from marine organism introduction and transfer, including GMOs. Drafted in co-operation with the FAO European Inland Fisheries Advisory Commission (EIFAC) and also applicable to freshwater organisms. Requires ICES members to submit a prospectus to regulators, including a detailed analysis of potential environmental impacts to the aquatic ecosystem	Working Group on Introductions and Transfers of Marine Organisms (ongoing tasks include developing guidelines for rapid response and control options): http://www.ices.dk/iceswork/wgdetail.asp?wg=WGITMO Working Group on Ballast and Other Ship Vectors: http://www.ices.dk/iceswork/wgdetail.asp?wg=WGBOSV
8. Food and Agriculture Organisation of the United Nations (FAO) http://www.fao.org	Code of Conduct for the Import and Release of Exotic Biological Control Agents (1995) Code of Conduct for Responsible Fisheries (1995, http://www.fao.org/fishery/ccrf) contains several measures related to introductions and transfers of non-native aquatic organisms (Article 9.3). Recent FAO Technical Guidelines published under the Code includes:	Maintenance/expansion of IAS-relevant technical support and databases eg: <ul style="list-style-type: none"> • Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (since 1994: (http://www.fao.org/EMPRES/default.htm); • Global Early Warning System for Animal Diseases including Zoonoses (GLEWS) by FAO, OIE and WHO (since 2003); • FAO Database on Introductions of Aquatic Species (DIAS), covers freshwater fish, molluscs, crustaceans and marine fish

Institution/programme	Instruments/activities since 2006	Ongoing or proposed work programme(s)
	<ul style="list-style-type: none"> Aquaculture development. 2. Health management for responsible movement of live aquatic animals (No. 5 Suppl.2, 2007). 	<p>(http://www.fao.org/fishery/dias).</p> <ul style="list-style-type: none"> IAS impacts on forests and forestry (http://www.fao.org/forestry/aliens/en/); FAO Invasive Tree Species database http://www.fao.org/forestry/24107/en/) <p>Continued discussion of FAO draft Code of Conduct on Biotechnology as it relates to Genetic Resources for Food and Agriculture (Eleventh Regular Session of the Commission on Genetic Resources for Food and Agriculture in 2007).</p>
9. United Nations Environment Programme (UNEP)	<p>Under Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (1995, http://www.gpa.unep.org/):</p> <ul style="list-style-type: none"> National Programme of Action guidance issued in 2006 on <i>Protecting Coastal and Marine Environments from Land-Based Activities</i> lists IAS as a source of degradation (http://www.gpa.unep.org/documents/2006_npa_handbook_for_english.pdf) 	<p>Continuing work on TEMATEA (UNEP-WCMC Synergy Project - Issues-based Modules for the coherent implementation of biodiversity related Conventions). Commitments and obligations relating to IAS are organised into a logical issue-based framework consisting of seven sections (http://www.tematea.org/?q=node/14):</p> <ul style="list-style-type: none"> <i>Assessments</i>: including risk assessment, impact assessment, presence of IAS, identification, reporting and indicators. <i>Legislative measures and national policies</i>: including national strategies. <i>Management</i>: including the prevention and eradication of IAS, rehabilitation and restoration, and other non-legislative approaches. <i>Economic instruments</i>: including incentives <i>Provision of resources</i>: including funding activities and capacity building. <i>Communication, education and public awareness</i>: including training <i>Cooperation</i>: including coordination across sectors
10. World Organisation for Animal Health (known till 2003 as the Office International des Epizooties, still referred to as OIE http://www.oie.int/eng	<p>Maintenance and updating of OIE Terrestrial Animal Health Code and the Aquatic Animal Health Code:</p> <ul style="list-style-type: none"> Contain standards, guidelines and recommendations designed to prevent the introduction of infectious agents and diseases pathogenic to animals and humans into the importing country during trade in animals, animal genetic material and animal products; OIE identified in the WTO SPS Agreement as the reference body for international standards on animal health. <p>OIE General Session (May 2008) addressed matters related to: regionalisation (promoting the use of disease free 'zones' (defined by geographical features) and 'compartments' (defined by management practices) to facilitate trade; capacity building and dispute mediation.</p>	<p>OIE maintains/contributes to:</p> <ul style="list-style-type: none"> Global Early Warning System for Animal Diseases; World Animal Health Information Database launched in 2005 (http://www.oie.int/eng/info/images/Nouv_SIS_pdf_en.JPG). <p>CBD Decision IX.4 requests OIE International Committee to note the lack of international standards covering IAS, in particular animals, that are not pests of plants under the IPPC, and to consider whether and how it could contribute to addressing this gap, including for example by:</p> <ul style="list-style-type: none"> expanding the OIE list of pathogens to include a wider range of diseases of animals, including diseases that solely affect wildlife; and considering whether it may play a role in addressing invasive animals that are not considered as causative agents of diseases under OIE and whether, for this purpose, it would need to broaden its mandate.
11. International Civil Aviation Organisation (ICAO) http://www.icao.int	<p>36th Assembly Session (Montreal, 18-28 September 2007) adopted Resolution A36-21: Preventing the introduction of invasive alien species (replaces earlier Resolutions on this subject). This recognises that international transportation, including civil air transportation, represents a potential pathway for the introduction of IAS and:</p> <ol style="list-style-type: none"> Urges all Contracting States to support one another's efforts to reduce the risk of introducing, through civil air transportation, potentially invasive alien species to areas outside their natural range; Requests the ICAO Council to continue working with the appropriate organizations in this regard. 	<p>ICAO-GISP collaboration with GISP to develop guidance for aviation pathway management. GISP secured a small amount of funding in 2007 to undertake a pilot study of Airports in South Africa with a view to identifying the gaps and making recommendations as appropriate i.e. a needs assessment, including capacity building & training etc. Part of the pilot study (completed June 2008) was to develop guidelines that would form the basis of the GISP-ICAO joint initiative. However, significant funding is now required to bring the outputs from the pilot project up to a standard where they can be developed into 'Best Practice Guidelines' and taken forward.</p>
12. The Pan-European Biological and Landscape Diversity Strategy (PEBLDS) http://www.strategyguide.org/	No specific decisions found.	No specific activities found.
13. Environment for Europe Ministerial Conference	No specific reference to IAS at Sixth Conference (Belgrade, 10-12 September 2007)	None found.
14. Nordic Council of Ministers	<p>The North European and Baltic Network on Invasive Alien Species (NOBANIS) now has 18 participating countries of which 13 are EU-27 countries. http://www.nobanis.org/default.asp</p>	<p>NOBANIS continues to build on past risk assessment and training courses and now provides a gateway to information on alien and invasive species in North and Central Europe: covers marine, freshwater and terrestrial environments and provides</p> <ul style="list-style-type: none"> integrated database on introduced species in the region catalogue of the regulation relevant to invasive species in participating countries literature database connected to regional and global networks and projects of invasive aliens species. <p>Building on the SEBI-2010 project and the EEA-commissioned EWS feasibility study, NOBANIS is currently developing a quarterly newsletter and a more interactive database: this involves standardisation of use of key terms (eg invasive) and taxonomic references and columns on arrival in an area, change of behaviour, abundance etc to make it possible to generate alerts through the portal. Cost-sharing to fund future operation of NOBANIS is currently under discussion amongst participating countries: no decision on long-term mechanism yet reached.</p>

Institution/programme	Instruments/activities since 2006	Ongoing or proposed work programme(s)
<p>15. Common Wadden Sea Secretariat (CWSS) established in 1987 to support cooperation between The Netherlands, Denmark and Germany.</p> <p>The trilateral Wadden Sea Forum acts as decision making body within framework of this collaboration and meets every 3-4 years.</p>	<p>Protection and conservation of the Wadden Sea (management, monitoring, research, policy).</p> <p>IAS threats addressed (briefly) in Policy Assessment Report (2005) presented to Tenth Trilateral Governmental Conference on the Protection of the Wadden Sea (Schiermonnikoog, November 3, 2005)</p>	<p>The Wadden Sea Forum has not undertaken specific IAS activities.</p> <p>The Quality Status Report 2004, which first documented IAS – and Pacific oyster in particular – in the Wadden Sea will be updated in November 2008 and contain a chapter on IAS. The Pacific oyster is now spreading throughout the Wadden Sea : in 2007, the CWSS held a workshop to obtain an up-to-date status of the Pacific oyster invasion and to assess the possible consequences for the ecosystem, as well as for monitoring and management (http://www.waddensea-secretariat.org/news/symposia/oyster2007/oyster2007.html)</p>

Annex 2 UPDATED INFORMATION ON COMMUNITY INSTRUMENTS AND ACTIVITIES RELEVANT TO IAS

* denotes new entries

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
General/Community						
1	<p>Treaty establishing the European Community</p> <p>(Consolidated text of the Treaty on European Union and the Treaty establishing the European Community Official, Journal C 325/1 of 24 December 2002)</p> <p>http://eur-lex.europa.eu/en/treaties/index.htm</p>	<p>Sets out the basic policies for operation of the European Community, including monetary policy, movement of goods, etc.</p> <p>Article 2 states that 'The Community shall have as its task, [...], to promote throughout the Community a harmonious, balanced and sustainable development of economic activities, a high level of employment and of social protection, [...], a high degree of competitiveness and convergence of economic performance, a high level of protection and improvement of the quality of the environment, [...], and economic and social cohesion and solidarity among Member States. Articles 28 and 29 state that quantitative restrictions on imports and exports are prohibited.</p> <p>Article 174(2) states that 2. Community policy on the environment shall aim at a high level of protection [...]. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay.</p>	<p>No specific reference.</p> <p>May apply to trade pathways in very general terms. Article 30 states that 'The provisions of Articles 28 and 29 [which prevent MS imposing quantitative restrictions on imports or exports] shall not preclude prohibitions or restrictions on imports, exports or goods in transit justified on grounds of [...] the protection of health and life of humans, animals or plants [...]. Such prohibitions or restrictions shall not, however, constitute a means of arbitrary discrimination or a disguised restriction on trade between Member States.' This provision has been used to justify restrictions on movement of living organisms within the EC (see discussion of Danish bees case).</p>	<p>The Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the EC was signed on 13 December 2007 (not yet in force). Its main objectives are to make the EU more democratic; strengthen standards of accountability, openness, transparency and participation; and to make the EU more efficient and able to tackle today's global challenges such as climate change, security and sustainable development. It will constitute the European Union as a legal entity. No changes are specifically relevant to IAS issues.</p> <p>The Consolidated Version of the Treaty on European Union and the Treaty on the Functioning of the European Union was published in Official Journal C 115 of 9 May 2008.</p>	<p>Many MS (especially 2004 and 2007 MS) reduced the scope of import restrictions related to potential IAS on joining the EC, perhaps in the belief that such restrictions were not legally justified under the EC Treaty.</p> <p>The provisions of Article 30 in direct or indirect relation to IAS have been tested in two European Court of Justice cases (see lines 8 and 9 below).</p> <p>Some MS may have been excessively conservative in their interpretation of the requirements of the EC Treaty in relation to IAS: there is some evidence that MS actively developing IAS policies are more willing to consider trade-related controls as part of a suite of policy measures. However, there is still no explicit basis under EU legislation to regulate trade and movement in species invasive in their own right (except for tightly defined categories of species e.g. for aquaculture) which means that any determination of compliance has to be made on a case by case basis.</p>	
2	<p>Environmental Impact Assessment Directive (85/337/EEC as amended by Directive 97/11/EC and Directive 2003/35/EC)</p> <p>'EIA Directive'</p> <p>http://ec.europa.eu/environment/eia/home.htm</p> <p>See also http://www.environment-integration.eu/content/view/165/231/lang,en/</p>	<p>The Directive applies to the assessment of the environmental effects of public and private projects that are likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location.</p>	<p>No specific reference.</p> <p>The Directive could cover IAS impacts caused or exacerbated by a 'project' falling within its scope, because EIA addresses the direct and indirect effects of a project on human beings, fauna and flora and on soil, water and landscape (see requirements in Article 3).</p> <p>Some potential IAS pathways covered by mandatory EIA requirements (transport corridors and water transfer between river basins, Annex I.7-8, 12) or categories left to MS discretion depending on characteristics (eg afforestation and salmon aquaculture under Annex II.I.(d) and (g)).</p>	<p>In 2001, the European Commission published EIA Scoping guidelines and a checklist which includes a question on possible introduction of alien species through the proposed project (http://ec.europa.eu/environment/eia/eia-support.htm).</p> <p>DG Environment published guidance in 2008 to assist MS to interpret project categories and reduce uncertainty in implementation (http://ec.europa.eu/environment/eia/pdf/interpretation_eia.pdf). However, this focuses on defining what constitutes a 'project' and does not provide guidance or criteria for consideration of IAS-related pathway risks as part of an assessment.</p>	<p>Limited information on MS application in relation to IAS.</p>	

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
3	Strategic Environmental Assessment Directive (2001/42/EC) 'SEA Directive' http://ec.europa.eu/environment/eia/home.htm	<p>The purpose of the SEA-Directive is to ensure that environmental consequences of certain plans and programmes are identified and assessed during their preparation and before their adoption (Article 5). The public and environmental authorities can give their opinion and all results are integrated and taken into account in the course of the planning procedure. After the adoption of the plan or programme the public is informed about the decision and the way in which it was made. In the case of likely transboundary significant effects, the affected Member State and its public are informed and have the possibility to make comments which are also integrated into the national decision making process.</p>	<p>No specific reference.</p> <p>IAS impacts may be covered as the Directive requires environmental assessment for all 'plans and programmes' for eg agriculture, forestry, fisheries, energy, industry, transport, waste/water management, tourism, town and country planning or land use and which set the framework for future development consent of projects listed in Annexes I and II to the EIA Directive or (b) which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of the habitats Directive. The assessment should consider significant environmental effects, and in particular, effects on sites designated under the habitats and birds Directives, or transboundary effects: these could include the impacts of IAS.</p> <p>"Plans and programmes" very broadly defined to cover some sectoral pathways eg. transport corridors</p>	<p>A 2005 study for DG Environment notes that overlaps between the SEA Directive and the EIA Directive are possible, but although experience in the application of the SEA Directive is still too limited to enable robust conclusions to be reached (Imperial College London Consultants (August 2005) 'The relationship between the EIA and SEA Directives', available on: http://ec.europa.eu/environment/eia/final_report_0508.pdf).</p> <p>In 2007, studies on the application of the Environmental Impact Assessment and SEA Directives were launched and will include examination of the relationship between these directives and the EU Biodiversity Action Plan and the Habitats Directive.</p> <p>Experience with application of Strategic Environmental Assessment (SEA) to Structural Funds for 2007-2013 is progressing.</p>	<p>No specific information on application in relation to IAS.</p>	
4	Environmental Liability Directive (2004/35/CE) http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_143/l_14320040430en00560075.pdf	<p>The purpose of the Directive is to establish a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage.</p>	<p>No specific reference but defines 'emissions' as 'the release to the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms' which could include release of IAS. 'Environmental damage' is defined to include 'damage to protected species and habitats which is any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species' as well as any damage that 'significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential, as defined in Directive 2000/60/EC, of the waters concerned, with the exception of adverse effects where Article 4(7) of that Directive applies.'</p> <p>Potentially covers IAS where 'environmental damage' is caused/threatened by an occupational activity listed in Annex III (covers activities involving GMOs) or any other occupational activity if the operator has been at fault or negligent. However, there needs to be one or more identifiable polluters, the damage must be concrete and quantifiable and a causal link should be established between the damage and the identified polluter(s). Liability is not a suitable mechanism for pollution of a widespread, diffuse character where it is impossible to link the negative environmental effects with acts or failure to acts of certain individual actors.</p>	<p>None found.</p>	<p>Does not deal with specific vectors (unless GMOs are considered to be within scope of IAS)</p> <p>The Environmental Liability Directive came into force in 2004 and MS have 3 years to implement its provisions. No reports assessing the effectiveness of the Directive through national implementation were found.</p> <p>One MS (Hungary) has included IAS in implementing legislation for the Directive. Government Decree 91/2007 (VI.26) on <i>Determining the degree of natural damage caused and the rules for remedying the damage</i> includes IAS in its list of environmental elements to be monitored: "elements of the monitoring must be chosen particularly considering the following groups: ...g) the populations/associations of invasive non-indigenous species (IAS) which are incidentally spreading and endangering nature because of the changed circumstances due to the damage caused to the environment.</p>	

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
5*	Directive 2008/98/EC of the European Parliament and of the Council on the protection of the environment through criminal law http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:328:028:0037:EN:PDF	<p>To ensure a minimum level of protection of the environment under criminal law throughout the EU, improve compliance with Community environmental legislation and ensure through action at Community level that offenders cannot exploit the significant differences which currently exist between MS (elimination of 'safe havens' for environmental crime).</p> <p>To subject commission of offences to effective, proportionate and dissuasive criminal sanctions (for legal persons, these may be of a non criminal nature eg clean- up or remediation; possibility of stopping businesses from operating). The Directive sets out an approximation of the maximum penalties for natural persons and legal persons.</p> <p>MS are free to maintain or introduce more stringent protective measures. They should transpose the Directive by 2010.</p>	<p>No specific reference.</p> <p>The Directive establishes a minimum set of serious environmental offences (already prohibited by EU or national legislation) that should be considered criminal throughout the Community when committed intentionally or with at least serious negligence. Participation in and instigation of such activities should also constitute an offence. Two types of conduct that should constitute offences under the Directive, when unlawful and committed intentionally or with at least serious negligence (see Art.3), could involve IAS:</p> <p>§a: 'the discharge, emission or introduction of a quantity of materials ... into air, soil or water, which causes or is likely to cause ... substantial damage to the quality of air, soil, water, animals or plants;</p> <p>§h: any conduct which causes the significant deterioration of a habitat within a protected site.</p>	<p>N/A</p> <p>The Directive could provide a basis for MS to create or strengthen legal sanctions on deliberate illegal introductions of IAS, notably in breach of provisions under the birds and habitats Directive. In addition, it might be possible to include IAS in the interpretation of potentially damaging "materials", treating them in effect as a type of biological pollution.</p> <p>However, the Directive leaves each MS full latitude to interpret key terms, including "materials", "substantial damage" and "significant deterioration", in the light of its traditions and legal system. It would be necessary for the prosecution to prove a particular threshold of damage (potentially difficult in the IAS context). This suggests that known damaging activities involving potential IAS (eg release of live alien bait into freshwater systems) are likely to fall outside the scope of this proposed legislation in its current version.</p>	N/A	
6	Communication from the Commission on the Precautionary Principle (COM(2000)1) http://ec.europa.eu/environment/docum/20001_en.htm	<p>The Communication aims to: outline the Commission's approach to using the precautionary principle; establish Commission guidelines for applying it; build a common understanding of how to assess, appraise, manage and communicate risks that science is not yet able to evaluate fully; and avoid unwarranted recourse to the precautionary principle, as a disguised form of protectionism. It also seeks to provide an input to the ongoing debate on this issue, both within the Community and internationally.</p>	<p>No specific reference.</p> <p>The Communication is relevant to IAS as it discusses the Community's right to establish the level of protection - particularly of the environment, human, animal and plant health that it deems appropriate. It states that applying the precautionary principle is a key tenet of its policy, and the choices it makes to this end will continue to affect the views it defends internationally, on how this principle should be applied.</p>		<p>Regulation 708/2007 concerning use of alien and locally absent species in aquaculture explicitly references the taking of measures based on the prevention and precautionary principles.</p> <p>A growing number of MS are developing risk assessment techniques to screen some categories of potential IAS for risks to native biodiversity prior to decision-making.</p>	
7	Sixth Environmental Action Programme (2001-2010) (Decision 1600/2002/EC of the EP and the Council of 22 July 2002) http://europa.eu/scadplus/leg/en/lvb/l28027.htm	<p>This Decision establishes a programme of Community action on the environment. It addresses the key environmental objectives and priorities based on an assessment of the state of the environment and of prevailing trends including emerging issues that require a lead from the Community. It sets out the key environmental objectives to be attained. It establishes, where appropriate, targets and timetables. The objectives and targets should be fulfilled before expiry of the Programme, unless otherwise specified.</p>	<p>IAS are clearly within the scope of the 6EAP and are mentioned in Article 6 in a specific objective: 'halting biodiversity decline with the aim to reach this objective by 2010, including prevention and mitigation of impacts of invasive alien species and genotypes', and in a specific priority action: 'developing measures aimed at the prevention and control of invasive alien species including alien genotypes'.</p>		<p>The EC's current activity programme to develop an EU framework on IAS is based <i>inter alia</i> on this commitment under the 6EAP.</p>	

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8	Case law on IAS: Danish bees case (Case C-67/97)	The case concerned the keeping of a non-indigenous species of bee on the island of Læsø. Danish law prohibited the keeping of nectar-gathering bees except the brown bee of Læsø. When the Danish government pursued a prosecution against an individual who was breaching the prohibition, he claimed that the law constituted a quantitative restriction on imports and was contrary to Article 28 of the EC Treaty. The Court found that the law was indeed a restriction, but that it was justified under Article 30 of the Treaty, for the protection of the health and life of animals.	Not specifically. But the case directly concerns the threat that non-native species may pose to natives. The Court referred to the existence of protected areas for biodiversity conservation under the Birds and Habitats Directives, and stated that the 'establishment by the national legislation of a protection area within which the keeping of bees other than Læsø brown bees is prohibited, for the purpose of ensuring the survival of the latter; constituted an appropriate measure.	N/A		
9*	Case law relevant to IAS: Belgian animal welfare case (Case C-219/07: judgment delivered on 19 June 2008)	The case concerned restrictions on holding of animals imposed under Belgian animal welfare legislation as amended in 1995, based on the Wildlife Trade Regulation 333/97 (see below). The Belgian Decree prohibited the holding of any animals <u>not</u> included in a regulatory list (i.e. a positive/white list), provided for certain derogations (zoos, laboratories etc.) and established a procedure for animal trading firms to apply to add new species to the authorised list subject to prior approval based on formal criteria. The Court found that the Decree was more stringent than the WTR Regulation and liable to restrict intra-Community trade for the purposes of Article 28 EC, but that it was justified under Article 30 of the Treaty, for the protection of the health and life of animals.	Not specifically, but the judgment provides generally applicable guidance on the criteria to be applied when assessing whether a national trade-restrictive measure is compatible with the Treaty. It is for the national court to determine whether: <ul style="list-style-type: none"> • the drawing up of a (positive) species list is based on objective and non-discriminatory criteria; • a procedure enabling interested parties to apply for species listing is provided for, readily accessible and can be completed within reasonable time; • relevant holding conditions are objectively justified and do not go beyond what is necessary to achieve the objective pursued by the national legislation as a whole. The competent authority may refuse applications only if the holding of the specimens of the species concerned poses a genuine risk to the protection of animal welfare and the environment. Its refusal must be based on a full assessment of the risk posed to such interests, established on the basis of the most reliable scientific data available and the most recent results of international research (§36-37). “Where it proves impossible to determine with certainty the existence or extent of the risk envisaged because of the insufficiency, inconclusiveness or imprecision of the results of the studies conducted, but the likelihood of real harm to human or animal health or to the environment persists should the risk materialise, the precautionary principle justifies the adoption of restrictive measures (§38). Any refusal decision must be open to challenge before the courts. Note that in the specific case, the National Council for Animal Welfare had established objective scientific criteria for dealing with applications to add new animal species to the list. These criteria precluded listing of species that, if they escaped into the wild, could continue to exist there and might constitute an ecological threat. The ECJ noted (§29) with regard to this criterion that “the Court has consistently held that restrictions of the free movement of goods may be justified by imperative requirements such as the protection of the environment (see Case C-350-95 <i>Bettati</i> [1998] ECR I-4355 §62 and Case C-314-98 <i>Snellers</i> [2000] ECR I-8633 §55)”. On proportionality, the ECJ noted (§30) that it was necessary when applying the principle to a case of this type, to “take into account the specific nature of the species concerned” as well as the general requirements for protection of animal welfare and the environment. “The fact that one Member State imposes less stringent rules than another Member State does not mean that the latter’s rules are disproportionate and hence incompatible with Community law” (§31). The ECJ also noted that “a negative list system – which entails limiting the prohibition to the species of mammals included in that list – might not suffice to achieve the objective... Reliance on such a system could mean that, as long as a species of mammal is not included in the list, specimens of that species may be freely held even though there has been no scientific assessment capable of guaranteeing that that holding entails no risk to the protection of those interests and requirements” (§32).			
10*	Case law relevant to IAS: Netherlands mussels case (Case C-249/07: judgment delivered on 4 December 2008) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:019:0004:0004:EN:PDF	The case brought by the Commission against the Kingdom of the Netherlands concerned a measure under domestic fisheries regulations. The ECJ declared that, by instituting a system of prior authorisation for the planting, in Netherlands coastal waters, of oysters and mussels coming lawfully from other Member States and being of species native to the Netherlands, the Kingdom of the Netherlands has failed to fulfil its obligations under Articles 28 EC and 30 EC.	The case is directly relevant to interpretation of Art 22, Habitats Directive. The Commission claimed that the prohibition on planting oysters and mussels in Dutch coastal waters without a permit amounted to a prior authorisation regime liable to restrict intra-Community trade and market access from other Member States. Whereas a permit was always required to plant oysters/mussels sourced from other Member States, even if those species were native to the Netherlands, a permit was not required in certain cases to plant oysters/mussels sourced within the Netherlands (planting in the Wadden Sea of stock originating from the Dutch part of that sea; planting in the western Escaut of stock originating from the western Escaut). It also claimed that the derogation for planting mussels from the western Escaut in the Wadden Sea was discriminatory because it benefited a large part of domestic mussel production. ECJ case law made clear that measures having equivalent effect to quantitative restrictions (prohibited under Art.28 EC) applied to any domestic measures liable to obstruct intra-Community trade, directly or indirectly, now or in the future. The regime in question affected oysters and mussels from other Member States differently to the majority of oysters and mussels in the Netherlands and could thus obstruct free trade by dissuading an importer to introduce or place products on the market in the State concerned. The Dutch government accepted that the permit regime could restrict free movement of goods but argued that such measures were justified for reasons of biodiversity protection and conservation of non-threatened fisheries species. It presented two arguments, based on the habitats Directive and on Art.30 EC respectively: <ul style="list-style-type: none"> • the permit regime was designed to prevent introduction of alien organisms attached to the introduced shellfish, which could threaten native fish and plant species in the waters concerned. The ECJ rejected the argument that such a measure was consistent with Art.22 of the Habitats Directive because that article only covered intentional introductions linked to a specific project and did not cover possible accidental introductions arising from the translocation of other species. The ECJ did not consider that foreseeable risk was enough to constitute ‘intention’ under Art.22 (c.f. ECJ case law that accepts a more subjective interpretation of ‘intention’ for activities involving harm to protected species in breach of Art.12 of the Directive); • second, the ECJ found that the measure was not justified on the grounds of protection of the life of animals under Art.30. It first noted that recourse to Art.30 was no longer possible once Community directives provided for harmonisation of measures to achieve the objective concerned (e.g. biodiversity protection on Member States’ European territory) but that the Dutch measure aimed to protect non-threatened fisheries species that fell outside the scope of the habitats Directive. Recourse to Art.30 was thus legally possible: the Dutch government thus had 			

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
			to show that the measure adopted was appropriate, necessary to achieve the desired objective and proportionate. The ECJ found, however, that the government had not demonstrated how its permit regime operated, the criteria used to grant or refuse permit applications, the objective and non-discriminatory nature of its system of derogations or detailed risk analysis which was a necessary precondition to invoking the precautionary principle.			
Fresh Water						
11	Water Framework Directive (2000/60/EC) http://europa.eu.int/comm/environment/water/water-framework/index_en.html	Sets objective that a 'good status' (both ecological and chemical) must be achieved for all European waters by 2015 and that water use be sustainable throughout Europe.	No specific reference. The Directive refers to high, good, moderate, poor and bad 'ecological status' and specifies which biological elements must be taken into account when assessing status. The list of biological quality elements (Annex V) includes an assessment of taxonomic composition in comparison to undisturbed conditions. If IAS are present at levels that significantly alter taxonomic composition, this will affect the level of ecological status assigned to a water body.	The First Report on the Implementation of the WFD (COM(2007) 128 final "Towards Sustainable Water Management in the European Union"; accompanying Staff Working Document (SEC(2007) 362 final) does not mention IAS or taxonomic composition specifically. It notes that there are still important gaps in the development of assessment methods at MS level for some of the biological quality elements. This brings in uncertainty as to what extent the monitoring networks will bring in complete and comprehensive information on the status of water bodies. The report stresses that investment in monitoring can be extremely cost-effective as it can help taking well-informed decisions in the programme of measures, preventing investing potentially higher amounts in the wrong places. Water Information System for Europe (WISE) launched at the European Water Conference in 2007 (http://water.europa.eu/content/view/20/36/lang,en).	The Directive is still in the early stages of implementation. Some Member States have included an assessment of IAS as part of their initial characterisation of water bodies under the directive, to determine whether they are at risk of failing their environmental quality objectives (e.g. Ireland, UK). This could drive future management of IAS as Member States aim to achieve good ecological status for water bodies.	
12	Water Framework Directive: Common Implementation Strategy Guidance http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents&vm=detailed&sb=Title	Sets out guidance for implementation of the WFD by Member States, particularly the intercalibration exercise to harmonise understanding of 'good ecological status' in all MS as well as the results of national assessments.	Specific reference included in three guidance documents: REFCOND, IMPRESS, and COAST. Technical intercalibration work is coordinated by the EC Joint Research Centre (Ispra, Italy) and carried out within 14 Geographical Intercalibration Groups (groups of MS that share ecological types of rivers, lakes and coastal/transitional waters, and can thus compare monitoring results between themselves). Examples of river, lakes and coastal Intercalibration Groups include "Mediterranean rivers", "Northern lakes" or "North-East Atlantic".			
13*	Directive 2007/60/EC on the assessment and management of flood risks (OJ L288 of 6.11.2007) http://ec.europa.eu/environment/water/flood_risk/index.htm	To reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity, in both inland and coastal waters across the whole territory of the EU.	No specific reference to IAS. Because certain IAS directly affect water regulation services, there is scope to consider IAS control and management in implementing the Directive. MS are required to: carry out a preliminary assessment by 2011 to identify river basins and associated coastal areas at risk of flooding; draw up flood risk maps by 2013; and establish flood risk management plans focused on prevention, protection and preparedness by 2015. MS must coordinate flood risk management planning with river basin management planning under the water framework Directive and also in shared river basins, including with third countries. In solidarity, they must not undertake measures that would increase the flood risk in neighbouring countries. MS must also take into consideration long term developments, including climate change, as well as sustainable land use practices in the flood risk management cycle addressed in this Directive.	In 2008, a Floods Working Group was set up under the WFD Common Implementation Strategy.	None known.	
Wildlife/Nature Protection/Biodiversity						
14	The Wildlife Trade Regulations (Council Regulation 338/97/EC and Commission Regulation 1808/2001/EC), as amended by Commission Regulation 252/2005 http://ec.europa.eu/environment	Article 1 provides that the object of the Regulation is to 'protect species of wild fauna and flora and to guarantee their conservation by regulating trade therein [...]'. Article 4(6) provides that "[...] the Commission may establish general restrictions, or restrictions relating to certain countries of origin, on the introduction into the Community: (d) of live specimens of species for which it has been established that their	Specific provisions address trade pathways for proven IAS, into and within the Community. Article 4(6) provides that "[...] the Commission may establish general restrictions, or restrictions relating to certain countries of origin, on the introduction into the Community: (d) of live specimens of species for which it has been established that their	There have been no new IAS listings since 2006. Commission Recommendation of 13 June 2007 (2007/425/EC) identifying a set of actions for the enforcement of Regulation No 338/97 calls on MS to take actions to increase enforcement capacity for wildlife trade crime, including:	Effectiveness of the Regulations was reviewed in 2002 by Adrados and Briggs. The analysis concluded that the Regulations were not sufficient to deal with all problems related to IAS, and the Regulations were also not preventing ecological impacts from the two species that were listed under Article 4(6) at the time.	Outermost Regions are covered by this Regulation, though <i>O.jamaicensis</i> is native in Guadeloupe and

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	t/cites/legis_wildlife_en.htm		<p>introduction into the natural environment of the Community presents an ecological threat to wild species of fauna and flora indigenous to the Community.'</p> <p>Article 9(6) provides that 'Under the procedure laid down in Article 18, the Commission may establish restrictions on the holding or movement of live specimens of species in relation to which restrictions on introduction into the Community have been established in accordance with Article 4 (6).'</p> <p>Four species continue to be subject to restrictions on import into the EC (under Article 4(6) but not to any intra-Community restrictions under Article 9(6):</p> <ul style="list-style-type: none"> • red eared slider (<i>Trachemys scripta elegans</i>) • American bullfrog (<i>Rana catesbeiana</i>) • painted turtle (<i>Chrysemys picta</i>) • American ruddy duck (<i>Oxyura jamaicensis</i>). 	<ul style="list-style-type: none"> • training/awareness raising for enforcement agencies, prosecution services and judiciary; • ensuring all relevant enforcement agencies have access to adequate training on Regulation 338/97 and on species identification; • provision of adequate information to public and stakeholders to raise awareness about negative impacts of illegal wildlife trade; • in addition to checks at border-crossing points required under Regulation 338/97, ensure in-country enforcement through regular checks on traders and holders (eg pet shops, breeders and nurseries); • systematic use of risk and intelligence assessments to ensure thorough checks at border-crossing points and in-country (Art.II.d-h) <p>MS should also take actions (Art.III) to increase co-operation and information exchange, including:</p> <ul style="list-style-type: none"> • procedures for coordinating enforcement among all relevant national authorities (eg through establishment of inter-agency committees, memoranda of understanding and other inter-institutional cooperation agreements); • facilitating access for relevant enforcement officers at all levels, including front line staff; to existing resources, tools and channels of communication for exchange of information; • appointing national focal points for exchange of wildlife trade information and intelligence; • sharing information about significant trends, seizures and court cases at regular meetings of the Enforcement Group and intersessionally; • co-operating with enforcement agencies in other MS on investigations of offences and supporting capacity building for application of the Regulation in other MS; • making available to other MS awareness-raising tools/materials aimed at the public/stakeholders. 		Martinique (BirdLife International, 2006).
15	<p>The Habitats Directive (92/43/EEC)</p> <p>http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm</p>	Article 2 provides that the aim of the Directive is to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States.	<p>Specifically addresses IAS.</p> <p>Article 22.b (under Supplementary Provisions) provides that Member States shall '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. [...].</p> <p>Article 6 sets out MS obligations in relation to Special Areas of Conservation (areas that make up the Natura 2000 network established under the Directive). These include avoiding deterioration of natural habitats and disturbance of species, both of which could be driven by IAS in specific circumstances. Plans or projects (which could include release of new species) should be subject to appropriate assessment of implications for the conservation objectives of Natura 2000 sites.</p>	<p>Guidance document on application of Article 6(4) published in January 2007 provides clarification on assessment requirements, including the concepts of alternative solutions, imperative reasons of overriding public interest, compensatory measures and overall coherence.</p> <p>Updated version of Interpretation Manual of European Union Habitats – EU-27 published in July 2007 (takes account of the accession of Bulgaria and Romania and of “Guidelines for the establishment of the Natura 2000 network in the marine environment: application of the Habitats and Birds Directives” (May 2007)).</p> <p>Guidance for the management of selected habitats for Natura 2000 launched by Commission on 4 July 2008.</p>	<p>The latest round of Article 17 reports prepared by MS, covering 2001-2006, were filed in the first half of 2008. The majority of MS (16 out of the 23 reports examined) did not report on implementation of Art.22.b even though several of them are pursuing active IAS policies or management programmes. MS that did report on this provision took different approaches (species/habitat-specific impacts c.f. general information). NB The report form requests information on:</p> <ul style="list-style-type: none"> • Annex I habitat types affected by the introduction; • Annexes II, IV or V species concerned; • Introduction period; • Regulation measures take to avoid threats/damages; • General description of the main measures taken. <p>(see http://ec.europa.eu/environment/nature/knowledge/rep_habitats/index_en.htm#csa).</p> <p>NB: For some habitat types, non-native species are included in the EU Habitats Interpretation manual as characteristic species (eg 3150, which includes <i>Azolla</i>, an introduced water fern that is subject to control in some places). The Austrian report references <i>Pacifastacus</i></p>	

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					<i>leniusculus</i> (threat to <i>Austropotamobius pallipes</i> , <i>Austropotamobius torrentium</i>) and notes that a legal exemption of <i>Orconectes limosus</i> was made from the full protection of all crayfish species to allow for selective elimination of that species.	
16	The Birds Directive (79/409/EEC) as amended http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm	Covers the protection, management and control of wild birds, and lays down rules for their exploitation.	<p>Specifically addresses IAS.</p> <p>Article 11 provides that MS 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 addition, MS have obligations to manage sites under the Directive, including avoiding deterioration of habitats or any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article. Member States are also obliged to avoid deterioration of habitats outside the protection areas. IAS can be drivers of habitat deterioration and disturbance, so IAS management may be included in measures needed to implement the Directive.</p> <p>Some species alien to the whole of Europe are protected through inclusion in the Annexes to the Directive: eg. the known IAS Canada goose <i>Branta canadensis</i> (Annex II/1). Some species that are alien/established in some MS are also listed in Annex II/1; eg.</p> <ul style="list-style-type: none"> • <i>Anser anser</i> (alien/established in Austria, Belgium and Germany); • <i>Anser fabalis</i> (alien/established in Finland) ; • <i>Anas penelope</i> and <i>Anas strepera</i> cryptogenic/established in Belgium, Estonia, Great Britain; • <i>Columba livia</i> (alien/established in Austria, Belgium, Denmark, Estonia, Finland, Hungary, Latvia, Lithuania, Netherlands, Poland, Spain, Sweden); • <i>Streptopelia decaocto</i> (alien/established in Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden. <p>See species-specific factsheets produced through DAISIE (http://www.europe-aliens.org/speciesFactsheet)</p>	<p>In 2008, the Commission updated its Guidance document on hunting under the birds Directive, issued under the Sustainable Hunting Initiative which aims to improve understanding of the legal and technical aspects of the Directive's provisions on hunting and support scientific, conservation and awareness raising measures to promote sustainable hunting under the Directive. The Guidance mentions Art.11 very briefly, in terms of threats that introduced species may pose to rare and more widespread species, including those subject to hunting. However, it does not address hunting as a pathway in its own right for introductions of alien species (eg stock replenishment).</p> <p>See http://ec.europa.eu/environment/nature/conservation/wildbirds/hunting/index_en.htm)</p>	<p>Reporting on introduced species has not been consistent through the period of application of the Directive, despite a specific question in the reporting format. Several MS have reported issues with specific introduced birds, eg Ruddy duck, monk parakeet, rose-ringed parakeet, Canadian goose, Egyptian goose.</p> <p>The most recent Report from the Commission on the implementation of the Directive COM/2006/ 0164 final dated 12 April 2006) reported for EU-15 that "No new introductions are reported. The Ruddy duck features most frequently in national reports, as a non-native species (Ireland, Spain, Sweden and UK). In Spain, control measures appear to have been effective with no hybrids sighted for over a year; in Sweden and Ireland hunting is a means of controlling numbers; in the UK, a limited control trial is underway to establish whether it is feasible to eradicate the species entirely. A number of other species are causing some concern, notably geese in the UK and Ireland. Monitoring schemes are in place for non-native species in Italy (110 non-native species) and the UK (introduced species with small breeding populations; non-native, non-breeding waterfowl and hybrids)".</p>	
17	Council Directive 1999/22/EC of 29 March 1999 relating to the keeping of wild animals in zoos	The objectives of this Directive are to protect wild fauna and to conserve biodiversity by providing for the adoption of measures by Member States for the licensing and inspection of zoos in the Community, thereby strengthening the role of zoos in the conservation of biodiversity	IAS could be considered in the context of Article 3 that states that MS should take measures to prevent the escape of animals in order to avoid possible ecological threats to indigenous species and preventing intrusion of outside pests and vermin. This is relevant to preventing unintentional introduction of animal IAS (including alien diseases and pests) from zoos.	None found.	No information found.	

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18	<p>Biodiversity Communication and Action Plan (COM (2006) 216 Final)</p> <p>(Communication on Biodiversity: Halting the Loss of Biodiversity by 2010 - and Beyond (22 May 2006)</p> <p>Endorsed by Committee of the Regions of 6 December 2006 CdR 159/2006 fin; Opinion of the European Economic and Social Committee of 15 February 2007 NAT/334 - CESE 205/2007 fin DE/Ho/hn; Committee on the Environment, Public Health and Food Safety (Rapporteur: Adamos Adamou), European Parliament, 28.3.2007</p>	<p>The Communication identifies four key policy areas for action to 2010 and beyond. It then sets out priority objectives related to each of the four policy areas and explains their scope.</p> <p>NB The Communication builds on the Message from Malahide (2004) http://ec.europa.eu/environment/nature/biodiversity/policy/pdf/malahide_conf_report.pdf</p>	<p>A priority objective in Policy Area 1 (Biodiversity in the EU) is 'to reduce the impact on EU biodiversity of invasive alien species and alien genotypes'.</p> <p>The EU Action Plan for 2010 and Beyond (Annex 1) includes specific actions for IAS, including developing a Community Strategy to address IAS which may contain measures to fill gaps; and establishing an early warning system for the prompt exchange of information between countries on the emergence of IAS and cooperation on control measures across national boundaries.</p> <p>The Council's Conclusions on COM(2006)216 of 18 December 2006, call on the Commission:</p> <ul style="list-style-type: none"> to assess gaps in the current legal, policy and economic framework for IAS prevention, control and eradication; in cooperation with MS, to prepare an EU strategy and an effective early warning system, taking into account biogeographical regions, on the basis of the CBD Guiding Principles, taking into account the Bern Convention European Strategy on Invasive Alien Species and recognizing the efforts made by relevant Conventions and Organisations such as IPPC and EPPO. 	<p>In early 2008, DG ENV created a dedicated IAS webpage (http://ec.europa.eu/environment/nature/invasivealien/index_en.htm) and ran an online policy consultation in which:</p> <ul style="list-style-type: none"> 91% of respondents agreed on urgent need for new measures to prevent the spread of IAS; 85% agreed on the importance of preventing the introduction of IAS in the wild; 90% supported an EU-wide early warning system; 86% thought that MS should be legally obliged to take action against the most harmful IAS; 90% considered that lack of public awareness would constitute a barrier to launching more stringent policies, and that it was therefore important to raise the profile of the issue (77%). <p>DG ENV organised consultations with Member State representatives, Stakeholders and Commission Services from June 2007-June 2008 and developed a joint Discussion Paper that has been used to inform development of the Commission Communication on IAS, due November 2008.</p> <p>The Commission jointly organised the European Conference on Invasive Alien Species with the Biodiversity Foundation of the Spanish Ministry of the Environment (Madrid, 15-16 January 2008) which produced recommendations to support development of IAS policy at European and national levels (Fundación Biodiversidad, 2008).</p>	<p>The Communication calls on MS to develop and implement national IAS strategies and to ratify and implement the International Convention for the Control and Management of Ship's Ballast Water and Sediments, adopted under the auspices of the International Maritime Organisation. As of 1 October 2008:</p> <ul style="list-style-type: none"> 7 MS have a specific IAS Strategy (or have completed their draft strategies and expect endorsement by end 2008); 5 MS are developing specific IAS strategies; 10 MS include IAS-related measures (level of detail varies) in their National Biodiversity Strategy or equivalent; One MS (Spain) has ratified the BWM Convention; four others indicate that preparatory work is well advanced. 	<p>Working session on IAS included in IUCN-EC Conference on The European Union and its Overseas Entities: Strategies to counter Climate Change and Biodiversity Loss (Réunion, 7-11 July 2008).</p>
Sanitary/Phytosanitary						
19	<p>Directive on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread in the Community (2000/29/EC) as amended.</p> <p>The 'Plant Health' Directive</p> <p>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0029:EN:HTML</p> <p>Rules for allocation of a financial contribution from the Community for plant-health control laid down by Regulation (EC) No 1040/2002 of 14 June 2002 and for inspection infrastructure by Regulation (EC) No 998/2002 of 11 June 2002</p>	<p>This Directive concerns protective measures against the introduction into the MS from other MS or third countries of organisms which are harmful to plants or plant products. The general principles are based upon provisions laid down in the International Plant Protection Convention concluded under the auspices of the United Nation Food and Agriculture Organisation and, in the World Trade Organisation Agreement on the Application of Sanitary and Phytosanitary Measures.</p>	<p>No specific reference to IAS (consistent with IPPC terminology, the terms "alien" or "non-native" are not used).</p> <p>The Directive applies to those categories of IAS that are included in its definition of 'harmful organisms' (pests of plants or of plant products, which belong to the animal or plant kingdoms, or which are viruses, mycoplasmas or other pathogens). Pests may be direct or indirect (eg weeds of cultivation). The definition of "plants" is not restricted to cultivated plants, so the Directive may apply to organisms that could harm wild (unmanaged) plants. The Directive requires phytosanitary certificates for specified plants/plant products entering from third countries, plant passports for certain plants/plant products in intra-Community trade and prohibition of import or introduction of certain organisms (detailed lists are contained in Annexes to the Directive). Specific 'protected zones' may be established within MS in relation to particular harmful organisms. Certain organisms must be targeted for eradication or control if detected. The Commission's Food and Veterinary Office manages EUROPHYT, an electronic rapid alert system between the Commission and Member States,</p>	<p>The Working Party of Chief Plant Health Officers (COPHS, represents MS National Plant Protection Organisations) has periodically considered phytosanitary aspects of IAS since 2002 when it found that most of the CBD Guiding Principles were already covered by the Directive and that IAS "which are harmful to plants in an area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled, are quarantine pests and should be subjected to measures according to IPPC provisions and standards" (SN 4411/02, 19.12.2005).</p> <p>In 2005, it "agreed that a joint exchange of views with DG SANCO and DG Environment might be useful in the near future in order to clarify the links between plant health and environmental legislation" and noted the importance of Pest Risk Analysis in this context (15634/05, 21.12.2005). In 2007, it stated that "despite the importance the IPPC assigns to the subject of invasive alien plants, the activities and recommendations from EPPO, and the support for these activities by the COPHS, not a single invasive alien plant is regulated in the framework of the Directive 2000/29/EC up to now." (10985/07, 3.7.2007).</p> <p>On 1 June 2009, the Commission launched a 12-month evaluation of the Community plant health regime to take account of e.g. relevant treaty developments,</p>	<p>MS appear to have been active in implementing the Directive which is the binding legal instrument used to implement the IPPC within the EU. However, as noted (preceding column), this does not currently list any invasive alien plant in its annexes.</p> <p>Some MS have incorporated measures for certain invasive alien plants in their plant protection/agricultural legislation, aligned with EPPO recommendations with regard to invasive alien plants eg Latvia.</p>	<p>There are specific references to the French overseas departments and the Canary Islands in art 1. The Directive does not apply to Ceuta or Melilla (art 1(3)).</p>

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				globalisation and changed expectations from society, erosion of the scientific expertise underpinning the existing Community regime and the establishment of EFSA. Based on the evaluation, a Community plant health strategy will be developed.		
20*	Forest Reproductive Materials Directive (Council Directive 1999/105/EC) http://ec.europa.eu/food/plant/propagation/forestry/index_en.htm	To ensure the plentiful supply of high quality forestry reproductive material of the species concerned within the Community by stipulating that forest reproductive material may not be marketed unless it is of one of four categories specified by the Directive. Forest reproductive material coming from third countries may only be marketed within the Community if it provides the same assurances as Community material.	References biological diversity of forests as one of goals. "Forest reproductive material of tree species and artificial hybrids which are important for forestry purposes should be genetically suited to the various site conditions and of high quality; the conservation and enhancement of biodiversity of the forests including the genetic diversity of the trees is essential to sustainable forest management".	Information on units of approval of basic material approved on a MS territory is held in a national register, including information about the area(s) in which the material is found or the exact geographic location (depending upon the category). This is crucial for determining whether any particular forest reproductive material is suitable for a site under consideration. A Community list is drawn up on the basis of the national lists, in order to ensure that the scheme operates smoothly across the whole of the Community. The unique register reference, shown on the master certificate issued by official bodies after harvesting, is central in the provision of information and the tracing of material.	Commission Decision 2003/122/EC, in view of difficulties in obtaining information from 3 rd countries and to prevent trade patterns from being disrupted, provided MS with time-limited authority to decide which forest material from 3 rd countries could be marketed. MS were required to notify the Commission of decisions taken.	
21	The species-specific and general Directives containing precautions against animal disease introductions. There are a large number of these Directives and also Regulations These relate to specific types of animals and animal products, and are too numerous to list individually here Co-financing of measures in the animal health sector by the European Community currently regulated by Council Decision 2006/965/EC.	The Directives contain a suite of measures relating to reporting of, prevention of entry of, eradication of, etc of animal diseases and pathogenic agents in the EC.	The Directives do not mention IAS, but regulate trade in animals and animal products to control animal diseases and pathogenic agents, some of which may also be IAS. The various instruments typically contain the following types of measures: control measures against major epizootic diseases to be taken as soon as disease is suspected; eradication and monitoring programmes for diseases already in the Community which are subject to national programmes co-financed by the EU; application of the concept of "regionalisation" in case of disease occurrence; registration of farms, identification of animals and establishment of a computerised system linking 2500 offices of the central and local veterinary authorities throughout the EU (ANIMO), which enables advance notification of the trade in animals and their products. Occurrence of the most important diseases must be notified to the Commission and the other MS, via the computerised Animal Disease Notification System, which now also involves many other European countries (EU acceding and candidate countries, Iceland, Norway, Switzerland, etc.); contingency plans in each MS for dealing with epizootic diseases; EU and national reference laboratories to ensure uniformity of testing and expert support to the Commission and the MS.	Commission Regulation (EC) No 318/2007 of 23 March 2007 laying down animal health conditions for imports of certain birds into the Community and the quarantine conditions thereof addresses avian influenza risks posed by third countries' imports. It was adopted on the basis of an assessment by the European Food Safety Authority (Panel on Animal Health and Welfare) of the risks posed by imports of birds caught in the wild and captive bred birds from third countries. The Regulation sets conditions for approved breeding facilities, animal health certification, marking (leg rings/microchips), transport, quarantine and monitoring. It does not apply <i>inter alia</i> to captive bred species reared or kept in captivity for eg breeding or re-stocking supplies of game (poultry); birds imported for conservation programmes approved by the competent authority in the MS of destination; pets accompanying their owner; or birds imported for zoos or experiments.	http://europa.eu.int/comm/food/animal/diseases/index_en.htm	
22*	Communication laying down the Action Plan for the implementation of the EU's Animal Health Strategy for 2007-2013 COM(2008) 545 final adopted on 10 September 2008 http://ec.europa.eu/food/animal/diseases/strategy/documents_en.htm	The EU Animal Health Strategy is based on the principle, "Prevention is better than cure". It covers the health of all animals in the EU kept for food, farming, sport, companionship, entertainment and in zoos; wild animals and animals used in research where there is a risk of them transmitting disease to other animals or to humans; and the health of animals transported to, from and within the EU.	The Strategy and Action Plan cover animal diseases and pathogenic agents that may also be IAS. The Action Plan sets out key actions and an indicative timetable structured around 4 pillars: <ul style="list-style-type: none"> • prioritisation of EU interventions (categorisation of animal-related threats); • EU animal health framework (single EU Animal Health Law proposed by 2010; legislative proposal for harmonised EU framework for responsibility and cost-sharing in detecting and eradicating diseases planned by 2011; • Prevention, surveillance and crisis preparedness (legislative proposal for better border biosecurity 			

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			to be adopted by 2010; reinforcement of on-farm biosecurity; fuller use of Community funds when addressing actions that will have positive impact on animal health, disease surveillance and traceability strengthened by 2011); <ul style="list-style-type: none"> science, innovation and research (stronger emphasis on cooperation, including European Food Safety Authority and Joint Research Centre). 			
23	Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_home.htm	Mandate to contribute to a high level of protection of human life and health, and in this respect take account of animal health and welfare, plant health and the environment, in the context of the operation of the internal market.	Powers to conduct PRA and to deliver or obtain scientific opinions that will serve as the scientific basis for the drafting and adoption of Community measures in the fields falling within its mission. EFSA, the Commission and MS shall cooperate to promote the effective coherence between risk assessment, risk management and risk communication functions (Art.22). The Scientific Committee and permanent Scientific Panels shall be responsible for providing the scientific opinions of the Authority, each within their own spheres of competence Art.28.4(c). shall provide opinions on multisectoral issues falling within the competence of more than one Scientific Panel, and on issues which do not fall within the competence of any of the Scientific Panels	Permanent Scientific Panels include Panels on plant health, plant protection products and their residues, animal health and welfare and on biological hazards.	in 2007 the European Food Safety Authority (EFSA) reviewed Pest Risk Assessments (PRA) for 3 species (<i>Lysichiton americanus</i> , <i>Hydrocotyle ranunculoides</i> and <i>Ambrosia artemisiifolia</i>) carried out by EPPO representatives in MS. These were held to be insufficient in proving the plant health-related damage claimed by their authors and were remitted to the authors concerned for further assessment.	
Genetically Modified Organisms						
24	Directive on the contained use of genetically modified micro-organisms (90/219/EC) http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:31990L0219:EN:HTML	To lay down common measures for the contained use of genetically modified micro-organisms for the purposes of protecting human health and the environment.	No specific reference, but focus of the Directive is on reducing the risks related to unintentional release of GMOs (some of which may be IAS). The Directive includes provisions for: classification and risk assessment; notification and approval system; accidents; enforcement; public consultation and information; accident and emergency plans; ; waste disposal, etc.	EU Policy on Biotechnology published by DG ENV in 2006 (see http://ec.europa.eu/environment/biotechnology/index_en.htm).	Fifth Summary Report on the experience of Member States with Directive 90/219/EEC, as amended by Directive 98/81/EC, for the period 2003 – 2006 issued on 30 November 2007(SEC(2007)1636). For updated information, see http://ec.europa.eu/environment/biotechnology/index_en.htm .	
25	Directive on the deliberate release into the environment of genetically modified organisms (2001/18/EC) http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:32001L0018:EN:HTML	The main aim of this Directive is to make the procedure for granting consent to the deliberate release and placing on the market of GMOs more efficient and more transparent, to limit such consent to a period of ten years (renewable) and to introduce compulsory monitoring after GMOs have been placed on the market. It also provides for a common methodology to assess the risks associated with the release of GMOs (the principles applying to environmental risk assessment are set out in Annex II to the Directive) and a mechanism allowing the release of the GMOs to be modified, suspended or terminated where new information becomes available on the risks of such release.	No specific reference, but focus of the Directive is on reducing the risks related to intentional release of genetically modified organisms (some of which may be IAS). The Directive makes public consultation and GMO labelling compulsory. A system of exchange of information contained in notifications is maintained. The Commission is obliged to consult the competent scientific committees on any question that may affect human health and/or the environment. The Directive requires registers to be established for the purpose of recording information on genetic modifications in GMOs and on the location of GMOs.	EU Policy on Biotechnology published by DG ENV in 2006 (see http://ec.europa.eu/environment/biotechnology/index_en.htm).	Second Report from the Commission to the Council and the European Parliament on the experience of member states with GMOs placed on the market under Directive 2001/18/EC issued in March 2007 (COM(2007) 81 final) and Annexes to the Report (SEC (2007) 274). For updated information, see http://ec.europa.eu/environment/biotechnology/index_en.htm .	

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26	European Parliament and the Council Regulation on transboundary movements of genetically modified organisms (EC 1946/2003) http://ec.europa.eu/environment/biotechnology/pdf/regu1946_2003.pdf	The objectives of this Regulation are to establish a common system of notification and information for transboundary movements of genetically modified organisms (GMOs) and to ensure coherent implementation of the provisions of the Cartagena Protocol on Biosafety on behalf of the Community. ‘Transboundary movement’ means the intentional or unintentional movement of a GMO between one Party or non-Party of the Cartagena Protocol and another Party or non-Party of the Protocol, excluding intentional movements between Parties within the Community.	No specific reference, however the Regulation applies to the transboundary movements of all GMOs that may have adverse effects on the conservation and sustainable use of biological diversity, also taking into account risks to human health. Yes, when the IAS in question are GMOs.	EU Policy on Biotechnology published by DG ENV in 2006 (see http://ec.europa.eu/environment/biotechnology/index_en.htm).	None found	
27	Council Regulation setting up a Community regime for the control of exports of dual-use items and technology (EC 1334/2000) (amended by Regulation (EC) No 1183/2007 of 18 September 2007) http://trade.ec.europa.eu/doclib/docs/2006/march/tradoc_127868.pdf	The Regulation sets up a Community system of export controls for dual-use items. ‘Dual-use items’ mean items, including software and technology, which can be used for both civil and military purposes, and shall include all goods which can be used for both non explosive uses and assisting in any way in the manufacture of nuclear weapons or other nuclear or explosive devices.	No specific reference to IAS. The Regulation applies to the exportation of micro organisms/GMOs that could be used for military purposes (Annex 1 of the Regulation) and could be relevant to IAS that are GMOs that could be used in military purposes.	On 11 September 2008, the Commission adopted a proposal for a Council Regulation amending and updating the list of dual use items set out in Annex I in conformity with the relevant obligations and commitments that Member States had accepted as a member of the international export control arrangements (see http://ec.europa.eu/trade/issues/sectoral/industry/dualuse/index_en.htm).	None found.	
European Funds						
28*	Regulation on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (EC) No 1698/2005) http://europa.eu/scadplus/leg/en/lvb/l60032.htm	The Regulation’s main purpose is contribute to the promotion of sustainable rural development throughout the Community in a complementary manner to the market and income support policies of the common agricultural policy, to cohesion policy and to the common fisheries policy.	No specific reference. MS are required to produce national strategic plans for 2007-2013 in line with Community strategic guidelines and national priorities, implemented through rural development programmes which specifically address measures to improve the environment and the countryside. Several activities related to IAS management are within the scope of the Fund, in relation to agri- and forest- environment payments.	The EAFRD has been operational since 1 January 2007. However there were delays in submission of national programmes by MS (by August 2007, out of 94 national and regional programmes, 87 had been sent to the Commission and 18 approved by the management committee). It is too early to make an overall assessment of the extent to which biodiversity objectives – including possible IAS control measures - are prioritised and promoted in these plans (European Commission 2008a).	Some MS are using their rural development programmes linked to EAFRD to support IAS control as part of land management (see Annex 3): Examples include: Hungary: EAFRD subsidies for biofuel plantation subject to conditions to prevent species spread. Slovakia: Order No. 160/2008 Coll. requires elimination of invasive alien plant species as one of the conditions for direct payments in agriculture (Rural Development Programme for 2007-2013).	
29*	Council Decision 2006/144/EC on Community Strategic Guidelines for Rural Development (programming period 2007-2013) (OJ L.55/20 25.02.2006) http://europa.eu/scadplus/leg/en/lvb/l60032.htm	The guidelines aim to: identify and agree the areas where the use of EU support for rural development creates the most value added at EU level; make the link with the main EU priorities (Lisbon, Göteborg) and translate them into rural development policy; ensure consistency with other EU policies, in particular in the fields of cohesion and environment; accompany the implementation of the new market-oriented common agricultural policy (CAP) and the necessary restructuring it will entail in the old and new Member States.	No specific reference. The Guidelines state that resources devoted to axis 2 should contribute to three EU-level priority areas: biodiversity and the preservation and development of high nature value farming and forestry systems and traditional agricultural landscapes; water; and climate change. Measures available under axis 2 should be used to integrate these environmental objectives and contribute to the implementation of the agricultural and forestry Natura 2000 network, to the Göteborg commitment to reverse biodiversity decline by 2010, to the objectives laid down in the Water Framework Directive 2000/60/EC and to the Kyoto Protocol targets for climate change mitigation. This could include measures to address IAS where they are compromising the chances of halting loss of biodiversity by 2010.		United Kingdom: IAS control for invasive weeds included in GAEC conditions for cross-compliance; control of grey squirrel, <i>Rhododendron ponticum</i> and other invasive plants under Woodland Grant scheme administered by Forestry Commission; multiple other grant mechanisms linked to EAFRD funding.	
30*	Regulation (EC) No 614/2007 of the European Parliament and of the Council of 23 May 2007	The Regulation establishes the financial instrument for the environment ("LIFE+"). The general objective of LIFE+ shall be to	No specific reference. IAS are clearly within the scope of LIFE+. Annex I	2 LIFE+ components are relevant to IAS: - ‘Nature and Biodiversity’ covers a wide range of	1992-2006: 187 IAS-related projects supported under earlier LIFE instruments (mainly LIFE NATURE) at cost of €44 million. 28 projects focused entirely on IAS	

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
	<p>concerning the Financial Instrument for the Environment (LIFE+) (OJ L149 of 9.06.2007)</p> <p>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007R0614:EN:NOT</p> <p>See generally http://ec.europa.eu/environment/life/</p>	<p>contribute to the implementation, updating and development of Community environmental policy and legislation, including the integration of the environment into other policies, thereby contributing to sustainable development. In particular, LIFE+ shall support the implementation of the 6th EAP, including the thematic strategies, and finance measures and projects with European added value in Member States.</p>	<p>contains measures that may be eligible for funding if they satisfy the criteria in Articles 3(2) and (3) in relation to added value. The list of measures includes: capacity building; networking; information and communications actions; and site and species management. These measures could be applied to IAS.</p>	<p>activities, not solely linked to the implementation of the habitats and birds Directives. The main criteria for selecting projects is the presence of innovative or demonstration measures to test/demonstrate biodiversity conservation objectives of the EC Communication Halting the loss of biodiversity by 2010 – and beyond (which explicitly mentions the need for measures against IAS);</p> <p>- ‘Information and Communication’ covers awareness raising campaigns related to implementation, updating and development of EU environment policy and legislation and could be used to cover IAS campaigns.</p> <p>The 2008 call for proposals was launched on 15 July 2008 and the final decision on projects for co-financing will be made in July 2009.</p>	<p>(€28.6 million) c.f. 159 projects had at least one IAS component (€15.4 million). Average of 12 IAS-related projects per year during LIFE programming period for average cost of €230,000 (ie nearly 3 million €/year). Alien plants addressed by 62.6% projects, alien animals by 27/8%, 9.6% projects targeted both groups (Scalera 2008).</p> <p>For compilation of LIFE-supported IAS projects, see: http://ec.europa.eu/environment/life/themes/animalandplants/lists/alienspecies.htm.</p>	
31*	<p>Council Regulation (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund (OJ L 223, 15.8.2006).</p> <p>http://europa.eu/scadplus/leg/en/lvb/l66004.htm</p>	<p>The Regulation establishes a European Fisheries Fund and defines the framework for Community support for the sustainable development of the fisheries sector, fisheries areas, and inland fishing.</p>	<p>No specific reference.</p> <p>IAS could be within the scope of two provisions. Article 29 provides that the Fund shall support investments in aquaculture that contribute to 'diversification towards new species' and/or to 'implementation of aquaculture methods substantially reducing negative impact or enhancing positive effects on the environment when compared with normal practice in the aquaculture sector'. The Fund may also be used to support broader measures in the common interest to protect and develop aquatic fauna and flora (Article 36).</p>	<p>It is still too early to determine to what extent the new European Fisheries Fund is being used to benefit biodiversity. The collection of basic scientific information to support periodic assessments of the progress of the CFP in incorporating environmental protection requirements, in particular biodiversity, should be covered under the Data Collection Regulation, currently under revision (European Commission 2008a).</p>	<p>None found.</p>	
32*	<p>Regulation (No 1080/2006) for the European Regional Development Fund (OJ 210/1 of 31.06.2006)</p> <p>http://ec.europa.eu/regional_policy/sources/docoffic/official/regulation/pdf/2007/feder/ce_1080(2006)_en.pdf</p> <p>See generally http://ec.europa.eu/regional_policy/index_en.htm</p>	<p>The ERDF shall contribute to the financing of assistance towards the reinforcement of economic, social and territorial cohesion by reducing regional disparities and supporting the structural development and adjustment of regional economies, including the conversion of declining industrial regions. In so doing, the ERDF shall give effect to the priorities of the Community, and in particular the need to strengthen competitiveness and innovation, to create sustainable jobs, and to promote environmentally sound growth.</p> <p>The mechanism is identified under the Biodiversity Action Plan as a key mechanism to reinforce compatibility of regional and territorial development with biodiversity in the EU.</p>	<p>No specific reference.</p> <p>IAS could be within the scope of the new structural funds programme for 2007-2013. The Regulation provides that funds can be used for environmental risk prevention, and specifically: stimulating investment for the rehabilitation of contaminated sites and land, and promoting the development of infrastructure linked to biodiversity and Natura 2000 and contributing to sustainable economic development and diversification of rural areas. Possibilities for financial support could include the development of regional IAS risk management plans and monitoring systems (stand-alone or part of a wider regional framework for risk management) which could be useful tools in addressing threats related to possible intentional or unintentional introductions of IAS, including IAS control and possibly complemented with restoration measures involving native species.</p>	<p>The evaluation of the new structural funds programmes (ERDF and Cohesion Funds) for 2007-2013 is largely complete. MS have reported an allocation of sums of €2700 million and €1090 million for spending on measures to promote biodiversity and nature protection (including Natura 2000) and for the protection of natural assets respectively. Around 80 % of these allocations are available in those regions benefiting from convergence status (EC 2008a, based on DG REGIO compilation of data from member states as at 12/11/2007).</p>	<p>INTERREG programmes funded by the ERDF are part of EU Cohesion Policy and support the objective of European territorial cooperation. Programmes cover three types of cooperation: cross-border, transnational and/or interregional. Some MS indicate that IAS management actions have been included in past or ongoing INTERREG-financed projects eg:</p> <p>INTERREG Quark Archipelago National Park project (Finland, 2001) for trapping of mink on islands;</p> <p>INTERREG IIIA: Within the Initiative “Neighbourhood Programme” (HU-SK-UA 2004–2006), Slovakia addressed IAS in its project: “Development of the Biomonitoring Network Supporting the Effective Management of Protected Areas”;</p> <p>INTERREG IIIB (Baltic Sea Region): Sweden produced information materials for fishery stakeholders on dealing with alien species in the aquatic environment;</p> <p>INTERREG IIIB : within HARBASINS project, report on status of the Pacific oyster invasion and possible consequences for the Wadden Sea ecosystem commissioned and international workshop (Denmark, Germany, Netherlands, UK) held on 22 March 2007 to develop management and research recommendations (see www.waddensea-secretariat.org).</p> <p>INTERREG IV: Netherlands (Noord-Brabant) and</p>	

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					neighbouring countries for IAS control in shared water catchments.	
33*	<p>Council Regulation No. 1084/2006 establishing a Cohesion Fund (OJ 210/79 of 31.07.2006)</p> <p>http://ec.europa.eu/regional_policy/sources/docoffic/official/regulation/pdf/2007/cohesion/ce_1084(2006)_en.pdf</p>	The Regulation establishes a Cohesion Fund for the purpose of strengthening the economic, social and territorial cohesion of the Community in the interests of promoting sustainable development.	<p>No specific reference.</p> <p>Dealing with IAS could be within the scope of the fund, but only where linked to other major projects that contribute to the aims of the fund.</p>	Budget for Structural and Cohesion Funds for 2007-2013 set at €347 billion (81.5% to be spent in the "Convergence" regions).		
Marine & Fisheries/Aquaculture						
34*	<p>Marine Strategy Framework Directive (Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy)</p> <p>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0056:EN:NOT</p>	<p>The Directive establishes a framework for MS to develop Marine Strategies designed to achieve good environmental status in the marine environment by 2020 at the latest, ensure the protection and preservation of that environment, prevent its deterioration and restore marine ecosystems in areas where they have been adversely affected. It promotes an ecosystem-based approach to management of human activities.</p> <p>“Environmental status” means the overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic and climatic factors, as well as physical and chemical conditions including those resulting from human activities in the area concerned.</p>	<p>IAS are clearly within the scope of the Directive. MS must make an initial assessment of the environmental status of their European marine waters in order to identify measures that must be taken to achieve ‘good environmental status’, which could include control/eradication of IAS. IAS are referenced in two annexes:</p> <p>Annex I (Qualitative descriptors for determining good environmental status): non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.</p> <p>Annex III (indicative list of characteristics, impacts and pressures). Table 1 (biological characteristics) requires an inventory of the temporal occurrence, abundance and spatial distribution of non-indigenous, exotic species or, where relevant, genetically distinct forms of native species, which are present in the marine region or subregion. Table 2 (Biological Disturbance’) includes Introduction of microbial pathogens, introduction of non-indigenous species and translocations.</p>	N/A	The Directive mandates cooperation between MS sharing a marine region or subregion to ensure a coherent approach. For certain regions (Baltic, North-East Atlantic, Mediterranean etc.), some MS are already engaged in cooperative marine activities that cover some IAS pathways.	
35*	<p>Council Regulation concerning use of alien and locally absent species in aquaculture (No.708/2007 of 11 June 2007) (OJ L168/1 of 28.06.2007)</p> <p>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:168:001:0017:EN:PDF</p>	The Regulation establishes a framework governing aquaculture practices in relation to alien and locally absent species to assess and minimise the possible impact of these on the aquatic environment and in this manner contribute to the sustainable development of the sector.	<p>IAS are the focus of this Regulation which refers to alien and locally absent species. It builds on the ICES and EIFAC Codes (see Annex I).</p> <p>The Regulation covers all aquaculture activities within MS jurisdiction (it does not apply to keeping of ornamental aquatic animals or plants in pet-shops, garden centres, contained garden ponds or aquaria). Each MS is required to designate a competent authority which may appoint an advisory committee. A permit is required for all routine movements (low risk): for non-routine movements, an environmental risk assessment (ERA) is additionally required and a permit may only be granted if, with mitigation measures, this shows low risk to the environment. The competent authority decides who bears the cost of ERA. The Regulation provides for contingency planning and monitoring for two years following release into open aquaculture facilities. There is no reference to liability or sanctions for environmental damage. The permit requirement does not apply to species listed in Annex IV (currently 10). MS that wish to restrict their use on their territory must comply with</p>	<p>The Regulation establishes a procedure for adding additional species to Annex IV (conditions include that species must have been used in aquaculture for a long time in certain parts of the Community with no ‘adverse effects’).</p> <p>Commission Regulation (EC) No 535/2008 of 13 June 2008 lays down detailed rules implementing the conditions necessary for adding species to Annex IV to Regulation 708/2007 and for the development of a specific information system concerning permits for introductions/translocations of alien and locally absent species in aquaculture.</p> <p>‘Adverse effect’ is defined to mean a case where scientific evidence shows that an aquatic species, after its introduction in a certain MS, cause <i>inter alia</i>, significant:</p> <ul style="list-style-type: none"> (i) habitat degradation; (ii) competition with native species for spawning habitat; (iii) hybridisation with native species threatening species integrity; (iv) predation on native species' population resulting in 	<p>The Regulation will enter into force on 1 January 2009.</p> <p>It is not yet clear how MS will build awareness of this instrument within the aquaculture sector. Data requirements to carry out a risk assessment of new alien species and to conduct post-introduction monitoring are extremely detailed (as under the voluntary ICES/EIFAC Codes). The technical and cost implications of this requirement may deter aquaculture operators from considering new alien species for their operations. Certain aspects (eg determination of ‘locally absent’) are likely to require an increase in biological expertise, especially taxonomy (pers. comm., S.Gollasch, 16 September 2008).</p> <p>At present, the UK and Ireland are the only MS following the voluntary requirements proposed in the updated ICES Code of Practice (2005). Swedish law prohibits the introduction of certain alien aquatic species. The Code is not in use in MS such as Spain, Italy, Germany, Belgium and France (pers. comm., S.Gollasch, 16 September 2008).</p>	The proposal specifically refers to transfers 'to, from or between the non-European territories of a Member State'.

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			<p>risk assessment procedures (Art.9).</p> <p>The Regulation requires prior consultation for proposed introductions that may affect neighbouring MS: the decision is then taken by the Commission after consulting the Scientific, Technical and Economic Committee for Fisheries (STECF) (established under Regulation (EC) No 2371/2002) and the Advisory Committee for Fisheries and Aquaculture (established by Decision 1999/478/EC) (Art.11).</p>	<p>their decline;</p> <p>(v) depletion of native food resources;</p> <p>(vi) spread of disease and novel pathogens in wild aquatic organisms and ecosystems.</p> <p>MS are required to establish and keep up to date an information system containing details of all requests for permits to introduce an alien species or to translocate a locally absent species (information sheets to contain data and follow format indicated in the Annex to this Regulation) and set up a website containing information specified in the Annex by 31 December 2009.</p>		
36*	<p>Integrated Maritime policy for the European Union (the ‘Blue Book’) (COM(2007) 575 final) and its Action Plan (SEC(2007) 1278) adopted by the European Commission on 10 October 2007</p> <p>http://ec.europa.eu/maritimeaffairs/policy_documents_en.html</p>	<p>The Policy and Action Plan support action towards integration of maritime affairs across the EU, use of tools for integrated policy-making, improved maritime surveillance, links between maritime spatial planning and integrated coastal zone management, maritime research and the operation of a European Marine Observation and Data Network. They address marine and air pollution by ships, implementation of the ecosystem approach in European fisheries and measures for mitigation and adaptation to climate change.</p>	<p>No specific reference.</p> <p>There is clearly scope to include IAS (especially marine pathways and vectors for alien species introductions) in the national integrated maritime policies that MS are required to prepare in collaboration with stakeholders. However, neither the Policy nor the Action Plan refer to alien species introduction vectors in the aquatic environment. Specifically, there is no reference to the BWM Convention or generally to ballast water.</p>	<p>The Action Plan requires the Commission to propose guidelines in 2008 for national integrated maritime policies and to report annually on EU and Member States' actions in this regard from 2009. The Commission will also organise a stakeholder consultation structure, feeding into further development of the maritime policy and allowing exchange of best practices.</p>	N/A	<p>The Action Plan supports the full integration of the 7 Outermost regions in an EU Maritime Policy. It proposes the participation of ORs and other islands in the networking activities under the <i>Regions for Economic Change</i> initiative in 2008.</p>
Ongoing Research						
37*	<p>Seventh Framework Programme for Research and Technological Development (RTD)</p> <p>http://ec.europa.eu/research/fp7/index_en.cfm</p>	<p>The Seventh Framework Programmes (FP7) for Research and Technological Development (RTD) sets out the Community RTD priorities and activities and aims to support the objectives of the Lisbon agenda (EU to become the ‘most dynamic competitive knowledge-based economy in the world’).</p> <p>It supports transnational research in thematic areas, including environment. Key themes are 1) prediction of climate, ecological, earth and ocean systems changes, 2) tools and technologies for monitoring, prevention and mitigation of environmental pressures and risks including those that affect health, and 3) tools and technologies for the sustainability of the natural and man-made environment.</p>	<p>Projects totally or partly addressing IAS that meet FP7 criteria may be funded (see eg PRATIQUE below). EU research can contribute directly to the need to increase knowledge and understanding of the threats posed by IAS through the emphasis on horizontal approach that can cut across different policy areas.</p> <p>FP7 (2007-2013) has total budget of € 53 billion and provides for the creation of a European Research Council.</p>	<p>The first call for proposals covered three biodiversity topics, related to development of the ecosystem services concept.</p> <p>The EEA commissioned a pilot study (Scalera 2008) to assess the contribution of IAS project costs supported by RTD Programme to developing an indicator under SEBI-2010 for EU response action to IAS threats. A cost indicator of this type could help a provide rationale for creating IAS policies and allocating funds to prevention, control and research.</p>	<p>1996-2006: 90 IAS-related projects funded under 4th, 5th and 6th RTD Framework Programmes at total cost of €88 million:</p> <ul style="list-style-type: none"> • 70 projects focused exclusively on IAS at a total cost of €81.3 million, of which 69% funded by EC; • 20 projects included an IAS component, at total cost €7.4 million. • Average of 7 IAS-related research projects funded per year (yearly budget of € 7 million). • Five additional FP6 projects (budget nearly €2.5 million) began in 2007 (Scalera 2008). <p>Some RTD-funded research contribute directly to IAS information mechanisms and policy development eg DAISIE, ALARM, IMPASSE, INCOFISH, EFFORTS. Others focused on specific IAS or groups. 35% (€35 million) covered phytosanitary research; 10% (€18.7 million) animal health and spread of epizooties, some of interest to human health.</p> <p>The EU has also contributed to administrative support for coordination of IAS-related projects funded under COST (Concerted action projects regarding international cooperation in the field of scientific and technical research) (2 projects on biological control) and under ERA-NET (<i>EUPHRESKO - Coordination of European Phytosanitary (Statutory Plant Health) Research</i>: funded by DG SANCO) (Scalera 2008).</p>	
38*	<p>Enhancements of pest risk analysis techniques</p>	<p>The purpose of PRATIQUE is to address the major challenges for pest risk analysis (PRA) in</p>	<p>IAS are specifically addressed by PRATIQUE which will produce the first structured inventory of</p>	<p>PRATIQUE began in June 2007 and will run for 39 months, coordinated by the Central Science Laboratory</p>		

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	(PRATIQUE) https://secure.csl.gov.uk/pratique/index.cfm	(a) predicting the entry and establishment of new plant pests, diseases and IAS in the EU, (b) estimating potential economic, environmental and social impacts and (c) preventing eradicating, containing and controlling invasions. This will be achieved through improvements to the functionality and user-friendliness of the current EPPO-PRA decision support scheme and a new decision support scheme to combat pest outbreaks.	PRA datasets for the whole EU and undertake targeted research to improve existing procedures and develop new methods for: <ul style="list-style-type: none"> the assessment of economic, environmental and social impacts; summarising risk in effective, harmonised ways that take account of uncertainty; mapping endangered areas; pathway risk analysis and systems approaches; guiding actions during emergencies caused by outbreaks of harmful pests. 	(UK). Results will be tested with a representative range of the major pests and IAS affecting EU cultivated and uncultivated habitats and will be independently validated by phytosanitary experts. The deliverables will be provided as protocols, decision support systems and computer programs with examples of best practice made available to pest risk analysts through modules and direct links to the PRA scheme hosted by the European and Mediterranean Plant Protection Organization (EPPO).		
39*	Development of new diagnostic methods in support of plant health policy CALL 2B: KBBE-2008-2B	The long-term objective is to enable DNA-barcoding identification for all quarantine plant pests or pathogens of statutory importance to significantly help tackle increasing risks to EU plant health from exotic pests linked to increased globalisation of trade in plants/products. The project will support better cooperation between EU diagnostic laboratories and potential moves towards reference laboratories by providing central approaches and a standardised and vouchered resource for using DNA/RNA sequence data in diagnostics for quarantine plants pests and pathogens.	Relevant to IAS that are pests of plants and plant products: identification techniques developed may have relevance to broader categories of potential IAS. Key work will include: obtaining or producing relevant vouchered sequence data for individual pests or pest groups and position them in a correct taxonomic context, developing generic diagnostic tools based on these barcode sequences; linking vouchered sequence information to published biological information; developing strategic approaches and methodologies to enable the establishment of DNA banks and access to digital voucher specimens	N/A		
40*	IMPASSE (Environmental impacts of alien species in aquaculture) http://ec.europa.eu/research/fp6/ssp/impasse_en.htm	IMPASSE will develop guidelines for environmentally sound practices for introductions and translocations in aquaculture, covering quarantine procedures, risk assessment protocols, and procedures for assessing the potential impacts of invasive alien species in aquaculture.	IAS are the sole focus of the project, which involves a review of the economic importance of aquaculture-related introductions and translocations, and the assessment of genetic interactions with wild populations. It is coordinated by the Joint Research Centre.	Outputs to project end (December 2008) included: <ul style="list-style-type: none"> review of the importance of alien species in aquaculture operations and aquaculture-based restocking practices; report on the spread of novel pathogens and disease resulting from alien species; reports on the social, ecological and economic impacts on ecosystems caused by the introduction of alien species; review of risk assessment protocols (environmental, fish disease, social, economic); report on mitigation-remediation procedures and contingency plans; a report on risk-assessment protocols and decision-making tools; Guidelines for environmentally sound practices for introductions and translocations. 		
41*	Effective Operations in Ports (EFFORTS) (EC Contract No. FP6-031486) http://www.efforts-project.org/	This FP-6 DG Research Integrated Project aims to improve the competitiveness of European port operations and the quality of the ports labour conditions and market.	The Project's component on 'Ports and Environment' notes that "invasive aquatic species are one of the four greatest threats to the world's oceans, and can cause extremely severe environmental, economic and public health impacts". Work Programme 2.2 covers pollution risks related to ship reception in ports ("Ballast waters pollutions during ships reception" and "Aluminium pollution related to the protection of ports infrastructures/quay"). Outcomes will include recommendations for treatment methods approval consistent with IMO criteria and to help port authorities regarding control activities and to	Project duration is 1 May 2006-1 November 2009. Project information notes that ports are currently not assessing the impact from ballast water but need to be aware of the current status and impact of different harmful aquatic organisms in ballast water and eliminate or at least reduce negative consequences. In case of economic, health or ecologic disaster, the ports liability (and not only of ship owners) could be at stake. At EU level, there is currently no treatment which complies entirely with the last IMO conditions (MEPC 55 10/2006).	Institutions from several MS are contributing to this integrated research in collaboration with the EC Joint Research Centre.	

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			prevent ecological impacts through harmful aquatic organisms in ballast water. Beneficiaries will include ports, citizens, the environment and all industries dependent on an intact aquatic biosphere like the fishing and the tourist industry.			
42	Delivering Alien Invasive Species Inventories for Europe (DAISIE) Research Project. http://www.europe-aliens.org/	DAISIE's aims are to: <ul style="list-style-type: none"> • create an inventory of invasive species that threaten European terrestrial, fresh-water and marine environments; • structure the inventory to provide the basis for prevention and control of biological invasions through the understanding of the environmental, social, economic and other factors involved; • assess and summarise the ecological, economic and health risks and impacts of the most widespread and/or noxious invasive species in Europe; • use distribution data and the experiences of individual MS as a framework for considering indicators for early warning. 	The sole focus is on IAS. DAISIE's outputs included a European one-stop-shop for information on biological invasions in Europe, the European Alien Species Expertise Registry: the European Alien Species Database: including all known established alien species in Europe, species distribution maps and spatial analysis; a breakdown by taxonomic groups and pathways/vectors; and a list of Europe's worse Invasive Alien Species. DAISIE's primary focus was on species and it does not cover all pathways for introduction (eg import into the Community) or certain categories of potential IAS (eg there is no information on human disease).	DAISIE was completed in 2008 (concluding conference on 'Biological invasions in Europe and the DAISIE initiative: current threats and future perspectives', Portoroz, Slovenia 23 January 2008). Building on the information resources developed and interlinked through DAISIE, the EEA launched a feasibility study for Developing a European Early Warning System for invasive alien species which is currently being conducted by DAISIE collaborators.	Research institutions from twelve MS participated in the DAISIE project, coordinated by ISPRA-Italy.	
43	Assessing Large scale Risks for biodiversity with tested Methods (ALARM) Research Project http://alarmproject.net/alarm	ALARM project goals are to: <ul style="list-style-type: none"> • develop an integrated large scale risk assessment for biodiversity as well as terrestrial and freshwater ecosystems as a part of environmental risk assessment, and to focus on risks consequent on climate change, environmental chemicals, rates and extent of loss of pollinators and biological invasions; • establish socio-economic risk indicators related to the drivers of biodiversity pressures as a tool to support long-term oriented mitigating policies and to monitor their implementation; • provide a contribution to objective based politics, to policy integration and to derive outcome-oriented policy measures in the field of biodiversity preservation by contributing to the integrated assessment of socio-economic drivers affecting biodiversity and integrated, long-term oriented means to mitigate them. 	IAS are specifically addressed by the project's Biological Invasions module to develop and test protocols to help prevent the introduction and spread of invasive species to European ecosystems. A range of taxonomic groups are being analysed using global and European databases. Risk analyses cover: the pathways of invasions; the invasibility of European ecosystems; characteristics of successful invaders; environmental drivers of invasion related to climate, land cover and population density; and the testing and integration of the elements named above where traditionally, these factors have been assessed separately. Impacts being taken into account include impact on: the gene pool of native species; the decline of native populations; the richness and functioning of ecosystems; socio-economic pressures (such as declines in agricultural, silvicultural or fishery yields); the management of invasive species, ie what is the effort of removing an invader from a system; and the integration of the previous analyses.	ALARM is contributing to the development of risk and impact assessments of biological invasions, in parallel to the IMPASSE project which focuses on aquaculture.	The biological invasions module of ALARM has produced deliverables such as: <ul style="list-style-type: none"> • Comparative analysis of the pathways of biological invasions in Europe (eg Hulme et al, 2008) • Predictive models of the susceptibility of representative European ecosystems to invasion • Risk index for non-native species and ecosystems in Europe. Deliverables are available through the project website.	
44	Streamlining European 2010 BioDiversity Indicators (SEBI-2010) Information on the project is available at http://biodiversity-chm.eea.eu.int/information/indicator/F1090245995	SEBI-2010, led by European Environment Agency, was set up in 2005 to select biodiversity indicators and maximise streamlining with national, regional and global indicators. It is linked to the CBD initiative to develop IAS indicator, coordinated by GISP.	The SEBI-2010 <i>Expert Group on Trends in IAS in Europe</i> has outlined strategy for development of IAS indicator, composed of 5 specific indicator elements to be further developed: <ul style="list-style-type: none"> • Cumulative number of alien species established in Europe since 1900 • Worst IAS threatening biodiversity in Europe • Impacts/abundance of IAS • Policy development • Cost 	Phase 1 (2005-7): first two indicator elements developed and proposed for inclusion in the set of European biodiversity indicators. Information to be broken down by major ecosystems (terrestrial, freshwater and marine) and selected taxonomic groups: vertebrates, invertebrates and plants (vascular plants, algae and fungi). Pilot project commissioned on Indicator 5 (Cost) (Scalera, R. 2008. EU funding for management and research of invasive alien species in Europe: Contract no. 3603/B2007.EEA.53070).	EEA indicated (Feb.2008) that the Expert Group is still in existence but is not currently funded. An EEA assessment report on general progress towards the 2010 target will be published in 2009. A specific chapter on IAS will be included in a new EEA report, 'Signals', published early 2009. EEA is currently negotiating with NOBANIS to obtain an expanded dataset for the indicator 'Cumulative numbers on invasive species establishing in Europe'. Indicator 4 (Policy development) does not have precise criteria: one option under discussion is to link this to IAS reporting requirements under the Bern Convention to cover national implementation of the European Strategy on IAS more concretely. Discussions are under way on	Data from Overseas Entities should be included, but at present it is unclear whether this will occur.

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
					how IAS should be reflected in the EEA Work Programme for 2009.	
Climate change/Renewable energies						
45*	Directive 2009/28/EC of 23 April 2009 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:EN:PDF	To establish a common framework for the promotion of energy from renewable sources. It sets mandatory national targets for the overall share of energy from renewable sources in gross final consumption of energy and for the share of energy from renewable sources in transport.	No reference to IAS but energy generated from biofuels and bioliquids may only count towards Community targets and be eligible for financial support if consistent with sustainability criteria (see Art.17), including: <ul style="list-style-type: none"> • Raw materials not to be obtained from specified categories of land of high biodiversity value (17.3), high carbon stock (17.4) or peatland (17.5); • agricultural raw materials cultivated in the Community and used for the production of biofuels and bioliquids to be obtained consistent with requirements of Annex II to Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers and in accordance with the minimum requirements for good agricultural and environmental condition defined pursuant to Article 6(1) of that Regulation. 	N/A	N/A	
46	EU biomass action plan (COM (2005) 628 adopted on 7 December 2005) http://ec.europa.eu/energy/res/biomass_action_plan/	Action plan is designed to increase the use of energy from forestry, agriculture and waste materials.	No specific reference to IAS. Relevant to IAS in the context of intentional introduction of plant species for biofuel production.	The Commission launched a public consultation on the preparation of a report on requirements for a sustainability scheme for energy uses of biomass (August-September 2008)	None found	Applicable
47*	White Paper “Adapting to climate change in Europe – options for EU action” (COM (2009) 147 final) adopted by the European Commission on 1 April 2009 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52007D0354:EN:NOT	Sets out a two-phase strategic approach to strengthen EU resilience in coping with climate change. The first phase of the Strategy will run until 2012 and will lay the groundwork for preparing a comprehensive EU adaptation strategy from 2013. Phase 1 will focus on four pillars of action: 1) building a solid knowledge base on the impact and consequences of climate change for the EU, 2) integrating adaptation into EU key policy areas; 3) employing a combination of policy instruments (market-based instruments, guidelines, public-private partnerships) to ensure effective delivery of adaptation and 4) stepping up international cooperation on adaptation.	No specific reference to IAS. White Paper notes that climate change could increase the spread of serious infectious vector-borne transmissible diseases including zoonoses, threaten animal wellbeing and also impact plant health, favouring new or migrant harmful organisms, which could adversely affect trade in animals, plants and their products. The impact of climate change must also be factored into the management of Natura 2000 to ensure the diversity of and connectivity between natural areas and to allow for species migration and survival when climate conditions change. In future it may be necessary to consider establishing a permeable landscape in order to enhance interconnectivity of natural areas.	On 1 April 2009, the Commission also presented three discussion papers on water, coasts and marine, agricultural and health issues based on the framework set out in the White Paper. The White Paper provides that most adaptation measures will need to be taken nationally and regionally, with Member State actions supported through an integrated and coordinated approach, particularly in cross-border issues and policies which are highly integrated at EU level. An Impact and Adaptation Steering Group will be established and, by 2011, a Clearing House Mechanism to exchange information on climate change risks, impacts and best practices.		Réunion recommends stronger reference to, or inclusion of, the ORs and OCTs
Forestry						

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
48*	<p>Communication on an EU Forest Action Plan (COM(2006) 302 final of 15.06.2006)</p> <p>http://ec.europa.eu/agriculture/fore/action_plan/com_en.pdf</p>	<p>The EU Forest Action Plan (building on the 1998 EU Forestry Strategy) establishes a framework for forest-related actions at Community and Member State level and serves as an instrument of coordination between Community actions and the forest policies of the Member States. Its overall objective is to support and enhance sustainable forest management and the multifunctional role of forests</p>	<p>IAS are specifically addressed in Key action 9: Protection of EU Forests which notes that global trade and climate change have increased the potential vectors for harmful organisms and invasive species.</p> <p>The Commission's commitments include:</p> <ul style="list-style-type: none"> • further analysis of factors affecting forest condition in Europe (including forest fires); • encouraging MS to form groupings to study particular regional problems with the condition of forests (NB this could include IAS that are forest pests with transboundary impacts); • support for research on protection of forests and phytosanitary issues under the 7th Research Framework Programme. <p>MS may, with support from the EAFRD and LIFE+:</p> <ul style="list-style-type: none"> • promote Natura 2000-forest measures and schemes for forest owners to engage in voluntary environmental commitments; • review and update broader protection strategies against biotic and abiotic agents, including studies on risk assessment in relation to harmful organisms and invasive species. 	N/A	None found	N/A
Soil						
49	<p>Proposed Soil Thematic Strategy COM(2006)231 final of 22.09.2006)</p> <p>http://ec.europa.eu/environment/soil/pdf/com_2006_0231_en.pdf</p>	<p>The proposed Strategy supports a common framework and principles for protecting soils across the EU, within which Member States will be in a position to decide how best to protect soil and how use it in a sustainable way on their own territory.</p>	No reference to IAS in current text.	N/A		
Development cooperation and external assistance						
50	<p>EU Development Policy: Joint statement 'The European Consensus on Development' (2006/C 46/01)</p> <p>http://europa.eu/scadplus/leg/en/lvb/r12544.htm</p>	<p>The Joint Statement on Development sets out a framework of common objectives, values and principles for development co-operation within the EU. It puts poverty eradication in line with the UN Millennium Development Goals (MDGs) as the overriding objective of the EU policy.</p>	<p>No specific reference.</p> <p>Addressing IAS can fall within the general biodiversity related scope of the Joint Statement, which commits the Community to support the efforts undertaken by its partner countries to incorporate environmental considerations into development, and help increase their capacity to implement multilateral environmental agreements, eg Convention on Biological Diversity. Additionally, protection of the environment must be included in the definition and implementation of all Community policies, particularly in order to promote sustainable development.</p>	<p>The Commission's Environmental Integration Manual, designed to assist in mainstreaming of environmental issues across all relevant policy areas, was completed in 2006. Advice covers integration of environmental considerations into Country Environmental Profiles which are the basis for programming much of EC external assistance.</p> <p>Annual Report 2007 on the European Community's Development Policy and the Implementation of External Assistance in 2006 (COM(2007) 349 final of 21 June 2007) highlights rolling 2006-2007 programme of 'Policy Coherence for Development' which plays a central role in reinforcing the EU contribution to developing countries progress towards the Millennium Development Goals. The aim is to maximise the positive impact of these policies on partner countries and to correct incoherence.</p>	None found	Applicable (with possible exceptions)

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
51	EU External Action: Thematic Programme For Environment and Sustainable Management of Natural Resources including Energy (COM(2006) 20) http://europa.eu/scadplus/leg/en/lvb/l28173.htm	A thematic programme for the environment and sustainable management of natural resources, including energy, is proposed to address the environmental dimension of development and other external policies as well as to help promote the European Union's environmental and energy policies abroad. The programme is delivered through a set of six instruments for Community external assistance under the Financial Perspectives 2007 to 2013 (see below).	Role of healthy and fully functional ecosystems providing several goods and services, eg resilience against IAS, is mentioned in the context of key environment and sustainable natural resource issues which are of concern to the EU (Annex 2). Addressing IAS can fall within the general biodiversity-related scope of the thematic programme. The thematic programme supports existing environmental initiatives such as the implementation of the Rio Conventions on climate change, biodiversity and desertification.	€120 million has been allocated to biodiversity-related matters under 2007-2010 ENRTP, including a component for climate change and biodiversity.	See under EDF below (South Atlantic project).	Applicable (with possible exceptions)
52*	EU External Action: Regulations for the instruments for external assistance in 2007-2013: 1638/2006/EC for European Neighbourhood Partnership Instrument (ENPI); 1905/2006/EC for Development Co-operation Instrument (DCI); 1717/2006/EC for Instrument for Stability (IfS); and 1257/96/EC on humanitarian aid). Council Regulation (EC) No.1257/96 concerning humanitarian aid Regulations on Macro Financial Assistance http://europa.eu/scadplus/leg/en/s05031.htm	In the context of the Financial Regulation, these six regulations provide the 'basic acts' for the relevant budget appropriations under Heading 4 'The EU as a Global Player' of the future Financial Perspectives.	No specific reference, although IAS could be addressed under the general environmental component of certain instruments. For example: the ENPI instrument states that Community assistance shall be used to support measures which pursue one or more of the following objectives [...] promoting environmental protection and good management of natural resources [...] supporting crossborder cooperation to promote sustainable economic, social and environmental development in border regions; the Development Cooperation and Economic Cooperation instrument states that the supported measures shall relate inter alia to [...] environmental protection.	N/A	None found	Applicable to a certain extent (ie some instruments)
53	Action Plan to accompany the EU Strategy on Climate Change in the Context of Development Cooperation – Action Plan 2004-2008 (adopted by the General Affairs and External Relations Council at its meeting on 22 November 2004) http://ec.europa.eu/development/i-center/repository/env_cc_com_2003_85_en.pdf	The Action Plan provides a tool for the EU Member States and the Commission to actively assist partner countries in their efforts to address Climate Change and implement the UNFCCC and the Kyoto Protocol.	No specific reference to IAS. The implementation of the Action Plan supports coherence/synergies with the CBD. This should cover aspects related to IAS ie assessment of risks associated with choice of potentially invasive species in afforestation projects for carbon sinks.	The Communication on Building a Global Climate Change Alliance between the European Union and poor developing countries most vulnerable to climate change (COM(2007) 540 final of 18.9.2007) will spend €60m in 2008-10 to create awareness and jointly address climate change between the EU and the most vulnerable developing countries. IAS could be integrated into funded projects in view of the recognised links between climate change and biological invasions.	None found	Applicable
54	European Neighbourhood Policy (ENP) – strategy paper COM(2004)373) http://ec.europa.eu/world/enp/documents_en.htm#1	The ENP is designed to give new impetus to cooperation with the EU's neighbours following enlargement. The policy applies to Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, Moldova, Morocco, the Palestinian Authority, Syria, Tunisia and Ukraine.	No specific reference In principle, IAS could be addressed under the general environmental objective of the strategy, eg as part of the EU-ENP cooperation activities.	The 2007 report on implementation (COM(2007) 774 final, 5.12.2007) commits the Commission to deepen its climate change dialogue and increase support for efforts to achieve a cleaner environment in the neighbourhood. IAS components could be integrated into certain areas proposed for stronger cooperation (eg the Danube Black Sea Task Force) and in general measures to promote shared environmental information systems, EIA, integrated coastal zone management and sustainable tourism throughout the region.	None found.	Not applicable

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
55	<p>The Cotonou Agreement between the ECP countries and the EC (signed on 23 June 2000)</p> <p>http://ec.europa.eu/development/geographical/cotonouintro_en.cfm</p>	<p>The Cotonou Agreement is a global and exemplary agreement that creates the basis for the ACP-EU cooperation. It is based on five interdependent pillars with the underlying objective of the fight against poverty: an enhanced political dimension, increased participation, and a more strategic approach to cooperation focusing on poverty reduction, new economic and trade partnerships and improved financial cooperation.</p>	<p>No specific reference to IAS.</p> <p>Addressing IAS as a cross-cutting issue within ACP cooperation could fall under the general provisions related to environment: Article 1 on objectives of the partnership; 'The principles of sustainable management of natural resources and the environment shall be applied and integrated at every level of the partnership.'; Article 49 on trade and environment: 'The Parties reaffirm their commitment to promoting the development of international trade in such a way as to ensure sustainable and sound management of the environment, in accordance with the international conventions and undertakings in this area and with due regard to their respective level of development.'</p> <p>Areas of cooperation under the Agreement can include aspects of IAS: Article 22: Cooperation on environmental protection and sustainable utilisation and management of natural resources shall aim at [...] supporting specific measures and schemes aimed at addressing critical sustainable management issues and also relating to current and future regional and international commitments concerning mineral and natural resources such as [...]tropical forests, water resources, coastal, marine and fisheries resources, wildlife, soils, biodiversity; protection of fragile ecosystems (e.g. coral reef); renewable energy sources notably solar energy and energy efficiency; sustainable rural and urban development; desertification, drought and deforestation; developing innovative solutions to urban environmental problems; and promotion of sustainable tourism.</p>	None found.	None found	Applicable
56	<p>Decision of the ACP-EC Council of Ministers on the Compendium providing policy guidelines in specific areas or sectors of cooperation (adopted in General Affairs Council meeting on 22-23 January 2001)</p> <p>http://ec.europa.eu/development/policies/legislation/policypapers_en.cfm</p>	<p>The compendium of texts on co-operation strategies is intended to provide detailed reference texts as regards objectives, policy orientations and operational guidelines in specific areas or sectors of co-operation, as provided for in article 20(3) of the ACP-EC Partnership Agreement. These orientations and guidelines will be developed and applied within the framework of the integrated approach for cooperation strategies as set out in the Agreement and on the basis of the provisions on development finance co-operation.</p>	<p>Relevant to IAS in the context of animal health: [...] cooperation should provide support for improved animal health and campaigns to control zoonoses, including, where justified, the development of infrastructure for that purpose.</p> <p>IAS could be addressed under the cross-cutting environmental objective, eg on preventive approach on the basis of the precautionary principle aimed at avoiding harmful effects on the environment as a result of any programme or operation.</p> <p>Specific areas of cooperation under the Agreement can include aspects of IAS, for example: Co-operation in the forestry sector shall give, for example, to improving sustainability of interventions in forest conservation and management [...] support locally adapted re-forestation and forest management activities [...].Cooperation in the fisheries sector assistance, for example, [...] for the formulation and implementation of sectoral fisheries policies that comply with the FAO Code of Conduct [...]</p>		None found	Applicable

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
57	EU Strategy for Africa: Towards a Euro-African pact to accelerate Africa's development (COM(2005) 489) http://europa.eu/scadplus/leg/en/lvb/r12540.htm	The purpose of the EU Strategy for Africa is to give the EU a comprehensive, integrated and long-term framework for its relations with the African continent. The principal objective is to promote the achievement of the UN Millennium Development Goals (MDGs) in Africa.	Yes, work on IAS mentioned as one of the areas to be supported by the EU in the context of environmentally sustainable future and conservation of biodiversity in Africa (Chapter 3.1.3.2). Yes, IAS is one of the areas to be supported to conserve biodiversity in Africa.	Communication on Interconnecting Africa: the EU-Africa Partnership on Infrastructure [COM(2006) 376 final]□The Partnership, based on the EU Strategy for Africa, is the EU's response to the AU-NEPAD Infrastructure Action Plan, will receive €5.6 billion from the 10th European Development Fund (EDF, 2008-13) and be supported by a new EU Infrastructure Trust Fund for Africa set up with the European Investment Bank (EIB). IAS considerations could be considered during the design of Partnership programmes to improve continental and regional infrastructure for transport networks and water, as these can open up new pathways for introductions between bioregions.	None found.	Applicable
58	A stronger partnership between the European Union and Latin America – strategy for the EU-Latin America partnership (COM(2005)636) http://ec.europa.eu/external_relations/la/index_en.htm	The strategy analyses the current challenges of EU-Latin America partnership and makes practical recommendations for revitalising the partnership. The recommendations put forward in the strategy include stepping up political dialogue between the two regions, stimulating economic and commercial exchanges, encouraging regional integration, tackling inequality and tailoring its development and aid policy.	No specific reference to IAS. IAS could fall under the strategy's objective to develop effective environmental dialogues with a view to promoting sustainable development. Biodiversity and implementation of CBD is one of the focal areas mentioned in this context (Chapter III-3.5).	Regional Programming Document 2007-2013 published on 12 July 2007 notes that additional regional integration measures could be taken in line with the EU Development Cooperation Initiative, giving particular attention <i>inter alia</i> to biodiversity (implementation of the Biodiversity Convention).	None found.	Not directly applicable
59	An EU-Caribbean partnership for growth, stability and development (COM(2006) 86) http://europa.eu/scadplus/leg/en/lvb/r12548.htm	The strategy aims to provide a foundation for the EU-Caribbean partnership. The objectives of the strategy are to create a political partnership based on shared values, address economic and environmental opportunities and vulnerabilities in the Caribbean and promote social cohesion and combating poverty.	No specific reference to IAS. IAS could be addressed under the general environmental objective of the strategy. The strategy states that 'the EU will support the current efforts of the Caribbean to engage into a proactive agenda to jointly manage structural environmental challenges such as [...] biodiversity [...]' (Chapter 4.2.)	None found.	None found	Applicable
60	Europe and Asia: A Strategic Framework for Enhanced Partnerships (COM(2001)469) http://europa.eu/scadplus/leg/en/lvb/r14202.htm	The Communication established a strategic framework for EU-Asia relationships and its subregions. The core objective is to core objective of strengthening the EU's political and economic presence across the region, and raising this to a level commensurate with the growing global weight of an enlarged EU.	No specific reference to IAS. One of the objectives for EU-Asia partnership is to strengthen the joint efforts on global environmental issues. In principle, IAS could fall under this broad scope.	None found.	None found	Not applicable
61	New partnership with South-East Asia (COM(2003)399) http://europa.eu/scadplus/leg/en/lvb/r14211.htm	The Communication established a strategic framework for the relationship between the EU and South-East Asia. This Communication identifies the strategic priorities for cooperation and outlines actions by which the EU's relationship with the Association of South East-Asian Nations (ASEAN) and the countries of South-East Asia could be improved.	No specific reference IAS could be addressed under the general environmental objective of the strategy. The strategy states that the Commission will continue to support bilateral and regional natural resource conservation and natural resource management projects and programmes, eg on biodiversity.	None found.	None found	Not applicable
Trade						
62	Sustainability Impact Assessment (SIA) As based on the Commission's Communication on Impact Assessment (COM (2002) 276) and guided by Handbook for Trade SIA	Sustainability Impact Assessment (SIA) is a process undertaken during a trade negotiation which seeks to identify economic, social and environmental impacts of a trade agreement. The purpose of an SIA is to integrate sustainability into trade policy by informing negotiators of the possible social, environmental and economic consequences of a trade agreement. An SIA should also provide	No specific reference to IAS. Issues related to trade and transport pathways for potential IAS could be considered as a part of the SIA environment/biodiversity related dimensions. According to the SIA Handbook, a detailed assessment of the impacts of a trade agreement on the three pillars of sustainable development can be	The Commission is conducting SIAs for all planned regional and bilateral free trade and partnership agreements. These studies will include an assessment of potential impacts on biodiversity (eg as a result of trade liberalisation in biofuels) and will identify possible preventive or mitigation measures. The SIA for the planned EC-Mercosur Free Trade Agreement will cover case studies in relation to the effects of trade liberalisation in agricultural products and biofuels. This	None in relation to IAS found	n/a

	Instrument	Main purpose	Extent applicable to IAS?	Policy developments since 2006	Recent evidence as to application/effectiveness?	Overseas Entities (application)
	http://europa.eu.int/comm/trade/issues/global/sia/faqs.htm	guidelines for the design of possible accompanying policy measures. Such measures may go beyond the field of trade as such, and may have implications for internal policy, capacity building or international regulation. Accompanying measures are intended to maximise the positive impacts of the trade negotiations in question, and to reduce any negative impacts.	undertaken if the preliminary overview on potential negative and positive impacts of outcome scenarios so suggests. This detailed assessment can include biodiversity related aspects (namely ecosystem, protected areas and species related objectives). If needed, it might be possible to address IAS as a part of this framework.	could provide an opportunity to screen biofuel pathways for IAS-related risks. From a biodiversity perspective, the Commission notes that in all cases, a key challenge will be to ensure that the recommendations made in these studies inform the negotiations, i.e. that they are translated into concrete policy measures, be they trade or non-trade related (EC 2008a).		
Overseas Countries and Territories (OCTs)						
63	Council Decision of 27 November 2001 on the association of the overseas countries and territories with the European Community ('Overseas Association Decision') (2001/822/EC) http://ec.europa.eu/development/policies/legislation/octslg_en.cfm	The Decision sets the basis for the association of the OCTs with the Community basing on the purpose set out in Article 182 of the Treaty, namely to promote the economic and social development of the OCTs and to establish close economic relations between them and the Community as a whole. It shall pursue the objectives laid down in Article 183 of the Treaty in accordance with the principles set out in Articles 184 to 188 of the Treaty by focusing on the reduction, prevention and, eventually, eradication of poverty and on sustainable development and gradual integration into the regional and world economies.	No specific reference to IAS The Decision states that the Community shall cooperate with the OCTs in the conservation, sustainable use and management of their biological diversity taking into account the Community Action Plan on biological diversity. Addressing IAS can fall within the general biodiversity related scope included in the Decision, eg supporting the implementation of CBD and the elaboration, updating and implementation of national biodiversity strategies and action plans.	The sixth OCT-EU Forum (Brussels, 27-28 November 2007) discussed the future OCT-EU Green Paper and general issues, including the islands' exceptionally high biodiversity and threats related to climate change (http://ec.europa.eu/development/icenter/repository/oct_forum_2007_report_en.pdf). The EC Biodiversity Communication (2006) emphasises that 'effective action in the biodiversity-rich OCTs of Member States is vital to the EU's credibility in this international arena'. The Green paper on the future relations between the EU and the overseas countries and territories is currently out to consultation (1 July-17 October 2008). The consultation document does not mention IAS but notes that all OCTs are characterised by a biodiversity that is much richer than in continental Europe as a whole and that these insular and isolated countries and territories constitute privileged locations for the development of endemic species. OCTs' environmental concerns merit special attention given their fragility in the face of climate change and their potential based on their biodiversity. The preservation of the OCTs' biodiversity is considered of major importance for the Community and for the world at large, but the current Overseas Association Decision does not confer any responsibilities on the OCTs to engage effectively in environmental protection and conservation activities according to Community standards. (http://ec.europa.eu/development/icenter/repository/1_EN_ACT_part1_v8.pdf)	The interlinkages between IAS, biodiversity management and climate change adaptation have been addressed by: <ul style="list-style-type: none"> • France (le Grenelle de l'Environnement): broad public consultation programme in 2007 which proposed a specific environmental programme devoted to French DOMs and OCTs (strategic fields include natural resources and biodiversity, with detailed IAS coverage); • UK (2006-2009 project coordinated by the Royal Society for the Protection of Birds <i>Increasing regional capacity to reduce the impacts of invasive species on the South Atlantic United Kingdom Overseas Territories</i>: funding of €2 million through EDF-9, Commission's EuropeAid Cooperation Office); • EDF funding provided through EuropeAid Cooperation Office to regional project on IAS in the Caribbean (<i>Management Needs of Nature-Protected Areas to support Sustainable Economies</i>) (Scalera 2008). 	Applicable
64	Commission Regulation on implementing Council Decision 2001/822/EC on the association of the overseas countries and territories with the European Community ('Overseas Association Decision') (No 2304/2002/EC) http://ec.europa.eu/development/policies/legislation/octslg_en.cfm	The Regulation lays down the procedures for the programming, implementation and control of the Community financial assistance to the OCT managed by the Commission under the This Regulation lays down the procedures for the programming, implementation and control of the Community financial assistance to the OCT managed by the Commission under the Ninth European Development Fund (EDF) covering the period 2003–2007, in accordance with the provisions of the Overseas Association Decision and the EDF Financial Regulation (EDF).	No provisions to address IAS directly or indirectly. However, the Regulation states that the Commission shall appraise the proposal for the OCT Single Programming Documents (SPD) to determine whether it contains all the elements required and is consistent with the aims of the Overseas Association Decision, this Regulation and the relevant Community policies.			
Outermost Regions						
65	Commission Communication of 26 May 2005 "A stronger partnership for the Outermost Regions" COM/2004/0343 final http://europa.eu/scadplus/leg/en/lvb/g24237.htm	The Communication recognises the remoteness, insularity, small size, difficult topography and climate, as well as economic dependence on a few products, faced by ORs and proposes measures consistent with European cohesion policy	No reference to IAS. The Communication notes environmental and climatic difficulties (including cyclones, volcanic activity and earthquakes) and the preservation of biodiversity: measures should concentrate on improving environmental conditions, the treatment of waste and taking into account the additional costs generated by particular climatic conditions.	None found.	None found.	Applicable.

Annex 3 UPDATED INFORMATION ON MEMBER STATE INSTRUMENTS AND ACTIVITIES RELEVANT TO IAS

1. AUSTRIA

Legislation: There is no general Federal legislation in place in relation to IAS, although the Austrian Law on Plant Protection (1995) covers IAS that are plant pests and the issue is under regional federal states (Länder) jurisdiction (Lebensministerium (Austria) 2005). The introduction of alien plants is restricted in eight of nine federal states, introduction of animals is restricted in all nine federal states. In some federal states, there is an exception for species introduced for fisheries, agricultural and forestry purposes.

Policy: Austria published a National Action Plan on IAS (2004) ('Aktionsplan Neobiota'). It is structured in four thematic fields, which cover 1) education and awareness rising, 2) capacity building, 3) research and monitoring, and 4) legal and organisational implementation. In each thematic field, actors, objectives, and measures have been addressed and prioritised. This Action plan is part of the revised Austrian national biodiversity strategy.

Research: Some research projects (eg inventory on IAS in Austria, ecological and economic impact of selected species, research on IAS under climate change in Austria) have been financed by governmental and research bodies. Austria is participating in the DAISIE, NOBANIS, ALARM and SEBI2010 projects. Austria hosted the 4th NEOBIOTA European Conference on Biological Invasions and a national conference on IAS and climate change is scheduled for 2009.

A risk assessment scheme (black list) to evaluate risks posed by IAS to native biodiversity project team has been developed by the Austrian Environment Agency in collaboration with the German Nature Conservation Agency. This is not legally binding, but will be used as a guiding instrument with results to be published online (possibly on www.neophyten.de). It is hoped that federal nature conservation authorities will use it as a decision-making tool with regard to applications to import or release animals and plants. The criteria used focus on documented negative impacts on native biodiversity, without reference to economic impacts. In accordance with the European Strategy on IAS (Genovesi and Shine, 2004), the scheme provides for different lists (black list, grey list) according to the certainty (or uncertainty) of the impact. The methodology has recently been approved by the German Agency for Nature Conservation and will be published by end 2008, followed by translation into English. Species lists will be developed separately for Germany and Austria. The system is currently being tested with selected plant and fish species to see how it works.

Eradication/control programmes: Eradication and control programmes, including monitoring, are underway for selected species (eg plants such as *Acer negundo*, *Ailanthus altissima*, *Fallopia japonica*, *F. sachalinensis*, *Fraxinus pennsylvanica*, *Heracleum mantegazzianum*, *Impatiens glandulifera*, *Populus x canadensis*, *Robinia pseudacacia*, *Solidago canadensis*, *S. gigantea*; animals such as *Anoplophora*

glabripennis, *Fascioloides magna*). Control is almost exclusively in protected or ecologically important areas (eg National Parks, pannonic dry grasslands). Hunting is allowed for some introduced animal species, and some pest species are under chemical control (especially pests of agriculture and forestry).

Other activities (botanic gardens and horticulture): In 2007, guidelines for actions related to alien plant species in botanic gardens¹ were jointly adopted by the *Verband Botanischer Gärten e.V* (the botanic garden federation of German-speaking countries) and the *AG Österreichische Botanische Gärten* (Austrian Botanic Gardens Working Group). These specify that botanic gardens have to take responsibility for informing the public (eg, by flagging ornamental plants potentially creating problems or by organising informative exhibitions) and raise awareness of the IAS problem generally and that they must take actions to reduce the risk of introducing new species that are potentially invasive in a region. For example, the Botanic Garden of the University of Vienna has eliminated Poison Ivy (*Toxicodendron radicans*) from its open area display to avoid the potential escape of this species (which causes serious allergic reactions) into the wild.

As part of implementation of the Global Strategy for Plant Conservation targets in Austria, the Austrian Ministry of Agriculture, Forestry, Environment and Water Management is currently supporting the establishment of a website at the site of the Austrian Botanic Gardens Working Group (linked inter alia to the corresponding sites at the Austrian Environmental Agency and the CBD-Focal Point). The site is intended to collect information about potential invasiveness of species cultivated at botanic gardens or newly reported as occurring in Austria as well as providing relevant links and documents. A trial online version will be operational from September 2008.

Challenges/limitations: Constraints to addressing all IAS issues identified in Austria are availability of sufficient funding and to some extent also the decentralised political and governmental structure, influencing cooperation on IAS at national and supranational level (Lebensministerium (Austria) 2005). One key improvement would be the establishment of a permanent national monitoring system for alien species. From the knowledge point of view, the information about alien species differs widely between different taxonomic groups.

2. BELGIUM

Legislation: At the Federal level, there are legal measures in place related to import, export and transit of non-indigenous wild bird species (*Arrêté royal portant des mesures relatives à l'importation et au transit de certaines espèces d'oiseaux sauvages non indigènes* of 26 October 2001, Art 3 §1) with an exception if the birds were bred in captivity. The deliberate introduction of alien species to the marine environment is forbidden (Royal Decree on the protection of species in the marine waters under Belgian jurisdiction, 2001). In addition, the Belgian Law of 20.01.1999 on the protection of the marine environment in marine areas under Belgian

¹ Kiehn M., Lauerer M., Lobin W., Schepker H., Klingenstein F., 2007. Grundsätze im Umgang mit invasiven und potentiell invasiven Pflanzenarten in Botanischen Gärten. Gärtn. Bot. Brief 169: 39-41.

jurisdiction forbids the intentional introduction of non-indigenous species in the marine environment without special licence (Art. 11, §1). The unintentional introduction of non-indigenous species via ballast water of ships can be prohibited by Royal Decree (Art. 11, §2), but is not currently addressed. Measures can also be taken (by Royal Decree and after scientific consultation) for the extermination of non-indigenous nuisance species (Art. 11, §3). The Law also prohibits the intentional introduction of genetically modified organisms into marine areas (Art. 11, §4).

Most activity in relation to IAS in Belgium is focused at the level of the three regions.

- In the Flemish Region, it is prohibited to introduce animals and plants without a permit (Forest Decree) in both public forests and forest reserves. The introduction of alien animal species is prohibited, and there is a legal base for measures to control and eradicate alien animal species. Measures can also be taken to control or prohibit the transport of animal species and their carcasses (Decree on Nature Conservation). A Decision describes what species of fish can be used as fish bait (only native fish species are allowed).
- In the Walloon Region: the introduction of non-indigenous species or indigenous species of non-indigenous origin in nature is prohibited except for species used for agriculture and forestry.
- In the Brussels Capital Region: it is prohibited to introduce non-indigenous species of birds into the wild.

Policy: Action 18 of the 2nd Belgian Federal Plan for Sustainable Development is devoted to biodiversity and focuses on sectoral integration of biodiversity in key Federal sectors (transport, economy, development cooperation, and scientific policy). The Action Plan for ‘integration of biodiversity in the economic sector’ (in preparation, adoption expected end 2008) will address IAS. Actions foreseen in this action plan include:

- consultation of key sectors to increase awareness and understanding of the issue and identification of the most appropriate measures (eg labelling, substitution, information, etc.)
- review/updating/extension of existing legislation at federal level to prevent introduction of IAS in Belgium.

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

- Strategic objective n°3: Maintain or rehabilitate biodiversity in Belgium to a favourable conservation status (operational objective n°3.7.: “*Avoid the introduction and mitigate the impact of invasive alien species on biodiversity*”);
- Strategic objective n°5: Improve the integration of biodiversity concerns into all social and economic sectoral policies (operational objective n°5.7.: “*Consider the potential impact on biodiversity, and in particular the invasiveness of species, in making import and export decisions*”). For the time being, this provision has not

yet been implemented and is thus not taken into consideration in Belgium's import and export policies, but the legal possibilities are currently being studied in detail as this constitutes a formal engagement at the national level².

The 'Belgian Forum on Invasive Alien Species (BFIS)'² is the Belgian node of the IUCN Invasive Species Specialist Group and the NOBANIS network. It aims to provide and gather scientific knowledge about invasive alien species in order to reduce threats to natural ecosystems.

Research: Several significant research projects relating to IAS have been undertaken in Belgium. These include: 'Invasive plants in Belgium: patterns, processes and monitoring' (INPLANBEL)³; alien crustaceans and molluscs in Belgium, 1996-ongoing, RBINS-MUMM; invasive species in the Walloon watercourses CRNFB, MRW-DCENN and FSAGx; 'Bijzondere Broedvogels Vlaanderen Project' (Flemish Special Breeding Bird Project). Research includes investigation of control of *Fallopia japonica* and *Heracleum mantegazzianum* in nature reserves.

Belgium has published a black list of invasive alien species based on a standardised impact assessment protocol (ISEIA). This list is the responsibility of members of the Belgian Forum on Invasive Species. It is not exhaustive and will be progressively completed. Species profiles including description, habitat preferences and detrimental impact are currently in development (see: <http://ias.biodiversity.be>).

Belgium participates in the ALARM project. The Walloon Region is funding a project dedicated to the identification of best management practices for the control of invasive plants (see <http://www.fsagx.ac.be/ec/gestioninvasives/pages/Accueil.htm>). Other ongoing research programs include:

- Alien impact: biodiversity impacts of highly invasive alien plants: mechanisms, enhancing factors and risk assessment ("Science for sustainable development" research programme 2007-2009, Belgian Federal Science Policy Service (Belspo);
- Modirisk : aims to study biodiversity of mosquitoes and monitor/predict changes, thus actively preparing to address issues related to the impact of biodiversity change with particular reference to invasive species and the risk of introducing new pathogens (Belspo).

Eradication/control programmes:

Control of IAS to protect dykes:

The Belgian regions are trying to eradicate both the muskrat and coypu, mainly to protect dikes. For this purpose, two international projects have been set up to address muskrat control: one between East- and West-Flanders and Zeeland (NL), another between West-Flanders, the North of France and the Walloon Region. A third project, aimed at coypu control, is now being established and will involve the Belgian and Dutch provinces of Limburg, and Germany.

A brochure on *Fallopia japonica*, *Heracleum mantegazzianum*, *Impatiens glandulifera* and *Senecio inaequidens* containing recommendations for the eradication

² Pers.comm., Claire Collin, Belgian federal Ministry for Health, Food Chain Safety and Environment.

or control of these species is available at the Ministry of the Walloon Region. Eradication/control programmes for these species are actively implemented along some river basins.

In Flanders there is active eradication of the Black cherry (*Prunus serotina*) in some areas and a programme to control the presence of floating pennywort (*Hydrocotyle ranunculoides*) in waterways. A localised but increasing population of an Asian squirrel species (*Callosciurus erythraeus*) was actively controlled in the spring of 2008: preliminary results indicate that this was very successful.

Other activities (reducing risk from invasive species by promoting use of natives): In the Flemish Region, subsidies are paid for planting and reforestation with native trees and shrubs under the ‘Bosdecreet’ (Besluit Vlaamse Regering du 27/06/2003 on subsidies for managers of private and public forests). The Flemish Institute for Nature and Forestry (INBO) has an advisory role and ensures that such native trees are used in appropriate locations. This legislation forms an integral part of Flemish forest policy which is different from the policy in place in the Walloon Region. However, subsidies for tree planting on agricultural land (Besluit Vlaamse Regering of 28/03/2003) are available for some exotic species (including larch (*Larix decidua*), Locust tree (*Robinia pseudoacacia*), Red Oak (*Quercus rubra*); Corsican pine (*Pinus nigra subsp. Laricio*); Douglas fir (*Pseudotsuga menziesii*) and poplar) which are promoted on economic grounds of more rapid and higher profitability.

Challenges/limitations: Belgium lacks effective coordination of its national and regional programmes (Royal Belgian Institute of Natural Sciences 2005). There is also a lack of a regulation tool for the introduction of biocontrol agents in Belgium. A legal framework and a risk assessment procedure must be developed at the federal level, taking into account the results of the ongoing research project by SPF_FOD (methodology in risk analysis for the registration of bio control agents-macro-organisms).

The Federal Public Service Health, Food Chain Security and Environment - DG Environment commissioned a survey on the legal aspects of IAS in 2006. The survey analysed all relevant Federal legislation, identified gaps and proposed legal options to be considered in order to regulate import, transit and trade of IAS⁴.

² See: <http://www.biodiversity.be/bbpf/>.

³ See project website at www.fsagx.ac.be/ec/inplanbel.

⁴ Information from Marianne Schlessler, Belgian representative at BEG 13 June 2006.

3. BULGARIA

Legislation: The Biological Diversity Law 2002 (amended most recently in 2007) defines regulation of the introduction of non-native and the reintroduction of native plant and animal species into the wild as one of its specific objectives (Article 2.4).

Article 67 provides that the introduction into the wild, import, breeding and raising of non-native animal and plant species shall only be permitted where this is not detrimental to natural habitats or to native species of wild flora and fauna or to any populations thereof. The authorisation of such activities, on the basis of an elaborated programme, is subject to a positive scientific expert assessment commissioned by the competent authority and a favourable decision of the National Council of Biological Diversity. The competent authority is the Head of the State Forestry Agency (tree, bush and game species) or the Minister of Environment and Water (all other species).

Conditions for the issue of permits by the respective authorities are laid down by *Regulation No.14 on the conditions and order for issuance of permits for introduction of non-native or reintroduction of native tree, bush and game species and giving of the public opinion* (SG 88/2005) and by *Regulation No.4 on the conditions and order for issuance of permits for introduction of non-native or reintroduction of native animal and plant species into the wild* (SG 65/2003).

The competent authority may also issue an order prohibiting the introduction into the wild of any non-native species that would threaten natural habitats or native species and/or the import, breeding and raising of non-native animal and plant species whose accidental introduction into the wild would threaten the existence of any native species of wild flora and fauna (Art.67). No such prohibitions have been issued to date (but see under Research below).

The introduction of plant and animal species not characteristic of the region is prohibited in protected natural territories (national and nature parks, reserves and protected sites) pursuant to Articles 21 and 31 of the Protected Territories Law 1998 (amended most recently in 2008).

The introduction of alien species and the repeated introduction of local species of fish and other aquatic organisms into inland, coastal and marine waters must be conducted in accordance with the Biological Diversity Law (Art.9.2, Fishery and Aquaculture Law 2001 as amended in 2005). This Law designates the Minister of Environment and Water and the Ministry of Agriculture and Food Supply as responsible authorities for preservation of biodiversity of fish resources.

Phytosanitary requirements for the import, export, transit, production and transfer within the country of plants, plant products and other products and specification of border control points are laid down by the Plant Protection Law (State Gazette of 28 March 2003) and by Regulation No.1/1998, SG No 82/1998 (amended by No 91/1999, No 8/2002, No 18/2003, No 7/2006) which implements the legal regulations of EC Directives 77/93, 92/90 and 92/105. The competent authority is the Ministry of Agriculture and Food Supply.

Policy: The National Biodiversity Conservation Strategy (1998), currently implemented through the National Biodiversity Conservation Action Plan 2006-2010, identifies IAS as one of the main threats to national biodiversity. Aquatic ecosystems are considered to be the most sensitive and endangered. A National IAS Strategy and Action Plan for the management of IAS affecting Bulgarian fauna, flora and mycota and the limitation of their impact on natural ecosystems is being developed, building on the European Strategy on Invasive Alien Species (Genovesi and Shine, 2004). A National seminar on “Alien Species in Bulgaria” will be held in October 2008 to contribute to preparation of the future Strategy.

Funding of IAS-related activities includes the following sources: State Budget Resources; European environment-related funding; bilateral collaboration, intergovernmental agreements and other donor funding; and private sources.

Research: Bulgaria participates in the EU-backed DAISIE and ALARM projects. Several significant research projects related to the IAS are being developed or have been completed in Bulgaria in recent years.

In 2007, an Assessment of Invasive Species in Bulgarian Fauna, Flora and Mycota and Measures to Control their Impact on the Native Species and Ecosystems (funded by the Ministry of Environment and Waters) was completed. This project provides the scientific data to prepare national lists of alien and invasive species of vascular plants, fungi and animals. The project included a public awareness component (preparation of brochures and posters concerning alien and invasive species). A key finding is the tripling of the number of introduced species in the Black Sea in the period 1990-2002 in comparison with the previous 10 years, mainly through shipping and ballast water but also through unintentional introductions linked to escapes from mariculture (around one third of the earlier acclimatised species). The study also noted the high level of threat posed by insects. A Scientific Conference on “Alien Arthropods in South East Europe – crossroad of three continents” will be held in Sofia in September 2008.

Other research projects include:

- Population genetics of a highly invasive insect pest, SEE-ERA.NET, EU-funding;
- Non-indigenous insects and their threat to biodiversity and economy in the Balkans (www.cabi.org), SCOPES Program of the Swiss government;
- CONTROCAM “Sustainable Control of the horse chestnut leafminer, *Cameraria ohridella* (Lepidoptera, Gracillariidae) a new invasive pest of *Aesculus hippocastanum* in Europe”, Sixth Framework Programme of EC, EU-funding;
- Assessment of Zebra Mussel (*Dreissena polymorpha*) Infestation Risk Using GIS for Water Basins in the North-West Bulgaria (funded by the International Research Office of the U.S. Army Engineer Research and Development Center, ERDC);
- Biology and Ecology of Invasive Gobiid Species (Gobiidae, Pisces) in the Lower and Middle Danube River (together with the Czech Academy of Sciences, funded by the National Science Fund - Ministry of Education and Science and Czech Grant Agency);

- Genetic, Biochemical, Morphological and Biological Characteristics of Populations of *Carassius gibelio* (Bloch, 1782) in Bulgarian Water Basins (funded by the National Science Fund - Ministry of Education and Science);
- Zebra Mussel (*Dreissena polymorpha*) - wild and invasive areas of distribution - recent knowledge, methodology and further investigations. (together with Austria, Romania, FIR of Macedonia, funded by the Austrian Federal Ministry of Science and Research);
- Assessment of the alien species influence on the native populations of Mugil spp. (pisces) in the Mediterranean region in connection with parasite communities (together with Spain, funded by EU, program INTAS);
- Invasive and native species of crustacea (together with Spain, funded by EU, program CSIC);
- Investigation and control of species of the genus *Ambrosia* (Asteraceae) causing allergy in Bulgaria.

Eradication/control measures: The Ministry of Environment and Water is required to organise and manage activities for the removal of introduced alien species, including sub-species and varieties, which could threaten natural habitats or native species of wild flora and fauna (Art.67a Biological Diversity Law, introduced in 2007). Currently, most control measures are implemented for IAS with detrimental economic consequences (eg *Dreissena polymorpha*, *Rapana tomasiana*, *Cameraria ochridella* etc.) but the results from the 2007 assessment of the non-native species in Bulgaria (see above) will determine the future strategy and actions in this area.

Management plans for some protected areas provide for measures to control the spread of invasive plant species such as *Amorpha fruticosa*, *Fallopia japonica* etc. Measures of this kind are mainly implemented in sensitive territories along the Danube river and the Black Sea coast.

Challenges/limitations: There is a lack of effective practical control and application of legal procedures on the import of alien species destined for breeding (including under controlled conditions) because of the insufficient scientific basis and experience for carrying out risk analysis.

Future activities need to concentrate on strengthening prevention, reducing the detrimental impact of some species on technological processes, insect pest control, controlling plants that threaten natural habitats and/or potentially dangerous to public health and carrying out monitoring and control on the most probable pathways for introduction of alien species.

4. CYPRUS

Legislation: The existing legislation in Cyprus was reviewed during the process of harmonisation with the EU directives. New legislation on nature-related issues was introduced in Cyprus in 2003. The Ministry of Agriculture, Natural Resources and Environment stated in its annual report for 2004 that national environmental policy had been revised as a result of the process of harmonisation with the European Union

acquis communautaire.

Law N° 153(I)2003 on the protection and management of nature and wildlife constitutes the main framework for biodiversity protection setting provisions (among others) for appropriate assessment, fauna and flora protection, special areas of conservation and the implementation of CITES-related provisions. Article 30 provides that the release in the natural environment of any non-native species of flora or fauna is prohibited unless a Ministerial permission is obtained. There are no other provisions dealing specifically with IAS.

The use of invasive non-native species in aquaculture is now managed in accordance with the Commission Regulation 708/2007 concerning the use of alien and locally absent species in aquaculture. Legal procedures are currently under way to incorporate the Regulation into national legislation.

The import of aquatic species in general is controlled by the Fisheries Law and Regulations, which states that no aquatic animal can be imported into Cyprus without a written permit from the Director of the Department of Fisheries and Marine Research. However, the grant of a fisheries permit is not currently subject to risk assessment or other type of screening.

Policy: Cyprus does not yet have a national biodiversity strategy but is currently in the process of preparing the terms of reference for tendering the preparation of the biodiversity strategy. The main policy of the Forestry Department is reforestation with native species and for roadside planting. Availability of native plants has been promoted in Forestry Department nurseries.

Promotion of native species through forest policy in Cyprus

In the beginning of the 20th century when Cyprus state forests were placed under systematic management, the British Colonial Authorities introduced hundreds of different alien species for increased wood production, ornament and soil protection. These species included mainly eucalypts, acacias, casuarinas, pines and various other drought resistant tree and shrub species. After independence, the Forestry Department gradually reduced the number and intensity of use of exotic species.

At present, plantings in major forest areas include only native species. Exotic species are used by the Forestry Department only in urban areas, roadside plantations and Parks in inhabited areas. Recently, the policy of the Department is to encourage the use of native species everywhere. For this purpose the range of native species produced in nurseries has increased substantially; several other incentives are given to the public, including local authorities, in favour of native species. These incentives include provision of planting material free of charge and provisions of the Rural Development Plan which finances forest plantations only if native species are used.

However, there are no legal instruments to prevent the import, production and use of alien species, even of confirmed IAS, by commercial private nurseries and other non-state enterprises or organisations. The Department of Forests has recently issued a guide addressed to local authorities and the general public for the use and the promotion of native species.

Research: The Department of Fisheries and Marine Research (DFMR) carries out monitoring studies and research on the distribution of invasive alien species in the Cyprus marine environment.

An inventory of the most invasive animals for Cyprus is being prepared by the Environment Service, suggesting the prohibition of import for these animals in Cyprus under a Ministerial decree aimed at the protection of biodiversity.

Eradication/control programmes: Management programmes for the eradication/control of feral dogs have been established as well as a programme for the eradication of *Acacia saligna* at a Natura 2000 site. Wild boar control programmes have been ended, following the successful eradication of these animals from the island.

Challenges/limitations: Not found.

5. CZECH REPUBLIC

Legislation: Czech nature conservation legislation, (Ministry of Environment Act No. 114/1992 Coll. on Nature and the Landscape Protection as amended), includes some basic measures focused on IAS (or alien species generally). No alien species can be deliberately introduced, planted or farmed in landscape without a permit of the nature protection authority (but there is no sanction procedure to enforce this obligation). In the protected areas (national parks, landscape protected areas and nature reserves), the intentional introduction of alien species is prohibited. However, some exceptions exist eg for woody species planted in forestry (there are special forestry management plans proved by the nature protection authority as a whole) or exceptions from the prohibition in protected areas. Some other general legal tools (namely § 66, 68, 69) could also be used to manage IAS.

Other legislation also addresses the issue of IAS, mainly legislation on plant health, fisheries and game-keeping (see Plesník and Stanková 2001) and water management (Act. 254/2001 Coll. on Water). Exceptions for introduction of fish may be granted by the nature and landscape protection authorities: in addition, approval of the water management authority is required for introduction of any aquatic species. The Council Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture is valid in the Czech Republic but the implementation structure is still not properly adjusted.

The Game Management Act No.449/2001 of 27 November 2001 contains provisions for import and introduction of non-native animal species. Their introduction must be authorised by nature conservation and game management organisations (Article 4(2)). Exceptions for release of game species may be granted by state game-keeping authorities with the approval of the nature and landscape authorities. Certain regulations largely inhibit use of effective measures of eradication of some alien animals (e.g. American mink, racoon). These animals may be hunted only by a very limited number of hunters (game managers).

The Phytosanitary Act (No. 326/2004) lists species that may not be imported into the country. The list is focused on agricultural weeds and pests. Article 10 of the Act requires the State Phytosanitary Service to monitor IAS included in this list. The most recent list (Order no. 215/2008 Coll., replacing order no. 330/2004 Coll. as amended by order no. 493/2006 Coll.) has significantly restricted the number of IAS for

monitoring to species which were covered by EPPO pest risk analysis in 2006 i.e. *Hydrocotyle ranunculoides* and *Lysichiton americanus*³.

Policy:

There is no national plan in relation to IAS, but IAS are addressed in the National Biodiversity Strategy (<http://www.chm.nature.cz>).

Research:

There is intensive research in IAS in the Czech Republic, especially in the field of plant invasions. However, other species groups (insects, crustaceans etc.) are studied as well. The established centres of research on invasions are mostly based at the Institute of Botany, the Academy of Sciences (Průhonice), the Faculty of Sciences (Charles University, Prague) and Masaryk University (Brno), which participate in international EU-funded projects (ALARM, DAISIE) and from 2008, PRATIQUE. Coordination between several levels of bodies responsible for dealing with IAS (NGOs, research centres, nature conservation agencies) was stimulated by organising the conference of the Czech Botanical Society in September 2007 and the European Conference NEOBIOTA (September 2008). There are several supported projects under way focused on biological invasions eg on assessing the risk and potential spread of invasive plant species, as well as several focused on selected species such as *Harmonia axyridis*, *Heracleum mantegazzianum*, *Pinus strobus* and *Fallopia* sp.

Eradication/control programmes: There have been no changes in planning and management of eradication and control programmes of IAS in the last year. The major effort invested in eradication and control is at the regional and local levels where local bodies and voluntary organisations have their IAS control programmes. In 2008, a project was launched to update information on distribution of *Heracleum mantegazzianum* at the national level. Other important invasive species are monitored and controlled if appropriate at landscape protected areas.

Financial aspects: There are several financial resources (subsidies) that include IAS issues. The main programme, running since 2008, is the “Operational programme ENVIRONMENT” coming out of EU Structure funds. This offers possibilities for bigger eradication projects, but administration and all requirements are complicated. State subsidies for NGOs may also be available for projects focused on mapping of IAS occurrence and on eradication (small scale projects). Regional subsidies programmes also provides some opportunities for IAS focused projects. However, the total costs that are invested into eradication programmes are not as well known as the amount spent on IAS research.

Voluntary and non-regulatory initiatives: Some public awareness campaigns are running at local or regional level operated mainly by NGOs, but also by the National parks administrations etc. A campaign at larger (national) scale was recently started by part of the Czech Union for Nature Conservation (the biggest Czech environmental NGO) which includes an information website, educational competition for students

³ The earlier list included *Acer negundo* L., *Ailanthus altissima* (Mill.) Swingle, *Aster* sp.div. (North American species), *Helianthus tuberosus* L., *Heracleum mantegazzianum* Sommier et Levier, *Impatiens glandulifera* Royle, *Lycium barbarum* L., *Pinus strobus* L., *Reynoutria japonica* Houtt., *Reynoutria sachalinensis* (Friedr. Smidt) Nakai, *Reynoutria ×bohemica* Chrték et Chrtková, *Robinia pseudacacia* L., *Solidago canadensis* L., and *Solidago gigantea* Ait.

and other activities.

Certain codes of conduct (guidelines for use of alien species) are part of the Forest Stewardship Council (FSC) standard used in the Czech Republic. Almost 20,000 ha of forests have recently received FSC certification.

Limitations/challenges:

No Act lists environmental weeds or pests that must not be imported to the country.

6. DENMARK

Legislation: §30 of the Nature Protection Act (Lovbekendtgørelse no. 749, updated on 21 June 2007) establishes rules for species protection. Implementing regulations (Statutory order no. 901 of 11 July 2007) protect a number of defined species as well as all species of reptiles, amphibians, Anthericum spp., Orchids, and Orobanchaceae. As this blanket provision could entail legal protection of some IAS (eg bullfrog), the Statutory Order provides that the Danish Forest and Nature Agency may authorise alien species considered to be a threat to native species to be eradicated (§§ 7 and 8).

§31 of the Nature Protection Act establishes a general prohibition on releasing non-native animals into the wild without permission. However, the Environment Minister may establish rules about the release of specific animals that are not found 'naturally free-living in nature' (§ 31.1). This provision has been used as the basis for regulating the introduction of fish, crustacea and molluscs to freshwater systems. The Danish Forest and Nature Agency has produced a guidance note on introduction of such organisms that takes account of EU veterinary rules. Two species lists were published in an appendix to statutory order 1065 of 5 December 1996 : a 'white list' (species that may be released without applying for a permit) and a 'black list' (introduced species occurring in the wild in Denmark for which any further release is subject to permit). These requirements are binding, but it is difficult for the Ministry of the Environment to know how much is done without permission.

The introduction of fish for mariculture purposes is regulated by the Fishing Act (828/2004). Chapter 12, Article 63, of the Fishing Act states that the deliberate introduction of fish and eggs or brood thereof into nature without permission is not allowed (any introduction of alien species into the wild requires a permit). The Minister of Food, Agriculture and Fisheries must approve the species to be introduced as well as a plan for the introduction. Mariculture is specifically mentioned by the Fishing Act which states that the Minister of Food, Agriculture and Fisheries must approve the breeding of fish on Danish fishing territories (chapter 13, articles 66 and 67).

The Hunting Act (no 114/1997) regulates the introduction of game animals, including alien species such as animals from fur farms (American mink, musk rat etc). The Act regulates alien game animals that are deliberately introduced or have unintentionally escaped captivity and which have established self-reproducing populations in the wild (article 2, para1). According to the Hunting Act (Article 6, paragraph 1) the Environment Minister may issue a prohibition against deliberate introductions of

certain game animals. The Hunting Act is supplemented by a statutory order on hunting methods and hunting gear (Statutory Order no. 870/2007). Under certain conditions, the statutory order allows breeding and release of Partridge (*Perdix perdix*), Mallard (*Anas platyrhynchos*) and the introduced Pheasant (*Phasianus colchicus*).

The Statutory order on keeping fur animals and import and transit of fur animals (1987/78) provides that import and transit of living or dead fur animals or products thereof may only take place on conditions specified by the Veterinary Directorate. The import of muskrat (*Fiber zibethicus*) and grey squirrel (*Sciurus carolinensis*) is prohibited (Art.2.3).

This is complemented by a Statutory Order on eradication of muskrats (819/1987). All owners or users of real estate/real property that see or assume that muskrats are present on the estate or lakes or streams bordering the estate are required to notify this. This obligation to notify still applies even if the owner/user has shot or otherwise killed the animal or animals (Art.1). The owner/user is obliged, consistent with recommendations from the 'pest animal laboratory', to perform or help in eradication, including inspection of the estate according to specific instructions (Art.3).

The introduction in the wild of alien wild-growing plants may be regulated under §31.2 of the Nature Protection Act, but to date the Environment Minister has not used these powers to regulate deliberate introductions of alien plants.

Alien species are not explicitly dealt with under the Forestry Act but some statutory orders issued under this Act set out lists of accepted species of trees/shrubs for use in connection with subsidised plantings in forests and hedges. Use of these species is voluntary but preference is generally given to listed species. The Danish authorities have removed alien plants from the lists which now contain only native species and a small number of alien species that have proved not to be invasive.

The Management of Agricultural Land Act entitles authorities to require the eradication of 'unwanted plants' on private land if an official eradication plan has been adopted in the specific geographical area. This is not a phytosanitary instrument and the list of unwanted plants includes at least one species (Giant Hogweed (*Heracleum mantegazzianum*)) that is not a problem for agriculture. Under this Act, Statutory Orders on management of *Avena fatua* and *Heracleum mantegazzianum* have been adopted.

Legislation for local authority action to eradicate an invasive alien plant

The Statutory Order on eradication of giant hogweed (17/2006) authorises communes to develop and adopt an action plan for all or part of the commune, to require owners of areas where giant hogweed grows to eradicate the plant (Art.1). Development of a communal eradication plan is voluntary: about 25-33% of communes have done so to date. Communes that adopt a plan may charge landowners a fee if they do not eradicate *Heracleum* and may enter private property to carry out the necessary control actions.

Policy: Denmark was among the promoters of NOBANIS through the Nordic Council of Ministers on Alien Species. Public awareness campaigns have been carried out by the Danish Forest and Nature Agency on the Giant hogweed, American mink, Iberian

slug and introduction of pets into nature.

Denmark has finalised a national IAS strategy, due to be confirmed by the Minister of Environment in autumn 2008. The state budget for 2008 allocates 2 million DKK for IAS measures : this is the first time that a specific budget line has been earmarked for this purpose. For the next two years, 8 million DKK will be allocated for IAS measures.

Research: Denmark has developed an IAS database available at www.skovognatur.dk/natur/invasive_arter/images/introarter.xls. It participates in NOBANIS and is represented in the ALARM project team.

A joint report (Denmark, Norway and Sweden) to review national legislation and guidelines concerning the import of *Homarus americanus* and to prevent introductions of new lobsters in the Nordic sea areas was published in 2004 by the Nordic Council of Ministers.

Eradication/control programmes: Statutory Orders are in place for management of *Avena fatua* and Giant Hogweed (*Heracleum mantegazzianum*) (see above). Hunting is allowed year-round on some introduced species as a means of control.

Denmark has also started research and development projects on the best eradication measures for Canada goldenrod (*Solidago canadensis*), American mink (*Mustela vison*) and American crayfish (*Pacifastacus leniusculus*). Campaigns have also been carried out to control Spanish slug (*Arion lusitanicus*). Information material on eradication of a number of invasive plants and the Spanish slug has been made available and continuously updated on the Danish Forest and Nature Agency homepage. A booklet on eradication of Rugosa rose (*Rosa rugosa*) has been produced and a home page for reporting specific alien species will be available autumn 2008. The Danish Forest and Nature Agency acts as national focal point for information on all IAS occurring in the country and is the largest landowner active in eradication of giant hogweed (*Heracleum mantegazzianum*), ruddy duck (*Oxyura jamaicensis*) and others.

The Danish Forest and Landscape Research Institute co-ordinated the Giant Alien Project. The project was financed by the European Commission within the 5th Framework Programme.

Challenges/limitations: Challenges identified by Denmark in relation to IAS include: open borders, sector integration, trade, tourism, transport, and lack of awareness.

7. ESTONIA

Legislation: According to the Nature Conservation Act (adopted in 2004; amended in 2007), "it is prohibited to introduce live specimens of non-native species in the wild, and to plant or sow non-native plants in the wild"⁴. However, raccoon dog

⁴ An English translation of the Nature Conservation Act is available at http://www.legaltext.ee/et/andmebaas/ava.asp?tyyp=SITE_ALL&ptyyp=I&m=000&query=llooduskaite

(*Nyctereutes procyonoides*) and American mink (*Mustela vison*) may be kept in fur farms under special conditions laid down by Regulations issued in 2008 which aim to minimise escapes to the wild. Permits for such farms may be issued by the Minister of the Environment. To date, only one permit has been issued (for a mink farm) but there are several farms with no permits in Estonia.

Secondary legislation providing for a regulatory List of Invasive Alien Species was issued in 2004 under the Nature Conservation Act and updated in 2007. It contains a list of species that may not be imported into Estonia: 13 plant species and 30 animal species (c.f. 2 plant species and 19 animal species in 2004).

Species prohibited for import into Estonia (Invasive Alien Species Regulation)

Plants:

- 1) *Heracleum mantegazzianum*
- 2) *Heracleum sosnowski*
- 3) *Acroptilon repens**
- 4) *Ambrosia spp.**
- 5) *Bidens frondosa**
- 6) *Impatiens glandulifera**
- 7) *Solidago canadensis**
- 8) *Solidago gigantea**
- 9) *Reynoutria japonica* (*Fallopia japonica*, *Polygonum cuspidatum*)*
- 10) *Reynoutria sachalinensis* (*Fallopia sachalinensis*, *Polygonum sachalinense*)*
- 11) *Reynoutria x bohémica**
- 12) *Egeria densa**
- 13) *Elodea nuttallii**

Animals, birds and fish (vertebrates):

- 1) *Castor canadensis*;
- 2) *Cervus nippon*;
- 3) *Dama dama*;
- 4) *Lutra canadensis*;
- 5) *Mustela vison*;**
- 6) *Nyctereutes procyonoides*;**
- 7) *Odocoileus virginianus*;
- 8) *Ondatra zibethicus*;
- 9) *Oryctolagus cuniculus*;
- 10) *Ovis ammon*;
- 11) *Sciurus carolinensis*;
- 12) *Oxyura jamaicensis*
- 13) *Umbra pygmaea**
- 14) *Pseudorasbora parva**
- 15) *Opsariichthys uncirostris**
- 16) *Ameiurus nebulosus**
- 17) *Ameiurus melas**
- 18) *Lepomis auritus**
- 19) *Lepomis gibbosus**
- 20) *Lepomis macrochirus**
- 21) *Perccottus glenii**
- 22) *Neogobius fluviatilis**
- 23) *Neogobius gymnotrachelus**

Invertebrates:

- 1) *Astacus leptodactylus*;
- 2) *Orconectes limosus*;
- 3) *Pacifastacus leniusculus*;
- 4) *Globodera rostochiensis* (Wollenweber) Behrens;
- 5) *Bursaphelenchus xylophilus* (Steiner ja Buhner);
- 6) *Hyphantria cunea* Drury;
- 7) *Megachile rotundata* (Fabricius) (syn. *Apis pacifica* Panzer).

* Species added to the List in 2007

** Exceptions can be made to *Mustela vison* and *Nyctereutes procyonoides* whose specimens can be brought into Estonia only for gene pool refreshment for licensed fur farms

The Fisheries Act (1995; amended in 2007) provides that introduction of alien fish species or species of other aquatic organisms is allowed only by written permission from the Minister of Environment. There is also a law in place in relation to environmental surveillance (Environmental Surveillance Act 2004) for organisms potentially harmful to human health or the environment.

The Environmental Register Act (2003, amended 2005) contains an obligation to create a national environmental database of natural resources and protected natural objects, including alien species and genetically modified organisms. The Estonian Environment Information Centre is responsible for maintaining an alien species database. Currently work is under way to create this database and make it interoperable with existing databases.

Research: Estonia participates in the NOBANIS and ALARM projects. There is no specific programme for monitoring of all IAS in Estonia, but some species are monitored, eg the populations of *Heracleum sosnowskyi*, and some bird species (*Branta canadensis*, *Columba livia*). Estonia also takes part in the Baltic Sea Alien Species Database.

IAS have been identified in different groups of organisms (plants, vertebrates, terrestrial and water invertebrates) and the vectors identified. Estonia has published a review of the current situation regarding invasive species (available on the Internet at www.envir.ee). A database on alien species in Estonia is available at: <http://eelis.ic.envir.ee/voorliigid/eng/?a>.

There is no systematic approach to IAS research in Estonia. Some research activities in different Estonian Universities are going on, but these are usually the by-product of other projects and not specialised IAS research. Although several students and even PhD students have carried out work on IAS, this work is scattered and results are not widely distributed.

Eradication/control programmes: In December 1998-April 2000 the American mink was eradicated from Hiiuma Island in order to establish a safe area for the European mink (*Mustela lutreola*). The programme carried out by Foundation Lutreola and the Zoo of Tallinn, in co-operation with Oxford University, was financially supported by the LIFE programme.

There is a national strategy in place to eliminate poisonous giant and Sosnowskyi hogweed (*Heracleum manegazzianum* and *H. sosnowskyi*). Eradication of the latter species has been going on for 3 years. This is financed by government and ca. 100 ha of population has been managed annually.

A management plan for raccoon dogs (*Nyctereutes procyonoides*) is now in progress and will be ready by the end of the year 2009. It is also planned to make the management plan for American mink (*Mustela vison*), but due to lack of funding, this work will start not earlier than the end of 2009.

Other activities: The Ministry of the Environment has arranged meetings with different institutions and organisations, scientists and surveillance bodies. Cooperation is considerably better than it was some years ago.

Emergency situations caused by IAS are included in the Ministry of Environment's Emergency Plan that regulates actions during emergency situations that could be caused by rapid spread of IAS.

Voluntary codes of conduct for alien species will be ready in the end of the year 2008.

Challenges/limitations: There is no strategy on IAS in Estonia. The IAS issue is not perceived as a priority by the authorities. Money allocated for collecting data and eradication programmes is not sufficient. Unfortunately, due to very limited funding, it is not possible to produce management plans for IAS more intensively than one plan per one/two years.

Estonia has not yet ratified the IMO Ballast Water Convention, but the first steps have been taken for this purpose. The Ministry of the Environment has arranged a meeting for the stakeholders who will be responsible for implementing the convention. Estonia has already specified areas where it is allowed to change ballast waters. However, the use of those areas is still voluntary and no monitoring is carried out in those areas.

8. FINLAND

Legislation: The Nature Conservation Act (1096/1996) restricts the introduction of alien species in Finland. Alien plant species are not to be planted or sown outside gardens, fields or other sites designated for special purposes⁵. In addition, if an alien plant or animal species is known to spread rapidly in the wild, and there is a reasonable cause to suspect that it might constitute a health hazard or have a detrimental effect on indigenous Finnish species, the Ministry of Environment may issue any regulations necessary to prevent the spread of such species.

In accordance with the Hunting Act (615/1993, 1268/1993), wild birds or mammals of foreign origin cannot be imported or introduced into the wild without permission from the Ministry of Agriculture and Forestry.

⁵ With the exception of tree species planted for forestry purposes.

Introduced game species as a resource:

White-tailed deer were introduced to Finland about 70 years ago, and have become the second most important game animal in economic terms. The official policy with regard to management of species such as white tailed deer is to undertake systematic management through regulated hunting. No attempts will be made to prevent such control of game species, or to promote the expansion of these species' distributions into new areas. Any proposals for introducing game species will be considered extremely critically. Imports and introductions of alien species have not been permitted in recent years

The Plant Protection Law (1203/1994) lays down provisions to prevent the introduction of pests and diseases of plants into Finland. In addition, pests and pathogens which are present in Finland as native or introduced, but which are not widely distributed, can be controlled in order to prevent their further spread. Secondary legislation lays down detailed provisions for import, monitoring, eradication, control and containment, and is enforced by a central authority, the Plant Production Inspection Centre.

The Law for Animal Diseases (55/1980 and subsequent amendments) provides the legislative framework for preventing the introduction and outbreaks of animal pathogens in Finland, eg alien pathogens. The law and related secondary legislation include, for example, provisions for prevention, early detection and eradication of animal diseases and are enforced by the Finnish Food Safety Authority.

Policy: Finland published a review of the current situation regarding invasive alien species in 2001 (see Nummi 2001). This report does not consist of a plan of action, but it does recommend measures to reduce observed impacts, as does a report on the same issue prepared by the Nordic Council of Ministers in 2000. Such measures are jointly planned by the ministries concerned, according to the need to target specific invasive species.

In 2002, the Finnish Ministry of Agriculture and Forestry, the Central Union of Agricultural Producers and Forest Owners (MTK) and the Finnish Forest Industries Federation (Metsäteollisuus ry) jointly developed a crisis action plan to be used in case the pinewood nematode (*Bursaphelenchus xylophilus*) appeared in Finland.

A comprehensive Finnish Plant Protection Strategy for the years 2004-2013 was prepared in 2004. One of the central targets addressed in the Strategy is to prepare crisis action plans for other potentially invasive forest pests.

In June 2008, the preparation of a National IAS Strategy and Action Plan was initiated. The process is being led by the Ministry of Agriculture and Forestry with the aim of involving all relevant stakeholders. The strategy is scheduled to be completed by the end of 2010.

Research: Finland's Ministry of Transport and Communications participated in the Academy of Finland's Baltic Sea Research Programme during the period 2003–2004. A research project on Invasive species in the Baltic Sea, jointly funded by the Ministry and the Academy, examined how invasive species get into the waters of the Baltic, and assessed their ecological significance, particularly with regard to plankton communities, algal blooms and zoobenthic communities in the Gulf of Finland. Finnish institutes are participating in the FP6 ALARM project, and Finland is part of

NOBANIS. In addition, a number of Finnish institutes and ports are part of the ongoing FP6 project "Effective Operations in Ports" (EFFORTS) that, among other things, aims to improve methods for ballast water treatment in order to prevent the spread of IAS.

Research is also ongoing in relation to the introduced raccoon dog which is an important vector of diseases (eg rabies) and parasites: studies are investigating its social system and dispersal, and possible competition (food and habitat use) between the introduced raccoon dog and the European badger.

As regards animal and plant diseases/pests, related research is carried out by eg the Finnish Food Safety Authority and MTT Agrifood Research Finland. Current research activities include studies related to potato blight (*Phytophthora infestans*), Colorado beetle (*Leptinotarsa decemlineata*) and bird influenza.

Monitoring: There is no unified national monitoring system for IAS in Finland, but some ecosystem-/species group-specific initiatives exist. For example, the Finnish Institute for Marine Research (FIMR) carries out regular monitoring of the Baltic Sea environment and the status of a number of known IAS (eg *Mnemiopsis leidyi*) in the Baltic is increasingly addressed as part of monitoring activities⁶. In addition, the general public can inform the Finnish Environment Institute about their possible IAS observations and citizens are also encouraged to record their IAS sightings into the open access database hosted by the Finnish Museum of Natural History (University of Helsinki).

Information exchange mechanism: There is no general protocol or mechanism for exchanging information on IAS at national level. However, cooperation on specific IAS issues has been established between some relevant national institutes, including the Finnish Environment Institute and the Finnish Museum of Natural History.

Eradication/control programmes: It has been decided that Canadian beavers (*Castor canadensis*) should be exterminated within the Lapland Game Management District, to stop the species spreading into Norway and Sweden. Elsewhere in Finland, measures are being taken to prevent the spread of Canadian beavers into areas still occupied by European beaver (*Castor fiber*). In the Archipelago Sea, Metsähallitus and local hunters have been working for several years to exterminate American minks (*Mustela vison*), which have negative impacts on seabird colonies. During 2001, a project involving the trapping of mink in the outer islands of the Quark Archipelago in Western Finland was begun by Metsähallitus and local hunters, as part of the Quark Environment INTERREG project. Trapping was later expanded to islands nearer the mainland, and is still continuing in both the Quark, and islands in the Archipelago National Park of SW Finland.

A two-year campaign began in 2001 to intensify hunting and trapping of two invasive small predatory mammals – *Mustela vison* and raccoon dog (*Nyctereutes procyonoides*). In 2002 a special project was started to intensify the trapping of mink and raccoon dogs in wetlands in the Helsinki region. Over the two-year project, a total

⁶ But note that no systematic IAS monitoring has been carried out to date.

of 300 raccoon dogs and 27 mink were caught. A related research project has been assessing the effects of such trapping on nesting birds' breeding success rates.

In addition, a number of projects have been initiated to eradicate / control giant hogweed (*Heracleum mantegazzianum* and *H. persicum*) at regional level (eg in Karjala and Kainuu regions).

Funding: There are no special funding instruments dedicated to financing activities for IAS prevention, eradication and control. Existing eradication and control initiatives have been funded from a number of different sources (eg national and regional public funding). In addition, voluntary actions (eg by regional and local NGOs) have contributed to IAS control activities.

In this context, no examples could be found of supporting IAS prevention, eradication or control through the EU funds for rural or regional development (EAFRD and EFRD). Similarly, there are no known cases of compensating IAS-related losses or costs of control actions.

Awareness-raising: Efforts to raise public awareness about IAS in Finland have increased during the past few years. For example, the Finnish Environment Institute has been active in informing the public on threats posed by several invasive plants. Information on a number of invasive plant species (eg instructions for their identification and eradication) have been made available on the Institute's WebPages⁷ and regular press releases on topical IAS issues and threats have been issued. Species addressed include giant hogweed (*Heracleum* sp.), Himalayan balsam (*Impatiens glandulifera*), Rugosa rose (*Rosa rugosa*) and Japanese knotweed (*Fallopia* sp.). Additionally, IAS information has been provided through a Nordic communication project on biological diversity ("Nordic Nature – trends towards 2010") coordinated by the Finnish Environment Institute.

Other issues: There are no known examples on using environmental impact assessments (EIA) and strategic impact assessments (SEA) to address threats posed by potential introduction of IAS.

Challenges/limitations: There are unresolved problems related to the presence of invasive species in ships' ballast water and also managing the introduction of IAS as biocontrol agents. In addition, it is foreseen that increasing interest in production of bioenergy can contribute to escalating IAS problems in Finland.

There is also an apparent need to improve national and regional cooperation between different relevant stakeholders, in particular to clarify respective areas of responsibility. It is anticipated that the forthcoming national strategy will aim to address these issues. It is also hoped that the strategy will clarify and/or appoint new funding sources for IAS management actions. Finally, there is a need to develop a European-Global Early Warning System and also to enhance information exchange at the European level. The NOBANIS project has proved to be an important network for information exchange between participating countries.

⁷ <http://www.ymparisto.fi/default.asp?node=722&lan=fi>.

9. FRANCE

Legislation: There are a number of legal instruments related to IAS in France. The import of all species of game birds is prohibited without authorisation except for six species (*Arrêté du 20 décembre 1983*) (*Code de l'environnement*, articles L.424-10 and L.424-11, Annex I.c).

The *Code de l'environnement* prohibits the introduction of new aquatic species in France (Article L.432-10, Annex Ie) without Ministerial authorisation. There are also other specific restrictions in place in relation to the introduction of aquatic organisms (fish, crustacea, frogs etc) (Nepveau and Saint-Maxent 2002).

Under Article L.411-3 of the *Code de l'environnement*, the introduction, trade, transport and/or use of listed invasive alien species may be prohibited. No lists have been adopted to date, although work is under way to complete a list of invasive alien plants for regulation on France's mainland territory. Specific prohibitions apply to two plants species.

Plant Protection legislation is also used to control invasive alien species, in particular through secondary legislation focused on control of harmful organisms (*Arrêté du 31 juillet 2000 établissant la liste des organismes nuisibles aux végétaux... soumis à des mesures de lutte obligatoire*).

Specific measures prohibit trade in two animal species: *Trachemys scripta elegans* and *Rana catesbeiana*.

There is a national list of pest species (both plant and animal species) for which control activities are obligatory. In addition, every year regional *Département* makes a list of the animal species that are classified as 'pests'. Species classified in this way may be hunted all year round.

France has developed a legal framework for ratification of the BWM Convention (provision in the Water Act of December 2006, followed by adoption of an Act on 23 May 2008 authorising the country to ratify the Convention).

Policy: Under the National Action Plan for Natural Heritage (2005), Objective 1.2 provides for strengthening actions against invasive alien species by preventing their introduction both in mainland France and in French overseas territories, carrying out awareness campaigns, renewing legislation, setting up a research programme and an observatory on IAS and developing mitigation campaigns.

The national multi-stakeholder environment forum held in 2007 (*Grenelle de l'environnement*) specifically addressed IAS issues and proposes control programmes and actions for future years (commitment n°74, article 20 of the draft 'Grenelle Act').

Research: France is represented on the DAISIE and ALARM project research teams. There is ongoing research on invasive ambrosia (common ragweed). An exhaustive

report on introduced fauna was published in 2003⁸

Eradication/control programmes: Programmes are underway in France in relation to control of some invasive species, eg *Caulerpa taxifolia*, *Ludwigia sp.*, African sacred Ibis, American mink and American bullfrog (*Rana catesbeiana*)⁹.

Challenges/limitations: Not found.

10.GERMANY

Legislation: The Federal Nature Conservation Act (Bundesnaturschutzgesetz BNatSchG) requires the federal states (Länder) to take suitable measures to reduce the impact of IAS on indigenous flora and fauna and to enact regulations governing approval of their release into the wild. Under Article 41(2) of the Bundesnaturschutzgesetz, the release of alien species is subject to approval. However, species used in agriculture or forestry, for hunting or fishing purposes, in biological plant protection and all species that are already present are exempt from this regulation.

Possession and trade may only be regulated at federal level. Currently, possession of and trade in four invasive species (American beaver *Castor canadensis*; two turtles *Chelydra serpentina* and *Macroclempys temminckii*; Grey squirrel *Sciurus carolinensis*) are prohibited throughout Germany (Article 52, BNatSchG).

The Act defines alien species as ‘any species of fauna or flora which does not occur in the wild in the area concerned or has not occurred in the area concerned for more than 100 years. This definition is not useful in the context of IAS as it excludes alien species that are already present on national territory i.e. established alien species are considered for legal purposes as ‘native’ and the definition can only apply to ‘not yet occurring’ species. Efforts to amend the definition have so far been unsuccessful, although there are proposals for other solutions in the draft for a revised BNatSchG. Reasons for opposition¹⁰ include:

- resistance to strengthening national possession/trade restrictions c.f. EU-harmonised approaches in the plant protection sector (Ministry for Agriculture);
- preference for already-introduced species to be considered as native (fisheries, forestry and other land use sectors);
- concern amongst hunters that hunting rights could be restricted if the definition of non-native species was broadened to cover already-introduced species (eg pheasant, sika deer and mouflon are ‘native’ under the current definition in the BNatSchG: the hunting legislation does not define this term).

⁸ Pascal M., Lorvelec O., Vigne J.-D., Keith P. & Clergeau P. (coordinators), 2003. *Évolution holocène de la faune de Vertébrés de France : invasions et disparitions*. Institut National de la Recherche Agronomique, Centre National de la Recherche Scientifique, Muséum National d'Histoire Naturelle. Rapport au Ministère de l'Écologie et du Développement Durable (Direction de la Nature et des Paysages), Paris, France. Version définitive du 10 juillet 2003 : 381 pages.

⁹ See <http://www.grenouilletaureau.net/>.

¹⁰ Pers.comm, F.Klingenstein, Germany Federal Agency for Nature Conservation.

The Plant Protection Act (Articles 3 and 4) contains the basis for measures and prohibitions, some of which are defined in greater detail in the Plant Inspection Ordinance. The Plant Inspection Ordinance is based on the EU 'Quarantine Directive' 2000/29/EC. At present the system is primarily concerned with unintentional introductions, but measures for preventing deliberate introduction of invasive alien species in the plant sector are under discussion.

The EC Aquaculture Regulation 708/2007 is implemented by the Ministry for Agriculture.

Policy: Suggestions for specific targets and measures to bring about improvements in the legal situation and strengthen cooperation between relevant sectors were made within a research project related to the preparation of a National Strategy on Alien Species. Discussions are still under way on whether an overarching national strategy or separate sectoral approaches (eg introduction of a specific definition of 'invasive' into conservation legislation) would be more suitable.

A National Biodiversity Strategy was published in November 2007 which outlines specific targets for IAS, one being the preparation of a National IAS Strategy. The problem of IAS introductions will probably also be addressed in the National Strategy for the Protection and Sustainable Use of the Seas' which is in production at present.

Sectoral plans and programmes for surveillance of introduction pathways and protection against the spread of invasive alien species already exist in the plant protection sector. A detailed analysis for implementation of the CBD Guiding Principles has been undertaken for the plant quarantine sector.

Many of the Guiding Principles are already being implemented in activities initiated by the nature conservation sector. Voluntary codes of conduct are in place for botanic gardens since 2007¹¹ and the horticultural sector since 2008 (<http://www.g-net.de/download/Empfehlung-Invasive-Arten.pdf>).

Germany took part in the development of the Ballast Water Convention of the International Maritime Organization and is currently involved in the preparation of relevant guidelines. In the context of the International North Sea Conference and the OSPAR Convention, Germany is involved in investigating whether it is possible to comply with the requirements of the Ballast Water Convention for ballast water exchange under the conditions that exist in the North Sea and the Baltic. No legally binding requirements are currently in place.

Germany is also active in two ICES working groups which deal with aquatic alien species: (a) ICES WGITMO, and (b) ICES/IOC/IMO WGBOSV. The Groups' terms of reference include the preparation of a rapid response and early warning tool and also measure to address hull fouling of vessels as species invasion vector.

¹¹ Kiehn, M.; Lauerer, M.; Lobin, W.; Schepker, H.; Klingenstein, F. (2007): Grundsätzen im Umgang mit invasiven und potentiell invasiven Pflanzenarten in Botanischen Gärten des Verbandes Botanischer Gärten und der AG Österreichischer Botanischer Gärten. - Gärtnerisch-Botanischer Brief 169 (4): 39-41.

Research: Germany and adjacent countries have a long tradition of research on alien species. Funded by the German Environment Protection Agency, the first European ballast water study was undertaken 1992 to 1995 in a joint effort of the Universities of Kiel and Hamburg. In 1999, German scientists founded the NEOBIOTA working group on biological invasions (www.tu-berlin.de/~neobiota) that aims to enhance communication and research on applied and basic aspects of invasions. It now operates as a European group and holds bi-annual meetings: the next one will take place in September 2008 in Prague (<http://www.ibot.cas.cz/neobiota/>). Germany is represented in the DAISIE, ALARM and IMPASSE project teams and is part of NOBANIS.

The BioTeam research programme of the Federal Ministry of Education and Research includes research related to the assessment of the threats that IAS may pose to native ecosystems. Many of the harmful organisms dealt with in the plant quarantine sector can have adverse effects on ecosystems, habitats or species. Risk assessment here is undertaken as standard practice in the context of phytosanitary risk analyses.

The German Nature Conservation Agency is currently collaborating with the Austrian Environment Agency on development of a risk assessment scheme (black list) to evaluate risks posed by IAS to native biodiversity.

Cost estimates:

A German study has found that 20 alien plant and animal species cost EUR156 million per year in Germany. *Ambrosia artemisiifolia* is most costly, contributing at least EUR20 million to the cost of asthmatic disease in Germany every year (Reinhardt et al 2003).

In the aquatic environment, the three most impacting species in German coastal waters are the Zebra mussel *Dreissena polymorpha*, the ship-worm *Teredo navalis*, and the Chinese mitten crab *Eriocheir sinensis*. For the latter two, a tentative economic impact is calculated as follows. The damage caused by the shipworm in the Baltic alone is calculated as 25 Mio € since 1993. The total damage along all German coastal waters is estimated as 50 Mio € since 1993 (Hoppe, pers. comm.). For the Chinese mitten crab it was calculated that the monetary impact caused to German waters has totalled approximately €80 million since 1912 when the crab was first recorded in German waters (Fladung @ Gollasch pers. comm.)¹².

Eradication/control programmes: The Federal Agency for Nature Conservation (BfN) raises public awareness on the issue and advises local authorities in addressing IAS problems. The majority of control efforts fail due to a lack of information, even though an estimated € 6 million annually is spent for control of invasive plants by community authorities alone. Under www.neophyten.de, Germany has developed an Internet manual for identifying and managing about 40 invasive plant species, in order to provide the Länder and administrative districts and other active bodies with basic information and hints on effective prevention and management measures.

Certain animal species are identified in the federal Bundesjagdgesetz as unrestricted and free for hunting. A summary of aquatic invaders is available at www.aquatic-aliens.de.

¹² Gollasch, S. & Rosenthal, H. (2006): The Kiel Canal. 5-90 pp. In: Gollasch, S., Galil, B.S. & A. Cohen (eds.) (2006). Bridging Divides – Maritime Canals as Invasion Corridors. Springer, Dordrecht, The Netherlands. 315 pp.

Challenges/limitations: Controlling imports of IAS would involve large inputs of human resources and is possible only to a limited extent due to the free market. One of the main challenges in Germany is to achieve better coordination of the fragmented legal competencies and bring about political agreement on objectives between the interest groups concerned. Nature conservation authorities and the plant protection system could achieve much by cooperating more, for which there is not really a tradition. More recently, the Federal Agency for Nature Conservation and the Federal Research Centre for Cultivated Plants – Julius Kuehn Institute communicate regularly on IAS issues.

Legislation within the conservation sector only covers intentional introductions (half of established alien plant species) so measures that focus on the prevention of unintentional introductions have to be developed. For ornamental plants (25% of all introductions¹³), ongoing secondary releases are the main reason for their spread c.f. natural spread from already inhabited areas¹⁴. Article 41 BNatSchG, which regulates this, suffers severely from too many exceptions: the permit requirement laid down by the article does not apply to agriculture, forestry or areas within settlements. In addition, due to the inadequate definitions of “alien” and “native”, all established alien species (= all invasive species) that were established more than 100 years ago are regarded as native and therefore do not need release permits. Lastly, nature conservation authorities often do not have the necessary resources, expertise, and overview to take well-founded decisions on release permits.

11. GREECE

Legislation: Article 20 of Law 1650/1986 on the Protection of the Environment obliges protection of indigenous flora and fauna. Under paragraph b. of Ministerial Decision n° I 1B/2000/19 on quarantine, the Sanitary Committee can decide to control introduced animal species. Import of all alien species to be farmed/used as baits is prohibited by Presidential Decree 109/2002.

Greece is a signatory party to the CITES convention and the trade of some alien species (eg pets) is controlled under CITES requirements and the customs offices are applying the relevant rules. Greece has also signed and is applying the IMO (International Maritime Organisation) relevant provisions regarding ballast invaders. However, no specific national legislative instruments are at place.

Greece also participates in the work of the Protocol for Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention under which an Action Plan Concerning Species Introductions And Invasive Species in the Mediterranean Sea was adopted in 2003.

Research: As regards marine invasive alien species, the Hellenic Centre for Marine Research (HCMR) has performed a lot of work. A network of marine researchers

¹³ Klotz, S., Kühn, I. and Durka, W. (2002): BIOFLOR - eine Datenbank mit biologisch-ökologischen Merkmalen zur Flora von Deutschland. - Schriftenreihe für Vegetationskunde 38, 334 S.

¹⁴ Kowarik I. (2003): Human Agency in Biological Invasions: Secondary Releases Foster Naturalisation and Population Expansion of Alien Plant Species. - *Biological Invasions* 5 (4): 281-300.

working on marine invasive species has been set up under the name ELNAIS (<http://elnais.ath.hcmr.gr/>) including nine research institutes/universities and over 34 Greek scientists currently carrying out relevant research. The list of marine alien species in Greek waters is constantly updated, taking into account new findings (published and unpublished data), which are stored in the HCMR database (private use) as well as in the ELNAIS webpage (<http://elnais.ath.hcmr.gr/>). HCMR research staff participate in the SEBI 2010 project (Streamlining European Biodiversity Indicators, 2010), specifically in Working Group 5 for the indicator of cumulative trends in alien marine species in Europe.

Marine invasive species in Greece:

By August 2007, the number of marine alien species had increased from 128 (known until the end of 2005) to 155. Most of them are zoobenthic species (69), followed by fish (39) and macroalgae (30) (Pancucci et al, 2005, 2006, 2007; Zenetos & Streftaris, 2008). A multi-annual analysis revealed an important increase of alien species during the last years. This can be attributed to the increased interest of the scientific community, but also to the gradual warming of the area, resulting in more favourable climatic conditions for the establishment of tropical-subtropical species. Their main pathway of introduction seems to be the Suez Canal followed by shipping, and aquaculture, while the Straits of Gibraltar and the Dardanelles appear to play a less important role. The study of their geographic distribution showed that their majority is present in the south-eastern Aegean (Dodecanese, with a peak of 80 species, an increase of about 16% in the 2006-2007 period). A huge increase was also observed in the Saronikos Gulf area (Young et al., 2007). Moreover a colonization trend of the alien species against the recession of autochthonous species has been detected. Since the majority of alien species have subtropical to tropical affinity (species of tropical Atlantic and of Indo-Pacific origin), the hypothesis of a tropicalisation phenomenon in the Mediterranean Sea has been put forward (Bianchi, 2007) as a result of four different phenomena: Atlantic influence, lessepsian migration, species introduction by humans and sea-water warming, e.g. the crab *Percnon gibbesi*, originating from the western tropical Atlantic, has been found progressively in the Tyrrhenian Sea, Sicily Island, Ionian and South Aegean Seas. Similarly, lessepsian immigrants established in the Levantine basin have spread into the eastern basin (Aegean Sea, Ionian Sea) and have even penetrated into the western basin (*Bursatella leachii*, *Cerithium scabridum*, *Fistularia commersoni*).

An on-going project funded by the Ministry of Research and Technology and Port authorities (initiated in 2003) aims at studying the introduced species via shipping (hull fouling) in major Greek ports (Peiraias, Thessaloniki, Heraklion, Kalamata).

A compilation of freshwater alien biota has revealed approximately 47 species, the majority of which (26 species) are fish introduced for aquaculture that have established self-sustaining populations (Zenetos et al, in preparation).

As regards terrestrial invasive alien species, individual researchers have carried out research projects (21 are included in the expertise registry of the European project Delivering Alien Invasive Species for Europe). A survey of the alien plants of the country was undertaken as part of this project. For this purpose, a thorough investigation of the existing literature was made. Information derived was compiled in a database with all the alien plants. The data collected concern taxonomy, status, life and growth form, habitat, origin, distribution etc. (Kokkoris et al. 2007). Data on 325 *taxa* reported for Greece have been compiled in this database, of which approximately 40% are naturalized. *Graminae*, *Compositae* and *Leguminosa* are the richest families in number of *taxa* comprising 30% of the total, while *Amaranthus* is by far the richest genus consisted of 17 species. As far as their life form is concerned, the majority of the alien plants are therophytes followed by phanerophytes and hemicryptophytes.

Chorological analysis shows that most of the taxa are of American origin (39%), followed by those of Asiatic (19%). As expected, most of the alien taxa grow in disturbed and man-made habitats such as cultivations, fallow lands, roadsides, wastelands, around and within inhabited areas. The alien flora of Greece is not yet fully studied, since several regions and habitats likely to host such species are under-sampled (Bazos et al. 2007).

Eradication/control programmes: There seems to be limited national legislation or policy related to IAS control or eradication. Nevertheless, actions have recently been undertaken by the Hellenic Ornithological Society targeting the eradication of rats from islets of the Aegean region, under a LIFE project for the protection of *Falco eleonora*¹⁵.

Challenges/limitations: National instruments to address IAS are very limited. A national plan to register, monitor and control the introduction of non-indigenous species and to mitigate their negative impact has not yet been elaborated. It is evident that more national funds should be allocated to studies on the increase of knowledge and control of IAS in a comprehensive manner and in such a framework (spatial and temporal) that sound assessment can be made and conclusions can be drawn.

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12.HUNGARY

Legislation: Hungary established a strict system on controlling invasive alien species in the 20th century, including obligatory control of certain aliens, border control and

¹⁵ For further information, see:
http://www.ornithologiki.gr/life/falcoel/en/news/show_article.php?artID=184&locale=en.

quarantine. Formerly (prior to EU membership), several alien organisms were checked through border control of shipments and cargos by plant protection and veterinary services with obligatory control of several species listed under relevant legislation.

The following laws contain provisions relevant to IAS¹⁶.

Act No. LIII of 1996 on Nature Conservation in Hungary:

- Article 8(4) introduces the concept of alien referred to the phytogeographical and zoogeographical perspective. Time scale is also considered in Article 8;
- Article 8(4) defines ‘harmful introduced species’ to cover any living organism which does not qualify as native from the phytogeographical or zoogeographical point of view, and in case it establishes and adapts itself, it may be capable of modifying the natural processes of the Hungarian wildlife communities unfavourably for the native species;
- Article 8(2) defines ‘native organism’ to mean any wild creature which lived or still lives in the natural geographical region of the Carpathian Basin in the last two thousand years - and not as a result of introduction (be it intentional or not).
- Article 9(4) provides that the introduction of any new organism (new to Hungary from a phytogeographical or zoogeographical aspect) may only be authorised if this colonisation does not harm natural processes within Hungary's communities for the disadvantage of native species;
- Article 13(2) provides that introductions of alien wild animal species which are not declared as game species, or reintroduction of wild animal species, need to be authorised by the Minister (granted with the approval of the Minister of Agriculture).
- Article 13(3): The authority responsible for hunting may oblige game-licence holders to reduce or liquidate the populations of harmful introduced wild animals by hunting techniques;
- Article 13(4): Subject to the exception specified in 13(2), in order to introduce any alien living organism or to reintroduce any living organism it is necessary to hold an authorisation of the Minister (which is granted with the approval of the Minister of Agriculture);
- Article 14 prohibits the introduction of alien fish species into natural or near-natural waters as well as their transfer from fish farms into any other wetland;
- Afforestation of habitat with native tree species (if possible) is considered in article 16(3) while reforestation in protected natural areas (Article 33(3)b) must be carried out exclusively with native species exception in “forest stands not able to naturally regenerate or consisting of alien species and being of a maximum block size of 3 hectares” (Article 33(5)a); and
- Efforts to establish close-to-natural conditions are to be made in forests of alien tree species in protected natural areas by replacing, complementing and changing the tree species and by regulating the species composition (Article 33(7)).

¹⁶ The following laws, except for Act No. CLIV of 1997 on Public Health, are described in the report to the Convention on the Conservation of European Wildlife and Natural Habitats, Group of experts on Invasive Alien Species, Horta (Azores, Portugal), 12 October 2002 (T-PVS (2002)11).

Act. No. LIV of 1996 on Forests and the Protection of Forests:

- Article 2(1): forests should be used, exploited in a manner and at a rate, which allow the prospects of forestry to endure for future generations as well (hereinafter: lasting (sustainable) forestry) so that the forests preserve their biological diversity and naturalness, fertility, regenerability, viability, furthermore, that they satisfy the criteria of defence and economy in harmony with the requirements of society, and fill in their role serving the purpose of nature and environment conservation, health and welfare, tourism and research and education;
- Article 25(2)a): In the course of preparing the district forestry plan, priority should be given to the restoration of natural (indigenous) forest conditions when determining the tasks of afforestation;
- Article 35(2): Where the conditions of the habitat permit, the creation of close to natural forest biocoenosis shall be given preference in the preparation of the plantation-implementation plan by applying indigenous tree species;
- Article 38(2): The liquidation of the plantation can be ordered by the forest authority in case the growing stock planted without permission or not in compliance with the permission would be harmful to the habitat or the neighbouring forest-lands; and
- Article 41(3): Where the conditions are provided for the natural afforestation from seed of indigenous tree species suiting the habitat, this shall be applied. . In case of artificial afforestation only propagating stock of the species set forth in the district forest plan and of the quality specified under a separate legal rule may be used.

The Forest and Forest Protection Act 1996 is being revised during 2008. The new Act will contain lists and regulations of invasive tree and herbaceous plant species.

Act No. LV of 1996 on the Protection of Game, Game Management and Hunting:

- Article 33(2): introduction of non-indigenous game species for hunting purposes must be authorised by the hunting authority.
- Implementing Decree 79/2004 (V.4.) of the Ministry of Agriculture and Rural Development contains a list of game species with a year-round hunting season. Three invasive species are on the list: muskrat (*Ondatra zibethicus*), raccoon dog (*Nyctereutes procyonoides*) and raccoon (*Procyon lotor*).

Act No. XLI of 1997 on Fisheries and Angling:

- This Act regulates and requires a permit for stocking all fish originating from abroad to natural waters and fishponds. It means that also in the case of indigenous fish species, a permit is required if the specimens come from abroad.
- There is no special regulation on the use of live bait.

Act No. LIII of 1995 on the General Regulations Concerning Environmental Protection:

- Sections 23(1), (2) and (3) contain general measures concerning protection of biodiversity;
- Section 67 and 68 (EIA);
- Section 69 and 70 (Preliminary Environmental Study);
- Section 71 (In-depth Environmental Impact Study).

Act No. CLIV of 1997 on Public Health (Article 35, 36, 56, 73)

Act No. XXXV of 2000 on Plant Protection contains provisions to the following effect:

- Article 1: aim is to protect plants, especially crops and plant products from any pests and to prevent and avoid risks ... to nature conservation;
- Article 4(1): plant protection activities should aim at preventing introduction or spread of pests;
- Article 5(1)a: the land user and producer are required to destroy the quarantine and the regulated non-quarantine pests, to prevent their introduction, establishment, spread, ...;
- Article 6(1): official treatment can be provided for if a non-quarantine pest has been recorded in the country ...;
- Article 7(1): an appeal against the decision ordering treatment of public interest has no postponing effect on the execution;
- Article 8: contains details on phytosanitary inspections;
- Article 19(3): studies with a plant protection product containing a viable organism not native in Hungary may only be conducted, even for laboratory purposes, with the permission of the Ministry [of Agriculture and Regional Development], issued observing the statement of the body designated by the Ministry of Health and of the Ministry of Environment¹⁷.

A series of decrees adopted in 2007 specifically address IAS that may impact on Hungarian biodiversity.

Government Decree 71/2007 (IV.14.) of the Ministry of Agriculture and Rural Development on the Establishment of Energy Plantation of Arboreal Species¹⁸ provides that energy plantation (including invasive species) in nature protected areas and Natura 2000 sites may be only authorised with the consent of the nature conservation authorities. Under Article 3§(4), the establishment of energy plantation as arboreal invasive species in protected natural areas and non-protected Natura 2000 sites may only be authorised in accordance with the procedure laid down by Ministerial Decree 45/2007.

This Government Decree is implemented through Decree 45/2007 (VI.11.) of the Ministry of Agriculture and Rural Development which lays down detailed rules regarding the establishment of energy plantation of arboreal species: in particular,

¹⁷ Data requirements on the origin and other ecological properties of living organisms in the registration dossiers for pesticide regulation are contained in Ministerial Order No. 6/2001 FVM on release of pesticides (Annex 1 and 2)).

¹⁸ The term 'tree' is not used to avoid confusion with forestry instruments.

Article 2 (4) establishes that introduction of *Robinia pseudoacacia* must not be authorised for planting in protected natural areas and non-protected Natura 2000 sites.

The list of species under Ministerial Decree 45/2007 (VI.11.) consists of the following species: *Populus alba*, *Populus nigra*, *Populus x canescens*, *Populus tremula*, *Salix alba*, *Salix viminalis*, *Alnus glutinosa*, *Fraxinus excelsior*, *Fraxinus angustifolia*, *Acer platanoides* and three non-indigenous species that are already widespread in forestry plantations in Hungary, *Robinia pseudoacacia*, *Quercus rubra* and *Juglans nigra*. The most problematic of these species is *Robinia pseudoacacia* which, as indicated, may not be authorised for planting as bioenergy plantation in protected or Natura 2000 sites (Article 2(4)). In any other cases, during the administrative procedure, it is possible to apply for subsidy for bioenergy plantation of arboreal species. Decree 72/2007 (VII.27) of the Ministry of Agriculture and Rural Development sets out rules for obtaining EAFRD subsidy for the establishment of bioenergy plantation of woody plant species. Applicants are required to have all necessary permits from the authorities (e.g. permission of nature conservation authorities if the plantation is situated in a protected area and/or Natura 2000 site). The authorities may make decisions on the choice of species during that administrative procedure when the client applies for permissions to establish an energy plantation.

In parallel, Decree 71/2007 (VII.27.) of the Ministry of Agriculture and Rural Development sets out rules for obtaining EAFRD subsidy for the establishment of energy plantation of perennial (energy grass) plant species. Under Article 4(8), the applicant is required to prevent (localise) the spontaneous spread of the plantation. Annex 1 to this Decree specifies which plant species may be planted: (1) *Agropyron* and *Elytrigia* genus, except the protected native species *Agropyron elongatum* and *Elytrigia repens*; (2) the *Miscanthus* genus.

The Agricultural and Rural Development Agency (operating under supervision of the Ministry of Agriculture and Rural Development) is responsible for monitoring and carries out ‘on-the-spot’ controls. If officials find that the applicant did not respect these conditions, they may require repayment of the full amount of the subsidy. It is of course not possible to check every applicant, but ARDA regularly checks the landowners.

Government Decree 91/2007 (VI.26.) on *Determining the degree of natural damage caused and the rules for remedying the damage* provides that invasive alien species must be taken into consideration during identifying the environmental elements to be monitored (Article 12(4)). This is a very new government decree and no available data is available yet for last year on how it worked in practice. This Decree mainly applies the provisions of the environmental liability Directive 2004/35/EC, but the text of article 12.4(3b) provides that “elements of the monitoring must be chosen particularly considering the following groups: ...g) the populations/associations of invasive non-indigenous species (IAS) which are incidentally spreading and endangering nature because of the changed circumstances due to the damage caused to the environment”.

Government Decree 269/2007 (X.18.) on detailed rules of maintenance of Natura 2000 grasslands has an appendix containing 15 invasive plant species: (1) Woody invasive species and non-native plant species: *Robinia pseudoacacia*, *Fraxinus*

Americana, Ailanthus altissima, Elaeagnus angustifolia, Pinus nigra, Pinus silvestris, Amorpha fruticosa, Prunus serotina, Acer negundo; (2) Perennial invasive plant species: *Phytolacca americana, Fallopia spp., Solidago canadensis, Solidago gigantean, Ambrosia artemisiifolia, Asclepias syriaca, Echinocystis lobata*.

Amendment 81/2003 (VII.9.) to Decree 5/2001 (I.16.) of the Ministry of Agriculture and Rural Development provides regulations for the eradication and prevention of *Ambrosia artemisiifolia* and *Asclepias syriaca*. These species are included on the list of dangerous weed species in Decree No. 50/2008 (IV.24.) of the Ministry of Agricultural and Rural Development on conditions for the maintenance of proper Agricultural and Environmental Status for some rural development subsidies.

Most recently, Act No. XLVI of 2008 on the Food Chain and its Supervising Authorities (in force since 1 September 2008) will amend other decrees applying to the common ragweed (*Ambrosia artemisiifolia*).

A new Government Decree on keeping and transfer of ownership of pets is under preparation. One of the articles will contain a list of 15 species which ecologically endanger native wildlife and natural habitats of Hungary: specimens of these species must not be traded, offered to sale, kept or bred. The list is still under negotiation but mostly contains reptiles and mammals.

Policy: Hungary has started to develop a national strategy based on the European Strategy on Invasive Alien Species and on Decision VI/23 of the CBD. The National Biodiversity Strategy and Action Plan states that proposals should be elaborated on how to limit or suppress the spreading of invasive alien species.

Control of invasive alien species is incorporated into the National Nature Conservation Master Plan (chapter 5.4.1.2.5), into the National Biodiversity Strategy and Action Plan, and into some sectoral programmes such as common health, plant protection and animal husbandry.

Awareness-raising with specific stakeholder groups:

In spring 2008, the Ministry of Environment and Water took part in a popular exhibition (FEHOVA - Exhibition of Gun, Hunting and Angling) in Budapest and published a small leaflet about live baits for educational purposes that recommended anglers:

- not to use non-indigenous fish species as live bait;
- if used, not to release the bait into the wild at the end of angling;
- if anglers caught a non-indigenous fish species, not to release it back into the wild.

Research: The most dangerous invasive plant species for Hungarian habitats were listed (35 species) during a symposium in 1998¹⁹. In 2008 Hungary started to compile a new list of IAS (excluding pest species) which now consists of 40 terrestrial and 22 aquatic plant species and 73 animal species. The first version was based on data collected from researchers and conservation managers and compared to other international lists. The Ministry of the Environment then held a meeting for colleagues in the Inspectorates of Environment, Conservation and Water

¹⁹ See Report to Bern Convention Group of Experts on IAS (T-PVS (2002) 11).

(conservation authorities). The list, still under discussion with experts and nature conservation authorities, will be advisory and is intended to provide a starting point to help the development of focused legislation and also to raise public awareness.

The state nature conservation organisation has initiated several programmes for the mechanical control of invasive plant species in protected areas. The government and non-governmental organisations launch programmes for ragweed (*Ambrosia artemisiifolia*) control. The Hungarian Biodiversity Monitoring System monitors five invasive plant species (*Ailanthus altissima*, *Amorpha fruticosa*, *Asclepias syriaca*, *Solidago gigantea*, *Solidago canadensis*) since 1998. The research of invasive alien plant species in aquatic ecosystems received more emphasis in the allocation of grants in 2007-2008.

The Authority for Nature Conservation, Ministry of Environment and Water published a book 'Invasive Alien Species in Hungary' in 2003, containing actions against IAS at international, European and national level and also information about invasive plant and animal species, followed by a book on invasive alien plant species in Hungary in 2004.

Scientific reports on invasive alien plant species were in progress in 2004 while some reports on invasive fishes and mammals were already been prepared but not published (Report on Implementation of Programme of Work for the Global Taxonomy Initiative Annex to Decision VI/8).

Eradication/control programmes: IAS are now covered by species action plans and in the management plans of protected natural areas (detailed management plans exist for 113 protected areas and for 59 planned protected areas). Control is under way for several alien invertebrate species, microorganisms and weeds eg common ragweed (*Ambrosia artemisiifolia*).

Inter-ministerial coordination and financial mechanisms for control of *Ambrosia artemisiifolia*

In 2004 an inter-ministerial committee was set up to deal with legal and financial aspects of the control of *Ambrosia artemisiifolia*. The Ministry of Agriculture indicates that prevention and protection against ragweed is an administrative procedure of authorities. Land users are obliged to protect their property (land, garden etc.) from ragweed before 30 June in a given year.

Land Registries Offices after 30 June hold inspections (on-site examinations) in three different cases: from duty, at the request of other authorities or following a notification from a member of the public (e.g. a complaint from a neighbouring landowner). Following the on-site examination, the Land Registry Office hands the case to the Plant and Soil Protection Directorates of County MGSZH (MGSZH=Central Agricultural Office) which then carries out the administrative action according to the following steps:

A) If the land user is known and there is evidence of failure of protection, the directorates (as authority) may make 3 different decisions:

1. Adjudicates an obligatory protection (due to public interest)
2. Adjudicates a fine (because of failure of protection)
3. Adjudicates a payment (cost of the protection, because in this case the authority does it instead of the land users).

B) If the land user is not definitely known, the authority still has to adjudicate an obligatory protection due to public interest.

C) If land user is unknown and the land owner is unknown, the authority will cancel the administrative action and does not make a decision of fine or payment of the cost, although in this case the state budget (from budget estimates) finances costs of the protection.

In addition, there are effective prevention actions: published brochures about ragweed and protection, public website and campaigns in media organised by the Ministry of Agricultural and Rural Development, and a so-called “hot-line” service at the Soil and Plant Protection Authorities to manage complaints and notices from the public.

Since 2004, 1% of personal income tax may be offered for ragweed protection by a taxable person. The Ragweed Committee (the inter-ministerial committee established in 2004) makes a proposal for spending the payments received from 1% income taxes, and the proposal (budget) is approved by the Ministry of Agriculture and Rural Development each year.

According to the Hungarian Act of Annual State Budget Act, as it concerns the Ministry of Agriculture and Rural Development, there are two budget lines which determine resources for ragweed measures (protection measures in the public interest; work of the inter-ministerial committee). These estimates can cover the cost of work, campaign programmes, brochures etc.

Most Hungarian national parks reported control programmes or other activities in connection with eradication of invasive alien species in 2007.

The Environment and Energy Operational Programme of the New Hungary Development Plan gives opportunity to finance measures aiming to reduce populations of IAS within habitat rehabilitation and restoration projects.

Challenges/limitations: One limitation identified in Hungary’s report to the CBD was that there is no priority governmental interest in solving this issue. However, 6 new decrees were issued in 2007 that reference IAS species lists and control, and 1 decree and 1 act relating to this issue are under preparation in 2008.

Within the European Community the trade of certain invasive species is not regulated and the import of these species may have considerable negative effect on the native flora (eg ornamental use of *Solidago gigantea*).

The Ministry of Water and Environment has translated the European Strategy on Invasive Alien species and published it in 2007. From the beginning of 2008 more intensive work started on species list of IAS of Hungary and developing the national strategy. However, collaboration with other ministries and creating a strong basis for the new strategy will be a big challenge and will require continuous conciliations and good coordination in the near future, although the first experiences are positive.

13.IRELAND

Legislation: There are several alien species prohibited by law both in the Republic and Northern Ireland. For example, in the Republic, *Berberis vulgaris* has been classified as a ‘noxious weed’ since 1958 and it has been systematically eliminated; in Northern Ireland, the 1985 Wildlife Order makes it an offence to plant or cause to grow in the wild *Heracleum mantegazzianum*, *Fallopia japonica* and all species of *Spartina*.

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

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

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

Under the Regulation on the Control of Importation of Wild Animals and Wild Birds, 1989, the importation of live wild animals or birds is subject to licence by the Minister.

A review of legislative provisions relating to invasive species and their enforcement in the Republic of Ireland and Northern Ireland was undertaken by the "Invasive Species in Ireland Project" (see under Policy below) and completed in May 2008. This makes recommendations for improvements and may result in the development of dedicated invasive species legislation but no decisions have been taken at this stage.

Recent developments in legislation include the review of the Wildlife Order 1985 in Northern Ireland which proposed a wide range of additions of invasive species to Schedule 9. In response to confirmed reports of muntjac deer in Co. Wicklow, the Minister signed Regulations - the Wildlife (Wild Mammals) (Open season) (amendment) Order 2008, (SI no.27 of 2008) - declaring an open season on muntjac deer. NPWS is also examining the appropriate regulatory measures to be taken to control the possession and dispersal of ecologically harmful and invasive species of plants and animals in Ireland. It is expected that this issue will be addressed in regulations to be made under the Wildlife Acts 1976 and 2000 later this year.

When introducing alien marine species for targeted fisheries, Ireland follows the principles and risk-reducing measures as outlined in the ICES Code of Practice on the Introductions and Transfers of Marine Organisms.

Policy: Proposals for addressing the impact of IAS on native biodiversity were published in The National Biodiversity Plan for Ireland (2002- 2006). For example:

- Action 28: 'Prepare strategies, in consultation with Northern Ireland, to control

introduced species and to prevent, or minimise, future (accidental or deliberate) introduction of alien species, which might threaten biodiversity. Unless clearly safe, all deliberate introductions of alien species into Ireland will require a risk assessment’.

- Action 29: ‘All public bodies will endeavour to use native species, landraces and breeds and the public will be encouraged to do so’.
- Action 30: ‘Ireland will seek to ensure that relevant laws and instruments, including those concerned with trade, - both within the EU and internationally - do not contribute to the problem posed by alien species and Ireland and will support the development of specific international instruments to address alien species’.

The same proposal of collaboration was included in Recommendation 48 of Biodiversity in Northern Ireland.

The National Biodiversity Plan, published in 2002, is under review and invasive species are a key theme that will receive particular attention. A new Plan is due for publication by the end of the year.

In 2004 a report on the situation of IAS in Ireland was carried out by Quercus jointly to the Environment & Heritage Service of the Department of Environment (Northern Ireland) and the National Parks and Wildlife Service of the Department of Environment, Heritage and Local Government (Republic of Ireland). A strategy is under development to implement the recommendations.

Sectoral policies: voluntary quality control schemes having an impact on alien species are in place for the sector of aquaculture. The refusal of the quality mark is given for non-compliance.

Under the Global Strategy for Plant Conservation and to fulfil its commitment to the CBD, a Stakeholder Meeting in 2005 adopted 16 targets. Target 10 of Ireland’s National Plant Conservation Strategy deals with IAS (Management plans in place for at least 10 major alien species that threaten plants, plant communities and associated habitats and ecosystems in Ireland: see www.botanicgardens.ie/gspc/gspc.htm). Reported actions include:

- Draft new lists of prohibited weeds in consultation with Northern authorities to ban the sale, introduction, introduction or movement, especially of aquatics. Maintain vigilance on emerging threats.
- Review of national phytosanitary legislation to be harmonised with international and regional provisions by 2006.
- Develop priority list of 10-12 species; Implement efficient management programmes and Species Action Plans for at least 10 established invasive plant species by 2008.
- Develop and implement mechanisms for early detection and rapid action against potentially new invasive species including a manual of procedures for border control by 2007. Prepare documents for horticulturists to enable guidelines to be developed to prevent the establishment of new invasive aliens in the country.
- Evaluate existing all-Ireland Species Action Plans for Alien species, and modify as appropriate, by 2009.
- Assess and monitor the risk of genetic pollution of native plant species and

populations from introductions of foreign 'Wild Flower seed' by 2009.

Milestones & Indicators:

- Develop an efficient target-10 webpage, as part of the GSPC page, which will co-ordinate actions and organisations in highlighting or controlling problem species.
- Leaflets warning of the dangers of alien plants especially aquatics such as *Crassula helmsii*.
- Noxious Weeds act extended to cover an increased list of prohibited species.
- *Hydrocotyle ranunculoides* exterminated in its two localities.

Ireland is developing and implementing measures to tackle IAS in partnership with the Northern Ireland administration. A review of invasive species in Ireland was jointly commissioned by National Parks and Wildlife Service and the Environment and Heritage Service. This report was presented to both Ministers in March 2004 and it was agreed that both agencies (Environment and Heritage Service in Northern Ireland, National Parks and Wildlife Service in the Republic of Ireland) would work together and with other stakeholders to tackle the IAS problem. In response to the recommendations of this report the 'Invasive Species in Ireland' project started in May 2006 and runs until May 2009.

'Invasive Species in Ireland' project

Aims of the Invasive Species in Ireland project:

1. Reducing the risks of invasions of new species
2. Developing contingency plans in conjunction with stakeholders
3. Producing management plans to help control and manage new and established invasive species and vectors
4. Engaging key stakeholders
5. Developing codes of good practise in conjunction with stakeholders
6. Raising public awareness
7. Recommending surveillance, monitoring and recording programmes
8. Reviewing legislation

Full details of the project can be found on www.invasivespeciesireland.com. The budget for this project is £262,000.

An extensive stakeholder engagement programme has been underway for two years, one element of which is the All-Ireland Invasive Species Forum. This forum meets annually and has over 100 organisations involved including central and local Government, state agencies, industry, academia and the NGO sector. There are four technical working groups on marine, freshwater, terrestrial invasive species and education and awareness. Details on Forum membership and activities can be found on the Invasive Species in Ireland website.

Education and awareness materials have been produced and are available for download from the site. In addition, IAS will be the focus of Ireland's biodiversity awareness campaign Notice Nature (www.noticenature.ie) in 2008. Materials for schools and the construction, business and tourism sectors are being developed.

A progress review was undertaken in 2008 to identify future options for tackling invasive species on the island of Ireland. Its outputs will be considered at a conference in November.

A risk assessment protocol has been developed and over 600 risk assessments have been carried out on established and potential invasive species to identify those species

that pose the greatest threat to biodiversity on the island of Ireland. Exclusion strategies, contingency plans and management strategies are being prepared for these species (see below). The highest risk to biodiversity in Ireland is from freshwater invasive species, in particular ornamental pond plants and fish.

Research: The National Research Centre for Biodiversity and Conservation Biology in Northern Ireland (Quercus) (<http://www.quercus.ac.uk>) has some projects on IAS: 'All-Ireland review of introduced species' (a cross-border project) and 'Impacts of invasive aquatic amphipods'. A report on the situation of IAS in Ireland was carried out by Quercus (2004). Ireland is represented in the DAISIE and ALARM project teams.

The Environmental Protection Agency, as part of the Science, Technology, Research & Innovation for the Environment (STRIVE) Programme 2007–2013, has funded a €280,000 project on alien invasive species in Irish waterbodies. This project will address the knowledge gap identified under the Water Framework Directive for IAS in Ireland's River Basin Districts, and produce a monitoring and reporting strategy. This will be achieved by: literature review of impacts on natural ecosystems, vectors, spread potential and control options; analysis of impacts of selected invasive species on structure and function of natural ecosystems (primarily by innovative studies of impacted and non-impacted food webs using stable isotopes in exemplar waterbodies); and preparation of an archived GIS-based database of aquatic aliens in Ireland. This project is being carried out by a consortium of Queens University Belfast, EnviroCentre, the Central Fisheries Board and the National Biodiversity Data Centre.

Research is also being carried out into the impacts of curly leaved waterweed (*Lagarosiphon major*) in Lough Corrib (Central Fisheries Board), control of giant rhubarb (*Gunnera tinctoria*) on Clare Island (National Botanical Gardens) and on the zebra mussel invasion and impacts on Irish lakes (multiple projects ongoing). The Invasive Species in Ireland project will put a research page on the website as a source of information on who is doing what relating to IAS research and control in the coming months.

Eradication/control programmes: Exclusion strategies and contingency plans have been prepared for non-native crayfish species, wild boar and non-native deer (muntjac, Chinese water deer and roe deer) and Japanese kelp. Some control measures have been undertaken in Killarney National Park where introduced Sika deer have interbred with Red deer. Eradication is not feasible for Grey squirrel and bank which have reached pest status in some localities.

Management plans have been prepared for the invasive tunicate *Didemnum*, chub, floating pennywort (*Hydrocotyle ranunculoides*) and ruddy duck. Management plans currently in preparation include those for invasive mammals on seabird islands, giant rhubarb, Hottentot fig, New Zealand pigmy weed, fringed water lily, parrot's feather and Chinese mitten crab.

There are a number of widely established species for whom island wide eradication is impossible so best practice management guidelines have been prepared along with templates for the development of site specific management plans. These include

Japanese knotweed, Himalayan balsam, giant hogweed and *Rhododendron ponticum* and cherry laurel. All strategies and guidance documents are available on the website. Active control programmes for *Rhododendron ponticum* and *Heracleum mantegazzianum* are in place.

Control programmes are underway for *Lagarosiphon major*, *Hydrocotyle ranunculoides* and zebra mussels. There are smaller site-specific control projects, many of which are now being undertaken by local authorities in Ireland. In relation to *Lagarosiphon major*, NPWS has funded the purchase by the Central Fisheries Board (CFB) of a weed cutting boat to be dedicated exclusively to removing the invasive species from Lough Corrib in County Galway. Additional funding of €200,000 has also been provided by the NPWS to the CFB in 2008 for work involving the removal and control of the species in the lake.

In addition a project is underway to investigate measures for the control of *Gunnera tinctoria* on Achill Island in Co. Mayo. The project is funded by Mayo County Council and by NPWS through the Biodiversity Fund, which is administered by the Heritage Council. *Gunnera tinctoria* is a large herbaceous plant that forms dense colonies that shade out and suppress native vegetation. This species is a vigorous seeder and also has the ability to spread vegetatively, so intense effort is required for its control.

Other activities: Codes of Practice are also being developed in conjunction with relevant sectors. The Horticulture Code is complete and Codes for the aquaculture sector and recreational water users are in development.

Challenges/limitations: It seems there are problems with enforcement of legislation related to IAS in the Republic of Ireland (Stokes et al 2004). Powers of access to private land if needed for control of IAS are not in place.

14. ITALY

Legislation: There has been a review of the Italian legal/policy framework in relation to IAS. The Decree of the President of the Republic (DPR no 357 of 1997) and its amendments (D.P.R. no. 120 of 2003) contain provisions prohibiting the introduction of alien species in Italy. The Decree transposes the habitats Directive, and states in Article 12(3) that introductions of 'non-local' species require the authorisation of the Ministry of Environment under the condition that the proposed introduction will not threaten biodiversity. Article 12 of the DPR 120/03 prohibits any introduction of alien species in Italy.

Guidelines for the application of this provision have been produced (*Linee guida per l'immissione di specie faunistiche* – Guidelines for the translocation of wildlife species (AA. VV., 2007)). A proposal to incorporate them into a Ministry of Environment Decree has not yet been approved and is under discussion.

Law n° 157/1992 applies to all mammal and bird species of which wild populations are permanently or temporarily established on national territory. The definition

includes non-native as well as native species, which means that the protection/control measures outlined in the Law are applicable to potentially invasive alien species (though no clear reference to IAS is made). Article 20 regulates the import from abroad into Italian territory of live mammals and birds for reintroduction and genetic improvement and clearly mentions the prohibition on using non-native species. An import permit is required from the Ministry of Agriculture and Forestry together with an advisory opinion from the Italian Wildlife Institute (I.N.F.S.). Article 19 establishes an authorisation procedure for control of mammals and birds, including non-native species.

In Italy, each of the twenty regions can adopt internal legislation. There are some Regional Laws that have provisions on IAS. The Lombardia region provides one example of a subnational legal approach to IAS. The new Regional Law (n° 10/31 March 31 2008) bans the introduction of alien invertebrates, herps or plants into the natural environment, with the exception of species released for biological control if authorised by national legal framework (there is no reference to releases for other purposes. Offenders may be fined € 200-2000 and obliged to eradicate the introduced species if applicable. The law also includes a black list of species to monitor, control or eradicate. A list has been circulated (made without PRA): the current version includes *Anoplophora chinensis*, *Dreissena polymorpha*, *Procambarus clarkii*, *Orconectes limosus*, *Astacus leptodactylus*, *Rana catesbeiana*, *Leptoglossus occidentalis*, *Trachemys scripta* and about 20 plants²⁰

There is also a specific Law (150/92) which contains provisions on the keeping of potentially dangerous alien species.

The Decree laying down phytosanitary measures concerning the importation of plants belonging to the *Chamaecyparis* Spach and *Pinus* L. species originating in Japan introduces some phytosanitary and quarantine measures in order to prevent the dissemination of pests which might arise from the importation into Italy from Japan of the plants specified in article 1. Prior to the exportation from Japan, the plants shall be subject to inspection to be carried out by the Japanese phytosanitary authorities (art. 2), so as to guarantee that they are free from the diseases defined under article 2 (2) and they meet the requirements established therein. The plants shall also be accompanied by the certificate referred to in article 3 and, upon arrival into Italy, shall be subject to the quarantine measures contained in article 4. An authorisation granted by the Ministry of Agricultural and Forestry Policies is compulsory as well (art. 5).

Policy: Monitoring and mitigation programmes for invasive alien species are among the criteria of management for Natura 2000 sites.

Bilateral cooperation on *Ambrosia artemisiifolia* (Italy, Croatia)

A partnership was established in January 2008 between the Venice Region (Regional Agency for Environmental Protection (ARPAV)) and the Croatian region of Slavonia (Slavonia regional development agency (RRASB)) to facilitate cross-border cooperation to address the growing human health impacts and associated socio-economic impacts caused by the pollen of this invasive plant. The Veneto Region Brussels Office held a joint press conference, with ARPAV and RRASB, in Brussels on 6 October, supported by Members of the European Parliament (ENVI Committee).

²⁰ http://www.provincia.milano.it/export/sites/default/polizia_provinciale/documenti/L.r._31_marzo_2008_n_10.doc

Research: Italy is participating in the DAISIE and ALARM projects. The new technical advisory body ISPRA (which merges the Italian Wildlife Institute (INFS), the ICRAM and the APAT) is implementing a database of alien species, with the financial support of the Ministry of Environment. ISPRA is also carrying out projects such as identification and distribution of alien species in Italian seas.

Other actions include: Inventory of Alien mammals and birds, Study on distribution and impact of *Rapana venosa*, Inventory of alien species in Italian Seas, Inventory of alien plants in Sardinia, a pilot study is being carried out in the Trieste and Milazzo harbours in order to identify species and monitor the ballast waters, Atlantic and Lessepsian Immigrant Environmental Noises project, etc.

LIFE projects play an important role in the management of IAS. In 2003, 64 per cent of Italian projects funded through the LIFE mechanism had as their main objective the eradication and control of IAS (IP/03/1202 Date: 05/09/2003). In the period 1994-2002 the following alien species were targeted through 27 LIFE projects:

Plant species:

Abies cephalonica, *Acacia cianophylla*, *Acer negundo*, *Ailanthus altissima*, *Amorpha fruticosa*, *Caulerpa taxifolia*, *Cedrus sp.*, *Eucaliptus sp.*, *Laserpitium niger*, *Lonicera japonica*, *Mesembryanthemum acinaciforme*, *Nelumbo nucifera*, *Pinus halepensis*, *Phytolacca americana*, *Pinus pinaster*, *Platanus spp.*, *Populus hybrida*, *Prunus serotina*, *Pseudotsuga menziesii*, *Quercus rubra*, *Robinia pseudoacacia*, *Solidago canadensis*, *Solidago gigantean*.

Animal species:

Canis lupus familiaris, *Carassius carassius*, *Ctenopharyngodon idella*, *Dama dama*, *Ictalurus melas*, *Lepomis gibbosus*, *Myocastor coypus*, *Procamburus clarkii*, *Rana catesbeiana*, *Silurus glanis*, *Trachemys scripta*.

Italy is also a member of the trilateral ballast water management sub-commission for the Adriatic Sea (Italy-Slovenia-Croatia) which deals with the problem of introduction of harmful organisms from ships in the area.

Eradication/control programmes: The Ministry for the Environment and Territory has produced an action plan for freshwater fishes (2003), and guidelines for *Myocastor coypus* (2001) and *Sciurus carolinensis* (2001). Also other eradication and control programmes have been undertaken in Italy.

Guidelines for exotic mammal and bird management were published in 2001 by the same Ministry (Andreotti A., N. Baccetti, A. Perfetti, M. Besa, P. Genovesi, V. Guberti, 2001 - *Mammiferi ed Uccelli esotici in Italia: analisi del fenomeno, impatto sulla biodiversità e linee guida gestionali*. Quad. Cons. Natura, 2, Min. Ambiente - Ist. Naz. Fauna Selvatica).

Challenges/limitations: There is currently no precedent in national legislation for regulating domestic trade in invasive alien species: for example the grey squirrel *Sciurus carolinensis* is still freely traded. The Region of Lombardia has requested approval of a trade regulation for this species: the matter is currently being considered

by the Ministry of Environment.

The inadequate legal basis also affects the effectiveness of mitigation programmes (eg attempts to eradicate grey squirrel). In particular, Article 2 of Law n° 157/1992 implies that alien species of mammals and birds, if established in the wild, are protected by national legislation. This can create problems for IAS management because even though Article 19 of the Law references species control measures, there is no explicit reference to eradication and control of IAS. In addition, control measures may only be carried out by agents authorised by local administrations.

Although a draft national Decree containing Guidelines for re-introductions of wild species on national territory was prepared, this has apparently been halted.

Major problems arise from the lack of legislation at Community level regulating the import into the community of exotic alien species that have been proven to threaten European habitats and species. Such EC-level legislation would provide a sound basis for creating national legislation in this area.

15.LATVIA

Legislation: The Law on Protection of Species and Habitats (16.03.2000) provides for control of pathways for introduced species (Chapter IV: Species Introduction and Reintroduction). Annex 1 to the Law on Environmental Impact Assessment provides that for introduction of wild species not native to the territory of Latvia, impact assessment is required. After positive assessment, introduction of certain species for economic or social use may be possible. Relevant regulations of the Cabinet of Ministers set a procedure of introduction and reintroduction.

The Law on Plant Protection lays down regulations for import and export of plants. Amendments in the law were introduced on 2 November 2006. Articles 18.1 and 18.2 establish the following provisions:

- criteria for inclusion of plant species in the list of invasive species and procedure for inclusion.
- prohibition on the introduction (import) into the country of invasive species;
- prohibition on the cultivation of listed invasive species. The landowner is responsible for eliminating such plants on his property and penalties apply to land owners that do not comply with control requirements.;
- State control on distribution and control of invasive plant species is vested with the State Plant Protection Service (SPPS);
- control measures should be carried out in all invaded areas;
- in accordance with an order of the Cabinet of Ministers, local governments may be involved in control actions for invasive plant species;
- local governments in cooperation with SPPS may organise control measures if this is not done by the land owner:
- The SPPS monitors invasive plant distribution in agriculture lands. Other state institutions are responsible for data submission to SPPS on the distribution of

- invasive plant species in other categories of land use;
- The SPPS is the nominated data keeper on invasive plant species: data is free for public access.

To date, one invasive plant (*Heracleum sosnowskyi*) has been included in this list. There are currently no proposals to list additional species but any EPPO-listed species may be included. Only limited support for control is available at present, due to general budgetary constraints²¹.

National legislation prohibits use of alien tree species for forest restoration or afforestation.

Policy: The National Programme on Biological Diversity (NPBD) sets numerous goals for control of invasive species in all relevant sub-programmes. Those dealing with control of pathways are described in the box below.

Goals on IAS in Latvian National Programme on Biological Diversity

In agriculture:

- 14.8. Contain the distribution of introduced species.
- 14.8.1. Allow the introduction of agricultural crops only after rigorous testing and experience in other countries. Observe precautionary principle when making decisions on cultivation of introduced species.
- 14.8.3. Control the distribution of aggressive species, especially by their removal from natural communities.
- 14.8.4. Develop and implement regulations on introduction of new crops, and stipulate grower responsibility for damages ensued to local species and communities.

In inland waters:

- 1.6.1. Ensure a ban on introduction of alien species into natural waters, and restrictions on their growing in fishponds
- 15.3. Prevent entry of foreign fish species or other organisms into the natural environment
- 15.3.1. Control and combat the already widespread aggressive species.
- 15.3.2. Assess the safety of the utilised technologies for fish growing in existing aquacultures, and the impact of possible release of the grown foreign species in natural ecosystems.
- 15.3.3. Exclude the introduction of genetically modified aquatic organisms in nature.

In marine and coastal areas:

- 1.6.2. Control the use of ballast waters.
- 2.1.8. Encourage use of local species for dune stabilisation, and prohibit planting of alien species on dunes.
- 2.1.9. Restrict distribution of expansive species (for example, roses *Rosa rugosa*, sea buckthorn and *elaeagnus*) on dunes.

In forests:

- 4.4.3. Monitor distribution of alien species in forests and combat expansive species.
- 13.9. Control the distribution of foreign tree species in forests.
- 13.9.1. Utilise specific tending methods in forests with high densities of foreign tree species in plant communities.

In urban ecosystems:

- 10.1. Identify the trends in expansion of distribution of species in human environments, with the appropriate monitoring.
- 1.1.1. Control the expansion of aggressive weeds, and hunting.

²¹ Pers.comm, Vilnis Bernards, Ministry of the Environment.

- 16.5. Prevent the impact of introduced species on natural populations.
16.5.1. Promote hunting of introduced predator species.
16.5.2. Monitor the population dynamics of introduced predator species.
16.5.3. Develop legislation on introduction of foreign species, and ensure compliance.

Research: A list of the most important and aggressive alien species has been made, including 15 species. The Latvian State Centre of Plant Protection and Institute of Biology of Latvia, Laboratory of Botany took part in a EU 5th Framework Programme project: ‘Giant Hogweed (*Heracleum mantegazzianum*) a perilous invasive weed: developing sustainable strategy for alien invasive plant management in Europe’. Studies on *Heracleum sosnowskyi* (genetics, ecology) were carried out in the frame of this project. Researchers of the Latvian University of Agriculture carried out project on biology of Giant Hogweed in 2001-2002. Studies on distribution of alien species in coastal habitats of Latvia have been also carried out (Faculty of Biology, University of Latvia, 2002), involving mapping of alien species along the coast of the Baltic Sea. A State Plant Protection Service was established in 1998.

Regional cooperation on alien invasive species is ongoing with the Nordic and Baltic countries through the NOBANIS project. Latvia’s alien species list home page, established on <http://lv.invasive.info> is contributing to information transfer.

Eradication/control programmes: One of the main threats to habitats and species in rural areas is *Heracleum sosnowskyi*. This expansion of this species is controlled by measures supported by Single Programming Document (2004-2006). A Programme for control of Giant Hogweed (2006-2012) has been adopted by Cabinet of Ministers Order (06.06.2006).

Challenges/limitations: Most of the invasive species do not have national strategies or plans for minimising their distribution. Although the main trans-regional distribution pathways are controlled to prevent invasion of new species, distribution of invasive species within the country is not sufficiently controlled. There is a lack of financial resources available for monitoring of invasive species. Other challenges identified were lack of capacity (specialists), knowledge and funding.

16. LITHUANIA

Legislation: The Law on Wild Flora (1999), the Regulation of the Ministry of Environment on import of new plant and fungi species (2000), and Law on Protected Plant, Animal and Fungi Species and Communities (1997, amended 2001) and related regulations provide control for pathways for introducing species. The Law on Plant Protection (1995, amended in 2003) states regulations for import and export of plants. According to national legislation it is prohibited to use alien species in afforestation.

The Ministry of Environment approved an Order on Introduction, Reintroduction and Relocation, the Order on Control and Eradication of Invasive Species Organisms and Composition of Committee on Invasive Species Control (Order No 352) issued in July

2002 (amended in June 2008)²². In 2004, the list of Invasive Species was approved by Ministerial Order No D1-433.

When importing live alien animal species into the country, a permit from the Ministry of Environment is required. The importer must apply to the Ministry, and get conclusions and recommendations from the Committee on Invasive Species Control to confirm that the distribution of such species in the wild will not have adverse ecological or economic effects, or negative effects on human health. The permit will be issued only if the Committee has approved the application. There are also provisions for quarantine of potential IAS. The same legislation also contains provisions to prohibit trade in invasive species, and allows for potential IAS that are known to cause harm elsewhere to be treated as dangerous (import prohibited etc).

Control of IAS is performed by the State Food and Veterinary Service, State Plant Protection Service, Customs Department, the Ministry of Health and the Ministry of Environment. The competence of each of these organisations is described in the Order on Control and Eradication of Invasive Species Organisms.

In 2002 the Ministry of Environment approved the Programme on Introduction, Reintroduction and Relocation, and a related Action Plan. In the Programme there are guidelines how to prevent and stop spread of invasive species and in the Action Plan there are detailed actions, together with responsible actors and provisions for financing.

Policy: The Lithuanian Biodiversity Strategy and Action Plan (1998) sets a goal and actions related to IAS. The goal is to protect locally characteristic species and natural populations by preventing the spread of adventitious and invasive species, and by enhancing research. The action is to prepare a study on introduced and invasive species and their ecological role.

Among various activities set in this Action plan (for 2002-2007) the following have particular relevance for invasive species :

- strengthening of institutional capacities for prevention of introduction, trade and relocation of harmful alien species
- creation of data base on alien bacteria, fungi, plant and phytoviruses;
- creation of data base on alien dendroflora in forest ecosystems;
- creation of data base on alien Baltic sea species;
- creation of data base on animal species;
- creation of consolidated data base on all alien species and integration of this database into international information networks on alien species;
- incorporation of monitoring of alien species into National monitoring programmes;
- preparation of specific monitoring programmes and implementation to track and control spreading and habitats of specific alien species;
- control of adventitious dendroflora in Lithuanian forest ecosystems;
- evaluation of introduced tree species in Lithuanian forests (inventory of tree

²² Available at:
http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=179371&p_query=introdukuotos%20rūšys&p_tr2=0.

species, preparation of catalogue, estimation of spreading, evaluation of ecological and economical damage or benefit);

- creation of the list of invasive species;
- identify invasive species origin, distribution, spreading routes and ways;
- preparation of maps of invasive species distribution;
- preparation of control and eradication plans for invasive species;
- creation of information system for public, education and awareness-raising.

The National Environment Monitoring Programme for 2005-2010 includes the following goal: a) To halt the loss of biodiversity till 2010 assessing the main tendencies of biodiversity changes... *to assess, forecast and control spread of the most dangerous fauna and flora invasive species to Lithuanian biodiversity.*

In 2010 it is planned to create a website on IAS in Lithuania.

Lithuania has not developed any voluntary or non-regulatory initiatives (eg codes of conduct, public awareness campaigns etc.).

Research: Lithuania is represented on the DAISIE and ALARM project teams and participates in NOBANIS.

Eradication/control programmes: Prevention and control plans for *Heracleum sosnowskyi* and *Orconectes limosus* species are currently being prepared. 15,000 Lt have been allocated for research on *Perccottus gleni* population and the preparation of action plan, and 40,000 Lt for investigation of *Nyctereutes procyonoides* population and preparation of action plan in 2008.

In 2008-2009, there will be assigned 500,000 Lt for estimation of implementation costs and preparation of action plans for population regulation and control activities for 7 invasive species (*Mustela vison*, *Nyctereutes procyonoides*, *Perccottus gleni*, *Orconectes limosus*, *Heracleum sosnowskyi*, *Acer negundo* L., *Lupinus polyphyllus* Lindl.). In 2010-2013, financial resources will be allocated for implementation of above mentioned action plans.

Challenges/limitations: Lack of capacity and funding.

17.LUXEMBOURG

Legislation: There is no specific piece of legislation concerning IAS in Luxembourg. However, the Act of 19 January 2004 on the Protection of Nature and Natural Resources as amended sets out several provisions that are relevant to IAS²³.

Article 30 prohibits the import and introduction of alien species into the wild without

²³ This Act repeals the earlier Act on the Protection of Nature and Natural Resources of 11 August 1982 (See: <http://www.legilux.public.lu/leg/a/archives/2004/0102901/0102901.pdf?SID=c3243b613dc6a330ed0eb304bb73463f#page=2>).

Ministerial authorisation. Permission may only be given if species are harmless for natural habitats and native fauna and flora and after a process of consultation with the Superior Council for the Protection of Nature and Natural Resources. Decisions are made on a one-off basis i.e. no 'black list' has been compiled.

Articles 26 and 27 prohibit the unjustified exploitation, damaging, capture and/or possession of wild native and alien flora and fauna. Article 27 also applies to trade in wild animal species and the provisions of the Article can also be used to control trade in and possession of IAS. On the other hand, these Articles may imply that the eradication or control of IAS might need a clear legal justification. This might hinder a quick response to prevent the establishment of IAS in the country.

A review of the legal framework is under way to determine whether it is sufficient and whether improved measures to control the most invasive plant species are necessary. In this context, it should be noted that Luxembourg will be bound by the Benelux decision under development requiring Parties to review national legislation "to prevent the introduction on their territory of non-native species that may become invasive and have adverse environmental impact as indicated by risk assessment".

There are some legal measures in place to prevent introduction and distribution of muskrat (*Ondatra zibethicus*) and raccoon (*Procyon lotor*). Development of hunting legislation is under way to enable hunting for control of alien species if necessary.

Policy: Luxembourg adopted its National Plan for Nature Conservation (*Plan National Protection de la nature* (PNPN 2007-2011) in May 2007. The Plan addresses IAS issues and provides that action plans may be prepared for IAS that threaten native biodiversity or public health (action is discretionary). The List of Priority Species annexed to the Plan includes the following invasive/problematic species in different taxonomic groups, with different priority levels assigned:

Taxonomic group	Species	Priority level	
Plants	<i>Heracleum mantegazzianum</i> Somm. et Lev.	1	
	<i>Fallopia japonica</i> (Houtt.) Ronse Decraene	2	
	<i>Fallopia sachalinensis</i> (F. Schmidt Petrop.) Ronse Decraene	2	
	<i>Helianthus tuberosus</i> L.	2	
	<i>Impatiens glandulifera</i> Royle	2	
	<i>Senecio inaequidens</i> DC.	2	
	<i>Ambrosia artemisiifolia</i> L.	2	
	Reptiles	<i>Pseudemys scripta</i>	1
	Amphibians	<i>Rana catesbeiana</i>	2
Mammals	<i>Capreolus capreolus</i>	1	
	<i>Ondatra zibethicus</i>	1	

Research: Non-native mammals are monitored through an ongoing project to determine their status and distribution on the territory, assess their impact on native fauna and flora and develop guidelines for their management. The same is being done for selected non-native plant species by the National Natural History Museum. (see related website: <http://mnhnl.lu/cgi-bin/baseportal.pl?htx=/projects/neophytes/intro>).

Eradication/control programmes: Several species of plants and animals are the target of control or eradication programmes, including *Ondatra zibethicus* (in relation

to increased predation on pearl mussels (*Margaritifera margaritifera*), *Ovis ammon* and *Syringus vulgaris*.

Challenges/limitations: Not found.

18.MALTA

Legislation²⁴: Under the primary legislation - the Environment Protection Act (EPA) (Chapter 435, Act XX of 2001, as amended)²⁵ - Regulation 9.2.k(iii) empowers the Minister responsible for the environment to make regulations which, in relation to the protection of biodiversity, may ‘declare any species to be an invasive species and establish rules for its control’. Various pieces of subsidiary legislation that address alien species have been enacted under the EPA and are mentioned below. The competent authority for implementing this legislation is the Malta Environment and Planning Authority (MEPA).

The Trees and Woodland Protection Regulations 2001 (LN 12 of 2001)²⁶ confer protection on native species listed under Schedule I (strictly protected trees), Schedule II (protected trees) and Schedule III (protected trees of more than 50 years of age). To further contribute to the protection of these species and of trees occurring in protected areas, Regulation 10(1) empowers the Minister to “indicate a list of alien invasive species, as listed in Schedule V to these Regulations, which cannot be propagated, sown, planted, imported or sold in Malta”. Schedule V lists six plant species that are invasive in Malta (*Acacia saligna*, *Acacia karoo*, *Ailanthus altissima*, *Albizia lebbek*, *Ricinus communis* and *Schinus terebinthifolius*). Under Regulation 10(2), the Director for the Protection of the Environment may take steps to order the uprooting of Schedule V listed species. Regulation 14 states that “the Director may stop the importation of trees which in his opinion may endanger the biological identity of Malta, or for any other reason in the national interest”.

No stop orders have been issued for Schedule V-listed tree species since the Regulation was adopted, according to MEPA’s records, nor have there been any requests for importation of such trees. It should be noted that these six species are not being actively used in landscaping, since the Regulations were drafted in collaboration with garden shops, nurseries, botanic gardens, the University of Malta and relevant governmental and non-governmental institutions and organisations, which are aware of the invasive nature of these species in the Maltese islands.

The above Regulations (LN12/01) are due to be replaced by new proposed Regulations currently undergoing public consultation. These amendments aim to:

- bring the Regulations in line with recent administrative changes;
- take account of new scientific knowledge; and
- improve the previous Regulations from a number of perspectives following a

²⁴ For the exact wording of cited regulations, please refer to the indicated links in this section.

²⁵ See http://www.mepa.org.mt/environment/legislation/chapt435_2001_E.pdf

²⁶ See http://www.mepa.org.mt/environment/legislation/LN_12_2001_E.pdf.

seven-year experience in their implementation.

Possible changes to the provisions on invasive alien tree species are also undergoing discussion. The related schedules for the public consultation are available at the following link: http://www.mepa.org.mt/planning/factbk/GNs/gn682_08.pdf.

Regulation 6(1) of the Trade in Species of Fauna and Flora Regulations 2004 (LN 236 of 2004)²⁷ enables the CITES Scientific Authority and Management Authority to advise the Minister to prohibit the import, export, re-export and possession of any species of fauna or flora, if, in the opinion of the said authorities, such transactions or possession would endanger the biological identity of any ecosystem or any species of flora or fauna in Malta. Regulation 6(2) places the responsibility on "... the person, who is seeking to import or is in possession of any live specimen, to obtain the necessary information from the Management Authority...", in order to establish whether such specimen is of any species referred to in Regulation 6(1).

The CITES Management Authority (within MEPA), with the assistance of the CITES Scientific Authority, has compiled a list of species the entry of which is prohibited into Malta. This is updated every time MEPA processes species-import-lists that are submitted to the CITES Management Authority. Species are 'blacklisted' on the basis of Regulation 6(1) of the Trade in Species of Fauna and Flora Regulations (LN236/04).

A system is in place for controlling importation from non-EU countries. An import licence, issued by the Trade Services Directorate in accordance with Regulation 3 of the Importation Control Regulations 2004²⁸ (LN 242 of 2004, as amended by LN 230 of 2005) is required before animals listed in Schedule II of the said regulations, can be imported from non-EU countries. Importation of plant species from non-EU countries currently does not require an import licence; nonetheless, importation must be done in conformity with national legislation.

The Flora, Fauna and Natural Habitats Protection Regulations 2006 (LN 311 of 2006)²⁹ address alien species under Part V (Introduction and Reintroduction of Species). Regulation 28 addresses several issues related to the control of alien species including *inter alia*:

- the possibility to regulate the importation and/or keeping of any species of flora and fauna, if deemed that such importation and/or keeping may harm or lead to the endangering of biodiversity of Malta (see Reg. 28[1]);
- regulation of the deliberate release of those species that are invasive or deemed to be invasive as referred to in Regulation 28(3) (see Reg. 28[5]);
- the possibility to develop eradication or control plans and related programmes for established alien species, invasive species and those alien species with a potential to become established and subsequently invasive (see Reg. 28[6]).

²⁷ See http://www.mepa.org.mt/environment/legislation/LN_236_2004_E.pdf

²⁸ <http://www.doi.gov.mt/EN/legalnotices/2004/04/LN242.pdf>

²⁹ Which repeal a number of legal notices including L.N. 257 of 2003 (see http://www.mepa.org.mt/Environment/legislation/LN_311_2006.pdf).

- Regulation 28(7) states that ‘The Competent Authority may issue guidelines on the keeping, monitoring, prevention, control, and eradication measures of established alien species’.

In the past, some development applications were assessed on the basis of their landscaping considerations: in some cases, these were adjusted to the Maltese scenario in line with the MEPA Guidelines on Trees, Shrubs and Plants for Planting and Landscaping in the Maltese islands adopted in 2002 (available at http://www.mepa.org.mt/Planning/factbk/policies/Guide_Trees_Plants.pdf).

In specific cases, a development application may be refused on the basis of the impact resulting from IAS. In one recent case a development application was refused for a number of reasons, including the fact that the species proposed was considered invasive.

Under Regulation 18 (Restrictions on Operations and Activities) of the Flora, Fauna and Natural Habitats Protection Regulations (LN311/06), certain activities or operations can be refused or granted permission to take place. In line with this obligation, a request for the removal of the invasive Agave species within the Rdum tal-Madonna Special Area of Conservation and Special Protection Area was granted.

Policy: The recently adopted Sustainable Development Strategy for the Maltese Islands 2006-2016³⁰ identifies the need to “adopt an official [national] policy on the introduction and eradication of alien species” as one of the main strategic directions under the policy sub-theme “Nature & Biodiversity”. The development of a strategy of alien species is under way and is intended to address the issue of alien species in Malta with respect to nature conservation and in relation to international and regional treaties.

Research: The Malta Environment and Planning Authority (MEPA) has commissioned two studies aimed at setting up lists of alien flora and alien fauna that have been introduced to the islands. Such lists will be made publicly available. The information obtained through the studies includes various details, including their distribution, source of introduction, level of invasiveness, and ease of eradication.

Maltese scientists are also working with other countries on projects such as the CIESM PORTAL project³¹ which deals with marine alien species in the Mediterranean.

Eradication/control programmes: Preliminary efforts have been undertaken or are ongoing and are aimed at controlling the spread of specific terrestrial invasive plants from earmarked areas in the Maltese Islands (such as the removal of *Carpobrotus edulis* from certain sand dune ecosystems).

A project has also been successfully completed which aimed *inter alia* at eradicating *Rattus norvegicus* from Saint Paul’s Islands, a protected area known to harbour the only population of the endemic sub-species of Maltese Wall Lizard – *Podarcis*

³⁰ http://www.mepa.org.mt/environment/index.htm?sustainable_development/mainframe.htm&1

³¹ <http://www.ciesm.org/marine/programs/portal.htm>.

filfolensis kieselbachi. In total, €4991.39 were spent on rodent eradication and monitoring over two years. This included assessment, treatment, monitoring and transport costs to the islands. The benefit of the eradication exercise was that the islands have been certified as under control. Regular monitoring and treatment as required have ensured that rodents are not allowed to re-establish. This rat eradication was part of a larger project, which involved other management measures on the islands.

Challenges/limitations: Combating the spread of alien species requires human and financial resources which are currently limited. More action needs to be undertaken nationally to address marine invasives and to control their introduction. Marine invasive aliens are much more challenging and even at times impossible to control and/or eradicate in view of the marine environment they are in. Coordination between various entities is also a pre-requisite for the effective interception and timely response to new potential invasives.

19. THE NETHERLANDS

Legislation: The Flora and Fauna Act 1998 (Article 14) prohibits releasing animal species into the wild, and also prohibits planting or sowing of certain assigned plant species without permission. The only plant species currently assigned is *Hydrocotyle ranunculoides* (Floating Pennywort). In addition, two species are currently restricted in terms of possession, trade and import and/or export: *Hydrocotyle ranunculoides* and *Muntiacus reevesi* (Reeve's Muntjac).

Article 67 of the Flora and Fauna Act contains provisions for the abatement of assigned species. The Article offers the possibility to limit the population size of species. It allows the use of 'normal' (legally defined) hunting methods, provided that 'other satisfying options' to control or limit the population size are not available (de Groot and Gerrits 2003).

Assignment of species under Article 67 can be for reasons of safety (eg at airports, dikes); to prevent economic damage; or to prevent damage to native flora and fauna. The execution of these measures is decentralised. Each of the twelve Provinces has the authority to grant permission for abatement in its own territory. Nationwide coordination is absent.

Under the Hunting Act 1954, Regulations adopted in 1995 provide extra possibilities for control of the following alien mammals and birds, including species which may threaten ecosystems, habitats or species: *Mustela vison*, *Procyon lotor*, *Myocastor coypus*, *Nyctereutes procyonoides*, *Ondatra zibethicus*, *Alopochen aegyptiacus*, *Oxyura jamaicensis*, *Tamias sibericus*.

In accordance with the CITES-related EU council regulation 338/97 (L 61) and commission regulation 1988/2000 (L 237), the import of *Rana catesbeiana* and *Trachemys scripta elegans* into the Netherlands from third countries is prohibited.

Since 1986 the provinces have the responsibility by law for reducing the muskrat

(*Ondatra zibethicus*) populations in the country.

Policy: Legal responsibility for prevention of ecological damage by invasive species lies with the Ministry of Agriculture, Nature and Food Quality, which submitted the draft Policy on alien invasive species in relation to biodiversity to Parliament in October 2007. This policy document applies the three-stage hierarchical approach. Prevention is preferred as IAS control is costly and less effective when the species are able to establish populations and disperse. If entry has already taken place, actions should be undertaken to prevent the establishment and spread of alien species. The preferred response is then to eradicate the populations when small and feasible. If not, control measures should be implemented to minimise dispersal of the species in question. In the phase of eradication and control, the Netherlands will consider the feasibility of the eradication or control programme (efficiency and effectiveness), the negative side effects on the environment (including other species) and whether the species poses serious threats to native biodiversity. The policy document also describes the need for education, public awareness and (voluntary) cooperation with relevant sectors.

In June 2008, the draft Policy was discussed in Parliament with NGOs and the Minister for Agriculture, Nature and Food Quality.

In parallel to the development of the National IAS Policy, it was originally proposed to establish a Commission on Invasive Alien Species to carry out related tasks within the Ministry (COIE; *coördinerend orgaan invasieve exoten*). In June 2008, however, it was decided instead to set up an extensive and flexible network of specialists and interest groups regarding invasive species³². This will be the first policy support structure to deal with all IAS issues affecting biodiversity, across forests, inland water and marine systems. Civil servants in the Ministry's invasive species team will use this network to advise the Minister how to deal with invasive species. The invasive species team will co-operate with the network on issues like early detection and risk analysis of IAS. If necessary, the Ministry will play a role in the coordination of management actions.

With regard to marine alien species, the Netherlands signed the IMO Ballast Water Convention in February 2004. Preparations for ratification and implementation are under way.

Research: The Netherlands is represented on the ALARM project team.

No criteria have been developed for using risk assessment to assess risks to biodiversity in general, but there have been criteria developed for use in inland water systems.

Eradication/control programmes: The two largest rodents in The Netherlands are exotic: the muskrat (*Ondatra zibethicus*) and the coypu (*Myocastor coypus*). They are considered pest species and there is a national control programme. Examples of other control programmes include:

³² Pers.comm. Lysbeth van Brederode, Ministry of Agriculture, Nature and Food Quality.

- eradication of floating primrose-willow (*Ludwigia peploides*) in the Biesbosch;
- control of muskrat (30 million euro a year);
- control of water pennywort *Hydrocotyle* (ca. 3 million euro a year);
- monitoring of Swinhoe's Striped Squirrel (*Tamias swinhoi*) in the Noord-Brabant province;
- cooperation with neighbouring countries on a LIFE/INTERREG IV project to control problem species in shared water catchments/shared land areas.

Other activities: These include:

- discussion meeting on policy with relevant actors; and
- drafting of voluntary agreements (covenants, not yet signed) between the Minister and the aquatic plant trade and birdseed sectors to promote the substitution of high-risk exotic species by other species (eg for birdseed, to replace seeds of *Ambrosia* by other seeds of other species). These will not involve any provision of financial incentives to the sectors concerned will be provided.

No payments have so far been made under EU funding instruments to assist landowners in controlling IAS on their lands.

Challenges/limitations: Not found.

20.POLAND

Legislation: At least three pieces of Polish legislation regulate intentional introductions of alien species. The Nature Conservation Act (2004) regulates introductions of all alien species, except for fish. According to this Act, the introduction of alien species has to be approved by the Minister responsible for environmental issues. Obtaining consent from the Minister responsible for the environment is also necessary for importing alien species whose introduction into the environment could pose a threat to native species. However, the criteria for recognising alien species as particularly dangerous are not specified.

The existing Nature Conservation Act is currently being revised. As of September 2008, the new draft legislation contained – for the first time in Polish legislation – a definition of alien species. In addition to the existing permit requirement for import or introduction into the wild of an alien species, the new legislation establishes a legal basis for prohibiting possession of and trade in alien species that may pose a threat and provides for the publication of a list of such species through ministerial decree. This would overcome the gap in the existing legislation which does not specify how to define which alien species pose a threat.

Introduction of alien fish species into freshwater is regulated by the Inland Fisheries Act (1985) and subject to approval by the Minister responsible for Agriculture. Introductions of alien fish into seas is controlled by the Fisheries Act (2004) which provides that carrying out breeding, fish farming and fish hatchery in Polish marine areas requires permission and prior approval from the Ministry of Agriculture. If the

planned investment would be dangerous for the marine environment, permission will not be given. Threat or danger may include as the possibility of fish escaping from the farm. The permission may be cancelled if the investment is carried out against the rules stated in the permission or the enterprise causes harm to the marine environment.

The Hunting Law also covers the introduction of alien species to the extent that some introduced game species (eg pheasant) are alien. There may be some discrepancy between its provisions and those of the draft revised Nature Conservation Act 2008³³.

With regard to alien animal species already introduced and established in Poland, the number of alien game species is controlled in accordance with the Ordinance of the Minister of the Environment on the list of game species and close seasons for those animals (2001, as amended in 2005). Two alien species of crayfish and three alien species of fish are subject to control in accordance with the Ordinance of the Ministry of Agriculture and Rural Development of 2001 on fishing and conditions for raising, breeding and catching other organisms living in water.

There is a comprehensive organisational-legal system for phytosanitary and veterinary protection in Poland (supervised by the Ministry of Agriculture and Rural Development) and for forests (supervised by the Ministry of the Environment). Tasks performed by those bodies indirectly pertain to reduction of adverse effects of alien species on native natural diversity.

Use of alien species in forestry is regulated and controlled through forest breeding principles, which regulate share of alien species. There is a ban on using American black cherry in undergrowth. Wider use of alien species is acceptable in post-industrial areas or buffer zones where they constitute a fore-crop, preparing the soil for indigenous species.

Policy: In 2007 the Council of Ministers adopted the National Strategy for Conservation and Sustainable Use of Biological Diversity with the Action Plan for 2007-2013, in which the needs and priorities for enforcing the CBD Guiding Principles were partly identified:

- Recording and monitoring of alien species and exploring the sources and routes of their expansion, impact on native species and ecosystems special and economic effects of that impact.
- Working out the principles and programme for preventing introductions, elimination, control of spreading and control of numbers of alien species, in particular those which pose the most serious threat to native resources of biological diversity.
- Implementation of the programme for preventing introductions, elimination, control of spreading and control of numbers of alien species, in particular those which pose the most serious threat to native resources of biological diversity.

Under the National Strategy, institutions taking part in activities aiming at reduction in adverse effects of alien species and possible sources of financing those activities

³³ Pers.comm, Wojciech Solarz, Polish Institute of Nature Conservation.

were identified, and institutions coordinating them (Ministry of the Environment) were indicated.

Estimated costs of IAS action to conserve biodiversity in Poland:

Under the National Strategy for Conservation and Sustainable Use of Biological Diversity, the Action Plan adopted by the Council of Ministers in 2007 estimates the costs and possible sources of financing tasks related to reducing the threat posed by IAS in the period 2007-2013 at approx. 3,500,000 PLN (approx. € 1,200, 000).

In 2005, the Institute of Nature Conservation, Polish Academy of Sciences, commissioned by the Ministry of Environment, developed a Code of conduct for Alien species in Poland. This included listing of alien species that are expanding and invasive in Poland, with suggested methods of control. This Code may become the basic element of the future Polish strategy on IAS.

Research: Work has continued on developing the database on alien species including basic characteristics and a portal with detailed information on about 120 species (see Box). The Committee for Nature Conservation of the Polish Academy of Science organised a special session dedicated to invasive species, which was the basis for preparing the above-mentioned publication by the Institute of Botany, PAS.

Polish IAS Database and Portal

In 1999 the Institute of Nature Conservation commissioned by the Ministry of the Environment developed the database "Alien Species in Poland". The first version of the database included some 250 most important alien species in Poland. Among others the scale of threat each of the species posed to biological diversity in Poland was determined and it was assessed whether it was necessary to control its population numbers specifying the methods for the species control. In 2003, thanks to the grant of the US Department of State, a part of the data in the database was translated into English and published on the Internet (www.iop.krakow.pl/ias). In 2003-2008 the information in the database was supplemented and there are over now 800 alien species in it. The work on the new database structure complying with the recommendations of the Global Invasive Species Program (GISP) and Invasive Species Specialist Group (ISSG) is under way. In the future, the database will be included in the developing Global Invasive Species Information Network (GISIN). In 2004-2008 also the database of Polish experts dealing with alien species was developed.

In 2008 a portal on alien animal species in Poland was developed at the Institute of Nature Conservation (<http://www.iop.krakow.pl/gatunkiobce/default.asp>) with comprehensive information on approximately 120 alien species. Based on this information, in a book will be published in Polish and English in 2009.

Since 2004 Poland has been participating in NOBANIS (North European and Baltic Network on Invasive Species). Poland also participates in the ALARM and DAISIE projects.

Eradication/control programmes: Alien species of phytosanitary or veterinary concerns are controlled at the national level. For alien species threatening nature, the only control programmes coordinated at the national level concern alien species listed in the hunting laws (raccoon, raccoon dog, American mink).

At the local level, there are numerous actions to combat biological invasions, including in national and landscape parks. A survey in 2007 showed that at least 1 alien species is controlled in 41% of these areas. In total, 96 control actions of 28

alien species were reported. Control was mainly for invasive plants (51% of all reported cases), mammals (19%) and fish (16%). The most often-controlled species were: *Padus serotina*, *Nyctereutes procyonoides*, *Cameraria ohridella*, *Robinia pseudacacia*, *Heracleum sosnowskyi*). The number of bottom-up initiatives of local communities to control aliens is increasing, particularly for *C. ohridella*.

Challenges/limitations: Lack of effective methods for counteracting adverse effects, restraining invasions and eliminating alien species. Finding appropriate financial means and very low social awareness with respect to the issue of invasive species are also important constraints to effective implementation of Article 8(h).

The fact that so far there has been no single definition of an alien species or introduction at all had led to considerable arbitrariness in interpretation of the existing regulations, making the applied measures less effective. In addition, introductions are regulated by three different laws (separate for alien inland water fish, alien marine fish, all other alien species, hunting). Another important gap in the legal system is a provision that renders introductions of alien plants used for establishment and maintaining green areas and in forestry practically unregulated. The lack of any provisions concerning the criteria for recognising species as dangerous or harmless in the legal regulations is yet another gap that has made the ban on import of possibly dangerous alien species to Poland unenforceable, although this should be addressed in the new draft Nature Conservation Act. Control of some IAS (eg Canada goose) is hampered by the fact that they are not included in the law on game species.

Outside phytosanitary and veterinary sectors, there are no procedures to follow if a new invasion is detected. There is no comprehensive monitoring system for invasions.

21.PORTUGAL

Legislation: The Portuguese framework Environment Act (Lei de Bases do Ambiente (Law 11/87 of 7 April 1987, Article 15(6)) provides for the development of adequate legislation regarding the introduction of exotic flora (Article 16(3)) and the adoption of control measures to control the introduction of animal species.

Portugal has adopted specific legislation to control the introduction of alien species (Decree-Law nr 565/99 of 21 December 1999). The Decree-Law provides for listing of alien species in two categories:

- those identified as ‘invasive’ (Annex I): *species already introduced in national territory whose introduction is a cause of threat for the biological diversity in a given territory*. An Action Plan for control and/or eradication must be prepared for each invasive species;
- those considered as entailing an ‘ecological risk’ (Annex III): *species with negative potential, sensitive impact of threatening the biological diversity in a given territory*. Normally, species classified as ‘ecological risk’ have already been introduced in Spain or elsewhere and are causing problems. The category may also include species already introduced in Portugal that might cause problems in

the future.

The Decree-Law currently regulates the following actions for both categories of species:

- introduction and possession (with the exception of non-living parts or in the absence of propagules) except for scientific/educational purposes (NB although it is impossible to prohibit imports, the competent authority formally advises against the import of these species as their possession is not legal);
- breeding, cultivation or detention in a confined space;
- use as ornamental species or as pets;
- purchase, sale, offer for sale and transport.

Articles 4 and 5 regulate the economic exploitation of alien species in a non-confined space, namely aquaculture and apiculture. Article 17 prohibits restocking with IAS. Unintentional introductions are addressed in Article 7, and security measures for prevention are provided in Articles 6 and 9-15 and for ballast waters in article 16.

Mitigation measures are not provided but Article 18 provides for the development of a national action plan (no progress to date). The Decree-Law provides for sanctions (article 21) and remediation of damage (Article 25°). The Law does not contain any provisions as regards export.

As of September 2008, this Decree-Law was being revised in order to address problems that arose during its period of implementation. Priority areas for revision include:

- review of the procedures relating to licensing the detention of alien species and to improve safety measures to prevent the introduction of invasive and ecological risk species; and
- to review the annexes related to invasive and ecological risk species.

Specific legislation has been adopted in each of Portugal's two Autonomous Regions (Madeira, Azores) which have the status of EU Outermost Regions.

Regional Decree No.27/99/M regulates the keeping, import and dissemination of exotic fauna species into the territory of the Autonomous Region of Madeira. It consists of 6 chapters and 1 annex establishing: general provisions (chap. 1); imports and dissemination requirements (chap. 2); licensing (chap. 3); administrative and scientific authority including Scientific Commission competencies (chap. 4); sanctions (chap. 5) and final provisions (chap. 6). The annex lists animal species not included in this legislation. This is a 'white list' type of system: regulatory controls apply to all alien animals not listed under the Regional Decree.

For the Azores, Resolution n° 148/98 of 25 June 1998 aims to limit the possibility of dissemination through the escape of specimens of non-native animal species. A proposed legislative regional Decree to regulate the import, detention and introduction of specimens of non-native species in the Azores region is currently waiting for approval and publication, but no further information is available.

Policy: The national strategy for Nature Conservation and Biodiversity (2001) contains a set of measures concerning IAS in the fields of integrated policy, scientific research, management, education, and public awareness.

The Ministry of Environment (in collaboration with the Ministry of Agriculture) is developing a national plan to control or eradicate IAS already present in nature. This plan is undergoing an approval process and its provisions have not been implemented in practice except for *Eichhornia crassipes*.

Research: Portuguese authorities are participating in the research project INVADER (www.uc.pt/invasoras) which aims to evaluate control methodologies. Portugal is represented in the ALARM project team.

The Regional Governments of Madeira and Azores participated together with regional Spanish authorities in a cooperative project for ‘the Control of Invasive Vertebrates in Islands of Spain and Portugal’.

Eradication/control programmes: A number of regional programmes have been established in order to control or eradicate IAS (in particular plan species). These programmes are often located in conservation areas. The Nature Conservation and Biodiversity Institute, had one LIFE to control IAS like Acacias, and the Azores have the LIFE-funded Priolo programme.

Portugal is working on the Plan for control and eradication of Water Hyacinth (*Eichhornia crassipes*). Following the EPPO/Council of Europe Workshop on How to manage Invasive Alien Plants: The case studies of *Eichhornia crassipes* and *E. azurea* (Mérida, 2-4 June 2008) (see Annex 1), the Portuguese authorities have established some contacts with Spanish. Portugal organised a workshop on the subject and colleagues of Mérida were present. It was a first step for the *Eichhornia crassipes* National Plan. The two countries face the same common problems especially on Guadiana River, and any measures have to be taken in cooperation with Spain.

The Azores Regional Government has published a Regional Plan for the Eradication and Control of Flora Invasive Species in Sensitive Areas (Resolution nº 110/2004, 29th July) that will be implemented until 2009. The plan foresees the eradication and control of 16 species of flora invasive species in sensitive areas in every island of the Azores archipelago (*Pittosporum undulatum*, *Hedychium gardnerarum*, *Hydrangea macrophylla*, *Arundo donax*, *Gunnera tinctoria*, *Clethra arborea*, *Carpobrotus edulis*, *Lantana camara*, *Ailanthus altissima*, *Polygonum capitatum*, *Drosanthemum floribundum*, *Acacia melenoxylon*, *Ulex europaeus*, *Ipomoea indica*, *Rubus ulmifolius*, *Pteridium aquilinum*).

In the Azores, the LIFE-funded Priolo (*Pyrrhula murina*) project for management of the biotope³⁴ includes:

- removal of *Hedychium gardnerarum* in the principal area of distribution of the Priolo and in a belt of exterior transition included in the buffer zone (SPEA);

³⁴ http://www.spea.pt/ms_priolo/pt/.

- chemical and manual removal of *Hedychium gardnerianum*, arboreal Clethra, *Pittosporum undulatum* and *Gunnera tinctoria*;
- chemical methods for eradication of *Hedychium gardnerianum* in the project area are still being tested .

The Azores is currently preparing a control plan for eradication of the marine invasive species *Caulerpa webbiana*.

Eradication of *Acacia longifolia* is underway in some places in Portugal, and there are programmes for eradication of invasive species to support restoration of the Azores bullfinch and the endemic Zino's petrel *Pterodroma madeira*. In 2004-2005, regional authorities followed the implementation of the control and eradication projects for (1) the conservation of Zino's Petrel (2) restoration of the terrestrial habitat of Selvagens Islands and (3) control of the invasive plant species in the laurel forest of Madeira.

Challenges/limitations: Constraints in financial and human resources have delayed the application and implementation of existing measures relating to IAS.

22.ROMANIA

(Report reproduced from Miller et al, 2006: no updated information provided).

Legislation: There is no law concerning IAS belonging to 'CORMOPHYTA' ('superior plants'). There is, however, a law for pests ('inferior plants' and microorganisms). There is no coherent strategy or action plan focused on IAS.

However, there are some laws that include articles referring to IAS, including:

- Law 192/19.04.2001 which forbids the introduction of fish species in rivers.
- Law 103/23.09.1996 regarding hunting stipulates that the introduction of animal species in hunting areas can be done only with the approval of some state organisations.
- Law 137/29.12.1995 regarding environmental protection forbids the introduction of animal, plant and microorganism species without the approval of the central authority of the Environment Protection which has to consult the Romanian Academy of Sciences.
- Order 322/16.03.2000 regarding the import of animal and plant species from wild fauna, stipulates that the import of alien animal and plant species can be done only with the necessary approvals of the Romanian Government and the Romanian Academy of Sciences.
- Law 58/13.07.1994 which implements the CBD in Romania. Article 8 stipulates that the signing bodies will prevent, control or eradicate the introduction of alien species that are potentially dangerous.

Policy: Not found.

Research: There are two national projects, aiming at developing control programmes and publishing a list of alien species in Romania:

- CNCSIS grant in the University of Bucharest;
- Neobiota in Romania coordinated by Babes-Bolyai University from Cluj-Napoca.

Additionally, the financing programmes of the Ministry of Research have IAS as one of their priority topics of research.

Control/eradication programmes: In some area, the forests are affected by invasive alien species. However, there is no strategy or coherent action plan focused on alien invasive species. Major problems are caused in the Danube Delta and floodplain by *Amorpha fruticosa*, *Fraxinus pennsylvanica*, *Fraxinus americana*, clones of Euro-American poplars and *Populus nigra* hybrids. Controls on ballast water in the Black Sea ports are in place. There are laboratories for the identification of invasive species, especially insect leaf miners, at all ICAS branches in the country. There is a Central Laboratory of Phytosanitary Quarantine with strict regulations.

Challenges/limitations: Lack of adequate technologies, restrictions in the use of chemicals. High costs of eliminating the invasive *Amorpha fruticosa* and other species from the Danube delta and floodplain.

23.SLOVAKIA

Legislation: The Slovak law (Act No. 543/2002 Coll. on Nature and Landscape Protection) provides a framework for protection of native species and ecosystems. The Act makes it prohibited to import, possess, grow, reproduce and trade in both IAS and their parts or products thereof that could cause spontaneous dissemination of IAS. However, according to the Order of the Ministry of the Environment No. 24/2003 Coll., the provision applies only to 7 plant species (the most problematic): *Fallopia japonica*, *Fallopia × bohemica*, *Fallopia sachalinensis*, *Heracleum mantegazzianum*, *Impatiens glandulifera*, *Solidago canadensis*, *Solidago gigantea*.

In 2007, the first regulations were adopted to require the elimination of invasive alien plant species. Under the Order of the Slovak Government No.81/2007 Coll (Conditions of agricultural support under the single area payment scheme), maintenance of good agricultural and environmental conditions (GAEC) is a basic mandatory condition for farmers to receive payments. From April 2008, for the new programming period for the Rural Development Programme 2007-2013, the Order of the Slovak Government No. 160/2008 Coll. includes elimination of invasive alien plant species as one sub-condition of the GAEC. This scheme was developed in cooperation between the Environment and Agriculture Ministries. For the time being, the regulatory requirement is limited to the seven invasive plant species listed under the Act on Nature and Landscape Protection (see above). However, a proposal has been finalised to expand the list of invasive plants covered, either as part of

amendments to that Act or through new legislation³⁵.

Figures are not yet available on the level of take-up of this condition by farmers. The Agricultural Payments Agency (APA), which is responsible for the payments under the Rural Development Programme, has a control system for implementation of GAEC by farmers. One component of this system is direct control of farmland that is divided according to the land parcel identification system (LPIS). APA is only able to do a limited number of direct controls per year but based on experience in 2007 and so far in 2008, it indicates that farmers accept this condition and have at least tried to control IAS. In one example provided by APA, a farmer in the region of Zvolen (Central Slovakia) is trying to control *Fallopia japonica* (one of the IAS listed in Slovakia) occurring near his farm even though the species has not yet occurred on his farmland included in the LPIS.

The Order of the Ministry of Environment No.110/2005 Coll prohibits possession of alien birds of prey (*Falconiformes*) and owls (*Strigiformes*), and Red-eared slider (*Trachemys scripta elegans*);

Slovakia currently has no clear methodology for risk assessment to address threats of IAS to biodiversity.

Policy: The National Biodiversity Strategy of Slovakia covers the issue of IAS. It was approved by the Slovak Government and the National Council of Slovakia in 1997, and was followed by the development of an Action Plan for the implementation of the National Biodiversity Strategy for 1998 – 2010. In 2002 the Action Plan was amended for 2003-2010.

Work is continuing on a specific National Strategy on Invasive Alien Species, based on the Global/European Strategy on Invasive Alien Species. The Strategy will include measures to prevent the introduction of, control or eradicate all invasive alien species in Slovakia. The first draft has completed cross-sectoral consultation.

There are currently no voluntary and non-regulatory initiatives with regard to IAS.

Slovakia has not yet made a special budget allocation for IAS coordination and projects. The following table provides information of money by the Ministry of the Environment and its technical organisation, the State Nature Conservancy, on IAS mapping and control measures. This does not include money spent on IAS management in other sectors, such as the Ministry of Agriculture for agriculture and forestry.

³⁵ Pers.comm, Ema Gojdičová, State Nature Conservancy.

Financial aspects of control of IAS in Slovakia:				
Year	IAS mapping		Control measures	
	Budget of SNC* (SKK/Euro)	Other sources** (in SKK/Euro)	Budget of SNC* (in SKK/Euro)	Other sources** (in SKK/Euro)
2002	150 000/5 000	300 000/10 000	100 000/3 300	300 000/10 000
2003	200 000	-	400 000/13 300	-
2004	-	260 000/8 7000	400 000/13 300	-
2005	100 000/3 300	-	689 000/ 22 888	-
2006	-	-	350 000/11 700	-
2007	-	-	300 000/10 000	-

Comment: the exchange rate for the Slovak Crown and Euro was taken as in May 2008 approximately 30 SKK = 1 Euro

Budget of SNC* means: budget of the State Nature Conservancy of SR
Other sources** means: Ministry of the Environment of SR from:

- Action Plan for Implementation of the National Biodiversity Strategy (2002)
- Structural Funds (2004).

Research: In 2002, List of Alien, Invasive Alien and Expansive Native Vascular Plant Species of Slovakia was published. From other systematic groups: fishes, mammals, invertebrates, only major species of concern have been identified. Lists of IAS (major species of concern) in the other systematic groups are being developed. Since 1997, alien vascular plant species have been mapped. Some alien animal species have been mapped since 2003.

The State Nature Conservancy of Slovak Republic in cooperation with the Slovak research and scientific institutions has promoted and carried out research on the vulnerability of ecosystems or habitats to invasion by alien species, the impact of alien species on biodiversity, and the development of environmentally friendly methods to control and eradicate invasive alien species.

Slovakia has developed and made available technical tools and related information to support efforts for the eradication and/or control of invasive alien plant species. Other relevant tools are under development, however, more information on prevention, monitoring, and particularly on early detection (programmes or systems) is needed. Slovakia has applied to become a member of the NOBANIS project and portal (official letter signed by the Minister of the Environment of SR confirming the interest of Slovakia to participate in the project and to provide the Slovakian data on IAS) but some details of cooperation still have to be completed.

Information exchange mechanism: Slovakia does not yet have a special IAS dedicated website. The State Nature Conservancy has its own website: www.soprs.sk and there is a proposal to create a special link for IAS, however the website is still under development, so the link with the appropriate IAS information has not been developed yet.

Eradication/control programmes: Management measures follow the results of invasive alien vascular plant species mapping and they are concentrated in protected areas. In Forestry, measures for control of black locust (*Robinia pseudoacacia*) are implemented at the local scale.

Slovakia lacks a comprehensive system of risk analysis. However, some watercourses (wetland habitats) mostly in southern parts of Slovakia (Protected Landscape Areas: Latorica, Dunajské luhy, Záhorie) have been assessed for impact of alien fish species on native fish species. Increased attention is given to reptiles (mostly *Trachemys scripta elegans*), birds of prey (mostly hybrids). As for vascular plants, some assessments of the risk posed by 28 identified invasive alien species to habitats/ecosystems have been done (eg *Heracleum mantegazzianum*, *Fallopia japonica*, *Fallopia × bohemica*, *Solidago canadensis* etc.).

Awareness-raising: The East Slovakian Museum in Košice was a partner of the project for “Development of the Biomonitoring Network Supporting the Effective Management of Protected Areas” within the INTEREG III A Initiative (Neighbourhood Programme HU-SK-UA 2004–2006. The Museum’s 2005 exhibition on “Unwanted invaders – invasive alien plant species around us” is still very popular and has been installed in many places throughout Slovakia. The exhibition has been followed by a series of talks addressing the invasive alien plant species issues. These have been organised with the cooperation of local authorities in Eastern and Southern Slovakia and have significantly contributed to public awareness.

Challenges/limitations: Challenges include:

- lack of coordination of work on invasive alien species;
- lack of cross-sectoral consideration
- limited awareness amongst the public and decision-makers;
- limited involvement of relevant stakeholders; and
- limited financial sources (Ministry of Environment 2005).

24.SLOVENIA

Legislation: Import and export is supervised by customs. Until May 2004, all imports of wild animals of alien species were subject to a permit which was issued only after the competent Authority was satisfied that such import would not pose the threat to native flora and fauna (Nature Conservation Act 1999). This provision ceased to be valid when Slovenia became a full member of the European Union. The main problem that arises from this suspension of IAS import controls is that Slovenia no longer has information on the amount and species composition of imported live alien species³⁶.

The revised Nature Conservation Act (ZON-UPB2; Uradni list RS, No. 96/04) regulates introduction of alien species into the wild in Slovenia. The measures relate to introduction, reintroduction, repopulation and captive breeding of alien species.

³⁶ Pers.comm., Branka Tavzes, Ministry of the Environment.

Detailed regulations under the Nature Conservation Act were introduced in 2002 by the Rules on the carrying-out of the assessment of risk to nature (Uradni list RS, No. 43/02). These Rules lay down the conditions and methods for the assessment of risk to nature prior to the introduction or repopulation of alien plant and animal species in the wild or the breeding of alien wild animal species. This provides a mechanism to control intentional introductions of alien species but does not address control of unintentional introductions.

In 2007, new Rules were issued under the Nature Conservation Act on wild animal species not requiring a permit for captive breeding (Uradni list RS, No. 62/2007) (<http://www.uradni-list.si/1/objava.jsp?urlid=200762&stevilka=3356>). These contain a list of alien organisms³⁷ for which there is no need to make an assessment of the risk as they do not pose any threat to native species. The list contained in Article 2 includes:

- mammals: *Chinchilla spp.* (only for specimens of domesticated breeds), *Dama dama*; game species that are addressed under wild game and hunting regulations and are bred in game pens with special purpose (it is prohibited to keep those alien species that could change the genetic composition of native species in case of escape);
- birds: *Perdix perdix*, *Anas platyrhynchos*, *Phasianus colchicus*, *Geopelia cuneata*, *Struthio camelus* (except for populations from certain countries), Passeriformes included in Annex 1 and Psittaciformes included in Annex 2 and not bred for commercial purposes;
- fish: *Oncorhynchus mykiss*, *Salvelinus fontinalis*, *Cyprinus carpio*, *Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*, *Aristichthys nobilis*;
- invertebrates: non protected species used for scientific, educational or biomedical purposes or for animal feed; non protected native marine species.

Article 3 states that a permit is not required for terrestrial or freshwater animals, except for birds, whose natural distribution is between 20 degrees of northern and southern latitude.

Risk assessment must be carried out by an individual or legal person duly accredited for this purpose in accordance with the 2002 Rules on the carrying-out of the assessment of risk to nature and on the obtaining of authorisation. A risk assessment should be provided by any person submitting an application to introduce, repopulate or breed alien species.

Other relevant legal measures include:

- the Environmental Protection Act (1993, 2004);
- the Forestry Act (Uradni list RS, No. 30/93) provides for forest management plans to define guidelines for conservation or reintroduction of autochthonous species and their habitats. It is thus implicit that non-native species commonly planted all over Slovenia should be replaced by native species;

³⁷ <http://www.uradni-list.si/1/objava.jsp?urlid=200762&stevilka=3356>.

- the Freshwater Fisheries Act (Uradni list RS, No. 61/06) aims to prevent introduction and spread of alien species in inland waters. It prohibits the release of alien species, regulates sustainable breeding of fish stocks in specific catchment areas and prohibits relocation of living organisms between different catchments. The implementing Regulation on Fishing Species in Inland Waters (Uradni list RS, No. 46/07) lists fishing species by river basin and specifically names alien species of fish and crayfish;
- the Plant Health Act (Uradni list RS, No. 62/2007) implements Council Directive 2000/29/EC and the International Plant Protection Convention (IPPC). The Phytosanitary Administration of the Republic of Slovenia (FURS) is the central responsible body for plant health in Slovenia. FURS provides for safety of the food of plant origin and the health and quality of agricultural plants, enabling the optimal plant production and regulating the trade in plants and plant products at national and international level in conformity with international standards and requirements.

Policy: In accordance with the National Environment Programme (2005), a strategy on alien species is being prepared. This will involve a review of legislation and provide a comprehensive list of priorities for action with regard to IAS. Progress on strategy development was slowed down partly due to preparation for the EU presidency. The need for stronger institutional cooperation is recognised and will be addressed through the development of the Strategy.

Research: The Marine Biological Station (MBP-NIB) in Piran has carried out some relevant activities to assess the risk posed by some marine alien species. Slovenian institutes are participating in DAISIE and ALARM.

Some studies have been carried out in implementation of the Water Framework Directive. For example, the report on human induced impacts includes information on alien species in lakes and rivers, coastal sea and brackish waters. Some research has also been done on the invasive alien species in the Slovene sea.

Eradication/control programmes: Not found.

Limitations/challenges: Lack of a systematic approach, finances and institutional interest. There are less potential controls on IAS post-EU accession. An overview of legislation on alien species has been undertaken. No major gaps were found, however the implementation of existing legislation is inadequate. The main constraints are in institutional organisation and division of responsibilities, and not in lack of legislative measures.

25.SPAIN

Legislation: The new Natural Heritage and Biodiversity Act (Law No. 42/2007) defines “invasive alien species” as a species that is introduced or established in a natural or semi-natural ecosystem or habitat and is an agent of change and threatens native biodiversity, either because of its invasive behaviour or because of the risk of genetic contamination (*la que se introduce o establece en un ecosistema o hábitat*

natural o seminatural y que es un agente de cambio y amenaza para la diversidad biológica nativa, ya sea por su comportamiento invasor, o por el riesgo de contaminación genética (Art.3.13).

Art. 61 provides for the creation of a National Catalogue of Invasive Alien Species, although the implementing regulations have not yet been adopted. The Ministry of the Environment is responsible for listing an IAS in the Catalogue, based on the advice of the National Commission for Natural Heritage and Biodiversity. Any person or organisation may propose a species for inclusion or deletion from the Catalogue, based on scientific and technical information. An Autonomous Community that considers that an alien species is potentially invasive in part of the country may propose its inclusion in the Catalogue (Art.61.4).

It is prohibited to possess, transport, trade in, import or export specimens, parts or propagules of IAS listed in the Catalogue, whether live or dead³⁸. Exceptions to this rule may only be made under administrative permit for reasons of research, public health and safety (Art.61.3). Breach of this prohibition constitutes an administrative infraction for which fines range from 500-5,000 € (minor offences) to 200,001-2 million € (very serious offences) (Arts. 76-77).

Breaches of the Act generate administrative responsibilities but these are not mutually exclusive with criminal liability (Art. 75.1)³⁹. Unlawful introductions of non-native species are punishable according to Article 333 of the Penal Code⁴⁰ which provides that introducing or releasing alien species with adverse effects for ecological balance, in breach of nature protection legislation or regulations, is punishable with a prison sentence of 6 months to 2 years or probation of 8 to 24 months. The unauthorised introduction of a species included in the National Catalogue of IAS is considered a 'severe' or 'very severe' infraction depending on the damage it causes (less than 100,000 € = severe; more than 100,000 € = very severe).

The Ministry and the Autonomous Communities are required to develop strategies and management guidelines for the control and possible eradication of IAS listed in the Catalogue, giving priority to IAS that present a serious risk to threatened native species and habitats and paying particular attention to island biodiversity. These strategies must be approved by the cross-sectoral Committee for the Environment (Art 61.5).

An Autonomous Community may also develop an IAS Catalogue for its own territory and define additional prohibitions and actions for control of such species (Art.61.6).

Art. 74.2.i establishes a National Biodiversity and National Heritage Fund to support actions to prevent forest fires and other activities to eliminate other serious impacts on biodiversity and the environment, specifically including control and eradication of IAS. The percentage of funds assigned to each type of activity will probably depend on political priorities and will be partly managed by the autonomous communities.

³⁸ The prohibition refers to "comercio exterior".

³⁹ "Las acciones u omisiones que infrinjan lo prevenido en la presente Ley generarán responsabilidad de naturaleza administrativa, sin perjuicio de la exigible en vía penal, civil o de otro orden a que puedan dar lugar".

⁴⁰ Organic Law 10/1995 of 23 November as amended in 2003 (Organic Law 15/2003 of 25 November).

Funds will usually be distributed by means of tenders. The Fund will be financed with state funds and may also use community funds that could be used for the same objective, and through other mechanisms that could be established in the future (Art 74.1).

Article 62.3.e of the Act prohibits the introduction of alien species for hunting or fishing; in the case of accidental introductions the exploitation of these species will not be allowed. However, these activities also appear to be subject to earlier legislation which was not repealed by the Act:

- Law 1/1970 of 4 April on hunting requires authorisation for the import, export, transfer and release of game species;
- introductions and restocking of hunting and fishing species are made conditional on the authorisation of competent authorities to guarantee the genetic diversity and conservation of native hunting and fishing species. (Royal Decree 1095/1989 of 8 September which identifies hunting and fishing species and provides rules for their protection);
- a permit is required from the administration to import marketable living hunting and fishing species. For non-native species, an authorisation may only be given a) when measures to avoid their escape are guaranteed or b) when there are no risks for biological and genetic conservation of native species in the case they are imported for releasing into the environment (Royal Decree 1118/1989 of 15 September which identifies marketable hunting and fishing species and provides rules on the subject).

It should be noted that regulation of introductions for angling and fishing varies widely between Autonomous Communities: some promote their introduction and permit fishing while others have established prohibitions. For example, in the case of *Pacifastacus leniusculus*, some Autonomous Communities actively introduced the species until 2001, permit fishing and establish limitations in the number of daily catches, minimum sizes and close periods for fishing. Size limitations are also in use for some species of fish. Restocking with some alien fishes (e.g. *Oncorhynchus mykiss*) is carried out by regional authorities.

The Royal Decree 1803/1999 of 26 November (corrected in BOE N° 13 of 15 January 2000) lays down regulations and general criteria for the management of National Parks. In chapter 3.2(c) measures to prevent and minimise impact of IAS are provided by prohibiting introductions of non-native taxa and encouraging efforts to eradicate established alien populations. Exceptions could be made for alien species that already form part of the natural processes where their eradication could impair the conservation of native species.

Law 31/2003 of 27 October on the conservation of wild fauna in zoological parks compels zoos to put in place measures to avoid escapes of animals and particularly potentially invasive species (Article 3 (d)) and sets fines for illegal, negligent and intentional releases (Article 14).

On the basis of this national legal framework, the governments of the Autonomous Communities have developed their own legislative tools (see eg Box for the Canary Islands).

IAS-related measures in the Canary Islands

The *Estatuto de Autonomía de Canarias* (Articles 31.3 and 32.12) confers exclusive competence for internal trade on the Canary Islands Autonomous Community. This regulatory power is interpreted to cover restrictions on possession and trade within the Canary Islands but not regulation of trade with mainland Spain. Within the Canary Islands, possession of and trade in certain species (eg *Procambarus*, *Caulerpa*,...) is already regulated. A decree is being developed under environmental impact legislation (*Ley 11/1990, de 13 de julio, de prevención del impacto ecológico* which covers human, plant and animal health as well as biodiversity conservation) to specify the list of species that may be lawfully sold in pet shops. This involves collaboration with several government departments (commerce, agriculture, justice). The first list will focus on animals and some algae. The possibility of mandatory microchips for identification of animals covered by such regulations is under consideration.

Any species purchased in mainland Spain can be legally brought into and kept in the Canary Islands, regardless of potential invasiveness. In August 2008, an inhabitant of Lanzarote Island purchased a specimen of *Bufo marinus* by internet and a king snake *Lampropeltis getula* (recently established as an invader in Gran Canaria Island) in a pet shop in Bilbao (Spain). These were detected on arrival at the airport and the veterinary service of the Agricultural Council informed. The accompanying documentation was correct but the animals were temporarily placed in a zoo while the Environmental Service was asked to assess the invasive potential of the species. This assessment was used by the veterinary service of the commune concerned to reject the entry of these animals in the Municipal Register of Domestic Animals (ie application of local council regulations to regulate holding of exotic pets).

The Service is working on a specific regulation on *Lampropeltis getula* and is funding eradication efforts in Gran Canaria: however, it remains legal to purchase specimens by internet to keep at home.

The Autonomous Communities have competence for hunting regulation and management. Existing hunting legislation protects species included on the list of game species, including three IAS (mouflon *Ovis aries*, Barbary sheep (*Ammotragus lervia*) and rabbit (*Oryctolagus cuniculus*). On the other hand, many protected area management plans and species recovery plans specifically target these species for control and eradication. Amendment of the Canary Islands hunting law is considered a priority.

A specific IAS pathway instrument (*Orden de 6 de agosto de 2001, por la que se establecen medidas generales y urgentes, con carácter provisional, para el tratamiento de arenas procedentes de continente africano, destinados al uso de la construcción, asfaltado o cualquier otro, con excepción del utilizado para la regeneración de playas*) was developed under environmental legislation to address IAS risks associated with the import of sand from Africa for beach replenishment in the late 1990s. The Order was a good initiative but the treatments established were difficult to apply and its application by the Cancellery of Industry was low.

Two phytosanitary instruments address IAS that impact on threatened native plants. The Order of 24 March 2006 declares *Rhynchophorus ferrugineus* a plague and establishes phytosanitary measures for its eradication and control (Boletín Oficial de Canarias No. 61). The Order APA/94/2006 (26 January 2006) establishes a phytosanitary procedure for the import, export and transport of vegetables and vegetable (plant) products, to prohibit the import of species of palms (Palmae) in the Canary Islands

Source: pers.comm of 4 September 2008, Juan Luis Rodríguez Luengo, Canary Islands government.

Policy: Policy initiatives in Spain include the following:

- a national action plan on IAS was developed in 2006: this provided a diagnosis of IAS in Spain to provide a basis for developing a national strategy⁴¹;

⁴¹ Capdevila-Argüelles L., Iglesias García A., Orueta J.F. & Zilletti B. (2006) *Especies Exóticas Invasoras: diagnóstico y bases para la prevención y el manejo*. Organismo Autónomo Parques Nacionales – Ministerio de Medio Ambiente, Madrid. 287 pp.

- the 2nd National Conference on IAS was held in November 2007⁴²;
- Spain has ratified the IMO Ballast Water Convention;
- as a contracting party to the Barcelona Convention, Spain has adopted the Action Plan Concerning Species Introductions and Invasive Species in the Mediterranean Sea;
- Spanish representatives are part of the Group of Experts on IAS of the Bern Convention and of the SEBI-2010 EG5 on trends in IAS;
- several Autonomous Communities are developing their own strategies on IAS eg in 2004, the Andalusian government launched a regional Plan for the control of IAS, including the identification and control of the most dangerous IAS;
- regulations for the Ebro Hydrological Confederation to control and prevent the spread of *Dreissena polymorpha* were adopted in 2002;
- the protocol of elimination of feral animals in the island of La Gomera (Canary Islands) was approved in 2006.

Research: Spanish institutions participated in the EPIDEMIE project related to exotic plants in Mediterranean ecosystems, the ALARM and the DAISIE project. In addition, specific research projects have been undertaken related to control of IAS at specific sites or to deal with impacts of some invasive species (eg *Mustela vison*, *Carpobrotus edulis*, *Cortaderia selloana*, *Eichhornia crassipes*, *Azolla filiculoides*, *Linepithema humile*, *Procambarus clarkii*, *Oxyura jamaicensis*).

Several institutions have adopted different approaches to establish databases on IAS. These include, for example, the following: InvasIber (IAS of the Iberian Peninsula, Ministry of Science and Technology of Spain, Special Action REN2002-10059-E), database of exotic species in Canary Island (Canary Islands Government), database of exotic bird species (Group of Alien Birds, SEO/BirdLife) and the Virtual Herbarium of the Western Mediterranean⁴³. Additionally, distribution maps have been produced for some groups (mammals, birds, fish amphibians and reptiles), an atlas of invasive alien plants was published by the Ministry of Environment.

IAS databases are managed by regional administrations or by institutions and some of them are under development. The Ministry of Environment produced a very preliminary national database on IAS within the framework of the elaboration of the National Action Plan (2003-2005) which is not on line. The main problem is that data are not updated regularly and merged into a national database/clearing house mechanism.

Eradication/control programmes: The Governments of Spain and Morocco have developed an action plan to control *Oxyura jamaicensis* (Ruddy duck) in the latter country, because such ruddy ducks detected in the wetlands of Morocco could threaten the Iberian population of *Oxyura leucocephala* (White-headed duck).

Some projects relating to the control and eradication of IAS have been undertaken in Spain (*Mustela vison*, *Caulerpa taxifolia*, *Rhynchophorus ferrugineus*, *Oxyura jamaicensis*, *Dreissena polymorpha*, *Carpobrotus edulis*), mainly in relation to protected areas. These include the project on ‘Control of invasive invertebrates on

⁴² <http://geib-en.blogspot.com/2007/11/eei-2006-2nd-national-conference-on.html>.

⁴³ <http://herbarivirtual.uib.es/eng-med/index.html>.

Spanish and Portuguese islands?. Work is underway to eradicate Ruddy duck from Spain, as this species is a threat to the endangered endemic White headed duck. Likewise mitigation efforts are in place for the American mink and Caulerpa. Eradication of *Carpobrotus* sp. has been carried out in Menorca (Balearic Islands) in the framework of the LIFE 2000NAT/E/7355.

At subnational level there is a control programme for *Eichhornia crassipes* in Extremadura, and the Government of Canary Islands has responded to the invasion of the Red palm weevil (*Rhynchophorus ferrugineus*). The Government of Andalusia has developed and implemented an IAS control plan.

Additionally, LIFE projects play an important role to fight IAS in Spain:

LIFE99 NAT/E/6392: *Oryctolagus cuniculus*, *Felis catus*, *Rattus*, *Nicotiana glauca*
LIFE00 NAT/E/7299: *Mustela vison*, *Populus hybrida*
LIFE00 NAT/E/7311: *Oxyura jamaicensis*
LIFE00 NAT/E/7330: *Azolla filiculoides*, *Pinus sp.*, *Populus híbrida*, *Eucalyptus sp.*
LIFE00 NAT/E/7335: *Mustela vison*, *Populus hybrida*
LIFE00 NAT/E/7355: *Carpobrotus edulis*
LIFE02 NAT/E/8604: *Mustela vison*
LIFE92 ENV/E/0067: *Caulerpa taxifolia*

Challenges/limitations: CBD definitions are not used in the Spanish legislation. The fragmentation of responsibilities and limited cooperation between different departments at national and sub-national level constitute one of the main weak points together with the lack of harmonisation in the legal field. The new law does not fully harmonise legislation on IAS (legislation on animal and plant health remains separate from environmental legislation) but does support closer cooperation. Article 7 of Act 42/2007 provides that public administrations should cooperate on biodiversity-related issues and should exchange information. A consultative and cooperative body assembling national and autonomous (regional) authorities is created by the new law.

The main efforts are devoted to mitigation. There is a relatively low level of effort in relation to IAS prevention, which is focused on the National IAS Catalogue and does not cover use of risk analysis for entry pathways (to prevent unintentional introductions) and species. Rapid response to incursions of IAS that are not considered pests is hampered by lack of rules, although funds for IAS eradication and control may be made available through the new National Biodiversity and Natural Heritage Fund.

Transboundary aspects of biological invasions are not kept in account (eg liability).

The new Act, combined with the amended Penal Code, has significantly increased penalties for unauthorised introductions of species included in the National IAS Catalogue. However, it should be stressed 1) that the damage caused by IAS could take a long time (sometimes years) before it becomes evident; 2) the difficulty to evaluate biodiversity loss in financial terms; and 3) fines are established only for IAS that are included in the National catalogue but not for species that are not included.

26.SWEDEN

Legislation: There is no general legislation on invasive alien species in Sweden. The various sectors that may deal with invasive alien species includes the forestry, agricultural, maritime, fisheries, hunting, biological control and environmental sectors. These sectoral laws and regulations include⁴⁴:

- the Environmental Code (section 8 on Protection of animal and plant species);
- the Hunting Law and Ordinance on Hunting (1987:905): section 41 prohibits the introduction of mammals and birds into the wild without permission from the Environmental Protection Agency;
- the Act on Import of Living Animals (SFS 1994:1830) regulates the entry and spread of animals to prevent the introduction of animal diseases and the translocation of alien animal species that may harm indigenous fauna.;
- the Ordinance on Fishing, Aquaculture and Fishing Industry (SFS 1994:1716) prohibits the introduction of fish into the wild without permission from the county administrative board;
- Law on Plant Protection (SFS 1995:681), Ordinance on Plant Protection and Measures Against the Spread of Plant Pests (SFS 1995:94) regulates the control and limits the spread of plant pests, which can seriously damage plant cultures, forests, other land or plants.

Policy: The Swedish parliament has approved a set of 16 environmental quality objectives to be achieved by around 2020. The implementation of targets is supported by three action strategies. The objectives include several targets relevant to IAS that relate to objectives for biological diversity, agriculture, freshwaters, wetlands, forests, and mountains. These objectives address the intentional introduction of alien species and genetically modified organisms into natural habitats, whereas the unintentional introduction of such organisms, and the pathways involved, are not addressed explicitly. Various sector authorities, such as the Environmental Protection Agency and the National Fisheries Agency, have had policies for invasive alien species in place since 1996 and 2001 respectively.

The Swedish Maritime Administration and the Swedish Environmental Protection Agency have investigated the consequences of implementation of the International Convention for the Control and Management of Ships Ballast Water and Sediments in a report to the government (SOU 2008⁴⁵). Their recommendation is that Sweden should ratify the Convention as soon as possible, but with a reservation that Sweden will not require shift of ballast water for traffic internal to the Baltic Sea due to its geophysical limitations (the Baltic is too shallow and does not meet the criteria in the Convention for minimum depth and distance from shore).

National needs for the implementation of the CBD Guiding Principles on IAS were identified in a 2004 review of national legislation, measures and procedures for

⁴⁴ More specific information can be found at <http://www.biodiv.se/eng/intr-art/lagar.htm>, see also www.nobanis.org/Regulations_SE.asp.

⁴⁵ *Barlastvattenkonventionen – om Sveriges anslutning. Betänkande av Barlastvattenutredningen. Statens Offentliga utredningar* SOU 2008 :1. In Swedish with a English summary.

dealing with alien species by the Swedish Biodiversity Centre, in cooperation with relevant government agencies. Identified needs included changes in legislation; developing a national IAS strategy; developing an organisation, plan and funding for dealing with newly discovered IAS; and developing methods for analysing and managing risks involved with IAS⁴⁶.

Development of a National Strategy for invasive alien species is now underway in a joint project by the competent authorities and was presented for the government on 1 July 2008. An IAS action plan is also being prepared and will be presented on 1 December 2008. As a part of this action plan, it is intended to produce a follow-up report in autumn 2008 to the 2004 report on Swedish legislation relevant to IAS to see where legislation is missing and how these “gaps” can be filled. Both the Strategy and the draft action plan will be presented for consultation to a reference group in October 2008.

The 2008 follow-up report will include a thorough analysis on administrative roles and responsibilities (what authorities are responsible for taking appropriate decisions and/or making action plans for individual species, who has the “operational” responsibility to act when needed). IAS issues are currently addressed through a wide range of measures and bodies. For example, the Swedish Plant Protection Inspectorate is charged with controlling the pathways of introduction of pests and pathogens that threaten agricultural crops and forest trees. The Swedish Environmental Protection Agency and the National Maritime Board are engaged with preventing the introduction of invasive alien species through ballast water and hull fouling. The National Board of Fisheries works with preventing the introduction of pathogens and pests through the importation of water-living plants and animals. The Swedish Veterinary Agency works with preventing the introduction and spread of diseases and invasive alien species that threaten domestic and wild animals’ health and biological diversity.

Research: *AquAliens* (www.aqualiens.tmb.gu.se) was a research programme (2002-2007) aimed at increasing knowledge about the ecological impacts of IAS in the aquatic environment and developing methods and procedures for assessing the risks posed by introduced aquatic species. Methods for assessing the effects of invasive alien species on society, economic value and human health were also developed within this project.

Research projects on the effects of spreading alien populations within forestry, wildlife and fisheries management on biological diversity at the genetic level have been carried out in cooperation between Stockholm University and the Swedish Environmental Protection Agency.

Other smaller research projects have concentrated on ecological effects of specific invasive alien species such as *Marezzelleria neglecta*, *Arion lusitanicus*, *Mnemiopsis leidyi* and various terrestrial plant species. Sweden has also participated in the EU research programmes DAISIE, ALARM and FORTHREAT.

⁴⁶ See: <http://www.cbm.slu.se/pdf/regeringsuppdrag/frammandearter/IASRapport.pdf>, for the Swedish Biodiversity Centre report.

Sweden completed a preliminary assessment of the risks posed to ecosystems or species by the introduction of alien species in three reports published by the Swedish Environmental Protection Agency in 1994, 1997 & 1999 and by the Nordic Council of Ministers in 2000. In 2007, an economic impact assessment report was published entitled “Calculation of costs of alien invasive species in Sweden – technical report” which covers both damage costs and control costs⁴⁷.

There is still a need for continued development and enhancement of risk assessments protocols and methods for all taxonomic groups and pathways of introduction. Adequate risk assessment procedures and methods are only in place for pests of plants and animal health.

Sweden together with Denmark coordinates the NOBANIS project, which is funded by the Nordic Council of Ministers since 2002. Sweden also participates in regional work within the North Sea Conference, OSPAR and HELCOM with regard to implementing the IMO Ballast Water Convention.

Information exchange mechanism: An Internet portal on alien species in the Swedish marine environment has been developed in cooperation with the Swedish Environmental Protection Agency and the County Administration Boards Information Offices (www.frammandearter.se). Most of the information is in Swedish with a shorter summary in English and the species list and facts sheets are available in English. Information on invasive alien species in Sweden is also found on Sweden’s Biodiversity Clearing House Mechanism at www.biodiv.se.

There are plans to include alien species in the existing reporting system (Species Gateway at www.artportalen.se/default.asp) whereby anyone (the general public, scientists, organisations and authorities) may submit reports for observations. Alien species will be included and “tagged” in this already existing system, permitting species-specific summary reports on distribution and relative abundance within the country to be developed⁴⁸.

The draft National Strategy proposes the creation of a dedicated Swedish website which in one place would collect and make available all information concerning alien species in Sweden. This website will be a tool for concerned authorities, a hub for the dissemination of information and a communication centre from which all work with alien species within the country would emanate.

Eradication/control programmes: To-date, very few species have so far been targeted for management, although this will be addressed in the IAS Strategy and the Action Plan for this autumn. Policies and programmes are under joint development by several actors, eg the Swedish Environmental Protection Agency, Swedish University of Agricultural Sciences, the National Board of Fisheries, and the Swedish Biodiversity Centre (www.cbm.slu.se).

Eradication programmes are in place in certain Swedish County Administrative

⁴⁷ Gren, I.-M., Isacs, L., Carlsson, M., (2007). Calculation of costs of alien invasive species in Sweden – technical report. Swedish University of Agricultural Sciences (SLU), Department of Economics, Working Paper Series 2007:7.

⁴⁸ Pers.comm, Helena Högländer, Ministry of Environment.

Boards for the American mink (*Mustela vison*), the Giant hogweed (*Heracleum mantegazzianum*), the Japanese rose (*Rosa rugosa*), *Impatiens glandiflora* and *Fallopia japonica*. In Västra Götalands län a programme has been developed for eradicating a newly discovered marine algae (*Gracilaria vermiculophylla*).

Awareness-raising: The AquAliens research programme produced a popular science brochure (in Swedish) about aquatic alien species. In Sjuhärad, a leaflet has been produced about problems with alien species in the aquatic environment in the region and how fishermen can help and avoid spreading these species (<http://www.sjuharad.info/files/Aliens.pdf>). The leaflet is published in Swedish but will be translated to English and German. This project is partly financed by the European Union via the Baltic Sea Region INTERREG IIIB.

Challenges/limitations: The strengths of the existing framework lie in the control of intentional introductions, whereas there is a clear weakness when it comes to unintentional introductions. Pathways of introduction need more attention. Another difficult area is the concept of risk analysis. Very few regulations call for such analyses, and the protocols applied are not well developed. The scientific basis for risk analysis still requires development, as well as the practical application of risk analysis procedures.

Responsibility for managing IAS is currently divided between at least eleven separate central government authorities and the many regional and local authorities. There is a clear lack of coordination between the fields of activities of these agencies. The Swedish legislation on IAS is also scattered in very many different laws and regulations. Funding for prevention of introduction and control of invasive alien species is limited. Acute eradication and control measures are hindered by lack of funding, clear definition of areas of responsibility, coordination between the authorities and rapid response plans. Most of these limitations/challenges will be addressed through the draft Strategy and Action Plan.

27. UNITED KINGDOM

Legislation: The main piece of domestic legislation regulating the introduction of alien species in Great Britain is the Wildlife and Countryside Act 1981. The Act contains measures for preventing the establishment of alien species that may be detrimental to native wildlife. It prohibits the introduction into the wild of animals of any kind that are not ordinarily resident in Britain or are not regular visitors in a wild state, or that are listed in Schedule 9 to the Act, and also the planting of plants listed in Schedule 9 to the Act.

Through the Natural Environment and Rural Communities Act 2006 (England and Wales) and the Nature Conservation (Scotland) Act 2004 (Scotland), two new provisions were added to the 1981 Act. These are:

- a power to prohibit the sale of live specimens of specified non-native species (plants or animals, including seeds, eggs etc). The changes also make it a criminal offence to advertise an intention to buy or sell any specified species and

- to possess or transport such species for the purpose of sale;
- a power to issue codes of practice (or “guidance” in Scotland), or approve codes of practice issued by others, concerning non-native species. The content of such guidance must be taken into account by a court in any enforcement proceedings to which the guidance seems relevant⁴⁹.

In Northern Ireland, the Wildlife Order 1985 (Northern Ireland), Article 15 contains similar provisions to those contained in the Wildlife and Countryside Act 1981 referred to above.

In Scotland provisions have been included in the Nature Conservation (Scotland) Act 2004, but no information is available on their efficacy.

Keeping of certain fish species is restricted under the Import of Live Fish Act 1980, and section 30 of the Salmon and Freshwater Fisheries Act 1975, which prohibits the introduction of any fish or fish spawn into English or Welsh waters, without written consent from the water authority. In Scotland, the Import of Live Fish Scotland Act 1978 and Prohibition of Keeping or Release of Live fish (Specified Species) Scotland Orders prohibit or licence the import, keeping or release of non-native fish species

Policy: The UK’s Department for Environment, Food, and Rural Affairs (Defra) carried out a non-native species policy review in 2003. A key recommendation of this Review was that the UK Government should designate or create a lead coordinating organisation to ensure consistency of application of IAS policies across Britain. The Review also supported the three tier hierarchical approach. Defra has now put in place a Non-native Species Programme Board to coordinate work on non-native species in Britain, supported by a Secretariat based at the Central Science Laboratory in York. One of the first aims of the Programme Board was to develop a Great Britain-wide strategy on non-native species. The “Invasive Non-native Species Framework Strategy for Great Britain” was launched on 28 May 2008 and can be accessed here: <http://www.nonnativespecies.org/>.

A similar review to that carried out by Defra in 2003 has been undertaken in Northern Ireland in coordination with the Government of Ireland. This All-Ireland Review has recently been published. This has enabled improved coordination of non-native species work in the island of Ireland.

When introducing alien marine species for targeted fisheries, the UK follows the principles and risk reducing measures as outlined in the ICES Code of Practice on the Introductions and Transfers of Marine Organisms.

With regard to the UK Overseas Territories, the Joint Nature Conservation Committee published Non-native species in UK Overseas Territories: a review (Karen Varnham (2006), JNCC Report 372) which summarises what is known of the presence of non-native species in these territories.

Exploring synergies with the Water Framework Directive: As part of the

⁴⁹ Full text of the Natural Environment and Rural Communities Act 2006 is available at http://www.opsi.gov.uk/acts/acts2006/ukpga_20060016_en.pdf.

characterisation of River Basin Districts required for implementation of the European Union's Water Framework Directive, the possible impacts on the water environment have been assessed for the ten most invasive alien aquatic species covering rivers, lakes, estuaries or coastal waters. Further assessments of other invasive alien aquatic and riparian species will be undertaken as and when information becomes available through routine monitoring (although this is not specifically aimed at alien species) and from other sources.

Defra, the Scottish Government and the Welsh Assembly Government have involved industry and the public in several ways, for example through the policy review and public consultations, to ensure they are fully aware of the consequences of their actions in relation to IAS. They developed and published a Code of Practice in partnership with the horticultural industry in 2005 to raise awareness of the threats posed by invasive plants escaping from gardens, and the risks of imported plants carrying invasive pests and diseases. A similar Code of Practice for companion animals is partly developed. These both pre-date the new GB Strategy and will be revisited under a new strategic media and communications plan being developed by a working group.

In 2008, two new country-based IAS working groups were also established (in Wales and England) to complement the existing group in Scotland.

Research: The UK has supported research to establish an effective risk assessment methodology. The first structured framework for evaluating the potential for any alien organism, whether intentionally or unintentionally introduced, to enter, establish, spread and cause significant impacts in all or part of the UK has been developed. In conjunction with the Scottish Government, a second project to test and peer review the assessment was taken forward and a third project to refine the methodology based on the recommendations of the peer review will be completed in 2008.

In addition, Defra, among others, has contributed to a project by CABI investigating the potential for biocontrol of Japanese knotweed. Two agents that appear to be very specific to this plant have been identified under this project.

Other projects have included a fact-finding assessment of responsibilities relating to IAS across central and local government and government bodies and research into methods of managing monk parakeets. Possible projects for the future include a public awareness survey concerning the issue of IAS to help inform a communications strategy, a study of IAS economic impacts, some horizon scanning for potential problem species and possible field-testing of the efficacy of a technique for detecting the presence of America bullfrog from DNA in water bodies.

There is a large body of other research underway in the UK in relation to invasive species. Institutions with a particular focus on IAS include the Natural Environment Research Council, the Central Science Laboratory and other institutes such as CABI Bioscience. A UK institution is leading the DAISIE project, and the UK is represented in the ALARM project team.

Eradication/control programmes: There are many examples of IAS control programmes in Britain and Northern Ireland. These are often carried out by statutory

conservation agencies, the Environment Agency and local authorities in conjunction with voluntary groups and landowners. Action is also being taken to control pathogens threatening plants. For example there is a control programme to eradicate *Phytophthora ramorum* or the similar *Phytophthora kernoviae* in areas where this threatens native trees.

Eradication programmes for coypu (*Myocastor coypus*) and muskrat (*Ondatra zibethicus*) have been successfully completed.

Use of EU funding mechanisms to support IAS control and management in the United Kingdom

LIFE Nature funds:

UK work has been undertaken to identify and quantify the threat posed by the Ruddy Duck. The Ruddy Duck is present in large numbers in the UK, having been accidentally introduced. It poses little conservation threat domestically, but is known to migrate to Spain where it interbreeds with the globally-threatened white-headed duck, threatening its long-term survival. The UK initiated a control trial to assess whether eradication was feasible and subsequently launched a five year UK eradication programme for ruddy duck in September 2005, supported by a successful LIFE bid to the European Commission to support this work.

The Hebridean Mink Project was set up in 2001 as a five-year conservation initiative with the aim of eradicating non-native American mink (*Mustela Vison*) from the islands of North Uist, Benbecula and South Uist, and significantly reducing their numbers in Harris in a bid to protect internationally significant populations of ground nesting birds. Following the end of the LIFE funded project, work has continued and it is anticipated that by the end of the year the entire island chain will have been trapped at least once reducing the population of mink by around 80%. Trapping will then start in South Harris once again, moving through the island three times a year with the aim of completely eradicating mink from the Outer Hebrides by 2011.

Rural Development Programme measures under the EAFRD:

The Forestry Commission has adopted a formal Grey Squirrel Policy and Action Statement (see <http://www.forestry.gov.uk/forestry/infid-614fdh>). Some funds are provided under the England Woodland Grant Scheme (<http://www.forestry.gov.uk/forestry/INFD-6DFKLB>) to support management of grey squirrel populations and of some invasive species that impact on woodland (especially *Rhododendron ponticum*).

Under the previous England Rural Development Programme (2000-2006) the Countryside Stewardship (CS) and Environmentally Sensitive Areas (ESA) Schemes had scrub control options that would primarily have been used to control species such as bracken, but were invariably also used to control IAS. Under the Rural Development Programme for England (2007-2013) Environmental Stewardship, the replacement for these 'classic' schemes has a Higher Level Stewardship strand that contains a specific option (HR4) for the control of invasive plant species. To date, 118 agreement holders have taken up this option covering an area just over 1,100ha. (pers. comm., William Pryer: see also <http://www.defra.gov.uk/erdp/schemes/hls/handbook/appendix1-r.htm#hr4>).

The Rural Payments Agency includes a specific IAS measure as part of the GAEC requirements under cross-compliance (to avoiding deterioration of habitats)*. The aim of these requirements is to "control the spread of injurious and invasive weeds that can damage habitats and agricultural land". Participants with such weeds on their land are required to take all reasonable steps to prevent the spread of the following species on their land and onto adjoining land and must not unreasonably fail to comply with a notice served on them under the Weeds Act 1959:

- **injurious weeds:** common ragwort (*Senecio jacobaea*); spear thistle (*Cirsium vulgare*); creeping or field thistle (*Cirsium arvense*); broad-leaved dock (*Rumex obtusifolius*); curled dock (*Rumex crispus*); and
- **invasive weeds:** rhododendron (*Rhododendron ponticum*); Japanese knotweed (*Reynoutria japonica*); giant hogweed (*Heracleum mantegazzianum*); Himalayan balsam (*Impatiens glandulifera*).

Schemes operated by English Nature (the predecessor to Natural England) included the **Reserves Enhancement Scheme** (for Wildlife Trusts) and the **Wildlife Enhancement Scheme** (open to the National Trust, Royal Society for the Protection of Birds, other NGOs and private landowners) which paid a percentage of the capital costs of IAS control within Sites of Special Scientific Interest or where IAS impacted on Biodiversity Action Plan species. These two grant schemes have been subsumed into the Higher Level Scheme.

The National Trust makes extensive use of available funding mechanisms, particularly for rhododendron clearance and control of invasive aquatic plants in river catchments. In certain cases, the **Environment Agency** may provide limited funds to pay for one-off works in rivers, streams and lakes. Under the **Land Fill Tax** grant, Land Fill Providers charge a premium to dump rubbish. A percentage of this is made into grants that can be accessed by conservation bodies. The Trust used this funding source to carry out research into stem injection for Japanese knotweed.

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http://www.rpa.gov.uk/rpa/index.nsf/vContentByTaxonomy/RPA%20Schemes**Single%20Payment%20Scheme*%20Cross%20Compliance**Farmer%20Guidance**Guide%20to%20Cross%20Compliance%20in%20England**GAECs**GAEC%2011**?OpenDocument

With regard to the UK Overseas Territories, plans are in place and operating in respect of some invasive species threatening endemic species, but not all, because of limited resources (Defra 2005). There have been some major successes, however, any attempt at organized eradication, and even small-scale removal of species has often been met with popular outcry. This response has extended to invasive flora (eg *Casuarina equisetifolia* which is prized for its shade and whistling needles) and even to feral chicken eradication.

Limitations/challenges: Challenges recorded include coordination of both policy development and programmes of action, lack of success in enforcement/implementation of current domestic legislation, lack of comprehensive information on IAS and focal point on the subject, lack of risk assessment expertise and lack of adequate resources. However, recent progress (eg establishment of the Non-native Species Programme Board and the launch of the GB Strategy) is intended to address these issues through a strong partnership approach with a range of key stakeholders.

Annex 4 IAS FRAMEWORKS IN OTHER COMPLEX JURISDICTIONS: MECHANISMS USED AND LESSONS LEARNT

The following table provides an overview of IAS frameworks developed in three complex jurisdictions where competence for prevention and management is shared between different tiers of government (federal/Commonwealth; subnational/state/province). Sources referenced include:

- national reports submitted as part of the CBD in-depth review of IAS activities (<http://www.cbd.int/invasive/assessments.shtml>);
- websites maintained by Invasive Species Australia and AusBIOSEC⁵⁰, Environment Canada⁵¹ and the National Invasive Species Council, United States (NISC)⁵²; and
- personal communication with Jonathan Miller and Bronwyn Shirley (Department of the Environment, Water, Heritage and the Arts, Australia), Mark Richardson (Environment Canada), Françoise Labonté (Department of Fisheries and Oceans, Canada) and Lori Williams, Richard Orr and Melinda Wilkinson (NISC).

Country	IAS actions
Coordination, strategy and funding	
Australia	<p>The Australian Biosecurity System for Primary Production and the Environment (AusBIOSEC) is being developed to promote whole of government and cross-sector management of biosecurity (thus extending and integrating the fairly comprehensive existing arrangements for primary industry to cover less economic threats to native biodiversity or ‘society’). This will involve signature of an Intergovernmental Agreement (IGA) by the Department of Agriculture, Fisheries and Forestry, the Department of Environment, Water, Heritage and the Arts and all state and territory governments. Once the IGA is signed (expected November 2008), coordination will be through a new National Biosecurity Committee reporting to both the Natural Resource Management and the Primary Industry Standing Committees: the Committee will engage stakeholders from relevant environmental groups depending upon the threat/issue being dealt with.</p> <p>National efforts to strengthen inter-jurisdictional cooperation on prevention have delivered results on cost-sharing for rapid response and will now address–better data sharing in interoperable formats, detection and reporting, post-border surveillance, etc..</p> <p>Two non-binding frameworks promote coordinated approaches to prevention and management (and notionally come under AusBIOSEC):</p> <ul style="list-style-type: none"> • the Australian Weeds Strategy (revised November 2006) sets out the country’s overarching policy for weed management. It aims to prevent new weed problems, reduce the impact of existing priority weed problems and enhance national capacity and commitment to solve weed problems. Strategy implementation is led by the Australian Weeds Committee (AWC) which provides an inter-governmental mechanism for identifying and resolving weed issues at a national level and includes

⁵⁰ <http://www.environment.gov.au/biodiversity/invasive/index.html>; <http://www.environment.gov.au/biodiversity/invasive/ausbiosec.html>.

⁵¹ <http://www.cbin.ec.gc.ca/issues/ias.cfm?lang=e>.

⁵² <http://www.invasivespeciesinfo.gov/council/main.shtml>.

	<p>representatives from all states and territories, the Commonwealth Scientific and Research Organization (CSIRO) and the Australian Government. State and territory governments provide the institutional and legislative framework, regulating the spread and control of targeted weed species and assigning responsibilities for control.</p> <ul style="list-style-type: none"> the Australian Pest Animal Strategy (endorsed May 2007) aims to provide leadership and inter-agency coordination to prevent the establishment of new pest animals, manage the undesirable impacts caused by exotic vertebrate animals that have become pests in Australia and implement a communication strategy and consultation mechanism. An Implementation group will investigate the feasibility of consistent legislation and policy approaches in all jurisdictions, including development of a priority pest animal list, identification of nationally significant environmental assets to be protected and development of a national pest information system to inform a range of management actions of key vertebrate pests. Work is also continuing to improve the risk assessment process for the import and keeping of exotic animals.
Canada	<p>The Invasive Alien Species Strategy for Canada was approved by federal, provincial and territorial Ministers for wildlife, forests, fisheries, aquaculture and endangered species in 2004 and aims to establish a coordinated national policy and management framework to minimise IAS risks to the economy, environment, and society. The federal government is charged with the first three priorities under the strategy - prevention, early detection and rapid response. Provincial governments also share in the early detection and rapid response priorities although the majority of their direct responsibility is for management once the species is well established. Progress under Phase 1 of the Strategy was aided by the 2005 Federal Budget, which allocated \$85 million over 5 years for new measures to address IAS threats (to 31 March 2010). Phase 2 of the Strategy (2010-2015) is under development: IAS governance will be addressed as a priority issue, closely tied to regulatory and policy ability. A National IAS Web Portal is being developed cooperatively with an expected launch date in January 2009 and will be the first point of contact for IAS information in Canada.</p> <p>A Leadership and Coordination Committee was established to support Strategy implementation. This is a federal and provincial committee, chaired by EC, with representation open to all departments with an interest/stakehold in IAS. It meets (by teleconference) several times a year to discuss progress on IAS issues and activities. It has no budget or authority to make decisions. The Committee's original role was to provide input on individual provincial actions and on those of relevant federal departments. However, engaging the Committee proved challenging for the same sectoral and jurisdictional barriers faced by other large jurisdictions. Environment Canada recognises that IAS are a very horizontal issue facing many levels of government, industry and society, with no single agency/department tasked with the management/prevention of invaders: funding and policy continue to be the primary barriers for implementation of the Strategy. Provided that these constraints are addressed, the Committee mechanism is considered to provide a very effective mechanism for delivery of IAS programming in Canada.</p> <p>The Invasive Alien Species Partnership Programme (IASPP) is an important component of Strategy implementation focused on engaging the general public, with a budget of \$5 million over 5 years. It is managed jointly by Environment Canada (EC), the Canadian Food Inspection Agency (CFIA) and the Department of Fisheries and Oceans (DFO) and administered by EC. A Memorandum of Understanding (2006-2010) outlines roles and responsibilities of participating departments. By end 2007, IASPP had provided grants and/or contribution funds to support 76 projects run by a wide range of stakeholders and provincial and territorial governments (eg communication products, educational courses, workshops, monitoring programmes, help for establishing provincial or regional Invasive Species Councils, research). In November 2007, Environment Canada has established an IAS Secretariat to coordinate communication and the IASPP.</p> <p>The following frameworks support coordinated action on specific categories of IAS in line with the national Strategy:</p> <ul style="list-style-type: none"> the Action Plan for Invasive Alien Terrestrial Plants and Plant Pests (2005) developed by the inter-jurisdictional Terrestrial Plants and Plant Pests Working Group on IAS (co-chaired by Ontario Ministry of Food and Agriculture and the CFIA). The CFIA and Natural Resources Canada were respectively allocated \$50 million and \$10 million over 5 years to support implementation. The Plan lays out roles, responsibilities and timelines for implementation of key initiatives covering eg leadership and coordination, legislation and regulation, risk analysis (for Phase 2, see http://www.inspection.gc.ca/english/plaveg/invenv/action/phase2e.shtml).

	<ul style="list-style-type: none"> the Canadian Action Plan to Address the Threat of Aquatic Invasive Species (2004) was developed by the federal-provincial National Aquatic Invasive Species Committee, co-chaired by DFO Science Sector and the Ontario Ministry of Natural Resources and approved by the Canadian Council of Fisheries and Aquaculture Ministers. The Committee provides a forum for information exchange and enhanced national and interjurisdictional planning and cooperation to maximise the combined efficiencies of jurisdiction (provincial/territorial) activities, reduce duplication/overlap of effort and ensure economies of scale wherever possible. Budget 2005 provided DFO with \$10 million over 5 years to assist with implementation of the aquatic component of the national Strategy (with a particular focus on early detection, monitoring, development of a test emergency response plan and development of a national regulatory framework). An additional \$10 million over 5 years was allocated for sea lamprey control. the National Forest Pest Strategy (2007), developed under the 2003-2008 National Forest Strategy, supports research into management of forest IAS in line with the National Strategy on Invasive Alien Species with a focus on: techniques for risk mapping information to improve science-based policy recommendations and advice; development of a national early warning system and diagnostic network; predictive models for new threats; and a framework for ecological risk analysis.
United States	<p>The National Invasive Species Council (NISC) was established by Presidential Executive Order 13112 in 1999 to provide coordination, planning and overall leadership for over 40 federal invasive species programmes. It is co-chaired by the Secretaries of Agriculture, Commerce, and Interior; other members include the Secretaries of State for Defence, Homeland Security, Treasury, Transportation and Health and Human Services, the U.S Trade Representative and the Administrators of the Environmental Protection Agency, the U.S. Agency for International Development and the National Aeronautics and Space Administration. Through monthly meetings, IAS focal points from NISC member agencies coordinate activities and discuss current IAS issues.</p> <p>NISC is advised by the Invasive Species Advisory Committee composed of 30 non-federal stakeholders representing state, tribal, local and private concerns: in 2006, its members issued a white paper interpreting the Executive Order's definition of invasive species (http://www.invasivespeciesinfo.gov/docs/council/isacdef.pdf).</p> <p>Since 2004, NISC has established an Invasive Species Performance Budget for each fiscal year. Its purpose (overseen by the Office of Management and Budget) is to :</p> <ul style="list-style-type: none"> deliver more efficient allocation of resources through enriched inter-agency cooperation; promote interagency performance-based approaches to address specific invasive species issues; provide a clear and comprehensive overview of invasive species issues and efforts across the federal government. <p>The most recent budget (Fiscal Year 2007) includes two sections:</p> <ul style="list-style-type: none"> General Categories: compilation of all (reported) federal expenditures for invasive species in seven categories. Overall total is US\$ 1229.48 million (increase of 5.9% on previous year), with increase for Early Detection and Rapid Response of nearly 20% and Restoration of nearly 34%); and Specific Initiatives (6 species-specific initiatives, 4 programme-based initiatives: ballast water, aquatic area monitoring, rapid response and innovative control technologies: total performance budget US\$ 43.76 million). <p>NISC is mandated to develop a national invasive species plan. The first plan (2001) has now been replaced by the 2008-2012 National Invasive Species Management Plan (approved 1 August 2008). It will direct Federal efforts (including overall strategy and objectives) to prevent, control and minimise invasive species and their impacts on the environment, the economy and health of the United States. It may be updated more frequently to reflect changes in circumstances, agency plans and priorities. The Plan establishes a targeted set of priority strategic action plans with objectives, implementation tasks and 87 performance elements, for implementation by 35 entities within member departments and agencies.</p> <p>More than 24 states now have invasive species coordination councils. Non-binding guidance on the approach and model provisions for individual State IAS laws has been prepared (ELI 2002, ELI 2004). Although NISC addresses education and public awareness activities, federal outreach is weak compared to state-level outreach.</p>

	<p>The Aquatic Nuisance Species Task Force (ANSTF, www.anstaskforce.gov) was established under the Nonindigenous Aquatic Nuisance Prevention and Control Act 1990. It is co-chaired by the Director of the Fish and Wildlife Service and the Undersecretary of Commerce for Oceans and Atmosphere and now includes representatives from 10 federal agencies and 12 ex officio organisations (Fisheries and Oceans Canada participates as an invited observer). 6 Regional Panels (comprising representatives of states, tribes, NGOs, commercial interests and neighbouring countries) identify regional aquatic nuisance species priorities, coordinate programme activities in each region, make recommendations to the ANSTF and provide advice to public and private interests for prevention and control. The work of 5 Standing Committees (Prevention, Detection and Monitoring, Control, Research, Communication and Outreach) includes development of species control and management plans (Asian carp, Brown tree snake, Caulerpa, Green crab, mitten crab). The second ANSTF Strategic Plan has been adopted for 2007-2012.</p>
Prevention at external borders	
Australia	<p>Australian Quarantine and Inspection Service (AQIS) is the operational border agency. Biosecurity Australia is responsible for providing science-based quarantine assessments and import risk analyses for plants, plant products and/or animals, animal products, covering all parts of the importation pathway and including consideration of potential environment risks and consequences (see revised Import Risk Analysis Handbook (2007)) and provides risk mitigation advice to AQIS. Both agencies operate out of the Australian Government Department of Agriculture, Fisheries and Forestry. Importers do not specifically pay relative to the risk they create (eg if their imported species causes a weed outbreak).</p> <p>In addition to quarantine legislation, the Environment Protection and Biodiversity Conservation Act 1999 provides that only species that appear on a list of approved species may be imported live into Australia. Amendment of the list is subject to assessment of the potential environmental impacts of the proposed species have been thoroughly assessed. The Permitted Seeds List under the Quarantine Act ensures that the minimum number of invasive plant species is legally imported into Australia: any species <u>not</u> on the list must undergo a weed risk assessment.</p> <p>Currently, Biosecurity Australia and AQIS deal mainly with threats to primary production. AusBIOSEC (see above) is being developed to allow biosecurity arrangements to be coordinated across environmental and primary production areas and to address gaps in policy coverage for pests and diseases with environmental and/or social amenity impacts.</p>
Canada	<p>All foreign trade matters are handled by federal government (Canada Border Services Agency). Substantive prohibitions are mainly focused on agriculture-related items and commodities. Since 2007, border controls have been strengthened to prevent establishment of introduced species, with enhanced inspection of imported plants and plant products and the development of new tools for inspection activities such as the <i>Import Inspection Manual</i>. All foods, animals, plants and related products must be declared at customs: failure to declare could lead to confiscation of products, fines of up to \$400 per undeclared item and/or prosecution. An Automated Import Reference System has been established as a first step to help commercial importers, and to a lesser extent individuals, determine import requirements. A detailed website for the “Be Aware and Declare” campaign (http://www.beaware.gc.ca/english/) provides accessible information on IAS-related risks (eg including introduction of items made from plants or wood, plant cuttings from family gardens) and notes that IAS are estimated to cost Canadian industries billions of dollars in lost revenues every year.</p> <p>Canada cooperates through the Commission on Environmental Cooperation (Canada-US-Mexico) on development of trilateral risk assessment guidelines to screen risks associated with certain trade pathways, with a particular focus on the aquarium trade in North America. These have been piloted using two groups of freshwater fishes: by Canada, for 5 species of snakeheads found in aquarium and food industries; by Mexico, for suckermouth catfish.</p>
United States	<p>External border control is led by the Department of Homeland Security’s U.S. Customs and Border Protection which applies the regulations developed by sectoral federal agencies. The main focus is prohibited agriculture items that may have the potential to become IAS. Outreach efforts with a similar focus are in place (e.g. <i>Protecting America’s Agricultural Resources</i>). The US Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS) includes the Veterinary Services agency and the Plant Protection and Quarantine Services agency.</p> <p>NISC leads the IAS Panel of the North American Plant Protection Organization (NAPPO) which is developing Guidelines for Conducting Pathway Risk Analysis (RSPM</p>

	<p>No. 31) and Pest Risk Analysis for Plants as Pests - Guidelines for Screening Plants for Planting Proposed for Import into NAPPO Member Countries (RSPM No. 32) (http://www.nappo.org/menu_e.shtml).</p> <p>NISC/ANSTF have formed multi-agency working groups to develop and coordinate new RA methodologies and processes (including screening methods) to identify potential IAS before entry and issued a Training and Implementation Guide for Pathway Definition and Risk Analysis and Risk Prioritization for risk management via unintentional man-made pathways (available at: www.anstaskforce.gov). Through the Generic Nonindigenous Aquatic Organisms Risk Analysis Review Process, ANSTF maintains a priority list of invasive pathways, is establishing a national integrated database of species-specific information based on the outcome of species invasion-risk forecast analyses and supports completion of a permanent barrier on the Chicago Sanitary and Ship Canal and analysis of barrier options on other interconnecting waterways.</p> <p>In June 2008, legislation was proposed (House of Representatives Bill H.R.6311 for a Non-native Wildlife Invasion Prevention Act) to establish a risk assessment process to prevent the introduction into, and establishment in, the US of non-native wildlife species that will cause or are likely to cause economic or environmental harm or harm to human or animal species' health (this excludes species defined or regulated as plant pests or as a threat to livestock or poultry under animal health legislation). This would provide for:</p> <ul style="list-style-type: none"> • criteria and procedures for the conduct of risk assessments; Regulations to be issued through the US Fish and Wildlife Service for all non-native wildlife species proposed for importation except those included in a list of approved species (species that based on the best scientific and commercial data available, are not harmful to the US economy, environment or human or other animal species' health; or species that may be harmful in some respects but already are so widespread that future import prohibitions or restrictions would have no practical utility); • a List of Unapproved Species prohibited or restricted from entering the US (except under permit for education, research or accredited zoological/aquarium display); • fee collection to recover to the maximum extent practicable the costs of RA under these Regulations; • establishment of the Nonnative Wildlife Invasion Prevention Fund into which fees should be paid and used for the purposes of implementing the act. <p>Part of the rationale behind this draft legislation is the lucrative and largely unregulated trade in imported exotic wildlife thriving in the US, which poses a risk of introducing and disseminating exotic zoonotic pathogens which threaten both human and animal health, and have the potential to become established and maintained in native animal and insect reservoirs (e.g. a monkeypox outbreak in 2003 revealed critical gaps in regulatory authorities and the need for coordination).</p>
<p>Prevention within national borders (intra-provincial trade and possession)</p>	
Australia	<p>Biosecurity regulation for intra-state and inter-state movement of commodities is handled on a jurisdictional basis (ie depending on the state in which the goods are being transported to, from or within.) The Australian constitution prohibits constraints on trade between jurisdictions, but quarantine is an allowable exception. Differences between jurisdictional recognition of regional differences in pest and disease status, and application of different biosecurity procedures can make this system complex. The position regarding regulation of domestic trade, possession and/or movement of problem species differs from state to state (which develop their own biosecurity strategies). Most of the controls to minimise spread of pests are agricultural controls: there is a range of inconsistencies between state legislations (eg on companion animals, ornamental plants) that can encourage the spread of pests from places where they are not problematic in Australia, to where they are (generally on the basis of differing ecology and climate). Some primary industry cross-jurisdictional committees have addressed coordination: AusBIOSEC should provide a broader opportunity to improve harmonisation of intra-state and inter-state quarantine regulations.</p> <p>The Strategies mentioned above all promote more consistent approaches (eg National Environmental Alert List). The Australian Weeds and Pest Animals Strategies (see above) are best seen as frameworks for moving national approaches forward with application done by each state (the national government has no powers of compulsion). This has – after some years – proved successful for priority weeds: all states and territories in Australia have now implemented legislative measures to prevent the sale and trade of the twenty Weeds of National Significance. In some cases, this effectively means one jurisdiction legislating for a benefit to another jurisdiction.</p>

	<p>At industry level, the Australian Nursery and Garden Industry Association has developed the Nursery Industry Accreditation Scheme (NIASA) and a Biosecure Hazard Analysis and Critical Control Points (HACCP) programme: these operate at individual state level. In South Australia, changes to state plant health legislation (Plant Health Act 2009) provide for recognition by Primary Industries and Resources South Australia of these industry-led programmes. For businesses with NIASA accreditation and BioSecure HACCP certification, benefits include cost savings (i.e. less surveillance audits required by government inspection officers of nursery stock movements into South Australia), technical support and improved market access (i.e. NIASA stock moving into the state does not require quarantine before being sold). NIASA businesses in South Australia will also forgo Accreditation for an Import Verification Compliance Agreement (IVCA) which will be mandatory for all businesses in SA wishing to import nursery stock. Compliance is assessed by qualified Industry Development Officers annually and in some states biannually: in future, these officers may be aligned to the national biosecurity auditing processes driven by state agencies across Australia (Interstate Certification Assurance Arrangement programme). The BioSecure HACCP programme has been reviewed by both state and national biosecurity agencies and feedback provided. The NIASA program has a mechanism in place for the future peer review of the programme but this has yet to be implemented⁵³.</p>
Canada	<p>The provinces deal with specific interprovincial trade issues and there is currently little capacity or desire to regulate IAS interprovincially, with the exception of invasive agricultural or forestry pests regulated by the Canadian Food Inspection Agency (CFIA) for certain areas or regions in an attempt to control the spread of or eradicate certain pests (http://www.inspection.gc.ca/english/plaveg/pestrava/pestravae.shtml). There are a few species (eg sea lamprey) for which the federal Government is responsible under international treaties.</p> <p>Environment Canada is developing a dedicated website which provides a platform to list alien species with strong invasive tendencies (http://www.ec.gc.ca/ee-ias/Default.asp?lang=En). It recognises the need for a national IAS listing system and a national portal is under development, partly to get the IAS message out to the public and other stakeholders. This will be further addressed in Phase 2 of the National Strategy. However, this faces several constraints: only a few species would be considered nationally invasive (coast to coast, excluding the north); invasiveness (ie harmful impacts) is dependent on region; funding and buy-in would be necessary from provinces and other stakeholders.</p> <p>The emerging Canadian Invasive Plants Framework includes ongoing development of invasive plant policies and regulations, development of risk management documents for plant species for which pest risk assessments have been completed and proposals for a list of prohibited invasive plants. Similar regulatory development is under way for aquatic invasive species (see below).</p>
United States	<p>The inter-state trade framework is broadly similar to that in Canada: once a species is cleared for entry to the US, it can for the most part be moved freely. Controls may be imposed on a state-by-state basis for various categories of IAS e.g. noxious weeds, but there appears to be no compulsory mechanism for coordinating lists and actions between neighbouring states for species of widespread concern.</p> <p>Mexico, Canada and the US cooperate through the Commission of Environmental Cooperation (North American Free Trade Agreement) to strengthen prevention of certain pathways e.g. "Trinational Risk Assessment Guidelines for Invasive Alien Species: Test Cases for the Snakeheads (Channidae) and Armored Catfishes (Loricariidae) in North American Waters" (currently in press).</p>
Early Detection and Rapid Response	
Australia	<p>States and territories have a strong interest in what happens at the national border as they are responsible for actions in the biosecurity continuum immediately post-border (detection and incursion response). Recent significant progress includes the development of a cost-sharing formula for contributions by different jurisdictions to enable major eradication campaigns for newly arrived incursions.</p>

⁵³ Anthony Kachenko, Nursery and Garden Industry Australia, pers.comm.

	<p>A National Weed Incursion Response Plan is being developed to develop a national framework for managing new incursions into Australia. The framework will include relevant technical and operational guidelines applicable to the detection and early eradication of new weed incursions.</p> <p>The National System for the Prevention and Management of Marine Pest Incursions (established on the basis of an Intergovernmental Agreement in 2005) is being developed and implemented by the National Introduced Marine Pest Coordination Group, which comprises Australian Government departments, state and Northern Territory government agencies, researchers and representatives from fishing and marine industries, port authorities and conservation groups.</p>
Canada	<p>This is primarily a federal responsibility. Under plant protection legislation, emergency measures and funding are available to eradicate certain newly-introduced pests eg forestry pests (through programmes coordinated by the CFIA, including federal ministerial orders for certain pests such as Emerald Ash Borer and Asian Long-Horned Beetle that are consistent with US approaches). A national surveillance network focused on plant health has been established, via a network of survey coordinators across the country, and increased surveillance of high risk entry sites for invasive plants and plant pests is delivered as part of the national IAS survey work plan. Environment Canada and CFIA are both represented on the Invasive Alien Species panel within the North American Plant Protection Organization. Under the Barcode of Life programme, financial support has been provided to the Pacific Forestry Centre to develop DNA barcodes for a wide variety of native and non-native forest pests to make it easier to quickly identify invasive forest pests that are intercepted or detected at international ports.</p> <p>For aquatic IAS, the Department of Fisheries and Oceans has implemented a limited national early detection monitoring programme based on provincial and stakeholder priorities identified through its biological risk assessments. Zonal workshops were also held in 2006 to assist in the identification of high priority pathways and species to be monitored.</p>
United States	<p>In addition to the NISC guidance documents on prioritisation for early detection and rapid response (see above), the Department of the Interior, US Department of Agriculture and Environmental Protection Agency lead the development of a Framework for Early Detection, Rapid Assessment, and Rapid Response to Invasive Species. This aims to provide access to reliable resources on IAS identification, reporting, expert verification, occurrence databases and planning through the National Biological Information Infrastructure which is linked to the Global Invasive Species Information Network (http://edrr.nbii.gov).</p> <p>Rapid response is also supported through the regional panels of the Aquatic Nuisance Species Task Force, which publishes lessons learnt from previous response efforts on its website; supports the development and use of common protocols for surveys and database standards; evaluates rapid response plans prepared for other events (oil spills, hurricanes, foreign animal diseases, etc.) to see how they could apply to reports of invasive species; facilitates contingency planning and encourages federal agencies to address key elements of regional contingency plans (infrastructure, resources and jurisdictional issues) in their programme planning.</p>
Management and control	
Australia	<p>States and territories have the main land management role. Jurisdictions allocate funds from their budgets according to their priorities. There is no major national/Australian Government funding programme for allocations to states or regions specifically for IAS management, although the Government has increased its involvement in biosecurity policy and does make major funds available through the previous government's Natural Heritage Trust and the reworked Caring for Our Country programme. In practice, this has been spread thinly across the broad range of natural resource management on-ground activities. Extended cost-sharing options may be considered through the AusBIOSEC process.</p> <p>National coordination and facilitation of action to address each of the 20 Weeds of National Significance (WoNS) is managed through the WoNS programme. WoNS coordinators work with their management committees to provide national leadership across all jurisdictions to promote a collaborative and cohesive approach to WoNS management. Funding has been provided to develop best practice methodology for management of WoNS. Best practice guides are now available at no cost for 11 of the 20 WoNS, with the remainder in train. National Mapping guidelines have been produced to encourage a standardised approach to collection of data on weed incursions. In parallel, a Uniform National System of Weed Categorisation and Risk Assessment is under development to develop a system of 4-6 generic weed management categories including management objectives for each category and also to develop and apply a rapid weed risk assessment and prioritisation tool to assign a preliminary selection of</p>

	<p>250 species to their appropriate categories.</p> <p>Several programmes focus on industry and public engagement in invasive plant control (eg Defeating the Weed Menace programme). Work is underway to support the nursery and garden industry to deliver industry training accreditation to growers, wholesalers and retailers on invasive plant issues (see above).</p> <p>Mandatory labelling for invasive plants (indicating the country of origin of the plant, the areas where it is indigenous and whether it has proven invasive elsewhere) was considered in 2004. The proposal found that such a system could be favourable to the nursery industry because it would: allow a graduated transition when replacing invasive species by non-invasive species, thus permitting the industry to maintain profits; incur lower costs than a banning/policing approach; help minimise potential future civil liability; increase consumer reliance on industry expertise; and as an industry-led strategy, would probably incur lower costs to governments than a regulatory one. A mandatory programme was expected to be more effective than a voluntary one because wide industry participation would be needed and it would be unfair for all the costs of such a programme to be borne by voluntary participants only. Overall, such a scheme was expected to be a cost-effective complement to regulations on impact and sale of invasive species provided that: prior to or during implementation, an information programme was developed to encourage consumers to modify their behaviour; regulatory and administrative systems were able to underpin the strategy; and industry and governments committed sufficient resources and efforts to overcome the difficulties met while implementing such a strategy (Martin et al. 2005, reported in EPPO 2007b). However, this proposal was opposed by the Nursery & Garden Industry Australia (NGIA) as well as individual states and territories. The NGIA has its own National Plant Labelling Guidelines which provide guidance on how to deal with 'potentially harmful plants'. It has also developed a Grow Me Instead programme which engages local nursery owners in identifying weedy species in their regions and then promoting low risk alternative species to consumers at the point of sale.</p> <p>The Australian Government provides funding under the Natural Heritage Trust and Invasive Animals Cooperative Research Centre to develop and promote improved pest animal control tools. IAS in inland water systems are dealt with at the state jurisdictional level and requirements differ from state to state. The spread of alien species by anglers is a major problem in some cases (eg Tilapia in Queensland). Catchment groups do some abatement work. Awareness initiatives to promote best practices for anglers exist in some states eg Queensland. National Control Plans are being developed for six marine pest species of concern to reduce impacts and minimise the spread of these pests.</p>
Canada	<p>The provinces are responsible for management of terrestrial natural resources, including most management of established IAS, except on federal lands (military lands, parks). No federal funding is provided to provinces specifically for IAS control. Provinces may choose to invest in IAS as they see fit. Management activities tend to be the most costly and consequently, there is a diversity of investment across the country (some provinces choose to invest very little while others opt to invest considerably more). The federal Government cannot control how provinces invest.</p> <p>Currently, aquatic invasive species (e.g. live bait, alien fish angling) are separately regulated by provincial jurisdictions. Proposed revisions to the existing Fisheries Act (subject to Parliamentary approval) would introduce a number of regulatory controls to manage aquatic invasive species (AIS) in all Canadian waters: (1) AIS will be defined by regulation; (2) certain species, such as lamprey in the Great Lakes or elsewhere, will be designated as such in order to apply control measures to them; (3) protocols to manage and control the spread of AIS; (4) rules governing the import, export, transport and release of aquatic invasive species; (5) the methods used for destroying aquatic invasive species by Minister or persons authorised by the Minister to destroy AIS; (6) the obligation to provide information about AIS (possibility of using reinforced information-gathering provisions in support of AIS-management programme); and (7) inspectors, in addition to fishery officers, would be able to enforce these particular provisions.</p>
United States	<p>Inter-jurisdictional cooperation and coordination is delivered through NISC, ANSTF, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (www.fws.gov/ficmnew) and the Committee on Invasive Terrestrial Animals and Pathogens. In addition, many state governments have established similar coordination groups and much of the control and management activity is generated at state level (in 2006 the State of Florida spent almost \$100 million on IAS control and the State of California \$39 million on control of aquatic invasives alone).</p>

	<p>Efforts are generally funded through the budgets of each partner agency/organisation. Several federal agencies may provide funds to non-federal partners as cost-share payments. In some cases, funds may be designated for specific IAS projects by the federal appropriations process. State, local, tribal, or private sector partners often provide their proportion of a cost-share to a foundation grant in the form of in-kind contributions (i.e., wages and benefits, travel costs and computer time).</p> <p>In 2001, principles to combat invasive plants were adopted in the St. Louis Declaration together with the St. Louis Voluntary Codes of Conduct for botanical gardens, the nursery industry, landscape architects, gardeners, and government agencies. Many professional associations have now endorsed the codes. Their primary purpose is as an outreach and education tool (levels of awareness of IAS risks even within the industries concerned were initially very low). A 2007 survey showed that respondents with higher awareness and/or with greater involvement in trade associations reported significantly greater participation in prevention measures (Burt et al. 2007. Reported in EPPO 2007/161 (Preventing introductions of invasive plants for horticultural purposes through voluntary initiatives in the USA).</p> <p>Two effective outreach and control programmes are ‘Stop Aquatic Hitchhikers’ (clean your boat campaign aimed at recreational boaters to prevent further spread of zebra and quagga mussels to western US: www.protectyourwaters.net; and ‘Habitattitude’ (don't dump your pet campaign, developed and run jointly with part of the pet industry to educate the industries and their customers about the impacts of releasing pets and invasive plants into the wild: www.habitattitude.net).</p> <p>Some federal agencies have policies that require use of certified IAS-free products for specific markets e.g. the National Park Service may require that only certified weed-free hay be used for livestock within a national park. Other examples are the requirement that crop seed must meet weed contamination standards before sale; regulations requiring that only artificial/nonliving fishing baits be used; and requirements that firewood be debarked to remove invasive insects or other bark-inhabiting organisms prior to shipment within the United States. Other measures, such as bounties and unrestricted hunting seasons and bag limits, are sometimes implemented to reduce populations of certain invasive alien animal species.</p> <p>An on-line training program by the U.S. Fish and Wildlife Service trains volunteers from the public to assist in managing invasive plants on National Wildlife Refuge System lands (www.fws.gov/invasives/).</p>
Management of ballast water and other pathways	
Aus	<p>Under the National System for the Prevention and Management of Marine Pest Incursions, the Australian Government is developing legislation for managing bio-fouling and ballast water. Bills currently being drafted will implement the BWM Convention and provide a basis for consistent national regulation of ballast water movements between Australian Ports (replacing current ballast water management requirements under quarantine legislation): jurisdictions are working to have the legislation in place by 1 July 2009. An Australian Ballast Water Unit will provide a single point of contact for the shipping industry and will coordinate inspections. A regulation impact statement was commissioned to examine the impact of implementing consistent national ballast water management requirements and concluded that ballast water exchange outside 12 nautical miles moving to on-board treatment after 2009 was the most cost effective management option in most cases.</p> <p>National Best Practice Management Bio-fouling Guidelines are being developed for a number of sectors including commercial, fishing and recreational vessels and ports and harbours The Australian Government is moving towards applying risk-based Biofouling Management Requirements to all international vessels arriving in Australia. The website http://www.daff.gov.au/aqis/avm/vessels/less-25m/biofouling-protocols will be updated when implementation of these requirements can be confirmed. These requirements are backed by a National Communication and Awareness Strategy including specific communication plans for each marine sector eg AQIS has produced a Biofouling Fact Sheet which provides information for yacht operators about how the protocol will impact them and what they should do prior to arrival in Australia.</p> <p>For military activities, the Department of Defence has signed a memorandum of understanding with AQIS concerning quarantine procedures, fees and requirements for defence force personnel and equipment returning to Australia. For international development assistance, IAS are taken into account through AusAID's environmental</p>

	assessment and management processes. If invasive species are identified as an issue, an activity environmental management plan will be prepared. A country level SEA can provide information for partner countries and regional organisations to raise the issue of invasive species in aid programme consultations.
Canada	The federal Government, through Transport Canada, developed guidelines in 1989 for ships entering the Great Lakes and expanded them nationally in 2000. On 28 June 2006, the Ballast Water Control and Management Regulations were adopted under the Canada Shipping Act. These Regulations, administered by Transport Canada, require all ships entering Canada (other than from nearby American ports) to exchange their ballast water at sea or treat it before discharging it in Canada. Ships on voyages within Canada are excluded from the Regulations but are subject to non-enforceable guidelines. Joint Canadian and American inspections cover about 80% ocean going foreign ships before they enter the Great Lakes. For the 2006 shipping season, 94% of the ships inspected were in compliance with the Regulations. The remaining 6% of ships had to take corrective action, effectively providing 100% compliance of inspected ships. For 2007, non-compliance dropped to 3.5% for ships entering the Great Lakes. While the Great Lakes inspections cover all ships, for 2007 Transport Canada also selectively targeted higher risk ships destined for Quebec ports and found a higher rate of non-compliance.
United States	A long-standing national ballast water management programme is supported through the Non-indigenous Aquatic Species Prevention and Control Act/National Invasive Species Act and delivered through ANSTF actions. The US works bilaterally with Canada on this issue (see above). Guidance for risk analysis and prioritisation of other major pathways is available and being further developed (see above).

Annex 5 REVIEW OF SELF-FINANCING MECHANISMS

Summary of unpublished report prepared for GloBallast in 2004 (Gollasch, S. 2004 (unpubl.). Review of Self-Financing Mechanisms for Ballast Water Management. Prepared for the Global Ballast Water Management Programme (Globallast) in 2004. Project No: GLO/99/G31/A/1G/19, Contract No: 2004-30. 37 pp.)

1. Overview of potential self-financing mechanisms

Self-financing mechanisms applicable at the national level

- **Mandatory insurance**

Many forms of mandatory insurance already exist to cover harmful impacts resulting from known risk actions e.g. driving cars. In 2000, the draft Biodiversity Strategy elaborated by Argentinean authorities proposes that mandatory insurance should be considered to cover the risks of escape, damage to third parties and the costs of eradication measures in the event of an alien species becoming established and causing harm (Shine et al 2000).

To generate funds for ballast water management, one option could be to require mandatory insurance for all relevant commercial resource users of the aquatic environment, with an insurance premium being independent from the company's revenue.

- **Deposit/performance Bonds**

Performance bonds are consistent with the “user pays” and “polluter pays principles”. They are comparatively easy to implement where the payment is a necessary step for issuing a business licence. This mechanism shifts the cost burden from the regulator/state to the resource user. In construction law, for example, a routine requirement provides for contractors to deposit a bond to ensure that up-front funds are available to pay the costs of completing and cleaning up the project if the contractor fails to do so. In the ballast water context, one option would be for shipping companies to place a bond to commit themselves to respect best practices of ballast water management. This bond could be refundable if it is recognised that the shipping company is efficiently respecting its engagements and complies with quality discharge standards laid down by the IMO Ballast Water Management Convention (Bonjean 2003).

A system of this type, where the user has to prove compliance to recover the bond, provides the user with a much greater incentive to comply with the requirements: in the absence of a bond-type system, it is uncertain whether non-compliance will be detected or sanctioned.

- **Ballast Water Levies or Taxes**

General taxation is the most common financial revenue source used to fund Government services. To fund ballast water management initiatives, a tax could be imposed related to the volume of ballast water onboard or on each individual ship when calling at a port. The tax could be regressive such as the VAT on products.

This tax could represent a fixed percentage for each measured volume (e.g. cubic meter) of ballast water carried on board ships. The tax could either address the total volume of ballast

water onboard or the total volume of ballast water being (intended to be) discharged in a certain region. However, it is important to note that the amount of money generated by the tax should be competitive with the price of other means of ballast water management, i.e. the better one manages its ballast water, the less one pays (assuming here that the best way of managing ballast water is treatment onboard or discharge to land-based reception facilities).

Another source of income would be the revenue recovered from the fines imposed on ships or shipping companies if they failed or persistently refused to comply with internationally-agreed ballast water discharge requirements. Companies that wish to participate and do not pay the non-compliance fee could be required to lodge an assurance bond.

Another option would be not to focus exclusively on ballast water when implementing a tax system. Alternatives could be to charge any commercial vessel, whether or not it carries ballast water, with a fee either according to the vessel size or cargo capacity and/or to charge a tax on importers of cargo according to the volume or weight of the goods being imported.

Another means to create funding could be applicable for passenger vessels, such as cruise liners. Passengers could be charged a levy when purchasing a ticket similar to the security fee applicable to purchasers of air-line tickets.

However, it should be noted that this kind of fees or taxes eventually will be paid by the consumers as industries likely will not pay from their own pocket, but will pass these costs on. The ultimate objective should be to impose a fee or levy that is not a disincentive for the trade and travel industry and at the same time produces sufficient funding to support e.g. inspection, monitoring, prevention, and rapid response efforts (Jenkins 2002). As an intermediate solution, shipping companies may seek exemption from a tax or levy under the condition when they exchange ballast water at sea.

- **Penalty System (“Polluter Pays Principle”)**

The Polluter Pays Principle involves direct charges on industries involved in global trade and travel to fund governmental responses, rather than relying on existing general funding and other sources detracted from other programmes. It has been shown to be an efficient basis for fund-raising tools for cleanup of oil spill pollution and could also work for “biological pollution” (i.e. IAS). However, the reactive approach is not helpful for biological invasions as a time lag usually occurs before a new species is detected and possibly demonstrated as harmful, which means that the specific “polluter” (e.g. the individual ship which introduced this new species) can almost certainly never be identified. This is why a more proactive approach is needed to use generally applicable tools, especially fees and taxation instruments (Jenkins 2002).

Even before the IMO Ballast Water Management Convention enters into force, countries may consider requiring ships calling at their ports to provide ballast water reporting forms and ask crews to enter all ballast water operations into a ballast water record book. A penalty system may apply to non-complying vessels, i.e. required ship reporting forms or keeping the ballast water record book are not correct or not complied with in a satisfactory manner.

- **Tradable Ballast Water Shares**

The system of tradable shares has been successfully applied in the USA for reducing air pollution. When applying this mechanism to ballast water discharges, the key mechanism would be to give all users shares for ballast water discharges and make those shares tradable, i.e. shipping companies with ballast water management systems onboard their ships can make profit from selling their shares.

However, applying this to ballast water discharges has a major downside as certain shareholders are permitted to release unmanaged ballast water and by doing so the risk of species invasions persists.

Self-financing Mechanisms applicable on subnational or port-level

In contrast to a nationwide approach, the European Bank for Reconstruction and Development has suggested that environmental financing may be less and less the task and responsibility of central governments. Instead, municipalities (e.g. ports) and industries may have to generate their own ways and means to finance measures to prevent or reduce negative impacts and improve the quality of the environment. This is especially valid in countries with an economy in transition as funding is especially critical here. An environmentally sustainable development should be financed increasingly from the profits of industry, from the locally generated revenues of concerned municipalities and industrial stakeholders (European Bank for Reconstruction and Development 1996).

However, it should be noted that much of the costs (i.e. all those apart from undertaking the management action) are aimed at supporting the regulation, which ultimately is a Government responsibility. It is the responsibility of government to oversee the behaviour of all industries and it cannot fully devolve the ultimate responsibility to check that industry is behaving as the community expects. As a result, local or port-level approaches may be seen as complementary measures to the instruments that government implements to protect the environment. They may be especially applicable in (marine) protected areas.

- **Environmental fees for tourism**

It should be considered to widen the scope and not to base self-financing options on shipping and related industries only. Where applicable, tourism may function as one additional source of revenue in a comparable way as e.g. in ski resorts where tourists are charged with an environment protection fee already.

Pristine aquatic environments, attracting tourists, may be seen as common goods to which everybody should be granted, at best, free and unconditional access. However, it is routine practice to ask visitors to pay fees when entering e.g. coastal marine parks or other protected areas. In many places around the world divers are already asked to pay a fee for using prime diving grounds. To date, these fees have mainly been used to cover maintenance and running costs but the revenue generated could also be used to avoid disturbance of such areas by introduced species. Revenues could also be spent on ballast water management programmes that, in turn, will reduce habitat or ecosystem changes caused by biological invaders.

The pioneer country in terms of a tourism-tax is Ecuador, which has implemented a tax to support financing the conservation of the Galapagos Islands. As a fund-raising tool for general environmental protection, the Government of Mauritius has already implemented an environmental protection fee in the tourism industry as a levy on hotel revenue (Macdonald et

al. 2002). Another good example is the Bonaire National Marine Park (BNMP) in the Netherlands Antilles, considered as a scuba diving paradise. Since 1992 the cost of basic park operations have been generated by a fee charged to divers (US \$10) which also covers expenses such as salaries, boats and vehicles, mooring maintenance, outreach materials, and law enforcement (fee revenue covers up to 80%-90% of BNMP's total budget: MPA News 2001).

Slightly increasing existing diver fees and broadening the scope to require other tourists to pay a fee may create some additional funding. Given that port regions are often located in close proximity to marine protected areas, this instrument of ecotourism support becomes of interest⁵⁴.

- **Fee for Aquaculture Activities and Fishing**

Mariculture farms are dependent on an unspoiled environment enabling maximum growth and recruitment of the target species. Similarly, fishermen depend on healthy environments for maximum catch. Biological invaders, such as food competitors or phytoplankton species causing harmful algal blooms, have already caused a loss of income in the aquaculture industry. It should be in the interest of these industries to avoid unintentional future species introductions. Therefore, it may be considered to pose a user fee on these stakeholders in order to help support the ballast water management that aims to protect them.

- **Fee for Marina Operators**

In the same way as other users, taxes or fees could be applied to operators of marinas.

2. Suggested tools for national governments and port managers for self-financing mechanisms for ballast water management programmes

Voluntary or mandatory instruments?

Industries may follow voluntary codes of practices to improve their image and reputation. Voluntary codes are incentives for all members to raise standards and eventually increase profits. These instruments are particularly useful for countries where the industry seeks to create a green image to attract their target customers. However, voluntary codes rely on motivation. Experience shows that, in general, shipping is reluctant to comply with voluntary guidelines. In the absence of a legal obligation for compliance with voluntary codes, some kind of pressure needs to be created on an industry not to be the non-compliant 'black sheep'. To solve this, one may consider combining voluntary ballast water management guidelines with a fee imposed on all incoming non-complying commercial vessels proportional to the volume of ballast water they carry or intend to discharge.

⁵⁴ The World Conservation Union (IUCN) has published a guidebook to assist managers of protected areas in identifying and securing appropriate and sustainable financing. The guide book "Financing Protected Areas: Guidelines for Protected Area Managers" provides a process for creating business and financial plans, and discusses mechanisms for generating revenues. The book is available at the associated IUCN website of <http://biodiversityeconomics.org/finance/topics-38-00.htm>

Another downside is that creating a demand for the industry to follow voluntary codes may take a long time. As biological invasions are an urgent and growing issue, it seems more appropriate to implement a mandatory instrument to increase compliance in a timely manner.

Incentives or penalty systems?

- **Incentives**

One incentive could be that ships that carry out proper ballast water management may be subject to lower port fees. As a result supportive stakeholders will save costs on port fees. However, a major problem persists: non-supportive stakeholders may continue without proper ballast water management by agreeing to pay higher port fees. One possible solution could be to set the port fees at a significant level with the hope of encouraging stakeholders to implement ballast water management measures to reduce the financial burden.

- **Penalty Systems**

In contrast, a penalty system may be established for non-compliance with ballast water management requirements. Penalty systems are easier to implement as compliance control is transparent and, compared to incentives, a time lag will usually be limited if the penalty fee is substantial.

- **Motivation**

Especially if applied on a voluntary basis, instruments to motivate the industry to comply need to be created. One key issue here will certainly be costs. Industries will be more likely to comply if the costs for non-compliance are high enough to be a real deterrent. A fee or tax system will likely result in compliance.

- **Creation of a label**

As in other codes of conduct (i.e. dolphin-friendly tuna fishing) a label may be created for importers using ships that apply ballast water management. If the importers are permitted to label their products accordingly, this might result in a well-designed scheme in a competitive advantage when marketing their products. This instrument may be particularly attractive for importers when a positive environmental image is an important sales factor.

- **Launching awards**

Annual awards could be created recognising businesses with high environmental standards, such as vessels being equipped with ballast water treatment systems, and by doing so providing them with a competitive marketing instrument.

3. Creating a Ballast Water Management Fund

Noting the experience gained in Australia, US and New Zealand, it is recommended that countries consider implementing a ballast water fee or tax applicable to all ships calling at their ports – regardless if they carry ballast water or intend to discharge ballast water in waters

of their jurisdiction. This approach seems to be the easiest in terms of compliance control – and is also capable of generating a considerable amount of funding.

It is recommended that the generated income should be paid into a Ballast Water Management Fund similar to many existing port fees levied for oil pollution response, ships' waste collection, provision of navigation aids, dredging etc. To prevent diversion of funds, the money generated should be deposited in a designated account.

When setting up a ballast water management fund, three financial phases may occur. Firstly, government funding is needed in the initial phase to allow proper planning of the initiative. Secondly, in an intermediate phase, government funding together with revenues from self-financing mechanisms may be used as co-financing resources for a ballast water management programme. The efforts and costs involved to gather funding may be under-estimated and co-financing is essential in these cases to guarantee the programme's success, continuation and financial sustainability. Thirdly, when the system is up and running, all costs should be covered by sums generated and at the same time the system should be profitable enough to allow funding for ballast water management programmes and related activities.

It is recommended to use the budget generated by self-financing mechanisms in a transparent way, enabling the donor stakeholder(s) to follow up how the money was spent. One way to achieve this could be to establish a fund control and supervision board, which includes representation from all relevant Governmental authorities and those who pay the fee. It may also be considered to release annual revenue reports.

4. Final observations

As funding is one of the key issues today in environmental protection initiatives, self-financing mechanisms are of vital importance. However, all additional costs placed on the burden of the shipping industry will likely result in increased costs for moving cargo with ships.

An awareness campaign may be useful to explain to the public that with little extra payment the rate of biological invasions can be reduced and by doing so safeguarding the (local) environment. Biological invasions are already understood as a major problem and this is why the author assumes the public is willing to accept little extra costs to avoid being exposed to the negative consequences caused by biological invaders. When informing the public, it should be considered to take a similar approach as when phasing out leaded fuel in the petrochemical industry.

As outlined above, there are different options that could be considered, however it is likely that they would be more effective in combination.

Countries may also consider implementing self-financing mechanisms to solve the lack of funding in other environmental protection initiatives. It should however be noted that external funding, no matter how it is generated, is not a solution for all fiscal difficulties.

It is hoped that the financial resources generated will facilitate ballast water management and research and eventually result in a reduction of unwanted ecological and economical impacts from unintentionally introduced species.