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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

**Standing Committee**

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**European Strategy**  
**on**  
**Invasive Alien Species**

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## INTRODUCTION

### *Why are invasive alien species a problem?*

The introduction of species beyond their natural range is rising sharply, due to increased transport, trade, travel and tourism and the unprecedented accessibility of goods resulting from globalisation. These activities provide vectors and pathways for live plants, animals and biological material to cross biogeographical barriers that would usually block their way.

Most alien species do not become invasive or cause problems in their new locations: many have considerable benefits to society e.g. in agriculture, horticulture, forestry and the pet industry. However, the subset of alien species that are invasive can have significant environmental, economic and public health impacts and present a significant risk of the wholesale homogenisation of ecosystems.

Invasive alien species (IAS) are now considered to be the second cause of global biodiversity loss after direct habitat destruction and have adverse environmental, economic and social impacts from the local level upwards. The European Community has recognized proliferation of IAS as an emerging issue<sup>1</sup>, noting that IAS introductions are one of the main recorded causes of biodiversity loss and cause serious damage to economy and health.<sup>2</sup>

### *IAS status and trends in Europe*

Introductions in Europe and the Mediterranean basin started in ancient times and in some cases, the impacts on native ecosystems occurred so long ago that we hardly perceive the effects on the biological diversity of the region. But although the history of biotic invasions in Europe is very ancient, the phenomenon has grown rapidly and enormously in recent times as a result of globalisation. Invasive alien species are now a major challenge for conservation in Europe in the new millennium.

Several endangered species in Europe are threatened by IAS (e.g. European mink by the American mink<sup>3</sup>; White-headed duck by the Ruddy duck<sup>4</sup>). The ongoing expansion of the American grey squirrel in north-west Italy is causing the progressive disappearance of the native red squirrel in all overlap areas and is considered a potential threat to forest ecosystems at a continental scale<sup>5</sup>. European forests have been profoundly altered by Dutch elm disease, caused by fungi introduced from Asia, that devastated elm tree populations in much of central Europe and Great Britain<sup>6</sup>.

European island biotas, hosting a major portion of the region's biodiversity, are particularly vulnerable to invasions because increased travel and trade break down the natural barriers that have protected and forged these biotas in million years. As a result, the number of invasive alien species on European islands is increasing exponentially and has led to an unprecedented extinction crisis of the islands' endemic species.

In addition to the impacts on biological diversity, IAS have also imposed huge losses on the European economy. Introduced pests and diseases affect agriculture and forestry and alien parasites (such as *Gyrodactylus salaris* and *Anguillicola crassus*) have led to dramatic decreases in fisheries sector incomes in several Nordic countries<sup>7</sup>. The muskrat and coypu, both introduced in the last century by the European fur industry, damage river banks through digging and have increased the risk and severity of floods in many central and southern European countries. The introduction of the American comb jelly

<sup>1</sup> COM(2001)162 final.

<sup>2</sup> European Council (Environment), Conclusions of 4 March 2002: 6592/02 (Presse 47 - G) 24.

<sup>3</sup> Sidorovich V, Kruuk H & Macdonald DW (1999) Body size, and interactions between European and American mink (*Mustela lutreola* and *M. vison*) in Eastern Europe. *Journal of Zoology* 248: 521-527

<sup>4</sup> Hughes B, Criado J, Dalany S, Gallo-Orsi U, Green A, Grussu M, Perennou C & Torres JA (1999) The status of the ruddy duck (*Oxyura jamaicensis*) in the western Palearctic: towards an action plan for eradication. Report by the Wildfowl & Wetlands Trust to the Council of Europe

<sup>5</sup> Bertolino S., P. Genovesi, 2003. Spread and attempted eradication of the grey squirrel (*Sciurus carolinensis*) in Italy, and consequences for the red squirrel (*Sciurus vulgaris*) in Eurasia. *Conservation Biology*, 19: 351-358.

<sup>6</sup> Schrader G., J.G. Unger (2000). Plant pests as alien invasive species: success and failure of European phytosanitary measures – a German view. *CBD Technical Series n°1*: 81-83.

<sup>7</sup> Weidema I (ed) (2000) *Introduced Species in the Nordic Countries*. Nord 2000:13. Nordic Council of Ministers, Copenhagen

(*Mnemiopsis leidyi*) into the Black and Azov Seas, caused the near extinction of the anchovy and sprat fisheries<sup>8</sup>.

### ***International action on invasive alien species***

Because IAS are a global problem, unilateral action by a few States can never be enough to prevent unwanted introductions. Cooperation at international, regional, transboundary and local levels is essential to develop compatible approaches to common problems.

Many international instruments or technical guidelines already deal with IAS issues from various perspectives: plant and animal health, biodiversity conservation, aquatic ecosystems, some sectoral pathways (a summary of key instruments is provided in the Annex to the Strategy). These binding or voluntary instruments provide the baseline from which countries and regional economic integration organizations such as the European Community develop policy, legal and management frameworks to address IAS issues.

In recent years, IAS have become a high-profile policy topic for the international community which has emphasised the need for cross-sectoral coordination between competent institutions and stakeholders at all levels. New programmes and tools have been developed, notably the Global Invasive Species Programme (GISP)<sup>9</sup> which actively promotes practical regional cooperation. GISP has published a Global Strategy on Invasive Alien Species and a Toolkit of Best Prevention and Management Practices<sup>10</sup>.

The Convention on Biological Diversity (CBD) has identified IAS as a major cross-cutting theme. This global treaty requires Parties “as far as possible and as appropriate, (to) prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species” (Article 8(h)). In 2002, the CBD Conference of the Parties adopted a specific Decision and Guiding Principles<sup>11</sup> to help Parties implement this requirement. The Decision urges Parties, other governments and relevant organizations to prioritise the development of IAS strategies and action plans at national and regional level and to promote and implement the Guiding Principles. These set out a “Three-stage hierarchical approach” as the basis for all action on IAS:

- prevention of IAS introductions between and within States is generally far more cost-effective and environmentally desirable than measures taken after IAS introduction and establishment;
- if an IAS has been introduced, early detection and rapid action are crucial to prevent its establishment: the preferred response is often to eradicate the organisms as soon as possible;
- where eradication is not feasible or resources are not available, containment and long-term control measures should be implemented (Guiding Principle 2).

However, it is important to go further than this basically defensive approach and to include in conservation policies restoration measures for species, natural habitats and ecosystems that have been affected by biological invasions.

### ***Rationale for a European Strategy on Invasive Alien Species***

Europe is a major trading bloc with many contiguous countries and shared borders and highly-developed free trade arrangements. Huge volumes of species are translocated, intentionally and unintentionally, in the course of routine sectoral activities between and within countries. Potentially

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<sup>8</sup> Ivanov V.P., Kamakin A.M., Ushvtzev V.B., Shiganova T. A., Zhukova O., Aladin N., Wilson S.I, Harbison R and Dumont H.J. (2000) Invasion of the Caspian Sea by the Comb Jellyfish *Mnemiopsis leidyi* (Ctenophora). *Biological Invasions* 2: 255-258.

<sup>9</sup> GISP is an international network of volunteers from various backgrounds: scientists, economists, lawyers, policy makers, activists and others from all sectors and constituencies affected by IAS. It has three partners: IUCN-The World Conservation Union; the intergovernmental bioscience organisation CAB International; and the Scientific Committee on Problems of the Environment (SCOPE).

<sup>10</sup> McNeely et al (2001) *Global Strategy on Invasive Alien Species*. IUCN; Wittenberg and Cock (2001) *Invasive Alien Species: A Toolkit of Best Prevention and Management Practices*. GISP/CAB International.

<sup>11</sup> Decision VI/23 on *Alien Species that threaten ecosystems, habitats and species* (COPVI, The Hague, April 2002) to which are annexed the *Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that threaten Ecosystems, Habitats or Species*.

invasive alien species may easily reach neighbouring States or ecologically different parts of the same State.

The need for a regional approach has long been recognised by European institutions such as the Convention on the Conservation of European Wildlife and Natural Resources 1979 (Bern Convention), the European and Mediterranean Plant Protection Organisation (EPPO) and the European Community, which have all developed legal and technical references for different aspects of IAS (see Annex to the Strategy).

The Bern Convention, to which the European Community and 38 European states are party, requires Parties “to strictly control the introduction of native species” (Article 11.2.b). Since 1984, a range of actions have been initiated for more effective implementation of this article. These include the adoption of Standing Committee recommendations on general IAS issues and specific problems, production of technical reports, organisation of workshops and establishment of an IAS Experts’ Group.

Despite these and other efforts, Europe now lags behind other regions that have developed strategic frameworks to address IAS in a holistic way. Whilst Europe’s complex characteristics can make it harder to develop and implement common trade and movement policies, this should not be used to postpone decisive and balanced action. The common trade and movement policy for the plant health sector developed under EPPO shows that coordination and cooperation is feasible.

The impacts of many past invasions could have been reduced if European countries had uniformly applied appropriate best practices and taken rapid action to eradicate introduced species following detection. Most biological invasions now threatening Europe might have been prevented by greater awareness of IAS issues and a stronger commitment to address them.

Current inaction in many - though not all - countries and sectors may threaten the region’s biodiversity, public health and economic interests. In line with international policy, it is now essential to develop efficient cooperation at national and regional level to prevent or minimise adverse impacts of IAS.

The Bern Convention initiative for a European Strategy on Invasive Alien Species, in collaboration with the European Section of the IUCN Invasive Species Specialist Group, began in 2000. It has been welcomed by the Second Intergovernmental Conference on Biodiversity in Europe in Budapest and the Convention on Biological Diversity.

### ***Challenges and opportunities for the Strategy***

Many European countries face similar constraints in their IAS efforts. Depending on the country, these may include:

- low public awareness and opposition to government intervention;
- shortage and inaccessibility of scientific information (for species identification, risk analysis, detection and mitigation techniques etc.);
- absence of clear and agreed priorities for action;
- ease of introduction and movement (e.g. through the post), inadequate inspection and quarantine;
- inadequate monitoring capacity;
- lack of effective emergency response measures;
- outdated or inadequate legislation;
- poor coordination between government agencies, countries and other stakeholders.

The Strategy addresses these constraints. It aims to facilitate implementation of international commitments and best practice and to support development of realistic policies, measures and targets. Priority actions are proposed that are key in terms of time and feasibility of implementation.

The Strategy recognizes that Parties’ existing legal obligations may constrain or influence the measures which can be taken, particularly with regard to regulation of trade-related activities.

***Who is the Strategy for?***

The Strategy is primarily targeted at governments of Contracting Parties to the Bern Convention and of other European countries. It is addressed not only to nature conservation agencies but also to all sectoral agencies with responsibility for activities relevant to IAS prevention or management.

The Strategy is also addressed to the Bern Convention Secretariat and strongly supports closer and sustained coordination and cooperation with relevant European and international organisations.

The Strategy also seeks to engage stakeholders involved in the movement, use and control of potentially invasive alien species (industry and trade, transporters, retailers, resource managers, the public etc.) and to build on the expertise and commitment of competent non-governmental organisations and research institutes. Many of the proposed key actions call for joint or complementary initiatives by private and public stakeholders.

**ABBREVIATIONS**

Bern Convention	Convention on the Conservation of European Wildlife and Natural Resources
CBD	Convention on Biological Diversity
CMS	Convention on the Conservation of Migratory Species of Wild Animals
EPPO	European and Mediterranean Plant Protection Organisation
GISP	Global Invasive Species Programme
Guiding Principles	Guiding Principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species (annexed to Decision VI/23 adopted by the Conference of the Parties to the CBD, The Hague, April 2002)
IAS	Invasive alien species
IPPC	International Plant Protection Convention 1951, revised 1997
IMO	International Maritime Organisation
ISSG	IUCN Species Survival Commission's Invasive Species Specialist Group
IUCN	World Conservation Union
NGO	Non-governmental organisation
Ramsar	Convention on Wetlands of International Importance especially as Waterfowl Habitat
OIE	International Epizootics Organisation (Organisation internationale des epizooties)
WTO-SPS	World Trade Organisation Agreement on Sanitary and Phytosanitary Measures (1995)

# STRATEGY

## **Objectives**

The Strategy promotes the development and implementation of coordinated measures and cooperative efforts throughout Europe to prevent or minimise adverse impacts of invasive alien species (IAS) on Europe's biodiversity as well as its economy and human health and wellbeing.

The Strategy provides guidance to help Bern Convention Parties in their efforts to:

- rapidly increase awareness and information on IAS issues and ways to tackle them (§1-2);
- strengthen national and regional capacity and cooperation to deal with IAS issues (§3-4)
- prevent the introduction of new invasive alien species into and within Europe (§5) and support rapid response to detected incursions (§6);
- reduce the adverse impact of existing invasive alien species (§7);
- recover species and restore natural habitats and ecosystems that have been adversely affected by biological invasions, where feasible and desirable (§8); and
- identify and prioritise key actions to be implemented at the national and regional level.

## **Scope**

The Strategy covers:

- terrestrial, freshwater and marine environments under the sovereignty or jurisdiction of Bern Convention Parties. It also provides guidance for activities carried out in areas beyond national jurisdiction (e.g. shipping);
- alien species (as defined by the Conference of the Parties to the Convention on Biological Diversity: see Box 1) in all taxonomic groups, including viruses, prions, bacteria, feral animals of domestic species (cats, dogs, goats, etc.) and alien biological control agents.

It does not apply to genetically modified organisms<sup>12</sup>.

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<sup>12</sup> The Strategy does not cover genetically modified organisms/living modified organisms, although some of these have the potential to become invasive alien species, because these are separately regulated under European Community legislation and by several other European states. However, there may be scope for countries to coordinate activities relevant to both IAS and genetically modified organisms (e.g. risk analysis, contained use, field trials, control of release, monitoring).

## **Terminology**

The Strategy uses the definitions agreed by the Conference of the Parties to the Convention on Biological Diversity for the purposes of the Guiding Principles (see Box 1).

For plant health and animal health issues, internationally-agreed terminology developed by competent organisations (IPPC, OIE) is relevant.

For the purposes of this Strategy:

“regional” refers to the whole of Europe;

“subregional” refers to an area (land, sea or freshwater) shared by two or more neighbouring States.

### **BOX 1**

#### **GUIDING PRINCIPLES FOR THE PREVENTION, INTRODUCTION AND MITIGATION OF IMPACTS OF ALIEN SPECIES THAT THREATEN ECOSYSTEMS, HABITATS OR SPECIES**

(annexed to CBD Decision VI/23)

*alien species*: a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce.

*invasive alien species*: an alien species whose introduction and/or spread threaten biological diversity.

*introduction*: the movement by human agency, indirect or direct, of an alien species outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction.

*intentional introduction*: the deliberate movement and/or release by humans of an alien species outside its natural range.

*unintentional introduction*: all other introductions which are not intentional.

*establishment*: the process of an alien species in a new habitat successfully producing viable offspring with the likelihood of continued survival

*risk analysis*: (1) assessment of the consequences of the introduction and of the likelihood of establishment of an alien species using science-based information (i.e. risk assessment), and (2) identification of measures that can be implemented to reduce or manage these risks (i.e., risk management), taking into account socio-economic and cultural considerations.

## **1. Building awareness and support**

Guiding Principle 6: Education and public awareness

In Europe, the public, decision-makers and many academics often have limited understanding of the different threats posed by IAS. This can make it hard to mobilise relevant agencies and other stakeholders, particularly for introductions that do not affect human health or major economic interests. Raising awareness and commitment is essential to develop shared responsibility and to encourage private efforts and voluntary compliance.

### **Aim**

Europe's public, decision-makers, scientists and other stakeholders have high awareness of the benefits of IAS prevention and mitigation for native biodiversity as well as for the economy and human wellbeing.

### **Key actions**

- 1.1 Set up vigorous information and education programmes for different target audiences (general public, schools, local authorities, government agencies etc.).
- 1.2 Work with key stakeholders (Box 2) to produce and disseminate information and guidance on best practices for those using or affected by IAS.
- 1.3 Support the holding of workshops and conferences on IAS.

### **BOX 2**

#### **EXAMPLES OF KEY STAKEHOLDERS**

Customs and quarantine services, protected area managers, wildlife trade personnel, other government departments/agencies

Professional associations for tourism/travel, bird breeding, hunting, fishing, forestry, horticulture, pet trade, botanic gardens

Universities and scientific and research institutes

Non-governmental organisations

## 2. Collecting, managing and sharing information

National and regional capacity to identify, prevent and mitigate IAS threats depends on accurate and updated information that is easily accessible.

Information-sharing between countries is critical: answers to a problem may be available elsewhere in Europe or the world. There is currently no pan-European information mechanism on IAS as such, although important resources exist for some taxonomic groups (e.g. the EPPO/EC plant health system). Information gaps (biologic, taxonomic, geographic) can make it harder to determine priorities and take effective prevention and response measures.

### 2.1. *Species inventories*

Guiding Principle 8.1: Exchange of information

#### **Aim**

A clear understanding of alien species recorded and established on national territory is developed to help identify species that are invasive, set priorities for research, prevention, monitoring and mitigation and rapidly detect new arrivals not already present in the country or part of the country (see Box 3).

#### **Key actions**

- 2.1.1 Develop a national inventory of alien species in all taxonomic groups recorded in the wild in the national territory and regularly update it to include newly-detected alien species.
- 2.1.2 Create and regularly update alien species pages in the national biodiversity Clearing House Mechanism or equivalent and link these to relevant IAS sites to ensure rapid dissemination of information.

#### **BOX 3**

##### **POSSIBLE STEPS TO DEVELOP A NATIONAL INVENTORY AND SET PRIORITIES**

Mobilise existing expertise for species inventory and review, based on a partnership approach (universities, research institutes, botanic gardens, NGOs, other stakeholders)

Start with known IAS and species for which information is already available. Link and integrate existing databases

Based on existing information and experience, make a preliminary assessment to identify priority species and areas for action

Include potentially invasive alien species, which are not yet introduced but have a high likelihood of introduction

Where available, include information on:

- date of introduction
- means of arrival
- range
- population size
- impacts recorded
- level of threat posed
- other data relevant for risk analysis
- prevention and mitigation methods

## **2.2. Research and monitoring**

Guiding Principles 5: Research and monitoring

Guiding Principle 9.d: Cooperation including capacity building

### **Aims**

The ecology, distribution, patterns of spread and response to management of IAS are better understood.

Capacity to predict the consequences of alien species introductions is strengthened.

Critical information is available to support IAS prevention and mitigation programmes and provide a stronger scientific basis for decision-making and allocation of resources.

### **Key actions**

- 2.2.1 Support research on priority topics (see Box 4).
- 2.2.2 Review existing research and monitoring programmes to identify gaps, areas for development and opportunities for more effective collaboration within Europe.
- 2.2.3 As necessary, establish or expand monitoring systems for pathways, vectors and vulnerable points (see §6).

### **BOX 4**

#### **EXAMPLES OF RESEARCH PRIORITIES**

Identification and risk analysis of different pathways and vectors for introductions, including methods to predict potential invasiveness of alien species prior to introduction (e.g. invasiveness in other regions with similar conditions)

Techniques for rapid detection of newly-arrived alien species

Patterns of spread of alien species with evidence of invasiveness or evidence of high potential for invasiveness.

Basic research on biology, ecology and epidemiology of alien species

Ecosystem vulnerability or resilience.

Assessment of adverse impacts of IAS on native biological and genetic diversity

Evaluation of economic and public health implications of IAS

Development and evaluation of more effective prevention, mitigation and restoration measures

### 2.3. Regional exchange of information

Guiding Principle 4.3: The role of States

Guiding Principle 8.1: Exchange of information

Guiding Principle 9.a: Cooperation, including capacity-building

#### Aims

Effective systems are in place to share IAS information with neighbouring countries, trading partners and regions with similar ecosystems to facilitate identification, early warning and coordination of prevention and mitigation measures.

Information systems can locate, document and provide electronic access to sources of information; provide quality control and ensure controlled vocabularies; and establish data protocols or standards where necessary.

#### Key actions

- 2.3.1 Identify and assist lead organisations (e.g. IUCN Invasive Species Specialist Group, European Topic Centre for Nature Conservation) to develop an interlinked European information network on IAS, using existing information resources and capacity as far as possible (see Box 5).
- 2.3.2 Draw up and link registers of European experts and institutions that can advise on taxonomy and other technical IAS issues
- 2.3.3 Promote regular meetings and workshops to update information on biology, ecology, epidemiology, methods of mitigation (see also §1.3).

#### BOX 5

##### POSSIBLE STEPS TOWARDS A EUROPEAN INFORMATION NETWORK

- National focal points work with lead organisations to establish regional information objectives and procedures
- National data is integrated into or linked to existing European inventories (e.g. EPPO/EC plant health system; Nordic-Baltic Invasive Species Informational Network; European Research Network on Aquatic Invasive Species)
- As soon as practicable, regional information mechanisms are linked to the global network of IAS databases currently under development
- Where necessary, new information tools are created (e.g. for specific taxonomic groups or subregions)
- Regional/subregional fast information systems facilitate communication
- Common formats are developed for data on species, including biology, taxonomy and harmful effects

### **3. Strengthening national policy, legal and institutional frameworks**

Invasive alien species - as a cross-cutting issue – concern many social, economic and environmental interests, including trade, health, agriculture, forestry, horticulture, aquaculture, tourism and recreation. In most countries, several departments and agencies have responsibility for some aspect of IAS prevention and management and several different laws may be relevant (e.g. plant and animal health and quarantine; hunting and fishing; nature conservation etc.).

The result can be a complex situation where responsibilities, policies and laws are not very clear or even compatible. This can also hamper efficient communication within the region.

It is therefore crucial that Parties initiate a coordinated review process of their institutional and legal frameworks and their strategies, policies and approaches relevant to IAS issues.

In several European countries, responsibility for environmental policy and nature conservation issues is decentralised to subnational authorities. The Strategy recommends that IAS issues are addressed (or at least coordinated) at the national level, but recognises that each country will need to choose an appropriate structure or network for this purpose.

### **3.1. Leadership and coordination**

#### **Aims**

Clear leadership or appropriate coordination is in place for IAS prevention and mitigation, involving relevant sectors and different levels of government as appropriate.

Efficient use is made of existing structures, procedures and expertise relevant to trade, movement, holding and management of potential IAS (e.g. national plant protection organisations, customs and quarantine services, CITES authorities, veterinary authorities etc.).

#### **Key actions**

- 3.1.1 Establish a national authority (or equivalent network or mechanism) to lead and coordinate the efforts of responsible agencies and subnational governments dealing with IAS (see Box 6).
- 3.1.2 Identify a focal point in relevant departments and agencies to coordinate IAS-related matters and liaise with the authority/network and other departments.
- 3.1.3 Work closely with counterpart national focal points for relevant instruments and organisations (CBD, Ramsar, CMS, UNESCO Man and the Biosphere Programme, IMO, IPPC/EPPO etc.) in the development and implementation of national IAS strategies and management responses.
- 3.1.4 Make available the contact details of the authority/network and IAS focal points to the public, national sectoral organisations, Bern Convention Secretariat and other Parties.

#### **BOX 6**

##### **POSSIBLE ROLES OF THE NATIONAL AUTHORITY OR NETWORK**

Lead or coordinate the policy and legal review process (§3.4-3.8)

Lead or coordinate the development and implementation of a national strategy/action plan on invasive alien species (§3.9)

Coordinate input from different agencies to national and European policy making and programmes

Consult with competent scientific authorities to obtain technical advice on decision-making related to IAS

### ***3.2. Policy and legal review and development***

#### **Aim**

IAS prevention, eradication and control are fully incorporated in national/subnational legislation and in biodiversity and other relevant policies, strategies and action plans, consistent with international law.

#### **Key actions**

- 3.2.1 Carry out a national review of existing measures and non-statutory procedures to manage trade, movement, holding, establishment and management of IAS or potential IAS (see Box 7).
- 3.2.2 Progressively adapt or introduce measures and procedures recommended by the review process.
- 3.2.3 Promote use of terminology consistent with internationally-agreed definitions (see Terminology), ensuring that the terms “alien” or ”native” are defined with reference to ecological, not political boundaries (see also 4.5).

#### **BOX 7**

##### **APPROPRIATE OBJECTIVES FOR A REVIEW PROCESS**

- produce practical and proportionate recommendations
- set priorities
- identify and involve relevant stakeholders
- identify areas where management capacity and training need to be improved
- identify appropriate organisations to take forward any measures

All proposed policies and measures should be assessed for likely compliance with international trade rules, taking particular account of national obligations under the WTO Agreement on Sanitary and Phytosanitary Measures. Parties need to avoid taking measures which amount to arbitrary or unjustified, discrimination or a disguised restriction on trade.

### 3.3. *Strategies and action plans*

#### **Aim**

Parties have specific strategies and action plans in place to address all aspects of IAS prevention and mitigation.

#### **Key actions**

- 3.3.1 Develop an IAS strategy, based on consultation with sectoral stakeholders, scientific organisations, protected area specialists, NGOs and the general public and taking full account of existing sectoral strategies or procedures (see Box 8).
- 3.3.2 Develop action plans to address specific problems identified e.g. for priority IAS, pathways, vulnerable sites, ecosystems, etc.
- 3.3.3 Recognise that terrestrial IAS can threaten and affect the ecological character of wetlands (e.g. lowering of water tables, alteration of water flow patterns) and ensure that appropriate measures to prevent or control such invasions are in place.

#### **BOX 8**

##### **POSSIBLE COMPONENTS OF A NATIONAL STRATEGY ON INVASIVE ALIEN SPECIES**

Status and trends of IAS in Europe and the rest of the world

Status and trends of IAS in the country: identification of specific problems

Main pathways, vectors and particular risks

Details of national IAS authority/network

Roles and responsibilities of key agencies and partners

Relevant legislation and non-statutory measures: proposals for improved prevention and management

Outline of criteria for risk analysis, management planning and mitigation

Needs related to monitoring, training, capacity building and funding

Where appropriate, specific measures or policies for isolated and biodiversity-rich ecosystems (e.g. islands and archipelagos, protected areas) (see §5.5)

Recovery of species/ecosystems affected by IAS and ways to promote use of native species (see §8)

Priority list of actions, timelines and lead partners for implementation, with realistic targets to be achieved (see e.g. § 7.2)

### 3.4. Key approaches and tools

Guiding Principle 1: Precautionary approach

Guiding Principle 2: Three-stage hierarchical approach

Guiding Principle 3: Ecosystem approach

Strategies, legal frameworks and measures need to follow and support the key approaches supported by the Guiding Principles. These approaches and tools are closely interlinked (see Box 9).

#### BOX 9

##### APPLICATION OF KEY APPROACHES AND TOOLS TO INVASIVE ALIEN SPECIES ISSUES

Predicting the potential invasiveness and impacts of an alien species requires an assessment of its likelihood of arrival, ability to survive, lag time before it becomes invasive, speed and extent of invasion, ease and cost of control and possible effects on a wide range of resources and values. Although the epidemiology of biological invasions in some taxonomic groups is now better understood, there are still no general rules applicable across all groups or even within the groups studied in detail. Species frequently change their behaviour when they invade a new habitat, so that studies of their ecology in their home country may not provide fully reliable indications of their behaviour in a new location.

Given the unpredictability of IAS pathways and impacts on biodiversity, CBD Guiding Principle 1 provides that (1) efforts to identify and prevent unintentional introductions, (2) decisions concerning intentional introductions and (3) consideration of mitigation measures should all be based on the **precautionary approach**, in particular with reference to risk analysis. Where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat.

**Risk analysis** involves making an assessment, using science-based information, of the actual risks related to introductions. Using this assessment, management decisions to reduce or manage these risks can be made in a thorough, consistent, logical and transparent way. Detailed guidance for risk analysis is already available for some sectors, such as plants/plant health, while for other sectors the systems still have to be established and adapted (e.g. pet trade).

**Environmental impact assessment (EIA)** is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. To be effective, EIA should be fully incorporated into existing legal planning processes and not be seen as an 'add-on' process.

Draft Guidelines annexed to CBD Decision VI/7 ((Identification, monitoring, indicators and assessment) suggest that an EIA could be mandatory for activities that indirectly affect legally protected species, e.g. by reducing its habitat, altering its habitat in such a manner that its survival is threatened, introducing predators, competitors or parasites of protected species, alien species or GMOs. The need for/level of an EIA should be determined for activities where biodiversity impacts are possible or likely but EIA is not necessarily triggered by law: for impacts at the species level, this might include all introductions of non-indigenous species. Priorities and targets defined in the national biodiversity/IAS strategy and action plan process can provide guidance for developing EIA screening criteria that take account of biodiversity impacts.

Potential adverse effects of an introduction to the environment, and the probability of the occurrence of these effects, can be assessed by analysing the intrinsic characteristics of the species, ecological relationships in its current range, the similarities between its existing range and the potential area for introduction, and any past history of the species (or a similar relative) as an IAS.

**Strategic environmental assessment (SEA)** is the formalised, systematic and comprehensive process of identifying and evaluating the environmental consequences of proposed policies, plans or programmes to ensure that they are fully included and appropriately addressed at the earliest possible stage of decision-making on a par with economic and social considerations (CBD Decision VI/7). It covers a wider range of activities or a wider area, often over a longer time span, than EIA. SEA can help streamline the incorporation of biodiversity concerns into the decision-making process and make project-level EIA more effective.

With regard to biodiversity considerations, the **ecosystem approach** as described in CBD Decision V/6 is an appropriate framework for the assessment of planned action and policies. The proper temporal and spatial scales of the problems should be determined as well as the functions of biodiversity and their tangible and intangible values for humans that could be affected by the proposed project or policy, the type of adaptive mitigation measures and the need for the participation of stakeholders in decision-making (see §4.3 and §8).

**Aim**

National and regional frameworks support the application of key approaches and tools for IAS prevention and mitigation and the development of improved criteria, techniques and capacity for their effective use.

**Key actions**

- 3.4.1 Provide for the application of the precautionary approach to IAS decision-making, consistent with international law, within a risk analysis framework that takes account of possible impacts on native biodiversity and ecosystem function.
- 3.4.2 Take steps to incorporate IAS risk analysis methodologies into EIAs and SEAs, as appropriate and relevant, and consider the use of EIA/SEA for activities and programmes that provide pathways for the unintentional introduction of potential IAS (see §5.3).
- 3.4.3 Promote use of the ecosystem approach as an appropriate framework for the assessment of planned actions and policies relevant to IAS.
- 3.4.4 Contribute to regional cooperation for development or compilation of criteria and indicators to deal with uncertainty on IAS issues, including criteria on using risk assessment techniques, precautionary approach and adaptive management.
- 3.4.5 Involve relevant stakeholders (e.g. botanic gardens for the horticultural trade) in the development of guidelines for analysis and assessment and in relevant assessment processes, including decision-making.

### **3.5.Ancient introductions**

The very ancient history of introductions in Europe makes this region unique, both because alien species play an important role in our culture, landscapes and present ecosystems and because Europeans are more used to coexisting with introduced animals and plants than inhabitants of most other regions of the world.

#### **Aim**

Encourage conservation strategies in Europe to give priority to conservation of endemic and native species. No conservation efforts should be devoted to the protection of invasive alien species or of alien species introduced in recent historic times.

Species introduced in ancient historic times shall be examined on a case by case basis, taking into account the approach proposed in Box 10.

#### **Key action**

- 3.5.1 Review species lists (national/Bern Convention) and existing conservation strategies to ensure that no invasive (or potentially invasive) alien species are listed for legal protection.

#### **BOX 10**

##### **PROPOSED APPROACH TO SPECIES INTRODUCED IN ANCIENT HISTORIC TIMES**

Conservation of species introduced in ancient historic times shall be examined on a case by case basis, taking into account the impacts caused, and the historical and cultural value.

Conservation of these species may be acceptable if:

- 1) recovery of the original ecosystems is no longer feasible;
- 2) their conservation does not conflict with the primary aim of conserving the native biological diversity (impact assessment before protection).

For these species, it is recommended that range expansion is allowed or promoted only in contiguous areas after an impact assessment and that translocation to isolated areas outside their present range is avoided.

As far as eradication is concerned, priority needs to be given to tackling new and relatively recent introductions of IAS, rather than concentrating resources on ancient introductions. Eradicating species introduced in ancient historic times may be considered where it is feasible to restore the original ecosystem and where such restoration is a conservation priority (e.g. islands containing important bird populations which are affected by introduced rats).

### ***3.6. Compliance and enforcement***

Where IAS cause damage, conventional approaches to liability are usually difficult to apply. This is partly because of difficulties in proving causation and/or fault (time lag, scientific uncertainty, number of users involved) and partly because many existing IAS were introduced to the environment in the past by businesses operating under legal standards and permits.

#### **Aim**

A mix of voluntary and regulatory measures is developed to underpin and enforce prevention policies, based on consultation with relevant sectors and industry.

Innovative measures for greater accountability are in place for individuals and entities responsible for the introduction and/or spread of invasive alien species (see Box 11).

#### **Key actions**

- 3.6.1 Review effectiveness of existing voluntary approaches with relevant stakeholders: where necessary, promote the development of new or stronger measures to address specific risks (see §5.3).
- 3.6.2 Establish criminal/administrative sanctions and appropriate penalties for illegal introductions, movement or holding of IAS, consistent with national policy or legislation.
- 3.6.3 Consider measures to allocate the costs of control measures and biodiversity restoration to the individual or entity responsible for the introduction of an IAS in breach of national laws or regulations.

#### **BOX 11**

##### **POSSIBLE OPTIONS FOR GREATER ACCOUNTABILITY**

Explore use of economic instruments to generate sustainable funding for IAS prevention, monitoring and mitigation (e.g. guarantee systems, insurance or levies involving professional breeders or traders, pathway levies for transport bodies etc.).

Explore techniques to promote application of voluntary codes and practices. At the trader/producer level, these might include clearer legal standards (e.g. a 'duty of care' to follow agreed industry codes) and/or labelling schemes linked to observance of relevant codes).

## **4. Regional cooperation and responsibility**

### **4.1. Cooperation between Bern Convention Parties**

Guiding Principle 4.1 and 4.2: Role of States

Guiding Principle 8.2: Exchange of information

Guiding Principle 9.a: Cooperation, including capacity-building

Cooperation within Europe - characterised by a shared coastline, transboundary mountain ranges and protected areas and international watercourses - is critical, because species introduced into the territory of one State can easily spread to neighbouring States or subregions. Cooperation with non-European trading partners is also particularly important.

#### **Aim**

States recognise the risk that activities within their jurisdiction or control may pose to other States as a potential source of IAS and take appropriate individual and cooperative actions to minimise that risk.

#### **Key actions**

- 4.1.1 Use existing mechanisms for inter-State information exchange, notification and consultation on IAS (e.g. EPPO, OIE, CBD, Bern Convention) and establish new mechanisms where necessary (also see §2.3.1).
- 4.1.2 Where not already in place, develop procedures to provide any available information on a species' invasive behaviour (or the invasive potential of a species) to neighbouring States, trading partners and countries with similar ecosystems and histories of invasion (see Box 12).
- 4.1.3 Provide all relevant information on the State's specific import requirements for alien species, particularly those already identified as invasive, and make this information available to other States.

#### **BOX 12**

##### **EXAMPLES OF ACTIVITIES FOR WHICH INFORMATION SHOULD BE PROVIDED**

Intentional transfer to another State of potentially invasive alien species, even if it is harmless in the State of origin (e.g.: export of wild boar, hare, etc., to States outside the natural range of these species, for release into the wild)

Intentional introduction of an alien species into national territory if there is a risk of that species subsequently spreading (with or without a human vector) into another State and becoming invasive

Activities that may lead to unintentional introductions, even where the introduced species is harmless in the State of origin

## ***4.2. Role of the Bern Convention***

The Bern Convention is well-placed to promote national and European cooperation on IAS issues. It provides a regional framework for implementation of the CBD in Europe and brings together the majority of European States and many NGOs specialised in biodiversity conservation. It has given particular attention to biotic invasions over the last twenty years and adopted a wide range of policy and technical recommendations.

### **Aim**

The Bern Convention continues its engagement with IAS issues by facilitating national implementation of this Strategy and strengthening cooperation with relevant regional and global institutions.

### **Key actions**

- 4.2.1 Continue and support the work of the Convention's IAS Expert Group (see Box 13).
- 4.2.2 Work with the European Commission and other key regional and global institutions to promote the further development of effective IAS measures for the European Union and Euro-Mediterranean Region, in particular concerning transboundary movement of potential IAS.
- 4.2.3 Contribute at the European level to developing a common interpretation of IAS terms and concepts.
- 4.2.4 Review the application of this Strategy after two years and report to the Standing Committee on the possible need for further actions in the future.

### **BOX 13**

#### **POSSIBLE ACTIVITIES OF THE BERN CONVENTION IAS EXPERT GROUP**

Support the Bern Convention Secretariat in reviewing the implementation of this Strategy.

Contribute to the development of technical codes of practice to reduce IAS impacts on European biodiversity, working with relevant sectors and organisations.

Organise seminars on specific IAS issues, taking account of the need for capacity-building in some Parties and subregions.

Continue technical assistance on methodology for IAS eradication

Facilitate exchange of information between national authorities/networks and focal points, NPPOs, scientific authorities for different taxonomic groups and ecosystems, research institutes and NGOs.

Continue the cooperation with and support the work of the European section of the IUCN Invasive Species Specialist Group

Organise a major European forum for key organisations involved in IAS issues, sectoral bodies and other stakeholders to raise awareness and strengthen cooperation throughout Europe

### **4.3. Subregional cooperation**

Guiding principle 3: Ecosystem approach

Guiding principle 9: Cooperation, including capacity-building

Although continental Europe is characterised by territorial continuity, there are marked biogeographical differences in terms of species, subspecies, populations and ecosystems. Many important habitat and ecosystem types (e.g. polar deserts, tundra, temperate forests, steppes, semi-deserts, alpine ecosystems, marine and coastal ecosystems, freshwater ecosystems, wetlands, etc.) would benefit from IAS planning and management consistent with the ecosystem approach as defined by CBD Decision V/6.

Because many of these areas straddle national boundaries, transboundary and subregional cooperation is a priority.

#### **Aim**

Use of a biogeographic scale is promoted when defining priorities and implementing measures for IAS prevention, monitoring and mitigation.

States sharing common problems in a subregion, including States not party to the Bern Convention, are encouraged to develop and participate in relevant programmes.

#### **Key actions**

- 4.3.1 Promote dialogue between countries, sectors and key institutions in the same subregion, where not already established, to harmonise strategic direction and develop common approaches to shared IAS pathways and problems.
- 4.3.2 Develop and implement subregional action plans and initiatives for priority IAS (see Box 14).
- 4.3.3 Make use of existing subregional expertise and networks (International Commission for Scientific Exploration of the Mediterranean Sea; Nordic-Baltic Invasive Species Informational Network; Regional Biological Invasions Centre hosting the virtual European Research Network on Aquatic Invasive Species; EPPO etc.).

#### **BOX 14**

##### **EXAMPLES OF POSSIBLE SUB-REGIONAL INITIATIVES**

- Action plan for the Grey squirrel in the Alpine region
- Mediterranean programme to deal with biological invasions on islands
- Baltic policy on the treatment of ballast water
- Management plan for the American mink in Nordic countries

## **5 Prevention**

Guiding principle 2.1-2: Three-stage hierarchical approach

Prevention - between and within States - is generally far more cost-effective and environmentally desirable than measures taken following the introduction and establishment of an invasive alien species. It should be given priority as the first line of defence.

Europe particularly needs common approaches to prevention because of the number of contiguous countries, the high volume of inter- and intra-continental trade and transport and its extensive free trade arrangements which can facilitate transboundary movements of IAS. Common prevention measures are already in place in some sectors (e.g. plant and animal health) but need to be developed for other activities that can lead to unwanted introductions.

For aquatic ecosystems, the emphasis on prevention is critical. Alien species can be particularly hard to detect in aquatic systems and can disperse rapidly, making eradication or control extremely difficult. For European countries with long coastlines and/or with islands, marine IAS issues are of great importance.

Bern Convention Parties have long-established customs, quarantine, plant and animal health systems which play a key role in control of international and domestic trade. However, the expanding volume of goods and passenger traffic entering and moving within Europe by air, sea and land makes it impossible to inspect all risk material. It is therefore important to prioritise available resources, build capacity in key areas and facilitate the application of agreed standards and practices in accordance with national and international law.

### **5.1 *Prevention at source and on arrival: border control and quarantine measures***

Guiding Principle 7: Border control and quarantine measures

Prevention efforts need to begin at the place of origin or export (before a living organism crosses the biogeographical barrier). Prevention at source is particularly important where there are known disease incursions and where interception of 'hitchhiking' species may be difficult (e.g. where consignments are packed into containers in a source country and transported to dispersed destinations, often remote from traditional inspection sites at entry points).

At the point of import, border controls and quarantine measures need to be used to prevent or minimise the risk of introducing alien species that are or could become invasive. This requires a framework of rules, trained staff, reference lists of species and risk goods, technical procedures and surveillance protocols.

Measures based on risk analysis should be in place to screen intentional introductions (§5.2) and minimise unintentional or unauthorised introductions (§5.3) of alien species that are or could become invasive. These national measures need to be consistent with the rules and disciplines adopted within the WTO framework (see Box 7).

Within a State, appropriate measures may also be needed to control in-country introductions of IAS (§5.4).

#### **Aim**

Parties cooperate to strengthen and prioritise border control and quarantine measures for alien species that are or could become invasive, making best use of existing resources and information systems.

#### **Key actions**

- 5.1.1 Review existing border controls and quarantine systems to identify and address gaps in coverage and technical or resource constraints.
- 5.1.2 Implement training and capacity-building programmes for quarantine, customs and other border officials.

## 5.2 *Decision-making on intentional introductions*

Guiding Principle 1: Precautionary approach

Guiding Principle 9.a and c: Cooperation, including capacity-building

Guiding Principle 10: Intentional introduction

### **Aim**

All proposed introductions are assessed through a comprehensive screening systems, based on risk analysis. As far as possible, alien species introductions are only authorised if unlikely to threaten biodiversity.

### **Key actions**

- 5.2.1 Take appropriate measures to prohibit first-time intentional introductions of alien species, or subsequent introductions of an alien species already invasive or potentially invasive within a country, without prior authorisation from the competent authority of the recipient State.
- 5.2.2 Develop an evaluation process, including an appropriate risk analysis which may include an environmental impact assessment (see §3.4), before deciding whether to authorise a proposed introduction. The burden of proof that a proposed introduction is unlikely to threaten biodiversity should be with its proposer or assigned as appropriate by the recipient State.
- 5.2.3 To facilitate common approaches to decision-making on proposed introductions and avoid unjustifiable trade restrictions, work towards a regional or subregional species listing system where measures are not already established, consistent with European and international law (see Box 15).

### **Box 15**

#### **POSSIBLE COMPONENTS OF AN AGREED LISTING SYSTEM FOR ALIEN SPECIES**

##### **Black list:**

Species whose introduction is strictly regulated, following a risk assessment prior to species listing. No further risk assessments are required for the area for which the assessment was conducted. Priority should go to:

- invasive species already identified in species inventories as particularly damaging in several European countries; and
- species that are likely to cause problems to several European countries, are not yet present there and have a high potential of introduction.

##### **White list:**

Species classified as low risk following a risk assessment or based on long-standing experience. Introduction of specimens of these species may be authorised without restriction or under conditions. However, care should be taken to avoid giving the impression that uncontrolled releases of white-listed species are encouraged.

##### **Grey (holding) list:**

Any species not included in the black or white list, or which is data-deficient, should be subject to risk assessment prior to a decision on authorisation. Species related to black- or white-listed species may need to be included in the grey list.

The listing system should be dynamic, making it possible to transfer a species to a different list if scientifically justified (e.g. if a white-listed species is repeatedly introduced over a long period, the risk should be reassessed if there is new evidence of potential invasive behaviour).

Species listing and decision-making need to be based on scientific criteria that are periodically reviewed and are transparent (e.g. New Zealand and Australia publish decision-making protocols on their respective websites and invite public and stakeholder input when they develop new import risk analyses and import standards).

### 5.3 *Unintentional introductions*

Guiding Principle 11

#### **Aim**

Appropriate measures and operational resources are in place to minimise unintentional introductions resulting from sectoral activities.

#### **Key actions**

- 5.3.1 Take appropriate steps to ensure that environmental impact assessment procedures address the risk of unintentional introductions through sectoral activities (also see 3.4).
- 5.3.2 Provide for risk analysis of the vectors and pathways for unintentional introductions, to support an integrated approach to pathway management at the subregional or regional level.
- 5.3.3 Promote the implementation and further development of standards, codes of conduct and best practices to minimise identified risks, in cooperation with international standard-setting organisations and relevant sectoral organisations as appropriate (see Boxes 16 and 17).
- 5.3.4 Carefully examine the potential environmental impacts linked to IAS before moving water or translocating species between river basins to prevent the introduction of species to a water system outside their natural range.

#### **BOX 16**

##### **EXAMPLES OF APPROPRIATE ACTIONS FOR TRADE AND TRANSPORT PATHWAYS**

Implement the IPPC Guidelines for Regulating Wood Packaging Material in International Trade and support their application to other categories of risk goods/biological material and packaging.

Implement the IMO's *Technical Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens* and support the adoption of the IMO International Convention for the Control and Management of Ship's Ballast Water and Sediments.

Support best practices to minimise hull fouling and the finalisation of the IMO's Draft International Convention on the Control of Harmful Anti-Fouling Systems. Provide guidance to sailors on risks associated with anchors (can transport eggs and seeds of alien aquatic organisms).

Support the International Civil Aviation Organisation's work to develop common measures to minimise the movement of invasive alien species in aeroplanes.

Cooperate with tourist operators and airport/port authorities to develop a code of conduct to minimise movement of potentially invasive species in biological material by tourists and travellers.

**BOX 17****APPROPRIATE ACTIVITIES AND PARTNERS FOR  
PREVENTING UNINTENTIONAL INTRODUCTIONS**

SECTOR	EXAMPLES OF BEST PRACTICES
Forestry	Control and monitor the use of alien species to detect unusual mortality, disease, or insect outbreaks and avoid adverse ecological impacts. Implement relevant Forest Stewardship Council principles and support the development of European forest stewardship standards on selection of species for planting and reduction of threats from alien tree species (also see §8).
Agriculture/forestry	Regulate/manage use of alien biocontrol agents, taking account of the IPPC Code of Conduct for the Import and Release of Exotic Biological Control Agents.
Horticulture	<p>Cooperate with horticultural trade bodies and botanic gardens to identify potentially invasive terrestrial and aquatic alien plants and promote initiatives to raise awareness amongst gardeners and landscapers of IAS risks. Where necessary, consider a ban on the domestic sale of known highly invasive alien plants.</p> <p>One approach (used in South Africa) is to draw up a national list of invasive alien plants and divide this into categories for regulatory and management purposes: (1) plants that must be removed and destroyed immediately; (2) plants that need a permit to be grown; and (3) plants that may not be planted, grown or sold, but whereby mature specimens of the species do not require removal.</p>
Aquaculture/ mariculture	Promote implementation of the International Council for the Exploration of the Sea (ICES) Code of Practice on the Introductions and Transfers of Marine Organisms (1994) and the FAO Code of Conduct for Responsible Fisheries (1995). Work with key stakeholders (e.g. Federation of European Aquaculture Producers) to address risks to native biodiversity associated with escapes from fish farms and introduction of alien parasites in fish stock. Consider the need for stricter controls on use of highly invasive alien fish species and stronger animal health measures.
Sport fishing	Work with angling associations to minimise risks associated with introduction of alien fish as game. Strictly regulate trade in, transport and use of live bait for fishing, to prevent introduction of species not present in the drainage basin concerned.
Ornamental fish and aquaria	Apply standards and procedures to public aquaria to reduce risks of escape when tanks are emptied. Work with relevant stakeholders (Ornamental Fish International, Ornamental Aquatic Trade Association) to promote awareness-building and best practice amongst dealers, retailers and the public.
Pet and animal retailers	Encourage retail associations to develop appropriate information materials as well as a recovery system for animals their owners wish to get rid of. Consider the need to prohibit trade in and possession of alien species assessed to be capable of becoming invasive in the event of release or escape into the wild.
Hunting	Work with the <i>Fédération des associations de chasseurs de l'UE</i> (FACE) and national hunting and shooting organisations to assess risks associated with introduction of alien game species for restocking. As appropriate, cooperate in the elaboration, adoption and implementation of a European Code of Conduct on Hunting to regulate and manage such introductions.
Aviculture	Work with bird breeders organisations to minimise risks associated with escapes of alien bird species from captivity. As appropriate, cooperate in the elaboration, adoption and implementation of a code of conduct on aviculture to prevent escapes from captivity, establishment into the wild and hybridisation with native species.
Falconry	Work with the International Association for Falconry and Conservation of Birds of Prey to prevent escapes into the wild of alien birds of prey used for falconry and hybridisation with native species. As appropriate, cooperate in the elaboration, adoption and implementation of a European Code of Conduct on Falconry.

## 5.4 *In-country prevention*

Guiding Principle 7.2: Border control and quarantine measures

Guiding Principle 10: Intentional introduction

Guiding Principle 11: Unintentional introductions

Species native in one part of a country, may be alien, even invasive, in another part of the same country (e.g. the hedgehog, native to mainland Scotland, was introduced to the Scottish island of Uist where it is invasive). Appropriate measures are therefore needed to control introductions of IAS within States, to new ecological regions, consistent with national legislation and policies where these exist.

### **Aim**

Measures are in place to minimise the introduction, establishment and spread of IAS or potential IAS within a country.

### **Key actions**

- 5.4.1 Consider a control system for intentional domestic movements of potential IAS to ecologically different parts of the country, making use where appropriate of existing systems such as EC plant passports (see Box 18).
- 5.4.2 Assess the need to adapt existing licensing rules for containment facilities holding potential IAS (e.g. botanic gardens, greenhouses, arboreta, garden centres, zoos, animal-breeding establishments, fish farms, research institutes). Existing licensing and control systems (e. g. in plant health) should be used where appropriate.

### **BOX 18**

#### **EXAMPLES OF APPROPRIATE ACTIONS FOR PREVENTING IN-COUNTRY INTRODUCTIONS**

- Prohibit or strictly regulate facilities holding potentially invasive alien species in containment/captivity in or near to vulnerable areas.
- Develop screening procedures for passenger and commodity traffic between the mainland and islands and between islands.
- Promote island information exchange networks connected to the GISP/IUCN Cooperative Islands Initiative.

## **5.5 *Special measures for isolated ecosystems***

Guiding Principle 3: Ecosystem approach

### **Aim**

Countries with biogeographically or evolutionarily isolated ecosystems (islands, lakes, enclosed and semi-enclosed seas) and centres of endemism and high biodiversity apply strict measures to prevent or minimise adverse impacts of biological invasions.

### **Key action**

- 5.5.1 Develop stricter measures where necessary to prevent or minimise the introduction and spread of potential IAS into these vulnerable areas.
- 5.5.2 Promote subregional cooperation for more effective protection of shared isolated and vulnerable ecosystems.

## **5.6 *Prevention of natural spread***

It is important to distinguish between the initial entry into a country (or region) and a later natural spread. Natural expansion of an invasive alien species established in a neighbouring country is particularly critical because:

- 1) it means that the ecological conditions are suitable to establishment; and
- 2) it may be more difficult to contain the natural spread of a species than to prevent its introduction.

### **Aim**

Better predict the patterns of spread of established IAS to allow timely responses (see §7.3).

### **Key actions**

- 5.6.1 Produce, update and circulate maps of distribution for the most problematic/priority IAS.
- 5.6.2 Develop predictions of patterns of spread.
- 5.6.3 Ensure that information is rapidly and effectively circulated to neighboring States.

## **6 Early detection and rapid response**

The counterpart to prevention at source (before a species crosses a biogeographical barrier) is prompt detection and intervention post-barrier. Early detection of IAS is essential because of the need for rapid action before significant populations are established.

### **6.1 Monitoring and surveillance**

Guiding principle 2.2: Three-stage hierarchical approach

Surveillance (activities aimed at identifying alien species new to the country) is a critical element of prevention: without effective surveillance, early detection will mostly cover larger species and remain anecdotal.

#### **Aim**

Parties have comprehensive and cost-effective monitoring and surveillance procedures in place.

#### **Key actions**

- 6.1.1 Making best use of existing capacity (see Box 19), establish procedures to collect, analyse and circulate information of IAS, including identification keys for different taxonomic groups (see §2).
- 6.1.2 Set up an Early Warning System and organise regular surveillance of high-risk areas such as:
- main entry points for commercial/tourist arrivals (airports, ports, harbours, open moorings, train stations, etc.);
  - entry points of natural dispersal pathways (coasts, border crossings of water systems shared with neighbouring countries, etc.);
  - areas adjacent to containment facilities for potential IAS;
  - areas where severe disturbance has occurred (land clearance, storm damage etc.); and
  - isolated ecosystems and protected areas.

#### **BOX 19**

##### **WAYS TO MAKE BEST USE OF EXISTING CAPACITY FOR EARLY DETECTION**

- Use established early warning systems (e.g. in plant and animal health sectors)
- Include invasive alien species in existing wildlife monitoring arrangements
- Train field officers and protected area staff to conduct site- and species-specific surveys
- For transboundary sites and ecosystems, promote joint surveys by neighbouring management bodies
- Encourage specialist NGOs to participate in reporting networks;
- Develop information materials to assist farmers, gardeners, birdwatchers, foresters, fishermen, hunters, divers, hikers and photographers to detect and report new arrivals.
- Introduce reporting requirements for landowners and occupiers, based on a list of priority IAS.

## 6.2 *Rapid response and contingency planning*

Guiding principle 2.2: Three-stage hierarchical approach

Guiding principle 13: Eradication

There is only a limited period of time in which eradication is a practicable option, before the invasive species reaches a certain level of population and/or range expansion. Islands have a much higher proportion of successful eradications than the mainland, for which it is difficult to predict with any certainty the length of the critical period during which eradication is feasible. This makes rapid implementation of an eradication programme particularly important for mainland incursions.

### **Aim**

The time between documenting an introduction and implementing a response is reduced through the clear allocation of roles and powers and the development of contingency plans for eradicating newly detected alien species.

### **Key actions**

- 6.2.1 Ensure that all competent authorities (including local authorities and protected area authorities) have sufficient powers to remove IAS or alien species with a high potential to become invasive, in accordance with national law and policy (see Box 20).
- 6.2.2 Prepare contingency plans for eradicating specific taxa (e.g. plants, invertebrates, marine organisms, fresh-water organisms, fresh-water fishes, reptiles, amphibians, birds, small mammals, large mammals).
- 6.2.3 Provide adequate funds and equipment for rapid response to new invasions and train relevant staff to use the control methods selected.

### **BOX 20**

#### **EXAMPLES OF ACTIONS TO SUPPORT RAPID RESPONSE OBJECTIVES**

- Where necessary, streamline the authorisation process for rapid response
- Consider the use of emergency orders where urgent eradication action is needed.
- Contribute to regional cooperation on research and development of emergency response materials.

## **7 Mitigation of impacts**

Prevention can reduce new introductions, but not halt them. When the establishment of an invasive alien species has been detected, appropriate management responses (eradication, containment, control) are needed in the earliest possible stages of invasion to mitigate adverse effects.

Consistent with the three-stage hierarchical approach set out in CBD Guiding Principle 2:

- eradication programmes should be considered first. Eradication is the most coherent solution in terms of biodiversity conservation and can be more effective, cost effective and ethical than other management alternatives (control, containment, do-nothing) (see §7.2);
- where a science-based assessment shows that eradication is no longer feasible, or resources are not available for eradication, containment (see §7.3) should be implemented. This is a high priority for IAS that could spread to neighbouring countries;
- long-term control measures (see §7.4) should be considered on the basis of a cost/benefit analysis for established species where such measures can reduce adverse impacts to an acceptable level.

## 7.1 *Policy and legal aspects*

Guiding Principle 1: Precautionary approach

Guiding Principle 2.2: Three-stage hierarchical approach

Guiding Principle 6: Education and public awareness

Guiding principle 12: Mitigation of impacts

At the regional level, common legal procedures are well-established for control of pests and diseases that affect plant, animal and human health, but not for invasive alien species that threaten native biodiversity and ecosystem function. Particularly sensitive sectors of the society may in some cases not support programmes to control alien species (especially for birds and mammals); this opposition may strongly limit the ability of the competent authorities to act.

### **Aim**

Parties have a clear legal basis for mitigation measures and procedures to consult and involve affected communities and stakeholders.

### **Key actions**

- 7.1.1 Equip competent authorities with powers to take appropriate mitigation measures, based on the precautionary approach and an examination of the long-term benefits and costs (environmental, economic and social) (see Box 21).
- 7.1.2 Where necessary, review protected species lists to remove automatic protection from invasive alien species under legal measures applicable to higher taxa and ensure that their legal status is compatible with mitigation measures.
- 7.1.3 Promote education and public awareness programmes to engage local communities and appropriate sector groups in support of necessary mitigation and, where appropriate, encourage their participation.
- 7.1.4 With affected States, promote coordinated mitigation measures for species identified as a transboundary, subregional or regional problem (e.g. Action Plan for Eradication of the Ruddy Duck in the Western Palearctic), using existing structures where possible (e.g. the European Plant Health System).

### **BOX 21**

#### **POSSIBLE MEASURES TO SUPPORT MITIGATION POLICIES AND ACTIVITIES**

- More effective use of existing legal measures (e.g. for game management, weed control)
- Active involvement of species user groups (e.g. hunting, shooting, falconry, angling) in monitoring and mitigation
- Establishing responsibility, within reasonable limits, for landowners, occupiers and relevant stakeholders to prevent or control further spread of listed invasive alien species (see §3.11)
- Incentives for landowners and occupiers to carry out mitigation measures on their land
- Powers of compulsory access to sites where voluntary approaches fail

## 7.2 *Eradication*

### Guiding Principle 13: Eradication

Eradication is an essential management tool but can only be carried out for an extremely limited proportion of invasive alien species established in a country. Eradication should only be attempted if adequately supported and if feasible (see Box 22).

For many long-established invasive alien species present in the wild, eradication campaigns will simply not be feasible.

### **Aim**

Realistic priorities for eradication are agreed and implemented and results are disseminated.

### **Key actions**

7.2.1 Establish priority lists of IAS to eradicate (see Box 23).

#### **BOX 22**

##### **CONDITIONS FOR STARTING AN ERADICATION**

There is adequate public support.

Sufficient funds are available.

There is adequate political commitment.

The eradication is ecologically feasible. Feasibility should be assessed on the basis of relevant biological characteristics of the target species, its ecological relationship with the invaded area and socio-economic considerations.

#### **BOX 23**

##### **PRIORITY SPECIES FOR ERADICATION**

- Newly-formed propagules, especially where non-reversible effects are predicted
- Species representing a major threat to native biodiversity
- Species already established in the wild, whose effects on native ecosystems are reversible
- Species for which eradication is most feasible

Removal of feral animals of domestic species and commensal non-native species that damage the natural environment should be considered as a management option, particularly on islands.

- 7.2.2 Prepare and implement national containment/eradication plans for two IAS (one aquatic and one terrestrial) to demonstrate what can be achieved (see Box 24).
- 7.2.3 Contribute to the implementation of Target 10 (Objective 2) of the Global Strategy for Plant Conservation adopted by the CBD Conference of the Parties in 2002 (*“Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems”*).
- 7.2.4 Prioritise vulnerable and relatively undisturbed ecosystems and islands for eradication, based on a classification of natural value, degree of disturbance and feasibility of success.
- 7.2.5 Prepare and implement a comprehensive containment/eradication strategy of invasive alien species for two regions (one predominantly containing dry and one with wet biotopes).
- 7.2.6 Implement and fund eradication programmes, subject to prior risk analysis and public consultation.

**BOX 24****DESIGN OF ERADICATION PROGRAMMES**

Promote use of risk analysis covering impacts, reversibility of effects and risk of re-invasion of the management area (immigration rate of the alien species being eradicated needs to be zero)

A trial eradication can be a useful tool to collect information for the assessment (e.g. bait preference and acceptance to target species, risk of destruction of non-target species, ways to minimise this risk, etc.), which should determine the chances of success and address worst case scenarios.

Select eradication methods primarily on the basis of their efficiency: all individuals of the population must be vulnerable to the removal methods

Methods should be as selective, ethical and humane as possible and comply with applicable regulations (e.g. animal welfare).

Combine different methods to ensure that individual organisms surviving the primary campaign are destroyed.

Monitor effort, costs and results to allow for corrections and identify means to prevent future re-invasions.

Monitor recovery of native plant and animal populations and provide, where necessary, for conservation measures.

### **7.3 Containment**

Guiding Principle 14: Containment

Containment programmes may have one or more specific aims:

- to contain the species within defined geographical boundaries;
- to prevent its spread to neighbouring countries;
- to prevent its expansion to isolated and/or ecologically important areas ; and/or
- to postpone the species' population growth in order to develop more effective eradication techniques.

Containment methods should be selected with regard to their efficiency, selectivity and the undesired effects they may cause. Regular monitoring is essential and needs to be linked with quick action to eradicate any new outbreaks.

#### **Aim**

Realistic priorities for containment are agreed and implemented; results are disseminated.

#### **Key actions**

- 7.3.1 Establish priority lists of IAS for containment, where appropriate in collaboration with neighbouring States for which the same species are problematic.
- 7.3.2 Prioritise areas for containment, based on classification of natural value, degree of disturbance, importance as invasion corridors and feasibility of success.
- 7.3.3 Implement and fund containment programmes for priority IAS, subject to prior risk analysis and public consultation.

## **7.4 Control**

### Guiding Principle 15: Control

The aim of control is to reduce the density and abundance of an IAS to keep its impact to an acceptable level in the long term.

Before starting a control programme a cost/benefit analysis should be realised, desired outcomes should be clearly defined and appropriate monitoring of the results should be planned. Control methods should be selected with regard to their efficiency, selectivity and the undesired effects they may cause; in some cases the use of integrated management techniques is the best option.

#### **Aim**

Control programmes, based on a cost/benefit analysis and realistic priorities, are agreed and implemented and their results are disseminated.

#### **Key actions**

- 7.4.1 Assess costs, benefits and outcomes of IAS control programmes already in place; disseminate results.
- 7.4.2 Establish priority lists of IAS and of areas for control.
- 7.4.3 Implement and fund control programmes in sectors where not yet established

## **8 Restoration**

Guiding principle 3: Ecosystem approach

As part of a holistic approach, IAS policies and measures need to go further than the defensive three stage hierarchical approach (Guiding Principle 2) and support restoration measures for species, natural habitats and ecosystems that have been affected by biological invasions. Increased resilience of native biodiversity can in turn provide greater protection against re-invasion or new incursions.

Soil and canopy disturbance can facilitate the establishment and spread of invasive alien species. Land and resource use policies therefore need to consider invasion risks and support practices to minimise and remedy any damage.

### **Aim**

IAS strategies and eradication and control programmes promote restoration measures for native biodiversity and, where appropriate, the use of native species in preference to alien species.

### **Key actions**

- 8.1 Identify and cooperate with appropriate partners on restoration programmes.
- 8.2 Promote the use of native plant species in landscaping, revegetation, roadside planting, erosion control, protected area and habitat management and development assistance programmes, unless these are unavailable, unsuited to the programme purpose and/or risk analysis indicates that alien species are unlikely to have adverse impacts (see Box 25).
- 8.3 Explore opportunities to reintroduce native species following eradication programmes, subject to consultation with neighbouring States and the Bern Convention Secretariat (see Box 26).

### **BOX 25**

#### **EXAMPLES OF APPROPRIATE ACTIONS TO SUPPORT BIODIVERSITY RESTORATION**

Take steps to increase the supply of native species of known local provenance to meet landscaping and environmental management needs

Design agri-environment measures to support restoration of native biodiversity damaged by invasions

Support the use of native species in the establishment of forest plantations and the restoration of degraded ecosystems, in accordance with the Forest Stewardship Council's Principles

### **BOX 26**

#### **RE-INTRODUCTION OF NATIVE SPECIES FOLLOWING ERADICATION PROGRAMMES**

This can be a suitable management option but should only be carried out in accordance with best practice guidelines (e.g. IUCN/SSC Guidelines for Re-introductions)

Particular care should be taken to avoid introducing a different subspecies of the native species concerned (e.g. a non-native plant genotype), due to the risk of genetic contamination

**Selected international and European instruments and institutions  
with provisions, programmes or activities  
relevant to invasive alien species<sup>13</sup>**

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
<b><i>Biodiversity-related instruments: global</i></b>				
Convention on Biological Diversity (Rio de Janeiro,1992)  <a href="http://www.biodiv.org">http://www.biodiv.org</a>	29.12.1993	Article 8 In-situ Conservation Each Contracting Party shall, as far as possible and as appropriate: (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.	Decisions IV/1 C, IV/5, V/8  Decision VI/23 on Alien species that threaten ecosystems, habitats or species and annexed Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species (adopted by the CBD COP, The Hague, April 2002)	The 3 <sup>rd</sup> Joint CBD-Ramsar Work Plan (2002- 2006) provides for collaborative actions with GISP, IUCN and the World Conservation Monitoring Centre to increase the availability of information and guidance on aquatic IAS.
<b>Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 1971)</b>  <a href="http://www.ramsar.org">http://www.ramsar.org</a>	21.12.1975		Resolution VII.14 on Invasive Species and Wetlands  Resolution VIII.18 on Invasive Species and Wetlands (November 2002)	Joint work programme with CBD (see above)
Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)  <a href="http://www.wcmc.org.uk/cms/">http://www.wcmc.org.uk/cms/</a>	01.11.1983	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		IAS covered by CMS-CBD Joint Work Plan

<sup>13</sup> Adapted from Shine, C., N.Williams and L.Gundling (2000). *A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species* (IUCN EPLaw Paper No.40).

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
		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.		
<b><i>Biodiversity-related instruments: regional and sub-regional</i></b>				
Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979)  <a href="http://www.nature.coe.int/english/cadres/bern.htm">http://www.nature.coe.int/english/cadres/bern.htm</a>	01.06.1982	Article 11(2)(b) Each Contracting Party undertakes to strictly control the introduction of non-native species.	Standing Committee Recommendations include:  Recommendation n° 18 (1989) on the protection of indigenous crayfish in Europe; Recommendation No. 45 (1995) on controlling proliferation of <i>Caulerpa taxifolia</i> in the Mediterranean; Recommendation No. 61 (1997) on the conservation of the White-headed Duck ( <i>Oxyura leucocephala</i> ); Recommendation No. 78 (1999) on the conservation of the Red squirrel ( <i>Sciurus vulgaris</i> ) in Italy Recommendation No. 57 (1997) on the Introduction of Organisms belonging to Non-Native Species into the Environment Recommendation No. 77 (1999) on the eradication of non-native terrestrial vertebrates	Reports published:  Legal Aspects of the Introduction and Re-introduction of Wildlife Species in Europe. Isabelle Trinquette T-PVS (92) 7.  Introduction of non-native organisms into the Natural Environment. (1996). Cyrille de Klemm Nature and Environment Series 73  Introduction of non-native plant species into the Natural environment (1997). J.Lambinon, Nature and Environment series No 87  Methods to control and eradicate non native terrestrial vertebrates (1998). J.F.Orueta  The status of the Ruddy Duck ( <i>Oxyura jamaicensis</i> ) in the western Palearctic and an Action Plan for eradication, 1999-2002 (1999)  Identification of non-native freshwater fish established in Europe, assessing their potential threat to native biodiversity (B.Elvera, 2000)

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
				Workshops and meetings include:  Control and Eradication of Non Native Terrestrial Vertebrate (Malta, 1999); Control of Ruddy Ducks (UK, 2000); IAS on European Islands and Evolutionary Ecosystem (Horta, Azores, 2002).
Benelux Convention on Nature Conservation and Landscape Protection (Brussels, 1982)	01.10.1983	Article 1 The present Convention aims at 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.	Benelux Council of Ministers Decision 17.10.83. Parties to the 1982 Benelux Convention are required 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.	
Protocol for the Implementation of the Alpine Convention in the Field of Nature Protection and Landscape Conservation (Chambery, 1994)	Date of adoption 20.12.1994	Article 17 The Contracting Parties guarantee that species of wild fauna and flora not native to the region in the recorded past are not introduced. Exceptions are possible when the introduction is needed for specific use and may not have adverse effects for nature and for the landscape.		
Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (Barcelona, 1995)	Entered into force December 1999	Article 6 The Parties, in conformity with international law and taking into account the characteristics of each specially protected area, shall take the protection measures required, in particular: the regulation of the introduction of any species not indigenous to the specially protected area in question, or of genetically modified species, as well as the introduction or reintroduction of species which are or have been present in the specially protected area.  Article 13 The Parties shall take all appropriate measures		Draft Action Plan on the Introduction of Species and on Invasive Species in the Mediterranean Sea (Expert Meeting held October 2002)

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
		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.		
<p>Agreement on the Conservation of African-Eurasian Migratory Waterbirds (The Hague, 1995)</p> <p><a href="http://www.wcmc.org.uk/aewa">http://www.wcmc.org.uk/aewa</a></p>	01.11.1999	<p>Article III(2)(g) Parties shall prohibit the deliberate introduction of non-native waterbird species into the environment and take all appropriate measures to prevent the unintentional release of such species if this introduction or release would prejudice the conservation status of wild 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.</p> <p>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 Table1. 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, 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 Table1.</p>		<p>African-Eurasian Waterbird Agreement Secretariat: proposed tripartite Joint Work Plan between AEWA, CMS and Ramsar</p> <p>Conservation Guideline on Avoidance of Introductions of Non-Native Migratory Waterbird Species (considered at the Second Session of the Meeting of the Parties to AEWA, September 2002)</p>

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
EC Council Directive 79/409/EEC on the Conservation of Wild Birds (as amended)	02.04.79	<p><b>Article 11</b></p> <p>Member States shall see that any introduction of species of bird which do not occur naturally in the wild state in the European territory of the Member States does not prejudice the local fauna and flora.</p>		
EC Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora	21.5.92	<p><b>Article 22</b></p> <p>In implementing the provisions of this Directive, 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>The EU's four sectoral Biodiversity Action Plans all reference IAS (Conservation of Natural Resources; Agriculture; Fisheries; Economic and Development Cooperation) . These were adopted under the Community Biodiversity Strategy (COM(98)42). These policy instruments are complementary to national strategies and measures.</p>
Council Regulation 338/97/EC on the Protection of the Species of Wild Flora and Fauna by Regulating Trade Therein		<p><b>Art.4(6)(d) establishes powers to restrict the introduction into the Community of live specimens of species for which it has been established that their introduction into the natural environment of the Community presents an ecological threat to wild species of fauna and flora indigenous to the Community.</b></p> <p><b>Article 9(6) establishes powers to prohibit or restrict the holding or movement of live specimens of species that are subject to import restrictions under Art.4(6).</b></p>		<p>Red-eared slider <i>Trachemys scripta elegans</i> and the American Bullfrog <i>Rana catesbeiana</i> are subject to an import ban under this Regulation.</p>

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
<b>Marine and freshwater systems</b>				
United Nations Convention on the Law of the Sea (Montego Bay, 1982)  <a href="http://www.un.org/Depts/los/losconv1.htm">http://www.un.org/Depts/los/losconv1.htm</a>  <a href="http://www.imo.org">http://www.imo.org</a>	16.11.1994	Article 196 States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or 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.		IMO Resolution A.868 (20)1997 Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens.  <b>IMO Marine Environment Protection Committee technical Circular on design measures for ballast water and sediment options in new ships (MEPC 47<sup>th</sup> session, London 4-8 March 2002).</b>  Global Ballast Water Management Programme ("GloBallast") launched in 2000, in co-ordination with United Nations Development Programme and Global Environment Facility, as a concerted response to the problem of harmful marine organisms ( <a href="http://globallast.imo.org">http://globallast.imo.org</a> )  IMO currently working on a draft International Convention on the Control of Harmful Anti-Fouling Systems.
Convention on the Law of the Non- navigational Uses of International Watercourses (New York, 1997)  <a href="http://www.un.org">http://www.un.org</a>	Date of Adoption 21.05.1997  Not in force	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.		
Convention Concerning Fishing in the Waters of the Danube	20.12.1958	Annex Part V Article 10 The acclimatization and breeding of new species of fish and other animals and of aquatic		

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
(Bucharest 1958)		plants in the waters of the Danube to which this Convention applies may not be carried out save with the consent of the Commission.		
International Council for the Exploration of the Sea ( ICES) and the European Inland Fisheries Advisory Commission (EIFAC)		Code of Practice on the Introductions and Transfers of Marine Organisms (1994) Recommends practices and procedures to diminish risks of detrimental effects from marine organism introduction and transfer.		Working Group on Introductions and Transfers of Marine Organisms
FAO Code of Conduct for Responsible Fisheries (1995) <a href="http://www.fao.org">http://www.fao.org</a>		Article 9.3.2 States should co-operate in the elaboration, adoption and implementation of international codes of practice and procedures for introductions/transfers of aquatic organisms. Article 9.3.3 States should, in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, encourage adoption of appropriate practices in the genetic improvement of broodstocks, the introduction of non-native species, and in the production, sale and transport of eggs, larvae or fry, broodstock or other live materials. States should facilitate the preparation and implementation of appropriate national codes of practice and procedures to this effect.		Technical guidance has been developed for implementation and is available from FAO (and the website)
<b>CIVIL AVIATION</b>				

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
International Civil Aviation Organisation			<p>ICAO Assembly Resolution A-32-9: Preventing the introduction of invasive alien species (1998).</p> <p><i>ICAO GENERAL ASSEMBLY RESOLUTION A33-18, ADOPTED AT THE 33<sup>RD</sup> SESSION, MONTREAL 2001: URGES CONTRACTING STATES TO TAKE MUTUALLY SUPPORTIVE EFFORTS TO REDUCE THE RISK OF INTRODUCING POTENTIAL IAS VIA THIS PATHWAY TO AREAS OUTSIDE THEIR NATURAL RANGE</i></p>	<p>The ICAO Council is working with appropriate organisations to identify possible steps to reduce introduction risks. It conducted a survey of Contracting States in 2002 to compile system- wide data on this pathway.</p>
<b>PLANT AND ANIMAL HEALTH MEASURES AND THE MULTILATERAL TRADING SYSTEM</b>				
<p>International Plant Protection Convention (Rome, 1951)</p> <p>Revised version adopted in 1997, but not yet entered into force</p>	03.04.1952	<p>Provides a framework for international cooperation to prevent the introduction of pests of plants and plant products, and to promote appropriate measures for their control. It deals with the spread of pests between countries and phytosanitary measures within a country .</p> <p>Parties are required to establish 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.</p>	<p>International Standards for Phytosanitary Measures include:</p> <p>Guidelines for pest risk analysis (ISPM #2) Code of Conduct for the Import and Release of Exotic Biological Control Agents (ISPM #3) Guidelines for surveillance (ISPM #6). Determination of pest status in an area (ISPM #8). Guidelines for pest eradication programmes (ISPM #9). Guidelines for the notification of non- compliance and emergency action (ISPM #13) Glossary of Phytosanitary Terms. Pest reporting (ISPM #17). Pest risk analysis for quarantine pests (ISPM #11).</p>	<p>In 2001, the CBD and IPPC established a programme of collaboration to better integrate biodiversity-related and phytosanitary expertise.</p>
Convention for the Establishment of the European and	01.11.53	Recognised regional plant protection organization within the framework of the IPPC. Advises Member Governments on the		Member States of the European Union implement plant health measures and standards consistent with EC plant health directives and

Instrument/ institution	Date of Entry into Force	Relevant Provisions	COP Decision(s) or equivalent	Related activities and programmes
Mediterranean Plant Protection Organisation (Paris, 1951)  <a href="http://www.eppo.org/">http://www.eppo.org/</a>		technical, administrative and legislative measures necessary to prevent the introduction and spread of pests and diseases of plants and plant products.		regulations
Office International des Epizooties		Develops standards and guidance on pests and diseases of animals (but not on animals themselves as pests). Codes set out standards on import risk analysis and import/export procedures and minimum health guarantees required of trading partners to avoid the risk of spreading animal diseases.	International Animal Health Code for Mammals, Birds and Bees (10 <sup>th</sup> Edition)  International Aquatic Animal Health Code (5 <sup>th</sup> Edition 2002)	Member States of the European Union implement animal health measures and standards consistent with EC animal health directives and regulations.
WTO Agreement on the Application of Sanitary and Phytosanitary Measures (Marrakech, 1995)	01.01.1995	Provides a uniform framework for measures governing phytosanitary measures for human, plant and animal life or health. Sanitary and phytosanitary measures are defined as any measure applied a) to protect human, 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. Currently recognises international standards developed within the IPPC framework (plant health), by OIE (animal health) and by Codex Alimentarius Commission (food safety).		

### Other references

Detailed technical and advisory material is available from international organisations, governments and specialist bodies working on IAS issues, including IUCN, GISP and the FAO which has legal and technical expertise with regard to IAS in agriculture, forestry and fisheries.

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Wittenberg and Cock. 2001. *Invasive Alien Species: A Toolkit of Best Prevention and Management Practices* (GISP/CAB International)