



# CONVENTION ON MIGRATORY SPECIES

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## INVASIVE ALIEN SPECIES AND MIGRATORY SPECIES

*(Prepared by the Secretariat)*

### Introduction

1. An ‘invasive alien species’ (IAS) is a species that has been introduced or spread outside its natural range and has become established in natural or semi-natural ecosystems or habitat, is an agent of change and threatens native biological diversity by the damage it causes<sup>1</sup>. Invasive species include not only plants and animals but also fungi, parasites and microbes. In recent times, increasing mobility, climate change and the globalization of trade and tourism have led to rapid growth in the incidence of species invasions.

2. There are a number of natural ways in which a species can extend its range. However, the human contribution to the process, both by accident and design, has greatly increased the spread of IAS. Some reasons for deliberate human introductions of species outside their normal range include: commercial (hunting, fishery, agriculture and forestry); ornamental; recreational; biological control of pests; restocking of exploited species; trade of pets; trade of species to zoos and aquaria; and tourism. Incidental introductions can also occur through human travel by the transfer of “hitchhiking” species.

3. In relation to species listed under Appendix I of CMS, the Convention states that Parties that are Range States to such a species shall endeavour: “to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species”.

4. This paper summarizes the known adverse impacts of IAS, and outlines responses that have occurred to date. The Secretariat has undertaken a preliminary analysis of the impacts of invasive species on species currently listed in the Appendices to the Convention. From this initial work, it is apparent that there are substantive information gaps, and further work is necessary to develop prioritized cooperative intervention.

<sup>1</sup> IUCN (2000) IUCN Guidelines for the prevention of biodiversity loss caused by alien invasive species. Prepared by the SSC Invasive Species Specialist Group.

## Adverse impacts of invasive species

5. Invasive species can produce substantial environmental and economic damage, and their negative impacts can be exacerbated by climate change, pollution, habitat loss and human-induced disturbance. They can also directly affect human health as exotic species of birds, bats, rodents and insects are often vectors for infectious diseases. The increasing predominance of IAS can lead to a loss of biodiversity as invasive species can prey upon and outcompete native species for resources. They may also have important indirect negative effects on ecosystems by causing changes in hydrology, fire regimes, nutrient cycling, and ecological relationships between species. These chain reactions can be difficult to identify and predict. Furthermore, the combined effect of multiple invasive species can have large and complex impacts on ecosystems.

6. In most cases, IAS come with a high monetary cost. Total global annual costs, including losses to crops, pastures and forests, as well as environmental damage and control costs, have been conservatively estimated to be in the hundreds of billions of dollars and possibly more than one trillion. It is estimated that damage and control costs of invasive species in the USA alone amounts to more than \$138 billion annually. In addition, economic losses also occur through the reduction of recreational and tourism revenues. This does not include the cost to society of species extinctions, losses in biodiversity, ecosystem services and aesthetics.

7. The natural behaviour of migratory species means that they can interact with invasive species not only in their breeding, stopover and wintering grounds, but also during migrations, which can result in cumulative impacts from invasive species. Migratory species are directly impacted by invasive species through predation, competition, and genetic changes through hybridization. They may also indirectly impact migratory species through the transmission of diseases, impairment of breeding, and by causing loss of habitat and resources crucial for migratory species. These ecological interactions may result in local extinction or decline in population numbers of certain species as well as changes to migration patterns.

8. The introduction of alien sturgeons is considered to be one of several causes that threaten the survival of the European sturgeon (*Acipenser sturio*) and success of recovery measures. There has been evidence of the predominance of non-native sturgeons, mainly the Siberian sturgeon (*Acipenser baerii*), the Russian sturgeon (*Acipenser gueldenstaedtii*) and different hybrids, and secondarily the White sturgeon (*Acipenser transmontanus*) and the Sterlet (*Acipenser ruthenus*). Reasons behind the introductions appear to be intentional (by professional and recreational fishermen) or accidental (escapes from aquaria, farms and garden ponds). The alien sturgeon may compete with the European sturgeon for habitat and may also transmit parasites and diseases and influence the genetic pool of the native sturgeon through hybridization. While the presence of alien sturgeon might have contributed to the decrease of the native sturgeon in the past, it now certainly poses a serious direct and indirect threat to the current and future re-establishment of the European sturgeon in its native habitat.

9. Another example of the impact of invasive species on migratory species is illustrated by the case of the White-Headed Duck (*Oxyura leucocephala*), listed on CMS Appendix I. The introduction of the North American Ruddy Duck (*Oxyura jamaicensis*) into Europe has led to concerns of hybridization with the white-headed duck. A lack of reproductive isolation between these species means there is the potential for genetic swamping, loss of native genetic diversity and eventually extinction of the white-headed duck as a species. The risk posed by the spread of the American ruddy duck is two-fold: in addition to the impact posed

by the species itself, its hybrids with the white-headed duck, being migratory, have the potential to spread and threaten further duck species. However, the American ruddy duck has been almost eradicated in Spain and the United Kingdom, which demonstrates that it is possible to control an invasive species, although these eradication programmes can be very expensive and the target species may come back if it is not controlled in all the affected countries.

### **Current actions to address invasive species**

10. The Convention, in cooperation with its daughter instruments and other partner organizations, develops International Single Species Action Plans (SSAP) for endangered species included in Appendix I and, where needed, ensures the inclusion of provisions to prevent and/or control invasive species. The CMS/AEWA SSAP for the White-headed duck, also supported by the EU and the Bern Convention, provides a good example of international coordination among countries concerned with the presence of the alien Ruddy duck. The plan in fact aims to increase the White-headed duck population size and range through managing key sites, raising awareness, and controlling and preventing the threat of hybridization posed by the non-native Ruddy duck.

11. Invasive species are a global issue that requires collaborative effort at regional and local levels, especially through prevention, early detection and rapid response. Measures that prevent international movement of invasive species and promote rapid detection at borders are less costly than control and eradication. Prevention requires collaboration among governments, economic sectors and non-governmental and international organizations.

12. In recognition of the urgent need to address the impact of invasive species and to raise awareness about the need to reduce effects on native biodiversity, several international organizations and agreements have developed policies dealing with this issue. These include; the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Wetlands (Ramsar Convention), the United Nations Convention on the Law of the Sea (UNCLOS), the International Convention for the Control and Management of Ships' Ballast Water and Sediments, the International Plant Protection Convention (IPPC), the United Nations Convention on the Law of Non-Navigational Uses of International Watercourses, the World Organisation for Animal Health (OIE), and a number of regional instruments such as the Bern and Barcelona Conventions.

13. COP10 of the Convention for Biological Diversity (Nagoya, October 2010) adopted the Strategic Plan for Biodiversity 2011–2020. Target 9 aims are: “invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment”. Management of invasive species to minimize their spread and impact should be based on the ecosystem approach. This methodological framework for supporting the decision-making process recognizes the full economic and ecological value of ecosystems and envisages the management of all environment components and living resources, including invasive species, in promoting economic growth and warranting biodiversity protection.

14. A number of CMS Agreements have already made progress towards tackling the threats posed by invasive species to species listed on Appendix II. In 2006, the African-Eurasian Migratory Waterbird Agreement (AEWA) adopted Guidelines on Avoidance of Introductions of Non-Native Waterbird Species. These guidelines focus on the importance of

putting in place appropriate measures to prevent the unintentional release of non-native waterbird species that might threaten native flora and fauna as well as to control those that have already been introduced and proved to be high-risk. A study on the impact of invasive alien aquatic weeds on waterbird habitats in Africa has been discussed at the 10<sup>th</sup> Meeting of the AEW Technical Committee in September 2011(AEWA TC10.44).

15. The Agreement on the Conservation of Albatrosses and Petrels (ACAP) has also adopted Conservation Guidelines that aim to assist with the development of plans for the eradication of introduced vertebrates from breeding sites of ACAP species. Introduced mammals have seriously threatened the breeding success of seabirds on many islands. These guidelines relate mainly to islands but many of the same principles apply to mainland sites.

16. In 2010, the Common Wadden Sea Secretariat, which supports the Agreement on the Conservation of Seals in the Wadden Sea as well as the Trilateral Sea Cooperation, adopted the Wadden Sea Plan 2010. This Plan foresees intensified support and efforts to harmonize approaches to the prevention, management and monitoring of aquatic and terrestrial invasive species introductions. It also foresees the development of a common strategy for dealing with invasive species associated with ballast waters and aquaculture at the next Ministerial Conference in 2013.

### **Future strategies**

17. Invasive species are considered in the updated CMS Strategic Plan 2006-2014 (UNEP/CMS/Conf.10.22) as one of the threats to migratory species, recognizing the inter-linkages between invasive species and migratory species and the need to deal with this issue. The Secretariat recently conducted a preliminary analysis of species currently listed in the Appendices to the Convention to examine whether, how and to what extent invasive species affect them and to provide general figures on such impacts. Information was obtained from original proposals for the inclusion of species on the Appendices, IUCN Red List of Threatened Species, GROMS (Global Register of Migratory Species) and IMS (CMS Information Management System).

18. Specific questionnaires were sent in 2007 to scientific councillors, focal points and relevant partners, and a further call took place in 2009 through a web announcement. The results of this preliminary analysis showed that more than 20 percent of the individual species, sub-species and/or populations of birds, mammals, fish and reptiles, currently listed on the CMS Appendices appear to be or have been threatened by invasive species. The results also indicate that our understanding of these threats is biased towards certain groups of migratory species and threats. In many cases, the occurrence and effects of these threats can be only assumed or predicted as only anecdotal documentation is available.

19. Predation is the main impact from invasive alien species on migratory species at their breeding sites. A range of IAS preys upon migratory birds, reptiles and mammals, both terrestrial and marine. Birds are however those that experience most decline or even local extinction on islands. Other threats, both direct and indirect impacts that might cause biological or behavioural changes of the migratory species occur to a lesser extent. The impact of competition and hybridization, for instance, is difficult to quantify, though closely related species are likely to compete and interbreed.

20. With increasing biological invasions due to continuing growth in trade, tourism and global change, it is important to ensure that future management of migratory species and their habitats adequately takes into account consequent impacts and risks posed by invasive species. It is crucial for governments and conservation managers to monitor migratory species processes to better understand how and to what extent they are affected and to respond to these threats. Three important elements need to be addressed:

- Improvement of understanding of interactions between IAS and threatened migratory species;
- Development of priorities for intervention; and
- Improvement in international cooperation and development of adaptable management strategies.

**Action requested:**

The Scientific Council is invited to:

- a. consider and discuss the issues raised by this paper;
- b. urge Parties to implement measures and recommendations included in CMS and CMS related instruments Species Action Plans which relate to invasive alien species;
- c. provide advice on future steps for the Convention regarding invasive species and, in particular, the opportunity to undertake an in-depth review of the impact of invasive species on migratory species; and
- d. encourage further research and contribute to collection of data on impacts on migratory species posed by invasive species.