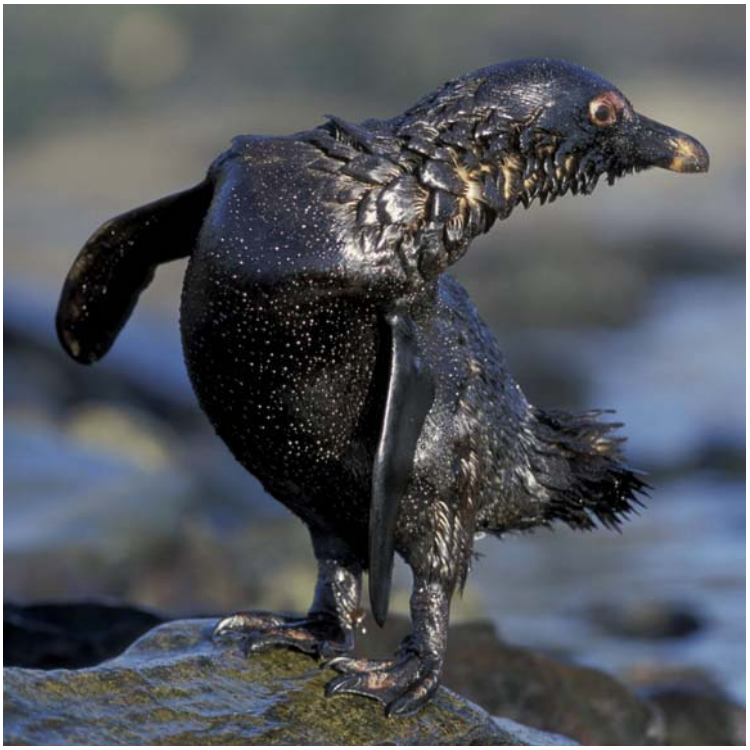
TECHNICAL SERIES No.16

AEWA

AEWA Conservation Guidelines No. 2

Guidelines on identifying and tackling emergency situations for migratory waterbirds



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Introduction

In Article II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds, Parties agree, as a fundamental principle, to take co-ordinated measures to maintain migratory waterbird species in a favourable conservation status or to restore them to such a status. To this end, the Parties agree to apply within the limits of their national jurisdiction a number of general conservation measures prescribed in Article III of the Agreement, as well as a number of more specific actions determined in the Action Plan appended to the Agreement. In paragraph 7.3 of the Action Plan, the Agreement Secretariat is required to co-ordinate the development of a series of Conservation Guidelines to assist the Parties in the implementation of their obligations under the Agreement. These Conservation Guidelines, which should be prepared in co-ordination with the Technical Committee and with the assistance of experts from Range States, were submitted to the First and Second Meetings of the Parties, which recommended publication after minor amendment, and further recommended regular review (Article IV, paragraph 4 of the Agreement). The Technical Committee keeps the guidelines under review, and formulates draft recommendations and resolutions relating to their development, content and implementation for consideration at sessions of the Meeting of the Parties (paragraph 7.6 of the Action Plan).

Paragraph 7.3 of the Action Plan gives a list of some of the topics that should be covered by the Conservation Guidelines. These are as follows:

(a) single species action plans;
(b) emergency measures;
(c) preparation of site inventories and habitat management methods;
(d) hunting practices;
(e) trade in waterbirds;
(f) tourism;
(g) reducing crop damage;
(h) a waterbird monitoring protocol.

Preparation of the Conservation Guidelines was identified as a major activity in the *International Implementation Plan for the Agreement of the Conservation of African-Eurasian Migratory Waterbirds 1997-1999*, prepared by Wetlands International in April 1997 with financial support from the Ministry of Agriculture, Nature Management and Fisheries in The Netherlands. Activity 3 of the *Implementation Plan* involved the preparation of nine sets of conservation guidelines, following the list in paragraph 7.3 of the Action Plan, but treating site inventories and habitat management methods as two separate topics. These Guidelines were accepted by the first Meeting of the Parties in Cape Town, South Africa, in November 1999, subject to minor amendment. The necessary amendments were made after discussion by the Technical Committee, and the amended version of the Conservation Guidelines was accepted by the second Meeting of the Parties to the Agreement in Bonn, Germany, in September 2002.

The nine sets of guidelines, as set out in the *Implementation Plan* and presented here, are as follows:

1. Guidelines on the preparation of Single Species Action Plans for migratory waterbirds

In paragraph 2.2.1 of the Action Plan, Parties are required to co-operate with a view to developing and implementing international single species action plans for populations listed in Category 1 in Column A of Table 1 as a priority and also for those populations listed with an asterisk in Column A of Table 1. Furthermore, in paragraph 2.2.2, Parties are required to prepare and implement national single species action plans for all those populations listed in Column A of Table 1 with a view to improving their overall conservation status. The Agreement Secretariat is required to co-ordinate the development, harmonisation and implementation of these plans. The present guidelines focus on national single species action plans. They outline a standard procedure for the preparation of such action plans, and identify the priority species and populations occurring in the Agreement Area.

2. Guidelines on identifying and tackling emergency situations for migratory waterbirds

In some situations, populations of waterbirds can suddenly be subjected to much higher levels of mortality than normal. These emergency situations can arise as a result of natural phenomena, such as periods of exceptionally cold weather or prolonged droughts, or as a result of man-made disasters, such as major pollution incidents. International co-operation is required to address these situations without delay. In Article III, paragraph 2 (f) of the Agreement, Parties agree to co-operate in emergency situations requiring international concerted action and in identifying the species of migratory waterbirds, which are the most vulnerable to these situations. Furthermore, Parties agree to co-operate in developing appropriate emergency procedures to provide increased protection to these species in such situations. In paragraph 2.3 of the Action Plan, Parties are required, in close co-operation with each other whenever possible and relevant, to develop and implement emergency measures for populations listed in Table 1, when exceptionally unfavourable or endangering conditions occur anywhere in the Agreement Area. At its third session, the AEWA Technical Committee adopted criteria to define emergency situations, which require urgent conservation measures, and determined the modalities for assigning responsibility for action to be taken (Article VI, paragraph 7 (e) of the Agreement). The present guidelines identify many of the possible emergency situations that may arise, and outline procedures for establishing early warning systems and tackling these situations at national level.

3. Guidelines on the preparation of site inventories for migratory waterbirds

In Article III, paragraph 2 (c) of the Agreement, Parties are required to identify sites and habitats for migratory waterbirds occurring within their territory. More specifically, in Paragraph 3.1.1 of the Action Plan, Parties are required, in liaison where appropriate with competent international organisations, to undertake and publish national inventories of the habitats within their territory, which are important to populations listed in Table 1. Parties should endeavour, as a matter of priority, to identify all sites of international or national importance for populations listed in Table 1 (Paragraph 3.1.2). These guidelines develop a step-wise approach to the inventory process, which takes full advantage of existing regional and national wetland inventories and lists of sites important for migratory waterbirds.

4. Guidelines on the management of key sites for migratory waterbirds

In Article III, paragraph 2 (c) of the Agreement, Parties are required to encourage the protection, management, rehabilitation and restoration of sites and habitats for migratory waterbirds occurring within their territory. More specifically, in Paragraph 3.2.1 of the Action Plan, Parties are required to endeavour to continue establishing protected areas to conserve habitats important for the populations listed in Table 1 of the Action Plan, and to develop and implement management plans for these areas. These guidelines set forth the basic procedures for the design and implementation of management plans, with special reference to sites of importance for migratory waterbirds.

5. Guidelines on sustainable harvest of migratory waterbirds

If populations of migratory waterbirds are to be maintained in a favourable conservation status, it is essential that any exploitation of these populations be carried out on a sustainable basis. Article III, paragraph 2 (b) of the Agreement requires that Parties ensure that any use of migratory waterbirds is based on an assessment of the best available knowledge of their ecology, and is sustainable for the species as well as for the ecological systems that support them. In paragraph 4.1.1 of the Action Plan, Parties are required to co-operate to ensure that their hunting legislation implements the principle of sustainable use as envisaged in the Action Plan, taking into account the full geographical range of the waterbird populations concerned and their life history characteristics. The present guidelines promote the establishment of 'harvest frameworks' at both international and national levels, and identify a series of steps to assist Range States in adopting a sustainable approach to the harvesting of waterbirds.

6. Guidelines on regulating trade in migratory waterbirds

Paragraph 7.3 of the Action Plan requires that guidelines be provided on the regulation of trade in waterbirds. Although it seems that there is relatively little international trade in migratory waterbirds in the Agreement Area, national (or domestic) trade can be very high, involving annual harvests of many thousands of birds for sale as food in local markets. In some areas, such trade may be of considerable

importance to the local economies. These guidelines concern both international and domestic trade, and offer practical advice on how trade in waterbirds can be regulated within the framework of sustainable harvests.

7. Guidelines on the development of ecotourism at wetlands

The development of ecotourism based on spectacular concentrations of migratory waterbirds can not only increase support amongst the general public for waterbird conservation, but can also, if properly managed, provide a valuable source of income for local people with negligible harm to the environment. In Paragraph 4.2.1 of the Action Plan, Parties are required to encourage, where appropriate, the elaboration of co-operative programmes to develop sensitive and appropriate ecotourism at wetlands. Furthermore, in Paragraph 4.2.2, Parties are required, in co-operation with competent international organisations, to endeavour to evaluate the costs, benefits and other consequences that can result from ecotourism at wetlands with concentrations of waterbirds. The present guidelines examine a wide range of issues relating to nature-oriented tourism in general, and offer practical advice for the sensitive development of ecotourism at wetlands important for migratory birds.

8. Guidelines on reducing crop damage, damage to fisheries and other forms of conflict between waterbirds and human activities

Changes in population levels and distribution of waterbirds, combined with an intensification of agriculture and aquaculture, have led to increased conflicts between some waterbird species and human activities, notably agriculture, aquaculture, and commercial and recreational fisheries. With the great increase in air traffic in recent decades, many large waterbirds now pose a serious hazard to aircraft. In Paragraph 4.3.2 of the Action Plan, Parties are required to endeavour to gather information on the damage, in particular to crops, caused by populations listed in Table 1, and report the results to the Agreement Secretariat. In paragraph 4.3.3, Parties are required to co-operate with a view to identifying appropriate techniques to minimise the damage, or to mitigate the effects of damage, in particular to crops, caused by populations of waterbirds listed in Table 1. The present guidelines examine the major causes of conflict between migratory waterbirds and agriculture, fisheries and aviation, outline procedures for investigating the problems, and suggest a number of measures that can be taken to reduce the damage.

9. Guidelines for a waterbird monitoring protocol

Populations of all migratory waterbirds in the Agreement Area should be monitored on a continuous basis to determine population trends and to provide an early-warning system for species in difficulty. This will enable appropriate measures to be implemented before the populations fall to dangerously low levels. Paragraph 5.2 of the Action Plan requires that Parties endeavour to monitor the populations of waterbirds listed in Table 1, and make the results of such monitoring available to appropriate international organisations, to enable reviews of population status and trends. Paragraph 5.3 requires that they co-operate to improve the measurement of bird population trends as a criterion for describing the status of such populations. In Paragraph 5.8, Parties agree to co-operate with relevant international organisations to support research and monitoring projects. The present guidelines examine the value of monitoring in the conservation of migratory waterbirds, review existing monitoring practices, and provide guidance on the development of national waterbird monitoring schemes that are most appropriate for international conservation efforts.

Acknowledgements

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Guidelines 1 to 9 were drafted by Albert Beintema, the late Dineke Beintema, Allix Brenninkmeijer, Simon Delany and Jeff Kirby and edited by Simon Delany and Derek Scott.

Drafts of five guidelines were discussed in Workshop 2 during the 2nd International Conference on Wetlands and Development in Dakar, November 1998. Many workshop participants gave useful comments.

The following people, in alphabetical order, provided information used for these guidelines, or commented on various drafts: Rachel Adams, Mindy Baha El Din, Sherif Baha El Din, Carlos Bento, Olivier Biber, Gerard Boere, Joost Brouwer, Luit Buurma, John Caldwell, John Clorley, Luis Costa, Earle Cummings, Elijah Danso, Nick Davidson, Bernard Deceuninck, Tim Dodman, Bob Douthwaite, Paul Eagles, Bart Ebbinge, Augustine Ezealor, Lincoln Fishpool, Vincent Fleming, Scott Frazier, Umberto Gallo-Orsi, Mariano Gimenez-Dixon, Andy Green, Patrick Green, Ward Hagemeijer, Elizabeth Halpenny, Jens Haugaard, René Henkens, John Harradine, David Hill, Baz Hughes, Alan Johnson, Tim Jones, Heribert Kalchreuter, Elena Kreuzberg-Mukhina, Namory Keita, Alexander Kozulin, Tony Laws, Yves Lecocq, Vicky Lee, Aivar Leito, Bert Lenten, Peter Leonard, Alison Littlewood, Heidi Luquer, Sonja Macys, Jesper Madsen, Gernant Magnin, Jamshid Mansoori, David Melville, Charles Mlingwa, Jerôme Mokoko Ikonga, Jean-Yves Mondain-Monval, Johan Mooij, Mike Moser, Wim Mullié, Dan Munteanu, Paul Murphy, Stephen Nash, Kike Olsder, John O'Sullivan, Michael Oneka, Dwight Peck, Stephan Pihl, Jim Porter, Crawford Prentice, David Pritchard, Rivo Rabarisoa, Marc van Roomen, Paul Rose, Rui Rufino, Luc Schifferli, Valentin Serebryakov, Marcel Silvius, Jan Willem Sneep, David Stroud, Barry Taylor, Wolf Teunissen, Graham Tucker, Janine van Vessem, Zoltan Waliczky, George Wallace, Rob van Westrienen, Johanna Winkelman, Marja Wren, Henk Zingstra.

AEWA Conservation Guidelines No.2

Guidelines on identifying and tackling emergency situations for migratory waterbirds

Prepared by Wetlands International

and

Adopted by the Meeting of the Parties to AEWA at its second session
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Step chart

To identify and tackle emergency situations affecting migratory waterbirds, each country should take the following steps:

Step 1: Identify lead agencies, and divide tasks both nationally and internationally.

Step 2: Produce a list of possible emergency situations involving migratory waterbirds.

Step 3: Rank waterbird sites according to their susceptibility to emergency situations.

Step 4: Identify potential risks and negotiate safety measures with industries located near waterbird sites.

Step 5: Establish a national Emergency Response Notification System.

Step 6: Adopt new legislation or adapt existing legislation where appropriate.

Step 7: Raise public awareness.

Introduction

An emergency situation for migratory waterbirds is a situation where a sudden, unusual change takes place (or is likely to take place) in the occurrence or mortality rate of waterbirds, or in the extent or condition of the habitats on which they depend. While it might not always be possible to deal with such situations effectively, it is very important to react as publicly as possible to draw people's attention to the situation. Public awareness is of extreme importance, especially in the case of human-induced catastrophic events, because it may help to prevent similar events from happening in the future.

Thus, keywords in successfully addressing emergency situations are:
- alertness
- public awareness
- prevention

Emergency situations can be recognised when:
- populations of waterbirds show sudden changes in size, distribution or mortality rate;
- conditions occur which by experience are known to lead to such changes.

Although it is the effect on populations that really matters, it is important to be able to recognise the conditions as soon as they occur, because by the time population changes are apparent, it is often too late to take effective action.

It is not easy to define criteria for recognising conditions that lead to emergency situations for the entire AEWA area. This will vary between regions and countries. In some areas, a small change in numbers may be alarming, while in other areas huge fluctuations are normal. Severe frost, for example, may be catastrophic in temperate Europe, will never occur in most of Africa, and is quite normal in Siberia. Peat fires may destroy waterbird habitats in northern latitudes, but are irrelevant to desert countries in Africa and the Middle East, and so on. Each country (or group of adjacent countries with similar conditions) will have to develop its own criteria.

Development of national criteria within the AEWA framework should be based specifically on the effects of an event on waterbirds. For migratory waterbirds, an event can always be classified as an emergency situation when:
- individuals of a Globally Threatened species are involved;
- more than 10% of the flyway population of a species with an unfavourable conservation status is threatened (these species are listed in Columns A and B of Table 1 of the AEWA Action Plan);
- more than 30% of the flyway population of a species with a favourable conservation status is threatened (these species are listed in Column C of Table 1 of the AEWA Action Plan).

A clear distinction should be made between permanent or slowly developing threats and sudden emergencies. Permanent threats and threat assessment are dealt with in Guidelines No.4: *Guidelines on the management of key sites for migratory waterbirds*.

Step 1: Identify lead agencies, and divide tasks both nationally and internationally

A national co-ordinator for emergency situations concerning migratory waterbirds should be appointed. As implementation of the AEWA Action Plan is a governmental responsibility, it is logical for the national co-ordinator for emergency situations to be someone with a position in a governmental agency or institute. However, it would also be possible to appoint an independent individual, or someone working in a non-governmental organisation (NGO), provided he or she can get sufficient support (financial, logistical and legal) from the government agency responsible for implementation of the AEWA.

Emergency situations are, by definition, unexpected, and very often call for rapid input of resources (especially manpower) for relatively short periods of time. Very often this includes a great deal of private effort from volunteers, and heavy involvement of NGOs. The respective roles of all agencies, both governmental and non-governmental, that might be involved in tackling emergency situations should be clearly defined.

The industrial sector and sometimes also governmental institutions are often reluctant to take safety measures because these may be costly. It often takes a disaster to change attitudes, and this is where NGOs may play an important role. In the case of emergency situations that arise as a result of neglect or failing legislation, government agencies are often eager to avoid publicity. However, public opinion is often extremely important in creating the pressure needed to stimulate action. NGOs may sometimes be better situated than government agencies in this respect. The national co-ordinator should therefore endeavour to locate financial resources to support NGOs dealing with emergency situations.

Emergency situations affecting migratory waterbirds often have international dimensions. The national co-ordinators of countries involved in a particular emergency situation should liaise with each other and with the AEWA Secretariat. International co-ordination of measures taken in the case of an international emergency situation should rest with the AEWA Secretariat, acting on the advice of the AEWA Technical Committee.

Step 2: Produce a list of possible emergency situations involving migratory waterbirds

Emergency situations for migratory waterbirds can be caused by human actions or by natural causes, although the distinction is not always clear (see Box 1).

Box 1: The human factor in the impact of a natural disaster

A non-AEWA example

This example features a non-migratory, non-waterbird from outside the AEWA area, but is one of the best examples to illustrate how human activities can affect the impact of natural disasters.

In 1989, Hurricane Hugo hit the coast of South Carolina in the USA, and severely damaged the Francis Marion National Forest. This would not have been a national ornithological emergency situation, had this forest not been the last stronghold of the Red-cockaded Woodpecker *Picoides borealis*, a species threatened with extinction.

The Red-cockaded Woodpecker lives in long-leaf pine forests, nesting in trees of 90 years of age and older that suffer from heart rot. Forestry management had rendered virtually all forests in its former range unsuitable for nesting, reducing its range to a few pockets, with over 60% of the world population in one single forest: the Francis Marion National Forest. Hurricane Hugo knocked down 90% of the trees suitable for nesting.

After some years with very low productivity, the species is now gradually recovering, thanks to new nesting trees becoming available through ageing, and the use of artificial nest sites.

(source: South Carolina Department of Natural Resources)

An AEWA example

Due to eutrophication and impoverishment of wetland habitats, the number of large insect species in Northwest European marshes has been greatly reduced. Large insects such as dragonflies are the main source of food for chicks of the Black Tern *Chlidonias niger*.

The occurrence of dragonflies shows distinct seasonal peaks, which differ between species. With fewer species available, there is an increased risk of short periods when no food is available for the tern chicks. This problem does not appear in breeding seasons with fine weather, but can occur during breeding seasons with periods of adverse weather.

Mass mortality of Black Tern chicks is often observed during prolonged periods of cold, rainy weather, and it may be concluded that the weather is causing an emergency situation. However, in a more diverse habitat with more prey species available, the same weather conditions would not cause an emergency at all.

In The Netherlands, a former major stronghold of the species in the Western Palearctic, Black Terns have shown a decline of more than 90% in recent decades.

(Source: Beintema, 1997)

Possible causes of emergency situations are:

- Extreme weather
- Earthquakes and volcanic activity
- Infectious diseases
- Botulism
- Harmful algal blooms
- Predation
- Introduction of alien species
- Fire

- Oil spills
- Chemical pollution
- Nuclear accidents
- Lead poisoning
- War

These are briefly discussed below.

Extreme weather

Extreme weather conditions affecting waterbirds include:
- adverse weather during the breeding season, causing low reproductive success;
- unusually cold weather in winter at temperate and northern latitudes, causing high mortality;
- excessive rainfall and flooding;
- drought.

The weather is beyond human control. Once populations of waterbirds have been affected, the only practical measure that can be taken is to optimise conditions for the recovery of the populations by increasing protection (see Box 2).

Box 2: Migratory waterbirds in the cold

Problems with cold weather are typical of those parts of the AEWA that lie close to the frost-line in the northern winter and support large numbers of wintering waterbirds. The countries involved lie in a belt running from Northwest Europe southeast through Central Europe and the Black Sea region to the countries bordering the southern half of the Caspian Sea.

Two possible measures to help waterbirds through a severe winter are winter feeding and shooting bans.

Winter feeding

Winter feeding is popular in many parts of Europe, but should not be encouraged. Common species such as the Mallard *Anas platyrhynchos* and Common Coot *Fulica atra* tend to profit disproportionately, because they are well adapted to the human environment. The shyer, rarer or more vulnerable species often escape attention, and may even suffer from competitive disadvantages.

Shooting bans

As winter conditions vary greatly between countries, the criteria for imposing shooting bans will have to be defined specifically for each country involved, in close collaboration with hunting organisations. Co-ordination between countries is necessary to avoid situations in which birds escaping cold weather in one country are shot in large numbers in a neighbouring country. The AEWA Technical Committee could play a central role in this international co-ordination.

The following example of a protocol for the introduction of a temporary shooting ban was developed in Great Britain, and is based on ground conditions. The protocol consists of six steps:
1. If the ground has been reported frozen for 5 successive days for more than half of the British weather stations, a state of alert is declared.
2. On the 7th day the hunters' organisation is informed. This organisation will then gather its own data, and call for voluntary restraint in shooting.
3. On the 13th day, the Secretary of State is asked to institute a shooting ban, which, after signing, comes into effect at 9 am on the 15th day.
4. Three consecutive days of intermittent thaw terminates the count-down process.
5. Shooting is banned for an initial period of 14 days, but this period can be extended or shortened, depending on conditions.
6. Bans can be instituted for Great Britain as a whole, or for Scotland, Wales or England alone.

(Source: Stroud, 1992)

Flooding is not normally a problem for waterbirds outside the breeding season, but may be catastrophic for nesting birds. River flooding is compounded by deforestation and loss of wetlands upstream, both of which lead to accelerated runoff. Wise management of river basins often requires international co-operation.

Drought may cause waterbirds to move out of an area. If there are insufficient alternative sites for the displaced birds, this may be classified as an emergency situation. Drought affects both breeding birds and non-breeding birds. Artificial flooding as a remedy for drought should be treated with caution, as irregular drought may be essential to the maintenance of certain natural ecosystems (*e.g.* in the Sahelian floodplains in Africa).

Infectious diseases

Infectious diseases, such as bird malaria, bird influenza (bird 'plague') and bird cholera, are serious threats to poultry, but rarely reach epidemic proportions in nature. A more serious potential threat is Newcastle disease (see Box 3).

Earthquakes and volcanic activity

Earthquakes and volcanic activity have unpredictable and catastrophic impacts over wide geographical areas. There are no well-documented cases of these impacts adversely affecting waterbird populations, but in 1997 on the West Indies island of Montserrat a major volcanic eruption destroyed most of the habitat of the endemic, globally threatened, forest-dwelling Montserrat Oriole *Icterus oberi.*

In the event of such a natural catastrophe, rapid deployment of scientists with appropriate experience to assess the situation and implement remedial measures is essential. Assesment of the neccessity for and feasibility of a captive breeding programme for any threatened population might be included in such an assessment. See:
http://www.rspb.org.uk/science/ecology/otherwork/montserratoriole/index.asp

Botulism

Botulism is caused by the bacterium *Clostridium botulinum* Type C, which develops in decaying protein where it may produce a highly poisonous toxin. The toxin is only produced when the bacterium itself is infected with a specific bacteriophage, and only at temperatures above 20°C.

Outbreaks may occur when infected carcasses lie exposed on the surface and insects spread the infection to other carcasses. Botulism occurs in shallow water with little flow, and is often associated with oxygen depletion after collapsing algal blooms. This happens more often in artificial water bodies than in nature, and is aggravated by eutrophication (see Box 3).

The USA and Canada have the longest tradition of combating botulism, and have developed a variety of measures aimed at reducing the frequency of outbreaks. However, some of these are considered to be inappropriate for the AEWA area, as they bring about drastic permanent changes to the wetlands. The only measures that are ecologically acceptable are temporarily increasing water depth, improving water circulation (and oxygenation) and, if the site is accessible and enough people can be mobilised, removal of carcasses. Emphasis should be on prevention through the maintenance of water quality.

Harmful algal blooms

Red tides (brown tides) are massive blooms of microscopic algae occurring in relatively warm seas. When algae die off, bacterial breakdown may result in anoxic conditions. Mortality of fish and shellfish may be followed by mass mortality of waterbirds (see Box 3), especially if the birds are unable to move elsewhere, *e.g.* young birds at breeding colonies. Red tides have been known since historic times, but now occur with increasing frequency in coastal

areas where the sea has been enriched with nutrients (eutrophication). Blooms of blue-green algae also occur in fresh water.

Once an algal bloom is in progress, it is too late to do much, as the algae will die and decompose anyway. The problem can be 'diluted' by increasing water flow, which also helps to aerate the water. The main solution to the problem of harmful algal blooms is prevention through the maintenance of water quality.

Box 3: Dangerous micro-organisms

Newcastle disease

Newcastle disease is a highly infectious, debilitating viral poultry disease that may be very dangerous for concentrations of waterbirds. Symptoms are rapid breathing, neck twisting and paralysis.

Species of Anatidae are fortunate in being resistant to Newcastle disease, but other families of waterbirds are vulnerable. There have been no recorded outbreaks of the disease in the AEWA area, but mass mortality of cormorants *Phalacrocorax* spp. and terns *Sterna* spp. has been reported in the USA and Canada. Newcastle disease has been found in poultry in the AEWA area, and there is therefore always a risk of an outbreak occurring at sites with concentrations of waterbirds.

South Africa has imposed severe restrictions on the taking of poultry products to their outlying weather stations on Marion Island in the Indian Ocean and Gough Island in the Atlantic, to avoid the possibility of introducing Newcastle disease amongst the millions of nesting seabirds.

Botulism

Mass mortality of waterbirds from botulism was first observed in the USA, where it now affects millions of waterbirds every year. In the AEWA area, botulism has been reported in Europe and South Africa. Countries that have reported outbreaks of botulism include:

Year first reported	Country
1910	USA
1914	Canada
1923	Uruguay
1937	Australia
1960	South Africa
1967	Denmark
1969	UK
1970	Netherlands
1971	Germany
1972	New Zealand
1973	Italy
1973	Spain
1973	Japan
1976	Mexico

(Source: *Avian botulism overview*: http://www.pnr-rpn.ec.gc.ca/nature/migratorybirds/avianb/ce00s02.en.html)

Poisonous algal blooms

Some dinoflagellates causing algal blooms, such as *Alexandrium* spp., produce toxins that accumulate in filter-feeding molluscs, which are not affected themselves. Consumption of such molluscs may produce various kinds of poisoning in humans, one of which, Paralytic Shellfish Poisoning (PSP), can be lethal, and may also kill large numbers of seabirds. PSP is indigenous to North America, but PSP-toxin producing algae have been found in European and Australian waters since the 1980s, and outbreaks have been recorded in Portugal in recent years.

Predation

An emergency situation warranting predator control may arise when predators reach previously predator-free islands with breeding colonies of waterbirds. In such cases, total eradication of the predator on the island may be the only solution, especially if the birds have no safe alternative sites in the vicinity.

Introduction of alien species

The three main types of alien species that may threaten waterbirds to the point of an emergency situation are:

- alien predators (*e.g.* North American Mink *Mustela vison* in Europe);
- alien waterbirds (*e.g.* Ruddy Duck *Oxyura jamaicensis* competing with White-headed Duck *Oxyura leucocephala*);
- invasive plant species that cause major changes to the habitat (*e.g. Pistia stratiotis* and *Eichhornia crassipes* in warm countries).

Once an alien species has become widely established, eradication may prove to be impossible. Public awareness of the potential problems of alien species and prevention of further introductions are therefore the key issues. No alien species should ever be deliberately introduced without detailed assessment of the possible consequences.

Fire

Fire can pose a threat to waterbird habitats in two main ways:

- direct effects of peat fires;
- indirect effects of oil fires.

Peat fires may destroy boreal and sub-arctic bogs and tropical peat swamps. The risk is increased when water levels have been lowered for agriculture. Peat fires are difficult to combat, as they can burn underground and continue to smoulder and spread unnoticed for long periods. Digging ditches to stop the spread of a fire may help, but there is a risk that opening up the soil will enable fresh air to reach the smouldering peat, thus re-activating the fire. Ditches are also damaging to wetlands, and if not thoroughly closed afterwards, will increase drainage. Legal restrictions on the use of fire in sensitive areas may help in the prevention of fires.

Oil fires are related to large spills or accidents at oil plants. Burning oil produces thick, black smoke that may be carried by wind over great distances. Soot pollution can cause digestive problems in waterbirds. In northern regions, blackened snow alters melting patterns, and this can disrupt ecological processes. Soot-covered food resources may be unsuitable or poisonous for waterbirds.

Oil spills

The most common causes of major oil spills are accidents with ships, illegal emissions from ships, and accidents or leakages at oil plants or pipelines (see Box 4). Spills from ships most often affect coastal wetlands, but may also occur in lakes and rivers. Oil contamination may kill large numbers of waterbirds by:

- affecting the waterproofing of the feathers;
- poisoning through ingestion when preening;
- affecting the food resources.

Prevention of spills from ships is difficult. Legal measures, which often require international agreements, include:

- restrictions on the use of inshore shipping lanes by oil tankers;
- mandatory safety procedures;
- bans on dumping.

In the case of coastal spills, the use of detergents is often presented as a solution, but the side effects on marine food webs may be as serious as the effects of the oil spill. Mechanical removal of oil is preferable, but this requires considerable human resources and may be costly. Involvement of volunteers is important. The removal of oil involves:

- cleaning coastlines manually (*e.g.* with shovels);
- use of high-pressure water hoses (especially on rocky shores);
- containing inshore floating oil in inflatable devices;
- sucking up floating oil from ships (in combination with floaters).

The rehabilitation of individual oiled birds is difficult and costly, and often has poor results. Even if successful, the impact on population levels is frequently minimal. However, such operations have good media value for raising public awareness. For details of successful rehabilitation of African Penguins following the June 2000 *Treasure* oil spill off Cape Town, South Africa, see: http://web.uct.ac.za/depts/stats/adu/oilspill/

Box 4: When the pipeline bursts

A major leak in a Russian pipeline in the Ousinsk Region, Republic of Komi (Siberia), in August 1994 resulted in 14,000 tons of oil spilling into the environment.

The response included clean-up operations, the construction of four dams on watercourses and the construction of various embankments.

In September/October 1994, the dams collapsed due to heavy rainfall. Oil contaminated two tributaries of the Pechora River, the Kolva and the Ousa.

In November/December 1994, the damaged pipeline was repaired, and clean-up operations were carried out along the affected rivers.

The Komi oil spill may have affected populations of swans, ducks and seabirds. No figures are available for the numbers of birds affected. However, AEWA species vulnerable to oiling in the area include:

- Bewick's Swan *Cygnus columbianus bewickii*
- Whooper Swan *Cygnus cygnus*
- Common Eider *Somateria mollissima*
- King Eider *Somateria spectabilis*
- Steller's Eider *Polysticta stelleri*
- Long-tailed Duck *Clangula hyemalis*

(Source: World Conservation Monitoring Centre)

Chemical pollution

Major sources of chemical pollution are:

- incidents and accidents (spills, situations comparable to oil spills);
- permanent pollution from untreated industrial waste;
- permanent pollution from agro-chemicals.

Untreated chemical waste flowing into rivers may cause incidental mass mortality in fish and waterbirds, but as chemicals often bind to silt, which accumulates in estuaries, pollution may be more structurally present in estuarine habitats. As the problem often develops gradually, it rarely leads to sudden emergency situations (see Box 5). Direct poisoning of birds by pesticides does not often occur, and is most commonly reported in Africa. In wet agriculture, such as rice fields, mortality may include waterbirds.

The collapse of tailings ponds associated with mineral mining are a regular cause of large-scale chemical pollution of extensive wetland complexes. Catastrophes of this type in Europe polluted the Coto Doñana in Spain with heavy metals in April 1998, and the Tisza and Danube rivers with arsenic in January-February 1999. See:

http://www.yale.edu/ynhti/curriculum/units/1999/6/99.06.01.x.html
http://www.reliefweb.int/w/rwb.nsf/0/4e30736ba1fddbbdc12568e300630b90?OpenDocument

Nitrogen emission from agricultural fertilisers rarely leads directly to emergencies, but the resulting eutrophication of water bodies increases the risk of algal blooms and botulism. Acid rain resulting from nitrogen emission may sterilise poorly buffered waters in northern latitudes, but it is difficult to decide at what stage an emergency should be declared.

Box 5: Gradual pollution leading to a global emergency

A gradual development turned into an emergency in the 1960s when organo-chloride compounds building up through food chains suddenly caused mass mortality in piscivorous birds.

Over a period of years, fish-eating birds had accumulated the poisonous compounds in their fat. When the fat reserves were needed, the poison was released into the bloodstream, and the victims died instantaneously as the poison affected their nervous systems. Sandwich Terns *Sterna sandvicensis* literally dropped dead from the sky.

The problem was most acute in countries bordering the North Sea in Europe, where waste products from the DDT manufacturing industry contaminated the sea.

Species of tern *Sterna* spp. and Eider Ducks *Somateria mollissima* suffered the greatest mortality, with the population of Sandwich Terns declining by more than 95%.

Widespread publicity and research led to a worldwide ban on DDT and some of its derivatives. Since the ban on DDT, populations of the affected waterbirds have been recovering gradually.

(Source: Koeman & Van Genderen, 1966)

Nuclear accidents

Radiation following nuclear accidents is a serious health risk for individuals, but nothing is known about its effects at population level. For example, it is not known how waterbird populations might have been affected, numerically or genetically, by the April 1986 accident at Chernobyl, Ukraine.

Lead poisoning

An emergency situation may develop when lowered water levels bring large deposits of spent lead shotgun pellets or fishing weights within reach of waterbirds, causing sudden mass mortality. A slight rise in water level can cure the problem temporarily. In early 2003, more than 40 Greater Flamingos *Phoenicopterus ruber* died in this way at Larnaca Salt lake in Cyprus.

A number of AEWA Range States have banned the use of lead shot in hunting, while a number of others have similar bans under study. Parties to the AEWA agreed to endeavour to phase out the use of lead shot for hunting in wetlands by the year 2000 (Paragraph 4.1.4 in the AEWA Action Plan).

Raising public awareness is an important issue, as in many countries lead poisoning is not recognised as a problem, and the environmental dangers have yet to be recognised.

War

Where waterbird sites are threatened or destroyed in war situations, records should be kept of the changes that occur, for use in possible future restoration projects.

Step 3: Rank waterbird sites according to their susceptibility to emergency situations

At this stage, susceptibility is based purely on the occurrence of important numbers of migratory waterbirds, irrespective of the presence of nearby threats (see Step 4). The more important a site is for migratory waterbirds, the more serious an emergency situation would be.

Sites should be ranked according to their importance for migratory waterbirds. Ranking can be based on the national site inventory (see Guidelines No.3: *Guidelines on the preparation of site inventories for migratory waterbirds*), if available. Results from a national waterbird monitoring scheme can be used in the ranking, if available (See Guidelines No.9 *Guidelines for a waterbird moitoring protocol*.) Alternatively, ranking can be based on the best possible judgement of local experts.

Ranking is important if resources are insufficient to carry out risk assessments at all sites, or to include all sites in an early warning system (Step 5).

The ranking system should be kept simple. It does not really matter whether similar sites rank sixth or seventh in the list, and any large differences will usually be evident. Thus, complicated, time-consuming calculations should be avoided. Furthermore, in many cases the available data will be incomplete.

Sites harbouring globally threatened species or other species or populations qualifying for Single Species Action Plans should be given the highest ranking. These species and populations are listed in Column A of Table 1 in the AEWA Action Plan (see Appendix I to these guidelines; for further details see Guidelines No.1 *Guidelines on the preparation of Single Species Action Plans for migratory waterbirds*).

Step 4: Identify potential risks and negotiate safety measures with industries located near waterbird sites

If the national site inventory has been completed, those waterbird sites lying adjacent to, or downstream of, an industrial complex should be identified and listed. Otherwise, local experts should be consulted.

For each combination of listed waterbird site and industrial complex (*e.g.* oil refinery, chemical plant, mining complex), a full analysis should be made of all possible accidents, spills, explosions, leaks *etc*. The relevant industries should be involved in this process.

Special attention should be given to the relative positions of the waterbird site and the industrial complex, especially with respect to altitude and direction of flow of contaminated water, as this information will be required in the design of safety measures.

Safety measures include:
- proper technical control and regular maintenance;
- guarding of sensitive areas;
- construction of dikes or ditches around the industrial area, to contain the oil or chemicals in the case of a disaster,
- careful routing of transportation routes for hazardous substances (*e.g. s*hipping lanes for oil tankers) away from sensitive and dangerous areas;
- clear definition of responsibilities for safety procedures within the industrial organisation.

Legislation should be developed and implemented to ensure that companies are financially responsible for the consequences of their neglect (the 'polluter pays' principle).

Risk analysis and the design of appropriate safety measures are complicated procedures requiring special skills. In the EU, standard procedures have been developed for HAZOP (Hazard and Operability) studies undertaken at industrial sites. Under the EC Directive on Major Hazards (commonly known as the Seveso Directive), potentially dangerous sites are required to prepare a safety study and also to carry out a HAZOP study, which they must finance themselves.

Existing statistics on incidents in the past are an important source of information in any risk analysis. In Europe, such statistics can be obtained from MARS (Major Accident Reporting System) at the European Commission's Joint Research Centre. The Seveso Directive places an obligation on EU Member States to exchange information on major accidents.

Details of MARS and HAZOP can be found in *The Dobris Assessment*, published by the European Environment Agency in 1991.

Step 5: Establish a national Emergency Response Notification System

Several countries have established a central organisational structure where all oil or chemical spill incidents are reported, and where remedial measures are co-ordinated. It is important that all relevant information on incidents is entered into an easily accessible database for future reference and use.

Emergency Response Notification Systems are particularly well developed in the USA (see Box 6). For most countries in the AEWA area, a much less complicated (and less costly) structure would suffice.

Box 6: Emergency Response Notification Systems – the US example

The US Coast Guard operates a National Response Center (NRC) 365 days a year, 24 hours a day, where all incidents such as oil spills, chemical releases, transportation accidents, liquid pipeline releases and gas pipeline releases can be reported toll-free in a standard format. These incidents are entered directly into an online database, to be electronically disseminated as part of the National Response System (NRS, see below). The data are stored centrally in the Emergency Response Notification System (ERNS).

The ERNS is a computer database containing information on incidents throughout the US that have been reported either to the NRC, to one of the ten regions of the Environmental Protection Agency (EPA), or to the US Coast Guard.

The National Response System (NRS) is a governmental mechanism for emergency response to oil and chemical discharges in the environment. It has three organisational levels:

- a National Response Team (NRT);
- 13 Regional Response Teams (RRTs);
- a large and flexible number of On-Scene Co-ordinators (OSCs).

The NRT consists of 16 members of government agencies from different departments. The EPA serves as chair, and the US Coast Guard, which operates the NRC, as vice-chair. The NRT also operates special forces to assist the OSCs. These include:

- Coast Guard National Strike Force (NSF);
- Coast Guard Public Information Assist Team (PIAT);
- EPA's Environmental Response Team (ERT);
- Scientific Support Co-ordinators (SSCs).

Information on the NRC (including the standard format used in reporting incidents), ERNS and NRT can be found on the Internet (see References and useful web sites).

Where Emergency Response Notification Systems (ERNS) already exist, these are usually environmental in a general sense, and not particularly focused on birds. It may therefore be necessary to involve a separate body to maintain records of all emergency situations involving waterbirds, and to co-ordinate actions and publicity in close co-operation with the general ERNS.

In the EU, ERNS-related activities should always be linked to MARS.

For continuity, a centralised ERNS and its database are best located within an established government department or institute.

To provide the ERNS with information, an early warning system should be established, based on a network of local contacts at the sites identified as being susceptible to emergency situations. NGOs could play an important role in the establishment of a network of people watching individual sites. This network should be carefully maintained, and names and addresses should be kept in a database, which is regularly updated.

In some countries (mostly in Europe) where BirdLife International has compiled a list of Important Bird Areas (IBAs), networks of IBA caretakers have been established. These networks already function as an early warning system for IBAs (see Box 7). As virtually all important sites for migratory waterbirds are listed as IBAs, these caretaker networks should be involved in the national Emergency Response Notification System.

Box 7: An early warning system based on IBA-caretakers

Lists of Important Bird Areas (IBAs), compiled by BirdLife International, exist for all countries in Europe and the Middle East and Africa.

Sites that are important for migratory waterbirds usually qualify as IBAs.

In an increasing number of countries, BirdLife International is establishing an early warning system for emergency situations in designated IBAs by setting up a network of volunteer IBA-caretakers. These are individuals who agree to keep a watchful eye on one or more IBAs in their neighbourhood. In the case of an emergency, these caretakers can respond immediately to a central focal point.

Step 6: Adapt legislation where appropriate

Legal measures can be temporary or permanent. An example of a temporary legal measure is a shooting ban instituted by the Secretary of State in Great Britain after a certain number of days of cold weather (see Box 2). Permanent legal measures are designed to change the behaviour of people or industries or to force them to take certain precautions. Such measures are often introduced after a major disaster, and while coming too late to help in that event, may prevent repetition of similar events in the future. An important aspect of permanent legal measures is that they can provide for a system of fines, which, in the event of future violations, can produce funds to be used in mitigation. Legal measures are only effective if they are supported by adequate law enforcement.

The introduction of legal measures may be required by international agreements and conventions or, for example within the EU, by regional standards. In such cases, public awareness of the broader issues is especially important, otherwise individual countries may feel that unnecessary measures are being imposed upon them.

Step 7: Raise public awareness

Reports should be published on all emergency situations involving migratory waterbirds, and the press and other media should be involved wherever possible.

Emergency situations involving waterbirds should be reported to the AEWA Secretariat in a brief, standardised format. The report, which may be no more than a single page, should contain the following:

- date and duration of emergency situation;
- location;
- type of emergency situation;
- sites affected;
- species involved;
- estimated impact of emergency situation;
- measures taken;
- estimated effect of measures taken;
- organisations involved;
- public awareness activities undertaken.

References and useful web sites

1. ACTION PLANS

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Useful web sites

AEWA Action Plans can be found at:
http://www.unep-aewa.org/publications/technical_series.htm

Action Plans for EC Birds Directive Annex 1 species can be found at:
http://europa.eu.int/comm/environment/nature/directive/birdspriority.htm

IUCN Species Survival Commission Specialist Groups
http://www.iucn.org/themes/ssc/sgs/sgs.htm

IUCN Species Survival Commission Specialist Groups Action Plans
http://www.iucn.org/themes/ssc/pubs/sscaps.htm

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Botulism
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Diseases
http://www.avianbiotech.com/diseases/newcastle.htm
Algal blooms
http://www.epa.gov/OWOW/estuaries/pfiesteria/
http://www.whoi.edu/redtide/
Lead posioning
http://www.unep-aewa.org/publications/other_publications.htm
http://www.britishcolumbia.com/Wildlife/wildlife/information/Lead%20Poisoning%20of%20Water%20Birds.htm
Oil spill in Wales
http://www.swan.ac.uk/biosci/empress/news.htm
Oil spill in the Russian Federation
http://www.american.edu/projects/mandala/TED/KOMI.HTM
Oils spill in South Africa
http://web.uct.ac.za/depts/stats/adu/oilspill/
Cyanide pollution of river Tisza
http://nfp-hu.eionet.eu.int/cyanide.html
Heavy metal pollution of Coto Doñana
http://www.yale.edu/ynhti/curriculum/units/1999/6/99.06.01.x.html
National Response Center
http://www.nrc.uscg.mil/nrchp.html
Emergency Response Notification System
http://www.nrc.uscg.mil/nrchp.html
National Response Team
http://www.nrt.org

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Useful web sites

Ramsar sites directory
http://www.wetlands.org/RDB/Directory.html
Ramsar Information Sheet
http://www.ramsar.org/key_ris_index.htm
Ramsar Information Sheet explanatory notes and guidelines
http://ramsar.org/key_ris.htm#note
Ramsar criteria
http://ramsar.org/key_criteria.htm
UNESCO World Heritage List
http://fp.thesalmons.org/lynn/world.heritage.html

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New guidelines for management planning for Ramsar sites and other wetlands
http://ramsar.org/key_guide_mgt_new_e.htm
Ramsar wise use guidelines
http://ramsar.org/key_wiseuse.htm
Additional guidance for the implementation of the Wise Use concept
http://ramsar.org/key_add_guide.htm
Eurosite Management Planning Toolkit
http://www.seit.ee/projects/toolkit.pdf

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Federation of Field Sports Associations of the EU (FACE)
http://www.face-europe.org/
The Game Conservancy Trust (UK)
http://www.gct.org.uk/
International Council for Game and Wildlife Conservation (C. I. C)
http://www.cic-wildlife.org/
Lead poisoning
http://www.npwrc.usgs.gov/resource/othrdata/pbpoison/pbpoison.htm
International Wildlife Rehabilitation Council
http://www.iwrc-online.org/

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IUCN Species Survival Commission Specialist Groups
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CITES
http://www.cites.org
http://international.fws.gov/cites/cites.html

EU wildlife trade regulations
http://europa.eu.int/comm/environment/cites/legislation_en.htm
http://www.wcmc.org.uk/species/trade/eu/

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- Focus No.8, 1997: (Recreational) Carrying Capacity.
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The International Ecotourism Society TES
http://www.ecotourism.org
The World Travel & Tourism Council WTTC
http://www.wttc.org
The World Tourism Organisation WTO
http://www.world-tourism.org
United Nations Environment Programme, Industry and Environment, UNEP-IE: Tourism
http://www.unepie.org/tourism

8. REDUCING CROP DAMAGE, DAMAGE TO FISHERIES, BIRD STRIKES AND OTHER FORMS OF CONFLICT

References and further reading

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Useful web sites

Bird strikes
http://www.birdstrike.org/birds.htm
www.airsafe.com

Conflict between fisheries and waterbirds
http://www.cormorants.info/pdfs/WM14.pdf
http://banchory.ceh.ac.uk/conflict/case_studies/case%20studies.htm

Costs and benefits of managing wild geese in Scotland
http://www.scotland.gov.uk/cru/kd01/purple/cbmwgs-05.asp

9. WATERBIRD MONITORING PROTOCOL

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Useful Web Sites

Wetlands International - International Waterbird Census
IWC brochure (global): http://www.wetlands.org/IWC/about.htm

Manuals for IWC coordinators and counters: http://www.wetlands.org/IWC/Manuals.htm

African Waterbird Census, reports, news, recording forms:
http://www.wetlands.org/IWC/africa/africa.html

Western Palearctic and Southwest Asia Waterbird Census, Background information and reports: http://www.wetlands.org/IWC/wpal&swa/wpal.htm

IWC publications: http://www.wetlands.org/IWC/wpal&swa/output/about.htm

Census procedures and recording forms for Africa, Western Palearctic and Southwest Asia:
http://www.wetlands.org/IWC/docs/census_proc.htm

Western Palearctic and Southwest Asia, national site lists (clickable map):
http://www.wetlands.org/IWC/wpal&swa/output/sites.htm

Western Palearctic and Southwest Asia, national coverage history, 1967-1996 (clickable map):
http://www.wetlands.org/IWC/wpal&swa/output/coverage.html

Western Palearctic and Southwest Asia: National Coordinators of waterbird monitoring:
http://www.wetlands.org/IWC/wpal&swa/partner/WPalNC.htm

Asian waterbird Census, information, Coordinators, reports, news:
http://www.wetlands.org/IWC/awc/awcmain.html

Avian Demography Unit, University of Cape Town
http://www.uct.ac.za/depts/stats/adu/

Patuxent Wildlife Research Center: Colonial Waterbird Inventory and Monitoring
http://www.pwrc.usgs.gov/

US Fish & Wildlife Service, Division of Migratory Bird Management, Bird Monitoring
http://migratorybirds.fws.gov/statsurv/mntrtbl.html

Useful contacts

General

African-Eurasian Waterbird Agreement
UNEP/AEWA Secretariat
UN-Premises, Martin-Luther-King-Str. 8
53175 Bonn, Germany
Tel: (+49) 228 815 2413
Fax: (+49) 228 815 2450
E-mail: aewa@unep.de
WWW: http://www.unep-aewa.org

Bern Convention Secretariat (Secretariat of the Convention on the Conservation of European Wildlife and Natural habitats)
Environment Conservation and Management Division
67075 Strasbourg Cedex
France
Tel.: +33-3-88413559/2256
Fax: +33-3-88413751
E-mail: gill.steimer@coe.int
WWW: http://www.nature.coe.int/english/cadres/bern.htm

BirdLife International
Wellbrook Court
Girton
Cambridge CB4 3QX
United Kingdom
Tel.: +44-1223-277318
Fax: +44-1223-277200
E-mail: birdlife@birdlife.org
WWW: http://www.birdlife.org/

CBD Secretariat - Secretariat for the Convention on Biological Diversity
World Trade Centre
393 St. Jacques Street
Office 300
Montréal, Québec H2Y 1N9
Canada
Tel.: +1-514-2882220
Fax: +1-514-2886588
E-mail addresses: http://www.biodiv.org/secretariat/contact.asp
WWW: www.biodiv.org

Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
UNEP/CMS Secretariat
United Nations Premises in Bonn
Martin-Luther-King Straße 8
53175 Bonn
Germany
Tel.: +49-228-815-2401 and +49-228-815-2402
Fax: +49-228-815-2449
E-mail: secretariat@cms.int

WWW: http://www.cms.int

Council of Europe
Environment Conservation and Management Division
Palais de l'Europe
Avenue de l'Europe
67075 Strasbourg Cedex
France
Tel.: +33-3-88412253
Fax: +33-3-88413751
E-mail: infopoint@coe.int
WWW: http://www.coe.int

EC - European Commission
Wetstraat 200
1049 Brussels
Belgium
Tel.: +32-2-2351111
E-mail: europawebmaster@cec.eu.int
WWW: www.europa.eu.int/comm/index.htm

ECNC - European Centre for Nature Conservation
PO Box 1352
5004 BJ Tilburg
The Netherlands
Tel.: +31-13-4663240
Fax: +31-13-4663250
E-mail: ecnc@ecnc.org
WWW: www.ecnc.nl

International Council for Game and Wildlife Conservation (C. I. C)
PO Box 74
H - 2092 Budakeszi
Hungary
Tel: 0036 60 444 647
Fax: 0036 60 444 648
E-mail: budapestoffice@cic-wildlife.org
WWW: http://www.cic-wildlife.org/

IUCN - the World Conservation Union
28, rue Mauverney
1196 Gland
Switzerland
Tel.: +41-22-9990001
Fax: +41-22-9990002
WWW: www.iucn.org
E-mail addresses at: http://www.iucn.org/wl/db/sitefeedback.cfm

IUCN/ELC - Environmental Law Centre
Adenauerallee 214
53113 Bonn
Germany
Tel.: +49-228-2692231
Fax: +49-228-2692250
E-mail: http://www.iucn.org/themes/law/elc01.html

Ramsar Convention Bureau
28, rue Mauverney
1196 Gland
Switzerland
Tel.: +41-22-999-0170
Fax: +41-22-999-0169
E-mail: ramsar@ramsar.org
WWW: www.ramsar.org

UNEP - United Nations Environment Programme
PO Box 30552
Nairobi
Kenya
Tel.: +254-2-621234
Fax: +254-2-226890 and +254-2-215787
E-mail addresses: http://www.unep.org/Contacts/
WWW: www.unep.org

UNESCO/MAB - Man and Biosphere Programme
Ecological Sciences Division
1, rue Miollis
75732 Paris Cedex 15
France
Tel.: +33-1-45684151
Fax: +33-1-40659897
E-mail: mab@unesco.org
WWW: http://www.unesco.org/mab/

UNESCO/WHC - World Heritage Centre
Place de Fontenoy 7
75352 Paris Cedex 07
France
Tel.: +33-1-45681443
Fax: +33-1-40569570
E-mail: wh-info@unesco.org
WWW: www.unesco.org/whc

UNEP - WCMC - World Conservation Monitoring Centre
219, Huntingdon Road
Cambridge CB3 0DL
United Kingdom
Tel.: +44-1223-277314
Fax: +44-1223-277136
E-mail: info@unep-wcmc.org
WWW: http://www.unep-wcmc.org/

Wetlands International
PO Box 471
6700 AL Wageningen
The Netherlands
Tel.: +31-317-478854
Fax: +31-317-478850
E-mail: post@wetlands.org
WWW: www.wetlands.org

WWF-International - World Wide Fund for Nature

Avenue du Mont-Blanc
1196 Gland
Switzerland
Tel.: +41-22-3649111
Fax: +41-22-3642926
E-mail addresses: http://www.panda.org/about_wwf/who_we_are/offices/offices.cfm
WWW: www.panda.org

Species Action Plans

IUCN Species Survival Commission
c/o IUCN (see under **General**)

Wetlands International Specialist Group Co-ordinators
c/o Wetlands International (see under **General**)
http://www.wetlands.org/networks/SGroups.htm

BirdLife International (see under **General**)

Emergency situations

No specific addresses. See under **General**, according to circumstances.

Site inventories

MedWet Coordination Unit
Villa Kazouli, Kifissias & Gr. Lambraki 1
14561 Kifissia
Greece
Tel.: +30-210-8089270
Fax: +30-210-8089274
E-mail: info@medwet.org
WWW: www.medwet.org

Ramsar Convention Bureau (see under **General**)

Site management

EUROSITE - European Network of Site Management Organizations
PO Box 1366
5004 BJ Tilburg
The Netherlands
Tel.: +31-13-4678638
Fax: +31-13-4634129
E-mail: eurosite@kub.nl
WWW: www.eurosite-nature.org

Ramsar Convention Bureau (see under **General**)

Sustainable harvest

International Council for Game and Wildlife Conservation (C. I. C) (see under **General**)

FACE - Fédération des Associations de chasseurs de l'EU
82 Rue F. Pelletier
B-1030 Brussels
Belgium
Tel: +32-2-732.69.00
Fax: +32-2-7327072
E-mail: face.europe@infoboard.be
WWW: http://www.face-europe.org/

Trade

TRAFFIC International
219c Huntingdon Road
Cambridge CB3 0DL
UK
Tel: (44) 1223 277427
Fax: (44) 1223 277237
E-mail: traffic@WCMC.org.uk

TRAFFIC Europe
Waterloosteenweg 608
1060 Brussels
Belgium
Tel.: +32-2-3470111
Fax: +32-2-3440511
WWW: www.traffic.org

UNEP/CITES Secretariat (Convention on International Trade of Endangered Species, Washington Convention)
PO Box 456
Geneva Executive Centre
1219 Châtelaine (Geneva)
Switzerland
Tel.: +41-22-9799139 and 9799140
Fax: +41-22-7973417
E-mail addresses: http://www.cites.org/eng/disc/sec/index.shtml
WWW: http://www.cites.org/

Ecotourism

The Ecotourism Society TES
PO Box 755
North Bennington
VT 05257
USA
Tel: +1-802-447-2121
Fax: +1-802-447-2122
E-mail: ecomail@ecotourism.org
WWW: http://www.ecotourism.org

Bird damage

FAO - Food and Agriculture Organization
Forest Resources Division
Viale delle Terme di Caracalla
00100 Rome
Italy
Tel.: +39-06-57053589
Fax: +39-06-57055137
WWW: www.fao.org/fo

IBSC - International Bird Strike Committee
C/o National Bird Strike Committee
Royal Netherlands Airforce Airstaff
P.O.Box 20703
2500 EB The Hague
The Netherlands
Tel: +31-70-3396911

Waterbird Monitoring

International Waterbird Census (IWC) & African Waterbird Census (AfWC)
Waterbird Conservation Officer
c/o Wetlands International (see under **General**)

SOVON
Rijksstraatweg 178
6573 Beek-Ubbergen
The Netherlands
Tel: 024 684 81 11
Fax: 024 684 81 88
WWW: http://www.sovon.nl/

The Wildfowl & Wetlands Trust
Slimbridge
Gloucester
GL2 7BT
UK
Tel: +44 1453 890333
Fax: +44 1453 890827
E-mail addresses: http://www.wwt.org.uk/contact/
WWW: http://www.wwt.org.uk/

British Trust for Ornithology
The Nunnery
Nunnery Place
Thetford
Norfolk
IP24 2PU
UK
Tel: +44-1842-750050
Fax: +44-1842-750030
E-mail: info@bto.org
WWW: http://www.bto.org/

The Avian Demography Unit
Department of Statistical Sciences
University of Cape Town
Rondebosch 7701
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Tel: +27 (021) 650 3219
Fax: +27 (021) 650 7578
E-mail addresses: http://web.uct.ac.za/depts/stats/adu/staff/p_staff.htm
WWW. http://www.uct.ac.za/depts/stats/adu/

The European Bird Census Council
WWW: http://zeus.nyf.hu/~szept/ebcc.htm

Training facilities

Within the AEWA region, there are many facilities for training at different levels, ranging from three-day courses on various environmental topics for people with no prior knowledge, to Ph.D. level at universities. Many universities and institutes offer courses of varying lengths on wildlife management, site management, wetland ecology, sustainable development, ecotourism development, and many other related topics. UNEP maintains a database listing hundreds of courses. The Ramsar Convention Bureau maintains a list of environmental courses specifically aimed at wetland management. For information contact:

UNEP Directory on Environmental Education and Training Opportunities worldwide:
http://www.unep.org/unep/products/publicat/education/index.htm

The Ramsar Convention Bureau
Rue Mauverney 28, CH-1196 Gland, Switzerland
Tel: +41-22-999-0170; fax: +41-22-999-0169
E-mail: ramsar@ramsar.org
WWW: http://www.ramsar.org

There are several schools in Africa that specifically offer education in wildlife management and site management. These are attended by wardens and reserve managers from all over the continent. The most important are:

Ecole de Faune de Garoua
B.P. 271, Garoua, Cameroun
Tel/fax: +237-273135

College of African Wildlife Management
Mweka, P.O. Box 3031, Moshi, Tanzania
Tel/fax: +255-55-51113
E-mail: ulgtan@eoltz.com
WWW: http://www.mwekawildlife.org/

Kenya Wildlife Training Institute
P.O. Box 842, Naivasha, Kenya
Tel: +254-0311-20267/21329
Fax: +254-0311-20577
E-mail: kwsti@users.africaonline.co.ke

Southern African Wildlife College
Private Bag X3015, Hoedspruit, 1380, South Africa
Tel/fax: +27-15-7932621
E-mail: sawc@iafrica.com
WWW: http://www.wildlifecollege.org.za/

Special wetland courses for managers from developing countries and countries with economies in transition are given by the Wetland Advisory and Training Centre (WATC) of the Institute for Inland Water Management and Waste Water Treatment (RIZA) of the Netherlands Ministry of Transport, Public Works and Water Management. For information contact:

WATC
P.O. Box 17, 8200 AA Lelystad, The Netherlands
Tel: +31-320-298346; fax: +31-320-298339
E-mail: watc@riza.rws.minvenw.nl

IUCN also regularly organises short courses on wetland management at different levels, both for managers with little prior education and for decision makers at higher levels. These courses are given in the region (*e.g.* in West Africa). For information contact:

IUCN
Rue Mauverney 28, CH-1196 Gland, Switzerland
Tel: +41-22-999-0001; fax: +41-22-999-0002

Appendix I

POPULATIONS OF WATERBIRDS REQUIRING NATIONAL SINGLE SPECIES ACTION PLANS

National Single Species Action Plans are required for all populations listed in Column A of Table 1 in the AEWA Action Plan (Paragraph 2.2.2 of the Action Plan). Populations are listed in Column A in one of three Categories:

Category 1: (a) Species that are included in Appendix I to the Bonn Convention.
(b) Species that are listed as threatened in the IUCN Red List of Threatened Animals.
(c) Populations that number less than around 10,000 individuals.

Category 2: Populations numbering between around 10,000 and around 25,000 individuals.

Category 3: Populations numbering between around 25,000 and around 100,000 individuals and considered to be at risk as a result of:
(a) concentration onto a small number of sites at any stage of their annual cycle;
(b) dependence on a habitat type which is under severe threat;
(c) showing significant long-term decline; or
(d) showing extreme fluctuations in population size or trend.

Species listed include those included in the Action Plan by MoP 1 in Cape Town (November 1999) and MoP 2 in Bonn (September 2002). Categories are assigned on the basis of recent information on population sizes and trends, as summarised in the *AEWA Report on the Conservation Status of Migratory Waterbirds in the Agreement Area* (2002).

Species/subspecies	Population	Category
SPHENISCIDAE		
Spheniscus demersus	- Southern Africa	1b
GAVIIDAE		
Gavia immer	- Europe (win)	1c
Gavia adamsii		
	- Northern Europe (win)	1c
PODICIPEDIDAE		
Podiceps cristatus cristatus	- Caspian & South-west Asia (win)	2
Podiceps grisegena grisegena	- Caspian (win)	2
Podiceps cristatus infuscatus	- Eastern Africa (Ethiopia to N Zambia)	1c
	- Southern Africa	1c
Podiceps auritus auritus	- North-west Europe (large-billed)	1c
	- Caspian & South Asia (win)	2
Podiceps nigricollis gurneyi	- Southern Africa	2
PELECANIDAE		
Pelecanus onocrotalus	- Southern Africa	2
	- Europe & Western Asia (bre)	1a, 3c
Pelecanus crispus	- Black Sea & Mediterranean (win)	1a, 1c
	- South-west Asia & South Asia (win)	1a, 2

SULIDAE		
Sula (Morus) capensis	- Southern Africa	1b
PHALACROCORACIDAE		
Phalacrocorax coronatus	- Coastal South-west Africa	1c
Phalacrocorax neglectus	- Coastal South-west Africa	1b, 1c
Phalacrocorax carbo lucidus	- Coastal Southern Africa	2
Phalacrocorax nigrogularis	- Gulf & Arabian Sea	1b
ARDEIDAE		
Egretta ardesiaca	- Sub-Saharan Africa	3c
Egretta vinaceigula	- South-central Africa	1b, 1c
Egretta gularis schistacea	- South-west Asia & South Asia	2
Egretta dimorpha	- Coastal Eastern Africa	2
Ardea purpurea purpurea	- West Europe & West Mediterranean/West Africa	2
Casmerodius albus albus	- W, C & SE Europe/Black Sea & Mediterranean	2
Bubulcus ibis ibis	- East Mediterranean & South-west Asia	2
Ardeola ralloides ralloides	- Medit., Black Sea & N Africa/Sub-Saharan Africa	3c
Ardeola idae	- Madagascar & Aldabra/Central & Eastern Africa	1b, 1c
Botaurus stellaris stellaris	- Europe (bre)	3c
	- South-west Asia (win)	2
Botaurus stellaris capensis	- Southern Africa	1c
CICONIIDAE		
Ciconia nigra	- Southern Africa	1c
	- South-west Europe/West Africa	1c
	- Central & Eastern Europe/Sub-Saharan Africa	2
Ciconia ciconia ciconia	- Southern Africa	1c
	- Iberia & North-west Africa/Sub-Saharan Africa	3b
	- Western Asia/South-west Asia	2
BALAENICIPITIDAE		
Balaeniceps rex	- Central Tropical Africa	1c
THRESKIORNITHIDAE		
Plegadis falcinellus falcinellus	- Black Sea & Mediterranean/West Africa	3c
Geronticus eremita	- Morocco	1a, 1b, 1c
	- South-west Asia	1a, 1b, 1c
Threskiornis aethiopicus aethiopicus	- Iraq & Iran	1c
Platalea leucorodia leucorodia	- West Europe/West Mediterranean & West Africa	1c
	- Cent. & SE Europe/Mediterranean & Tropical Africa	2
Platalea leucorodia archeri	- Red Sea & Somalia	1c
Platalea leucorodia balsaci	- Coastal West Africa (Mauritania)	1c
Platalea leucorodia major	- Western Asia/South-west & South Asia	2
Platalea alba	- Sub-Saharan Africa	2*
PHOENICOPTERIDAE		
Phoenicopterus ruber roseus	- West Africa	3a
	- Eastern Africa	3a
	- Southern Africa (to Madagascar)	3a
Phoenicopterus minor	- West Africa	2
	- Southern Africa (to Madagascar)	3a

ANATIDAE		
Thalassornis leuconotus leuconotus	- West Africa	1c
	- Eastern & Southern Africa	2*
Oxyura leucocephala	- West Mediterranean (Spain & Morocco)	1a, 1b, 1c
	- Algeria & Tunisia	1a, 1b, 1c
	- East Mediterranean, Turkey & South-west Asia	1a, 1b, 1c
Oxyura maccoa	- Eastern Africa	1c
	- Southern Africa	1c
Cygnus cygnus	- Iceland/UK & Ireland	2
	- N Europe & W Siberia/Black Sea & E Mediterranean	2
	- West & Central Siberia/Caspian	2
Cygnus columbianus bewickii	- Western Siberia & NE Europe/North-west Europe	3c
	- Northern Siberia/Caspian	1c
Anser albifrons albifrons	- Western Siberia/Central Europe	3c*
	- Northern Siberia/Caspian & Iraq	2
Anser albifrons flavirostris	- Greenland/Ireland & UK	3a
Anser erythropus	- N Europe & W Siberia/Black Sea & Caspian	1a, 1b, 2
Branta leucopsis	- Svalbard/South-west Scotland	2
Branta bernicla hrota	- Svalbard/Denmark & UK	1c
	- Canada & Greenland/Ireland	2
Branta ruficollis	- Northern Siberia/Black Sea & Caspian	1a, 1b, 3a
Alopochen aegyptiacus	- West Africa	2
Tadorna ferruginea	- North-west Africa	1c
	- East Mediterranean & Black Sea/North-east Africa	2
Tadorna tadorna	- Black Sea & Mediterranean	3c
Nettapus auritus	- West Africa	1c
Anas capensis	- Eastern Africa (Rift Valley)	1c
	- Lake Chad basin	1c
Anas erythrorhyncha	- Madagascar	2
Anas hottentota	- Lake Chad Basin	1c
Marmaronetta angustirostris	- West Mediterranean/West Medit. & West Africa	1a, 1b, 1c
	- East Mediterranean	1a, 1b, 1c
	- South-west Asia	1a, 1b, 2
Netta rufina	- Black Sea & East Mediterranean	3c
Aythya nyroca	- West Mediterranean/North & West Africa	1a, 1c
	- Eastern Europe/E Mediterranean & Sahelian Africa	1a, 3c
	- Western Asia/SW Asia & NE Africa	1a, 3c
Polysticta stelleri	- Western Siberia/North-east Europe	1a
Melanitta fusca fusca	- Black Sea & Caspian	1c
Bucephala clangula clangula	- Western Siberia & North-east Europe/Black Sea	2
	- Western Siberia/Caspian	2
Mergellus albellus	- North-west & Central Europe (win)	3a
	- Western Siberia/South-west Asia	3c
Mergus serrator serrator	- Western Siberia/South-west & Central Asia	1c
Mergus merganser merganser	- North-east Europe/Black Sea	1c
	- Western Siberia/Caspian	2
GRUIDAE		
Balearica pavonina pavonina	- West Africa (Senegal to Chad)	2
Balearica pavonina ceciliae	- Eastern Africa (Sudan to Uganda)	3c
Balearica regulorum regulorum	- Southern Africa (N to Angola & S Zimbabwe)	1c

Balearica regulorum gibbericeps	- Eastern Africa (Kenya to Mozambique)	3c
Grus leucogeranus	- Iran (win)	1a, 1b, 1c
Grus virgo	- Black Sea (Ukraine)/North-east Africa	1c
	- Turkey (bre)	1c
Grus paradisea	- Extreme Southern Africa	1b, 2
Grus carunculatus	- Central & Southern Africa	1b, 1c
Grus grus	- Eastern Europe/Turkey, Middle East & NE Africa	3c
	- Turkey & Georgia (bre)	1c
RALLIDAE		
Sarothrura boehmi	- Central Africa	1c
Sarothrura ayresi	- Ethiopia and Southern Africa	1a, 1b, 1c
Crex crex	- Europe & Western Asia/Sub-Saharan Africa	1b
Porzana pusilla intermedia	- Europe (bre)	2
Aenigmatolimnas marginalis	- Sub-Saharan Africa	(2)
Fulica cristata	- Spain & Morocco	1c
DROMADIDAE		
Dromas ardeola	- North-west Indian Ocean, Red Sea & Gulf	3a
HAEMATOPODIDAE		
Haematopus moquini	- Coastal Southern Africa	1c
RECURVIROSTRIDAE		
Himantopus himantopus himantopus	- Southern Africa ('*meridionalis*')	2
Recurvirostra avosetta	- Southern Africa	2
	- South-east Europe, Black Sea & Turkey (bre)	(3c)
	- West & South-west Asia/Eastern Africa	2
BURHINIDAE		
Burhinus senegalensis senegalensis	- West Africa	(2)
Burhinus senegalensis inornatus	- North-east & Eastern Africa	(2)
GLAREOLIDAE		
Pluvianus aegyptius aegyptius	- Eastern Africa	(2)
Glareola pratincola pratincola	- Western Europe & NW Africa/West Africa	2
	- Black Sea & E Mediterranean/Eastern Sahel zone	2
Glareola nordmanni	- SE Europe & Western Asia/Southern Africa	3b, 3c
Glareola ocularis	- Madagascar/East Africa	(2)
Glareola nuchalis liberiae	- West Africa	(2)
Glareola cinerea cinerea	- SE West Africa & Central Africa	(2)
CHARADRIIDAE		
Pluvialis apricaria apricaria	- Britain, Ireland, Denmark, Germany & Baltic (bre)	3c*
Charadrius pallidus pallidus	- Southern Africa	2
Charadrius pallidus venustus	- Eastern Africa	1c
Charadrius alexandrinus alexandrinus	- West Europe & West Mediterranean/West Africa	3c
	- Black Sea & East Mediterranean/Eastern Sahel	3c
Charadrius marginatus mechowi	- Southern & Eastern Africa	2
	- West to West-central Africa	2
Charadrius leschenaultii	- Turkey & SW Asia/E. Mediterranean & Red Sea	1c

columbinus		
Charadrius asiaticus	- SE Europe & West Asia/E & South-central Africa	3c
Eudromias morinellus	- Europe/North-west Africa	(3c)
Vanellus lugubris	- Southern West Africa	2
	- Central & Eastern Africa	3c
Vanellus melanopterus minor	- Southern Africa	1c
Vanellus coronatus coronatus	- Central Africa	(2)
Vanellus superciliosus	- West & Central Africa	(2)
Vanellus gregarius	- SE Europe & Western Asia/North-east Africa	1a, 1b, 1c
	- Central Asian Republics/NW India	1a, 1b, 1c
Vanellus leucurus	- SW Asia/SW Asia & North-east Africa	2
SCOLOPACIDAE		
Limosa limosa islandica	- Iceland/Western Europe	3a*
Numenius phaeopus alboaxillaris	- South-west Asia/Eastern Africa	1c
Numenius tenuirostris	- Central Siberia/Mediterranean & SW Asia	1a, 1b, 1c
Numenius arquata orientalis	- Western Siberia/SW Asia, E & S Africa	3c
Numenius arquata suschkini	- South-east Europe & South-west Asia (br e)	2
Calidris tenuirostris	- Eastern Siberia/SW Asia & W Southern Asia	1c
Calidris alpina schinzii	- Britain & Ireland/SW Europe & NW Africa	2
	- Baltic/SW Europe & NW Africa	1c
Calidris alpina arctica	- NE Greenland/West Africa	3a
Limicola falcinellus falcinellus	- Northern Europe/SW Asia & Africa	3c
LARIDAE		
Larus leucophthalmus	- Red Sea & nearby coasts	1a, 2
Larus audouinii	- Mediterranean/N & W coasts of Africa	1a, 3a
Larus armenicus	- Armenia, Eastern Turkey & NW Iran	3a
Larus ichthyaetus	- Black Sea & Caspian/South-west Asia	3a
Larus genei	- West Africa (bre)	2
Sterna nilotica nilotica	- Western Europe/West Africa	2
	- Black Sea & East Mediterranean/Eastern Africa	3c
	- West & Central Asia/South-west Asia	2
Sterna caspia caspia	- Southern Africa (bre)	1c
	- Europe (bre)	1c
	- Caspian (bre)	2
Sterna bengalensis par	- Red Sea/Eastern Africa	3a
Sterna bengalensis emigrata	- S Mediterranean/NW & West Africa coasts	1c
Sterna bergii bergii	- Southern Africa (Angola – Mozambique)	2
Sterna bergii enigma	- Madagascar & Mozambique/Southern Africa	1c
Sterna bergii thalassina	- Eastern Africa & Seychelles	1c
Sterna bergii velox	- Red Sea & North-east Africa	3a
Sterna sandvicensis sandvicensis	- Black Sea & Mediterranean (bre)	3a, 3c
Sterna dougallii dougallii	- Southern Africa	1c
	- East Africa	3a
	- Europe (bre)	1c
Sterna dougallii arideensis	- Madagascar, Seychelles & Mascarenes	2
Sterna dougallii bangsi	- North Arabian Sea (Oman)	1c
Sterna vittata vittata	- P.Edward, Marion, Crozet & Kerguelen/South Africa	1c
Sterna vittata tristanensis	- Tristan da Cunha & Gough/South Africa	1c
Sterna albifrons albifrons	- Eastern Atlantic (bre)	3b
	- Black Sea & East Mediterranean (bre)	3c
	- Caspian (bre)	2

Sterna albifrons guineae	- West Africa (bre)	1c
Sterna balaenarum	- Namibia & South Africa/Atlantic coast to Ghana	2
Chlidonias hybridus hybridus	- Western Europe & North-west Africa (bre)	3c
Chlidonias hybridus sclateri	- Eastern Africa (Kenya & Tanzania)	1c
	- Southern Africa (Malawi & Zambia to South Africa)	(2)
RYNCHOPIDAE		
Rynchops flavirostris	- Coastal West Africa & Central Africa	2
	- Eastern & Southern Africa	2

Footnotes:

1. Suffixes (breeding) or (wintering) in population listings are solely aides to population identification. They do not indicate seasonal restrictions to actions in respect of these populations under the Agreement and Action Plan.

2. *Vanellus gregarius* is listed under the name *Chettusia gregaria* in Appendix I to the Bonn Convention.

Appendix II

GLOBALLY THREATENED MIGRATORY WATERBIRD SPECIES IN AEWA RANGE STATES

The occurrence of globally threatened species of migratory waterbirds in AEWA Range States, based on BirdLife International 2000 *Threatened Birds of the World,* the official source for birds in the *2000 IUCN Red List of Threatened Species*. Breeding species are indicated with a 'B'; species occurring only as passage migrants and winter visitors are indicated with a 'W'. No attempt has been made to indicate relative numbers, and in some instances, the numbers of birds involved may be very small. Codes followed by an asterisk * mark species not included in *Threatened Birds of the World* but known nevertheless to occur in the country.

	Slaty Egret	Waldrapp	White-headed Duck	Lesser White-fronted Goose	Red-breasted Goose	Marbled Teal	Siberian Crane	Blue Crane	Wattled Crane	Sociable Lapwing	Slender-billed Curlew	Total Number of species
Algeria			B			B					W	3
Armenia						B						1
Azerbaijan			W	W	W	B						4
Botswana	B								B			2
Bulgaria			W	W	W						W	4
Chad						W						1
Democratic Republic of Congo	B								B			
Eritrea										W		1
Estonia				W								1
Ethiopia									B			1
Finland				B								1
Greece			W	W	W						W	4
Hungary				W	W						W	3
Iran			B			B	W			W		4
Iraq			W			B				W		3
Israel			W			W				W		3
Italy											W	1
Jordan						W						1
Kazakhstan			B	W	W	B				B	W	6
Lithuania				W								1
Malawi									B			1
Mali						W						1
Morocco		B				B					W	3
Mozambique	B								B			2
Namibia	B							B	B			1
Netherlands					W							1
Nigeria						W						1
Norway				B								1
Oman										W		1
Poland				W								1
Romania			W	W	W						W	4
Russia			B	B	B	B	B			B	B	7

Saudi Arabia										W		1
Senegal						W						1
	Slaty Egret	Waldrapp	White-headed Duck	Lesser White-fronted Goose	Red-breasted Goose	Marbled Teal	Siberian Crane	Blue Crane	Wattled Crane	Sociable Lapwing	Slender-billed Curlew	Total Number of species
South Africa	B							B	B			3
Spain			B			B						2
Swaziland								B				1
Sweden				B								1
Syria		B	W			W				W		4
Tunisia			B			B					W	3
Turkey			B	W		B				W	W	5
Turkmenistan			B	W*		B				W		4
Ukraine				W*	W						W	3
Uzbekistan			B	W*		B				W	W*	4
Serbia & Montenegro											W	1
Zambia	B								B			2
Zimbabwe	B								B			2

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