Global Overview of the Conservation of Migratory Arctic Breeding Birds Outside the Arctic

August 1998

CAFF Technical Report no. 4

CAFF
Conservation of Arctic Flora and Fauna

About CAFF

The Program for the Conservation of Arctic Flora and Fauna (CAFF) of the Arctic Council was established to address the special needs of Arctic ecosystems, species and their habitats in the rapidly developing Arctic region. It was initiated as one of four programs of the Arctic Environmental Protection Strategy (AEPS) which was adopted by Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden and the United States through a Ministerial Declaration at Rovaniemi, Finland in 1991. The other AEPS programs were the Arctic Monitoring and Assessment Program (AMAP) and the programs for Emergency Prevention, Preparedness and Response (EPPR) and Protection of the Arctic Marine Environment (PAME). The AEPS is now integrated into the Arctic Council.

Since its inaugural meeting in Ottawa, Canada in 1992, the CAFF program has provided scientists, conservation managers and groups, and indigenous people of the north with a distinct forum in which to tackle a wide range of Arctic conservation issues at the circumpolar level.

CAFF's main goals, which are achieved in keeping with the concepts of sustainable development and utilisation, are:

- to conserve Arctic flora and fauna, their diversity and their habitats;
- to protect the Arctic ecosystems from threats;
- to improve conservation management laws, regulations and practices for the Arctic;
- to integrate Arctic interests into global conservation fora.

CAFF operates through a system of Designated Agencies and National Representatives responsible for CAFF in their respective countries. CAFF also has an International Working Group which has met annually to assess progress and to develop Annual Work Plans. CAFF is headed up by a chair and vice-chair which rotate among the Arctic countries and it is supported by an International Secretariat. When needed, CAFF also sets up specialist and expert groups to handle program areas.

The majority of CAFF's activities are directed at conserving Arctic biodiversity—the abundance and diversity of Arctic flora, fauna, and habitats—and at integrating indigenous peoples and their knowledge into CAFF. Some examples are: development and implementation of conservation strategies and action plans for a Circumpolar Protected Areas Network (CPAN), for Arctic Biological Diversity, for Circumpolar Murres and Eiders; work on a Circumpolar Arctic Vegetation Map (CAVM) and Rare Endemic Arctic Plants, analysing and making recommendations on Threats to Arctic Biological Diversity; mapping Traditional Ecological Knowledge on the Beluga Whale; etc. Most of CAFF's work is carried out through a system of Lead Countries as a means of sharing the workload. Some projects are also assigned to the CAFF Secretariat. Whenever possible, CAFF works in co-operation with other international organisations and associations to achieve common conservation goals in the Arctic.

CAFF Publications:

CAFF Habitat Conservation Reports:

No. 1 The State of the Protected Areas in the Circumpolar Arctic (August 1994)
No. 2 Proposed Protected Areas in the Circumpolar Arctic (June 1996)
No. 3 National Principles and Mechanisms for Protected Areas in the Arctic Countries (March 1996)
No. 4 Circumpolar Protected Areas Network (CPAN) Principles and Guidelines (March 1996)
No. 5 Gaps in Habitat Protection in the Circumpolar Arctic (February 1996)
No. 6 Circumpolar Protected Areas Network (CPAN) – Strategy and Action Plan (March 1996)
No. 7 Circumpolar Protected Areas Network (CPAN) – Progress Report 1997 (June 1997)

CAFF Technical Reports:

No. 1 Incidental Take of Seabirds in Commercial Fisheries in the Arctic Countries (January 1998)
No. 2 Human Disturbance at Arctic Seabird Colonies (January 1998)
No. 3 Atlas of Rare Endemic Vascular Plants of the Arctic (to be published in 1998)
No. 4 Global Overview of the Conservation of Migratory Arctic Breeding Birds Outside the Arctic (May 1998)

CAFF Strategies:

Circumpolar Protected Areas Network (CPAN) Strategy and Action Plan (March 1996)
International Murre Conservation Strategy and Action Plan (March 1996)
Circumpolar Eider Conservation Strategy and Action Plan (June 1997)
The Co-operative Strategy for Conservation of Biological Diversity in the Arctic Region (June 1997)
Strategic Plan for the Conservation of Arctic Biological Diversity (September 1998)

CAFF Program Management and Meetings:

CAFF Framework Document (March 1996)
CAFF Report to Ministers 1996 (March 1996)
CAFF Report to SAAOs 1997 (June 1997)
Report of the Working Group 1992–1993 (1993)
Third Meeting of the CAFF International Working Group (CAFF III), Reykjavík1994: Proceedings (1994)
Fourth Annual Meeting of the CAFF International Working Group (CAFFIV), Moscow 1995: Summary Report (February 1996)
Fifth Annual Meeting of the CAFF International Working Group (CAFFV), Rovaniemi 1996: Summary Report (March 1997)
Sixth Annual Meeting of the CAFF International Working Group (CAFFVI), Nuuk 1997: Summary Report (January 1998)
Circumpolar Seabird Working Group Bulletin, Vol. 1–2, (1995–1996)

For information and additional copies contact:

CAFF INTERNATIONAL SECRETARIAT
Hafnarstraeti 97
IS-600 Akureyri
ICELAND

Telephone: +354 462 3350
Fax: +354 462 3390
E-mail: CAFF@nattfs.is; snorri@nattfs.is
Internet: http:llwww.grida.nolcaff

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CONSERVATION OF ARCTIC FLORA AND FAUNA

Global Overview of the Conservation of Migratory Arctic Breeding Birds outside the Arctic

Derek A. Scott

Study report prepared by Wetlands International under contract with the Netherlands Government in consultation with Russian experts

CAFF Technical Report No. 4

Wetlands International Publication No. 45

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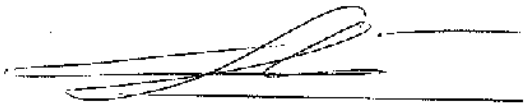
FOREWORD

Interest in the Arctic has increased in recent years. Rapid economic development in some areas and a deterioration in conditions in others are of great social concern. These contrasting situations, in combination with important issues in the fields of environment, nature protection and indigenous peoples, have now become a focus of attention for the Arctic countries. A direct result of this increasing concern for the welfare of the Arctic has been the development of closer and more intensive cooperation between the countries concerned, as stimulated by the so-called Rovaniemi process.

The Arctic is undoubtedly worthy of more attention, and from our point of view, it is the great natural values and natural resources that make the region so important. One aspect of these natural resources is the wealth of breeding birds that migrate outside the Arctic to virtually all other countries in the world, thus contributing to their species richness and biodiversity. This is something very specific to the Arctic avifauna, worthy of study and worthy of protection.

This report describes the migratory birds of the Arctic, their migration systems, and how they are already protected under international legislation when they leave the Arctic. It shows that much has already been achieved, but also that much has still to be done.

We hope that this excellent compilation on Arctic migratory breeding birds will stimulate further international cooperation to increase protection where necessary, and will contribute to the sustainable management of populations where this is not in conflict with the maintenance of healthy population sizes. In particular, we welcome stronger cooperation with countries in the developing world where so many Arctic birds spend almost half their lives.



Dr. Amirkhan M. Amirkhanov,
CAFF Representative,
Russian Federation.

Dr. Gerard C. Boere,
Observer to CAFF,
The Netherlands.

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The first draft of this document was circulated for discussion at the CAFF Meeting in Nuuk, Greenland, in September 1997. Since then, comments have been received from Snorri Baldursson (CAFF Secretariat), Colin J. Bibby (BirdLife International), Richard Elliot (Canadian Wildlife Service), A.W. de Haas (Directorate-General of Public Works and Water Management, The Netherlands), Berit Lein and Finn Kateras (Directorate for Nature Management, Norway), Jeanne Pagnan (Ottawa, Canada) and Aevar Petersen (Institute of Natural History, Reykjavik, Iceland). These comments have been taken into consideration in the completion of this final version, and an Executive Summary has been added.

Derek A. Scott
May 1998

EXECUTIVE SUMMARY

1. This report focuses on migratory birds which breed in the Arctic region, as defined by the CAFF member states, and migrate to winter quarters outside CAFF countries. It investigates those international mechanisms (conventions, agreements, programmes and action plans), both legally-binding and voluntary, which are relevant to the conservation of migratory Arctic birds and their habitats throughout their non-breeding ranges.

2. Of the 450 species of birds which breed or have bred in the Arctic region, 279 breed in significant numbers within the Arctic and spend the boreal (northern hemisphere) winter in significant numbers outside the CAFF member states.

3. Migratory birds from the Arctic reach every part of the world except the interior of Antarctica. Thirty species reach southern Africa, 26 species reach Australia and New Zealand, 22 species reach southern South America, and several pelagic species reach the southern Oceans.

4. Virtually all of the world's major ecosystems support some Arctic breeding birds during the boreal winter, with Arctic migrants occupying virtually every major habitat in every major region.

5. The conservation of all Arctic breeding birds throughout their migratory ranges is a global challenge, covering virtually all of the world's major terrestrial and marine ecosystems. It requires a higher level of international cooperation than would be required for any other group of birds, or indeed any other group of animals, from a region of comparable size elsewhere in the world.

6. There are many international legal instruments dealing with the protection of nature in general or with the protection of migratory birds in particular. Global conventions of particular relevance to migratory birds include the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), World Heritage Convention, Convention on Biological Diversity and International Tropical Timber Agreement.

7. In Western Eurasia, the most important instruments for the conservation of migratory birds are the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), the European Community Directives on the Conservation of Wild Birds and Conservation of Natural Habitats and of Wild Fauna and Flora, and the Protocol to the Barcelona Convention Concerning Mediterranean Specially Protected Areas.

8. The African Convention on the Conservation of Nature and Natural Resources (Convention of Algiers, 1968) contains many provisions that would benefit the conservation of Arctic migrants in Africa, but this Convention has never been properly implemented due to the lack of an institutional structure such as a specific secretariat or a regular meeting of the Parties.

9. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (an Agreement under the Bonn Convention) adopts a 'flyway' approach to the conservation of 170 species of migratory waterbirds, and covers the entire continents of Africa and Europe, as well as large parts of western Asia and parts of northeastern Canada. The Final Act to the Agreement was signed in 1995 and is expected to enter into force in 1999.

10. In Asia and the Pacific, bilateral agreements for the protection of migratory birds have been concluded between the U.S.S.R and Japan (1973), Japan and Australia (1974), Japan and China (1981), India and the U.S.S.R. (1984), Australia and China (1986), and the Republic of Korea and Russia (1994). A similar bilateral agreement between Australia and the Russian Federation is currently being developed.

11. In the Insular Pacific, there are two conventions dealing with nature conservation and the natural environment in general; the Convention on Conservation of Nature in the South Pacific and the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region.

12. In North America, the most useful international instruments for the protection of migratory birds are the bilateral agreements between the U.S.A. and Canada (1916, as amended) and the U.S.A. and Mexico (1936, as amended).

13. The Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere has long been available as a potential instrument for nature conservation throughout the Americas, but this Convention has never been effectively implemented, perhaps partly because of the lack of a secretariat (see also Convention of Algiers, 1968).

14. In South America, four bilateral agreements have some provisions that could benefit migratory birds from the Arctic: agreements between Colombia and Brazil (1973), Peru and Brazil (1975), and Colombia and Peru (1979) concerning the conservation of the flora and fauna of the Amazon Basin, and an agreement between Argentina and Bolivia (1976) concerning the protection of forests and fauna and the development of border parks.

15. Spanning the North Pacific, bilateral agreements between the U.S.A. and Japan (1972, as amended) and the U.S.A and U.S.S.R. (1976) are concerned with the protection of species of birds which are common to both countries, or which migrate between them.

16. The land and sea areas of Antarctica north to the Antarctic Convergence are well covered by a series of instruments aimed at the preservation and conservation of the living resources of Antarctica (Antarctic Treaty, Convention on the Conservation of Antarctic Marine Living Resources – CCAMLR, etc.).

17. There are many international conventions and agreements dealing with pollution at sea. The most important from the point of view of the conservation of seabirds are the Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and Amendments, the International Convention for the Prevention of Pollution from Ships and Protocol of 1978, and the United Nations Convention on the Law of the Sea.

18. At regional level, conventions, agreements and protocols concerning various types of marine pollution have been concluded for the Northeast Atlantic, Southeast Atlantic, North Sea, Baltic Sea, Mediterranean Sea, Black Sea, coastal region of West and Central Africa, coastal region of Eastern Africa, Gulf area of the Middle East, Red Sea and Gulf of Aden, South Pacific region, southeast Pacific, and wider Caribbean. Some of these instruments make special provisions for protected areas and wildlife.

19. There are numerous international agreements concerned with fisheries and other marine fauna, many of which are of considerable relevance to Arctic breeding seabirds, because of their role in the maintenance of the fish stocks and marine food-chains. These are listed in an Appendix.

20. The principal international instruments concerning air pollution and climate change are described briefly in an Appendix.

21. There are numerous global and regional initiatives (programmes, strategies, action plans) that provide frameworks for international cooperation in the conservation of nature and the environment. Many of these include issues related to the conservation of migratory birds and their habitats. Some of the more important global initiatives include the Man and the Biosphere Programme of UNESCO, the Regional Seas Programme of UNEP, the Tropical Forestry Action Plan of FAO, the Important Bird Areas Programme of BirdLife International, the International Waterfowl Census of Wetlands International, and the series of inventories of wetlands of international importance variously sponsored by Wetlands International, IUCN, WWF, BirdLife International and the Ramsar Convention Bureau.

22. There are many regional initiatives and programmes in Europe which are of relevance to migratory birds from the Arctic. Some of the most important include the European Network of Biogenetic Reserves (Council of Europe), Trilateral Cooperation on the Protection of the Wadden Sea, the MedWet Programme, and the International Conferences of Baltic Sea States. Others are listed in an Appendix.

23. In Asia, three very similar regional action plans for the conservation of wetlands and waterbirds have been developed at regional meetings: one for South and West Asia (Karachi, 1991), one for Southeast Asia (Bogor, 1994), and one for East Asia (Beidaihe, 1997).

24. A major recent initiative in Asia has been the development of an Asia-Pacific Migratory Waterbird Conservation Strategy for the period 1996–2000 that would initially take the place of a formal multilateral agreement. This strategy covers the three main 'flyways' of the Asia-Australasian bird migration systems, and thus complements the geographical coverage of the African-Eurasian Waterbird Agreement. Components of the Strategy already in place or being developed include a Shorebird Action Plan and East Asian-Australasian Shorebird Reserve Network, an Action Plan for the Conservation of Anatidae in the East Asian Flyway, and an Asia-Pacific Migratory Crane Action Plan and North East Asian Crane Site Network

25. An Action Strategy for Nature Conservation in the South Pacific Region, developed at the Fourth South Pacific Conference on Nature Conservation and Protected Areas in Vanuatu in 1989, includes a 'Regional Avifauna Conservation Strategy for the South Pacific' which promotes the wise management of bird communities and their habitats.

26. In the Americas, three important programmes have considerable benefits to migratory birds from the Arctic. The Western Hemisphere Shorebird Reserve Network (WHSRN), launched in 1985, focuses attention on important sites for shorebirds throughout the Americas. The North American Waterfowl Management Plan (NAWMP), first developed in 1986, coordinates conservation efforts for waterbirds (principally Anatidae) in Canada, the U.S.A. and Mexico. Partners in Flight, launched in 1990, seeks to improve understanding of migratory birds which winter in the Neotropics, especially forest and grassland species, and to promote their conservation.

27. International action plans or conservation plans have been developed for a number of species or groups of species which are considered to be under threat regionally or globally, or which frequently come into conflict with human interests. Arctic breeding species or populations covered by single species plans include the Greenland White-fronted Goose *Anser albifrons flavirostris*, Lesser White-fronted Goose *Anser erythropus*, Dark-bellied Brent Goose *Branta bernicla bernicla*, Red-breasted Goose *Branta ruficollis* and Steller's Eider *Polysticta stellaris*. Plans are in preparation for the Great Cormorant *Phalacrocorax carbo* and Barnacle Goose *Branta leucopsis*. Groups of species covered by existing action plans include the murres (*Uria aalge* and *Uria lomvia*), the cranes (Gruidae), the grebes (Podicipedidae) and the eiders (*Somateria* spp. and *Polysticta stelleri*). An action plan

for the conservation of Anseriformes (ducks, geese, swans and screamers) is currently in preparation.

28. The effectiveness of existing international conventions, legally-binding agreements, voluntary agreements and other initiatives in providing adequate conservation measures for Arctic breeding birds and their habitats outside the CAFF member countries is considered both from the point of view of species protection and habitat protection.

29. All of the 279 Arctic breeding species under consideration obtain some measure of protection from one or more of the major formal, legally-binding agreements considered in this report.

30. All except 44 species are afforded some measure of protection under one or more of the seven main international conventions and agreements which have a direct bearing on the conservation of migratory birds (Ramsar Convention – 136 species; CITES – 26 species, Bonn Convention – 159 species, African Convention – 10 species, Bern Convention – 163 species, EEC Wild Birds Directive – 164 species, and African-Eurasian Waterbird Agreement – 69 species). Ninety-five species are covered by the Asia-Pacific Migratory Waterbird Conservation Strategy.

31. All except 18 species are covered by one or more of the legally-binding bilateral agreements for the protection of migratory birds in force in North America (Canada, U.S.A. and Mexico), Asia (China, India, Japan and U.S.S.R./Russian Federation) and Australia. Of the 18 exceptions, all but two (*Dendrocopos major* and *Cinclus cinclus*) are confined to the West Eurasian/African bird migration systems.

32. Most of the international conventions, agreements and voluntary initiatives discussed in this report contain some special provisions relating to globally threatened species. Nine of the Arctic breeding species under review are currently listed as globally threatened by IUCN and BirdLife International: Lesser White-fronted Goose *Anser erythropus*, Red-breasted Goose *Branta ruficollis*, Baikal Teal *Anas formosa*, Steller's Eider *Polysticta stelleri*, Steller's Sea-Eagle *Haliaeetus pelagicus*, Siberian Crane *Grus leucogeranus*, Eskimo Curlew *Numenius borealis*, Bristle-thighed Curlew *Numenius tahitiensis* and Spoon-billed Sandpiper *Eurynorhynchus pygmeus*. All of these species have received a considerable amount of international attention, and most are the subject of major conservation efforts.

33. Forty-three of the species under consideration are confined to countries which are covered by international, legally-binding instruments that provide an adequate level of protection to all, or virtually all, migratory species of birds throughout the year. A further 24 species are primarily pelagic, spending much of the non-breeding season outside territorial waters and therefore outside the scope of land-based instruments.

34. There remain 212 species which are not as yet adequately covered by legally-binding international agreements throughout their migratory ranges. Seven types of regional agreement have been identified as being necessary to provide adequate coverage for these species. The African-Eurasian Waterbird Agreement, likely to enter into force in the near future, makes adequate provisions for 55 of the 212 species in Africa and Western Eurasia, while a future legally-binding agreement based on the Asia-Pacific Migratory Waterbird Strategy could achieve the same for 62 species throughout their Asian-Australasian flyways.

35. Many of the international agreements and programmes under review involve the designation of sites specially worthy of protection, and provide a strong basis for international cooperation in the conservation of habitats, e.g. the World Heritage Convention, UNESCO's Man and the Biosphere Programme, the EU Birds Directive

and Habitats Directive, and the Important Bird Areas Programme of BirdLife International.

36. Many of the international instruments for the prevention and control of pollution at sea (or their protocols) call for the establishment of marine and coastal protected areas, e.g. those relating to the Mediterranean, Eastern African, Wider Caribbean, Southeast Pacific and South Pacific.

37. Wetland habitats are well covered by the Ramsar Convention, which now (1 May 1998) has 106 Contracting Parties worldwide. Many of the 904 wetlands which have been designated as Ramsar Sites are of considerable importance for migratory waterbirds from the Arctic. Wetlands also receive considerable attention under the Bonn Convention, EU Wild Birds Directive and several other regional agreements and programmes in Europe. Action Programmes have been developed for the conservation of wetlands throughout south and east Asia, while in the Americas, the North American Waterfowl Management Plan and Western Hemisphere Shorebird Reserve Network place considerable emphasis on habitat protection.

38. About 112 (40%) of the Arctic species under consideration are birds of forest, woodland, scrub or grassland. Many of these may be at risk from the loss and degradation of natural forest and grassland habitats in their winter quarters and at critical stopover sites on their migration routes. The species at greatest risk are the long-distance migrants which spend the winter in tropical forest (and to a lesser extent tropical woodland) in Central and South America, Central and Eastern Africa and Southeast Asia. Unfortunately, there are few, if any, effective international legal instruments for the protection of migratory land-birds in the tropics. Partners in Flight was established to address the problems facing migrant forest and grassland birds wintering in the Neotropics, and could provide a useful model for similar endeavours in Eurasia and Africa.

39. A general conclusion is that the further a migratory bird travels south from the Arctic, the less likely it is to find itself, or its habitat, adequately protected by legally-binding conventions or agreements.

40. The extent to which different groups of birds with different habitat requirements are protected by international instruments varies greatly between groups.

41. Pelagic seabirds spend much of the non-breeding season in the open ocean, outside territorial jurisdiction. Their welfare is dependent on the effective implementation of the many international instruments for the prevention and control of marine pollution and regulation of fishing activities.

42. The 30 Arctic breeding species which winter in coastal marine habitats are almost entirely confined to north temperate regions where they are well covered by existing multilateral and bilateral agreements.

43. Waterbirds benefit greatly from the Ramsar Convention, and are also well covered by a number of regional agreements and programmes, as well as a variety of international species conservation plans and action plans. The Anatidae, in particular, are especially well covered. Large gaps remain in the coverage of legally-binding agreements for the protection of long-distance migrants, mostly shorebirds, which winter in the southern hemisphere, but these birds have been the focus of major voluntary initiatives in the Americas and in eastern Asia and the Pacific.

44. All 15 species of raptors are included in the appendices to the CITES, Bonn, Bern and African Conventions, as well as most of the bilateral agreements for the protection of migratory birds. However, there are no multilateral agreements or major international initiatives specifically concerned with the protection of migratory raptors, despite the fact that many are under threat from loss of habitat, pesticide use and illegal hunting.

45. Very little attention has been given to grassland species in international instruments. However, almost all of the 29 Arctic breeding species characterized as grassland species in this report have adapted well to pastureland and arable land, and only two, the Lesser White-fronted Goose *Anser erythropus* and Eskimo Curlew *Numenius borealis*, give any cause for concern.

46. While most of the 34 species of Arctic breeding birds which winter in temperate forests and woodland are well covered by existing conventions and agreements, the 36 species which undertake long migrations to winter in tropical forest and woodland receive very little benefit from international instruments once they leave temperate regions, and are perhaps the least well covered of any group of Arctic breeding birds.

47. The principal recommendations of this report are as follows:
    a. closer involvement of CAFF countries in conventions and agreements to which they are already party, and promotion of better collaboration between these instruments;
    b. greater participation by CAFF countries in the Bonn Convention, promotion of Agreements under this Convention, and participation by all Range States in the Agreement on the Conservation of African-Eurasian Migratory Waterbirds;
    c. increased adherence to the Convention on Biological Diversity;
    d. increased support for implementation of the Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000;
    e. promotion of the Ramsar Convention and designation of further sites to the List;
    f. promotion of the Bern Convention in Eastern Europe;
    g. confirmation of participation in the multilateral and bilateral agreements of the former USSR by members of the Commonwealth of Independent States;
    h. increased collaboration between bilateral agreements for the protection of migratory birds in the Asia-Pacific region, and possible amalgamation of these into a multilateral agreement for the entire Asian/Australasian region;
    i. development of multilateral agreements for the conservation of migratory raptors, especially in the Americas and Western Eurasia/Africa;
    j. greater emphasis on the conservation of migratory species at population level;
    k. further research on migratory birds that are inadequately protected throughout large parts of their non-breeding ranges, especially species that winter in tropical forests;
    l. further research on seabirds wintering along the edge of the pack ice;
    m. assessment of the impacts of climate change on Arctic migratory birds;
    n. assessment of the pressures on Arctic migratory birds outside the Arctic;
    o. establishment of an Expert Group on Migratory Species within the CAFF Programme.

1. INTRODUCTION

It has often been pointed out that Arctic flora and fauna are dependent on countries outside the region covered by CAFF. As the present report will demonstrate, this is especially the case for migratory birds. The 1992–93 Report of the CAFF Working Group stressed the need for this circumpolar group to focus on the use of international environmental and conservation instruments and fora, in order to make certain that the interests of Arctic ecosystems are taken into account on a global level. The Working Group drew particular attention to the importance of the Ramsar, CITES, Bern, Bonn, World Heritage, Western Hemisphere and Biodiversity Conventions in this regard.

A review of existing and proposed international and bilateral agreements and policy declarations pertaining to the Arctic environment has been produced under the aegis of the Arctic Environmental Protection Strategy (AEPS). This review, entitled *List of Major International Instruments and Policy Declarations Pertaining to the Arctic Environment*, has revealed a number of mechanisms that may be employed to protect the Arctic environment, and provides a useful tool for the implementation of the AEPS.

International agreements pertaining to the Arctic Region have also been summarised in a report entitled *Co-operation in the Arctic Region*, submitted to the Nordic Council of Ministers in 1995. This report focuses on international agreements regarding the control and prevention of marine pollution, air pollution and nuclear activities, although some reference is also made to the major international agreements dealing with wildlife and protected areas.

In a Working Paper on *Linkages Between the Agreement on the Conservation of Arctic Flora and Fauna and Multilateral Conservation Conventions*, Legare (1994) comments as follows:

> "... the Arctic ecosystem is affected, in no small part, by activities which take place outside the Arctic. As a result effective solutions to Arctic environmental problems cannot focus solely on programs and activities confined to the Arctic, but require coordination with other international environmental instruments, where these other jurisdictions are represented ... By working with established global instruments, CAFF can ensure that Arctic interests are taken into account at the broader, global level ... several of these instruments are ready-made vehicles to pursue the various components of Arctic conservation (e.g. wetlands, migratory species, wildlife trade) (...) Lastly, there are many scientific and research linkages among many of the conventions (...) and there is every reason for CAFF to also take advantage of these intellectual resources."

Against this problem background and in recognition of the need to consider the welfare of migratory Arctic species throughout their migratory ranges, the 5th Meeting of the CAFF International Working Group in Rovaniemi (1996) included in its 1996–97 Annual Work Plan the following activity:

1.1.v) Prepare, by CAFF VI, a discussion paper on the establishment of linkages with other international co-operation efforts for species migrating outside CAFF countries, to ensure appropriate habitat conservation throughout the range of migratory species utilising the Arctic.

The present study has been carried out as a part of this activity. It focuses primarily on migratory birds that breed in the Arctic region, as defined by the CAFF member states, and migrate to winter quarters outside CAFF countries. It investigates those international mechanisms (conventions, agreements, programmes, and action plans), both legally-binding and voluntary,

which are relevant to the conservation of migratory Arctic birds and their habitats, throughout their non-breeding ranges. Of primary concern are those mechanisms devoted to, or with special provisions for, migratory birds and their habitats. However, consideration is also given to broader environmental instruments and initiatives which, by seeking to maintain a healthier environment for humankind and wildlife alike, may in the long-term have an even greater influence on the welfare of migratory species world-wide. An attempt is made in the discussion to identify the main gaps and weaknesses in the international protection of migratory Arctic birds and their habitats, and some recommendations are made regarding the way forward.

2. MIGRATORY BIRDS OF THE ARCTIC

The limits of the Arctic Region as defined by the CAFF member states are shown in Figure 5. About 450 species of birds breed or have bred within this region (Appendix I and Appendix II). However, only 279 of these are species which breed widely in at least one of the eight member countries of CAFF (Appendix I), and commonly spend the boreal winter in at least one country outside the CAFF member states. These species are listed in Table 1. In a number of circumpolar species, only some discrete or relatively discrete populations of the species fall into this category. In many cases, the North American populations remain throughout the year in CAFF countries (Canada and the USA), while populations from the east Russian Arctic migrate south to Japan and China and/or populations from northern Scandinavia and northwest Russia migrate southwest to winter in western Europe. Furthermore, many of the species listed in Table 1 have discrete populations confined to temperate regions, and therefore outside the scope of this discussion. As far as possible, in the analyses which follow an attempt has been made to identify and hence consider only those subspecies and 'biogeographical populations' which are relevant to the Arctic (for a discussion of 'biogeographical populations', see Scott & Rose, 1996).

In over half of the 279 species under consideration, a substantial proportion of the birds breeding in the Arctic remain throughout the winter in CAFF countries. This is especially the case in North America, where in many species, only a relatively small proportion of the birds migrate as far south as Mexico and the Caribbean. However, there are 128 species which winter exclusively (or almost exclusively) outside CAFF countries (indicated in column 3 in Table 1).

Table 2 lists those 170 species of birds which breed or have bred in the Arctic region, but which are not considered in this report. These species can be divided into four categories:

- Ninety species are primarily birds of temperate latitudes which just extend into the Arctic Region at the northern extremity of their range. Only a tiny proportion of the world population breeds in the Arctic, and in many cases, breeding is irregular. Many of the birds in this category are birds of the boreal forests which extend into the Arctic Region in western Canada, northern Scandinavia and east-central Russia. Over half (51) are passerines; the others include species such as *Podilymbus podiceps*, *Ardea cinerea*, nine species of ducks (Anatidae), *Milvus migrans*, *Falco subbuteo*, *Grus monacha*, *Fulica atra*, *F. americana*, *Cepphus carbo*, *Cerorhinca monocerata*, three species of pigeons (Columbidae) and *Apus apus*.

- Four species, *Somateria fischeri*, *Pagophila eburnea*, *Rhodestethia rosea* and *Plectrophenax hyperboreus*, are essentially confined to the Arctic Region throughout the year. A few individuals stray outside the Arctic each winter, but these represent only a tiny fraction of the total population.

- A further 42 species are entirely sedentary or almost so. Some post-breeding dispersal may occur, generally over short distances, and in some cases, irruptions occur at more or less regular intervals, depending on food supplies, but there are no regular long-distance migrations, and few if any individuals from Arctic breeding populations ever leave the CAFF member states. Many of the species in this category are grouse (Phasianidae – 9 species), owls (Strigidae – 5 species), woodpeckers (Picidae – 6 species), tits and nuthatches (Aegithalidae, Paridae and Sittidae – 8 species) and crows (Corvidae – 5 species).

- The Arctic breeding populations of a further 34 species, although migratory, rarely if ever leave the CAFF member states. Species in this category occurring in Eurasia are mainly

partial migrants, the northernmost populations vacating their breeding ranges in autumn and moving south to spend the winter in more temperate latitudes within Russia and Scandinavia. A few individuals may straggle to Western Europe, Japan, northeast China and Korea, but these represent only a tiny proportion of the Arctic breeding populations. In North America, some of the species in this category are partial migrants, extending no further south than southern Canada or the northern USA, while others are typical long-distance migrants, vacating their breeding areas entirely to winter in the southern USA. In some cases, small numbers of birds reach Baja California and the northern border areas of Mexico, but again these represent only a tiny proportion of the Arctic breeding populations. Species in this category include *Gavia adamsii*, *Phalacrocorax urile*, a variety of Anatidae such as *Anser rossii*, *Anser canagica*, *Anas rubripes* and *Bucephala islandica*, *Haliaeetus leucocephalus*, *Falco rusticolus*, *Grus americana*, *Coturnicops noveboracensis*, *Rissa brevirostris*, several auklets (Alcidae), *Zoothera naevia*, both treecreepers (Certhiidae), seven North American sparrows (Emberizidae), *Agelaius phoeniceus*, *Eupagus carolinus* and several finches (Fringillidae).

The winter distributions of the 279 Arctic breeding species considered in this report are summarized in Table 3 and Figure 1. For simplicity, the world (excluding the CAFF countries) has been divided into 26 major wintering regions, with nine regions in the world's oceans, seven in Western Eurasia and Africa, five in Asia and Australasia, and five in the Americas. Not surprisingly, the largest numbers of Arctic species are to be found wintering in the northernmost regions, with the highest totals in Northwest Europe (100 species) and Eastern Asia (89 species). However, Table 3 and Figure 1 vividly demonstrate the ubiquitousness of Arctic breeding species during the boreal winter, with birds from the Arctic reaching every part of the world except the interior of the Antarctic continent. As many as 30 species reach southern Africa, while 26 species reach Australia and New Zealand, and 22 species reach southern South America. Several pelagic species reach the southern Oceans, and one species, the Arctic Tern *Sterna paradisaea*, reaches the edges of the pack ice in Antarctica.

The 279 Arctic migrant birds under consideration occupy a broad range of habitat types both during their migration seasons and in winter. An indication of the principal wintering habitat of each species is given in Appendix II. This may be summarised as follows:

• Pelagic (open ocean)	24 species
• Coastal marine habitats (inshore marine waters)	30 species
• Coastal wetlands (mudflats, mangroves etc.)	40 species
• Freshwater and brackish wetlands	53 species
• Open country habitats	30 species
• Grasslands, steppe and arable land	29 species
• Desert habitats	1 species
• Temperate forests and woodland	34 species
• Tropical forests (lowland and montane)	26 species
• Tropical woodland	12 species

Virtually all of the world's major ecosystems support some Arctic breeding birds during the boreal winter. No species regularly occurs in alpine heath and tundra habitats (outside the CAFF countries), and only one species is typical of desert habitats (the Eurasian Dotterel *Charadrius morinellus*, which winters in the deserts of south-west Asia and North Africa). In Table 3, the major wintering areas are linked to main habitat preferences in an attempt to identify which are the key wintering areas and habitats for Arctic birds. However, this reveals that not only do Arctic birds reach virtually every corner of the globe, but they also occupy virtually every major habitat in every major region. There are some notable exceptions, e.g. no land-birds reach the southern cone of South America or New Zealand, and very few reach

Australia, but several forest birds extend south to the southern limit of the worlds tropical forests in South America, Africa and Australasia, and many coastal and wetland species reach the southern tip of South America, the southern tip of Africa, southern Australia and New Zealand.

Clearly, the conservation of all Arctic breeding birds throughout their migratory ranges is a global problem, covering virtually all of the world's major terrestrial and marine ecosystems, and requiring a higher level of international cooperation than would be required for any other group of birds, or indeed any other group of animals, from a region of comparable size elsewhere in the world. In seeking to review those international legal instruments, voluntary agreements and other major initiatives which have a bearing on Arctic migrant birds outside the breeding season, the present report has, in fact, become an overview of the international mechanisms available for the conservation of migratory birds world-wide.

3. INTERNATIONAL CONVENTIONS AND OTHER LEGAL INSTRUMENTS RELEVANT TO THE CONSERVATION OF MIGRATORY BIRDS

There are many international legal instruments dealing with the protection of nature in general or with the protection of migratory birds in particular. In 1985, at the request of the German Ministry of Agriculture, Food and Forestry, IUCN's Environmental Law Centre prepared an overview of all treaties, multilateral or bilateral, dealing with migratory species, and examined each treaty in relation to Article V of the Convention on Migratory Species, which sets criteria for the development of Agreements under the Convention. This extremely useful document, entitled *Migratory Species in International Instruments: An Overview* (IUCN, 1986) was submitted as a background document to the First Conference of the Parties to the Convention on Migratory Species in Bonn in October 1985, and was published by IUCN in 1986.

The various international legal instruments for the protection of migratory birds in the West Palearctic and Africa have been reviewed in some detail by Biber-Klemm (1991). This author provides an overview of the African, Ramsar, World Heritage, Bonn and Bern Conventions and the EEC Wild Birds Directive, and provides an excellent summary of the treaties' substantial provisions concerning protection of species and habitats, geographical scope within the West Eurasian-African bird migration system, and regulations concerning migratory birds.

A major work entitled *Global Biodiversity: Status of the Earth's Living Resources*, compiled by the World Conservation Monitoring Centre in 1992 (IUCN, 1992), contains a major section on international policies and instruments, and an entire chapter on the Convention on Biological Diversity. It provides an extremely useful list of all the multilateral international treaties which had been adopted for the conservation of elements of biodiversity by 1992, and gives details of the status and membership.

Much of the information that follows is taken from one or other of these three major sources or from the original texts of conventions and agreements on file at IUCN's Environmental Law Centre. However, another major source of information has been the Internet. A data access service provided by the Consortium for International Earth Science Information Network (CIESIN, 1996) under the name *Environmental Treaties and Resource Indicators* (ENTRI) is especially useful, containing information on about 140 international environmental treaties, and in many cases the full text of the treaties. The Asia-Pacific Centre for Environmental Law provides a useful data access service on environmental treaties in the Asia-Pacific region, although much of this database is still being developed. Many of the major international conventions have their own home pages on the Internet (e.g. Bonn Convention, Ramsar Convention), while various national agencies provide an overview of the international environmental legislation to which their country is party (e.g. the Digest of Federal Resource Laws and List of Treaties provided by the U.S. Fish and Wildlife Service).

3.1 Land-based instruments

3.1.1 Global conventions

a) Convention on the Conservation of Migratory Species of Wild Animals (CMS; Bonn, 1979)
The Convention on the Conservation of Migratory Species of Wild Animals (CMS) was concluded in Bonn, Germany, in June 1979, and came into force on 1 November 1983. The Bonn Convention is the most important global convention in relation to migratory birds. The Convention aims to provide a framework for the conservation of migratory species and their habitats by means of strict protection and the conclusion of international agreements. The

Convention seeks to ensure strict protection for a number of migratory species, listed in Appendix I, which are in danger of extinction throughout all or a significant portion of their range, by imposing strict conservation obligations on Parties that are Range States. In addition, migratory species are eligible for inclusion in Appendix II if they have an unfavourable conservation status and require international agreements for their conservation, or if they have a conservation status which would significantly benefit from international cooperation (thus a species does not need to be threatened or potentially threatened to qualify for Appendix II). Listing in Appendix II, of itself, confers no protection, but the Convention requires Parties that are Range States for such species to conclude legally-binding Agreements for their conservation.

Three types of agreement are possible under the Bonn Convention. 'Agreements' are formal international legal documents for Appendix II species with priority for species having an unfavourable conservation status. Range States can participate in such Agreements without being parties to the Bonn Convention, enabling countries to be involved in conservation measures without formal ratification of the Convention. The main objective of an Agreement should be to restore migratory populations of a species or group of species to a favourable conservation status, or to maintain that status, throughout their entire migratory range. The more formal and comprehensive Agreement (Article IV, paragraph 3) should preferably deal with more than one species, cover the whole range concerned, and include all necessary instruments to make the Agreement operational and effective. The Convention also provides for Agreements (Article IV, paragraph 4) for the conservation of any population or geographically separate part of the population of any species of migratory wild animal. The geographical coverage does not have to extend to the whole of the migration range of the species concerned, nor does the species have to be listed in Appendix II of the Convention. Finally, Memoranda of Understanding are – in a legal sense – less binding international instruments used for a single species (or a population of species) or the coverage of a particular regional problem. They may be concluded between administrative governmental bodies, such as Ministries and Agencies (and their Directors) responsible for nature conservation, and are intended to promote consensus on urgently needed conservation actions.

Seven Agreements have been concluded under the aegis of the CMS to date:

- Agreement on the Conservation of African-Eurasian Migratory Waterbirds (1995).
- Agreement on the Conservation of Bats in Europe (1991).
- Agreement on the Conservation of Small Cetaceans of the Baltic and North Sea (1991).
- Memorandum of Understanding Concerning Conservation Measures for the Slender-billed Curlew *Numenius tenuirostris* (1994).
- Agreement on the Conservation of Seals in the Wadden Sea (1990).
- Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane (1993).
- Agreement on the conservation of Cetaceans of the Black Sea, Mediterranean, and contiguous Atlantic Area (ACCOBAMS).

A Memorandum of Understanding on the Middle-European population of the Great Bustard (*Otis tarda*) and an Agreement on the conservation and management of the Asian population of the Houbara Bustard (*Chlamydotis undulata*) are now well advanced. Other groups of species for which agreements and memoranda of understanding are currently being prepared include marine turtles, land mammals and albatrosses.

The Convention gives a detailed definition of the term 'migratory' which refers both to the entire population of a species or subspecies, and to geographically separate populations of the same species or subspecies. The fact that geographically separate populations may be considered makes it possible to afford different levels of protection according to the conservation needs of a species in different parts of its overall range. The Convention promotes the establishment of

networks of protected sites which are used by the same migratory populations ('green routes'). Species or populations deemed to have an unfavourable conservation status are those which are unable to maintain themselves on a long-term basis, or for which the range is likely to be reduced on a long-term basis, or for which there is insufficient habitat to maintain the species, or for which the present distribution and numbers approach historic low levels.

The Convention now has 52 Contracting Parties (as of 1 February 1998), concentrated mainly in Europe, Africa, South America, and parts of Asia (see Figure 2). The Convention Secretariat is provided by the United Nations Environment Programme (UNEP) and a Conference of the Parties meets every two and a half years. An overview of the Convention has been given by Boere (1991).

b) Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention; Ramsar, 1971), as amended by the Protocol of 1982

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) was signed in Ramsar, Iran, in February 1971 and came into force on 21 December 1975. The aim of the Convention is to "stem the progressive encroachment on and loss of wetlands now and in the future". The Convention provides a framework for international cooperation for the conservation of wetland habitats; it places general obligations on Contracting Parties relating to the conservation of wetlands throughout their territory, and special obligations pertaining to those wetlands which have been designated to the 'List of Wetlands of International Importance'. An important feature of the Ramsar Convention is that it advocates the wise and sustainable use of wetlands, providing that the use is compatible with wetland conservation, as opposed to strict prohibitions on human use and use of the wetland's resources. This approach has practical, economic and political appeal.

Each Party to the Convention is obliged to designate at least one site at the time of ratification, and is encouraged to list additional sites as and when appropriate. Sites are selected for designation to the List on the basis of an agreed set of criteria (the Ramsar criteria), although there is no external scrutiny. A Standing Committee has been set up and meets annually, and an independent Ramsar Convention Bureau (Secretariat) has been established in Gland, Switzerland. The Conference of the Parties is held every three years. By 1 May 1998, there were 106 Contracting Parties to the Convention (see Figure 3), and together these had designated a total of 904 sites covering over 68,000,000 ha. These sites are described in *A Directory of Wetlands of International Importance*, updated for each Conference of the Parties. Matthews (1993) has summarised the history and development of the Convention, and Frazier (1996) has recently given an overview of the world's Ramsar Sites.

c) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES; Washington, 1973)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was initiated at an IUCN General Assembly in 1963 and concluded at Washington in 1973. It came into force in July 1975. The aim of the Convention is to regulate international trade in endangered species and species that may become so unless their exploitation is controlled. It prohibits, with a few exceptions, international trade in species threatened with extinction (listed in Appendix I), and allows regulated trade in species whose survival is not threatened but may become so (listed in Appendix II). Appendix III provides a mechanism whereby a Party which has domestic legislation regulating to the export of species not in Appendix I and II can seek the support of other Parties in enforcing its own domestic legislation. Procedures are provided for periodic amendments to the appendices. Each Party designates a Management Authority which issues import and export permits on the basis of advice from one or more Scientific Authorities. The Conference of the Parties meets every two years, and

the Secretariat, originally funded by UNEP, is now financed by contributions from the Parties themselves.

d) Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention; Paris, 1972)

The Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) was adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris, France, in November 1972, and came into force in December 1975. As of December 1996, 147 Member States had ratified the Convention. The aim of the Convention is the protection of natural and cultural sites of global significance. The Convention seeks to define the worldwide natural and cultural heritage, to draw up a list of sites and monuments considered to be of such exceptional interest and such universal value that their protection is the responsibility of all mankind, and to promote international cooperation in order to contribute effectively to this protection. Each site nominated by the Parties for inclusion in the World Heritage List is assessed by a World Heritage Committee which, in the case of natural sites, is advised by experts from IUCN.

The Convention imposes a legal duty on each Party to do its utmost to protect designated sites, and many are protected as National Parks. Sites which might be considered as 'Natural Heritage' should be "geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation". Sites under threat can be included on the List of World Heritage in Danger. Each Party is required to contribute to the World Heritage Fund which may be used to secure the protection of sites on either list. One of the main responsibilities of the World Heritage Committee is to provide technical cooperation under the World Heritage Fund for the safeguarding of World Heritage Sites to Parties whose resources are insufficient. Thus a mechanism is provided for the transfer of resources from rich to poor nations for the safeguard of mankind's common heritage. By December 1996, 506 sites had been inscribed on the World Heritage List (380 cultural, 107 natural and 19 mixed properties in 107 Party States).

e) Convention on Biological Diversity (Nairobi, 1992)

The text of the Convention was negotiated by an Intergovernmental Negotiating Committee under the auspices of the United Nations Environmental Programme (UNEP) and concluded in May 1992 in Nairobi. The Convention was opened for signature in June 1992 at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. The Convention Secretariat is based in Montreal.

The Convention on Biological Diversity is the first global convention to concentrate specifically on the conservation and sustainable use of species and ecosystems. The objectives of the Convention, as set out in Article 1, are "the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources". In order to implement the Convention, Parties are required to develop national strategies for the conservation and sustainable use of biological diversity, and to promote public education and awareness on the conservation of biological diversity. The Convention calls for the establishment of programmes of research, technology and training, and encourages greater access to genetic resources and technology. It also calls on Parties, *inter alia*:

- to cooperate directly and through international organizations for the conservation and sustainable use of biological diversity;
- to cooperate internationally for biological monitoring;
- to develop inventories of biological diversity;
- to establish a system of protected areas and a set of criteria for their selection and

management, and to conserve biological diversity outside protected areas;
- to control the introduction of alien species;
- to respect and maintain the involvement, knowledge and practices of indigenous and local communities relevant to conservation and sustainable use.

Developed countries are encouraged to provide financial resources to developing country Parties in order for them to meet the terms of the Convention.

f) International Tropical Timber Agreement (Geneva, 1983)
The International Tropical Timber Agreement was negotiated and adopted at the UN Conference on Tropical Timber in Geneva in 1983, and came into force on 1 April 1985. Originally conceived as a commodities agreement, the ITTA developed into a mechanism much more similar to an agreement for international development assistance (IUCN, 1992). In the preamble to the agreement, it is stated that Parties enter into the agreement "recognizing the importance of, and the need for proper, and effective conservation and development of tropical timber forests with a view to ensuring their optimum utilisation while maintaining the ecological balance of the regions concerned and the biosphere". The objectives of the ITTA include not only the development of the industry, but research and development with a view to improving forest management. One of the purposes of this is to encourage the development of national policies aimed at sustainable utilization and conservation of tropical forests and their genetic resources, and at maintaining the ecological balance in the regions concerned.

The administrative structure for the agreement is known as the International Tropical Timber Organization (ITTO). This has two categories of membership, 'Producing members' (countries with tropical forest resources and/or net exporters of timber) and 'Consuming members' (other countries). The ITTO sponsors a number of research projects and pilot studies, and has a programme to assist countries in the development of management procedures to direct timber production in tropical forests toward sustainability (IUCN, 1992).

3.1.2 Western Eurasia and Africa

a) Europe
The very first international agreement concerning birds in Europe appears to have been the Convention for the Protection of Birds Useful to Agriculture, concluded in Paris in 1902. This was subsequently substituted by the International Convention for the Protection of Birds (Paris, 1950). Both are formally still in force, but are now of only historical and methodological interest (Biber-Klemm, 1991). Two trilateral conventions between the Benelux countries (Belgium, The Netherlands and Luxembourg), the Benelux Convention on Hunting and Protection of Birds (Brussels, 1970), as amended by the Protocol of 1977 (Brussels, 1977), and the Benelux Convention on Nature Conservation and Landscape Protection (Brussels, 1982), afford considerable protection to migratory species and their habitats, but are very limited in geographical coverage, and have to a large extent been superseded by the later Bern Convention and EEC Directives, to which all three Benelux countries are parties. The 1970 Benelux Convention focuses on hunting seasons and the protection of wild birds; the 1982 Convention focuses on cooperation in the field of conservation, management and rehabilitation of the natural environment and landscapes, particularly in transboundary areas.

At present, the most important convention dealing with birds throughout Europe is the Bern Convention. Two EEC Directives are also especially relevant in the fifteen member states of the European Union.

- *Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979)*
  The Convention on the Conservation of European Wildlife and Natural Habitats was

sponsored by the Council of Europe following a recommendation from the Second European Ministerial Conference on the Environment in 1976. The text was finally agreed at Bern in 1979, and the Convention came into force in June 1982. The aims of the Convention are "to conserve wild flora and fauna and their natural habitats", to promote cooperation between countries in their conservation efforts, and to give "particular emphasis to endangered and vulnerable species, including endangered and vulnerable migratory species". In order to achieve its objectives, the Convention provides for the conservation of wildlife and wildlife habitats in general, and for the special protection of species listed in Appendix I (strictly protected plants), Appendix II (strictly protected animals) and Appendix III (protected animals) of the Convention. With respect to the protection of birds, the Convention adopts a 'reverse listing' approach, including all species of birds in Appendix III (protected animals) except for those listed in Appendix II (strictly protected) and eleven common and widespread species often regarded as pests.

The Convention imposes a clear and unequivocal legal obligation on Parties to protect all important breeding and resting sites of the hundreds of species of animals in Appendix II, and requires Parties to take such measures as are necessary to maintain populations of all species of animals and plants at levels corresponding to ecological, scientific and cultural requirements. Exemptions are, however, permitted under certain limited circumstances. A Standing Committee has been established which meets annually to review implementation of the Convention and to recommend a more effective approach to its work. The Council of Europe provides the Secretariat for the Convention.

The Bern Convention is, according to the practice of the Council of Europe, what is called an 'open convention'. This means that non-member states of the Council of Europe can also sign or accede to the convention at the invitation of the Committee of Ministers. This openness has been justified by the necessity to cover the whole range of migratory species, including at least northern Africa and most of the eastern European countries including the Russian Federation. There are currently 31 Contracting Parties, covering most of Europe except Russia and some of the newly independent eastern European states, and also including Burkina Faso and Senegal.

Two European Community Directives, the Wild Birds Directive and the Habitats Directive, are particularly effective in affording adequate protection to migratory birds and their habitats throughout the Member States of the European Community (currently Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and the United Kingdom). These Directives are Community Law, based on the international convention founding the Community and its amendments.

- *Directive and Resolution of the Council of the European Community on the Conservation of Wild Birds (Brussels, 1979)*
  The European Community Directive on the Conservation of Wild Birds (79/409/EEC of 2 April 1979) imposes strict legal obligations on Member States of the European Community to maintain populations of naturally occurring wild birds at levels corresponding to ecological requirements, to regulate trade in birds, to limit hunting to species able to sustain exploitation, and to prohibit certain methods of capture and killing. The Directive is considered a more detailed interpretation of the Bern Convention concerning wild birds. Article 1 covers the protection, management and control of wild birds, and lays down rules on their exploitation. It applies not only to birds, but also to their eggs, nests and habitats. In particular, in Article 4, the Directive states that the species and subspecies of birds mentioned in the Annex I (currently 175) "shall be the subject of special conservation measures concerning their habitat", and requires Member States to classify "the most suitable territories in number and size as special protection areas for the conservation of these

species". Member States are further required to take similar measures for regularly occurring migratory species not listed in Annex I, and should "pay particular attention to the protection of wetlands and particularly to wetlands of international importance". In a Resolution of April 1979, the Council of the European Community called upon Member States to notify the Commission within 24 months following the adoption of the Directive of the Special Protection Areas (SPAs) designated for Annex I species and regularly occurring migratory species not listed in Annex I. Member States are also required to encourage research as a basis for the protection, management and exploitation of birds, giving particular emphasis to the subjects listed in an annex.

Like the Bern Convention, the EEC Wild Birds Directive protects, in principle, all species of birds, and therefore provides lists of species which can be hunted or otherwise exploited under certain conditions. Annex II/1 lists those species which may be hunted under national legislation throughout the entire land and sea of the Community; Annex II/2 lists those which may only be hunted in certain member states. Other annexes are concerned with trade in birds, and the methods and modes of transport prohibited by the Directive in respect of hunting, capture and killing of birds.

- *European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Brussels, 1992)*
  The European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC of 21 May 1992) aims to establish, by the year 2000 at the latest, a network of protected areas throughout the Community designed to maintain both the distribution and abundance of threatened species and habitats, both terrestrial and marine. The Directive is split into two parts: Articles 3 to 9 cover the conservation of habitats, and Articles 10 to 14, the protection of species. The network of Special Areas of Conservation (SACs), known as Natura 2000, will include the Special Protection Areas designated under the EEC Wild Birds Directive. Each Member States is under an obligation to contribute to Natura 2000 in proportion to the representation within its territory of the natural habitat types listed in Annex I and habitats of the species referred to in Annex II (animals other than birds). Criteria for the selection of SACs are set out in Annex III.

  Member States are required to establish appropriate conservation measures for SACs, involving, if necessary, appropriate management plans and appropriate statutory administrative or contractual measures which correspond to the ecological requirements of natural habitat types in Annex I and the species in Annex II present on the sites. Member States should also take appropriate steps to avoid the deterioration of natural habitats and the habitats of species, as well as disturbance of the species. Member States are required to draw up national lists of sites of Community interest, and from these the Commission will establish a list of sites of Community importance. Any site hosting one of the priority habitats or species listed in Annex I or Annex II automatically becomes a site of Community importance for designation as a Special Area of Conservation.

In the Mediterranean Basin, a Protocol to the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona, 1976) concerning the establishment of 'Specially Protected Areas' has proved to be a very valuable mechanism for the protection not only of marine habitats but also coastal areas and wetlands of considerable importance to migratory birds.

- *Protocol to the Barcelona Convention Concerning Mediterranean Specially Protected Areas (Geneva, 1982)*
  The Contracting Parties to the Barcelona Convention met in Geneva in April 1982 and adopted the Protocol Concerning Mediterranean Specially Protected Areas, which entered

into force in March 1986. This Protocol specifies the action Mediterranean States are bound to undertake to identify, establish and manage marine and coastal areas requiring special protection in the Mediterranean Sea Area. To the extent possible, the Parties should "establish protected areas and ..., as appropriate, restore them, as rapidly as possible". Protected areas should be established in order to safeguard in particular: sites of biological and ecological value; the genetic diversity, as well as satisfactory population levels, of species, and their breeding grounds and habitats; and representative types of ecosystems, as well as ecological processes. To aid the Parties, a Regional Activity Centre of Specially Protected Areas was established in Salammbo, Tunisia, in 1985. One of the activities of the Centre is to maintain a computerised database containing information on the marine and coastal conservation activities of each Mediterranean country and on individual protected areas, either existing or planned. All 20 of the countries in the Mediterranean Basin are Parties to this Protocol, and by September 1994 had designated a total of 122 Specially Protected Areas (Hecker & Tomas Vives, 1995).

Two agreements under Article IV (4) of the Bonn Convention, although not directly related to migratory birds, could have considerable benefits to Arctic birds through improved protection and management of key staging and wintering areas for shorebirds and other waterbirds. These are the Agreement on the Conservation of Seals in the Wadden Sea (1990) and the Memorandum of Understanding concerning Conservation Measures for the Slender-billed Curlew, *Numenius tenuirostris* (1994).

- *Agreement on the Conservation of Seals in the Wadden Sea (Bonn, 1990)*
  This agreement aims to promote close cooperation between the Parties (Denmark, Germany and The Netherlands) with a view to achieving and maintaining a favourable conservation status for the seal population of the Wadden Sea. Parties are required, *inter alia*, to take "appropriate measures for the protection of habitats. They shall pay due regard to the necessity of creating and maintaining a network of protected areas also in the migration areas of the seals in the Agreement Area" (the Wadden Sea), and "of ensuring the preservation of areas which are essential to the maintenance of the vital biological functions of seals". Furthermore, Parties are required to "preserve habitats and seals present from undue disturbances or changes resulting, directly or indirectly, from human activities", and to "have regard to the protection of habitats from adverse effects resulting from activities carried out outside the Agreement Area". The Parties should also "explore the possibility of restoring degraded habitats and of creating new ones", and "do their utmost to further reduce pollution of the North Sea from whatever source with the aim of conserving and protecting the Agreement Area".

- *Memorandum of Understanding concerning Conservation Measures for the Slender-billed Curlew,* Numenius tenuirostris *(1994)*
  This agreement, which has been signed by 15 countries and three cooperating organisations (the UNEP/CMS Secretariat, BirdLife International and the International Council for Game and Wildlife Conservation) entered into force on 10 September 1994. It covers all 30 Range States of *Numenius tenuirostris* in western Asia, southern Europe and North Africa. The aim of the agreement is to improve the conservation status of the Slender-billed Curlew throughout its potential breeding, migrating and wintering range. The Parties agree to "endeavour to provide strict protection for the Slender-billed Curlew and identify and conserve the wetlands and other habitats essential for its survival," and to implement in their respective countries the provisions of the Action Plan annexed to the Memorandum as a basis for the conservation of the whole population of the species. Actions specified in the Action Plan include enacting legislation to protect the Slender-billed Curlew and the wetlands that are critical to its survival, imposing a ban on the hunting of similar-looking wader species, and closing

key sites which are regularly frequented by the Slender-billed Curlew (wintering sites, resting sites on its migratory route or breeding areas) to hunters during the appropriate phenological period. The Action Plan also includes a series of actions to be carried out in each of the Range States and by the three cooperating organizations.

b) Africa
Potentially the most valuable tool was:

- *African Convention on the Conservation of Nature and Natural Resources (Algiers, 1968)*
  The African Convention was prepared under the auspices of the Organization of African Unity, and adopted in Algiers on 15 September 1968. It entered into force on 9 October 1969, and effectively replaced the old Convention Relative to the Preservation of Fauna and Flora in their Natural State, concluded in London in 1933 (see Appendix III to this report). The fundamental principle of the African Convention is that "Contracting States shall undertake to adopt the measures necessary to ensure conservation, utilisation and development of soil, water, floral and faunal resources in accordance with scientific principles and with due regard to the best interests of the people". Parties are required, *inter alia*, to:
  — establish policies to conserve, utilise and develop water resources, prevent pollution and control water use;
  — conserve faunal resources and use them wisely, manage populations and habitats, control hunting, capture and fishing, and prohibit the use of poisons, explosives and automatic weapons in hunting;
  — give special protection to species listed in an Annex; those in Class A should be totally protected, those in Class B may be taken only with authorisation;
  — establish conservation areas in order to protect those ecosystems which are most representative of and more particularly those which are in any respect peculiar to their territories, and ensure the conservation of all species and more particularly of those listed or which may be listed in the Annex.

  The African Convention includes many similar and equivalent provisions to the Bern Convention and EEC Wild Birds Directive in Europe, but does not give general protection to all species of wild fauna and flora, and there are no special prescriptions for migratory birds. Although there are 28 Contracting Parties to the Convention, it lacks a secretariat, and has never been properly implemented. Biber-Klemm (1991) suggests that the main reason for this lies in the enormous socio-economic problems of most of the member states, which are taking up most of the governments' time and efforts. The Convention also suffers from the fact that no measures to control implementation were provided for.

- *Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region (Nairobi, 1985)*
  This Protocol to the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi, 1985) contains a number of Articles that specify the actions that Parties should undertake to protect and preserve rare or fragile ecosystems as well as rare, depleted, threatened or endangered species of wild fauna and flora in the Eastern African region. Species of fauna requiring special protection are listed in Annex II (totally protected species) and Annex III (species the exploitation of which should be regulated). Special protection should also be afforded to migratory species listed in Annex IV. All of the birds listed in Annex II are resident Afro-tropical species, and Annexes III and IV are confined to mammals and marine turtles. The Parties are required, where necessary, to establish protected areas with a view to safeguarding the natural resources of the region, and should take into account, *inter alia*, the importance of these areas as critical habitats for species of fauna and flora, and as "migration routes or as wintering, staging, feeding or moulting sites for migratory species".

Other regional agreements which may be of some relevance include the Agreement on the Joint Regulations on Fauna and Flora (Enugu, 1977), the Agreement for the Cooperation and Consultation Between the Central African States for the Conservation of Wild Fauna (Libreville, 1983), the Protocol Agreement on the Conservation of Common Natural Resources (Khartoum, 1982), and the Agreement between the Democratic Republic of the Sudan and the Republic of Central Africa on Combat of Poaching and Wild Life Conservation (Khartoum).

c) Western Eurasial Africa

Much the most important instrument for the protection of migratory birds throughout Western Eurasia and Africa is the recently concluded Agreement on the Conservation of African-Eurasian Migratory Waterbirds, a multilateral, inter-governmental and legally-binding Agreement under Article IV (4) of the Bonn Convention.

- *Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA; The Hague, 1995)*

  The Final Act to this Agreement, sponsored by The Netherlands, was signed by 53 States in The Hague on 16 June 1995. The Agreement will enter into force on the 1st day of the 3rd month after at least 14 Ranges States (comprising at least seven from Africa and seven from Eurasia) have joined. The aim of the Agreement is the conservation of migratory waterbirds in the West Eurasian-African bird migration systems through coordinated measures to restore species to a favourable conservation status or to maintain them in such a status. The Agreement covers the entire continents of Africa and Europe, as well as large parts of western Asia and some of the islands off northeastern Canada, and encompasses some 117 Range States. It covers 170 species of waterbirds (in 17 families) listed in Appendix I and Appendix II to the Bonn Convention, including all migratory species of ducks, geese and swans (Anatidae) and shorebirds (Charadriidae and Scolopacidae) of regular occurrence in the Agreement Area.

  The Agreement has two parts, both of which are legally binding: the Agreement text, which describes the philosophy, legal framework and provisions; and an Action Plan which specifies the actions which Parties shall take in the following areas: species conservation; habitat conservation; management of human activities; research and monitoring; education and information; and implementation. At present, the Action Plan is restricted to four species of storks (Ciconiidae), five species of ibises and spoonbills (Threskiornithidae) and 50 species of swans, geese and ducks (Anatidae). However, it is envisaged that the Action Plan will eventually be expanded to include all 170 species of waterbirds listed in the Agreement itself.

  The First Meeting of the Parties is to be hosted by the Government of The Netherlands not later than one year after entry into force of the Agreement. An interim secretariat was established by the Dutch Ministry of Agriculture, Nature Management and Fisheries in January 1996, and although the Agreement has not yet entered into force, the secretariat has started to function. A Technical Committee, comprised of experts appointed on a regional basis as well as representatives of relevant non-governmental organisations, will be established at the first session of the Meeting of the Parties, as will a permanent Agreement secretariat. A historical overview of the development and completion of the Agreement has been given by Boere & Lenten (1997).

There are many bilateral economic and/or cultural agreements between European countries and countries in Africa, e.g. between The Netherlands and Benin, between France and the francophile countries in West Africa, and between the United Kingdom and a number of anglophile countries. Some of these agreements have provided funding for conservation projects, including projects on wetlands and migratory birds.

3.1.3 Asia and the Pacific

a) Bilateral agreements for the protection of migratory birds

Much the most useful international instruments for the protection of migratory birds over much of Asia and the Pacific are the various bilateral agreements which have been concluded between Australia, China, India, Japan, the Republic of Korea and Russia. At least six such agreements for the protection of migratory birds have been concluded within the region, Australia/China, Australia/Japan, China/Japan, Japan/Russia, India/Russia and the Republic of Korea/Russia. Furthermore, two Asian countries, Japan and Russia, have signed agreements with the United States of America for the protection of migratory birds. The aim of these agreements is to ensure that the governments involved recognise the value of migratory birds by protecting those birds that migrate between the territories of the parties, and by protecting their important habitats.

All of the agreements have very much in common, and indeed their basic texts are generally very similar. Migratory birds are defined as species of birds for which there is reliable evidence of migration between the Parties from the recovery of rings (bands) or other markers, and either species which are jointly determined by the contracting parties to migrate between the two countries, or species or subspecies of which are common to both countries. In all cases, the migratory birds covered by the agreements are listed in an Annex which may be amended by mutual arrangement. Table 5 shows which of the Arctic species under consideration in this report are listed in each of the agreements (including the draft agreement between Australia and Russia).

The basic provisions of the agreements are very similar, with only minor variations in wording. The Contracting Parties are encouraged to prohibit the taking of migratory birds, their eggs and derivatives, although exceptions may be made for scientific, educational, propagative or other purposes consistent with the agreement, for the protection of human life or property, and for hunting during seasons established by each Contracting Party. These hunting seasons must take into account the maintenance of annual reproduction required for the survival of the birds. In most agreements, there is also a provision to allow the hunting and gathering of birds or their eggs by indigenous peoples who have traditionally carried out such activities (aboriginal take). Most of the agreements also place some restrictions on trade in migratory birds, their eggs and derivatives. In all cases, the Parties are encouraged to establish sanctuaries for the management and protection of migratory birds and their habitats, to take appropriate measures to preserve and enhance the habitat of migratory birds, and to provide special protection to species in danger of extinction. The Parties should seek means to prevent damage to migratory birds and their environment, and take measures to restrict or prevent the importation and introduction of animals and plants which are hazardous to the preservation of migratory birds and their habitats. The Parties are encouraged to exchange data and publications regarding research on migratory birds and endangered species, and to establish joint research programmes for their protection.

- *Convention between the Government of the Union of Soviet Socialist Republics and the Government of Japan on the Protection of Migratory Birds and Birds under Threat of Extinction and on the Means of Protecting Them (Moscow, 1973)*
  This Convention entered into force in 1988. It covers endangered species of birds as well as migratory species, and lists 287 species in an Annex. A joint study of Steller's Sea Eagle *Haliaeetus pelagicus* has already been undertaken under this Convention.

- *Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Tokyo, 1974)*

This Agreement, commonly referred to as JAMBA, was signed on 6 February 1974, and came into force in April 1981. Like the Russia/Japan Convention, this Convention covers endangered species as well as migratory species. Sixty-six migratory species are listed in one Annex, and species in danger of extinction in Australia and Japan are listed in separate annexes.

- *Agreement between the Government of Japan and the Government of the People's Republic of China for the Protection of Migratory Birds and their Habitats (Peking, 1981)*
  This Agreement, which came into force in June 1981, covers 227 species of birds. Consultative meetings are held every two years to exchange information on actions taken to promote conservation of migratory birds and their habitats.

- *Convention between the Government of the Republic of India and the Government of the Union of Soviet Socialist Republics on Protection of Migratory Birds (1984)*
  This Convention covers 303 species of birds. Following the disintegration of the Soviet Union, the listing of species in the agreement is being reviewed. The Indian Government is currently reviewing its bilateral agreements with the newly independent republics, and is already considering a bilateral agreement on migratory birds with Turkmenistan.

- *Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (Canberra, 1986)*
  This Agreement, commonly referred to as CAMBA, was signed on 20 October 1986, and came into force in September 1989. Eighty-one migratory species are listed in the Annex. CAMBA and the Australia/Japan Agreement (JAMBA) have recently been discussed in some detail by Weaver (1997). Both are actively supporting cooperative research projects on species of special interest, and have highlighted the need for research on the Great Knot *Calidris tenuirostris*.

Details of the agreement between the Republic of Korea and Russia for the protection of migratory birds are not available, but it is believed that this agreement, which came into force in July 1994, is similar in scope and content to the other bilateral agreements outlined above. There is a voluntary agreement between the Forest Research Institute in the Republic of Korea and the Wild Bird Society in Japan for cooperation in the conservation of the Red-crowned Crane *Grus japonensis*, and there are plans to develop this agreement further into a bilateral agreement for all migratory species.

The Government of Australia has commenced talks with the Government of the Russian Federation on developing a bilateral agreement for the protection of migratory birds and their habitats, and a draft text with appendix list of 97 species of common concern has been prepared. Discussions have also taken place between the governments of Australia and Papua New Guinea on developing a similar bilateral agreement for migratory birds, or possibly a trilateral agreement that includes Indonesia (Watkins *et al.*, 1996).

b) Other regional instruments

Only one multilateral agreement in the Asia-Pacific region is specifically related to migratory birds: The Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane (Kushiro, July 1993).

- *Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane (Kushiro, 1993)*
  This Agreement, concluded under Article IV (4) of the Bonn Convention, aims at ensuring the survival of the west and central Asian populations of the Siberian Crane, which are on the brink of extinction. By July 1996, seven of the nine Range States had signed the

Memorandum: Pakistan, Russian Federation, Islamic Republic of Iran, Kazakhstan, Turkmenistan, Uzbekistan, and India (the other Range States being Afghanistan and Azerbaijan). The Agreement has also been signed by three cooperating organisations: the UNEP/CMS Secretariat, International Crane Foundation and Wild Bird Society of Japan. The Memorandum came into force on 1 July 1993. An action plan was developed at the First Meeting of the Range States in Moscow in May 1995, and revised at the Second Meeting in India in November 1996. This Action Plan, to be read in conjunction with the Memorandum of Understanding, lists a series of actions to be carried out by all of the Range States as well as a series of more specific activities to be undertaken by each of the Range States and the cooperating organisations. In particular, the Action Plan requires that Parties enact legislation "to protect Siberian cranes and the wetlands that are critical to their survival, and take such measures as may be necessary to enforce such legislation".

Various other regional agreements relating to the environment in Asia may have a bearing on migratory birds, e.g. the Articles of Association of the South Asia Cooperative Environment Programme (Colombo, 1981) and the Jakarta Resolution on Sustainable Development of October 1987. In the latter, the Association of South-East Asian Nations (ASEAN) member countries adopt the principle of sustainable development "to guide and to serve as an integrating factor in their common efforts". The ASEAN Agreement on the Conservation of Nature and Natural Resources (Kuala Lumpur, 1985) has many provisions that would benefit migratory birds, but this Agreement has yet to come into force (see Appendix III).

In the Insular Pacific, there are two conventions dealing with nature conservation and the natural environment in general; the Convention on Conservation of Nature in the South Pacific (Apia, 1976) and the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea, 1986).

- *Convention on Conservation of Nature in the South Pacific (Apia, 1976)*
  The Apia Convention focuses on the establishment of protected areas in the South Pacific Region. The Parties should encourage the creation of protected areas which "together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species)". In addition to protecting indigenous fauna and flora in protected areas, Parties agree to "use their best endeavours to protect such fauna and flora (special attention being given to migratory species) so as to safeguard them from unwise exploitation and other threats that may lead to their extinction". Special protection measures should be taken for species that are threatened with extinction. In particular, the hunting, killing, capture or collection of specimens (including eggs and shells) of such species is allowed only with the permission of the appropriate authority, such permission being granted only under special circumstances.

- *Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea, 1986)*
  This Convention, sponsored by the South Pacific Regional Environment Programme (SPREP) and commonly known as the SPREP Convention, covers the South Pacific Region and is primarily concerned with marine pollution. The Parties agree to take "all appropriate measures" to prevent, reduce and control pollution of the South Pacific, from any source, and to ensure sound environmental management and development of natural resources. Forms of pollution covered by the Agreement include pollution from vessels, land-based sources, seabed activities and disposal of wastes, airborne pollution, pollution from testing nuclear devices and pollution from mining and coastal erosion. The Convention also includes provisions for the establishment of specially protected areas and for the protection of wild flora and fauna. Parties are required to take "all appropriate measures to protect and preserve rare or fragile ecosystems and depleted, threatened or endangered flora and fauna as well

as their habitat." Two Protocols to the SPREP Convention are concerned with marine pollution.

3.1.4 The Americas

a) Bilateral agreements for the protection of migratory birds

Much the most useful international instruments for the protection of migratory birds in North America are the bilateral agreements between the United States of America and Canada and Mexico.

- *Convention Between the United States of America and Great Britain (for Canada) for the Protection of Migratory Birds (Washington, 1916), as amended*
  This treaty adopted a uniform system of protection for certain species of birds which migrate between the United States and Canada, in order to assure the preservation of species either harmless or beneficial to man. The Convention identifies protected groups of birds by Family or species group names, and does not include a full list of species. It establishes close seasons during which no taking is permitted except for the purposes of science or propagation, and also prohibits the taking of nests and eggs of the species to which it applies (again with exceptions for scientific or propagation purposes). The Convention prohibits killing of insectivorous birds, except under permit when harmful to agriculture. No trade, except for the purpose of science or propagation, is permitted during the close season. It provides for the taking of special measures (such as the establishment of refuges) in respect of certain species. Subsistence hunting for migratory birds as currently practised in Canada and the USA does not comply with the requirements of the 1916 Treaty. To resolve this problem, the treaty has recently been amended by a protocol, drawn up by the US Fish and Wildlife Service and Canadian Wildlife Service, which makes the subsistence hunting provisions of the 1916 Treaty consistent with those of the more recent Convention between the USA and the former USSR (1974) by allowing regulated hunting of migratory birds for subsistence purposes between March 10 and September 1.

- *Convention Between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Animals (Mexico City, 1936) as amended by the Agreement Supplementing the Convention of February 7, 1936, for the Protection of Migratory Birds and Game Animals (Mexico City, 1972)*
  This Convention adopted a system for the protection of certain families of migratory birds in the United States and Mexico. Documents of ratification were exchanged on 15 March 1937. The Convention allows, under regulation, the rational use of certain migratory birds. It provides for enactment of laws and regulations to protect birds by establishment of closed seasons and refuge zones. Hunting of migratory birds is confined to a season not exceeding four months in duration in any year, and hunting from aircraft is prohibited. The Convention prohibits killing of insectivorous birds, except under permit when harmful to agriculture. It provides for enactment of regulations on transportation of game mammals across the United States-Mexican border. The 1936 Convention provides for a list of migratory game birds, the hunting of which should be regulated, and a list of migratory non-game birds, the killing of which is prohibited. The Agreement of 1972 adds an additional 32 families of birds, including eagles, hawks, owls and Corvidae, but does not specify whether the listed bird families are to be considered as game or non-game.

b) Other regional instruments

- *Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (Washington, 1940)*
  This Convention, commonly known as the Western Hemisphere Convention, has long been

available as a potential instrument for nature conservation throughout the Americas. Contracting Parties express their wish to "protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna, including migratory birds", and to protect regions and natural objects of scientific value. The Parties agree to take certain actions to achieve these objectives, including the establishment of national parks, national reserves, nature monuments, and strict wilderness reserves, and the adoption of "appropriate measures for the protection of migratory birds of economic or aesthetic value or to prevent the threatened extinction of any given species". However, although the Western Hemisphere Convention has been ratified by 19 republics in the Americas, including the USA, Mexico and nine South American countries, it has never been effectively implemented, perhaps partly because of the lack of a secretariat.

- *Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Kingston, 1990)*
  This Protocol closely parallels the Protocol to the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi, 1985), and contains many similar provisions. The Parties are required to take the "necessary measures to protect, preserve and manage in a sustainable way ... areas that require protection to safeguard their special value; and threatened or endangered species of flora and fauna." Such areas should be established in order to conserve, *inter alia*, representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability, and "habitats and their associated ecosystems critical to the survival and recovery of endangered, threatened or endemic species of flora and fauna". Endangered and threatened species of flora and fauna requiring special protection are listed in a series of Annexes.

The North American Free Trade Agreement (NAFTA) of 1992 and especially its Environmental Side Accord, the North American Agreement on Environmental Cooperation (1993), contain a number of provisions relating to the natural environment which could benefit migratory birds throughout the Americas through a general improvement in the protection of the environment (see Appendix III).

Within South America, the only major multilateral agreement which has a direct bearing on the conservation of natural ecosystems is the Treaty for Amazonian Cooperation (Brasilia, 1978). The emphasis in this agreement is very much on development and sustainable exploitation, and there are no special provisions for the preservation of migratory birds or their habitats (see Appendix III). However, there are three bilateral agreements between Colombia, Brazil and Peru concerning the conservation of the flora and fauna of the Amazon Basin.

- *Agreement for the Conservation of the Flora and Fauna of the Amazon Territories of the Republic of Colombia and the Federal Republic of Brazil (Bogota, 1973)*

- *Agreement for the Conservation of the Flora and Fauna of the Amazon Territories of the Republic of Peru and the Federal Republic of Brazil (Lima, 1975)*

- *Agreement for the Conservation of the Flora and Fauna of the Amazon Territories of the Republic of Colombia and the Republic of Peru (1979)*

  These very similar Agreements provide for an exchange of information between the governments concerned relating to policies, programmes and legislation regarding the conservation and development of the animal and plant life of their respective Amazon

territories. They encourage the development of common policies in respect of collection for scientific purposes of endangered species of flora and fauna, close seasons in general, and restrictions on the introduction of exotic species in the Amazon region. They require parties to curtail the import or transit of native natural products of one of the parties whose export is prohibited by that party, and encourage studies for the establishment of experimental stations and artificial breeding and rearing stations for the conservation of Amazon flora and fauna of scientific interest or possible value.

One other bilateral agreement in South America (between Argentina and Bolivia) is also specifically concerned with flora and fauna.

- *Agreement between Argentina and Bolivia on the protection of forests and fauna and on the development of border parks (La Paz, 1976)*
  This Agreement requires the Parties to develop a system of cooperation for the joint protection of forests, terrestrial and aquatic fauna, and national parks in border areas. It designates national authorities to promote the adoption and implementation of technical and administrative standards for the protection and conservation of terrestrial or aquatic species, particularly migratory species. It also requires these authorities to cooperate to promote scientific research, promote the establishment of nature reserves, ensure the rational exploitation of protected species, promote the adoption of coordinated regulations on hunting, fishing and the transport of and trade in animal products, and develop education and public information programmes on all aspects of the conservation and rational utilisation of terrestrial and aquatic fauna. The National Parks administrations of each country are required to provide technical assistance to the other party, exchange information on the establishment of national parks in border areas, and carry out studies with a view to determining the feasibility of establishing contiguous national parks.

3.1.5 Asian/American bilateral agreements

The United States of America has entered into two agreements with Asian countries for the protection of migratory birds, the USA/Japan Convention of 1974 and the USA/USSR Convention of 1976. Both are very similar to one another and to the bilateral agreements between various Asian nations and Australia described above. They are designed to provide for the protection of species of birds which are common to both countries, or which migrate between them, by protection and enhancement of habitat, exchange of research data and other information, and regulation of hunting.

- *Convention Between the Government of the United States of America and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction, and Their Environment (Tokyo, 1972), as amended by the Agreement amending the Annex to the Convention (Washington, 1974)*
  This Convention, which entered into force in September 1974. deals with migratory species and threatened species of birds, and covers 189 species listed in an Annex. The Convention applies not only to the mainland of the two Contracting Parties, but also to islands under their jurisdiction, including the U.S. Trust Territory in the Pacific Islands. An Agreement amending the annex to the Convention by adding Malay Bittern was affected by exchange of notes on 19 September 1974. This exchange also included a list of endangered birds as provided for in Article IV of the Convention. By a 1988 exchange of diplomatic notes, the appendices were updated to correct common names and scientific names of species, and to both add and delete species on the list based upon the latest scientific knowledge.

- *Convention Between the United States of America and the Union of Soviet Socialist Republics Concerning the Conservation of Migratory Birds and Their Environment (Moscow, 1976)*
  This Convention, which entered into force in October 1978, provides for the protection of 208 species of birds that migrate between the United States and Russia or that occur in either country and "have common flyways, breeding, wintering, feeding or moulting areas". The Convention contains very similar provisions to those in the USA/Japan and Asian migratory bird agreements, but also makes special reference to the need to prevent and abate pollution of migratory bird habitat. It requires each Party to alert the other Party to any fall in the numbers of migratory birds or threats to their environment, and to cooperate in minimising such threats. The Parties are required to identify the areas under their jurisdiction which are of importance as breeding, wintering, feeding and moulting areas for migratory birds, and to protect such areas. Special provision is made for attention to be paid to species regarded as endangered by one Contracting Party in the management plans prepared by the other Party.

The USA/USSR Agreement followed on from the Agreement Between the United States of America and the Union of Soviet Socialist Republics on Cooperation in the Field of Environmental Protection (1972), as amended in 1994. An objective of this 1972 Agreement is cooperation in the field of environmental protection through exchange of scientific personnel, organisation of bilateral conferences, exchange of scientific and technical information, and development and implementation of projects. The agreement emphasizes activities related to air and water pollution, enhancement of urban environment, preservation of nature, establishment of reserves, and arctic and subarctic ecological systems. Various projects on seabirds in the Bering Sea have been conducted under the auspices of this agreement.

Canada and Russia have also concluded agreements for the exchange of scientific and technical information (Arctic Technical Exchange Agreement of 1978) and cooperation in environmental matters (Accord for Environmental Cooperation of 1991).

3.1.6 Antarctica

The land and sea areas of Antarctica north to the Antarctic Convergence are well covered by a series of instruments aimed at the preservation and conservation of the living resources of Antarctica. These are summarized in Appendix III to this report.

3.2 Marine pollution

There are many international conventions and agreements dealing with pollution at sea. Most of these are listed in Appendix IV, and only the most important from the point of view of the conservation of seabirds are described below.

3.2.1 Global

- *Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London, 1972) and Amendments of 1978 Concerning Settlement of Disputes*
  This is one of the most important instruments for the regulation of dumping of radioactive wastes and any material produced for biological or chemical warfare. The convention is backed by a panel of experts, the Inter-Governmental Panel of Experts on Radioactive Waste Disposal at Sea (IGPRAD). In 1993, a moratorium on the dumping of radioactive substances was adopted within the framework of the convention.

- *International Convention for the Prevention of Pollution from Ships (MARPOL) (London, 1973) and Protocol of 1978*
  This Convention, the principal multilateral convention focusing on marine pollution from ships, entered into force in 1978. The Parties undertake to "prevent the pollution of the marine environment by the discharge of harmful substances or effluents containing such substances in contravention of the Convention". 'Harmful substances' are defined as any substance which, if introduced into the sea, is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea. Parties are required to cooperate in the detection of violations and the enforcement of the provisions of the Convention, using all appropriate and practicable measures of detection and environmental monitoring. Reports on incidents involving harmful substances should be made without delay to the fullest extent possible. Annexes to the Convention set out a series of regulations for the prevention of pollution by oil and for the control of pollution by noxious liquid substances.

- *United Nations Convention on the Law of the Sea (UNCLOS) (Montego Bay, 1982)*
  This convention came into force in November 1994. However, the actual contents of the convention had been applied in practice in several areas prior to its entry into force. In the Preamble, Parties recognize "the desirability of establishing ... a legal order for the seas and oceans which will facilitate international communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment".

  Part XII of the Convention is concerned with the protection and preservation of the marine environment. The general obligation in Article 192 stipulates that States have the obligation to protect and preserve the marine environment. Article 194 is concerned with measures to prevent, reduce and control pollution of the marine environment. States are required to "take, individually or jointly as appropriate, all measures ... that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal ...". States are also required to "take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights". The measures taken in accordance with Part XII should include "those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life". Articles 198 and 199 are concerned with the notification of imminent or actual damage to the marine environment, and international cooperation in the development and promotion of contingency plans against pollution. Section 5 of Part XII is concerned with international rules and national legislation to prevent, reduce and control pollution of the marine environment, including pollution from land-based sources, from sea-bed activities, from dumping, from vessels, and from or through the atmosphere. Article 235 states that "States are responsible for the fulfilment of their international obligations concerning the protection and preservation of the marine environment. They shall be liable in accordance with international law".

3.2.2 Western Eurasia and Africa

Conventions, agreements and protocols concerning various types of marine pollution (covering prevention, combating, compensation etc.) have been concluded specifically for the Northeast Atlantic, South-east Atlantic, North Sea, Baltic Sea, Mediterranean Sea, Black Sea, coastal region of West and Central Africa, and coastal region of Eastern Africa. These are listed in

Appendix IV. Only those major instruments with implications over and above the problem of marine pollution are discussed below.

- *Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona, 1976)*
  The Convention for the Protection of the Mediterranean Sea against Pollution (the Barcelona Convention) was adopted in Barcelona in 1976. Three Protocols to the Barcelona Convention are related to specific forms of pollution (see Appendix IV). The Mediterranean Action Plan, developed by UNEP under the Barcelona Convention, aims to improve the quality of the Mediterranean environment by implementing the Barcelona Convention (1976), including through the Geneva Protocol on Specially Protected Areas. The Action Plan has regional centres in Athens, Valbonne, Tunis, Malta and Split. The MedSPA Programme, also developed by UNEP under the Barcelona Convention, aims to provide special protection for endangered Mediterranean species and habitats vital for their conservation.

- *Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki, 1974), as amended in 1992*
  The Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area was signed in 1974 by the coastal states of the Baltic Sea at that time. Its aim was to protect the marine environment of the Baltic Sea, and it was the first international agreement to cover all sources of pollution, both from land and from ships as well as airborne. In 1992, a new Convention was signed by all the countries bordering on the Baltic Sea and by the European Economic Community. The governing body of the Convention is the Helsinki Commission (Baltic Marine Environment Protection Commission), often referred to as HELCOM. The Helsinki Commission meets annually and, from time to time, meetings are held at ministerial level. Decisions taken by the Helsinki Commission (reached unanimously) are regarded as recommendations to the governments concerned, and are to be incorporated into the national legislation of the member countries. HELCOM has four committees, one of which, the Environment Committee, works on joint monitoring programmes covering different sectors of the marine environment, the open sea and the coastal waters. The data are compiled into joint databases and are evaluated at regular intervals by experts from the Baltic Sea States, in order to assess the environmental conditions. This Committee also coordinates issues related to nature conservation and biodiversity.

- *Oslo and Paris Convention for the Protection of the Marine Environment of the North-east Atlantic (Paris, 1992)*
  The Convention for the Protection of the Marine Environment of the North-east Atlantic (OSPAR Convention) was concluded in September 1992 by the merger of two existing conventions, the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (Oslo, 1972), and the Convention for the Prevention of Marine Pollution from Land-based Sources (Paris, 1974). The Convention has been signed by all of the Contracting Parties to the Oslo or Paris Conventions (Belgium, Denmark, the Commission of the European Communities, Finland, France, Germany, Iceland, Ireland, The Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom) and by Luxembourg and Switzerland. It will enter into force when it has been ratified by all of the Contracting Parties to the present Oslo or Paris Conventions. In the meantime, the Decisions, Recommendations and all other agreements adopted under the present Conventions will continue to apply.

  The OSPAR Convention covers the marine areas of the North-east Atlantic covered by the two previous conventions, and excludes the Baltic Sea and Belts and the Mediterranean Sea. It addresses all sources of pollution of the marine environment and the adverse effects of human activities upon it, takes into account the precautionary principle and strengthens regional cooperation. The Convention adopts the polluter pays principle, by virtue of which

the costs of pollution prevention, control and reduction measures are to be borne by the polluter. It imposes a general ban on the dumping of wastes and other materials, with certain listed exceptions. It bans the dumping of all types of radioactive waste for a minimum of 15 years (with effect from 1 January 1993). During the 15-year period, its Commission (OSPARCOM) can unanimously decide that the ban might be given the status of a permanent ban.

3.2.3 Asia and the Pacific

Conventions have been concluded for cooperation on the protection of the marine environment in the Gulf area of the Middle East (Kuwait, 1972) and for the conservation of the Red Sea and Gulf of Aden (Jeddah, 1982). Two protocols to the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea, 1986) are concerned with pollution in the South Pacific Region.

3.2.4 The Americas

There are Conventions for the Protection of the Marine Environment and Coastal Area of the South-East Pacific (Lima, 1981) and for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena, 1983). Both of these Conventions include some provisions for the protection of coastal zones and their fauna. A 1989 Protocol to the Lima Convention provides for the 'Conservation and Management of the Protected Marine and Coastal Areas of the South-East Pacific', while a 1990 Protocol to the Cartagena Convention makes special provisions for protected areas and wildlife.

3.3 Fisheries and marine mammals

There are numerous international agreements concerned with fisheries and other marine fauna. Many of these are of considerable relevance to Arctic breeding seabirds, as they are fundamental to the maintenance of the fish stocks and marine food-chains on which the seabirds depend for food. The main agreements are listed in Appendix V, and no attempt has been made to discuss them further here.

3.4 Air pollution and climate change

The principal international instruments concerning air pollution and climate change are:

- The Convention on Long-Range Transboundary Air Pollution (LRTAP) (UN-ECE, 1979), and Protocols of 1985 and 1988.
- The Convention for the Protection of the Ozone Layer (Vienna, 1985), the Protocol on Substances that Deplete the Ozone Layer (Montreal, 1987), and the Adjustments and Amendments to the Montreal Protocol of 1990 and 1992.
- The United Nations Framework Convention on Climate Change (1992).

These are described briefly in Appendix VI.

4. INTERNATIONAL INITIATIVES AND PROGRAMMES

There are numerous global and regional initiatives (programmes, strategies, action plans) that provide frameworks for international cooperation in the conservation of nature, natural resources and the environment. Many of these can be encouraged to include issues related to the conservation of migratory birds and their habitats. Only the more important initiatives having a direct bearing on the conservation of migratory Arctic birds and their habitats are described below. Other initiatives with a more general environmental focus are described briefly or simply listed in Appendix VII.

4.1 Global initiatives

- *Man and the Biosphere Programme (UNESCO, 1970)*
  The Man and the Biosphere Programme of UNESCO was launched in 1970, and aims, amongst other things, to develop within the natural and social services a basis for the rational use and conservation of the resources of the biosphere. Project 8 of the MAB Programme is directed at the conservation of natural areas and the genetic material they contain, through the creation of a world-wide network of reserves. These reserves, known as Biosphere Reserves, are designated not only for the protection of unique natural areas, but also for a wide range of other objectives which include research, monitoring, training and demonstration. In most cases, the human component is vital to the functioning of the reserve. Biosphere Reserves are nominated by the national MAB committee of the country concerned, and are only designated following review and acceptance by the MAB Bureau at UNESCO (IUCN, 1992). States which participate in the MAB Programme are not obliged to nominate any reserves, but most do so.

- *UNEP Regional Seas Programme (1974)*
  The Regional Seas Programme was initiated in 1974 to develop an integrated and comprehensive approach to protect the marine environment. The Programme addresses problems such as dumping from ships, land-based pollution and over-fishing. By 1992, the Programme covered 10 different regions, involved 50 different countries, and had resulted in 24 separate international agreements. The Mediterranean was the first region in which the programme developed a cooperative framework for environmental protection. The approach developed here has served as a blueprint for other regional plans subsequently developed by UNEP (IUCN, 1992). Regional Action Plans have been developed as follows:

  - Mediterranean Action Plan – adopted February 1975
  - Gulf Action Plan – adopted April 1978
  - West/Central Africa Action Plan – adopted March 1981
  - South-east Pacific Action Plan – adopted November 1981
  - Red Sea Action Plan – adopted February 1982
  - Caribbean Action Plan – adopted April 1981
  - Eastern Africa Action Plan – adopted June 1985
  - South Pacific Action Plan – adopted March 1982
  - East Asia Action Plan – adopted October 1981
  - South Asia Action Plan – (in preparation in 1992)
  - Black Sea Action Plan – (planned in 1992)

- *Tropical Forestry Action Plan (TFAP; FAO, 1985)*
  The Tropical Forestry Action Plan, run by FAO, is intended to provide a mechanism whereby international aid efforts can be harmonised and coordinated with a view to halting the

destruction of tropical forests and promoting their sustainable development. The programme seeks to do this by helping countries which have tropical forests to develop national forest management strategies. These strategies are intended as the basis for increasing investment in tropical forestry with the coordinated assistance of aid programmes from donor countries. The plan originated from the Committee on Forest Development in the Tropics (CFDT) – a statutory body of FAO – and was adopted by FAO in October 1985 with the formal release of the TFAP. The plan lays out the principles and recommendations for the guidance of development assistance agencies in order to inform them how aid might be directed to the objective of sustainable forestry management. The process requires the development of an individual national level TFAP for every country which has tropical forests. By the end of March 1990, 70 countries, which together held 60% of the world's remaining tropical forests, had become involved in the TFAP process (IUCN, 1992).

Three major international efforts, now virtually global in coverage, have contributed immeasurably to our knowledge of key sites for migratory birds, the Important Bird Areas Programme of BirdLife International (formerly ICBP), the International Waterfowl Census of Wetlands International (formerly IWRB), and the series of international wetland inventories variously sponsored by Wetlands International, the World Wide Fund for Nature, IUCN, BirdLife International and the Ramsar Convention Bureau.

- *Important Bird Areas (IBA) Programme*
  The Important Bird Areas (IBA) programme, initiated by the International Council for Bird Preservation (ICBP) in the mid-1980s, is especially noteworthy in that it covers all species of birds, and thus all Arctic species. IBA projects have already been completed for Europe (Grimmett & Jones, 1989) and the Middle East (Evans, 1994), and are ongoing in Africa (where several IBA national reports have already been completed) and in Asia. Work has begun on an update of the European IBA; IBA projects have recently been initiated in Canada, the USA and Mexico, and in 1996 BirdLife International and the American Bird Conservancy announced the launch of a Latin American and Caribbean IBA programme. An IBA project is also planned in Oceania. IBAs are discrete sites which hold either globally threatened species, species with small geographical ranges, species restricted to specific habitats, or those that tend to congregate in large concentrations to breed, during their migrations, or in winter. The programme involves the identification, designation and subsequent protection of the sites identified. Sites are selected on the basis of scientifically credible, international criteria, and thus sites designated as globally important in one region are comparable with similar sites elsewhere in the world. Although the designation of a site as an 'Important Bird Area' confers no legal protection, the programme has received such widespread recognition as one of the most valuable mechanisms for the identification of globally important sites for birds that many governments are adopting the national IBA networks as a basis for their bird conservation strategies.

- *International Waterfowl Census*
  The International Waterfowl Census, launched by IWRB in the Western Palearctic in 1967, has gradually been extended, through regional schemes, to cover almost the whole of Asia, parts of Australasia, much of Africa, and most of South America. The census, which takes place in January (mid-winter) in the northern hemisphere and July (austral winter) and January (boreal winter) in the southern hemisphere, covers all major waterbird groups (Gaviiformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Phoenicopteriformes, Anseriformes, Gruiformes, Ralliformes and Charadriiformes) and, taken with national waterbird monitoring schemes in North America, Australia, New Zealand and Russia, provides vital information on key sites for those migratory waterbirds which concentrate in wetland habitats during the 'mid-winter' period. The results of the censuses are published in the form of annual reports from each of the major regions, and as regional overviews or

group reviews. The results of the censuses have constituted the principal source for the derivation of waterbird population estimates (as summarized in Rose & Scott, 1997), and have proved invaluable in the identification of wetlands of international importance for migratory waterbirds on the basis of the Ramsar Criteria.

- *Inventories of Wetlands of International Importance*
  Over the past two decades, regional directories of wetlands of international importance have been compiled for most regions of the world. The former IWRB (now Wetlands International) took the lead in many of these, but IUCN, WWF, BirdLife International and the Ramsar Convention Bureau have also co-sponsored several of the projects. Most of the inventories have used the criteria developed under the Ramsar Convention for the identification of sites of international importance. Thus, the published directories, in effect, constitute 'shadow lists' of wetlands which would qualify for designation as Ramsar Sites. Regions covered by directories of this type include Europe and North Africa (1980), the Middle East (1995), South and East Asia (1989), Oceania (1993), Australia (1994), New Zealand (1996) and the Neotropical Region (including the Caribbean) (1986). Similar directories are currently being produced by the Russian Federation and other republics of the C.I.S.

  Selection of sites for inclusion in the directories has been heavily biased towards sites important for waterbirds (especially in the earlier directories), partly because of all of the Ramsar Criteria, those relating to waterbirds are the most objective and easiest to apply, and partly because the information base for waterbirds is generally so much better than that for other groups of wetland animals or plants. As with the Important Bird Areas Project, although inclusion of a wetland in a directory does not confer any official status, it does draw the attention of the wider conservation community to the 'international importance' of the site, and helps to focus conservation efforts. The directories have been widely used in the development of national wetland policies, and have assisted Contracting Parties to the Ramsar Convention in the designation of sites for the Ramsar List.

4.2 Europe

- *European Network of Biogenetic Reserves (Council of Europe, 1976)*
  In 1976, the Committee of Ministers of the Council of Europe adopted a Resolution on the European Network of Biogenetic Reserves, with the aim of conserving representative examples of Europe's fauna, flora and natural areas. A Biogenetic Reserve should be a protected area enjoying legal status and characterised by one or more typical, unique, endangered or rare habitats, biocenoses or ecosystems. Member States were asked to compile an inventory of the different types of habitats, biocenoses and ecosystems in their territory, so that the rarest and most endangered environments could be preserved and designated as a contribution to the Biogenetic Reserve Network.

- *Trilateral Cooperation on the Protection of the Wadden Sea*
  Trilateral Wadden Sea Conferences at the ministerial level have been held regularly since 1978 to coordinate the conservation of the Wadden Sea and promote integrated management for nature conservation. A Common Wadden Sea Secretariat (CWSS) was established in 1987 to support, initiate, facilitate and coordinate the activities of the Trilateral Cooperation. The CWSS is responsible for the collection and assessment of information with regard to Wadden Sea protection, management and monitoring including progress in the implementation of the decisions of the ministerial conferences. It also collects information on activities that have, or may have, significant effects on the natural environment of the Wadden Sea, and makes suggestions for appropriate actions. At the Sixth Trilateral

Governmental Conference in Esbjerg, Denmark, in 1991, a Ministerial Declaration set out the guiding principles and common objectives of the Trilateral Cooperation.

- *MedWet*
  The MedWet Programme was launched in 1992 by the European Commission, the Ramsar Convention, the governments of France, Italy, Spain, Greece and Portugal, WWF, IWRB (now Wetlands International) and the Station Biologique de la Tour du Valat. It is a long-term collaborative action to stop and reverse the loss of wetlands in the Mediterranean basin, and to ensure the wise use of wetlands throughout the Mediterranean.

- *International Conferences of Baltic Sea States*
  This series of conferences, initiated in 1993, seeks to intensify international cooperation in the conservation and rational utilization of waterbirds in the Baltic Sea area. The conferences, which are held every three years, develop strategies and review progress. Participants include representatives of administrative bodies and organisations dealing with waterbirds from all states bordering the Baltic Sea (nine countries). The proceedings of the first two conferences (Vilm, May 1993 and Dierhagen, May 1995) were published in 1996 (Kalchreuter, 1996).

4.3 Asia and the Pacific

Three very similar regional action plans for the conservation of wetlands and waterbirds were developed at regional meetings in Pakistan (1991), Indonesia (1994) and China (1997). These covered South and West Asia, South-east Asia and East Asia, respectively.

- *Action Programme for the Conservation of Wetlands in South and West Asia (Karachi, 1991)*
  Developed at the International Conference on Wetland and Waterfowl Conservation in South and West Asia, Karachi, December 1991 (Anon, 1992). International Waterfowl and Wetlands Research Bureau, Asian Wetland Bureau and National Council for Conservation of Wildlife, Pakistan.

- *Priorities in Wetland Conservation in South-East Asia: Selected recommendations for action (Bogor, 1994)*
  Developed at the Ramsar South-east Asia Regional Workshop, Bogor, Indonesia, March/April 1994 (AWB, 1994). Asian Wetland Bureau, Ramsar Convention Bureau and PHPA, Indonesia

- *Priorities in Wetland Conservation in North-east Asia (Beidaihe, 1997)*
  Developed at the International Workshop On East Asian Wetlands and Waterbird Conservation, Beidaihe, China, March 1997. Wetlands International – Asia Pacific, Ministry of Forestry of China and Environment Agency of Japan.

  These three action plans are very similar in basic characteristics. All three contain a series of required actions grouped under broad headings and covering more or less the same suite of topics, e.g. wetland management, maintenance of biodiversity, policy and legislation, monitoring and research, exchange of information, training, education and awareness, development and coordination, and international cooperation. Considerable attention is given to migratory species of waterbirds and threatened and vulnerable species, and countries in the regions concerned are urged to identify key sites for these species and, as far as possible, ensure their protection. The Action Plan for South and West Asia includes a series of specific national actions for many of the countries in the region, often concerning particular sites and/or particular species. The South-East Asian document includes a report

on the status of wetlands in South-east Asia, as will the Northeast Asian document, which is still being finalised.

Using the bilateral migratory bird Agreement between Australia and Japan (JAMBA), Australia and Japan co-hosted an International Workshop on Conservation of Migratory Waterbirds and their Wetland Habitats in the East Asian-Australasian Flyway in Kushiro, Japan, in November/December 1994. The objective of this workshop was to examine the potential of a multilateral approach to these issues. General agreement was reached between the 17 participating countries that a multilateral approach to the conservation of migratory waterbirds and their wetland habitats was required for the Asia-Pacific flyways. A workshop statement was produced that has become known as the 'Kushiro Initiative'.

- *Kushiro Initiative (Kushiro, 1994)*
  Statement of the International Workshop on Conservation of Migratory Waterbirds and their Wetland Habitats in the East Asian-Australasian Flyway, Kushiro, Japan, November/December 1994. This Initiative identifies the objective of developing a multilateral agreement of treaty status to protect migratory waterbirds throughout the Asia-Pacific region, and called for the preparation of the Asia-Pacific Migratory Waterbird Conservation Strategy : 1996–2000, that would initially take the place of a formal agreement. It also recommended the immediate establishment of an Asian-Australasian Shorebird Reserve Network, linking sites of importance for shorebirds throughout the flyway.

- *Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000*
  The Asia-Pacific Migratory Waterbird Conservation Strategy 1996–2000 (Anon, 1996) aims to serve as an informal framework to identify priority actions and suggest implementation mechanisms by bringing together governments, inter-governmental agencies, non-governmental organizations and local people in an attempt to enhance the conservation of migratory waterbirds and their habitats in the Asia-Pacific region until the end of the millennium (Mundkur & Matsui, 1997). The Strategy covers all groups of waterbirds (20 Families) occurring in the region. Its geographical coverage incorporates the three main 'flyways' of the Asia-Australasian bird migration systems: the Central Asian-Indian flyway, the East Asian-Australasian flyway, and the West Pacific flyway. It thus complements the geographical coverage of the African-Eurasian Waterbird Agreement, to the extent that all populations of migratory waterbirds in the Old World are covered by one or other of the two initiatives (and in a few cases, by both). The Strategy provides an overview of conservation issues, priorities for action, mechanisms and available resources. It calls for the development of Action Plans for species groups which will be implemented through site networks, along the lines of the Western Hemisphere Shorebird Reserve Network. The Strategy is non-legal in its approach, although a legally-binding agreement is envisaged for the future. Components of the Conservation Strategy already in place or being developed include the following:

  - *Shorebird Action Plan and East Asian-Australasian Shorebird Reserve Network (Brisbane, 1996)*
    The East Asian-Australasian Shorebird Reserve Network was launched at the Conference of the Contracting Parties to the Ramsar Convention in Brisbane in March 1996. The Network is an international cooperative effort supported by both governments and non-governmental organisations. It links wetlands that are internationally important for shorebirds, and promotes activities for their conservation. Eight countries are currently participating in the network, and have designated 19 sites. The Network helps site owners, managers, local people and participating organisations to gain international recognition and support for their site and their conservation efforts (Watkins *et al.*, 1996).

- *Action Plan for the Conservation of Anatidae in the East Asian Flyway*
  This Action Plan had its origins at a workshop held at the 1995 North-east Asia and North Pacific Environment Forum in Kushiro, Japan, in September 1995, and is being finalized by Wetlands International-Japan Programme and Wetlands International – Asia-Pacific. The Action Plan was, to a large extent, modelled on the Action Plan appended to the African-Eurasian Waterbird Agreement, and covers a similar range of issues (species conservation, habitat conservation, management of human activities including sustainable use, research and monitoring, and education and information). It covers all 55 species and subspecies of Anatidae that still occur regularly in the East Asian flyway.

- *Asia-Pacific Migratory Crane Action Plan and North East Asian Crane Site Network*
  Like the East Asian Anatidae Action Plan, this had its origins at the workshop in Kushiro, Japan, in September 1995, and is still being finalised. It covers six species of cranes (ten populations). The Action Plan includes an overview of the status of cranes in Northeast Asia, a review of the conservation needs, and a series of recommended actions, as well as a list of critical sites for crane conservation in the region. The East Asian Crane Site Network was launched at the International Workshop On East Asian Wetlands and Waterbird Conservation in Beidaihe, China, in March 1997, and will operate on similar lines to the East Asian-Australasian Shorebird Reserve Network.

An action plan has also been developed for the South Pacific.

- *Action Strategy for Nature Conservation in the South Pacific Region (Port Vila, 1989)*
  This Strategy was prepared during the Fourth South Pacific Conference on Nature Conservation and Protected Areas, organised by the South Pacific Regional Environment Programme (SPREP) and IUCN, and held in Port Vila, Vanuatu, in September 1989 (Anon, 1989). The Strategy has seven goals concerned with national strategies for sustainable resource use: incorporating nature conservation values and sustainability into national resource management policies; establishing representative systems of conservation areas; promoting the integration of traditional knowledge and resource conservation; fostering links between conservation and tourism; improving public environmental awareness; developing training and education in nature conservation and conservation area management; and promoting regional and international cooperation. Actions required to achieve these goals are grouped under a series of objectives. Country priorities for action on nature conservation and protected areas are given in an Appendix. The Strategy includes a 'Regional Avifauna Conservation Strategy for the South Pacific', the goal of which is to ensure the wise management of bird communities and their habitats in order to facilitate the recovery of endangered species and the conservation of all other indigenous species.

Other environmental initiatives in the Asia Pacific region include the Association of South East Asian Nations (ASEAN) Environment Programme and the Australia New Zealand Environment and Conservation Council (ANZECC).

4.4 The Americas

- *Western Hemisphere Shorebird Reserve Network Programme (WHSRN)*
  Launched in 1985 by the World Wildlife Fund, the International Association of Fish and Wildlife Agencies, and the Academy of Natural Sciences of Philadelphia, WHSRN began life as a voluntary collaboration of government and private organisations that are committed to shorebird conservation. In recent years, it has developed as a partnership programme of

the Manomet Center for Conservation Sciences and Wetlands International – the Americas (formerly Wetlands for the Americas). WHSRN gives international recognition to critically important sites, and promotes cooperative management and protection of these sites as part of an international reserve network. Parties to this initiative include non-governmental organisations, government agencies, private land-owners, industry etc. Funding is secured from private initiatives and governments on an *ad hoc* basis. The five main goals of the Network are:

- to protect sites critical to the Western Hemisphere's migratory shorebirds;
- to promote and support the development of strong conservation organisations and their efforts to protect shorebirds and shorebird habitat;
- to build strong public support for wetlands and shorebird conservation through education and public awareness;
- to develop and support international, national and local policies to help ensure the long-term protection and management of the hemisphere's migratory shorebirds and critical wetlands;
- to compile, improve and disseminate information on shorebird distribution, migration, habitat and biology in the Western Hemisphere.

Important shorebird sites along the migration routes are declared as 'WHSRN' sites, and may be 'twinned', e.g. Canada has 'twinned' an important feeding ground on the Bay of Fundy with an important site in Suriname. Four categories of reserve are recognized: hemispheric, international, regional and endangered species (Hunter *et al.*, 1991; Davidson, 1997). As a partner in WHSRN, Wetlands International – the Americas is responsible for services to the sites in Canada and South America. The WHSRN Secretariat, based at Manomet, is responsible for overall programme coordination and services to sites in the U.S.A. and Mexico. At least 31 sites have now been nominated as Network Reserves, and many of these are extremely important for Arctic breeding shorebirds, particularly species such as *Calidris canutus*.

- *North American Waterfowl Management Plan (NAWMP)*
  The North American Waterfowl Management Plan is a tripartite agreement between the USA, Canada and Mexico, designed to provide a framework to restore the biological and the functional integrity of wetland ecosystems to benefit waterfowl and other wetland-dependent species on an international level (Streeter *et al.*, 1997). The NAWMP had its origins in 1985, when the Governments of Canada and the United States developed a strategy of cooperation to restore waterfowl populations. Scientists from both countries worked together to establish waterfowl restoration goals and to identify important wetland habitat that would need to be secured, restored or enhanced to achieve population goals. The resulting waterfowl restoration strategy, or North American Waterfowl Management Plan as it became known, was signed by the Governments of Canada and USA in May 1986. A Waterfowl Management Plan Committee, a partnership of federal, state, provincial and territorial wildlife agencies, was established to coordinate work, review project proposals, authorise joint ventures, and to monitor the Plan. The Plan was updated in 1994 when Mexico became a full partner. Implementation is by way of Canadian and United States Government federal legislation, which allows funds generated to be matched by the state and non-governmental organisations, and allocated to the trilateral partners. A key to the plan's effectiveness is its regional and local implementation. Regional private and public voluntary partnerships, called joint ventures, have formed to implement the plan. One of these, the Arctic Goose Joint Venture (AGJV), is a cooperative programme to address significant information gaps in knowledge of the ecology, distribution and behaviour of Arctic nesting geese. One activity under the AGJV is cooperative work with Russian scientists on Lesser Snow Geese on Wrangel Island.

The 1998 NAWMP up-date will place renewed emphasis on the conservation of sea ducks (Tribe Mergini), and will initiate a Sea Duck Joint Venture (SDJV) to address key conservation concerns. Research and monitoring initiatives will be undertaken by Canadian and American agencies, often in partnership with Russian, Greenlandic or Danish partners, to study the four species of eiders (*Somateria* spp. and *Polysticta stelleri*), Harlequin Duck *Histrionicus histrionicus*, Long-tailed Duck *Clangula hyemalis*, three species of scoters (*Melanitta* spp.) and two species of goldeneye (*Bucephala* spp.) which breed in the Arctic.

- *Partners in Flight*
  Partners in Flight was launched by the U.S. National Fish and Wildlife Foundation (NFWF) in 1990 as a cooperative effort among numerous state and federal government agencies, non-governmental conservation organisations and private industry to improve understanding of migratory birds which winter in the Neotropics, identify species most at risk, and develop and carry out cooperative plans to protect their habitat. The original focus of Partners in Flight was on terrestrial birds, typically forest and grassland species, which breed in North America and winter in the Neotropics, but as the emphasis has shifted to integrated management planning at ecosystem level, there has been a movement towards including all birds. Progress has already been made towards developing regional and national migratory bird habitat conservation plans, based on the concept of management at landscape level (Bonney *et al.*, 1995). From its origins in the US, Partners in Flight has expanded into Canada, Mexico and parts of the Caribbean, and hopes ultimately to spread throughout the Americas.

5. INTERNATIONAL SPECIES CONSERVATION PLANS AND ACTION PLANS

International action plans were developed in the 1970s for several populations of North American waterfowl because of this group's economic importance. A framework for these plans was developed by the North American Waterfowl Management Plan. More recently, international action plans or conservation plans have been developed for a number of species or groups of species of birds which are considered to be under threat regionally or globally. In a few cases, management plans have been prepared for commoner species of birds which frequently come into conflict with human interests, e.g. species of geese which cause damage to crops in north-west Europe. The purpose of Action Plans is to define the actions needed to reach a given set of goals, and to build consensus among the organisations and individuals who are in a position to influence the outcome. The process should facilitate exchange between countries, and establish the most appropriate actions in specific areas. The plans should form the basis for decisions at international level, and provide a framework for more detailed planning at national level (Heredia *et al.*, 1996).

5.1 Single species plans

Recent action plans and conservation plans dealing with single species or populations of birds breeding in the Arctic region are listed below.

- *International Species Conservation Plan for the Greenland White-fronted Goose* Anser albifrons flavirostris
  Draft document, produced in January 1992 by the Joint Nature Conservation Committee, U.K. and the National Parks and Wildlife Service, Ireland (Stroud, 1992).

- *Lesser White-fronted Goose* Anser erythropus *Action Plan*
  Prepared by the Goose Specialist Group and published in 1996 by the Council of Europe (Madsen, 1996). (Confined to the western population wintering in Europe).

- *Dark-bellied Brent Goose* Branta bernicla bernicla *Flyway Management Plan*
  Prepared by J. van Nugteren for the Ministry of Agriculture, Nature Management and Fisheries, The Netherlands, and published in 1997 by the Information and Reference Centre for Nature Management and the Dutch Society for the Preservation of the Wadden Sea. (van Nugteren, 1997).

- *Red-breasted Goose* Branta ruficollis *Action Plan*
  Prepared by the Threatened Waterfowl Specialist Group and the Wildfowl and Wetlands Trust, and published in 1996 by the Council of Europe (Hunter and Black, 1996)

- *Action Plan for the Steller's Eider* Polysticta stellaris
  Prepared by S. Pihl of the National Environmental Research Institute, Denmark and the Scaduck Specialist Group, on behalf of Wetlands International and BirdLife International. (Primarily concerned with the West Eurasian population). Published by RSPB in 1997. (Pihl, 1997).

Single species plans currently in preparation include the following:

- *Action Plan for the Great Cormorant* Phalacrocorax carbo
  Being prepared by R. Veldkamp (Bureau Veldkamp) for the National Forest and Nature Agency, Denmark and the National Reference Centre for Nature Management, The

Netherlands. (West Eurasian populations only).

- *Management Plan for the Barnacle Goose* Branta leucopsis
  In preparation by the Wildfowl and Wetlands Trust (J. Black) for the Scottish National Heritage, U.K. and Directorate for Nature Management, Norway. (Black, 1998a & 1998b).

5.2 Plans for groups of species

Recent action plans and conservation plans dealing with groups of species which include species breeding in the Arctic region are listed below.

- *International Murre Conservation Strategy and Action Plan*
  Prepared by the Circumpolar Seabird Working Group, CAFF, and published in March 1996. (Includes only *Uria aalge* and *Uria lomvia*). (CAFF Circumpolar Seabird Working Group, 1996).

- *The Cranes: – Status Survey and Conservation Action Plan*
  Compiled by C.D. Meine and G.W. Archibald of the IUCN/SSC Crane Specialist Group for IUCN/SSC, and published in 1996 (Meine & Archibald, 1996).

- *Grebes: A Global Action Plan For Their Conservation*
  Prepared by C. O'Donnell and J. Fjeldså for IUCN/SSC, and published in 1997 (O'Donnell & Fjeldså, 1997).

- *Circumpolar Eider Conservation Strategy and Action Plan*
  Prepared by the Circumpolar Seabird Working Group, CAFF, and published in June 1997. (Confined to eiders within the CAFF countries, and therefore excludes West European populations of the Common Eider *Somateria mollissima*). (CAFF Circumpolar Seabird Working Group, 1997).

Group plans currently in preparation include:

- *Ducks, Geese, Swans and Screamers: An Action Plan for the Conservation of Anseriformes*
  In compilation by D. Callaghan *et al.*, Threatened Waterfowl Specialist Group, and coordinated by the Wildfowl and Wetlands Trust, UK. (Covers all species of Anseriformes worldwide) (Callaghan *et al.* In prep.).

6. DISCUSSION

The following discussion seeks to review the effectiveness of existing international conventions, legally-binding agreements, voluntary agreements and other initiatives in providing adequate conservation measures for Arctic breeding birds and their habitats outside the CAFF member countries. The effectiveness of these instruments is considered both from the viewpoint of species protection and habitat protection. The discussion ends with a brief summary of the results of a recent workshop, which examined international mechanisms for the conservation of waterbirds.

6.1 Species conservation

Table 4 indicates which of the 279 species of Arctic birds under consideration in this report are covered by seven of the main international conventions and agreements which have a direct bearing on the conservation of migratory birds (Ramsar, CITES, Bonn, African and Bern Conventions, EU Wild Birds Directive and African-Eurasian Waterbird Agreement), and also those species covered by the Asia-Pacific Migratory Waterbird Conservation Strategy. Table 5 indicates those species covered by nine of the bilateral agreements for the protection of migratory birds currently in force in North America and the Asia/Pacific region, and also the draft Australian/Russian agreement. The principal international conventions, agreements and initiatives which have a strong element of species protection are discussed below.

6.1.1 Global Instruments

a) Bonn Convention (CMS)

This is the most important global instrument to promote the conservation of migratory birds. Of the 279 Arctic species under consideration, over half (159) are listed in the Appendices, including all of the Anatidae, Pandionidae, Accipitridae, Falconidae, Gruidae, Charadriidae, Scolopacidae and Muscicapidae (in the broad sense), as well as certain West Eurasian populations of three species of Gaviidae, two species of Podicipedidae and three species of Laridae which are considered to have an unfavourable conservation status. Six globally threatened species and *Haliaeetus albicilla* are listed in Appendix I (see below). The remainder, listed in Appendix II, are species for which Parties that are Range States are required to conclude legally-binding Agreements. As Boere (1991) has pointed out, the only real difficulty with this approach is that for many bird species which undertake long migrations (notably trans-equatorial migrants), a large number of Range States would have to become party to an Agreement before it is likely to be effective, at least from a legal point of view.

b) Ramsar Convention

The Ramsar Convention defines waterfowl as "birds ecologically dependent on wetlands". In recent years, the term 'waterfowl', as used in the broad Ramsar sense, has generally been replaced by the term 'waterbird' (e.g. in the African-Eurasian Waterbird Agreement), to avoid confusion with North American usage of the term 'waterfowl' (restricted to ducks, geese and swans). Nevertheless, even with the broader term 'waterbird' now in widespread usage, it is often overlooked that a number of species of raptors (kites, sea-eagles, and the Osprey *Pandion haliaetus*), many kingfishers (Alcedinidae) and some Passerines are as dependent on wetland ecosystems as species of Anatidae or shorebirds. While it might not be practicable or necessary to develop conservation strategies for all of these species (e.g. some of the smaller Passerines), they will often benefit from measures taken to protect the habitat of other waterbirds. All Arctic breeding birds which fall under the broad definition of 'waterfowl' are indicated in the first column of Table 4. Some 136 species, or almost half of the total, fall into this category. A

very high proportion of the 904 wetlands (1 May 1998) which have been designated as Ramsar Sites are important for waterbirds, and many are of considerable importance for migratory birds from the Arctic. Over 400 sites (totalling over 5 million ha) have been designated in Western Europe alone, a particularly important wintering area for Arctic birds. The Ramsar Criteria for site selection, although covering a wide range of wetland values, give considerable attention to the values of the wetlands for waterbirds, and one group of the criteria is devoted to them. Specific criteria (Montreux Criteria 3) that determine when a wetland is of international importance based on waterbirds are as follows:

a) it regularly supports 20,000 waterfowl;

or b) it regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity;

or c) where data on populations are available, it regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl.

Many Ramsar Sites have been designated on the basis of one or more of these three criteria. Of 731 Ramsar Sites for which information was available in December 1995, over 250 fulfilled criterion 3a, over 530 criterion 3b, and over 300 criterion 3c (Frazier, 1996). This high preponderance of sites of importance for waterbirds is partly attributable to the fact that of the Ramsar Criteria, the waterfowl criteria are amongst the most objective and easiest to apply.

Criterion 2c, in the group of criteria referring to plants and animals in general, is also relevant to migratory waterbirds. The criterion states that a wetland should be considered internationally important if "it is of special value as the habitat of plants or animals at a critical stage of their biological cycle." This criterion could presumably be used to designate migratory staging areas which are critical for the survival of a particular population of waterbirds, even if the numerical criteria (3a and 3c) fail to apply.

c) CITES

The Convention on International Trade in Endangered Species is of rather little relevance to Arctic birds because so few are globally threatened (only 3% of the 279 species under consideration, as compared with 11% of the birds of the world as a whole (Collar *et al.*, 1994)). However, although only four of the nine globally threatened Arctic birds are listed in the CITES Appendices (see below), two other species, the near-threatened White-tailed Eagle *Haliaeetus albicilla* and the Peregrine Falcon *Falco peregrinus* (certain subspecies only), are included in Appendix I (all trade prohibited), and all other raptors, all cranes and all owls are included in Appendix II (trade to be regulated). Thus CITES affords some measure of protection to 25 of the species under consideration, as well as the subspecies *leucopareia* of *Branta canadensis*.

d) Convention on Biological Diversity

Because of its very broad scope, the Convention on Biological Diversity has the potential to become one of the most effective legal mechanisms to achieve the conservation of migratory birds on a global scale. It fills many of the gaps between existing environmental treaties, and aims to set the conservation of global biodiversity in a broader framework than its more technical predecessors. The majority of countries are already Parties to the Convention, and as such are signatories to legislation powerful enough to safeguard biodiversity including migrants from the Arctic. The effectiveness of this Convention, and indeed that of other international environmental treaties, will ultimately depend on the political and financial will of the Parties to fulfill their obligations, particularly, in this case, with respect to the development and implementation of national strategies.

6.1.2 Europe and Africa

a) Bern Convention

The Bern Convention is an effective mechanism for the conservation of migrant Arctic birds throughout much of Europe. All species of birds occurring in the native state in Europe are covered by the Convention, except for 11 species commonly regarded as pests. The only Arctic species in this category are *Larus marinus, L. argentatus, L. fuscus, Sturnus vulgaris* and *Corvus corone*. Of the 163 Arctic bird species included in the Appendices, 100 are listed in Appendix II (strictly protected), and the remainder in Appendix III (protected animals which may be hunted during certain seasons). In its article concerning habitat protection (Article 4), the Bern Convention obliges parties to "undertake to give special attention to the protection of areas that are of importance for the migratory species specified in Appendices II and III and which are appropriately situated in relation to migration routes, as wintering, staging, feeding, breeding or moulting areas". Furthermore, Contracting Parties are generally obliged to "coordinate their efforts for the protection of the migratory species specified in Appendices II and III whose range extends in their territories".

b) EC Wild Birds Directive

The EC Wild Birds Directive has rapidly become the most useful legally binding international instrument for the protection of birds within the 15 member states of the European Community. It covers all birds naturally occurring in the wild state within the Community, and gives complete protection year-round to the great majority. Of 164 Arctic species of regular occurrence in the Community, 115 are protected at all times of the year, 12 species may be hunted at appropriate times of the year throughout the Community (Annex II–1), and 37 species may only be hunted in certain countries within the Community (Annex II–2). Only 15 of the Arctic species may be traded (Annex III): *Anser albifrons albifrons*, *Anser anser*, nine common species of ducks, *Pluvialis apricaria*, *Scolopax rusticola*, *Gallinago gallinago* and *Lymnocryptes minimus*. Thirty-two Arctic species, including two species in Annex II–2, are listed in Annex I and should therefore be the "subject of special conservation measures concerning their habitat". However, the Directive requires Member States to "take similar measures for regularly occurring migratory species not listed in Annex I, bearing in mind their need for protection in the geographical sea and land area where this Directive applies ... as regards their breeding, moulting and wintering areas and staging posts along their migration routes." On this basis, Member States are required to take special conservation measures to protect the habitat of all migrant birds from the Arctic. As of 13 January 1998, the 15 Member States of the European Community had designated a total of 1,740 SPA's covering 11,597,000 hectares. This vast network of protected areas includes many of the most important coastal areas, wetlands and forested areas in Europe, and supports huge numbers of migratory birds from the Arctic during the migration seasons and winter months.

c) African-Eurasian Waterbird Agreement

The African-Eurasian Waterbird Agreement is potentially an extremely valuable tool for the conservation of migratory waterbirds throughout the vast West Eurasian-African bird migration system. Concluded as recently as 1995, the Agreement has yet to come into force, and it is still far too early to predict how successful the Agreement will be in attracting Parties from the 117 Range States in the Agreement Area. Sixty-nine of the Arctic birds under consideration are covered by the Agreement, *viz.* all those species of waterbirds listed in Appendix I and Appendix II to the Bonn Convention which are of regular occurrence in the Agreement Area (except the Eurasian Woodcock *Scolopax rusticola*, a woodland species).

d) African Convention

The African Convention contains no special provisions for migratory birds. However, all species of cranes (Gruidae) are listed in Class A in the Annex (totally protected), and all species of

birds of prey (Falconiformes) and owls (Strigiformes) are listed in Class B (taking regulated). Unfortunately, this Convention has never been properly implemented.

6.1.3 Asia and the Pacific

The only legal entities which focus specifically on the conservation of migratory waterbirds in the Asia-Pacific region are bilateral agreements, of which there are now at least eight. These agreements generally cover all migratory species including passerines, which are known or believed to migrate between the two parties. The seven agreements involving Asian countries examined in Table 5 all provide complete lists of species in an Appendix, as does the draft Australia/Russia agreement. These would appear to be complete lists of birds migrating between the two countries in question, except in the case of the China/Japan agreement, which excludes the Hooded Crow *Corvus corone*. These bilateral agreements, and the very similar agreements between the USA and Canada and the USA and Mexico in North America, have proved to be very useful mechanisms for promoting the conservation of migratory birds. They have some obvious advantages over multilateral agreements, notably ease of negotiation and the ability to take rapid action on issues of concern to both bilateral partners (Weaver, 1997). In Northeast Asia as in North America, where a small number of mostly very large neighbouring countries cover huge areas, many migratory species, even some long-distance migrants, may remain throughout the year within the confines of just two or three countries. This compares strikingly with the situation in Western Europe, for example, where even a relatively short-distance migrant may pass through 10–15 countries within the space of a few weeks.

Within the last few years, great progress has been made in the development of voluntary initiatives for the conservation of migratory waterbirds in the Asia-Pacific region. The Kushiro Initiative of 1994 called for the development of an Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000, which could provide the framework for the development, at a later stage, of a legally-binding multilateral agreement for the conservation of waterbirds comparable with, and complementary to, the African-Eurasian Waterbird Agreement. The Strategy covers all species of waterbirds from Gaviidae to Laridae and Rhynchopidae, listing these by family rather than by species. Approximately 95 of the Arctic species considered in this report belong to the listed families and are of regular occurrence in the Asia-Pacific region. The Kushiro Initiative also called for the development of Action Plans for Anatidae, Shorebirds and Cranes in the Asia-Pacific region, and provided the impetus for the development of two reserve networks for migratory waterbirds in the region: the East Asian-Australasian Shorebird Reserve Network, launched in Brisbane in 1996, and the North East Asian Crane Site Network, launched in Beidaihe, China, in March 1997.

6.1.4 The Americas

The two bilateral conventions for the protection of migratory birds in North America, between Canada and the USA, and between Mexico and the USA, date back to 1916 and 1936 respectively, and provide an adequate measure of protection to virtually all migratory species of birds south to the Guatemalan border in Central America. The Canada/USA Convention lists groups of birds that are to be protected, rather than individual species, and excludes cormorants (Phalacrocoracidae), all families of birds of prey, and owls (Strigidae). The Mexico/USA Convention lists all those families of birds which include migratory species. Both of these Conventions cover over half of the Arctic migrants under consideration in this report (see Table 5).

The Western Hemisphere Convention (Washington, 1940) has long been available as a potential instrument for the protection of migratory birds and their habitats throughout the Americas. Parties to this Convention agree, *inter alia*, to take appropriate measures for the protection of

migratory birds of "economic or aesthetic value". However, this Convention has never been effectively implemented.

The North American Waterfowl Management Plan, involving Canada, the USA and Mexico, has developed into a very effective strategy of cooperation to restore waterfowl (Anatidae) populations in North America, while the Western Hemisphere Shorebird Reserve Network (WHSRN) has been very successful in promoting the conservation of migratory shorebirds throughout the Americas.

6.1.5 Antarctica

Only one species of bird breeding in the Arctic commonly reaches the Antarctic Ocean, namely the Arctic Tern *Sterna paradisaea*. Large concentrations of terns have only been observed in the main 'wintering' areas along the edge of the ice shelf, and there are surprisingly few definite records of the species close to land. There are, for example, only three totally reliable records of *S. paradisaea* in the waters around South Georgia (J.P. Croxall, pers. comm.). It seems, therefore, that the birds remain at sea throughout the boreal winter. The Antarctic seas (as well as the continent itself) are well protected by the Antarctic Treaty, Agreed Measures for the Conservation of Antarctic Fauna and Flora, Convention on the Conservation of Antarctic Marine Living Resources, and Protocol to the Antarctic Treaty on Environmental Protection.

6.1.6 The special case of threatened species

Most international conventions, agreements and voluntary initiatives concerned with nature conservation and the environment, even those primarily concerned with habitat protection or broader environmental issues, contain some special provisions relating to threatened species, especially those in danger of extinction.

Nine of the Arctic breeding species under review are currently listed as globally threatened in the 1996 IUCN Red List of Threatened Animals (Aves) (IUCN, 1996) and *Birds to Watch 2* (Collar *et al.*, 1994):

- Lesser White-fronted Goose *Anser erythropus*
- Red-breasted Goose *Branta ruficollis*
- Baikal Teal *Anas formosa*
- Steller's Eider *Polysticta stelleri*
- Steller's Sea-Eagle *Haliaeetus pelagicus*
- Siberian Crane *Grus leucogeranus*
- Eskimo Curlew *Numenius borealis*
- Bristle-thighed Curlew *Numenius tahitiensis*
- Spoon-billed Sandpiper *Eurynorhynchus pygmeus*

All of these species have received a considerable amount of international attention, and international Action Plans have recently been produced for four of them: Lesser White-fronted Goose *Anser erythropus*, Red-breasted Goose *Branta ruficollis*, Steller's Eider *Polysticta stelleri* and Siberian Crane *Grus leucogeranus*. One of the agreements concluded under Article IV (4) of the Bonn Convention, the Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane (1993), aims at ensuring the survival of the west and central Asian populations of the Siberian Crane *Grus leucogeranus*. These two populations, both numbering fewer than 10–12 individuals, are on the brink of extinction.

Four Arctic breeding species were included in the original Appendix I to the Bonn Convention: *Haliaeetus albicilla*, *Haliaeetus pelagicus*, *Grus leucogeranus* and *Numenius borealis*. Three more, *Anser erythropus*, *Branta ruficollis* and *Polysticta stelleri*, were added at the Fifth Session of

the Conference of the Parties in Geneva in April 1997. This meeting adopted a resolution highlighting the urgent need for action to protect *Grus leucogeranus* and other species that are highly endangered.

One of the Ramsar Criteria for the identification of sites of international importance for designation under the Ramsar Convention is based on the presence of threatened species at a site. Thus, Criterion 2a states that a wetland should be considered internationally important if: "it supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species". This criterion, in effect, states that any wetland which regularly holds significant numbers of a globally threatened species of bird is of international importance and would be eligible for designation under the Ramsar Convention. All nine of the globally threatened Arctic species could be considered to be waterbirds, and all except perhaps *Numenius borealis* (primarily a grassland species outside the breeding season) could benefit from the designation of Ramsar Sites under this criterion.

Only two of these globally threatened species appear on Appendix I to the CITES Convention: *Grus leucogeranus* and *Numenius borealis*. Two others, *Branta ruficollis* and *Anas formosa*, are listed in Appendix II (species in which trade is to be regulated).

In the Pacific, both the Convention on Conservation of Nature in the South Pacific (Apia Convention) and the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP Convention) contain provisions for the protection of threatened species of fauna and flora, and could be used to promote protection of the Bristle-thighed Curlew *Numenius tahitiensis*.

6.1.7 Summary of species coverage

All of the 279 species of birds considered in this report obtain some measure of protection from one or more of the formal, legally-binding agreements considered in Tables 4 and 5. All except 18 species are covered by one or more of the legally-binding bilateral agreements in force in North America, Asia and Australia. Of the 18 exceptions, all but two (*Dendrocopos major* and *Cinclus cinclus*) are confined to the West Eurasian/African bird migration systems.

Figure 4 shows those countries outside the CAFF member states which are covered by international, legally-binding instruments that provide an adequate level of protection to all, or virtually all, migratory species of birds throughout the year, except in the case of certain permissible quarry species which may be hunted during prescribed open seasons. These countries are party to one or more of the bilateral agreements considered in Table 5, or party to the Bern Convention and, in the case of EU Member States, the EC Wild Birds Directive. As far as species protection is concerned, all, or virtually all, of the Arctic species under review are considered to have an adequate measure of protection in these countries.

Forty-three of the Arctic species under consideration are confined to these countries throughout the year (except for occasional vagrancy), and thus enjoy some measure of protection year-round throughout their ranges. These species are indicated in the second column in Table 6. This Table attempts to identify the requirements for a comprehensive suite of multilateral agreements for the protection of migratory birds that would give year-round coverage to all Arctic breeding species, except for the 24 pelagic species which spend much of the non-breeding season outside territorial waters.

The 212 species which would benefit from additional agreements fall into seven major groups, based on their migratory ranges:

- North American species which could be covered by a regional instrument covering Central America and the Caribbean (31 species);
- North American species which would require a regional instrument covering Central America, the Caribbean and South America (a hemispheric agreement) (49 species);
- West Eurasian species with ranges restricted to the Western Palearctic, i.e. Europe, south-west Asia and North Africa, requiring a regional (Western Palearctic) agreement (59 species);
- West Eurasian species wintering in Africa south of the Sahara and requiring an agreement covering the whole of Western Eurasia and Africa (e.g. the African-Eurasian Waterbird Agreement) (53 species);
- Central and East Asian species confined to temperate regions, largely covered by existing bilateral agreements, but requiring the involvement of one or more of the following countries: North Korea, Mongolia, Kazakhstan, Kyrgyzstan and Tajikistan (39 species);
- Central and East Asian species wintering in the Indian subcontinent and/or south-east Asia (to Indonesia), and requiring a regional agreement covering the whole of Central and Eastern Asia (50 species);
- Central and East Asian species wintering in the Australasian region, and requiring a formal agreement with similar coverage to that of the Asia-Pacific Migratory Waterbird Conservation Strategy (29 species).

All groups include a mixture of waterbirds, raptors and passerines, with a wide range of habitat requirements. Those species which are included in the African-Eurasian Waterbird Agreement, the Asia-Pacific Migratory Waterbird Conservation Strategy and the Western Hemisphere Shorebird Reserve Network are indicated in Table 6.

6.2 Habitat conservation

6.2.1 General site protection

Various international conventions and programmes concerned with the natural environment involve the identification and designation of sites specially worthy of protection, and provide a strong basis for international cooperation in the conservation of habitats. Such designations usually guarantee the sites in question a considerable measure of legal protection.

The World Heritage Convention, although not primarily a nature conservation convention, provides considerable encouragement and financial support to the protection and management of sites of outstanding natural value. Migratory species are mentioned in the criteria for the inclusion of natural properties in the World Heritage List. These criteria state that "in the case of migratory species, seasonable sites necessary for their survival, wherever they are located, should be adequately protected. Agreements made in this connection, either through adherence to international conventions or in the form of other multilateral or bilateral agreements, would provide this assurance". Many of the 126 natural sites currently inscribed on the World Heritage List are outstanding wildlife areas of considerable importance for migratory birds from the Arctic. Notable examples include Kakadu National Park in Australia, Tikal National Park in Guatemala, Keoladeo National Park and Sundarbans National Park in India, Banc D'Arguin National Park in Mauritania, "W" National Park in Niger, Darien National Park in Panama, the Danube Delta in Romania, Djoudj National Bird Sanctuary in Senegal, Donana National Park in Spain, Thungyai-Huai Kha Khaeng Wildlife Sanctuaries in Thailand, Ichkeul National Park in Tunisia, Serengeti Game Reserve in Tanzania, and Canaima National Park in Venezuela. The broad global adherence to this convention, and the financial assistance that can be granted to poorer countries, could prove useful especially for cooperation with African countries (Biber-Klemm, 1991).

UNESCO's Man and the Biosphere Programme promotes the creation of a worldwide network of reserves (Biosphere Reserves), many of which are designated for the protection of unique natural areas. Three hundred Biosphere Reserves had been established by 1992, covering over 161 million ha in 77 countries worldwide (IUCN, 1992). Many of these sites are major staging or wintering areas for migratory birds from the Arctic. One interesting feature of the Biosphere Reserve network in the present context is that it includes a relatively large number of sites in South America (26), Africa (43) and Southern Asia (23), regions in which rather few international legal mechanisms are available for site protection.

The Important Bird Areas initiative of BirdLife International is proving to be a valuable tool in the identification of key staging and wintering areas for migratory birds of all species, land-birds as well as waterbirds and seabirds. The programme has the potential to increase protection of key areas where habitat-based initiatives are not completely effective, and to bolster activities taking place in other areas such as Canada. The Important Bird Areas projects in Europe and the Middle East have already proved effective in increasing site protection for vulnerable species, while the ongoing project in Africa has a substantial component of field work and is providing a great deal of valuable new information on sites specially worthy of protection.

In Europe, the Bern Convention and the EC Wild Birds Directive place considerable obligations on their member states to identify, designate and safeguard protected areas for birds, while the EC Habitats Directive calls for the establishment of a network of Special Areas of Conservation (Natura 2000) to maintain both the distribution and abundance of threatened species and habitats throughout the Community. This network will include all of the Special Protection Areas designated under the Wild Birds Directive. Designation of Special Areas of Conservation is required by the year 2004 at the latest. So far, the 15 member States of the European Community have proposed the designation of 5,771 sites by that date, covering a total of 22,013,800 hectares. A Protocol to the Barcelona Convention makes special provisions for the protection of important marine and coastal areas in the Mediterranean Basin. All 20 of the countries in the Mediterranean Basin are Parties to this Protocol, and by September (1994) had designated a total of 122 Specially Protected Areas (Hecker & Tomas Vives, 1995). The Council of Europe's Network of Biogenetic Reserves also focuses on the designation of important sites for nature conservation.

In Africa, the principal international instrument for the conservation of natural ecosystems and establishment of protected areas is the African Convention on the Conservation of Nature and Natural Resources, but this has never been properly implemented. The Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region makes provisions for the establishment of both marine and terrestrial protected areas, and requires the Parties to take into account the importance of these areas as wintering, staging, feeding or moulting sites for migratory species. This provision is clearly of considerable relevance to migratory birds from the Arctic, especially shorebirds which stage and/or winter in large numbers along the eastern African coast.

In Southeast Asia, the ASEAN Agreement on the Conservation of Nature and Natural Resources makes provisions for the establishment of protected areas, but this Agreement has not yet entered into force. Two conventions covering the South Pacific contain some provisions relating to the establishment of protected areas: the Convention on Conservation of Nature in the South Pacific (Apia Convention) and the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP Convention). An Action Strategy for Nature Conservation in the South Pacific Region, developed under the auspices of the South Pacific Regional Environment Programme (SPREP) in 1989, places considerable emphasis on the need to establish both marine and terrestrial protected areas in the South Pacific.

In the Americas, the Western Hemisphere Convention could be a valuable mechanism for the protection of natural ecosystems and the habitats of migratory birds, but this remains something of a 'sleeping convention'. The Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean encourages the establishment of protected natural areas in the Caribbean region, and is thus a potentially very valuable mechanism for protecting many migratory birds from the Arctic, including seabirds, waterbirds and forest birds, which winter in the Caribbean or pass through during the course of their migrations. A bilateral agreement between Argentina and Bolivia on the protection of forests and fauna and on the development of border parks is of considerable relevance in the present context because of the large numbers of Arctic-breeding shorebirds, notably *Tringa melanoleuca, T. flavipes, Calidris bairdii* and *C. melanotos*, which winter around high Andean lakes in Bolivia and northwestern Argentina.

6.2.2 Marine birds

There are numerous international agreements concerned with fisheries and other marine fauna. Many of these are of considerable relevance to Arctic breeding seabirds, as they are fundamental to the maintenance of the fish stocks and marine food-chains on which the seabirds depend for food (see Appendix V). Similarly, there are many international instruments for the prevention and control of pollution at sea, from a wide range of sources. These have been discussed briefly under Section 3.2 and are listed in Appendix IV. The most important global instruments are the Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, the International Convention for the Prevention of Pollution from Ships (MARPOL) and its Protocol of 1978, and the United Nations Convention on the Law of the Sea (UNCLOS). Regional conventions have been concluded for the Northeast Atlantic, Southeast Atlantic, North Sea, Baltic Sea, Mediterranean Sea, Black Sea, coastal regions of West and Central Africa, coastal regions of Eastern Africa, Persian/Arabian Gulf, Red Sea and Gulf of Aden, South Pacific, Southeast Pacific and Caribbean Region. Several of these conventions (or their protocols) call for the establishment of marine and coastal protected areas, e.g. those relating to the Mediterranean, Eastern African, Wider Caribbean, Southeast Pacific, South Pacific, and recently North Atlantic (OSPAR). The UNEP Regional Seas Programme, initiated in 1974, has been instrumental in the development of many of these regional conventions, and has produced a number of Regional Action Plans for the protection of the marine environment (see Section 4.1).

One of the aims of the Convention for the International Council for the Exploration of the Sea (Copenhagen, 1964) is to "promote and encourage research and investigations for the study of the sea, particularly those related to the living resources thereof". Presumably, this Convention could be used to promote research on pelagic seabirds outside the breeding season.

6.2.3 Wetland birds

The Ramsar Convention defines wetlands as "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres". Wetlands designated under the convention may "incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands, especially where these have importance as waterfowl habitat" (Article 2, paragraph 1). The Convention therefore aims to stem encroachment on habitats as diverse as mangrove swamps, peat bogs, water meadows, sandy beaches, shallow coastal waters, tidal mudflats, mountain lakes and tropical river systems. A large proportion of the world's coral reefs are found in marine waters less than six metres deep, and also, therefore, fall within the Convention's broad definition of 'wetland'.

The Ramsar Convention has become a powerful tool for promoting the conservation of wetlands and indirectly the protection of migratory waterbirds, not least because of its very wide coverage. The 106 Contracting Parties (on 1 May 1998) cover a large proportion of all of the continents except Antarctica, which has few wetlands in the conventional sense. The only major gaps are in northern South America (notably Colombia), the Caribbean, Central and Eastern Africa, the Arabian Peninsula, Central Asia, and mainland Southeast Asia. However, all of these regions contain important staging and wintering areas for Arctic birds, and clearly participation in the Ramsar Convention by the states in these regions should continue to be promoted.

In Europe, the EC Wild Birds Directive places considerable emphasis on the protection of habitat for migratory birds, and to this end, requires Member States to "pay particular attention to the protection of wetlands and particularly to wetlands of international importance". Many of the Specially Protected Areas designated in the Mediterranean Basin under the Protocol to the Barcelona Convention are wetlands. Of the 122 sites designated by September 1994, 35 are wholly or partly categorized as 'wetlands', and most of the others contain some wetland habitat (Hecker & Tomas Vives, 1995).

Two Agreements under the Bonn Convention, the Wadden Sea Seal Agreement and the Slender-billed Curlew Memorandum of Understanding, are likely to benefit Arctic birds through improved protection and management of key staging and wintering areas for shorebirds and other waterbirds. The Wadden Sea is well-known as one of the most important staging and wintering areas in Western Eurasia for migratory shorebirds from Arctic breeding areas, especially *Calidris canutus* and *Limosa lapponica*. The Slender-billed Curlew *Numenius tenuirostris* frequents a variety of inland and coastal wetland habitats which are of great importance for migratory shorebirds and other species from Arctic breeding grounds. Clearly, these species will benefit from any actions taken to conserve the habitat of the curlew, and several species (other *Numenius* species and *Limosa* species) might benefit greatly from a ban on hunting of similar-looking species.

Other regional initiatives promoting the protection and management of wetlands in Europe include the Trilateral Cooperation on the Protection of the Wadden Sea, MedWet and the International Conferences of Baltic Sea States.

Wetlands International – Asia Pacific (formerly the Asian Wetland Bureau) has been instrumental in the development of international action plans for the conservation of wetlands in South and West Asia (Karachi, 1991) with IWRB, Southeast Asia (Bogor, 1994) and Northeast Asia (Beidaihe, 1997), all three of which place considerable emphasis on the wise use of wetlands and establishment of protected areas in sites with high faunal and floral values, including key sites for migratory waterbirds.

In the Americas, the North American Waterfowl Management Plan (NAWMP) seeks to identify important wetland habitat that requires protection, restoration or enhancement if populations of Anatidae are to be restored to former levels. The Western Hemisphere Shorebird Reserve Network (WHSRN) gives international recognition to critically important sites for migratory shorebirds throughout the hemisphere, and promotes cooperative management and protection of these sites as part of an international reserve network.

6.2.4 Forest and grassland birds

Seabirds and waterbirds are a very spectacular component of the Arctic fauna, and not surprisingly have commanded a considerable amount of attention from researchers and conservationists both within the Arctic and at their migration staging areas and winter quarters

further south. However, of the 279 species under consideration in this report, about 112 (40%) are neither seabirds nor waterbirds but birds of forest, woodland, scrub or grassland. The plight of many of these birds, once they have left the Arctic on their annual migrations, is no less serious than that of most of the seabirds and waterbirds. Undoubtedly those at greatest risk are the long-distance migrants which spend the winter in tropical forest (and to a lesser extent tropical woodland) in Central and South America, Central and Eastern Africa and Southeast Asia.

Rappole (1991) has reviewed some of the conservation problems facing Nearctic migrant birds wintering in neotropical forests. Nearly one third of all migrants to the Neotropics winter in tropical forests, and these include 16 species which breed in the Arctic. These species are by no means restricted to forest edge or disturbed habitat, but occur commonly in undisturbed primary forest. Clearly, the loss or degradation of the tropical forests will have the same effect on those migrant species dependent on the forests as on the resident forest birds. Furthermore, protection of stopover sites is probably just as critical for forest species as for wetland or coastal species, although the requirements of forest birds on migration are often far less obvious.

Forest loss and fragmentation in North America and deforestation in Central and South America have been cited as the likely causes of major declines in some of the raptors and passerines that breed in Canada and the USA and winter in the Neotropics. Of the 44 species that breed in Canada's forested regions and winter mainly in the Neotropics, half have been predicted to lose more than 25% of their wintering habitat during the period 1985–2000, and one quarter have been predicted to lose more than 50% (Hyslop, 1996).

Unfortunately, there are few, if any, effective international legal instruments for the protection of migratory land-birds in the tropics. The Western Hemisphere Convention, African Convention and ASEAN Agreement on the Conservation of Nature and Natural Resources all include provisions for the establishment of protected areas, but the first two have never been implemented, and the ASEAN Agreement has yet to come into force.

The global International Tropical Timber Agreement promotes sustainable exploitation of tropical forests "while maintaining the ecological balance of the regions concerned and the biosphere" and could, in theory at least, provide some measure of protection to the world's remaining tropical forests. In South America, the Treaty for Amazonian Cooperation focuses on development and the sustainable exploitation of forest resources, and does not contain any special provisions for the preservation of migratory birds or their habitats. Three bilateral agreements between Brazil, Colombia and Peru are also concerned with sustainable exploitation, but place far more emphasis on the conservation of the flora and fauna, especially threatened species. Obviously, any agreement which serves to conserve the tropical forests of the Amazon Basin will have considerable benefits to those migrant birds from the Nearctic which spend the boreal winter this far south.

One of the most useful mechanisms for promoting the conservation of tropical forests has been the FAO Tropical Forestry Action Plan, which seeks to halt the destruction of tropical forests and promote their sustainable development by helping countries which have tropical forests to develop national forest management strategies. Partners in Flight was established in the USA in 1990 to address the problems facing migrant forest and grassland birds wintering in the Neotropics, and this voluntary association is now extending its activities throughout the Americas.

6.3 Comparison of mechanisms for the conservation of migratory waterbirds

The relative merits of various types of international mechanism for the conservation of waterbirds have recently been discussed at a workshop on determining priorities for waterbird and wetland conservation held at the International Conference on Wetlands and Development in Kuala Lumpur, Malaysia, in October 1995 (van Vessem, 1997). The aim of the workshop was to address the effectiveness of available bilateral and multilateral agreements (both governmental and non-governmental) and conventions as tools for the conservation of migratory waterbirds and their habitats.

The Workshop considered the advantages and disadvantages of bilateral and multilateral approaches, and concluded that a multilateral approach should be the preferred mechanism for implementing waterbird conservation at a flyway level. Bilateral agreements had a number of advantages, including formal allocation of financial resources, flexible and efficient channelling of technical and financial support, and stimulation of information flow. However, except in the case of species or populations with restricted ranges and relatively short migrations (i.e. which remain within the confines of two neighbouring countries throughout the year), agreements of this type are biologically inadequate for the effective conservation of migratory species. Multilateral agreements, although preferable, have many disadvantages, notably the length of time taken to develop and negotiate the agreements, the length of time taken to bring into place actions under the agreement, and the high costs of maintaining an effective secretariat. One way to overcome some of these difficulties would be to use existing voluntary agreements (such as the Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000) or a group of related bilateral agreements (such as the many bilateral agreements for the conservation of migratory birds in the Asia-Pacific region) as a basis for the development of multilateral, legally-binding agreements.

The Kuala Lumpur Workshop also examined the 'Twinned Sites' approach, and concluded that this was a useful tool for raising awareness and conceptually linking sites, such as breeding and non-breeding areas. It was also found to be a useful vehicle for transferring technical and financial support (van Vessem, 1997).

7. Conclusions and recommendations

One obvious conclusion from the present study is that the further a migratory bird travels south from the Arctic, the less likely it is to find itself, or its habitat, adequately protected by legally-binding conventions or agreements. Virtually all species of migratory birds are afforded some measure of protection throughout North America south to Guatemala, throughout most of Europe, and throughout much of Asia north of the Himalayas and South China Sea. In Europe, increased adherence to the Bern Convention in eastern Europe (and EC Wild Birds and Habitats Directives as the European Union expands) would seem to be a straightforward way to fill the gaps in this region. In Eastern and Central Asia, participation by the Democratic People's Republic of Korea, Mongolia, Kazakhstan and the smaller Central Asian republics in bilateral agreements with one or more of their neighbours (e.g. the Russian Federation) might be the easiest way to complete coverage in this vast region. In the Alma-Ata Declaration of 21 December 1991, members of the Commonwealth of Independent States (Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan) have undertaken to guarantee "in conformity with their legislative procedures, the fulfilment of international obligations, stemming from the Agreements signed by the former USSR". Clarification is required as to whether this applies to the various bilateral agreements on migratory birds entered into by the former USSR.

There is a substantial gap in the coverage of comprehensive, legally-binding agreements for migratory birds in the Middle East, where three countries, Iraq, the Islamic Republic of Iran and Afghanistan, are major staging and wintering areas for large numbers of birds from the Arctic, particularly Anatidae and shorebirds. It is unlikely that any significant progress will be made in the protection of migratory birds in Iraq and Afghanistan in the near future. However, the situation in Iran (home of the Ramsar Convention) is already favourable for migratory birds. Iran has excellent national legislation for the protection of birds, and has one of the most comprehensive protected area systems of any country in Eurasia.

Further south, the situation is far less secure. Major multilateral conventions concerning nature conservation exist for the whole of the Western Hemisphere, the whole of Africa, and the six ASEAN nations in Southeast Asia, but the first two appear to be 'sleeping conventions' and the third, concluded in 1985, has not yet entered into force. While attempts to 're-awaken' these three conventions might still be worthwhile, it is possible that a new agreement or initiative, legally-binding or otherwise, with a more realistic and practical approach would be more acceptable in developing regions in the tropics, and therefore more likely to lead to effective measures for the conservation of migratory birds on the ground.

Further south still, the situation improves again. In the southern cone of South America, Southern Africa and Australasia, national legislation generally provides adequate measures of protection for migratory birds, and this is supported in Australia by participation in legally-binding bilateral agreements with China and Japan.

The extent to which different groups of birds with different habitat requirements are protected by international instruments varies greatly between groups. Pelagic seabirds spend much of the non-breeding season in the open ocean, outside territorial jurisdiction. Their welfare is dependent on the effective implementation of the many international instruments for the prevention and control of marine pollution and regulation of fishing activities. It is difficult to see how conditions can be improved for these pelagic wanderers except through broader adherence to, and stricter enforcement of, treaties such as the United Nations Convention on the Law of the Sea.

The thirty Arctic breeding species which winter in coastal marine habitats are almost entirely confined to north temperate regions where they are well covered by existing multilateral and bilateral agreements. These species are especially vulnerable to oil pollution, and although most of the main areas where they concentrate are covered by international agreements for the prevention of marine pollution (e.g. North Sea and Baltic Sea), the birds continue to suffer periodic heavy losses.

Wetland birds benefit greatly from the Ramsar Convention. With over 100 Contracting Parties in all major regions of the world, this Convention helps to safeguard waterbird populations not only through the listing of key sites, but also through its provisions relating to the 'wise use' of all wetlands within the territory of the Parties. (It is perhaps worth noting that, with the exception of important African states, many of the 100 or so countries that have not yet joined the Convention are small island states in the Caribbean and Pacific with few large wetlands in the conventional sense, and very few if any wetlands of major significance to migratory birds). Wetland birds which winter mainly if not entirely in north temperate regions, e.g. most of the Anatidae, are very well covered by multilateral and bilateral instruments, regional programmes (such as the North American Waterfowl Management Plan), and a variety of action plans for single species and groups of species. The relatively few species of Anatidae which migrate further south to winter quarters in sub-Saharan Africa and the Indian subcontinent (e.g. Northern Pintail *Anas acuta*) remain rather well covered, as most of the countries in the regions where the majority of birds winter are Parties to the Ramsar Convention, or will be Parties to the African-Eurasian Waterbird Agreement when it comes into force.

Most of the Arctic wetland species which continue on to winter in the southern hemisphere are shorebirds. Large gaps remain in the coverage of legally-binding agreements for the protection of these species, although the African-Eurasian Waterbird Agreement has the potential to fill one of the main gaps when it comes into force. However, this group of birds has been the focus of major voluntary initiatives in the Americas (the well-established Western Hemisphere Shorebird Reserve Network) and in eastern Asia and the Pacific (the recently launched East Asian-Australasian Shorebird Reserve Network). As a group, therefore, the Arctic breeding shorebirds are receiving a considerable amount of attention.

The 15 species of raptors considered in this report are all included in the appendices to the CITES, Bonn, Bern and African Conventions and most of the bilateral agreements for the protection of migratory birds, and are generally well protected by national legislation over much of their ranges. Furthermore, four species are wholly or largely dependent on wetlands, and thus benefit from the Ramsar Convention. However, there do not appear to be any multilateral agreements or major international initiatives specifically concerned with the protection of migratory raptors, despite the fact that many species are long-distance migrants, and many are under threat from loss of habitat, pesticide use and illegal hunting. This is an obvious gap which needs to be filled.

Very little attention has been given to grassland species in international instruments, and it is only in recent years that the serious plight of many of these species has become apparent. Natural grasslands are disappearing rapidly in many parts of the world, and in some regions, such as central South America, many bird species dependent upon these grasslands are now listed as globally threatened or 'near-threatened'. However, almost all of the 29 Arctic breeding species characterized as grassland species in this report have adapted well to pastureland and arable land, e.g. many of the geese (*Anser* and *Branta* spp.) and several plovers (Charadriidae), and most have probably benefited from man's agricultural activities, especially in semi-arid regions. Two notable exceptions are the Lesser White-fronted Goose *Anser erythropus* and Eskimo Curlew *Numenius borealis*. The former is the subject of a major international conservation effort; the latter is now so seldom sighted that conservation efforts are largely

passive, through protection of traditional breeding and wintering areas, and prohibition of hunting of almost all shorebird species in North America.

Most of the Arctic breeding birds which winter in temperate forests and woodland (34 species) are well covered by existing conventions and agreements. However, the 36 species which undertake long migrations to winter in tropical forest and woodland receive very little benefit from international instruments once they leave temperate regions, and are perhaps the least well covered of any group of Arctic breeding birds. Some of the problems facing these forest species have been discussed in section 6.2.4. It is clear that there is an urgent need to promote further research into the requirements of these birds, especially during the migration seasons, to determine to what extent, if any, they are dependent on a chain of critical staging areas, and hence whether or not a 'green route' or reserve network approach would be the most appropriate way to ensure their survival.

By way of conclusion, it is worth drawing attention to the interesting study of Davidson and Piersma (1992), who reviewed the international conservation status of the world's five main populations of the Red Knot *Calidris canutus*, one of the high Arctic's most characteristic birds and one of the world's longest-distance migrants. These authors found that the extent to which Knot were protected in reserves varied greatly both between subspecies and within a subspecies at different times of the year. Some subspecies, notably *rufa* and *roselaari*, are poorly safeguarded (at least by site designations) at most or all times of the year, while in the case of nominate *canutus*, over two-thirds of the population is safeguarded within conservation sites throughout most of the annual cycle. Davidson and Piersma found that by 1992, there were 24 Ramsar Sites that were internationally important for Knot (each supporting over 1% of a biogeographical population), and a further 24 Ramsar Sites at which Knots regularly occurred in smaller numbers. However, most of the Ramsar Sites important for Knot were in the East Atlantic Flyway (nominate *canutus* and *islandica*) or in Australia (*rogersi*), and there was very little Ramsar Site coverage for the Western Hemisphere subspecies *rufa* and *roselaari*. In Europe, the system of Special Protection Areas (SPAs) established under the EC Wild Birds Directive provides excellent coverage of major sites for Knot, to the extent that almost all Knot staging and wintering in Northwest Europe are now covered by the Ramsar/SPA network.

Analyses of this type are extremely valuable in identifying priorities for action and focusing resources where they are most needed. Unfortunately, there are very few migratory species, other than some of the more intensively studied waterbirds, for which sufficiently detailed information is available.

Principal Recommendations

A. General Recommendations directed at CAFF Member States

(a) Closer involvement of CAFF countries in conventions and agreements to which they are already party, and promotion of better collaboration between these instruments.
All CAFF countries are parties to the Ramsar Convention and World Heritage Convention, and at least four of the eight CAFF countries are parties to the other major international conventions and agreements considered in this report (e.g. Bonn Convention, CITES, Convention on Biological Diversity, and Bern Convention). The Arctic countries should work more closely within the conventions and agreements to which they are already a party in order to achieve better protection of migratory birds from the Arctic, and should collectively seek to promote better collaboration between these conventions to maximize benefits to Arctic birds.

(b) Greater participation by CAFF countries in the Bonn Convention, promotion of Agreements under this Convention, and participation by all Range States in the Agreement on the Conservation of African-Eurasian Migratory Waterbirds.

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) has the potential to be the most effective legal mechanism to achieve the conservation of migratory birds on a world scale. Its advantages include the infrastructure offered by a global environmental convention coupled with the fact that countries which are a Range State for a particular species or group of species do not need to be a Party to the Convention in order for them to be a full and active member of an Agreement under the Convention. Those CAFF countries which have not as yet become parties to the Convention should be encouraged to do so without further delay. The CAFF countries would then be in a powerful position to encourage adherence to the Bonn Convention in those regions of the world which are especially important for Arctic migratory birds outside the breeding season. CAFF countries which are already Parties to the Convention should be encouraged to conclude formal Agreements for groups of species with similar migration patterns and/or habitat requirements and, as appropriate, informal agreements (Memoranda of Understanding) between governments and between non-governmental organizations and governments.

All CAFF countries which are listed as Range States in the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (Canada, Finland, Greenland, Iceland, Norway, Russia and Sweden) should become members of this Agreement, irrespective of whether or not they are parties to the Bonn Convention, and actively encourage other countries throughout the Agreement area to participate. Only through wide adherence throughout the flyway is this potentially very important Agreement for Arctic migratory birds likely to achieve its desired goals.

(c) Increased adherence to the Convention on Biological Diversity.

Seven of the eight CAFF countries are parties to the Convention on Biological Diversity. Those CAFF countries which have not already done so should be encouraged to complete and adopt national plans and strategies for the conservation of biodiversity, as called for under the Convention. The U.S.A. should be encouraged to join the Convention without further delay.

(d) Increased support for implementation of the Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000.

The CAFF countries (particularly Russia, Canada and the U.S.A.) should give full support to the implementation of the Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000. One of the stated objectives of the Strategy is the development of a legally-binding multilateral agreement for the conservation of migratory waterbirds and their habitats throughout the Asia-Pacific region. Such an agreement would parallel the African-Eurasian Waterbird Agreement, and would be appropriate as a formal Agreement under the Bonn Convention. There is, however, a need to increase the profile of the Bonn Convention in the Asia-Pacific region to attract more Parties and to create a climate which would favour the evolution of the Strategy into an Agreement under this Convention.

(e) Promotion of the Ramsar Convention and designation of further sites to the List.

All CAFF countries are Contracting Parties to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). This Convention has become the most effective international legal mechanism for the conservation of wetlands, and is especially relevant in a CAFF context because of the large number of Arctic breeding birds which winter in wetlands outside the CAFF countries (93 species). CAFF countries should take a collective initiative to encourage other countries, particularly in the Caribbean,

Africa and Central Asia, to join the Ramsar Convention, and to designate important wetlands for Arctic migratory waterbirds to the Ramsar List.

B. Specific Recommendations directed at individual CAFF Member States

(f) Promotion of the Bern Convention in Eastern Europe.
CAFF countries in Europe (Finland, Greenland, Iceland, Norway and Sweden) should actively encourage countries in Eastern Europe to join the Bern Convention. This has become the principal international legal mechanism for the protection of birds and their habitats in Europe outside the European Community.

(g) Confirmation of participation in the multilateral and bilateral agreements of the former USSR by members of the Commonwealth of Independent States.
The Russian Federation should encourage those members of the Commonwealth of Independent States which have not already done so to confirm their participation in multilateral and bilateral agreements pertaining to the conservation of migratory birds entered into by the former USSR. The Convention between the Government of the Republic of India and the Government of the Union of Soviet Socialist Republics on Protection of Migratory Birds (1984) is particularly important in this regard, as many migratory birds from the Arctic pass through the Central Asian Republics on their way to and from wintering areas in India.

(h) Increased collaboration between bilateral agreements for the protection of migratory birds in the Asia-Pacific region, and possible amalgamation of these into a multilateral agreement for the entire Asian/Australasian region.
Currently the most useful legal instruments for the protection of migratory birds from the Arctic in the Asia-Pacific region are the bilateral agreements for the protection of birds involving Australia, China, India, Japan, the Republic of Korea, the Russian Federation and the U.S.A. The Russian Federation and the U.S.A. should, as far as possible and appropriate, promote increased collaboration between these agreements and harmonization with respect to the lists of species to which they apply, to ensure that all Arctic migratory species receive adequate protection throughout the territory covered by these agreements.

Consideration should be given to amalgamating the six existing bilateral agreements involving Asian countries and Australia into a multilateral agreement for the protection of migratory birds throughout the Asian/Australasian region, open to participation by all countries in the region. As a party to bilateral agreements with Japan, India and the Republic of Korea, the Russian Federation would be in an excellent position to promote such an amalgamation, perhaps as a joint initiative with the Government of Japan (also a party to three of the bilateral agreements). The development of a multilateral agreement along these lines should present no major obstacles, as the existing bilateral agreements are very similar to one another in their overall objective and in the provisions which they contain. A multilateral agreement based on the existing bilateral agreements would have the advantage over an agreement based on the Asia-Pacific Migratory Waterbird Conservation Strategy in that it would cover all migratory species of birds and not just waterbirds.

(i) Development of multilateral agreements for the conservation of migratory raptors, especially in the Americas and Western Eurasia/Africa.
CAFF countries should promote the development of one or more multilateral agreements for the conservation of migratory raptors (Falconiformes), especially in the Americas and Western Eurasia/Africa, to ensure that migratory raptors from the Arctic are given adequate protection throughout their ranges. Many species of raptors are long-distance migrants, concentrating in enormous numbers at migratory 'bottlenecks' where intensive illegal

shooting sometimes occurs. Boere (1991) has already suggested that an Agreement be developed under the Bonn Convention for raptors in Western Eurasia and Africa. Such an Agreement could focus on the protection of sites where mass concentrations occur, and also promote joint efforts to prevent illegal hunting. As parties to the Bonn Convention, Finland, Greenland, Norway and Sweden could take the initiative in the development of this raptor agreement in Western Eurasia and Africa.

C. Recommendations for further research under the CAFF Programme

(j) Greater emphasis on the conservation of migratory species at population level.
Much greater consideration should be given to the conservation of migratory species at population level. Many Arctic species and species of north temperate regions have a wide circumpolar or Holarctic distribution, and consist of a number of discrete, or largely discrete, populations with widely separated wintering grounds, and in some cases very different migration strategies. Some populations may be large and healthy, while others may be seriously threatened. Efforts should be made to identify such discrete 'biogeographical populations', wherever they exist, and to assess the conservation needs of each separately.

(k) Further research on migratory birds that are inadequately protected throughout large parts of their non-breeding ranges, especially species that winter in tropical forests.
More emphasis should be given to specific studies of the migration routes, staging areas and habitat use of those Arctic bird species, subspecies or biogeographical populations which are identified as being inadequately protected in large parts of their non-breeding ranges, e.g. in sub-Saharan Africa, parts of South America and Central Asia. Studies of this type would provide a better understanding of the types of protection measures that should be taken in order to safeguard the main wintering areas and a chain of appropriately spaced staging areas (the 'green route' approach). In particular, further research should be carried out on those Arctic migratory birds which winter in tropical forests, specifically with respect to their requirements at staging areas during the spring and autumn migrations. Every effort should be made to identify key staging areas for these birds, and to determine the most appropriate mechanisms to safeguard these sites. The Partners in Flight initiative in the Americas could serve as a model for the development of similar initiatives in Europe/ Africa and Asia.

(l) Further research on seabirds wintering along the edge of the pack ice.
More attention should be given by the CAFF Circumpolar Seabird Working Group (CSWG) to the conservation of seabirds which spend the winter along the edge of the pack ice. The southern limit of the pack ice varies greatly from year to year, and in some years extends well outside the Arctic Region as delineated by CAFF. Further research is required into the distribution and ecological requirements of these seabirds to determine the most appropriate mechanisms for their conservation. At the same time, CAFF Member States should endeavour to ensure that adequate attention is given to the conservation of Arctic seabirds in conventions and agreements for environmental protection at sea.

(m) Assessment of the impacts of climate change on Arctic migratory birds.
An assessment is needed of the potential impacts of climate change on Arctic migratory birds, their routes and destinations. Over the past decades, significant temperature changes have been observed in the Arctic region, with some areas warming and others cooling by up to 1°C per decade. Although such temperature changes could have profound effects on the breeding cycles and nesting habitats of migratory species, e.g. through changes in the abundance and phenology of their food species, few investigations have been conducted to assess the effects of such changes on migratory birds.

(n) Assessment of the pressures on Arctic migratory birds outside the Arctic.
More effort is needed to define and assess the full scope of pressures (e.g. habitat destruction, land-use conversions, and hunting) and the impacts of these pressures on Arctic migratory birds during their migrations and at over-wintering sites. Such studies could be conducted within the framework of the Circumpolar Protected Areas Network (CPAN) programme of CAFF.

(o) Establishment of an Expert Group on Migratory Species within the CAFF Programme.
The CAFF Programme should appoint an Expert Group on Migratory Species. Such a group could cover all migratory species (birds, mammals, fish etc.), or restrict itself to those species or groups of species that CAFF wishes to highlight (e.g. threatened species and species of common concern). The mandate of such an Expert Group might include the following:

- to establish better links with the various conventions, agreements and initiatives of relevance to migratory species from the Arctic, to ensure that these species are given adequate attention in the implementation of these instruments;
- to promote the conservation of migratory species at the population level, giving special attention to threatened species or species of common concern;
- to promote the development of multilateral agreements for the conservation of migratory raptors;
- to develop other recommendations on migratory species as required.

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9. TABLES

Table 1: Migratory birds of the Arctic region

Restricted to those species breeding in significant numbers in the Arctic Region (as defined by the CAFF member states) and wintering in significant numbers outside CAFF member states. The sequence and composition of bird families follow the traditional sequence as given by Morony, Bock & Farrand (1975); the treatment and taxonomic sequence of species within families, scientific nomenclature and vernacular names follow Sibley & Monroe (1990).

Key to columns

(a) Globally threatened species, as listed in the 1996 IUCN Red List of Threatened Animals (Aves) (IUCN, 1996) and *Birds to Watch 2* (Collar *et al.*, 1994).

(b) Some individuals or populations of the species winter within the territories of the CAFF member states, and other individuals or populations winter outside these countries.

(c) All individuals or populations breeding in the Arctic region undertake long-distance migrations to winter quarters outside CAFF member states.

Species	(a)	(b)	(c)
GAVIIDAE			
Red-throated Loon *Gavia stellata*		×	
Arctic Loon *Gavia arctica*		×	
Pacific Loon *Gavia pacifica*		×	
Common Loon *Gavia immer*		×	
PODICIPEDIDAE			
Red-necked Grebe *Podiceps grisegena*		×	
Horned Grebe *Podiceps auritus*		×	
PROCELLARIIDAE			
Northern Fulmar *Fulmarus glacialis*		×	
Manx Shearwater *Puffinus puffinus*			×
HYDROBATIDAE			
European Storm-Petrel *Hydrobates pelagicus*			×
Leach's Storm-Petrel *Oceanodroma leucorhoa*			×
Fork-tailed Storm-Petrel *Oceanodroma furcata*		×	
SULIDAE			
Northern Gannet *Morus bassanus*		×	
PHALACROCORACIDAE			
Double-crested Cormorant *Phalacrocorax auritus*		×	
Great Cormorant *Phalacrocorax carbo*		×	
Pelagic Cormorant *Phalacrocorax pelagicus*		×	
European Shag *Phalacrocorax aristotelis*		×	
ANATIDAE			
Whooper Swan *Cygnus cygnus*		×	
Tundra Swan *Cygnus columbianus*		×	
Pink-footed Goose *Anser brachyrhynchus*			×
Bean Goose *Anser fabalis*			×
Greater White-fronted Goose *Anser albifrons*		×	

Table 1 continued.

Species	(a)	(b)	(c)
Lesser White-fronted Goose *Anser erythropus*	×		×
Greylag Goose *Anser anser*			×
Snow Goose *Anser caerulescens*		×	
Canada Goose *Branta canadensis*		×	
Barnacle Goose *Branta leucopsis*			×
Brent Goose *Branta bernicla*		×	
Red-breasted Goose *Branta ruficollis*	×		
Eurasian Wigeon *Anas penelope*		×	
American Wigeon *Anas americana*		×	
Baikal Teal *Anas formosa*	×		×
Common Teal *Anas crecca*		×	
Mallard *Anas platyrhynchos*		×	
Northern Pintail *Anas acuta*		×	
Northern Shoveler *Anas clypeata*		×	
Canvasback *Aythya valisineria*		×	
Tufted Duck *Aythya fuligula*		×	
Greater Scaup *Aythya marila*		×	
Lesser Scaup *Aythya affinis*		×	
Common Eider *Somateria mollissima*		×	
Steller's Eider *Polysticta stelleri*	×	×	
Harlequin Duck *Histrionicus histrionicus*		×	
Long-tailed Duck *Clangula hyemalis*		×	
Black Scoter *Melanitta nigra*		×	
Surf Scoter *Melanitta perspicillata*		×	
White-winged Scoter *Melanitta fusca*[1]		×	
Common Goldeneye *Bucephala clangula*		×	
Smew *Mergellus albellus*		×	
Red-breasted Merganser *Mergus serrator*		×	
Common Merganser *Mergus merganser*		×	
PANDIONIDAE			
Osprey *Pandion haliaetus*		×	
ACCIPITRIDAE			
White-tailed Eagle *Haliaeetus albicilla*		×	
Steller's Sea-Eagle *Haliaeetus pelagicus*	×	×	
Northern Harrier *Circus cyaneus*		×	
Eurasian Sparrowhawk *Accipiter nisus*		×	
Sharp-shinned Hawk *Accipiter striatus*		×	
Northern Goshawk *Accipiter gentilis*		×	
Swainson's Hawk *Buteo swainsoni*			×
Red-tailed Hawk *Buteo jamaicensis*		×	
Rough-legged Hawk *Buteo lagopus*		×	
Golden Eagle *Aquila chrysaetos*		×	
FALCONIDAE			
Eurasian Kestrel *Falco tinnunculus*		×	
American Kestrel *Falco sparverius*		×	
Merlin *Falco columbarius*		×	
Peregrine Falcon *Falco peregrinus*		×	
GRUIDAE			
Siberian Crane *Grus leucogeranus*	×		×

Table 1 continued.

Species	(a)	(b)	(c)
Sandhill Crane *Grus canadensis*		×	
Common Crane *Grus grus*			×
RALLIDAE			
Sora *Porzana carolina*		×	
HAEMATOPODIDAE			
Eurasian Oystercatcher *Haematopus ostralegus*			×
CHARADRIIDAE			
European Golden-Plover *Pluvialis apricaria*			×
Pacific Golden-Plover *Pluvialis fulva*			×
American Golden-Plover *Pluvialis dominica*		×	
Grey Plover *Pluvialis squatarola*		×	
Common Ringed Plover *Charadrius hiaticula*			×
Semipalmated Plover *Charadrius semipalmatus*		×	
Killdeer *Charadrius vociferus*		×	
Mongolian Plover *Charadrius mongolus*			×
Eurasian Dotterel *Eudromias morinellus*			×
Northern Lapwing *Vanellus vanellus*			×
SCOLOPACIDAE			
Eurasian Woodcock *Scolopax rusticola*		×	
Pintail Snipe *Gallinago stenura*			×
Great Snipe *Gallinago media*			×
Common Snipe *Gallinago gallinago*		×	
Jack Snipe *Lymnocryptes minimus*		×	
Black-tailed Godwit *Limosa limosa*			×
Hudsonian Godwit *Limosa haemastica*			×
Bar-tailed Godwit *Limosa lapponica*			×
Little Curlew *Numenius minutus*			×
Eskimo Curlew *Numenius borealis*	×		×
Whimbrel *Numenius phaeopus*			×
Bristle-thighed Curlew *Numenius tahitiensis*	×		×
Eurasian Curlew *Numenius arquata*		×	
Spotted Redshank *Tringa erythropus*			×
Common Redshank *Tringa totanus*		×	
Common Greenshank *Tringa nebularia*			×
Greater Yellowlegs *Tringa melanoleuca*		×	
Lesser Yellowlegs *Tringa flavipes*		×	
Solitary Sandpiper *Tringa solitaria*			×
Green Sandpiper *Tringa ochropus*			×
Wood Sandpiper *Tringa glareola*			×
Terek Sandpiper *Tringa cinerea*			×
Common Sandpiper *Tringa hypoleucos*			×
Spotted Sandpiper *Tringa macularia*		×	
Grey-tailed Tattler *Tringa brevipes*			×
Wandering Tattler *Tringa incana*		×	
Ruddy Turnstone *Arenaria interpres*		×	
Black Turnstone *Arenaria melanocephala*		×	
Short-billed Dowitcher *Limnodromus griseus*		×	
Long-billed Dowitcher *Limnodromus scolopaceus*		×	
Surfbird *Aphriza virgata*		×	

Table 1 continued.

Species	(a)	(b)	(c)
Great Knot *Calidris tenuirostris*			×
Red Knot *Calidris canutus*		×	
Sanderling *Calidris alba*		×	
Semipalmated Sandpiper *Calidris pusilla*			×
Western Sandpiper *Calidris mauri*		×	
Little Stint *Calidris minuta*			×
Rufous-necked Stint *Calidris ruficollis*			×
Temminck's Stint *Calidris temminckii*			×
Long-toed Stint *Calidris subminuta*			×
Least Sandpiper *Calidris minutilla*		×	
White-rumped Sandpiper *Calidris fuscicollis*			×
Baird's Sandpiper *Calidris bairdii*			×
Pectoral Sandpiper *Calidris melanotos*[2]			×
Sharp-tailed Sandpiper *Calidris acuminata*			×
Purple Sandpiper *Calidris maritima*		×	
Dunlin *Calidris alpina*		×	
Curlew Sandpiper *Calidris ferruginea*			×
Stilt Sandpiper *Micropalama himantopus*		×	
Buff-breasted Sandpiper *Tryngites subruficollis*			×
Spoon-billed Sandpiper *Eurynorhynchus pygmeus*	×		×
Broad-billed Sandpiper *Limicola falcinellus*			×
Ruff *Philomachus pugnax*			×
Red-necked Phalarope *Phalaropus lobatus*			×
Red Phalarope *Phalaropus fulicaria*			×
STERCORARIIDAE			
Great Skua *Catharacta skua*		×	
Pomarine Jaeger *Stercorarius pomarinus*			×
Parasitic Jaeger *Stercorarius parasiticus*			×
Long-tailed Jaeger *Stercorarius longicaudus*			×
LARIDAE			
Mew Gull *Larus canus*[3]		×	
California Gull *Larus californicus*		×	
Great Black-backed Gull *Larus marinus*		×	
Glaucous-winged Gull *Larus glaucescens*		×	
Glaucous Gull *Larus hyperboreus*		×	
Iceland Gull *Larus glaucoides*[4]		×	
Herring Gull *Larus argentatus*		×	
Lesser Black-backed Gull *Larus fuscus*			×
Common Black-headed Gull *Larus ridibundus*		×	
Bonaparte's Gull *Larus philadelphia*		×	
Sabine's Gull *Xema sabini*			×
Black-legged Kittiwake *Rissa tridactyla*		×	
Caspian Tern *Sterna caspia*		×	
Common Tern *Sterna hirundo*			×
Arctic Tern *Sterna paradisaea*			×
Aleutian Tern *Sterna aleutica*			×
ALCIDAE			
Dovekie *Alle alle*		×	
Common Murre *Uria aalge*		×	
Thick-billed Murre *Uria lomvia*		×	

Table 1 continued.

Species	(a)	(b)	(c)
Razorbill *Alca torda*		×	
Marbled Murrelet *Brachyramphus marmoratus*		×	
Ancient Murrelet *Synthliboramphus antiquus*		×	
Cassin's Auklet *Ptychoramphus aleuticus*		×	
Crested Auklet *Aethia cristatella*		×	
Least Auklet *Aethia pusilla*		×	
Atlantic Puffin *Fratercula arctica*		×	
Tufted Puffin *Fratercula cirrhata*		×	
CUCULIDAE			
Common Cuckoo *Cuculus canorus*			×
Oriental Cuckoo *Cuculus saturatus*			×
STRIGIDAE			
Snowy Owl *Nyctea scandiaca*		×	
Boreal Owl *Aegolius funereus*		×	
Long-eared Owl *Asio otus*		×	
Short-eared Owl *Asio flammeus*		×	
CAPRIMULGIDAE			
Common Nighthawk *Chordeiles minor*			×
APODIDAE			
Fork-tailed Swift *Apus pacificus*			×
ALCEDINIDAE			
Belted Kingfisher *Ceryle alcyon*		×	
PICIDAE			
Eurasian Wryneck *Jynx torquilla*			×
Yellow-bellied Sapsucker *Sphyrapicus varius*		×	
Great Spotted Woodpecker *Dendrocopos major*		×	
TYRANNIDAE			
Olive-sided Flycatcher *Contopus borealis*			×
Western Wood-Pewee *Contopus sordidulus*			×
Yellow-bellied Flycatcher *Empidonax flaviventris*			×
Alder Flycatcher *Empidonax alnorum*			×
Least Flycatcher *Empidonax minimus*			×
Eastern Phoebe *Sayornis phoebe*		×	
Say's Phoebe *Sayornis saya*		×	
Eastern Kingbird *Tyrannus tyrannus*			×
ALAUDIDAE			
Eurasian Skylark *Alauda arvensis*		×	
Horned Lark *Eremophila alpestris*		×	
HIRUNDINIDAE			
Tree Swallow *Tachycineta bicolor*		×	
Violet-green Swallow *Tachycineta thalassina*			×
Sand Martin *Riparia riparia*			×
Barn Swallow *Hirundo rustica*			×
Cliff Swallow *Hirundo pyrrhonota*			×

Table 1 continued.

Species	(a)	(b)	(c)
House Martin *Delichon urbica*			×
MOTACILLIDAE			
White Wagtail *Motacilla alba*			×
Yellow-hooded Wagtail *Motacilla citreola*			×
Yellow Wagtail *Motacilla flava*			×
Tree Pipit *Anthus trivialis*			×
Olive-backed Pipit *Anthus hodgsoni*			×
Pechora Pipit *Anthus gustavi*			×
Meadow Pipit *Anthus pratensis*			×
Red-throated Pipit *Anthus cervinus*			×
Rock Pipit *Anthus petrosus*		×	
Buff-bellied Pipit *Anthus rubescens*[5]		×	
LANIIDAE			
Brown Shrike *Lanius cristatus*			×
Northern Shrike *Lanius excubitor*		×	
BOMBYCILLIDAE			
Bohemian Waxwing *Bombycilla garrulus*		×	
CINCLIDAE			
White-throated Dipper *Cinclus cinclus*		×	
TROGLODYTIDAE			
Winter Wren *Troglodytes troglodytes*		×	
PRUNELLIDAE			
Siberian Accentor *Prunella montanella*			×
Dunnock *Prunella modularis*			×
MUSCICAPIDAE – TURDINAE			
Grey-cheeked Thrush *Catharus minimus*			×
Swainson's Thrush *Catharus ustulatus*			×
Hermit Thrush *Catharus guttatus*		×	
Ring Ouzel *Turdus torquatus*			×
Eurasian Blackbird *Turdus merula*		×	
Eye-browed Thrush *Turdus obscura*			×
Dusky Thrush *Turdus naumanni*			×
Fieldfare *Turdus pilaris*			×
Redwing *Turdus iliacus*			×
Song Thrush *Turdus philomelos*			×
Mistle Thrush *Turdus viscivorus*			×
American Robin *Turdus migratorius*		×	
European Robin *Erithacus rubecula*			×
Siberian Rubythroat *Luscinia calliope*			×
Bluethroat *Luscinia svecica*			×
Orange-flanked Bush-Robin *Tarsiger cyanurus*			×
Common Redstart *Phoenicurus phoenicurus*			×
Whinchat *Saxicola rubetra*			×
Siberian Stonechat *Saxicola maura*[6]			×
Northern Wheatear *Oenanthe oenanthe*			×

Table 1 continued.

Species	(a)	(b)	(c)
MUSCICAPIDAE – SYLVIINAE			
Lanceolated Warbler *Locustella lanceolata*			×
Sedge Warbler *Acrocephalus schoenobaenus*			×
Willow Warbler *Phylloscopus trochilus*			×
Eurasian Chiffchaff *Phylloscopus collybita*			×
Inornate Warbler *Phylloscopus inornatus*			×
Arctic Warbler *Phylloscopus borealis*			×
Blackcap *Sylvia atricapilla*			×
Garden Warbler *Sylvia borin*			×
Ruby-crowned Kinglet *Regulus calendula*		×	
Goldcrest *Regulus regulus*		×	
Golden-crowned Kinglet *Regulus satrapa*		×	
MUSCICAPIDAE – MUSCICAPINAE			
Spotted Flycatcher *Muscicapa striata*			×
European Pied Flycatcher *Ficedula hypoleuca*			×
Red-throated Flycatcher *Ficedula parva*			×
EMBERIZIDAE – EMBERIZINAE			
Yellowhammer *Emberiza citrinella*		×	
Little Bunting *Emberiza pusilla*			×
Rustic Bunting *Emberiza rustica*			×
Yellow-breasted Bunting *Emberiza aureola*			×
Pallas' Bunting *Emberiza pallasi*			×
Reed Bunting *Emberiza schoenichus*			×
Lapland Longspur *Calcarius lapponicus*		×	
Snow Bunting *Plectrophenax nivalis*		×	
Song Sparrow *Melospiza melodia*		×	
Lincoln's Sparrow *Melospiza lincolnii*		×	
White-crowned Sparrow *Zonotrichia leucophrys*		×	
Golden-crowned Sparrow *Zonotrichia atricapilla*		×	
Savannah Sparrow *Passerculus sandwichensis*		×	
Chipping Sparrow *Spizella passerina*		×	
PARULIDAE			
Tennessee Warbler *Vermivora peregrina*			×
Orange-crowned Warbler *Vermivora celata*			×
Yellow Warbler *Dendroica petechia*			×
Yellow-rumped Warbler *Dendroica coronata*		×	
Blackpoll Warbler *Dendroica striata*			×
Black-and-white Warbler *Mniotilta varia*		×	
Northern Waterthrush *Seiurus noveboracensis*			×
Wilson's Warbler *Wilsonia pusilla*			×
VIREONIDAE			
Red-eyed Vireo *Vireo olivaceus*			×
Warbling Vireo *Vireo gilvus*			×
FRINGILLIDAE			
Brambling *Fringilla montifringilla*			×
Hoary Redpoll *Carduelis hornemanni*		×	
Common Redpoll *Carduelis flammea*		×	
Twite *Carduelis flavirostris*		×	
Rosy-Finch *Leucosticte arctoa*		×	

Table 1 continued.

Species	(a)	(b)	(c)
Common Rosefinch *Carpodacus erythrinus*			×
Pine Grosbeak *Pinicola enucleator*		×	
Red Crossbill *Loxia curvirostra*		×	
STURNIDAE			
Common Starling *Sturnus vulgaris*		×	
CORVIDAE			
Carrion Crow *Corvus corone*		×	

Notes:

1. Sibley & Monroe (1990) note that the North American form *deglandi* (including *stejnegeri*) likely represents a distinct species.
2. Cox's Sandpiper *Calidris paramelanotos* is not listed as a distinct species by Sibley & Monroe (1990). They argue that "present evidence is not sufficient to confirm or refute the hypothesis of valid species or that of hybrid origin".
3. *Larus kamtschatschensis* may be a separate species, but intergradation with *L. canus* appears to occur in the Lena River Region.
4. Sibley & Monroe (1990) lump Thayer's Gull (*thayeri*) and Kumlien's Gull (*kumlieni*) with *Larus glaucoides*. They note that "*kumlieni* appears intermediate between *glaucoides* and *thayeri*, all these forms constituting one continuum of breeding populations representing a single species".
5. Often considered conspecific with *Anthus spinoletta*.
6. Often considered conspecific with *Saxicola torquata*.

Table 2: Birds breeding in the Arctic region not considered in this report

Reasons for exclusion

(a) The species breeds in the Arctic Region in relatively insignificant numbers at the very edge of its range.

(b) The species is confined to the Arctic Region (as defined by CAFF member states) throughout the year. Only a few individuals straggle outside this region.

(c) Populations of the species breeding in the Arctic Region are entirely sedentary or almost so; some post-breeding dispersal may occur, but few individuals extend outside the Arctic Region in winter.

(d) Populations of the species breeding in the Arctic Region winter entirely (or almost entirely) within the territories of the member states (i.e. within CAFF countries). Only a few individuals straggle outside these countries in winter.

Globally threatened species, as listed in the 1996 IUCN Red List of Threatened Animals (Aves) (IUCN, 1996) and *Birds to Watch 2* (Collar *et al.*, 1994) are marked with an asterisk.

Species	(a)	(b)	(c)	(d)
GAVIIDAE				
Yellow-billed Loon *Gavia adamsii*				×
PODICIPEDIDAE				
Pied-billed Grebe *Podilymbus podiceps*	×			
PHALACROCORACIDAE				
Red-faced Cormorant *Phalacrocorax urile*				×
ARDEIDAE				
Grey Heron *Ardea cinerea*	×			
ANATIDAE				
Ruddy Duck *Oxyura jamaicensis*	×			
Trumpeter Swan *Cygnus buccinator*	×			×
Ross's Goose *Anser rossii*				×
Emperor Goose *Anser canagica*				×
Falcated Duck *Anas falcata*	×			
Gadwall *Anas strepera*	×			
American Black Duck *Anas rubripes*				×
Blue-winged Teal *Anas discors*	×			
Common Pochard *Aythya ferina*	×			
Redhead *Aythya americana*	×			
Ring-necked Duck *Aythya collaris*	×			
King Eider *Somateria spectabilis*				×
Spectacled Eider *Somateria fischeri**		×		×
Barrow's Goldeneye *Bucephala islandica*				×
Bufflehead *Bucephala albeola*	×			
Hooded Merganser *Lophodytes cucullatus*	×			×
ACCIPITRIDAE				
Black Kite *Milvus migrans*	×			
Bald Eagle *Haliaeetus leucocephalus*				×
Eastern Marsh-Harrier *Circus spilonotus*[1]	×			

Table 2 continued.

Species	(a)	(b)	(c)	(d)
Common Buzzard *Buteo buteo*	×			
FALCONIDAE				
Eurasian Hobby *Falco subbuteo*	×			
Gyrfalcon *Falco rusticolus*				×
PHASIANIDAE				
Spruce Grouse *Dendragapus canadensis*			×	×
Blue Grouse *Dendragapus obscurus*	×		×	×
Willow Ptarmigan *Lagopus lagopus*			×	×
Rock Ptarmigan *Lagopus mutus*			×	×
White-tailed Ptarmigan *Lagopus leucurus*	×		×	×
Black Grouse *Tetrao tetrix*			×	×
Eurasian Capercaillie *Tetrao urogallus*			×	×
Black-billed Capercaillie *Tetrao parvirostris*			×	×
Hazel Grouse *Bonasa bonasia*			×	×
Ruffed Grouse *Bonasa umbellus*			×	×
Sharp-tailed Grouse *Tympanuchus phasianellus*			×	×
GRUIDAE				
Hooded Crane *Grus monacha*	×			
Whooping Crane *Grus americana**				×
RALLIDAE				
Yellow Rail *Coturnicops noveboracensis*				×
Water Rail *Rallus aquaticus*	×			
Corncrake *Crex crex*	×			
Common Coot *Fulica atra*	×			
American Coot *Fulica americana*	×			
HAEMATOPODIDAE				
Black Oystercatcher *Haematopus bachmani*			×	×
CHARADRIIDAE				
Little Ringed Plover *Charadrius dubius*	×			
SCOLOPACIDAE				
Marbled Godwit *Limosa fedoa*	×			
Far Eastern Curlew *Numenius madagascariensis*	×			
Upland Sandpiper *Bartramia longicauda*	×			
Rock Sandpiper *Calidris ptilocnemis*				×
LARIDAE				
Ring-billed Gull *Larus delawarensis*	×			
Slaty-backed Gull *Larus schistisagus*	×			
Little Gull *Larus minutus*	×			
Ivory Gull *Pagophila eburnea*		×		×
Ross's Gull *Rhodostethia rosea*		×		×
Red-legged Kittiwake *Rissa brevirostris**				×
Black Tern *Chlidonias niger*	×			
ALCIDAE				
Black Guillemot *Cepphus grylle*			×	×

Table 2 continued.

Species	(a)	(b)	(c)	(d)
Pigeon Guillemot *Cepphus columba*			×	×
Spectacled Guillemot *Cepphus carbo*	×		×	×
Kittlitz's Murrelet *Brachyramphus brevirostris*				×
Parakeet Auklet *Cyclorrhynchus psittacula*				×
Whiskered Auklet *Aethia pygmaea*				×
Rhinoceros Auklet *Cerorhinca monocerata*	×			
Horned Puffin *Fratercula corniculata*				×
COLUMBIDAE				
Rock Dove *Columba livia*			×	×
Common Wood Pigeon *Columba palumbus*	×			
Oriental Turtle-Dove *Streptopelia orientalis*	×			
Eurasian Collared-Dove *Streptopelia decaocto*	×		×	×
STRIGIDAE				
Great Horned Owl *Bubo virginianus*			×	×
Eurasian Eagle-Owl *Bubo bubo*			×	×
Barred Owl *Strix varia*	×		×	×
Ural Owl *Strix uralensis*			×	×
Great Grey Owl *Strix nebulosa*			×	×
Northern Hawk Owl *Surnia ulula*			×	×
Eurasian Pygmy-Owl *Glaucidium passerinum*	×		×	×
APODIDAE				
Common Swift *Apus apus*	×			
PICIDAE				
Lesser Spotted Woodpecker *Dendrocopos minor*			×	×
Downy Woodpecker *Picoides pubescens*			×	×
Hairy Woodpecker *Picoides villosus*				×
Three-toed Woodpecker *Picoides tridactylus*			×	×
Black-backed Woodpecker *Picoides arcticus*			×	×
Northern Flicker *Colaptes auratus*				×
Pileated Woodpecker *Dryocopus pileatus*			×	×
Black Woodpecker *Dryocopus martius*			×	×
MOTACILLIDAE				
Black-backed Wagtail *Motacilla lugens*	×			
Grey Wagtail *Motacilla cinerea*	×			
Richard's Pipit *Anthus richardi*	×			
BOMBYCILLIDAE				
Cedar Waxwing *Bombycilla cedrorum*	×			
CINCLIDAE				
American Dipper *Cinclus mexicanus*			×	×
TROGLODYTIDAE				
Marsh Wren *Cistothorus palustris*	×			
PRUNELLIDAE				
Alpine Accentor *Prunella collaris*	×		×	×

Table 2 continued.

Species	(a)	(b)	(c)	(d)
MUSCICAPIDAE – TURDINAE				
Siberian Thrush *Zoothera sibirica*	×			
Varied Thrush *Zoothera naevia*				×
Eastern Bluebird *Sialia sialis*	×			
Mountain Bluebird *Sialia currucoides*	×			
Townsend's Solitaire *Myadestes townsendi*	×			
Dark-throated Thrush *Turdus ruficollis*	×			
Rufous-tailed Robin *Luscinia sibilans*	×			
MUSCICAPIDAE – SYLVIINAE				
Pallas' Warbler *Locustella certhiola*	×			
Blyth's Reed-Warbler *Acrocephalus dumetorum*	×			
Icterine Warbler *Hippolais icterina*	×			
Wood Warbler *Phylloscopus sibilatrix*	×			
Dusky Warbler *Phylloscopus fuscatus*	×			
Greater Whitethroat *Sylvia communis*	×			
Lesser Whitethroat *Sylvia curruca*	×			
AEGITHALIDAE				
Long-tailed Tit *Aegithalos caudatus*			×	×
PARIDAE				
Willow Tit *Parus montanus*			×	×
Black-capped Chickadee *Parus atricapillus*			×	×
Siberian Tit *Parus cinctus*			×	×
Boreal Chickadee *Parus hudsonicus*			×	×
Coal Tit *Parus ater*	×		×	×
Great Tit *Parus major*			×	×
SITTIDAE				
Eurasian Nuthatch *Sitta europaea*			×	×
Red-breasted Nuthatch *Sitta canadensis*				×
CERTHIIDAE				
Eurasian Treecreeper *Certhia familiaris*				×
Brown Creeper *Certhia americana*				×
EMBERIZIDAE – EMBERIZINAE				
Pine Bunting *Emberiza leucocephalos*	×			
Ortolan Bunting *Emberiza hortulana*	×			
Yellow-browed Bunting *Emberiza chrysophrys*	×			
Black-faced Bunting *Emberiza spodocephala*	×			
Smith's Longspur *Calcarius pictus*				×
McKay's Bunting *Plectrophenax hyperboreus*		×		×
Fox Sparrow *Passerella iliaca*				×
Swamp Sparrow *Melospiza georgiana*				×
Harris' Sparrow *Zonotrichia querula*				×
White-throated Sparrow *Zonotrichia albicollis*				×
Dark-eyed Junco *Junco hyemalis*				×
Sharp-tailed Sparrow *Ammodramus caudacutus*	×			×
Le Conte's Sparrow *Ammodramus leconteii*	×			×
American Tree Sparrow *Spizella arborea*				×
Clay-colored Sparrow *Spizella pallida*	×			

Table 2 continued.

Species	(a)	(b)	(c)	(d)
Vesper Sparrow *Pooecetes gramineus*	×			
EMBERIZIDAE – CARDINALINAE				
Rose-breasted Grosbeak *Pheucticus ludovicianus*	×			
EMBERIZIDAE – THRAUPINAE				
Western Tanager *Piranga ludoviciana*	×			
PARULIDAE				
Magnolia Warbler *Dendroica magnolia*	×			
Cape May Warbler *Dendroica tigrina*	×			
Black-throated Green Warbler *Dendroica virens*	×			
Palm Warbler *Dendroica palmarum*	×			
Bay-breasted Warbler *Dendroica castanea*	×			
American Redstart *Setophaga ruticilla*	×			
Ovenbird *Seiurus aurocapillus*	×			
Connecticut Warbler *Oporornis agilis*	×			
Common Yellowthroat *Geothlypis trichas*	×			
VIREONIDAE				
Solitary Vireo *Vireo solitarius*	×			
Philadelphia Vireo *Vireo philadelphicus*	×			
ICTERIDAE				
Red-winged Blackbird *Agelaius phoeniceus*				×
Common Grackle *Quiscalus quiscula*	×			×
Rusty Blackbird *Euphagus carolinus*				×
Brown-headed Cowbird *Molothrus ater*	×			
FRINGILLIDAE				
Chaffinch *Fringilla coelebs*	×			
European Greenfinch *Carduelis chloris*	×			
Eurasian Siskin *Carduelis spinus*	×			
Pine Siskin *Carduelis pinus*				×
Purple Finch *Carpodacus purpureus*				×
Pallas' Rosefinch *Carpodacus roseus*	×			
Parrot Crossbill *Loxia pytyopsittacus*			×	×
White-winged Crossbill *Loxia leucoptera*			×	×
Eurasian Bullfinch *Pyrrhula pyrrhula*	×			
Evening Grosbeak *Coccothraustes vespertinus*	×			×
PLOCEIDAE				
House Sparrow *Passer domesticus*			×	×
Eurasian Tree Sparrow *Passer montanus*			×	×
CORVIDAE				
Eurasian Jay *Garrulus glandarius*	×		×	×
Siberian Jay *Perisoreus infaustus*			×	×
Grey Jay *Perisoreus canadensis*			×	×
Black-billed Magpie *Pica pica*			×	×
Eurasian Nutcracker *Nucifraga caryocatactes*			×	×
Northwestern Crow *Corvus caurinus*	×		×	×
American Crow *Corvus brachyrhynchos*				×
Common Raven *Corvus corax*			×	×

Notes:

1. Often considered conspecific with *Circus aeruginosus*.

Table 3: Wintering regions of migratory birds breeding in the Arctic

Key to main wintering habitat

PE: Pelagic (open ocean)
CM: Coastal marine habitats (inshore marine waters)
CW: Coastal wetlands (mudflats, sandy beaches, rocky shores, mangroves)
IW: Freshwater and brackish wetlands, including deep-water lakes
OC: Open country habitats
GR: Grasslands, steppe and arable land
DE: Desert habitats
DF: Temperate forests and woodland (coniferous and deciduous)
TF: Tropical forests (lowland and montane)
TW: Tropical woodland (acacia woodland, miombo woodland, etc.)

	Main wintering habitat**										
Wintering region*	**PE**	**CM**	**CW**	**IW**	**OC**	**GR**	**DE**	**DF**	**TF**	**TW**	**Total**
West Eurasia and Africa											
Northwest Europe	–	20	17	21	10	12	–	20	–	–	100
Southern Europe	–	10	12	20	10	11	–	14	–	2	79
Southwest Asia	–	7	14	27	10	8	1	13	–	2	82
North Africa	–	2	14	15	7	6	1	7	–	2	54
West and Central Africa	–	1	13	17	5	1	–	–	2	10	49
Eastern Africa	–	2	12	17	5	2	–	–	1	10	49
Southern Africa	–	1	11	8	3	1	–	–	1	5	30
Asia and Australasia											
Southern Asia	–	1	15	25	10	6	–	4	5	6	72
Eastern Asia	–	16	8	27	11	8	–	16	1	2	89
Southeast Asia	–	1	14	17	8	4	–	2	8	4	58
West Pacific islands	2	1	14	10	7	4	–	–	4	1	43
Australia and New Zealand	–	1	14	5	3	2	–	–	1	–	26
The Americas											
Nearctic Mexico	–	7	16	20	10	7	–	11	6	–	77
Central America	–	4	14	20	8	2	–	5	11	–	64
Caribbean	1	5	11	17	5	2	–	3	2	–	46
Northern South America	–	1	9	15	7	1	–	–	10	–	43
Southern South America	–	1	9	5	4	3	–	–	–	–	22
Pelagic											
North Pacific	10	23	–	–	–	–	–	–	–	–	33
Tropical Pacific	6	1	3	–	1	1	–	–	–	–	12
South Pacific	5	1	–	–	–	–	–	–	–	–	6
North Atlantic	11	23	–	–	–	–	–	–	–	–	34
Tropical Atlantic	5	2	–	–	–	–	–	–	–	–	7
South Atlantic	8	1	–	–	–	–	–	–	–	–	9
Tropical Indian Ocean	3	2	–	–	–	–	–	–	–	–	5
South Indian Ocean	2	1	–	–	–	–	–	–	–	–	3
Antarctica	1	–	–	–	–	–	–	–	–	–	1
No. of species	**24**	**30**	**40**	**53**	**30**	**29**	**1**	**34**	**26**	**12**	**279**

Notes:

* Only the main wintering areas of populations breeding in the Arctic Region have been considered.

Thus, for example, the wintering populations of *Anser anser* in North Africa, Southwest Asia, Southern Asia and Eastern Asia have been ignored as these birds do not breed in the Arctic.

** Only the main wintering habitat of populations breeding in the Arctic Region has been considered. Thus, for example, *Limosa limosa* is considered as a bird of coastal wetlands, since the Arctic population under consideration (*L. l. islandica*, breeding in Iceland and northern Norway) winters almost exclusively on inter-tidal mudflats. The nominate subspecies, breeding at temperate latitudes, winters primarily at freshwater wetlands, especially riverine floodplains.

Table 4: Coverage of migratory Arctic species by major global and regional conventions, agreements and strategies

Key to instruments

Ramsar — Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (Ramsar, 1971).

CITES — Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Washington, 1973).

CMS — Convention on the Conservation of Migratory Species of Wild Animals (CMS) (Bonn, 1979).

Africa — African Convention on the Conservation of Nature and Natural Resources (Algiers, 1968).

Bern — Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979).

EEC — Directive and Resolution of the Council of the European Community on the Conservation of Wild Birds (Brussels, 1979).

AEWA — Agreement on the Conservation of African-Eurasian Migratory Waterbirds (The Hague, 1995).

APMWS — Asia-Pacific Migratory Waterbird Conservation Strategy: 1996–2000 (1996).

Key to symbols

× The species is covered by the Convention (Ramsar), Directive (EEC), Agreement (AEWA) or Strategy (APMWS)
1 The species is listed in Appendix I (CITES, CMS) or Annex I (EEC)
2 The species is listed in Appendix II (CITES, CMS, Bern)
2-1 The species is listed in Annex II/1 (EEC)
2-2 The species is listed in Annex II/2 (EEC)
3 The species is listed in Appendix III (Bern)
A The species is listed in Class A in the Annex (Africa)
B The species is listed in Class B in the Annex (Africa)
o The species belongs to a family of birds that is covered by the instrument in question, but either does not occur in the region concerned, or occurs only as a rare vagrant (Africa, Bern, EEC, APMWS)

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Gavia stellata	×		2[1]		2	1	×	×
Gavia arctica	×		2[1]		2	1	×	×
Gavia pacifica	×				o	×		×
Gavia immer	×		2[1]		2	1	×	×
Podiceps grisegena	×		2[1]		2	×	×	×
Podiceps auritus	×		2[1]		2	1	×	×
Fulmarus glacialis					3	×		
Puffinus puffinus					2	×		
Hydrobates pelagicus					2	1		
Oceanodroma leucorhoa					2	1		

Table 4 continued.

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Oceanodroma furcata					o	o		
Morus bassanus					3	×		
Phalacrocorax auritus	×				o	o		o
Phalacrocorax carbo	×				3	×		×
Phalacrocorax pelagicus					o	o		×
Phalacrocorax aristotelis					3	×		o
Cygnus cygnus	×		2		2	1	X[3]	×
Cygnus columbianus	×		2		2	1	X[3]	×
Anser brachyrhynchus	×		2		3	2-2	X[3]	o
Anser fabalis	×		2		3	2-1	X[3]	×
Anser albifrons	×		2		3	2-2[2]	X[3]	×
Anser erythropus	×		1		2	1	X[3]	×
Anser anser	×		2		3	2-1	X[3]	×
Anser caerulescens	×		2		3	o		×
Branta canadensis	×	1[4]	2		3	2-1		o
Branta leucopsis	×		2		2	1	X[3]	o
Branta bernicla	×		2		3	2-2	X[3]	×
Branta ruficollis	×	2	1		2	1	X[3]	o
Anas penelope	×		2		3	2-1	X[3]	×
Anas americana	×		2		o	o		o
Anas formosa	×	2	2		o	o		×
Anas crecca	×		2		3	2-1	X[3]	×
Anas platyrhynchos	×		2		3	2-1	X[3]	×
Anas acuta	×		2		3	2-1	X[3]	×
Anas clypeata	×		2		3	2-1	X[3]	×
Aythya valisineria	×		2		o	o		o
Aythya fuligula	×		2		3	2-1	X[3]	×
Aythya marila	×		2		3	2-2	X[3]	×
Aythya affinis	×		2		o	o		o
Somateria mollissima	×		2		3	2-2	X[3]	×
Polysticta stelleri	×		1		2	×	X[3]	×
Histrionicus histrionicus	×		2		2	o		×
Clangula hyemalis	×		2		3	2-2	X[3]	×
Melanitta nigra	×		2		3	2-2	X[3]	×
Melanitta perspicillata	×		2		o	o		o
Melanitta fusca	×		2		3	2-2	X[3]	×
Bucephala clangula	×		2		3	2-2	X[3]	×
Mergellus albellus	×		2		2	×	X[3]	×
Mergus serrator	×		2		3	2-2	X[3]	×
Mergus merganser	×		2		3	2-2	X[3]	×
Pandion haliaetus	×	2	2	B	2	1		
Haliaeetus albicilla	×	1	1	o	2	1		
Haliaeetus pelagicus	×	2	1	o	o	o		
Circus cyaneus	×	2	2	B	2	1		
Accipiter nisus		2	2	B	2	×		
Accipiter striatus		2	2	o	o	o		
Accipiter gentilis		2	2	B	2	×		
Buteo swainsoni		2	2	o	o	o		
Buteo jamaicensis		2	2	o	o	o		
Buteo lagopus		2	2	o	2	×		
Aquila chrysaetos		2	2	B	2	1		
Falco tinnunculus		2	2	B	2	×		
Falco sparverius		2	2	o	o	o		

Table 4 continued.

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Falco columbarius		2	2	B	2	1		
Falco peregrinus		1	2	B	2	1		
Grus leucogeranus	×	1	1	o	o	o	×	×
Grus canadensis	×	2	2	o	o	o		×
Grus grus	×	2	2	A	2	1	×	×
Porzana carolina	×				o	o		o
Haematopus ostralegus	×				3	2-2		×
Pluvialis apricaria	×		2		3	2-2[5]	×	o
Pluvialis fulva	×		2		o	o		×
Pluvialis dominica	×		2		o	o		o
Pluvialis squatarola	×		2		3	2-2	×	×
Charadrius hiaticula	×		2		2	×	×	×
Charadrius semipalmatus	×		2		o	o		o
Charadrius vociferus	×		2		o	o		o
Charadrius mongolus	×		2		o	o	×	×
Eudromias morinellus			2		2	1	×	×
Vanellus vanellus	×		2		3	2-2	×	×
Scolopax rusticola			2		3	2-1		×
Gallinago stenura	×		2		o	o		×
Gallinago media	×		2		2	1	×	o
Gallinago gallinago	×		2		3	2-1	×	×
Lymnocryptes minimus	×		2		3	2-1	×	×
Limosa limosa	×		2		3	2-2	×	×
Limosa haemastica	×		2		o	o		o
Limosa lapponica	×		2		3	2-2	×	×
Numenius minutus	×		2		o	o		×
Numenius borealis	×	1	1		o	o		o
Numenius phaeopus	×		2		3	2-2	×	×
Numenius tahitiensis	×		2		o	o		×
Numenius arquata	×		2		3	2-2	×	×
Tringa erythropus	×		2		3	2-2	×	×
Tringa totanus	×		2		3	2-2	×	×
Tringa nebularia	×		2		3	2-2	×	×
Tringa melanoleuca	×		2		o	o		o
Tringa flavipes	×		2		o	o		o
Tringa solitaria	×		2		o	o		o
Tringa ochropus	×		2		2	×	×	×
Tringa glareola	×		2		2	1	×	×
Tringa cinerea	×		2		2	×	×	×
Tringa hypoleucos	×		2		2	×	×	×
Tringa macularia	×		2		o	o		o
Tringa brevipes	×		2		o	o		×
Tringa incana	×		2		o	o		×
Arenaria interpres	×		2		2	×	×	×
Arenaria melanocephala	×		2		o	o		o
Limnodromus griseus	×		2		o	o		o
Limnodromus scolopaceus	×		2		o	o		×
Aphriza virgata	×		2		o	o		o
Calidris tenuirostris	×		2		o	o	×	×
Calidris canutus	×		2		3	2-2	×	×
Calidris alba	×		2		2	×	×	×
Calidris pusilla	×		2		o	o		o
Calidris mauri	×		2		o	o		×

Table 4 continued.

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Calidris minuta	×		2		2	×	×	×
Calidris ruficollis	×		2		o	o		×
Calidris temminckii	×		2		2	×	×	×
Calidris subminuta	×		2		o	o		×
Calidris minutilla	×		2		o	o		o
Calidris fuscicollis	×		2		o	o		o
Calidris bairdii	×		2		o	o		×
Calidris melanotos	×		2		o	o		×
Calidris acuminata	×		2		o	o		×
Calidris maritima	×		2		2	×	×	o
Calidris alpina	×		2		2	×	×	×
Calidris ferruginea	×		2		2	×	×	×
Micropalama himantopus	×		2		o	o		o
Tryngites subruficollis	×		2		o	o		×
Eurynorhynchus pygmeus	×		2		o	o		×
Limicola falcinellus	×		2		2	×	×	×
Philomachus pugnax	×		2		3	2-2[5]	×	×
Phalaropus lobatus	×		2		2	1	×	×
Phalaropus fulicaria	×		2		2	×	×	×
Catharacta skua					3	×		
Stercorarius pomarinus					3	×		
Stercorarius parasiticus					3	×		
Stercorarius longicaudus					3	×		
Larus canus	×				3	2-2		×
Larus californicus	×				o	o		o
Larus marinus						2-2		o
Larus glaucescens					o	o		×
Larus hyperboreus					3	×		×
Larus glaucoides					3	×		o
Larus argentatus	×					2-2		×
Larus fuscus	×					2-2		o
Larus ridibundus	×				3	2-2		×
Larus philadelphia	×				o	o		o
Xema sabini					2	×		×
Rissa tridactyla					3	×		×
Sterna caspia	×		2[1]		2	1	×	×
Sterna hirundo	×		2[1]		2	1	×	×
Sterna paradisaea			2[1]		2	1	×	×
Sterna aleutica					o	o		×
Alle alle					3	×		
Uria aalge					3	×		
Uria lomvia					3	×		
Alca torda					3	×		
Brachyramphus marmoratus					o	o		
Synthliboramphus antiquus					o	o		
Ptychoramphus aleuticus					o	o		
Aethia cristatella					o	o		
Aethia pusilla					o	o		
Fratercula arctica					3	×		
Fratercula cirrhata					o	o		
Cuculus canorus					3	×		
Cuculus saturatus					o	o		
Nyctea scandiaca		2		o	2	1		

Table 4 continued.

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Aegolius funereus		2		o	2	1		
Asio otus		2		o	2	×		
Asio flammeus		2		B	2	1		
Chordeiles minor					o	o		
Apus pacificus					o	o		
Ceryle alcyon	×				o	o		
Jynx torquilla					2	×		
Sphyrapicus varius					o	o		
Dendrocopos major					2	×		
Contopus borealis					o	o		
Contopus sordidulus					o	o		
Empidonax flaviventris					o	o		
Empidonax alnorum					o	o		
Empidonax minimus					o	o		
Sayornis phoebe					o	o		
Sayornis saya					o	o		
Tyrannus tyrannus					o	o		
Alauda arvensis					3	2-2		
Eremophila alpestris					2	×		
Tachycineta bicolor					o	o		
Tachycineta thalassina					o	o		
Riparia riparia	×				2	×		
Hirundo rustica					2	×		
Hirundo pyrrhonota					o	o		
Delichon urbica					2	×		
Motacilla alba					2	×		
Motacilla citreola	×				o	o		
Motacilla flava	×				2	×		
Anthus trivialis					2	×		
Anthus hodgsoni					o	o		
Anthus gustavi					o	o		
Anthus pratensis					2	×		
Anthus cervinus	×				2	×		
Anthus petrosus	×				2	×		
Anthus rubescens	×				o	o		
Lanius cristatus					o	o		
Lanius excubitor					2	×		
Bombycilla garrulus					2	×		
Cinclus cinclus	×				2	×		
Troglodytes troglodytes					2	×		
Prunella montanella					o	o		
Prunella modularis					2	×		
Catharus minimus			2		o	o		
Catharus ustulatus			2		o	o		
Catharus guttatus			2		o	o		
Turdus torquatus			2		2	×		
Turdus merula			2		3	2-2		
Turdus obscurus			2		o	o		
Turdus naumanni			2		o	o		
Turdus pilaris			2		3	2-2		
Turdus iliacus			2		3	2-2		
Turdus philomelos			2		3	2-2		
Turdus viscivorus			2		3	2-2		

Table 4 continued.

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Turdus migratorius			2		o	o		
Erithacus rubecula			2		2	×		
Luscinia calliope			2		o	o		
Luscinia svecica	×		2		2	1		
Tarsiger cyanurus			2		2	o		
Phoenicurus phoenicurus			2		2	×		
Saxicola rubetra			2		2	×		
Saxicola maura			2		o	o		
Oenanthe oenanthe			2		2	×		
Locustella lanceolata			2		o	o		
Acrocephalus schoenobaenus	×		2		2	×		
Phylloscopus trochilus			2		2	×		
Phylloscopus collybita			2		2	×		
Phylloscopus inornatus			2		2	o		
Phylloscopus borealis			2		2	o		
Sylvia atricapilla			2		2	×		
Sylvia borin			2		2	×		
Regulus calendula			2		o	o		
Regulus regulus			2		2	×		
Regulus satrapa			2		o	o		
Muscicapa striata			2		2	×		
Ficedula hypoleuca			2		2	×		
Ficedula parva			2		2	1		
Emberiza citrinella					2	×		
Emberiza pusilla					2	×		
Emberiza rustica					2	×		
Emberiza aureola					2	×		
Emberiza pallasi	×				o	o		
Emberiza schoeniclus	×				2	×		
Calcarius lapponicus					2	×		
Plectrophenax nivalis					2	×		
Melospiza melodia					o	o		
Melospiza lincolnii	×				o	o		
Zonotrichia leucophrys					o	o		
Zonotrichia atricapilla					o	o		
Passerculus sandwichensis					o	o		
Spizella passerina					o	o		
Vermivora peregrina					o	o		
Vermivora celata					o	o		
Dendroica petechia					o	o		
Dendroica coronata					o	o		
Dendroica striata					o	o		
Mniotilta varia					o	o		
Seiurus noveboracensis	×				o	o		
Wilsonia pusilla					o	o		
Vireo olivaceus					o	o		
Vireo gilvus					o	o		
Fringilla montifringilla					3	×		
Carduelis hornemanni					2	×		
Carduelis flammea					2	×		
Carduelis flavirostris					2	×		
Leucosticte arctoa					o	o		
Carpodacus erythrinus					2	×		

Table 4 continued.

Species	Instrument							
	Ramsar	CITES	CMS	Africa	Bern	EEC	AEWA	APMWS
Pinicola enucleator					2	×		
Loxia curvirostra					2	×		
Sturnus vulgaris						2-2		
Corvus corone						2-2		
Total number of species	**136**	**26**	**159**	**10**	**163**	**164**	**69**	**95**

Notes:

1. Only certain populations in Western Eurasia.
2. The subspecies *Anser albifrons flavirostris* breeding in Greenland is included in Annex 1.
3. Included in the Action Plan in Annex 3 to the Agreement.
4. Only the subspecies *Branta canadensis leucopareia*.
5. Also included in Annex 1.

Table 5: Coverage of migratory Arctic species by bilateral conventions and agreements in Asia, Australasia and North America

Key to Conventions and Agreements

CA/US Convention Between the United States of America and Great Britain (for Canada) for the Protection of Migratory Birds (Washington, 1916) as amended.

MX/US Convention Between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Animals (Mexico City, 1936) as amended.

JP/RU Convention between the Government of the Union of Soviet Socialist Republics and the Government of Japan on the Protection of Migratory Birds and Birds under Threat of Extinction and on the Means of Protecting Them (Moscow, 1973).

AU/JP Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Tokyo, 1974).

JP/US Convention Between the Government of the United States of America and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction, and Their Environment (Tokyo, 1972) as amended.

RU/US Convention Between the United States of America and the Union of Soviet Socialist Republics Concerning the Conservation of Migratory Birds and Their Environment (Moscow, 1976).

CN/JP Agreement between the Government of Japan and the Government of the People's Republic of China for the Protection of Migratory Birds and their Habitats (Peking, 1981).

IN/RU Convention between the Government of the Republic of India and the Government of the Union of Soviet Socialist Republics on Protection of Migratory Birds (1984).

AU/CN Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (Canberra, 1986).

AU/RU Draft Agreement between the Government of Australia and the Government of the Union of Soviet Socialist Republics for the Protection of Migratory Birds and Their Habitats.

Key to symbols

× Species covered by the Convention or Agreement

o The species belongs to a family of birds that is covered by the Convention or Agreement, but either does not occur in the region concerned, or occurs only as a rare vagrant.

Species	Instruments									
	CA/ US	MX/ US	JP/ RU	AU/ JP	JP/ US	RU/ US	CN/ JP	IN/ RU	AU/ CN	AU/ RU
Gavia stellata	×	×	×		×	×	×	×		
Gavia arctica	×	o	×		×	×	×	×		
Gavia pacifica	×	×	×[1]		×[1]	×	×[1]			
Gavia immer	×	×					×[2]			
Podiceps grisegena	×	×	×		×	×		×		
Podiceps auritus	×	×	×		×	×	×			
Fulmarus glacialis	×	×	×		×	×				
Puffinus puffinus	×	×								×
Hydrobates pelagicus	o	o								
Oceanodroma leucorhoa	×	×	×	×	×	×			×	×
Oceanodroma furcata	×	×	×		×	×				
Morus bassanus	×	×								
Phalacrocorax auritus		×								
Phalacrocorax carbo		×								×
Phalacrocorax pelagicus		×	×		×	×	×			
Phalacrocorax aristotelis		o								
Cygnus cygnus	o	o	×		×	×	×	×		
Cygnus columbianus	×	×	×			×	×	×		
Anser brachyrhynchus	o	o								
Anser fabalis	o	o	×		×	×	×	×		
Anser albifrons	×	×	×		×	×	×	×		
Anser erythropus	o	o	×				×	×		
Anser anser	o	o	×					×		
Anser caerulescens	×	×	×		×	×				
Branta canadensis	×	×	×		×	×				
Branta leucopsis	o	o								
Branta bernicla	×	×	×		×	×	×			
Branta ruficollis	o	o						×		
Anas penelope	o	o	×		×	×	×	×		
Anas americana	×	×			×	×				
Anas formosa	o	o	×		×	×	×	×		
Anas crecca	×	×	×		×	×	×	×		
Anas platyrhynchos	×	×	×		×	×	×	×		
Anas acuta	×	×	×		×	×	×	×		
Anas clypeata	×	×	×		×	×	×	×	×	×
Aythya valisineria	×	×			×					
Aythya fuligula	o	o	×		×	×	×	×		
Aythya marila	×	×	×			×	×	×		
Aythya affinis	×	×								
Somateria mollissima	×	×				×				
Polysticta stelleri	×	×	×		×	×				
Histrionicus histrionicus	×	×	×		×	×	×			
Clangula hyemalis	×	×	×		×	×	×	×		
Melanitta nigra	×	×	×		×	×				
Melanitta perspicillata	×	×				×				
Melanitta fusca	×	×	×			×	×			
Bucephala clangula	×	×	×		×	×	×	×		
Mergellus albellus	o	o	×		×	×	×	×		
Mergus serrator	×	×	×		×	×	×	×		
Mergus merganser	×	×	×		×	×	×	×		
Pandion haliaetus		×	×		×	×		×		
Haliaeetus albicilla		o	×		×	×		×		
Haliaeetus pelagicus		o	×		×	×	×			

Table 5 continued.

Species	Instruments									
	CA/ US	MX/ US	JP/ RU	AU/ JP	JP/ US	RU/ US	CN/ JP	IN/ RU	AU/ CN	AU/ RU
Circus cyaneus		×	×			×	×	×		
Accipiter nisus		o	×					×		
Accipiter striatus		×								
Accipiter gentilis		×	×					×		
Buteo swainsoni		×								
Buteo jamaicensis		×								
Buteo lagopus		×	×		×	×	×			
Aquila chrysaetos		×				×		×		
Falco tinnunculus		o						×		
Falco sparverius		×								
Falco columbarius		×	×			×	×	×		
Falco peregrinus		×	×		×	×		×		
Grus leucogeranus	o	o	×					×		
Grus canadensis	×	×	×		×	×				
Grus grus	o	o	×			×	×	×		
Porzana carolina	×	×								
Haematopus ostralegus	o	o	×				×	×		
Pluvialis apricaria	o	o						×		×
Pluvialis fulva	o	o	×[3]	×[3]	×[3]	×[3]	×[3]	×[3]	×[3]	×[3]
Pluvialis dominica	×	×			×	×				
Pluvialis squatarola	×	×	×	×	×	×	×	×	×	×
Charadrius hiaticula	×	o	×	×	×			×	×	×
Charadrius semipalmatus	×	×				×				
Charadrius vociferus	×	×								
Charadrius mongolus	×	o	×	×	×	×	×	×	×	×
Eudromias morinellus	×	o	×		×	×				
Vanellus vanellus	o	o	×				×	×		
Scolopax rusticola	o	o	×				×	×		
Gallinago stenura	o	o	×			×		×	×	×
Gallinago media	o	o						×		
Gallinago gallinago	×	×	×		×	×	×	×		
Lymnocryptes minimus	o	o	×		×	×		×		
Limosa limosa	o	o	×	×		×	×	×	×	×
Limosa haemastica	×	×								
Limosa lapponica	×	×	×	×	×	×	×	×	×	×
Numenius minutus	o	o	×	×	×				×	×
Numenius borealis	×	×			×[4]					
Numenius phaeopus	×	×	×	×	×	×	×	×	×	×
Numenius tahitiensis	×	o			×					
Numenius arquata	o	o	×				×	×	×	×
Tringa erythropus	o	o	×		×	×	×	×		×
Tringa totanus	o	o	×				×	×	×	×
Tringa nebularia	o	o	×	×	×	×	×	×	×	×
Tringa melanoleuca	×	×			×					
Tringa flavipes	×	×								
Tringa solitaria	×	×								
Tringa ochropus	o	o	×				×	×		×
Tringa glareola	×	o	×	×	×	×	×	×	×	×
Tringa cinerea	o	o	×	×		×	×	×	×	×
Tringa hypoleucos	o	o	×	×	×	×	×	×	×	×
Tringa macularia	×	×								
Tringa brevipes	o	o	×	×	×[5]	×	×[5]		×	×

Table 5 continued.

Species	Instruments									
	CA/ US	MX/ US	JP/ RU	AU/ JP	JP/ US	RU/ US	CN/ JP	IN/ RU	AU/ CN	AU/ RU
Tringa incana	×	×	×	×	×	×	×			×
Arenaria interpres	×	×	×	×	×	×	×	×	×	×
Arenaria melanocephala	×	×								
Limnodromus griseus	×	×								
Limnodromus scolopaceus	×	×	×		×	×				
Aphriza virgata	×	×								
Calidris tenuirostris	o	o	×	×	×	×	×	×	×	×
Calidris canutus	×	×	×	×	×	×	×	×	×	×
Calidris alba	×	×	×	×	×	×	×	×	×	×
Calidris pusilla	×	×								
Calidris mauri	×	×				×				×
Calidris minuta	o	o						×		×
Calidris ruficollis	o	o	×	×	×	×	×	×	×	×
Calidris temminckii	o	o	×		×	×	×	×		
Calidris subminuta	o	o	×[6]	×[6]	×[6]	×	×[6]	×	×	×
Calidris minutilla	×	×	×	×	×		×			
Calidris fuscicollis	×	×	×							×
Calidris bairdii	×	×	×	×	×	×				×
Calidris melanotos	×	×	×	×	×	×				×
Calidris acuminata	o	o	×	×	×	×	×	×	×	×
Calidris maritima	×	×								
Calidris alpina	×	×	×		×	×	×	×	×	×
Calidris ferruginea	o	o	×	×	×	×	×	×	×	×
Micropalama himantopus	×	×								
Tryngites subruficollis	×	×		×	×	×				×
Eurynorhynchus pygmeus	o	o	×		×	×	×	×		
Limicola falcinellus	o	o	×	×	×	×	×	×	×	×
Philomachus pugnax	o	o	×	×	×	×	×	×	×	×
Phalaropus lobatus	×	×	×	×	×	×	×	×	×	×
Phalaropus fulicaria	×	×	×		×	×	×	×	×	×
Catharacta skua	×	×			×[7]					×[7]
Stercorarius pomarinus	×	×	×	×	×	×	×		×	×
Stercorarius parasiticus	×	×	×	×	×	×				×
Stercorarius longicaudus	×	×	×		×	×				×
Larus canus	×	×	×			×	×			
Larus californicus	×	×								
Larus marinus	×	×								
Larus glaucescens	×	×	×		×	×				
Larus hyperboreus	×	×	×		×	×				
Larus glaucoides	×	×								
Larus argentatus	×	×	×		×	×	×	×[8]		
Larus fuscus	o	o						×		×
Larus ridibundus	×	×	×		×	×	×	×		
Larus philadelphia	×	×								
Xema sabini	×	×			×	×				
Rissa tridactyla	×	×	×		×	×	×			
Sterna caspia	×	×						×	×	×
Sterna hirundo	×	×	×	×	×	×	×	×	×	×
Sterna paradisaea	×	×				×				×
Sterna aleutica	×	o	×		×	×				
Alle alle	×	×								
Uria aalge	×	×	×		×	×				

Table 5 continued.

Species	Instruments									
	CA/ US	MX/ US	JP/ RU	AU/ JP	JP/ US	RU/ US	CN/ JP	IN/ RU	AU/ CN	AU/ RU
Uria lomvia	×	o	×		×	×				
Alca torda	×	o								
Brachyramphus marmoratus	×	×	×			×	×			
Synthliboramphus antiquus	×	×	×		×	×	×			
Ptychoramphus aleuticus	×	×								
Aethia cristatella	×	o	×		×	×				
Aethia pusilla	×	o	×		×	×				
Fratercula arctica	×	o								
Fratercula cirrhata	×	×	×		×	×				
Cuculus canorus	o	o	×		×	×	×	×		
Cuculus saturatus	o	o	×	×	×	×	×	×	×	×
Nyctea scandiaca		×	×		×	×	×			
Aegolius funereus		×	×			×		×		
Asio otus		×	×				×	×		
Asio flammeus		×	×		×	×	×	×		
Chordeiles minor	×	×								
Apus pacificus	o	o	×	×	×	×	×	×	×	
Ceryle alcyon		×								
Jynx torquilla	o	o			×	×		×		
Sphyrapicus varius	×	×								
Dendrocopos major	o	o								
Contopus borealis	×	×								
Contopus sordidulus	×	×								
Empidonax flaviventris	×	×								
Empidonax alnorum	×	×								
Empidonax minimus	×	×								
Sayornis phoebe	×	×								
Sayornis saya	×	×								
Tyrannus tyrannus	×	×								
Alauda arvensis	o	o	×		×	×		×		
Eremophila alpestris	×	×	×			×	×			
Tachycineta bicolor	×	×				×				
Tachycineta thalassina	×	×								
Riparia riparia	×	×	×		×	×	×	×		
Hirundo rustica	×	×	×	×	×	×	×	×	×	×
Hirundo pyrrhonota	×	×				×				
Delichon urbica	o	o	×			×	×	×		
Motacilla alba	×	o	×		×	×	×	×	×	×
Motacilla citreola	o	o					×	×	×	×
Motacilla flava	×	×	×	×	×	×	×	×	×	×
Anthus trivialis	o	o						×		
Anthus hodgsoni	o	o	×		×	×	×	×		
Anthus gustavi	o	o				×	×			
Anthus pratensis	o	o						×		
Anthus cervinus	×	o	×		×	×	×	×		
Anthus petrosus	o	o								
Anthus rubescens	×	×	×[9]		×[9]	×[9]	×[9]			
Lanius cristatus	o	o	×				×	×		
Lanius excubitor	×	×	×			×	×	×		
Bombycilla garrulus	×	×	×				×	×		
Cinclus cinclus	o									
Troglodytes troglodytes	×	×								

Table 5 continued.

Species	Instruments									
	CA/ US	MX/ US	JP/ RU	AU/ JP	JP/ US	RU/ US	CN/ JP	IN/ RU	AU/ CN	AU/ RU
Prunella montanella			×		×	×		×		
Prunella modularis										
Catharus minimus	×	×				×				
Catharus ustulatus	×	×				×				
Catharus guttatus	×	×								
Turdus torquatus	o	o								
Turdus merula	o	o								
Turdus obscurus	o	o	×		×	×	×[10]	×		
Turdus naumanni	o	o	×				×	×		
Turdus pilaris	o	o				×				
Turdus iliacus	o	o						×		
Turdus philomelos	o	o								
Turdus viscivorus	o	o								
Turdus migratorius	×	×								
Erithacus rubecula	o	o								
Luscinia calliope	o	o	×		×	×	×	×		
Luscinia svecica	×	o				×		×		
Tarsiger cyanurus	o	o	×				×			
Phoenicurus phoenicurus	o	o						×		
Saxicola rubetra	o	o								
Saxicola maura	o	o	×[11]				×[11]	×[11]		
Oenanthe oenanthe	×	×				×		×		
Locustella lanceolata	o	o	×				×	×		
Acrocephalus schoenobaenus	o	o								
Phylloscopus trochilus	o	o				×		×		
Phylloscopus collybita	o	o						×		
Phylloscopus inornatus	o	o					×	×		
Phylloscopus borealis	×	×	×		×	×	×	×	×	×
Sylvia atricapilla	o	o								
Sylvia borin	o	o								
Regulus calendula	×	×								
Regulus regulus	o	o	×							
Regulus satrapa	×	×								
Muscicapa striata	o	o						×		
Ficedula hypoleuca	o	o								
Ficedula parva	o	o						×		
Emberiza citrinella	o	o								
Emberiza pusilla	o	o					×	×		
Emberiza rustica	o	o	×		×	×	×			
Emberiza aureola	o	o	×				×	×		
Emberiza pallasi	o	o				×	×			
Emberiza schoeniclus	o	o	×				×	×		
Calcarius lapponicus	×	×	×			×	×			
Plectrophenax nivalis	×	×	×			×	×			
Melospiza melodia	×	×								
Melospiza lincolnii	×	×								
Zonotrichia leucophrys	×	×			×					
Zonotrichia atricapilla	×	×			×					
Passerculus sandwichensis	×	×				×				
Spizella passerina	×	×								
Vermivora peregrina	×	×								
Vermivora celata	×	×								

Table 5 continued.

Species	Instruments									
	CA/ US	MX/ US	JP/ RU	AU/ JP	JP/ US	RU/ US	CN/ JP	IN/ RU	AU/ CN	AU/ RU
Dendroica petechia	×	×								
Dendroica coronata	×	×				×				
Dendroica striata	×	×								
Mniotilta varia	×	×								
Seiurus noveboracensis	×	×				×				
Wilsonia pusilla	×	×								
Vireo olivaceus	×	×								
Vireo gilvus	×	×								
Fringilla montifringilla	o	o	×		×	×	×	×		
Carduelis hornemanni	×	×			×	×	×			
Carduelis flammea	×	×	×		×	×	×			
Carduelis flavirostris	o	o						×		
Leucosticte arctoa	×	×	×				×			
Carpodacus erythrinus	o	o				×	×			
Pinicola enucleator	×	×	×		×					
Loxia curvirostra	×	×	×				×			
Sturnus vulgaris								×		
Corvus corone			×					×		
Total number of species	**159**	**163**	**150**	**37**	**121**	**147**	**117**	**122**	**41**	**57**

Notes:

1. Considered to be conspecific with *Gavia arctica*, and listed under that name.
2. Considered to be conspecific with *Gavia adamsii*, and listed under that name.
3. Considered to be conspecific with *Pluvialis dominica*, and listed under that name.
4. Considered to be conspecific with *Numenius minutus*, and listed under that name.
5. Considered to be conspecific with *Tringa incana*, and listed under that name.
6. Considered to be conspecific with *Calidris minutilla*, and listed under that name.
7. Presumably refers to one or more of the forms breeding in the southern hemisphere, now generally regarded as distinct species.
8. Presumably refers to the Yellow-legged Gull *Larus cachinnans*, formerly regarded as conspecific with *L. argentatus*.
9. Considered to be conspecific with *Anthus spinoletta*, and listed under that name.
10. Considered to be conspecific with *Turdus pallidus*, and listed under that name.
11. Considered to be conspecific with *Saxicola torquata*, and listed under that name.

Table 6: Requirements for comprehensive coverage by international instruments

Key to Column headings

HAB Main wintering habitat (see codes in Table 3).

COV Entire Arctic breeding population already covered throughout the year by existing multilateral or bilateral conventions and agreements.

PEL Pelagic outside the breeding season, and largely outside the scope of land-based agreements.

NA/CAC North American species which could be covered by a regional instrument covering Central America and the Caribbean.

NA/SA North American species which would require a regional instrument covering Central America, the Caribbean and South America (a hemispheric agreement).

EU/WP West Eurasian species with ranges restricted to the Western Palearctic, i.e. Europe, Southwest Asia and North Africa, requiring a regional (Western Palearctic) agreement.

EU/AF West Eurasian species wintering in Africa south of the Sahara and requiring an agreement covering the whole of Western Eurasia and Africa (e.g. the African-Eurasian Waterbird Agreement).

AS/EA Central and East Asian species confined to temperate regions, largely covered by existing bilateral agreements, but requiring the involvement of one or more of the following: the Korean Peninsula, Mongolia, Kazakhstan, Kyrgyzstan and Tajikistan.

AS/SA Central and East Asian species wintering in the Indian subcontinent and/or Southeast Asia (to Indonesia), and requiring a regional agreement covering the whole of Central and Eastern Asia.

AS/AUS Central and East Asian species wintering in the Australasian region, and requiring a formal agreement with the coverage of the Asia-Pacific Migratory Waterbird Conservation Strategy.

Species	HAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Gavia stellata	CM					×[1]		×[2]		
Gavia arctica	CM					×[1]		×[2]		
Gavia pacifica	CM							×[2]		
Gavia immer	CM	×								
Podiceps grisegena	CM					×[1]		×[2]		
Podiceps auritus	CM					×[1]		×[2]		
Fulmarus glacialis	PE		×							
Puffinus puffinus	PE		×							
Hydrobates pelagicus	PE		×							
Oceanodroma leucorhoa	PE		×							
Oceanodroma furcata	PE		×							
Morus bassanus	PE		×							

Table 6 continued.

Species	HAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Phalacrocorax auritus	CM	×								
Phalacrocorax carbo	CM	×								
Phalacrocorax pelagicus	CM	×								
Phalacrocorax aristotelis	CM	×								
Cygnus cygnus	IW					×[1]		×[2]		
Cygnus columbianus	IW					×[1]		×[2]		
Anser brachyrhynchus	GR	×								
Anser fabalis	GR					×[1]		×[2]		
Anser albifrons	GR					×[1]		×[2]		
Anser erythropus	GR					×[1]				
Anser anser	GR	×								
Anser caerulescens	GR	×								
Branta canadensis	GR	×								
Branta leucopsis	GR	×								
Branta bernicla	CW							×[2]		
Branta ruficollis	GR					×[1]				
Anas penelope	IW					×[1]			×[2]	
Anas americana	IW			×						
Anas formosa	IW							×[2]		
Anas crecca	IW			×		×[1]			×[2]	
Anas platyrhynchos	IW					×[1]			×[2]	
Anas acuta	IW			×			×[1]		×[2]	
Anas clypeata	IW			×			×[1]		×[2]	
Aythya valisineria	IW	×								
Aythya fuligula	IW					×[1]			×[2]	
Aythya marila	CM					×[1]		×[2]		
Aythya affinis	IW			×						
Somateria mollissima	CM	×								
Polysticta stelleri	CM	×								
Histrionicus histrionicus	CM							×[2]		
Clangula hyemalis	CM							×[2]		
Melanitta nigra	CM					×[1]		×[2]		
Melanitta perspicillata	CM	×								
Melanitta fusca	CM					×[1]		×[2]		
Bucephala clangula	IW					×[1]		×[2]		
Mergellus albellus	IW					×[1]		×[2]		
Mergus serrator	CM					×[1]		×[2]		
Mergus merganser	IW					×[1]		×[2]		
Pandion haliaetus	IW				×		×		×	
Haliaeetus albicilla	IW					×		×		
Haliaeetus pelagicus	CW	×								
Circus cyaneus	IW				×	×		×		
Accipiter nisus	DF					×			×	
Accipiter striatus	DF			×						
Accipiter gentilis	DF					×		×		
Buteo swainsoni	OC				×					
Buteo jamaicensis	OC			×						
Buteo lagopus	OC					×		×		
Aquila chrysaetos	OC					×				
Falco tinnunculus	OC						×		×	
Falco sparverius	OC				×					
Falco columbarius	OC				×	×			×	
Falco peregrinus	OC				×		×			×

Table 6 continued

Species	IIAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Grus leucogeranus	IW					×[1]			×[2]	
Grus canadensis	GR	×								
Grus grus	GR						×[1]	×[2]		
Porzana carolina	IW				×					
Haematopus ostralegus	CW					×				
Pluvialis apricaria	GR					×[1]				
Pluvialis fulva	GR									×[2]
Pluvialis dominica	GR				×[3]					
Pluvialis squatarola	CW				×[3]		×[1]			×[2]
Charadrius hiaticula	CW						×[1]			
Charadrius semipalmatus	CW				×[3]					
Charadrius vociferus	GR				×[3]					
Charadrius mongolus	CW						×[1]			×[2]
Eudromias morinellus	DE					×[1]				
Vanellus vanellus	GR					×[1]				
Scolopax rusticola	DF					×				
Gallinago stenura	IW								×[2]	
Gallinago media	IW						×[1]			
Gallinago gallinago	IW				×[3]		×[1]		×[2]	
Lymnocryptes minimus	IW						×[1]		×[2]	
Limosa limosa	CW						×[1]			
Limosa haemastica	CW				×[3]					
Limosa lapponica	CW						×[1]			×[2]
Numenius minutus	GR									×[2]
Numenius borealis	GR				×[3]					
Numenius phaeopus	CW				×[3]		×[1]			×[2]
Numenius tahitiensis	CW									×[2]
Numenius arquata	CW					×[1]				
Tringa erythropus	IW						×[1]		×[2]	
Tringa totanus	CW						×[1]			
Tringa nebularia	IW						×[1]			×[2]
Tringa melanoleuca	IW				×[3]					
Tringa flavipes	IW				×[3]					
Tringa solitaria	IW				×[3]					
Tringa ochropus	IW						×[1]		×[2]	
Tringa glareola	IW						×[1]			×[2]
Tringa cinerea	CW						×[1]			×[2]
Tringa hypoleucos	IW						×[1]			×[2]
Tringa macularia	IW				×[3]					
Tringa brevipes	CW									×[2]
Tringa incana	CW									×[2]
Arenaria interpres	CW				×[3]		×[3]			×[2]
Arenaria melanocephala	CW	×								
Limnodromus griseus	CW				×[3]					
Limnodromus scolopaceus	CW			×[3]						
Aphriza virgata	CW				×[3]					
Calidris temirostris	CW					×[1]				×[2]
Calidris canutus	CW				×[3]		×[1]			×[2]
Calidris alba	CW				×[3]		×[1]			×[2]
Calidris pusilla	CW				×[3]					
Calidris mauri	CW				×[3]					
Calidris minuta	CW						×[1]		×[2]	
Calidris ruficollis	CW									×[2]

Table 6 continued

Species	HAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Calidris temminckii	IW						×[1]		×[2]	
Calidris subminuta	IW									×[2]
Calidris minutilla	IW				×[3]					
Calidris fuscicollis	CW				×[3]					
Calidris bairdii	IW				×[3]					
Calidris melanotos	IW				×[3]					×[2]
Calidris acuminata	IW									×[2]
Calidris maritima	CW	×								
Calidris alpina	CW			×[3]			×[1]		×[2]	
Calidris ferruginea	CW						×[1]			×[2]
Micropalama himantopus	IW				×[3]					
Tryngites subruficollis	GR				×[3]					
Eurynorhynchus pygmeus	CW								×[2]	
Limicola falcinellus	CW						×[1]			×[2]
Philomachus pugnax	IW						×[1]			×[2]
Phalaropus lobatus	PE		×							
Phalaropus fulicaria	PE		×							
Catharacta skua	PE		×							
Stercorarius pomarinus	PE		×							
Stercorarius parasiticus	PE		×							
Stercorarius longicaudus	PE		×							
Larus canus	CW					×		×		
Larus californicus	CW			×						
Larus marinus	CM	×								
Larus glaucescens	CM	×								
Larus hyperboreus	CM	×								
Larus glaucoides	CM	×								
Larus argentatus	CM			×				×		
Larus fuscus	CM						×			
Larus ridibundus	CW						×		×[2]	
Larus philadelphia	CW			×						
Xema sabini	PE		×							
Rissa tridactyla	PE		×							
Sterna caspia	CM			×						
Sterna hirundo	CM				×		×[1]			×[2]
Sterna paradisaea	PE		×							
Sterna aleutica	PE		×							
Alle alle	PE		×							
Uria aalge	PE		×							
Uria lomvia	PE		×							
Alca torda	CM	×								
Brachyramphus marmoratus	PE		×							
Synthliboramphus antiquus	CM							×		
Ptychoramphus aleuticus	CM	×								
Aethia cristatella	PE		×							
Aethia pusilla	PE		×							
Fratercula arctica	PE		×							
Fratercula cirrhata	PE		×							
Cuculus canorus	TW						×		×	
Cuculus saturatus	TF									×
Nyctea scandiaca	OC	×								
Aegolius funereus	DF	×								
Asio otus	DF					×		×		

Table 6 continued.

Species	HAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Asio flammeus	OC					×			×	
Chordeiles minor	OC				×					
Apus pacificus	OC									×
Ceryle alcyon	IW			×						
Jynx torquilla	TW						×		×	
Sphyrapicus varius	DF			×						
Dendrocopos major	DF	×								
Contopus borealis	TF				×					
Contopus sordidulus	TF				×					
Empidonax flaviventris	TF			×						
Empidonax alnorum	TF				×					
Empidonax minimus	TF			×						
Sayornis phoebe	OC			×						
Sayornis saya	OC			×						
Tyrannus tyrannus	OC				×					
Alauda arvensis	GR					×			×	
Eremophila alpestris	GR	×								
Tachycineta bicolor	OC			×						
Tachycineta thalassina	OC			×						
Riparia riparia	IW				×		×		×	
Hirundo rustica	OC				×		×			×
Hirundo pyrrhonota	OC				×					
Delichon urbica	TF						×		×	
Motacilla alba	OC						×		×	
Motacilla citreola	IW					×			×	
Motacilla flava	GR						×		×	
Anthus trivialis	TW						×		×	
Anthus hodgsoni	TW								×	
Anthus gustavi	TF								×	
Anthus pratensis	GR					×				
Anthus cervinus	IW						×		×	
Anthus petrosus	CW	×								
Anthus rubescens	IW			×				×		
Lanius cristatus	OC								×	
Lanius excubitor	OC					×		×		
Bombycilla garrulus	DF					×		×		
Cinclus cinclus	IW	×								
Troglodytes troglodytes	DF	×								
Prunella montanella	DF							×		
Prunella modularis	DF					×				
Catharus minimus	TF				×					
Catharus ustulatus	TF				×					
Catharus guttatus	TF			×						
Turdus torquatus	OC					×				
Turdus merula	DF					×				
Turdus obscurus	TF								×	
Turdus naumanni	DF							×		
Turdus pilaris	DF					×				
Turdus iliacus	DF					×				
Turdus philomelos	DF					×				
Turdus viscivorus	DF					×				
Turdus migratorius	DF			×						
Erithacus rubecula	DF					×				

Table 6 continued.

Species	HAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Luscinia calliope	TW								×	
Luscinia svecica	IW					×			×	
Tarsiger cyanurus	TF								×	
Phoenicurus phoenicurus	TW						×			
Saxicola rubetra	TW						×			
Saxicola maura	OC								×	
Oenanthe oenanthe	OC						×			
Locustella lanceolata	GR								×	
Acrocephalus schoenobaenus	IW						×			
Phylloscopus trochilus	TW						×			
Phylloscopus collybita	TW						×		×	
Phylloscopus inornatus	TF								×	
Phylloscopus borealis	TF								×	
Sylvia atricapilla	TW						×			
Sylvia borin	TW						×			
Regulus calendula	DF			×						
Regulus regulus	DF					×		×		
Regulus satrapa	DF	×								
Muscicapa striata	TW						×			
Ficedula hypoleuca	TF						×			
Ficedula parva	TF								×	
Emberiza citrinella	GR					×				
Emberiza pusilla	DF								×	
Emberiza rustica	DF							×		
Emberiza aureola	GR								×	
Emberiza pallasi	IW							×		
Emberiza schoeniclus	IW					×			×	
Calcarius lapponicus	GR	×								
Plectrophenax nivalis	OC	×								
Melospiza melodia	DF	×								
Melospiza lincolnii	IW			×						
Zonotrichia leucophrys	DF	×								
Zonotrichia atricapilla	DF	×								
Passerculus sandwichensis	GR			×						
Spizella passerina	GR	×								
Vermivora peregrina	TF				×					
Vermivora celata	TF			×						
Dendroica petechia	TF				×					
Dendroica coronata	DF			×						
Dendroica striata	TF				×					
Mniotilta varia	TF				×					
Seiurus noveboracensis	IW				×					
Wilsonia pusilla	TF			×						
Vireo olivaceus	TF				×					
Vireo gilvus	TF			×						
Fringilla montifringilla	DF					×		×		
Carduelis hornemanni	DF	×								
Carduelis flammea	DF							×		
Carduelis flavirostris	OC	×								
Leucosticte arctoa	OC	×								
Carpodacus erythrinus	TF								×	
Pinicola enucleator	DF	×								

Table 6 continued.

Species	HAB	COV	PEL	NA/ CAC	NA/ SA	EU/ WP	EU/ AF	AS/ EA	AS/ SA	AS/ AUS
Loxia curvirostra	DF	×								
Sturnus vulgaris	OC					×				
Corvus corone	OC					×			×	

Notes:

1. Covered by the African-Eurasian Waterbird Agreement
2. Covered by the Asia-Pacific Migratory Waterbird Conservation Strategy
3. Covered by the Western Hemisphere Shorebird Reserve Network

10. APPENDICES

Appendix I: Check-list of the breeding birds of the Arctic region (as defined by the CAFF member states)

The sequence and composition of bird families follow the traditional sequence as given by Morony, Bock & Farrand (1975); the taxonomic sequence, treatment of species within families, scientific nomenclature and vernacular names follow Sibley & Monroe (1990).

Key to symbols
×: breeds widely in Arctic region
×: marginal breeding bird, at edge of range
b: occasional breeder/has bred

Species	Region CA	US	GL	IS	NO	SE	FI	RU
GAVIIDAE								
Red-throated Loon *Gavia stellata*	×	×	×	×	×	×	×	×
Arctic Loon *Gavia arctica*	×	×			×	×	×	×
Pacific Loon *Gavia pacifica*	×	×						×
Common Loon *Gavia immer*	×	×	×	×				
Yellow-billed Loon *Gavia adamsii*	×	×						×
PODICIPEDIDAE								
Pied-billed Grebe *Podilymbus podiceps*	×							
Red-necked Grebe *Podiceps grisegena*	×	×						×
Horned Grebe *Podiceps auritus*	×	×	b	×	×		×	×
PROCELLARIIDAE								
Northern Fulmar *Fulmarus glacialis*	×	×	×	×	×			×
Manx Shearwater *Puffinus puffinus*				×				
HYDROBATIDAE								
European Storm-Petrel *Hydrobates pelagicus*				×				
Leach's Storm-Petrel *Oceanodroma leucorhoa*	×	×		×	×			
Fork-tailed Storm-Petrel *Oceanodroma furcata*		×						
SULIDAE								
Northern Gannet *Morus bassanus*				×	×			
PHALACROCORACIDAE								
Double-crested Cormorant *Phalacrocorax auritus*		×						
Great Cormorant *Phalacrocorax carbo*			×	×	×			×
Red-faced Cormorant *Phalacrocorax urile*		×						
Pelagic Cormorant *Phalacrocorax pelagicus*		×						×
European Shag *Phalacrocorax aristotelis*				×	×			×
ARDEIDAE								
Grey Heron *Ardea cinerea*					×			
ANATIDAE								
Ruddy Duck *Oxyura jamaicensis*	×	b						
Whooper Swan *Cygnus cygnus*				×	×	×	×	×

Appendix I continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
Trumpeter Swan *Cygnus buccinator*		×						
Tundra Swan *Cygnus columbianus*	×	×	b					×
Pink-footed Goose *Anser brachyrhynchus*			×	×	×			
Bean Goose *Anser fabalis*					×	×	×	×
Greater White-fronted Goose *Anser albifrons*	×	×	×					×
Lesser White-fronted Goose *Anser erythropus*					×	×	×	×
Greylag Goose *Anser anser*				×	×			×
Snow Goose *Anser caerulescens*	×	×	×					×
Ross's Goose *Anser rossii*	×	b						
Emperor Goose *Anser canagica*		×						×
Canada Goose *Branta canadensis*	×	×	×					
Barnacle Goose *Branta leucopsis*			×	×	×			×
Brent Goose *Branta bernicla*	×	×	×		×			×
Red-breasted Goose *Branta ruficollis*								×
Eurasian Wigeon *Anas penelope*				×	×	×	×	×
American Wigeon *Anas americana*	×	×						
Falcated Duck *Anas falcata*								×
Gadwall *Anas strepera*		×		×				
Baikal Teal *Anas formosa*								×
Common Teal *Anas crecca*	×	×	b	×	×	×	×	×
Mallard *Anas platyrhynchos*	×	×	×	×	×	×	×	×
American Black Duck *Anas rubripes*	×							
Northern Pintail *Anas acuta*	×	×	b	×	×	×	×	×
Blue-winged Teal *Anas discors*	×							
Northern Shoveler *Anas clypeata*	×	×		×		×	×	×
Common Pochard *Aythya ferina*				b				×
Canvasback *Aythya valisineria*	×							
Redhead *Aythya americana*	×	b						
Ring-necked Duck *Aythya collaris*	×							
Tufted Duck *Aythya fuligula*				×	×	×	×	×
Greater Scaup *Aythya marila*	×	×		×	×	×	×	×
Lesser Scaup *Aythya affinis*	×	×						
Common Eider *Somateria mollissima*	×	×	×	×	×			×
King Eider *Somateria spectabilis*	×	×	×		×			×
Spectacled Eider *Somateria fischeri*		×						×
Steller's Eider *Polysticta stelleri*		×						×
Harlequin Duck *Histrionicus histrionicus*	×	×	×	×				×
Long-tailed Duck *Clangula hyemalis*	×	×	×	×	×	×	×	×
Black Scoter *Melanitta nigra*	×	×		×	×	×	×	×
Surf Scoter *Melanitta perspicillata*	×	×						
White-winged Scoter *Melanitta fusca*	×	×			×	×	×	×
Common Goldeneye *Bucephala clangula*	×	×			×	×	×	×
Barrow's Goldeneye *Bucephala islandica*	×	×	b	×				
Bufflehead *Bucephala albeola*	×	×						
Smew *Mergellus albellus*							×	×
Hooded Merganser *Lophodytes cucullatus*	×							
Red-breasted Merganser *Mergus serrator*	×	×	×	×	×	×	×	×
Common Merganser *Mergus merganser*	×	×		×	×	×	×	×
PANDIONIDAE								
Osprey *Pandion haliaetus*	×	×			×	×	×	×

Appendix I continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
ACCIPITRIDAE								
Black Kite *Milvus migrans*								×
White-tailed Eagle *Haliaeetus albicilla*		×	×	×	×	×		×
Bald Eagle *Haliaeetus leucocephalus*	×	×						
Steller's Sea-Eagle *Haliaeetus pelagicus*								×
Eastern Marsh-Harrier *Circus spilonotus*								×
Northern Harrier *Circus cyaneus*	×	×			×	×	×	×
Eurasian Sparrowhawk *Accipiter nisus*					×	×	×	×
Sharp-shinned Hawk *Accipiter striatus*	×	×						
Northern Goshawk *Accipiter gentilis*	×	×			×	×	×	×
Swainson's Hawk *Buteo swainsoni*	×							
Red-tailed Hawk *Buteo jamaicensis*	×							
Common Buzzard *Buteo buteo*								×
Rough-legged Hawk *Buteo lagopus*	×	×			×	×	×	×
Golden Eagle *Aquila chrysaetos*	×	×			×	×	×	×
FALCONIDAE								
Eurasian Kestrel *Falco tinnunculus*					×	×	×	×
American Kestrel *Falco sparverius*	×	×						
Merlin *Falco columbarius*	×	×		×	×	×	×	×
Eurasian Hobby *Falco subbuteo*								×
Gyrfalcon *Falco rusticolus*	×	×	×	×	×	×	×	×
Peregrine Falcon *Falco peregrinus*	×	×	×		×	×	×	×
PHASIANIDAE								
Spruce Grouse *Dendragapus canadensis*	×	×						
Blue Grouse *Dendragapus obscurus*	×							
Willow Ptarmigan *Lagopus lagopus*	×	×			×	×	×	×
Rock Ptarmigan *Lagopus mutus*	×	×	×	×	×	×	×	×
White-tailed Ptarmigan *Lagopus leucurus*	×							
Black Grouse *Tetrao tetrix*					×	×	×	×
Eurasian Capercaillie *Tetrao urogallus*					×	×	×	×
Black-billed Capercaillie *Tetrao parvirostris*								×
Hazel Grouse *Bonasa bonasia*						×	×	×
Ruffed Grouse *Bonasa umbellus*	×							
Sharp-tailed Grouse *Tympanuchus phasianellus*	×							
GRUIDAE								
Siberian Crane *Grus leucogeranus*								×
Sandhill Crane *Grus canadensis*	×	×						×
Common Crane *Grus grus*						×	×	×
Hooded Crane *Grus monacha*								×
Whooping Crane *Grus americana*	×							
RALLIDAE								
Yellow Rail *Coturnicops noveboracensis*	×							
Water Rail *Rallus aquaticus*			b					
Sora *Porzana carolina*	×							
Corncrake *Crex crex*					×			
Common Coot *Fulica atra*				b				×
American Coot *Fulica americana*	×							

Appendix 1 continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
HAEMATOPODIDAE								
Eurasian Oystercatcher *Haematopus ostralegus*				×	×			×
Black Oystercatcher *Haematopus bachmani*		×						
CHARADRIIDAE								
European Golden-Plover *Pluvialis apricaria*			×	×	×	×	×	×
Pacific Golden-Plover *Pluvialis fulva*		×						×
American Golden-Plover *Pluvialis dominica*	×	×	b					
Grey Plover *Pluvialis squatarola*	×	×	b					×
Common Ringed Plover *Charadrius hiaticula*	×	b	×	×	×	×	×	×
Semipalmated Plover *Charadrius semipalmatus*	×	×						
Little Ringed Plover *Charadrius dubius*							×	
Killdeer *Charadrius vociferus*	×							
Mongolian Plover *Charadrius mongolus*		b						×
Eurasian Dotterel *Eudromias morinellus*		×			×	×	×	×
Northern Lapwing *Vanellus vanellus*				b	×	×	×	
SCOLOPACIDAE								
Eurasian Woodcock *Scolopax rusticola*					×			
Pintail Snipe *Gallinago stenura*								×
Great Snipe *Gallinago media*					×	×		×
Common Snipe *Gallinago gallinago*	×	×	b	×	×	×	×	×
Jack Snipe *Lymnocryptes minimus*					×	×	×	×
Black-tailed Godwit *Limosa limosa*				×	×			×
Hudsonian Godwit *Limosa haemastica*	×	×						
Bar-tailed Godwit *Limosa lapponica*		×			×	×	×	×
Marbled Godwit *Limosa fedoa*		×						
Little Curlew *Numenius minutus*								×
Eskimo Curlew *Numenius borealis*	×							
Whimbrel *Numenius phaeopus*	×	×	×	×	×	×	×	×
Bristle-thighed Curlew *Numenius tahitiensis*		×						
Eurasian Curlew *Numenius arquata*				b	×	×	×	×
Far Eastern Curlew *Numenius madagascariensis*								×
Upland Sandpiper *Bartramia longicauda*	×	×						
Spotted Redshank *Tringa erythropus*					×	×	×	×
Common Redshank *Tringa totanus*				×	×	×	×	×
Common Greenshank *Tringa nebularia*					×	×	×	×
Greater Yellowlegs *Tringa melanoleuca*	×	×						
Lesser Yellowlegs *Tringa flavipes*	×	×						
Solitary Sandpiper *Tringa solitaria*	×	×						
Green Sandpiper *Tringa ochropus*						×	×	×
Wood Sandpiper *Tringa glareola*		b		b	×	×	×	×
Terek Sandpiper *Tringa cinerea*								×
Common Sandpiper *Tringa hypoleucos*		b			×	×	×	×
Spotted Sandpiper *Tringa macularia*	×	×						
Grey-tailed Tattler *Tringa brevipes*								×
Wandering Tattler *Tringa incana*		×						×
Ruddy Turnstone *Arenaria interpres*	×	×	×		×			×
Black Turnstone *Arenaria melanocephala*		×						
Short-billed Dowitcher *Limnodromus griseus*	×	×						
Long-billed Dowitcher *Limnodromus scolopaceus*	×	×						×

Appendix I continued.

Species	Region							
	CA	US	GL	IS	NO	SE	FI	RU
Surfbird *Aphriza virgata*		×						
Great Knot *Calidris tenuirostris*								×
Red Knot *Calidris canutus*	×	×	×					×
Sanderling *Calidris alba*	×	×	×		×			×
Semipalmated Sandpiper *Calidris pusilla*	×	×						
Western Sandpiper *Calidris mauri*		×						×
Little Stint *Calidris minuta*					×			×
Rufous-necked Stint *Calidris ruficollis*		×						×
Temminck's Stint *Calidris temminckii*					×	×	×	×
Long-toed Stint *Calidris subminuta*								×
Least Sandpiper *Calidris minutilla*	×	×						
White-rumped Sandpiper *Calidris fuscicollis*	×	×						
Baird's Sandpiper *Calidris bairdii*	×	×	×					×
Pectoral Sandpiper *Calidris melanotos*	×	×	b					×
Sharp-tailed Sandpiper *Calidris acuminata*								×
Purple Sandpiper *Calidris maritima*	×		×	×	×	×	×	×
Rock Sandpiper *Calidris ptilocnemis*		×						×
Dunlin *Calidris alpina*	×	×	×	×	×	×	×	×
Curlew Sandpiper *Calidris ferruginea*		b						×
Stilt Sandpiper *Micropalama himantopus*	×	×						
Buff-breasted Sandp. *Tryngites subruficollis*	×	×						×
Spoonbill Sandpiper *Eurynorhynchus pygmeus*								×
Broad-billed Sandpiper *Limicola falcinellus*						×	×	×
Ruff *Philomachus pugnax*		b			×	×	×	×
Red-necked Phalarope *Phalaropus lobatus*	×	×	×	×	×	×	×	×
Red Phalarope *Phalaropus fulicaria*	×	×	×	×	×			×
STERCORARIIDAE								
Great Skua *Catharacta skua*				×				
Pomarine Jaeger *Stercorarius pomarinus*	×	×						×
Parasitic Jaeger *Stercorarius parasiticus*	×	×	×	×	×			×
Long-tailed Jaeger *Stercorarius longicaudus*	×	×	×		×	×	×	×
LARIDAE								
Mew Gull *Larus canus*	×	×		×	×	×	×	×
Ring-billed Gull *Larus delawarensis*	×							
California Gull *Larus californicus*	×							
Great Black-backed Gull *Larus marinus*	×		×	×	×		×	×
Glaucous-winged Gull *Larus glaucescens*		×						
Glaucous Gull *Larus hyperboreus*	×	×	×	×	×			×
Iceland Gull *Larus glaucoides*	×		×					
Herring Gull *Larus argentatus*	×	×	b	×	×	×	×	×
Slaty-backed Gull *Larus schistisagus*								×
Lesser Black-backed Gull *Larus fuscus*			b	×	×		×	×
Common Black-headed Gull *Larus ridibundus*			×	×		×		×
Bonaparte's Gull *Larus philadelphia*	×	×						
Little Gull *Larus minutus*							×	×
Ivory Gull *Pagophila eburnea*	×		×		×			×
Ross's Gull *Rhodostethia rosea*	b		b					×
Sabine's Gull *Xema sabini*	×	×	×		×			×
Black-legged Kittiwake *Rissa tridactyla*	×	×	×	×	×			×
Red-legged Kittiwake *Rissa brevirostris*		×						

Appendix 1 continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
Caspian Tern *Sterna caspia*	×							
Common Tern *Sterna hirundo*	×				×		×	×
Arctic Tern *Sterna paradisaea*	×	×	×	×	×	×	×	×
Aleutian Tern *Sterna aleutica*		×						
Black Tern *Chlidonias niger*	×							
ALCIDAE								
Dovekie *Alle alle*	×	×	×	b	×			×
Common Murre *Uria aalge*	×	×	×	×	×			×
Thick-billed Murre *Uria lomvia*	×	×	×	×	×			×
Razorbill *Alca torda*	×		×	×	×			×
Black Guillemot *Cepphus grylle*	×	×	×	×	×			×
Pigeon Guillemot *Cepphus columba*		×						×
Spectacled Guillemot *Cepphus carbo*								×
Marbled Murrelet *Brachyramphus marmoratus*		×						×
Kittlitz's Murrelet *Brachyramphus brevirostris*		×						×
Ancient Murrelet *Synthliboramphus antiquus*		×						×
Cassin's Auklet *Ptychoramphus aleuticus*		×						
Parakeet Auklet *Cyclorrhynchus psittacula*		×						×
Crested Auklet *Aethia cristatella*		×						×
Whiskered Auklet *Aethia pygmaea*		×						×
Least Auklet *Aethia pusilla*		×						×
Rhinoceros Auklet *Cerorhinca monocerata*		×						
Atlantic Puffin *Fratercula arctica*	×		×	×	×			×
Horned Puffin *Fratercula corniculata*		×						×
Tufted Puffin *Fratercula cirrhata*		×						×
COLUMBIDAE								
Rock Dove *Columba livia*				×				×
Common Wood Pigeon *Columba palumbus*							×	
Oriental Turtle-Dove *Streptopelia orientalis*								×
Eurasian Collared-Dove *Streptopelia decaocto*				b	×			
CUCULIDAE								
Common Cuckoo *Cuculus canorus*					×	×	×	×
Oriental Cuckoo *Cuculus saturatus*								×
STRIGIDAE								
Great Horned Owl *Bubo virginianus*	×	×						
Eurasian Eagle-Owl *Bubo bubo*					×		×	×
Snowy Owl *Nyctea scandiaca*	×	×	×	b	×	×	×	×
Barred Owl *Strix varia*	×							
Ural Owl *Strix uralensis*								×
Great Grey Owl *Strix nebulosa*	×						×	×
Northern Hawk Owl *Surnia ulula*	×	×			×	×	×	×
Eurasian Pygmy-Owl *Glaucidium passerinum*							×	×
Boreal Owl *Aegolius funereus*	×	×			×	×	×	×
Long-eared Owl *Asio otus*	×							×
Short-eared Owl *Asio flammeus*	×	×		×	×	×	×	×
CAPRIMULGIDAE								
Common Nighthawk *Chordeiles minor*	×							

Appendix I continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
APODIDAE								
Common Swift *Apus apus*							×	×
Fork-tailed Swift *Apus pacificus*								×
ALCEDINIDAE								
Belted Kingfisher *Ceryle alcyon*	×	×						
PICIDAE								
Eurasian Wryneck *Jynx torquilla*						×	×	×
Yellow-bellied Sapsucker *Sphyrapicus varius*	×							
Lesser Spotted Woodpecker *Dendrocopos minor*					×	×	×	×
Great Spotted Woodpecker *Dendrocopos major*						×	×	×
Downy Woodpecker *Picoides pubescens*	×	×						
Hairy Woodpecker *Picoides villosus*	×							
Three-toed Woodpecker *Picoides tridactylus*	×	×			×	×	×	×
Black-backed Woodpecker *Picoides arcticus*	×							
Northern Flicker *Colaptes auratus*	×							
Pileated Woodpecker *Dryocopus pileatus*	×							
Black Woodpecker *Dryocopus martius*						×	×	×
TYRANNIDAE								
Olive-sided Flycatcher *Contopus borealis*	×	×						
Western Wood-Pewee *Contopus sordidulus*	×							
Yellow-bellied Flycat. *Empidonax flaviventris*	×							
Alder Flycatcher *Empidonax alnorum*	×	×						
Least Flycatcher *Empidonax minimus*	×							
Eastern Phoebe *Sayornis phoebe*	×							
Say's Phoebe *Sayornis saya*	×	×						
Eastern Kingbird *Tyrannus tyrannus*	×							
ALAUDIDAE								
Eurasian Skylark *Alauda arvensis*		b			×	×	×	×
Horned Lark *Eremophila alpestris*	×	×	b		×	×	×	×
HIRUNDINIDAE								
Tree Swallow *Tachycineta bicolor*	×	×						
Violet-green Swallow *Tachycineta thalassina*	×	×						
Sand Martin *Riparia riparia*	×	×			×	×	×	×
Barn Swallow *Hirundo rustica*	×			b	×	×	×	×
Cliff Swallow *Hirundo pyrrhonota*	×	×						
House Martin *Delichon urbica*					×	×	×	×
MOTACILLIDAE								
White Wagtail *Motacilla alba*		×	×	×	×	×	×	×
Black-backed Wagtail *Motacilla lugens*		×						
Yellow-hooded Wagtail *Motacilla citreola*								×
Yellow Wagtail *Motacilla flava*	×	×			×	×	×	×
Grey Wagtail *Motacilla cinerea*					×			×
Richard's Pipit *Anthus richardi*								×
Tree Pipit *Anthus trivialis*					×	×	×	×
Olive-backed Pipit *Anthus hodgsoni*								×
Pechora Pipit *Anthus gustavi*								×

Appendix I continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
Meadow Pipit *Anthus pratensis*			×	×	×	×	×	×
Red-throated Pipit *Anthus cervinus*		×			×	×	×	×
Rock Pipit *Anthus petrosus*					×			×
Buff-bellied Pipit *Anthus rubescens*	×	×	b					×
LANIIDAE								
Brown Shrike *Lanius cristatus*								×
Northern Shrike *Lanius excubitor*	×	×			×	×	×	×
BOMBYCILLIDAE								
Bohemian Waxwing *Bombycilla garrulus*	×	×			×	×	×	×
Cedar Waxwing *Bombycilla cedrorum*	×							
CINCLIDAE								
White-throated Dipper *Cinclus cinclus*					×	×	×	×
American Dipper *Cinclus mexicanus*	×	×						
TROGLODYTIDAE								
Marsh Wren *Cistothorus palustris*	×							
Winter Wren *Troglodytes troglodytes*	×	×		×	×		×	×
PRUNELLIDAE								
Alpine Accentor *Prunella collaris*								×
Siberian Accentor *Prunella montanella*								×
Dunnock *Prunella modularis*					×	×	×	×
MUSCICAPIDAE – TURDINAE								
Siberian Thrush *Zoothera sibirica*								×
Varied Thrush *Zoothera naevia*	×	×						
Eastern Bluebird *Sialia sialis*	×							
Mountain Bluebird *Sialia currucoides*	×							
Townsend's Solitaire *Myadestes townsendi*	×							
Grey-cheeked Thrush *Catharus minimus*	×	×						×
Swainson's Thrush *Catharus ustulatus*	×	×						
Hermit Thrush *Catharus guttatus*	×	×						
Ring Ouzel *Turdus torquatus*					×	×	×	×
Eurasian Blackbird *Turdus merula*				b	×	×		
Eye-browed Thrush *Turdus obscurus*								×
Dark-throated Thrush *Turdus ruficollis*								×
Dusky Thrush *Turdus naumanni*								×
Fieldfare *Turdus pilaris*			×	b	×	×	×	×
Redwing *Turdus iliacus*			b	×	×	×	×	×
Song Thrush *Turdus philomelos*					×	×	×	×
Mistle Thrush *Turdus viscivorus*						×	×	×
American Robin *Turdus migratorius*	×	×						
European Robin *Erithacus rubecula*					×	×	×	×
Rufous-tailed Robin *Luscinia sibilans*								×
Siberian Rubythroat *Luscinia calliope*								×
Bluethroat *Luscinia svecica*		×			×	×	×	×
Orange-flanked Bush-Robin *Tarsiger cyanurus*								×
Common Redstart *Phoenicurus phoenicurus*					×	×	×	×
Whinchat *Saxicola rubetra*					×	×	×	×

Appendix I continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
Siberian Stonechat *Saxicola maura*								×
Northern Wheatear *Oenanthe oenanthe*	×	×	×	×	×	×	×	×
MUSCICAPIDAE – SYLVIINAE								
Lanceolated Warbler *Locustella lanceolata*								×
Pallas' Warbler *Locustella certhiola*								×
Sedge Warbler *Acrocephalus schoenobaenus*					×	×	×	×
Blyth's Reed-Warbler *Acrocephalus dumetorum*								×
Icterine Warbler *Hippolais icterina*					×			
Willow Warbler *Phylloscopus trochilus*					×	×	×	×
Eurasian Chiffchaff *Phylloscopus collybita*					×	×	×	×
Wood Warbler *Phylloscopus sibilatrix*					×			
Dusky Warbler *Phylloscopus fuscatus*								×
Inornate Warbler *Phylloscopus inornatus*								×
Arctic Warbler *Phylloscopus borealis*		×			×		×	×
Blackcap *Sylvia atricapilla*					×	×		
Garden Warbler *Sylvia borin*					×	×	×	
Greater Whitethroat *Sylvia communis*					×			
Lesser Whitethroat *Sylvia curruca*						×	×	×
Ruby-crowned Kinglet *Regulus calendula*	×	×						
Goldcrest *Regulus regulus*					×	×	×	×
Golden-crowned Kinglet *Regulus satrapa*	×	×						
MUSCICAPIDAE – MUSCICAPINAE								
Spotted Flycatcher *Muscicapa striata*					×	×	×	×
European Pied Flycatcher *Ficedula hypoleuca*					×	×	×	×
Red-throated Flycatcher *Ficedula parva*								×
AEGITHALIDAE								
Long-tailed Tit *Aegithalos caudatus*					×	×		
PARIDAE								
Willow Tit *Parus montanus*					×	×	×	×
Black-capped Chickadee *Parus atricapillus*	×	×						
Siberian Tit *Parus cinctus*	×	×			×	×	×	×
Boreal Chickadee *Parus hudsonicus*	×	×						
Coal Tit *Parus ater*						×		×
Great Tit *Parus major*					×	×	×	×
SITTIDAE								
Eurasian Nuthatch *Sitta europaea*								×
Red-breasted Nuthatch *Sitta canadensis*	×							
CERTHIIDAE								
Eurasian Treecreeper *Certhia familiaris*					×	×		×
Brown Creeper *Certhia americana*	×	×						
EMBERIZIDAE – EMBERIZINAE								
Yellowhammer *Emberiza citrinella*					×	×	×	×
Pine Bunting *Emberiza leucocephalos*								×
Ortolan Bunting *Emberiza hortulana*							×	
Little Bunting *Emberiza pusilla*						×	×	×

Appendix 1 continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
Yellow-browed Bunting *Emberiza chrysophrys*								×
Rustic Bunting *Emberiza rustica*						×	×	×
Yellow-breasted Bunting *Emberiza aureola*								×
Black-faced Bunting *Emberiza spodocephala*								×
Pallas' Bunting *Emberiza pallasi*								×
Reed Bunting *Emberiza schoenichus*					×	×	×	×
Lapland Longspur *Calcarius lapponicus*	×	×	×		×	×	×	×
Smith's Longspur *Calcarius pictus*	×	×						
Snow Bunting *Plectrophenax nivalis*	×	×	×	×	×	×	×	×
McKay's Bunting *Plectrophenax hyperboreus*		×						
Fox Sparrow *Passerella iliaca*	×	×						
Song Sparrow *Melospiza melodia*	×	×						
Lincoln's Sparrow *Melospiza lincolnii*	×	×						
Swamp Sparrow *Melospiza georgiana*	×							
Harris' Sparrow *Zonotrichia querula*	×							
White-crowned Sparrow *Zonotrichia leucophrys*	×	×						
White-throated Sparrow *Zonotrichia albicollis*	×							
Golden-crowned Sparrow *Zonotrichia atricapilla*		×						
Dark-eyed Junco *Junco hyemalis*	×	×						
Savannah Sparrow *Passerculus sandwichensis*	×	×						
Sharp-tailed Sparrow *Ammodramus caudacutus*	×							
Le Conte's Sparrow *Ammodramus leconteii*	×							
American Tree Sparrow *Spizella arborea*	×	×						
Chipping Sparrow *Spizella passerina*	×							
Clay-colored Sparrow *Spizella pallida*	×							
Vesper Sparrow *Pooecetes gramineus*	×							
EMBERIZIDAE – CARDINALINAE								
Rose-breasted Grosbeak *Pheucticus ludovicianus*	×							
EMBERIZIDAE – THRAUPINAE								
Western Tanager *Piranga ludoviciana*	×							
PARULIDAE								
Tennessee Warbler *Vermivora peregrina*	×							
Orange-crowned Warbler *Vermivora celata*	×	×						
Yellow Warbler *Dendroica petechia*	×	×						
Magnolia Warbler *Dendroica magnolia*	×							
Cape May Warbler *Dendroica tigrina*	×							
Yellow-rumped Warbler *Dendroica coronata*	×	×						
Black-throated Green Warbler *Dendroica virens*	×							
Palm Warbler *Dendroica palmarum*	×							
Bay-breasted Warbler *Dendroica castanea*	×							
Blackpoll Warbler *Dendroica striata*	×	×						
Black-and-white Warbler *Mniotilta varia*	×							
American Redstart *Setophaga ruticilla*	×							
Ovenbird *Seiurus aurocapillus*	×							
Northern Waterthrush *Seiurus noveboracensis*	×	×						
Connecticut Warbler *Oporornis agilis*	×							
Common Yellowthroat *Geothlypis trichas*	×							
Wilson's Warbler *Wilsonia pusilla*	×	×						

Appendix 1 continued.

Species	Region CA	US	GL	IS	NO	SE	FI	RU
VIREONIDAE								
Solitary Vireo *Vireo solitarius*	×							
Philadelphia Vireo *Vireo philadelphicus*	×							
Red-eyed Vireo *Vireo olivaceus*	X							
Warbling Vireo *Vireo gilvus*	X							
ICTERIDAE								
Red-winged Blackbird *Agelaius phoeniceus*	X							
Common Grackle *Quiscalus quiscula*	×							
Rusty Blackbird *Euphagus carolinus*	X	X						
Brown-headed Cowbird *Molothrus ater*	×							
FRINGILLIDAE								
Chaffinch *Fringilla coelebs*				b		×	×	
Brambling *Fringilla montifringilla*				b	X	X	X	X
European Greenfinch *Carduelis chloris*						×	×	
Eurasian Siskin *Carduelis spinus*						×	×	
Pine Siskin *Carduelis pinus*	X							
Hoary Redpoll *Carduelis hornemanni*	X	X	X		X	×	×	X
Common Redpoll *Carduelis flammea*	X	X	X	X	X	X	X	X
Twite *Carduelis flavirostris*					X			×
Rosy-Finch *Leucosticte arctoa*		X						X
Common Rosefinch *Carpodacus erythrinus*						×	×	X
Purple Finch *Carpodacus purpureus*	X							
Pallas' Rosefinch *Carpodacus roseus*								×
Pine Grosbeak *Pinicola enucleator*	X	X				X	X	X
Parrot Crossbill *Loxia pytyopsittacus*					X	X	X	X
Red Crossbill *Loxia curvirostra*	X					X	X	×
White-winged Crossbill *Loxia leucoptera*	X	X					×	×
Eurasian Bullfinch *Pyrrhula pyrrhula*						×	×	×
Evening Grosbeak *Coccothraustes vespertinus*	×							
PLOCEIDAE								
House Sparrow *Passer domesticus*				×	X	X	X	×
Eurasian Tree Sparrow *Passer montanus*								X
STURNIDAE								
Common Starling *Sturnus vulgaris*	X			X	X	X	X	×
CORVIDAE								
Eurasian Jay *Garrulus glandarius*						×		×
Siberian Jay *Perisoreus infaustus*					X	X	X	X
Grey Jay *Perisoreus canadensis*	X	X						
Black-billed Magpie *Pica pica*	×	X			X	X	X	X
Eurasian Nutcracker *Nucifraga caryocatactes*								X
Northwestern Crow *Corvus caurinus*		×						
American Crow *Corvus brachyrhynchos*	X							
Carrion Crow *Corvus corone*					X	X	X	X
Common Raven *Corvus corax*	X	X	X	X	X	X	X	X

Appendix II: Distribution, migration and habitat of birds breeding in the Arctic

Key to symbols

Breeding (BRE)
A: Entire breeding range within Arctic Region as defined by CAFF member states
B: Major part (>90%) of breeding range within Arctic Region
C: Significant part of breeding range within Arctic Region
D: Only small portion (<5%) of breeding range within Arctic Region

Migration (MIG)
R: Resident: populations entirely sedentary or almost so.
RD: Mainly resident; some dispersal after breeding season, especially at northern edge of range, but no regular migrations.
RI: Mainly resident; prone to irruptions, sometimes on a massive scale, at more or less regular intervals, but no regular migrations.
PM: Partial migrant; northernmost populations largely or wholly migratory, other populations partially migratory or sedentary.
LM: Long-distance migrant; all individuals from Arctic populations vacate the breeding areas in winter.

Wintering (WIN)
AR: Most if not all individuals remain within the Arctic Region throughout the winter (i.e. species confined to the Arctic Region).
CA: Most if not all individuals breeding within the Arctic Region remain within the CAFF member states throughout the winter.
CA*: All populations of the species remain within the CAFF member states throughout the winter (species confined to the CAFF member states).
CB: Part of the Arctic breeding population remains within the CAFF member states throughout the winter, and part winters outside.
OU: All individuals breeding in the Arctic Region winter outside the CAFF member states.

Habitat (HAB)
PE: Pelagic (open ocean)
CM: Coastal marine habitats (inshore marine waters)
CW: Coastal wetlands (mudflats, sandy beaches, rocky shores, mangroves)
IW: Freshwater and brackish wetlands, including deep-water lakes
OC: Open country habitats
GR: Grasslands, steppe and arable land
DE: Desert habitats
DF: Temperate forests and woodland (coniferous and deciduous)
TF: Tropical forests (lowland and montane)
TW: Tropical woodland (acacia woodland, parkland, scrub)

Species	BRE	MIG	WIN	HAB
GAVIIDAE				
Gavia stellata	B	LM	CB	CM
Gavia arctica	C	LM	CB	CM
Gavia pacifica	B	LM	CB	CM
Gavia immer	C	LM	CB	CM
Gavia adamsii	A	PM	CA*	CM

Appendix II continued.

Species	BRE	MIG	WIN	HAB
PODICIPEDIDAE				
Podilymbus podiceps	D	LM	CA	IW
Podiceps grisegena	C	LM	CB	CM
Podiceps auritus	C	LM	CB	CM
PROCELLARIIDAE				
Fulmarus glacialis	C	PM	CB	PE
Puffinus puffinus	C	LM	OU	PE
HYDROBATIDAE				
Hydrobates pelagicus	C	LM	OU	PE
Oceanodroma leucorhoa	C	LM	OU	PE
Oceanodroma furcata	C	PM	CB	PE
SULIDAE				
Morus bassanus	C	PM	CB	PE
PHALACROCORACIDAE				
Phalacrocorax auritus	C	PM	CB	CM
Phalacrocorax carbo	C	PM	CB	CM
Phalacrocorax urile	B	PM	CA	CM
Phalacrocorax pelagicus	C	PM	CB	CM
Phalacrocorax aristotelis	C	PM	CB	CM
ARDEIDAE				
Ardea cinerea	D	LM	CB	IW
ANATIDAE				
Oxyura jamaicensis	D	LM	CB	IW
Cygnus cygnus	C	LM	CB	IW
Cygnus buccinator	D	LM	CA*	IW
Cygnus columbianus	A	LM	CB	IW
Anser brachyrhynchus	A	LM	OU	GR
Anser fabalis	C	LM	OU	GR
Anser albifrons	A	LM	CB	GR
Anser erythropus	B	LM	OU	GR
Anser anser	C	LM	OU	GR
Anser caerulescens	A	LM	CB	GR
Anser rossii	A	LM	CA*	GR
Anser canagica	A	PM	CA*	CW
Branta canadensis	C	LM	CB	GR
Branta leucopsis	A	LM	OU	GR
Branta bernicla	A	LM	CB	CW
Branta ruficollis	A	LM	CB	GR
Anas penelope	C	LM	CB	IW
Anas americana	C	LM	CB	IW
Anas falcata	D	LM	OU	IW
Anas strepera	D	LM	CB	IW
Anas formosa	C	LM	OU	IW
Anas crecca	C	LM	CB	IW
Anas platyrhynchos	C	PM	CB	IW
Anas rubripes	C	LM	CA*	IW
Anas acuta	C	LM	CB	IW

Appendix II continued.

Species	BRE	MIG	WIN	HAB
Anas discors	D	LM	CB	IW
Anas clypeata	C	LM	CB	IW
Aythya ferina	D	LM	CB	IW
Aythya valisineria	C	LM	CB	IW
Aythya americana	D	LM	CB	IW
Aythya collaris	D	LM	CB	IW
Aythya fuligula	C	LM	CB	IW
Aythya marila	B	LM	CB	CM
Aythya affinis	C	LM	CB	IW
Somateria mollissima	C	PM	CB	CM
Somateria spectabilis	A	PM	CA*	CM
Somateria fischeri	A	PM	AR	CM
Polysticta stelleri	A	PM	CB	CM
Histrionicus histrionicus	C	PM	CB	CM
Clangula hyemalis	B	PM	CB	CM
Melanitta nigra	B	LM	CB	CM
Melanitta perspicillata	C	LM	CB	CM
Melanitta fusca	C	LM	CB	CM
Bucephala clangula	C	LM	CB	IW
Bucephala islandica	C	PM	CA*	CM
Bucephala albeola	D	LM	CB	IW
Mergellus albellus	C	LM	CB	IW
Lophodytes cucullatus	D	LM	CA*	CM
Mergus serrator	C	PM	CB	CM
Mergus merganser	C	LM	CB	IW
PANDIONIDAE				
Pandion haliaetus	C	LM	CB	IW
ACCIPITRIDAE				
Milvus migrans	D	LM	OU	OC
Haliaeetus albicilla	C	PM	CB	IW
Haliaeetus leucocephalus	C	PM	CA*	IW
Haliaeetus pelagicus	C	PM	CB	CW
Circus spilonotus	D	LM	OU	IW
Circus cyaneus	C	LM	CB	IW
Accipiter nisus	C	LM	CB	DF
Accipiter striatus	C	LM	CB	DF
Accipiter gentilis	C	PM	CB	DF
Buteo swainsoni	C	LM	OU	OC
Buteo jamaicensis	C	LM	CB	OC
Buteo buteo	D	LM	OU	OC
Buteo lagopus	B	LM	CB	OC
Aquila chrysaetos	C	PM	CB	OC
FALCONIDAE				
Falco tinnunculus	C	LM	CB	OC
Falco sparverius	C	LM	CB	OC
Falco columbarius	C	LM	CB	OC
Falco subbuteo	D	LM	OU	OC
Falco rusticolus	B	PM	CA*	OC
Falco peregrinus	C	LM	CB	OC

Appendix II continued.

Species	BRE	MIG	WIN	HAB
PHASIANIDAE				
Dendragapus canadensis	C	R	CA*	DF
Dendragapus obscurus	D	R	CA*	DF
Lagopus lagopus	C	R	CA	DF
Lagopus mutus	C	R	CA	MT
Lagopus leucurus	D	R	CA*	MT
Tetrao tetrix	C	R	CA	DF
Tetrao urogallus	C	R	CA	DF
Tetrao parvirostris	C	R	CA	DF
Bonasa bonasia	C	R	CA	DF
Bonasa umbellus	C	R	CA*	DF
Tympanuchus phasianellus	C	R	CA*	GR
GRUIDAE				
Grus leucogeranus	B	LM	OU	IW
Grus canadensis	C	LM	CB	GR
Grus grus	C	LM	OU	GR
Grus monacha	D	LM	OU	GR
Grus americana	A	LM	CA*	IW
RALLIDAE				
Coturnicops noveboracensis	C	LM	CA*	IW
Rallus aquaticus	D	PM	CB	IW
Porzana carolina	C	LM	CB	IW
Crex crex	D	LM	OU	GR
Fulica atra	D	LM	CB	IW
Fulica americana	D	LM	CB	IW
HAEMATOPODIDAE				
Haematopus ostralegus	C	LM	OU	CW
Haematopus bachmani	C	R	CA	CW
CHARADRIIDAE				
Pluvialis apricaria	C	LM	OU	GR
Pluvialis fulva	A	LM	OU	GR
Pluvialis dominica	A	LM	CB	GR
Pluvialis squatarola	A	LM	CB	CW
Charadrius hiaticula	C	LM	OU	CW
Charadrius semipalmatus	C	LM	CB	CW
Charadrius dubius	D	LM	OU	IW
Charadrius vociferus	C	LM	CB	GR
Charadrius mongolus	C	LM	OU	CW
Eudromias morinellus	C	LM	OU	DE
Vanellus vanellus	C	LM	OU	GR
SCOLOPACIDAE				
Scolopax rusticola	C	LM	CB	DF
Gallinago stenura	C	LM	OU	IW
Gallinago media	C	LM	OU	IW
Gallinago gallinago	C	LM	CB	IW
Lymnocryptes minimus	C	LM	CB	IW
Limosa limosa	C	LM	OU	CW
Limosa haemastica	B	LM	OU	CW

Appendix II continued.

Species	BRE	MIG	WIN	HAB
Limosa lapponica	A	LM	OU	CW
Limosa fedoa	D	LM	CB	CW
Numenius minutus	A	LM	OU	GR
Numenius borealis	A	LM	OU	GR
Numenius phaeopus	B	LM	OU	CW
Numenius tahitiensis	A	LM	OU	CW
Numenius arquata	C	LM	CB	CW
Numenius madagascariensis	D	LM	OU	CW
Bartramia longicauda	D	LM	OU	GR
Tringa erythropus	B	LM	OU	IW
Tringa totanus	C	LM	CB	CW
Tringa nebularia	C	LM	OU	IW
Tringa melanoleuca	C	LM	CB	IW
Tringa flavipes	B	LM	CB	IW
Tringa solitaria	C	LM	OU	IW
Tringa ochropus	C	LM	OU	IW
Tringa glareola	C	LM	OU	IW
Tringa cinerea	C	LM	OU	CW
Tringa hypoleucos	C	LM	OU	IW
Tringa macularia	C	LM	CB	IW
Tringa brevipes	C	LM	OU	CW
Tringa incana	C	LM	CB	CW
Arenaria interpres	B	LM	CB	CW
Arenaria melanocephala	B	LM	CB	CW
Limnodromus griseus	C	LM	CB	CW
Limnodromus scolopaceus	A	LM	CB	CW
Aphriza virgata	C	LM	CB	CW
Calidris tenuirostris	A	LM	OU	CW
Calidris canutus	A	LM	CB	CW
Calidris alba	A	LM	CB	CW
Calidris pusilla	A	LM	OU	CW
Calidris mauri	A	LM	CB	CW
Calidris minuta	A	LM	OU	CW
Calidris ruficollis	A	LM	OU	CW
Calidris temminckii	B	LM	OU	IW
Calidris subminuta	C	LM	OU	IW
Calidris minutilla	C	LM	CB	IW
Calidris fuscicollis	A	LM	OU	CW
Calidris bairdii	A	LM	OU	IW
Calidris melanotos	A	LM	OU	IW
Calidris acuminata	A	LM	OU	IW
Calidris maritima	B	LM	CB	CW
Calidris ptilocnemis	B	PM	CA*	CW
Calidris alpina	C	LM	CB	CW
Calidris ferruginea	A	LM	OU	CW
Micropalama himantopus	A	LM	CB	IW
Tryngites subruficollis	A	LM	OU	GR
Eurynorhynchus pygmeus	A	LM	OU	CW
Limicola falcinellus	B	LM	OU	CW
Philomachus pugnax	C	LM	OU	IW
Phalaropus lobatus	B	LM	OU	PE
Phalaropus fulicaria	A	LM	OU	PE

Appendix II continued.

Species	BRE	MIG	WIN	HAB
STERCORARIIDAE				
Catharacta skua	C	LM	CB	PE
Stercorarius pomarinus	A	LM	OU	PE
Stercorarius parasiticus	C	LM	OU	PE
Stercorarius longicaudus	B	LM	OU	PE
LARIDAE				
Larus canus	C	PM	CB	CW
Larus delawarensis	D	LM	CB	IW
Larus californicus	C	LM	CB	CW
Larus marinus	C	PM	CB	CM
Larus glaucescens	C	PM	CB	CM
Larus hyperboreus	A	PM	CB	CM
Larus glaucoides	A	PM	CB	CM
Larus argentatus	C	PM	CB	CM
Larus schistisagus	D	PM	CB	CM
Larus fuscus	C	LM	OU	CM
Larus ridibundus	C	PM	CB	CW
Larus philadelphia	C	LM	CB	CW
Larus minutus	D	LM	OU	CM
Pagophila eburnea	A	PM	AR	PE
Rhodostethia rosea	A	PM	AR	PE
Xema sabini	A	LM	OU	PE
Rissa tridactyla	C	PM	CB	PE
Rissa brevirostris	B	PM	CA*	PE
Sterna caspia	C	LM	CB	CM
Sterna hirundo	C	LM	OU	CM
Sterna paradisaea	B	LM	OU	PE
Sterna aleutica	B	LM	OU	PE
Chlidonias niger	D	LM	OU	CW
ALCIDAE				
Alle alle	A	PM	CB	PE
Uria aalge	C	PM	CB	PE
Uria lomvia	A	PM	CB	PE
Alca torda	C	PM	CB	CM
Cepphus grylle	C	RD	CA	CM
Cepphus columba	C	RD	CA*	CM
Cepphus carbo	D	RD	CA	CM
Brachyramphus marmoratus	C	PM	CB	PE
Brachyramphus brevirostris	B	PM	CA*	PE
Synthliboramphus antiquus	C	PM	CB	CM
Ptychoramphus aleuticus	C	PM	CB	CM
Cyclorrhynchus psittacula	B	PM	CA*	PE
Aethia cristatella	C	PM	CB	PE
Aethia pygmaea	C	PM	CA*	PE
Aethia pusilla	B	PM	CB	PE
Cerorhinca monocerata	D	PM	CB	PE
Fratercula arctica	C	PM	CB	PE
Fratercula corniculata	C	PM	CA*	PE
Fratercula cirrhata	C	PM	CB	PE

Appendix II continued.

Species	BRE	MIG	WIN	HAB
COLUMBIDAE				
Columba livia	C	R	CA	OC
Columba palumbus	D	PM	OU	DF
Streptopelia orientalis	D	LM	OU	TF
Streptopelia decaocto	D	R	CA	OC
CUCULIDAE				
Cuculus canorus	C	LM	OU	TW
Cuculus saturatus	C	LM	OU	TF
STRIGIDAE				
Bubo virginianus	C	RD	CA	DF
Bubo bubo	C	RD	CA	DF
Nyctea scandiaca	B	PM	CB	OC
Strix varia	D	R	CA	DF
Strix uralensis	C	RD	CA	DF
Strix nebulosa	C	RI	CA*	DF
Surnia ulula	B	RI	CA*	DF
Glaucidium passerinum	D	RD	CA	DF
Aegolius funereus	C	PM	CB	DF
Asio otus	C	PM	CB	DF
Asio flammeus	C	PM	CB	OC
CAPRIMULGIDAE				
Chordeiles minor	C	LM	OU	OC
APODIDAE				
Apus apus	D	LM	OU	OC
Apus pacificus	C	LM	OU	OC
ALCEDINIDAE				
Ceryle alcyon	C	PM	CB	IW
PICIDAE				
Jynx torquilla	C	LM	OU	TW
Sphyrapicus varius	C	LM	CB	DF
Dendrocopos minor	C	RD	CA	DF
Dendrocopos major	C	RI	CB	DF
Picoides pubescens	C	RD	CA*	DF
Picoides villosus	C	PM	CA	DF
Picoides tridactylus	C	RD	CA	DF
Picoides arcticus	C	RD	CA*	DF
Colaptes auratus	C	PM	CA	DF
Dryocopus pileatus	C	R	CA*	DF
Dryocopus martius	C	R	CA	DF
TYRANNIDAE				
Contopus borealis	C	LM	OU	TF
Contopus sordidulus	C	LM	OU	TF
Empidonax flaviventris	C	LM	OU	TF
Empidonax alnorum	C	LM	OU	TF
Empidonax minimus	C	LM	OU	TF
Sayornis phoebe	C	LM	CB	OC

Appendix II continued.

Species	BRE	MIG	WIN	HAB
Sayornis saya	C	LM	CB	OC
Tyrannus tyrannus	C	LM	OU	OC
ALAUDIDAE				
Alauda arvensis	C	PM	CB	GR
Eremophila alpestris	C	PM	CB	GR
HIRUNDINIDAE				
Tachycineta bicolor	C	LM	CB	OC
Tachycineta thalassina	C	LM	OU	OC
Riparia riparia	C	LM	OU	IW
Hirundo rustica	C	LM	OU	OC
Hirundo pyrrhonota	C	LM	OU	OC
Delichon urbica	C	LM	OU	TF
MOTACILLIDAE				
Motacilla alba	C	LM	OU	OC
Motacilla lugens	D	LM	OU	OC
Motacilla citreola	C	LM	OU	IW
Motacilla flava	C	LM	OU	GR
Motacilla cinerea	D	LM	OU	IW
Anthus richardi	D	LM	OU	GR
Anthus trivialis	C	LM	OU	TW
Anthus hodgsoni	C	LM	OU	TW
Anthus gustavi	B	LM	OU	TF
Anthus pratensis	C	LM	OU	GR
Anthus cervinus	C	LM	OU	IW
Anthus petrosus	C	PM	CB	CW
Anthus rubescens	C	LM	CB	IW
LANIIDAE				
Lanius cristatus	C	LM	OU	OC
Lanius excubitor	C	LM	CB	OC
BOMBYCILLIDAE				
Bombycilla garrulus	C	PM	CB	DF
Bombycilla cedrorum	D	LM	CB	DF
CINCLIDAE				
Cinclus cinclus	C	PM	CB	IW
Cinclus mexicanus	C	R	CA	IW
TROGLODYTIDAE				
Cistothorus palustris	D	LM	CB	IW
Troglodytes troglodytes	C	PM	CB	DF
PRUNELLIDAE				
Prunella collaris	D	RD	CA	MT
Prunella montanella	B	LM	OU	DF
Prunella modularis	C	PM	OU	DF
MUSCICAPIDAE – TURDINAE				
Zoothera sibirica	D	LM	OU	DF

Appendix II continued.

Species	BRE	MIG	WIN	HAB
Zoothera naevia	C	LM	CA*	DF
Sialia sialis	D	LM	CB	OC
Sialia currucoides	D	LM	CB	OC
Myadestes townsendi	D	LM	CB	DF
Catharus minimus	C	LM	OU	TF
Catharus ustulatus	C	LM	OU	TF
Catharus guttatus	C	LM	CB	TF
Turdus torquatus	C	LM	OU	OC
Turdus merula	C	LM	CB	DF
Turdus obscurus	C	LM	OU	TF
Turdus ruficollis	D	LM	OU	OC
Turdus naumanni	C	LM	OU	DF
Turdus pilaris	C	LM	OU	DF
Turdus iliacus	C	LM	OU	DF
Turdus philomelos	C	LM	OU	DF
Turdus viscivorus	C	LM	OU	DF
Turdus migratorius	C	LM	CB	DF
Erithacus rubecula	C	LM	OU	DF
Luscinia sibilans	D	LM	OU	TF
Luscinia calliope	C	LM	OU	TW
Luscinia svecica	C	LM	OU	IW
Tarsiger cyanurus	C	LM	OU	TF
Phoenicurus phoenicurus	C	LM	OU	TW
Saxicola rubetra	C	LM	OU	TW
Saxicola maura	C	LM	OU	OC
Oenanthe oenanthe	C	LM	OU	OC
MUSCICAPIDAE – SYLVIINAE				
Locustella lanceolata	C	LM	OU	GR
Locustella certhiola	D	LM	OU	IW
Acrocephalus schoenobaenus	C	LM	OU	IW
Acrocephalus dumetorum	D	LM	OU	IW
Hippolais icterina	D	LM	OU	TF
Phylloscopus trochilus	C	LM	OU	TW
Phylloscopus collybita	C	LM	OU	TW
Phylloscopus sibilatrix	D	LM	OU	TF
Phylloscopus fuscatus	D	LM	OU	IW
Phylloscopus inornatus	C	LM	OU	TF
Phylloscopus borealis	B	LM	OU	TF
Sylvia atricapilla	C	LM	OU	TW
Sylvia borin	C	LM	OU	TW
Sylvia communis	D	LM	OU	TW
Sylvia curruca	D	LM	OU	TW
Regulus calendula	C	LM	CB	DF
Regulus regulus	C	PM	CB	DF
Regulus satrapa	C	LM	CB	DF
MUSCICAPIDAE – MUSCICAPINAE				
Muscicapa striata	C	LM	OU	TW
Ficedula hypoleuca	C	LM	OU	TF
Ficedula parva	C	LM	OU	TF

Appendix II continued.

Species	BRE	MIG	WIN	HAB
AEGITHALIDAE				
Aegithalos caudatus	C	RI	CA	DF
PARIDAE				
Parus montanus	C	RI	CA	DF
Parus atricapillus	C	RD	CA*	DF
Parus cinctus	B	RD	CA*	DF
Parus hudsonicus	C	RD	CA*	DF
Parus ater	D	RD	CA	DF
Parus major	C	RI	CA	DF
SITTIDAE				
Sitta europaea	C	RD	CA	DF
Sitta canadensis	C	RD	CA*	DF
CERTHIIDAE				
Certhia familiaris	C	PM	CA	DF
Certhia americana	C	PM	CA	DF
EMBERIZIDAE – EMBERIZINAE				
Emberiza citrinella	C	LM	CB	GR
Emberiza leucocephalos	D	LM	OU	DF
Emberiza hortulana	D	LM	OU	TW
Emberiza pusilla	C	LM	OU	OC
Emberiza chrysophrys	D	LM	OU	DF
Emberiza rustica	C	LM	OU	DF
Emberiza aureola	C	LM	OU	GR
Emberiza spodocephala	D	LM	OU	IW
Emberiza pallasi	C	LM	OU	IW
Emberiza schoeniclus	C	LM	OU	IW
Calcarius lapponicus	B	LM	CB	GR
Calcarius pictus	B	LM	CA*	GR
Plectrophenax nivalis	B	LM	CB	OC
Plectrophenax hyperboreus	A	PM	AR	OC
Passerella iliaca	C	LM	CA*	DF
Melospiza melodia	C	LM	CB	DF
Melospiza lincolnii	C	LM	CB	IW
Melospiza georgiana	C	LM	CA*	IW
Zonotrichia querula	C	LM	CA*	DF
Zonotrichia leucophrys	C	LM	CB	DF
Zonotrichia albicollis	C	LM	CA	DF
Zonotrichia atricapilla	C	LM	CB	DF
Junco hyemalis	C	LM	CA*	DF
Passerculus sandwichensis	C	LM	CB	GR
Ammodramus caudacutus	D	LM	CA*	CW
Ammodramus leconteii	D	LM	CA*	GR
Spizella arborea	C	LM	CA*	OC
Spizella passerina	C	LM	CB	GR
Spizella pallida	D	LM	CB	OC
Pooecetes gramineus	D	LM	CB	GR
EMBERIZIDAE – CARDINALINAE				
Pheucticus ludovicianus	D	LM	OU	DF

Appendix II continued.

Species	BRE	MIG	WIN	HAB
EMBERIZIDAE – TIIRAUPINAE				
Piranga ludoviciana	D	LM	OU	DF
PARULIDAE				
Vermivora peregrina	C	LM	OU	TF
Vermivora celata	C	LM	OU	TF
Dendroica petechia	C	LM	OU	TF
Dendroica magnolia	D	LM	OU	TF
Dendroica tigrina	D	LM	OU	TF
Dendroica coronata	C	LM	CB	DF
Dendroica virens	D	LM	OU	TF
Dendroica palmarum	D	LM	CB	TW
Dendroica castanea	D	LM	OU	TF
Dendroica striata	C	LM	OU	TF
Mniotilta varia	C	LM	CB	TF
Setophaga ruticilla	D	LM	OU	TF
Seiurus aurocapillus	D	LM	OU	TF
Seiurus noveboracensis	C	LM	OU	IW
Oporornis agilis	D	LM	OU	TF
Geothlypis trichas	D	LM	CB	IW
Wilsonia pusilla	C	LM	OU	TF
VIREONIDAE				
Vireo solitarius	D	LM	CB	DF
Vireo philadelphicus	D	LM	OU	TF
Vireo olivaceus	C	LM	OU	TF
Vireo gilvus	C	LM	OU	TF
ICTERIDAE				
Agelaius phoeniceus	C	LM	CA	IW
Quiscalus quiscula	D	LM	CA*	OC
Euphagus carolinus	C	LM	CA*	DF
Molothrus ater	D	LM	CB	OC
FRINGILLIDAE				
Fringilla coelebs	D	LM	OU	OC
Fringilla montifringilla	C	LM	OU	DF
Carduelis chloris	D	LM	CB	OC
Carduelis spinus	D	LM	CB	DF
Carduelis pinus	C	LM	CA	DF
Carduelis hornemanni	B	LM	CB	DF
Carduelis flammea	C	LM	CB	DF
Carduelis flavirostris	C	LM	CB	OC
Leucosticte arctoa	C	LM	CB	OC
Carpodacus erythrinus	C	LM	OU	TF
Carpodacus purpureus	C	LM	CA	DF
Carpodacus roseus	D	LM	CB	OC
Pinicola enucleator	C	LM	CB	DF
Loxia pytyopsittacus	C	RI	CA*	DF
Loxia curvirostra	C	PM	CB	DF
Loxia leucoptera	C	RI	CA	DF
Pyrrhula pyrrhula	D	PM	CB	DF
Coccothraustes vespertinus	D	LM	CA*	DF

Appendix II continued.

Species	BRE	MIG	WIN	HAB
PLOCEIDAE				
Passer domesticus	C	R	CA	OC
Passer montanus	C	R	CA	OC
STURNIDAE				
Sturnus vulgaris	C	LM	CB	OC
CORVIDAE				
Garrulus glandarius	D	RI	CA	DF
Perisoreus infaustus	C	RI	CA*	DF
Perisoreus canadensis	C	RI	CA*	DF
Pica pica	C	R	CA	OC
Nucifraga caryocatactes	C	RI	CA	DF
Corvus caurinus	D	R	CA*	OC
Corvus brachyrhynchos	C	PM	CA*	OC
Corvus corone	C	PM	CB	OC
Corvus corax	C	RD	CA	OC

Appendix III: Other regional instruments concerned with nature conservation and the environment

Convention Relative to the Preservation of Fauna and Flora in their Natural State (London, 1933).

This Convention was concluded by the Governments of the Union of South Africa, Belgium, the United Kingdom, Egypt, Spain, France, Italy, Portugal, and the Anglo-Egyptian Sudan in London in 1933, and entered into force in January 1936. Its aim was to institute a special regime for the preservation of fauna and flora in Africa. The Convention made provisions for the establishment of national parks, strict natural reserves, and other reserves within which the hunting, killing or capturing of fauna, and the collection or destruction of flora was limited or prohibited, the institution of regulations concerning the hunting, killing and capturing of fauna outside such areas, the regulation of the traffic in trophies, and the prohibition of certain methods of and weapons for the hunting, killing and capturing of fauna. Species of animals and plants listed in an Annex were to be afforded special protection. Most of the species listed in the Annex are large mammals, and the only birds are resident Afrotropical species.

ASEAN Agreement on the Conservation of Nature and Natural Resources (Kuala Lumpur, 1985).

This Agreement, which has been signed by the six member states of the Association of South-East Asian Nations (Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand), does not enter into force until it has been ratified by all six nations. As of 1991, there were still no ratifications (IUCN, 1992). Parties to the Agreement undertake to adopt "the measures necessary to maintain essential ecological process and life-support systems, to preserve genetic diversity, and to ensure the sustainable utilization of harvested natural resources under their jurisdiction in accordance with scientific principles and with a view to attaining the goal of sustainable development". To this end, they agree to develop national conservation strategies, and to coordinate these strategies within the framework of a conservation strategy for the Region. The Parties agree, wherever possible, to maintain genetic diversity by taking action aimed at ensuring the survival and promoting the conservation of all species under their jurisdiction and control. To that end, they agree to: conserve natural, terrestrial, freshwater and coastal or marine habitats; ensure sustainable use of harvested species; protect endangered species; conserve endemic species; and take measures to prevent the extinction of any species or subspecies. To achieve these goals, the Parties should endeavour to: create and maintain protected areas; regulate the taking of species and prohibit unselective taking methods; regulate and, where necessary, prohibit the introduction of exotic species; and promote and establish gene banks, and other documented collections of animal and plant genetic resources. The Parties should pay special attention to harvested species, and endeavour to develop, adopt and implement management plans for those species, based on scientific studies. Special protection is to be given to 73 endangered and endemic species of fauna listed in an Appendix.

The Parties also agree to take all necessary measures to ensure the conservation of the vegetation cover and in particular of the forest cover on lands under their jurisdiction, and to endeavour to prevent, reduce and control polluting discharges, emissions or applications that might have an adverse effect on natural processes and the functioning of natural ecosystems. The Parties shall as appropriate establish, in areas under their jurisdiction, terrestrial, freshwater, coastal or marine protected areas. Particular attention should be given, *inter alia*, to preserving areas which constitute the critical habitats of endangered or rare species and of species that migrate between countries of Contracting Parties.

NAFTA and the North American Agreement on Environmental Cooperation (1993).

In September 1992, the Governments of Canada, Mexico and the United States signed the North American Free Trade Agreement (NAFTA). The main objectives of NAFTA are to "eliminate barriers to trade, promote conditions of fair competition, increase investment opportunities, provide adequate protection for intellectual property rights, establish effective

procedures for the implementation and application of the Agreement and for the resolution of disputes and to further trilateral, regional and multilateral cooperation." NAFTA is a pioneering agreement from the view of trade and environmental policy, because it directly addresses environmental laws and standards, and includes an Environmental Side Accord, the North American Agreement on Environmental Cooperation (1993). Objectives of this Agreement include: fostering the protection and improvement of the environment; promoting sustainable development; increasing cooperation between the Parties "to better conserve, protect, and enhance the environment, including wild flora and fauna"; enhancing compliance with, and enforcement of, environmental laws and regulations; and promoting policies and practices to prevent pollution. The Agreement establishes a Commission for Environmental Cooperation, the duties of which include mediating in disputes over any "persistent pattern of failure to effectively enforce an environmental law relating to a situation involving the production of goods or services traded between the Parties" (Kelly, 1993).

Treaty for Amazonian Cooperation (Brasilia, 1978).

In the preamble to this Treaty, the Contracting Parties (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela) accept that, "so as to achieve overall development of their respective Amazonian territories, it is necessary to maintain a balance between economic growth and conservation of the environment". The Parties therefore agree to undertake joint actions to promote the development of their respective Amazonian territories in such a way that these actions produce equitable and mutually beneficial results and achieve also the preservation of the environment, and the conservation and rational utilization of the natural resources of these territories. The Parties take into account the need for the exploitation of the flora and fauna of the Amazon region to be rationally planned so as to maintain the ecological balance within the region and preserve the species. They agree to promote scientific research so as to increase their knowledge of the flora and fauna of their Amazon territories, and to establish a regular system for the proper exchange of information on the conservationist measures adopted. The Amazonian Co-operation Council, which meets once a year, is responsible for ensuring that the aims and objectives of the Treaty are complied with.

The Antarctic Treaty (Washington, 1959).

This Treaty, which came into force in 1961, is essentially a self-denying ordinance under which Parties agree: to prevent military activity in the area and to use Antarctica for peaceful purposes only; to promote international cooperation in scientific research; and to ban nuclear explosions and disposal of radioactive waste. The Treaty is a classic example of a 'framework convention', the Treaty itself being general in nature, leaving matters of detail to be negotiated at a future time through recommendations or protocols. The Treaty contains only one brief but comprehensive reference to environmental matters: a short provision calling upon the Consultative Parties to develop measures for the "preservation and conservation of the living resources of Antarctica" (IUCN, 1992).

Agreed Measures for the Conservation of Antarctic Fauna and Flora (Brussels, 1964).

The general intention of the Agreed Measures was to protect the living resources of Antarctica. In particular, the Agreed Measures covered protection of mammal and bird life from unnecessary slaughter, and the minimization of disturbance on land by personnel from the growing number of scientific bases. The Agreed Measures allowed for provisions with regard to 'Specially Protected Areas' and 'Specially Protected Species'. Criteria for the establishment of 'Sites of Special Scientific Interest' were developed later. Two further categories of protected areas were added in the late 1980s: 'Specially Reserved Areas' and 'Multiple Use Planning Areas' (IUCN, 1992).

Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) (Canberra, 1980).

This Convention, which entered into force in 1982, applies to the Antarctic marine living

resources of the area south of the Antarctic Convergence. Its objective is the conservation of Antarctic marine living resources, defined as the populations of fin fish, molluscs, crustaceans and all other species of living organisms, including birds, found south of the Antarctic Convergence. The Convention adopts a whole ecosystem approach, because of the concerns for the effects that over-harvesting of krill would have on other species and the entire Antarctic ecosystem. CCAMLR is unlike most other fishery agreements (which set quotas based upon maximum sustainable yields) in that it sets a standard based not only on the maximum sustainable yield of the target species, but also requires that equal consideration be given to the likely effects on other species and the marine ecosystem as a whole (IUCN, 1992). A Commission for the Conservation of Antarctic Marine Living Resources has been established to implement the objectives of the Convention. An interesting feature of CCAMLR is that Contracting Parties which are not Parties to the Antarctic Treaty agree that, in their activities in the Antarctic Treaty area, they will "observe as and when appropriate the Agreed Measures for the Conservation of Antarctic Fauna and Flora and such other measures as have been recommended by the Antarctic Treaty Consultative Parties in fulfilment of their responsibility for the protection of the Antarctic environment from all forms of harmful human interference".

Protocol to the Antarctic Treaty on Environmental Protection (Madrid, 1991).

The Parties commit themselves to the "comprehensive protection of the Antarctic environment and dependent and associated ecosystems and hereby designate Antarctica as a natural reserve, devoted to peace and science". They accept that the protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica should be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area, and to this end, agree that activities in the Antarctic Treaty area should be planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems. Specifically, they agree that activities in Antarctica should be planned and conducted so as to avoid:

- adverse effects on climate or weather patterns;
- significant adverse effects on air or water quality;
- significant changes in the atmospheric, terrestrial (including aquatic), glacial or marine environments;
- detrimental changes in the distribution, abundance or productivity of species or populations of species of fauna and flora;
- further jeopardy to endangered or threatened species or populations of such species; or
- degradation of, or substantial risk to, areas of biological, scientific, historic, aesthetic or wilderness significance.

The Protocol also rationalized the protected areas system into two categories: 'Antarctic Specially Protected Areas' and 'Antarctic Specially Managed Areas'. Annex II to the Protocol is concerned with the conservation of Antarctic fauna and flora. The taking or "harmful interference" of all native fauna and flora is prohibited, except in accordance with a permit which will only be issued under certain circumstances, primarily for scientific purposes. Furthermore, the introduction of non-native species of animal or plant is also prohibited, except in accordance with a permit.

Appendix IV: Major international instruments concerned with marine pollution

Global

- International Convention for the Prevention of Pollution of the Sea by Oil (London, 1954), as amended on 11 April 1962 and 21 October 1969.

- International Convention on Civil Liability for Oil Pollution Damage (1969) and Protocols of 1976 and 1984.

- International Convention Relating to Intervention on the High Sea in Cases of Oil Pollution Casualties (1969).

- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (1971) and Protocols of 1976 and 1984.

- Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London, 1972) and Amendments of 1978 Concerning Settlement of Disputes.

- International Convention for the Prevention of Pollution from Ships (MARPOL) (London, 1973) and Protocols of 1978.

- Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil (1973).

- United Nations Convention on the Law of the Sea (UNCLOS) (Montego Bay, 1982).

- Agreement Relating to the Implementation of Part XI of the 1982 United Nations Convention on the Law of the Sea (1994).

- International Convention on Oil Pollution Preparedness, Response and Cooperation (London, 1990).

Western Eurasia and Africa

- Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona,1976):
  - Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (Barcelona, 1976);
  - Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency (Barcelona, 1976);
  - Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources (1980);
  - Protocol Concerning Mediterranean Specially Protected Areas (Geneva, 1982).

- Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil (1969).

- Agreement between Denmark, Finland, Norway and Sweden on Cooperation on Oil Pollution (1971).
  Supplemented by the global International Convention on Oil Pollution Preparedness, Response and Cooperation (London, 1990).

- Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (Oslo, 1972).
  Merged with the Paris Convention (1974) in 1992 to form a single convention: the Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic.

- Convention for the Prevention of Marine Pollution from Land-based Sources (Paris, 1974).
  Merged with the Oslo Convention (1972) in 1992 to form a single convention: the Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic.

- Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki, 1974), amended 1992:
  - Baltic Sea Joint Comprehensive Environmental Action Programme.

- Agreement Concerning the Protection of the Waters of the Mediterranean Shores (Monaco, 1976).

- Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and Other Harmful Substances (1983).

- Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) (1992).

- Bucharest Convention on the Protection of the Black Sea against Pollution (1992).

- Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan, 1981):
  - Protocol Concerning Regional Cooperation in Combating Pollution in Cases of Emergency in the West and Central African Region (Abidjan, 1981).

- Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi, 1985):
  - Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region (Nairobi, 1985);
  - Protocol Concerning Cooperation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region (Nairobi, 1985).

- Convention on the Conservation of the Living Resources of the Southeast Atlantic (Rome, 1969), as amended in Tarragona (1985).

Asia and the Pacific

- Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution (Kuwait, 1978):
  - Protocol Concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency (Kuwait, 1978).

- Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah, 1982).
  - Protocol Concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency (Jeddah, 1982).

- Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea, 1986):
  - Protocol Concerning Cooperation in Combating Pollution Emergencies in the South Pacific Region (Noumea, 1986);
  - Protocol for the Prevention of Pollution of the South Pacific Region by Dumping (Noumea, 1986).

- Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific (Lima, 1981):
  - Agreement on Regional Cooperation in Combating Pollution of the South-East Pacific by Hydrocarbons and other Harmful Substances in Cases of Emergency (Lima, 1981);
  - Supplementary Protocol to the Agreement on Regional Cooperation in Combating Pollution of the South-East Pacific by Hydrocarbons and other Harmful Substances in Cases of Emergency (Quito, 1983);
  - Protocol for the Protection of the South-East Pacific Against Pollution from Land-based Sources (Quito, 1983);
  - Protocol for the Conservation and Management of the Protected Marine and Coastal Areas of the South-East Pacific (1989);
  - Protocol for the Protection of the South-East Pacific Against Radioactive Contamination (1989).

- Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena, 1983):
  - Protocol Concerning Cooperation in Combating Oil Spills in the Wider Caribbean Region (Cartagena, 1983);
  - Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Kingston, 1990).

Appendix V: International instruments concerned with fisheries and marine mammals

Global

- International Convention for the Regulation of Whaling (Washington, 1946) and Protocol of 1956.
- Convention on Fishing and Conservation of the Living Resources of the High Seas (Geneva, 1958).
- Agreement Concerning Cooperation in Marine Fishing (Warsaw, 1962).
- Convention for the International Council for the Exploration of the Sea (ICES) (Copenhagen, 1964), as amended.
- Fisheries Convention (London, 1964).
- Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993).

Atlantic, Black Sea and Mediterranean Sea

- Agreement for the Establishment of a General Fisheries Council for the Mediterranean (Rome, 1949), as amended.
- Agreement between the Government of Norway and the Government of the USSR on Measures for Regulating the Catch and Conserving Stocks of Seals in the North Eastern Part of the Atlantic Ocean (Oslo, 1957).
- Agreement concerning Measures for Protection of the Stocks of Deep Sea Prawns (*Pandalus borealis*), European Lobsters (*Homarus vulgaris*), Norway Lobsters (*Nephrops norvegicus*) and Crabs (*Cancer pagurus*) (Oslo, 1952), as amended by the Protocol of 1959.
- Northeast Atlantic Fisheries Convention (1959).
- Convention Concerning Fishing in the Black Sea (Varna, 1959), as amended.
- Agreement on the Protection of the Salmon in the Baltic Sea (Stockholm, 1962), as amended by the Stockholm Protocol of 1972.
- International Convention for the Conservation of Atlantic Tunas (Rio de Janeiro, 1966), as amended by the Paris Protocol of 1984.
- Agreement on Reciprocal Access in the Skagaarak and the Kattegat (Copenhagen, 1966).
- Convention on Conduct of Fishing Operations in the North Atlantic (London, 1967).
- Agreement between the Government of Canada and the Government of Norway on Sealing and the Conservation of the Seal Stocks in the Northwest Atlantic (Ottawa, 1971).
- Convention on Fishing and Conservation of the Living Resources in the Baltic Sea and Belts (Gdansk, 1973), as amended in Warsaw (1982).
- Convention on Future Multilateral Cooperation in Northwest Atlantic Fisheries (Ottawa, 1978).
- Convention on Multilateral Cooperation in North-East Atlantic Fisheries (London, 1980).

- Convention for the Conservation of Salmon in the North Atlantic Ocean (Reykjavik, 1982).

- Agreement between Canada and Denmark/Greenland regarding cooperation for protection of the marine environment between Greenland and Canada (1984).

- Agreement on the Conservation of Seals in the Wadden Sea (Bonn, 1990).

Pacific

- Convention for the Establishment of an Inter-American Tropical Tuna Commission (Washington, 1949).

- International Convention for the High Seas Fisheries of the North Pacific Ocean (Tokyo, 1952), as amended by the 1962 Amendments to the Annex and Tokyo Protocol of 1978.

- Treaty for the Permanent Commission on Exploitation and Conservation of Marine Resources of the South Pacific (Santiago, 1952).

- Soviet-Japanese Convention concerning the high seas fisheries of the Northwest Pacific Ocean (Moscow, 1956).

- Interim Convention on Conservation of North Pacific Fur Seals (Washington, 1957), as amended by the Protocol of 1963.

- Agreement extending the Interim Convention on Conservation of North Pacific Fur Seals (Washington, 1969) and Protocols of 1976, 1980 and 1984.

- South Pacific Forum Fisheries Agency Convention (Honiara, 1979).

- Eastern Pacific Ocean Tuna Fishing Agreement (San Jose, 1983).

- Treaty between the Government of the United States of America and the Government of Canada concerning Pacific Salmon (Ottawa, 1985).

- South Pacific Fisheries Treaty (Port Moresby, 1987).

- Convention for the Protection of Fishing with Long Driftnets in the South Pacific (Wellington, 1989), and Protocols I and II (Noumea, 1990).

Southeast Asia

- Agreement Establishing the Southeast Asian Fisheries Development Center (Bangkok, 1967).

Antarctica

- Convention for the Conservation of Antarctic Seals (London, 1972).

- Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) (Canberra, 1980).

Appendix VI: Major international instruments concerned with air pollution and climate change

Convention on Long-Range Transboundary Air Pollution (LRTAP) (UN-ECE, 1979), and Protocols of 1985 and 1988.

Concluded between the Arctic states in 1979 and ratified by a further 23 sovereign states and the European Union. It covers long-range transboundary pollution, the aim being to protect people and the environment. Two protocols have been adopted on the reduction of emissions of sulphur and nitrogen oxides. The secretariat for the convention is the United Nations Economic Commission for Europe (UN-ECE). Also: Protocol of September 1984 on Long-Term Financing of Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmissions of Air Pollutants in Europe (EMEP).

Convention for the Protection of the Ozone Layer (Vienna, 1985), Protocol on Substances that Deplete the Ozone Layer (Montreal, 1987) and Adjustments and Amendments to the Montreal Protocol of 1990 and 1992.

These stipulate concrete goals and a timetable for the reduction of emission of ozone-depleting substances. These demands have since been tightened at meetings held by the convention states in 1990 (London) and in 1992 (Copenhagen) (Adjustments and Amendments)

United Nations Framework Convention on Climate Change (1992).

In 1988, the United Nations General Assembly adopted a resolution recognising climate change as a common concern of humanity. After negotiations spanning 15 months, the UN Framework Convention on Climate Change was finalized in May 1992, and opened for signature at UNCED in June 1992. In order for the Convention to come into force, it must be ratified by 50 countries. The aim of the Convention is to stabilise atmospheric concentrations of greenhouse gases at levels that will prevent human activities from interfering dangerously with the global climate system. States will be required to report on their efforts to slow climate change by reducing emission and enhancing carbon sinks and reservoirs. Developed countries will agree to afford financial assistance to developing countries to meet their obligations under the Convention.

Appendix VII: International environmental initiatives and programmes

Global

World Charter for Nature (1982).
The World Charter for Nature, produced as United Nations General Assembly Resolution 37/7, contains a series of principles of conservation by which all human conduct affecting nature is to be guided and judged.

World Conservation Strategy and the subsequent Strategy for Sustainable Living (Caring for the Earth) (IUCN/UNEP/WWF).
The World Conservation Strategy was a major global initiative which encouraged the interpretation of 'conservation' as 'wise use'. The WCS and Caring for the Earth provide a strategic conservation framework and practical guidance to all nations to maintain essential ecological processes and life support systems, preserve genetic diversity, and ensure the sustainable utilization of species and ecosystems.

The Rio Declaration on Environment and Development (Rio de Janeiro, 1992).
This Declaration, produced at the United Nations Conference on Environment and Development in Rio de Janeiro in June 1992, contains several 'Principles' concerned with the avoidance of environmental degradation.

Agenda 21 (UNCED) (1992).
Agenda 21, concluded in Rio de Janeiro in June 1991 during the Earth Summit, provides an international framework for a global partnership for forging future agreements and understandings that affect the environment, development and resources of the planet. The document outlines priorities and guidelines toward sustainable development to be implemented at national level. Chapter 17 is concerned with "the protection of the oceans, all kinds of seas (...), and coastal areas and the protection, rational use and development of their living resources." Emphasis is given to integrated management and sustainable development, marine environmental protection, and sustainable use and conservation of marine living resources.

Europe

European Conservation Strategy (Council of Europe).
A strategy to provide governments with the basis for developing policies to safeguard and manage natural resources. The strategy seeks to integrate landscapes and economic sectors into biodiversity conservation.

European Ecological Network (EECONET).
The aim is to develop a Europe-wide ecological network for the conservation of nature. This was the first initiative to call on the need for a European Biological and Landscape Diversity Strategy; emphasis is given to pan-European ecological coherence.

IUCN Parks for Life: Action for Protected Areas in Europe (IUCN).
The first European Strategy for concerted action to ensure an adequate, effective and well-managed network of protected areas in Europe.

Agreement on the Protection of the Rhine Against Chemical Pollution (International Commission for the Protection of the Rhine against Pollution (ICPRP), 1963 and subsequently).

Environmental Action Programme for Central and Eastern Europe (1993–95).
A Task Force to promote environmental protection measures in central and eastern Europe; established by Ministers with EU, OECD, World Bank, EBRD and others, and endorsed by a Ministerial Conference in Lucerne in 1993.

Environmental Programme for the Danube River Basin.
A Task Force established to conserve the Danube River Basin.

Danube River Basin Programme (1991) (European Commission).
Environmental protection for the Danube.

Black Sea Action Plan (UNEP, UNDP, World Bank/GEF).
Environmental management programme for the Black Sea region.

Ministerial Conference on the North Sea (Danish Ministry of the Environment).
Protection of the North Sea ecosystem.

Ecological Bricks for our Common House of Europe.
Aims to promote the establishment of 18 transboundary protected areas (European Ecological Movement, Global Challenges Network, Munich).

Baltic Sea Joint Comprehensive Environmental Action Programme.
A programme developed under the Helsinki Convention to improve the quality of the Baltic environment through the designation of marine and coastal protected areas.

Helsinki Summit Declaration.
Encourages the development of a network of protected areas in the CSCE region to conserve and safeguard large-scale biotopes and ecosystems, and conservation of species.

European Community Communication on Wise Use and Conservation of Wetlands (Commission of the European Communities, 1995).

European Community Communication on Integrated Coastal Zone Management (Commission of the European Communities, 1995).

Odessa Protocol (Wader Study Group, 1992).
A new programme to identify and fill gaps in knowledge of migratory shorebirds, and to promote the exchange of expertise.

Programme on International Nature Conservation (PIN).
A new programme covering, *inter alia*, wetlands, coastal zones and migratory birds.

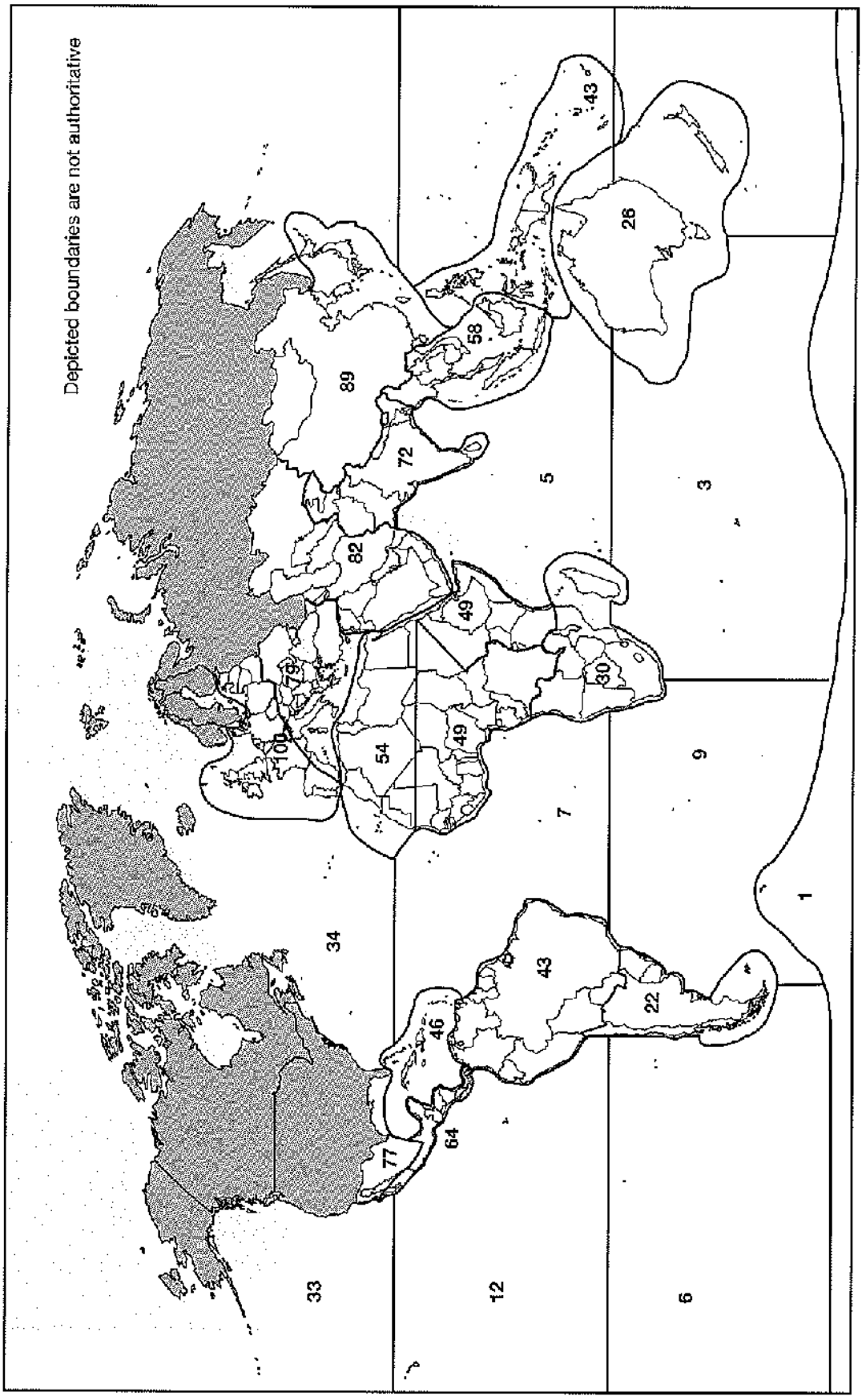


Figure 1. Main wintering regions of Arctic migrant birds with number of species wintering commonly in each region

Figure 2. Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) – as of 01/02/98

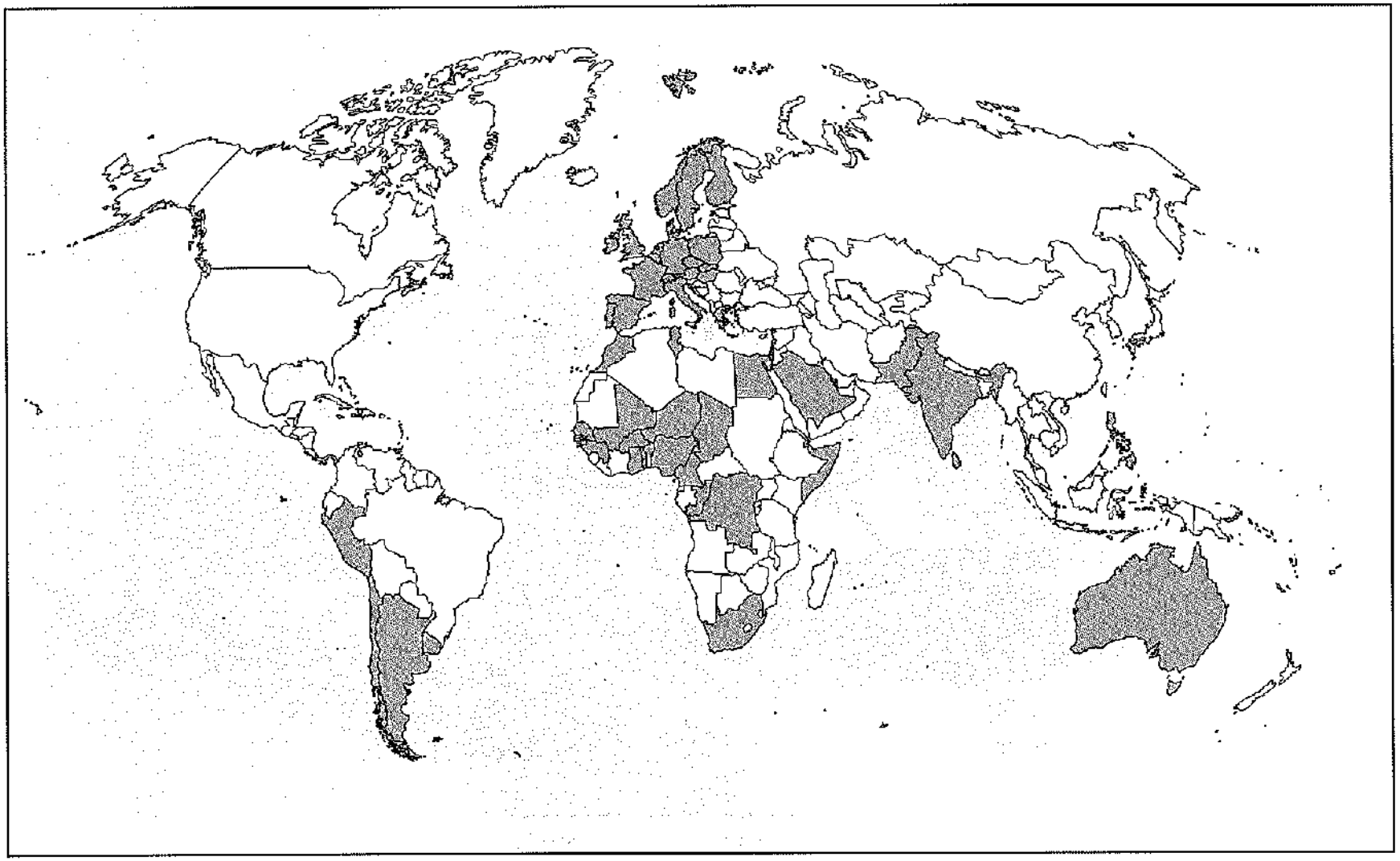


Figure 3. Contracting Parties to the Ramsar Convention on Wetlands – as of 01/05/98

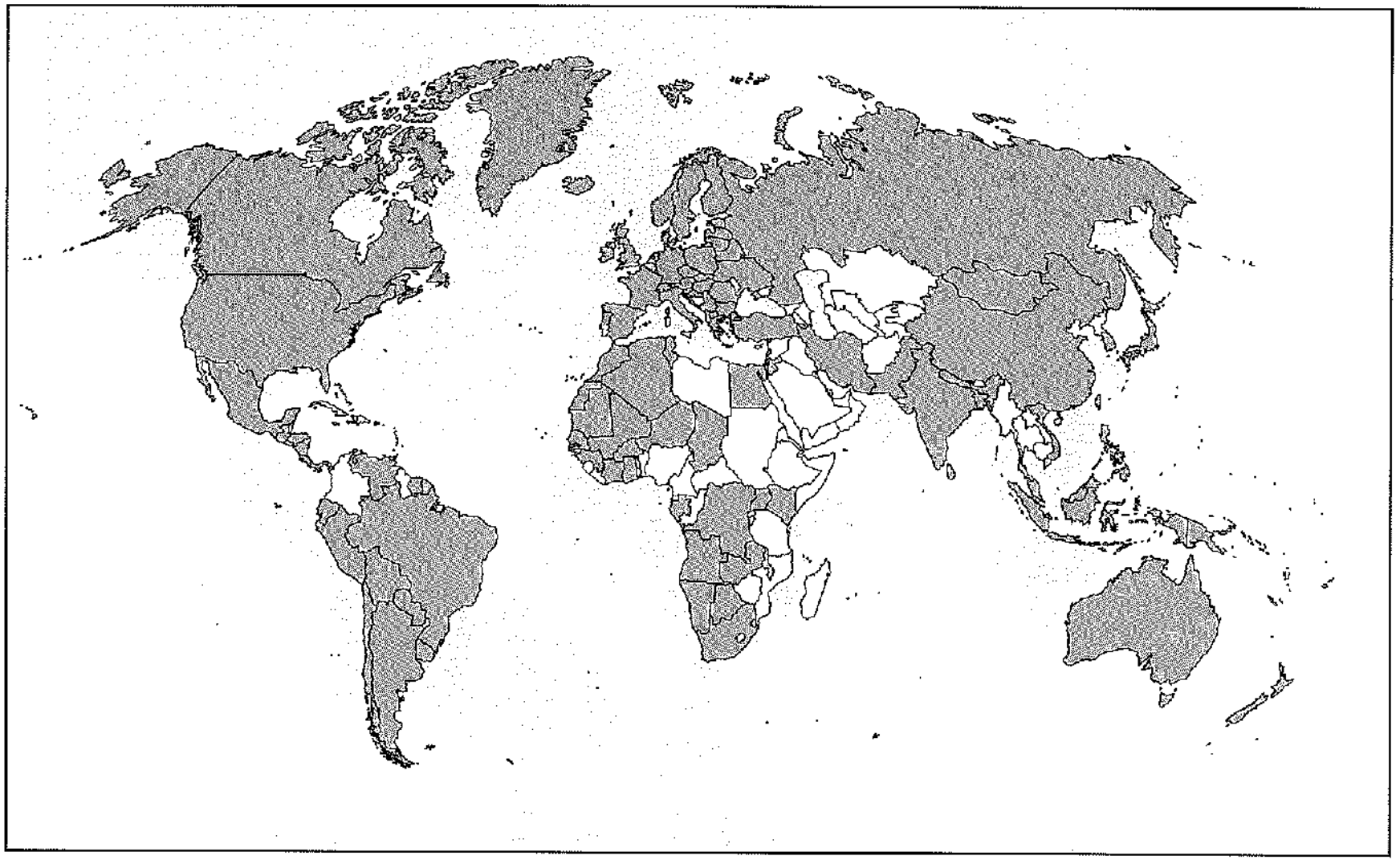


Figure 4. Coverage of key instruments for the protection of all migratory birds, including bilateral agreements covering all migratory bird species, the Bern Convention and the EC Wild Birds Directive

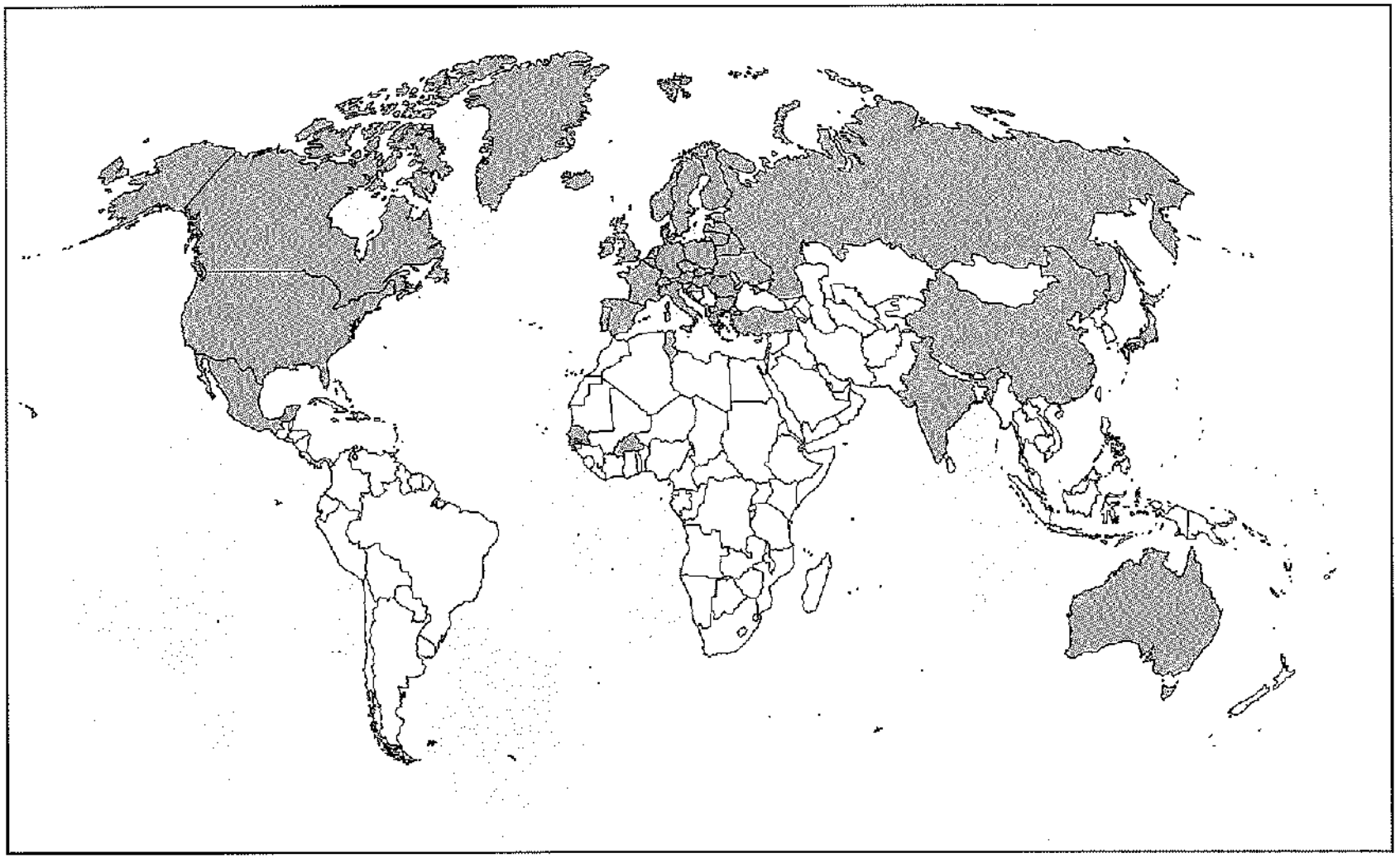
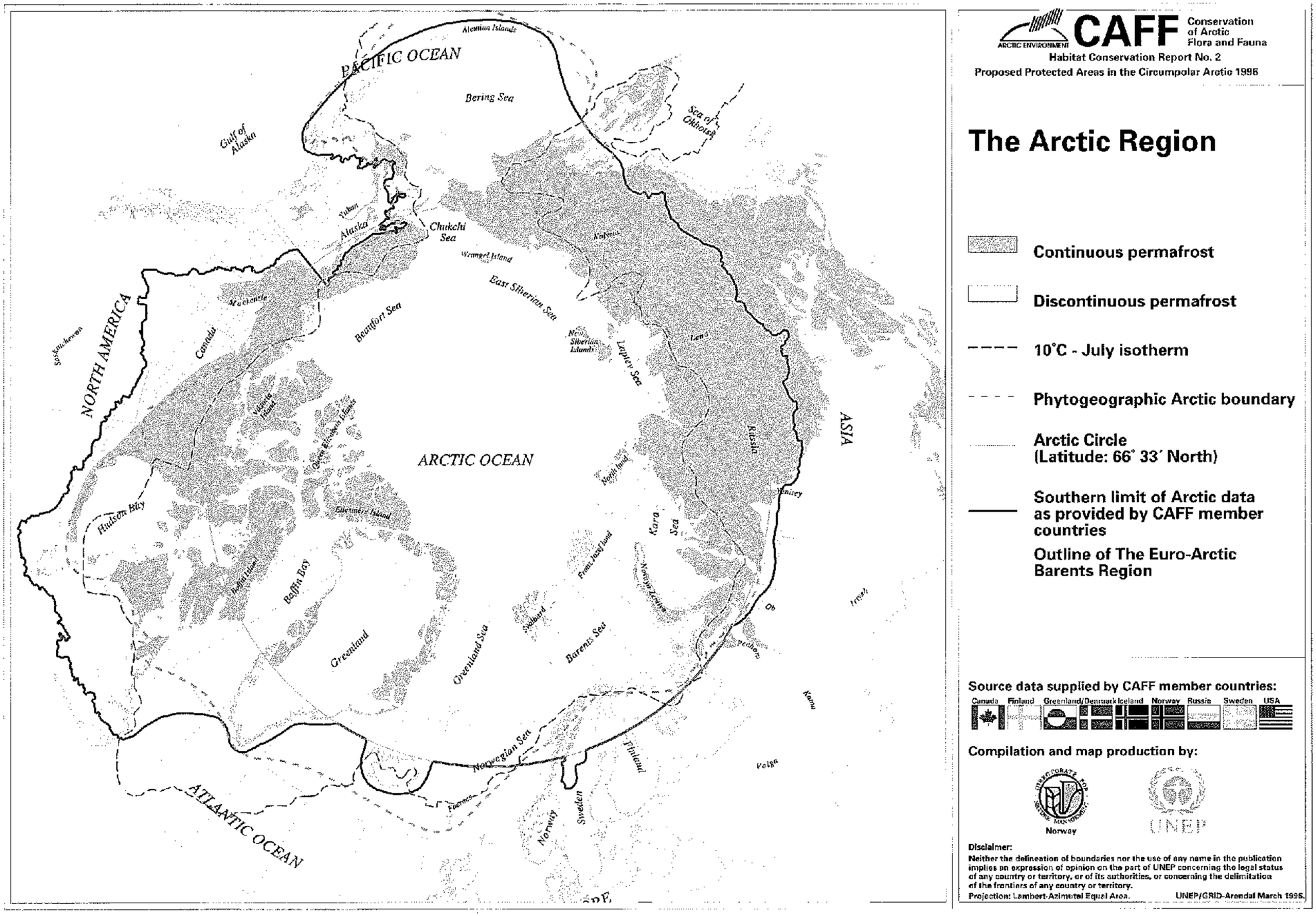


Figure 5. Limits of the Arctic region as defined by CAFF



CAFF Conservation of Arctic Flora and Fauna

ARCTIC ENVIRONMENT

Habitat Conservation Report No. 2

Proposed Protected Areas in the Circumpolar Arctic 1996

The Arctic Region

Continuous permafrost

Discontinuous permafrost

10°C - July isotherm

Phytogeographic Arctic boundary

Arctic Circle (Latitude: 66° 33′ North)

Southern limit of Arctic data as provided by CAFF member countries

Outline of The Euro-Arctic Barents Region

Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

Compilation and map production by:

Norway

UNEP

Disclaimer:

Neither the delineation of boundaries nor the use of any name in the publication implies an expression of opinion on the part of UNEP concerning the legal status of any country or territory, or of its authorities, or concerning the delimitation of the frontiers of any country or territory.

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal March 1996.