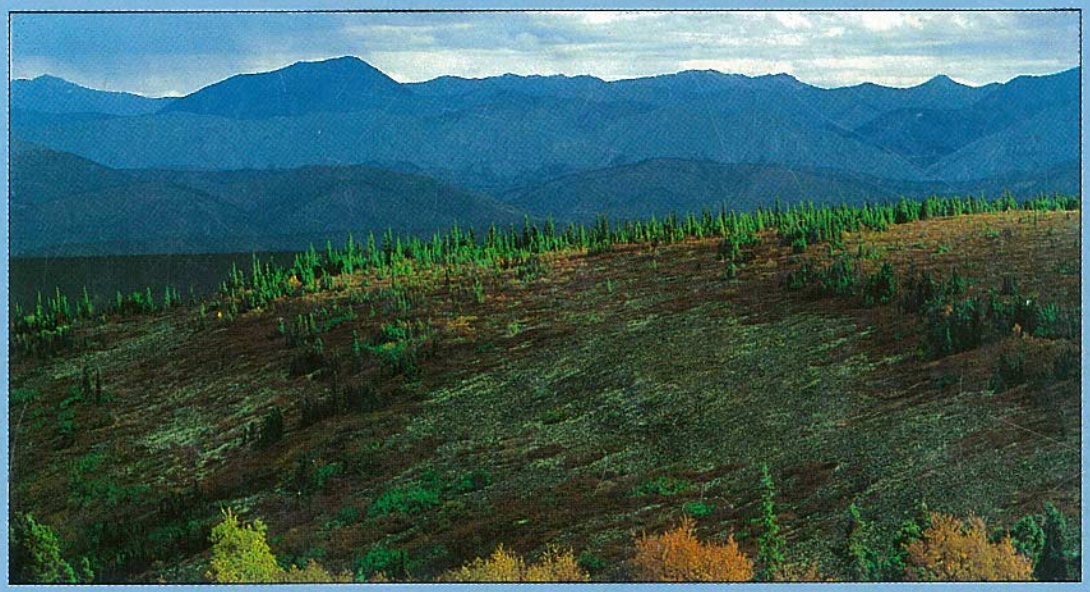


The State of Protected Areas in the Circumpolar Arctic 1994

ARCTIC ENVIRONMENT

CAFF

Conservation of Arctic Flora and Fauna

Habitat Conservation Report No. 1

ABOUT CAFF

The Program for the Conservation of Arctic Flora and Fauna (CAFF) was established to address the special needs of Arctic species and their habitats in the rapidly developing Arctic region. It forms 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 Ministerial Declaration at Rovaniemi, Finland in 1991. The other programs of the AEPS include 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).

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

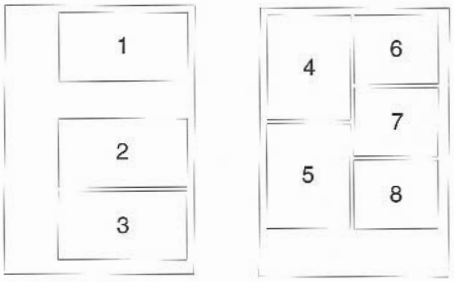
CAFF's main goals, which are achieved in keeping with the concepts of sustainable development and utilization, are;

- to conserve Arctic flora and fauna, their diversity and their habitats;
- to protect the Arctic ecosystem 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 Contacts responsible for CAFF in their respective countries. CAFF also has an International Working Group which meets at least annually to assess progress and to develop CAFF Work Plans. It is headed up by a chair and vice-chair which rotate among the Arctic countries and is supported by an International Secretariat. When needed, CAFF also sets up Specialist and Experts Groups to handle program areas.

The majority of CAFF's Work Plan activities are directed at species and habitat conservation and at integrating indigenous peoples and their knowledge into CAFF. Some examples are: work on rare, vulnerable and endangered plants and animals of the Arctic; developing circumpolar conservation strategies for certain species; work on Arctic vegetation; analyzing and making recommmendations on threats to Arctic species and habitat; an indigenous peoples mapping project. 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 on behalf of the CAFF National Contacts. Whenever possible, CAFF works in co-operation with other international organizations and associations to achieve common conservation goals in the Arctic.

Cover Photos:



1. Ogilvie mountains, Alaska/Canada. Photo: Dag Karlsen.
2. Polygon ponds, Taymyr, Russia Photo: Peter Prokosch.
3. Oulangan National Park, Finland. Photo: Ole Nergård.
4. Hällingsåfallet, Sweden. Photo: Kjell-Erik Moseid.
5. Whale bone, Farmhavna, Svalbard, Norway. Photo: Tor Kviljo.
6. Adventsdalen, Svalbard, Norway. Photo: Ole Nergård
7. Barnacle goos (Branta leucopsis), Reindalen, Svalbard, Norway. Photo: Per Jordhøy.
8. Elk, (Alces alces), Sarek National Park, Sweden. Photo: Kjell-Erik Moseid.

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Conservation of Arctic Flora and Fauna

The State of Protected Areas in the Circumpolar Arctic 1994

Habitat Conservation Report No. 1

Compiled by

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Overhead colour transparents of maps are available from GRID - Arendal, N-4800 Arendal, Norway.

PREFACE

It is with great satisfaction that we are now able to present the final version of the CAFF Habitat Conservation Report No.1 - *The State of Protected Areas in the Circumpolar Arctic 1994.*

The report is based on former versions (first draft for the CAFF Second Working Group Meeting in Fairbanks; Alaska, May 1993 and second draft for the AEPS Ministrial Meeting, Nuuk, Greenland, September 1993) and data provided by the CAFF member countries up until 25th July 1994.

As with all documents dealing with a large number of data from different international sources the level of accuracy will depend on the material provided. This is also the case for this report, but we still believe the compilation done is of high quality.

We wish to thank all those who have provided data for the report. A special thanks to Programme Coordinator *Mrs. Jeanne Pagnan*, CAFF International Secretariat, for her assistance in retreiving information from the nations and for editorial assistance.

Due to late arrival of data, the preparation of the report once again turned out to be a formidable fight against time. Under such conditions there is a satisfaction in observing the close and very fruitful cooperation that has taken place between the staff at the Directorate for Nature Management, lead by *Mr. Jan-Petter Huberth Hansen,* the staff at GRID-Arendal, lead by *Mr. Lars Kullerud* and the staff at the World Conservation Monitoring Centre, particularly *Mr. Jeremy Harrison* and *Mr. Richard Luxmoore*.

We want to honour the Project Group for the admirable job they have done in the production of this report. We believe that this report represents an important first step towards completing of CAFF's strategy on habitat conservation.

Trondheim, Arendal and Cambridge 31th of August 1994

Peter Johan Schei
Director

DIREKTORATE FOR NATURE MANAGEMENT
NORWAY

Svein Tveitdal
Director

UNEP

Mark Collins
Director

WORLD CONSERVATION MONITORING CENTRE

INTRODUCTION

by Jeanne Pagnan, CAFF International Secretariat and
Pål Prestrud, CAFF National Contact (Norway)

When the Ministers of the Arctic countries adapted the Arctic Environmental Protection Strategy (AEPS) in 1991, they signalled out habitat conservation as an area for special attention. Consequently when the International Working Group for the Conservation of Arctic Flora and Fauna (CAFF) met at its inaugural meeting in 1992, it included Arctic habitat conservation as a priority in its Work Plan. Norway, on behalf of the eight Arctic countries, accepted the task of examining the current status of habitat protection within the Arctic countries as the first phase of CAFF's long-term strategy on habitat. The following Report is the result of that effort. The information contained in the Report is, for the most part, a compilation of information gained from each of the countries through Norway's initial Questionnaire (Appendix III) and from ongoing consultation.

The Report is divided into three main Parts. Part 1 provides information on the various types of habitat classification in the Arctic countries and an overview of the Protected Area System in each of the countries. Included are descriptions of the methods used for site designation and the legal and administrative instruments in place. Facilities and the types of activity within the Protected Areas of each country are also described. Several countries have identified gaps in their Protected Area System and these have been reported on. As well, Part 1 introduces the topics of threats, both actual and potential, to Arctic habitats and habitat conservation outside Protected Areas. Part 2 of the Report consists of a Directory of Protected Areas of the Arctic on a country by country basis. Part 3 of the Report consists of literature, references and appendices, and also includes a submission by the non-governmental organization (NGO) community on its recommendations for habitat protection in the Arctic.

TABLE OF CONTENTS

SUMMARY

There is no universally accepted definiton of the term Arctic and, for the purpose of this Report, each of the Arctic countries has chosen to apply its own description. The result is that more than one third, or 14.8 million square kilometres of the total land area of approximately 39.6 million square km, is considered "Arctic".

The Arctic is home to a significant and growing number of indigenous and non-indigenous people. Technologies from other regions have been transferred into the Arctic and, more and more, it is becoming a resource pool for commodities such as oil and minerals. This development initiates countless opportunities and challenges not the least of which is nature conservation and maintenance of the biological diversity of the region. All the Arctic countries have realized that one important mechanism to achieve these goals is to provide some type of formal protection to important tracts of land or marine areas.

One of the main reasons for protecting an area is because of its importance as flora and fauna habitat. The Arctic countries have adopted various habitat classification systems for their own use. There is no one habitat classification system that applies to the whole Arctic region.

The World Conservation Union (IUCN) has developed a system of categories to designate an area as protected. These are termed the Management Categories of which there are ten at the time of developing this Report. Within the Arctic, most protected areas can be classified using the IUCN system. However, in this Report, the focus is on areas that fall within the first five IUCN categories as was decided at the Second CAFF Working Group Meeting in Fairbanks, Alaska in 1993. In total, there are 280 such areas described in this report. They cover about 2 million square kilometres or roughly 14 % of the Arctic areas. It is pointed out, however, that the vast North and East Greenland National Park with its approximately 1 million square kilometres makes us about half of this total.

The criteria and selection methodes used to designate Protected Areas differ among the Arctic countries. Some countries base their selection on systematic inventories and evaluations while other countries have mainly designated their protected areas on a case-by-case study.

In the Arctic, there are 37 Wetlands of International Importance designated under the Ramsar Convention, 6 Biosphere Reserves under the UNESCO Man and the Biosphere Program and 2 World Heritage sites designated under the World Heritage Convention.

All eight CAFF countries have the necessary legislative tools for designating and managing Protected Areas in the Arctic. Within and among the countries, regulations and restrictions in Protected Areas varies from complete prohibition of all types of human interference without special permission to more or less free access to Protected Areas. The type of management regime also varies both by country and by IUCN Management Categories, but in general there is some kind of hierarchical model in place.

When Protected Areas are established, all countries with an indiginous population have made arrangements to allow those populations to maintain their traditional activities, including subsistence activities within the Protected Areas. In some cases, special rights are also granted to local residents other than indiginous peoples.

All countries except USA (Alaska) have identified gaps in their network of Protected Areas in the Arctic. Some kind of plan for new Protected Areas or extensions of existing Protected Areas is found in all countries but the level of concrete proposals varies. Using the levels of protection derived from the Arctic Landscape Classification system the most important gaps and habitats not satisfactorily covered are marine areas, coasts, fjords and forests.

Furthermore, even if all the proposals for Protected Areas in the Arctic were realized, there would still be signifacant gaps. The Non-government organizations also provided some input to this Report and their submission which appears as Annex I, focuses on the need for protection of Arctic Marine Ecosystems.

The Report also provides examples of habitat conservation measures outside Protected Areas in the Arctic countries, including special legislation and restrictions around important habitat.

The countries have identified several potential or actual threats to Arctic habitat and their species and these have been summarized. They are all directly or indirectly related to human activity. Some have already had negative impacts both on several indiginous peoples societies and on the biological diversity in the Arctic. Many of these negative impacts, however, can be avoided.

CAFF will undertake two additional tasks related to habitat conservation. It will develop a plan for a circumpolar Protected Areas network and it will carry out more intensive analyses and investigations into the threats to Arctic species and their habitat. Both will be presented to the Ministers of the Arctic Environmental Protection Strategy.

PART 1

1. THE ARCTIC

1.1 Overview

The Arctic is a unique and fragile ecosystem to which the animal and plant life has adapted. It is a vast territory, of nearly fifteen million square kilometres, portions of which are either totally or practically barren and unsuitable for all but a handful of life forms, if any. Some parts of the Arctic, on the other hand, teem with life and suitable faunal and floral habitat, in comparison, Some also offer excellent examples of the Arctic's frequently spectacular geophysical features. The eight Arctic countries have assessed that certain of these areas are sufficiently important within their own countries or to the Arctic ecosystem and its species as a whole to warrant some type of formal protection. This can range from designating tracts of land or marine area where almost no human activity is permitted to establishing multiple-use areas where development and use of natural resources is regulated to ensure compatibility with other environmental needs. Some areas are already protected, in one way or another, or designation is underway. In other areas, more research and study is needed before a determination on designation can be made.

The Arctic is also home to a significant and partly fast growing number of indigenous and non-indigenous people, a large percentage of whom live off the land and marine resources, as they have done for countless generations.

The Arctic is increasingly being exposed to the technologies of other regions of the world and more and more, is becoming attractive as a resource pool for certain types of commodities such as oil and minerals. Countless opportunities exist for positive and beneficial sustainable development and resource utilization, provided they are carried out in an environmentally compatible way and provided that those very sensitive and special areas needed by other species are maintained in an ecologically-sound way.

A question often debated is "what is the Arctic". There is no universally accepted answer because the term "Arctic" conjures up different images and meanings to different people. To those unfamiliar with the region, it often brings to mind a cold, desolate and vast empty space. To geographers, it may mean anything above the Arctic circle (66°33'N) or the 10°C July Isotherm. Physical scientists or engineers may use the presence of continuous or discontinuous permafrost in their determination. Sociologists may approach it from a perspective of living conditions and cultural activities. From another standpoint, the Arctic is often defined on the basis of political boundaries. Biologists or other life scientists and ecologists generally use some variation on continuous or discontinuous tree-line locus as well as take into consideration species ranges, habitat needs and transition zones in their interpretation of Arctic.

For the purposes of this Report, each of the eight countries has chosen to use its own description of Arctic and these are presented in the following section.

1.2 Descriptions - By Country

Canada has defined Arctic as being delineated by three major geographical land zones: Boreal-Tundra transition, Tundra, and High Arctic. These areas encompass seven ecozones with the southern boundary following closely the continuous tree line or, the northern limits of the predominantly forested Boreal Region. Also included are marine areas.

Finland considers the area north of the Arctic Circle to be Arctic. By using the criteria of permafrost and vegetation, only the very northern area of the country can be considered as semiarctic. The northernmost part of the coniferous forest area is included for practical reasons.

Greenland - The whole area of the world's largest island is considered to be Arctic and includes the great ice-cap which covers some 1.8 million km² or 82% of the island's land area.

Iceland considers the whole of Iceland, and adjacent seas (200-mile fishing zone), as Arctic. This holds true for land according to two commonly used definitions of Arctic boundaries, the 10°C July isotherm and the timberline. Due to prevailing warm currents, the seas around Iceland are of less Arctic character.

Norway includes Svalbard, Jan Mayen and the mainland north of the Arctic Circle in the Norwegian Arctic. For practical reasons, a small area south of the Arctic Circle is included, to embrace the Saltfjellet-Svartisen National Park and the whole municipality of Rana.

Russia considers north of the Arctic Circle, and adjacent areas to the south, as the Russian Arctic for CAFF purposes. The main zones encompass polar desert, all types of tundra (including lowland, mountain and forest), forests and sparse growth of Larix sibirica in west Siberia and the area of Pinus pumila.

Sweden has defined Arctic as the area north of the Arctic Circle between approximately 19° and 24° east longitude, together with an area south of the Arctic Circle from the 19° longitude following the timberline and bordering Norway.

United States of America has for this purpose defined parts of the State of Alaska as Arctic. The Alaskan Arctic is considered equivalent to tundra, or treeless lands beyond the latitudinal treeline.

The Arctic, as described by the countries is indicated in Table 1.1 and shown in Figure 1.1.

Figure 1.2 show the Vegetation Index of the Arctic.

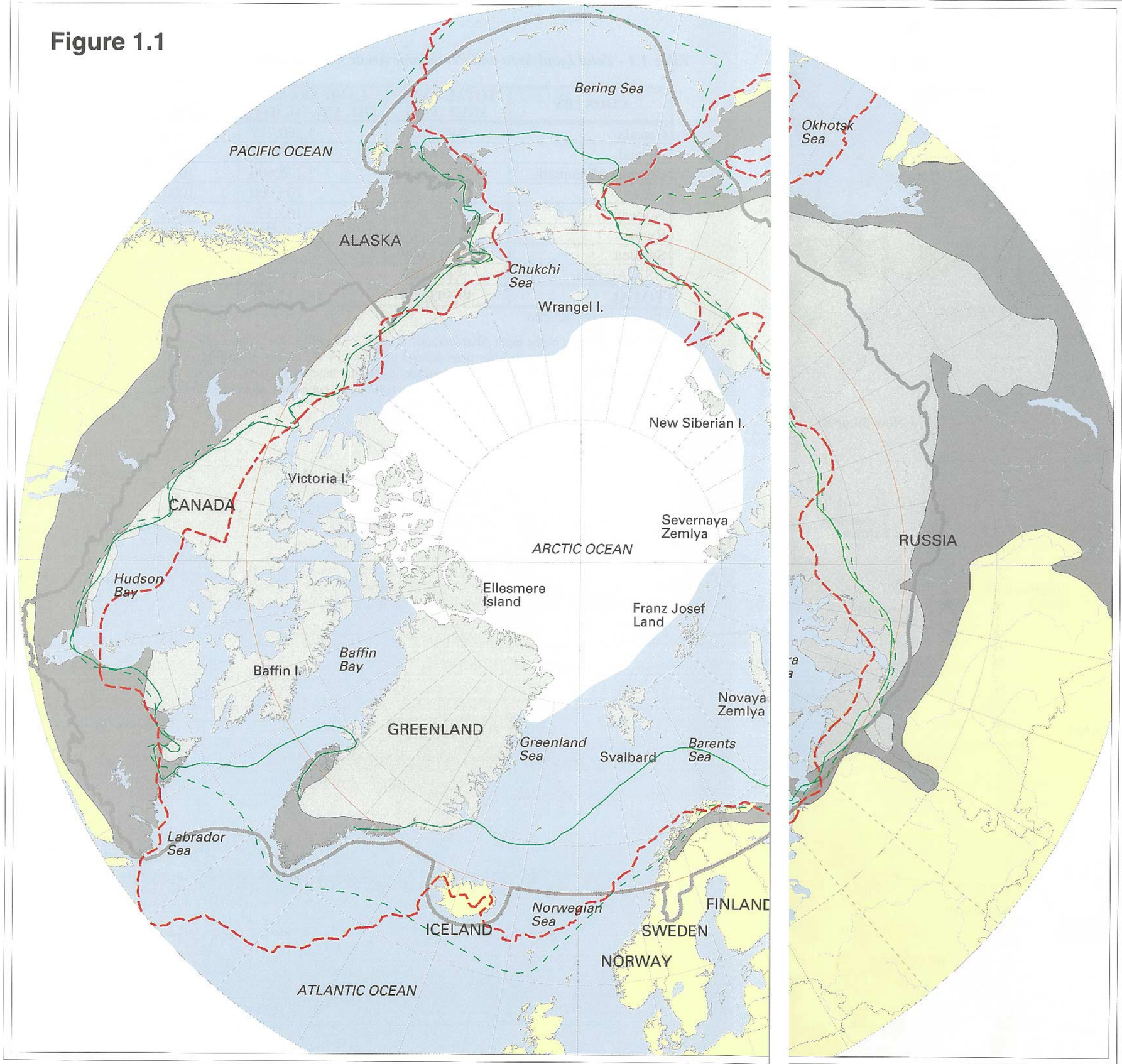
Table 1.1 - Total Land Area and Percentage Arctic - By Country.

COUNTRY	TOTAL LAND AREA (km^2)	LAND AREA IN THE ARCTIC (km^2)	% ARCTIC
Canada	9,970,610	5,260,777	52.8
Finland	304,623[1]	79,547	26.1
Greenland/Denmark	2,175,600	2,175,600	100.0
Iceland	103,000	103,000	100.0
Norway	386,975	163,522	42.2
Russia	17,075,400	6,349,780	37.2
Sweden	411,000	95,000	23.1
USA(Alaska)	9,166,758	590,553	6.4
TOTAL	**39,593,966**	**14,817,779**	**37**

[1] Freshwater not included.

The total land area of the eight Arctic nations is about 39.5 million km^2. About one third or 14.8 million km^2 of this area has been defined as Arctic by the countries themselves. This varies from Greenland and Iceland that consider their total land area (100%) as Arctic to the United States of America (Alaska) that considers 6.4% of the country or about one third of the State of Alaska, as Arctic.

Figure 1.1



CAFF Conservation of Arctic Flora and Fauna

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The State of Protected Areas in the Circumpolar Arctic 1994

The Arctic Region

- 10°C - July isotherm
- Floristic Arctic boundary
- Phytogeographic Arctic boundary
- Southern limit of Arctic data as provided by member countries
- Arctic Circle (Latitude: 66° 33' North)
- Discontinuous permafrost
- Continuous permafrost

Source data supplied by CAFF member countries:

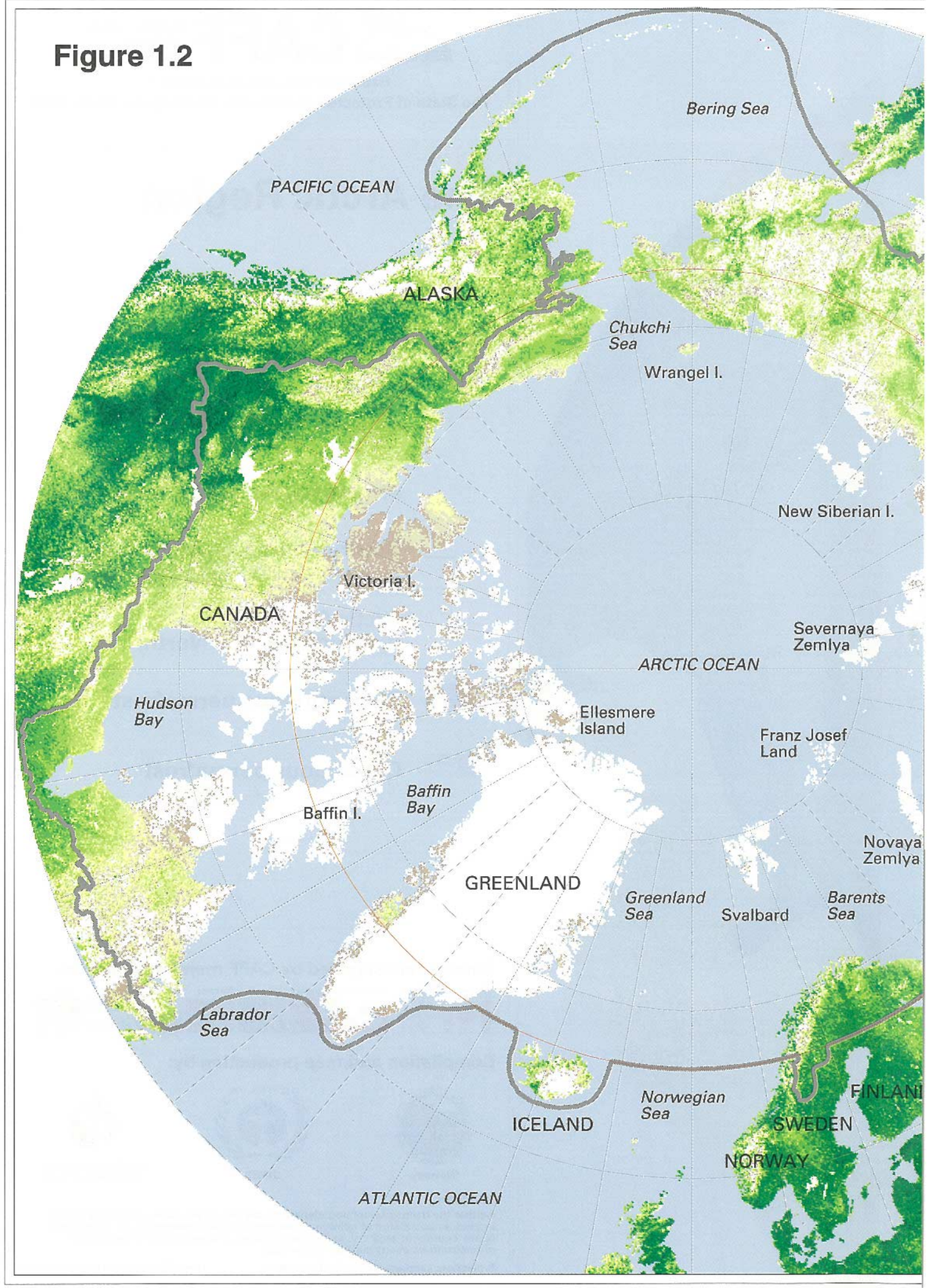
Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

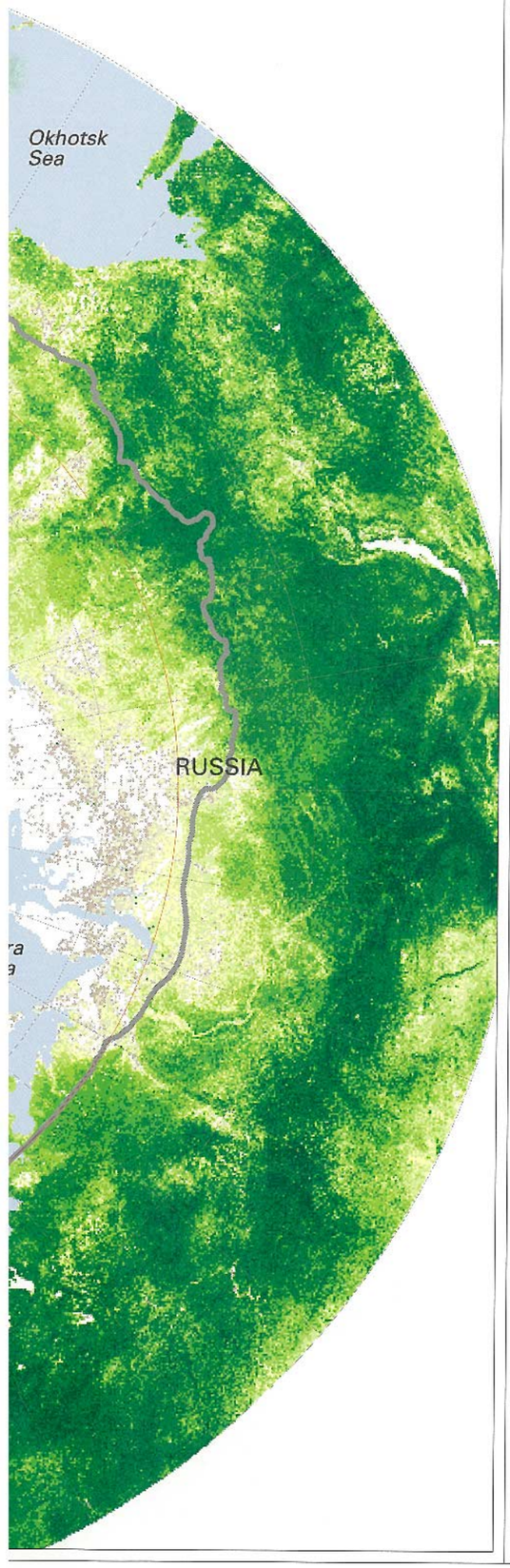
Compilation and map production by:

Norway UNEP WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.

Figure 1.2





CAFF Conservation of Arctic Flora and Fauna

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Vegetation Greenness in the Arctic

Normalized Difference Vegetation Index (NDVI)
1 km AVHRR, June 21-30, 1992

Snow cover
Low productivity

High productivity

Southern limit of Arctic data as provided by member countries

Arctic Circle (Latitude: 66° 33′ North)

Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

Compilation and map production by:

Norway — UNEP — WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.

2. ARCTIC HABITAT TYPES - CLASSIFICATION AND DISTRIBUTION

2.1 Classification Systems

There are several classification systems in use that try to describe and group the world's habitats. For the Arctic, there are different systems originating from the various fields of study (see section 1.1). All provide insight and tools for habitat management and conservation.

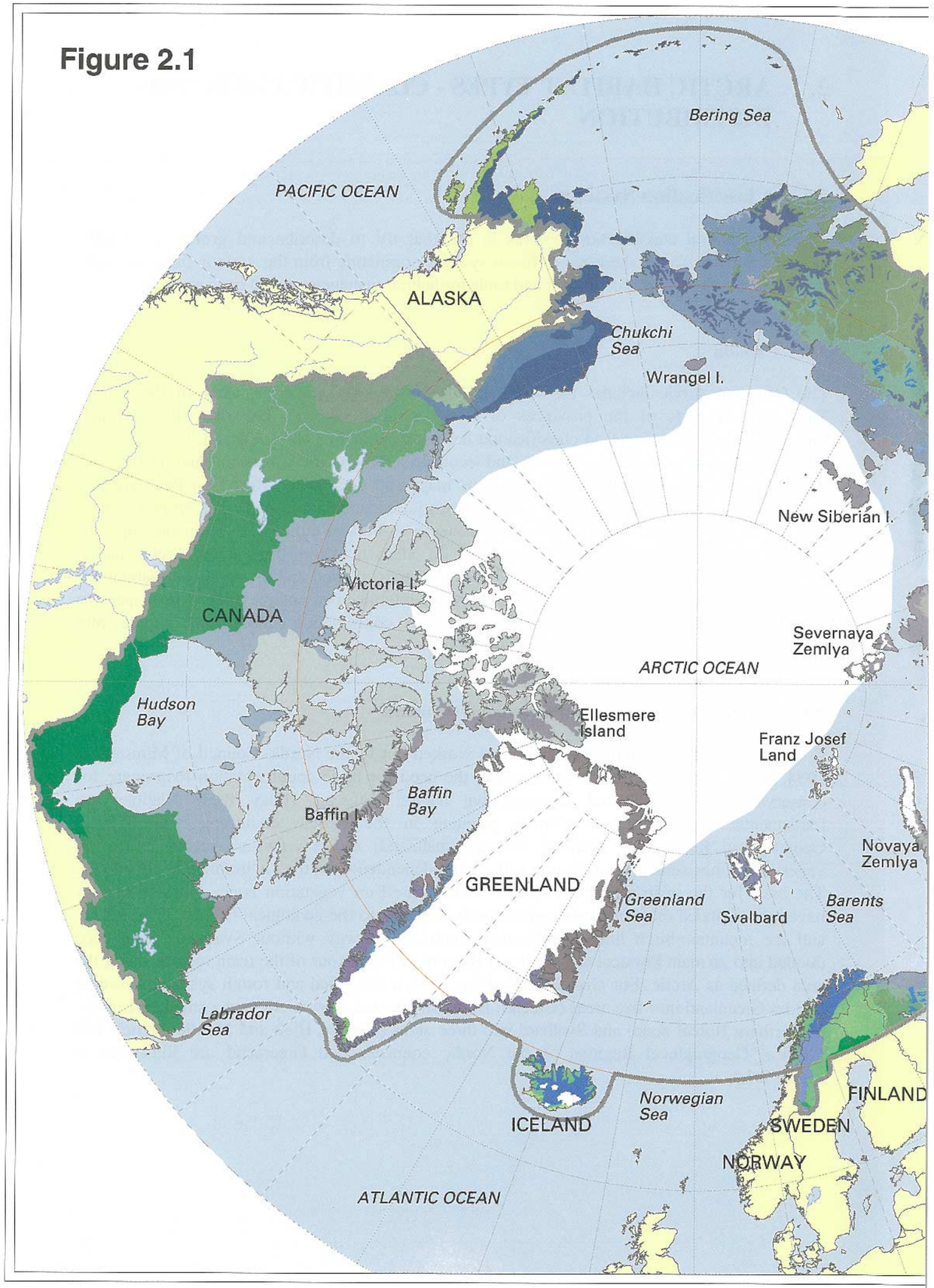
2.1.1 Canada

The Canadian Arctic includes the whole of the Northwest Territories, parts of the Yukon Territory and parts of the provinces of Newfoundland, Quebec, Ontario, Manitoba and Saskatchewan. Ecological land classification has been applied to all of Canada. Coverages for the ecozone, ecoprovince, ecoregion and ecodistrict levels are consistent and efforts are currently underway to further refine previous maps and documents. Based on the Canadian ecological land classification, the system of terrestrial ecozones in Canada was worked out in 1982. It divides Canada into 15 separate ecozones, and the area defined as Arctic encompasses seven of these (see Table 2.1 and Figure 2.1). In addition to terrestrial areas, Arctic marine areas are of great importance to Canada both as sources of food and as significant habitat for migratory and non-migratory species. Canada has undertaken extensive work with respect to the development of strategies for Arctic marine conservation. Indigenous people rely extensively on Arctic marine ecosystems for food.

2.1.2 The Nordic Countries and Greenland/Denmark

A set of Physical Geographical Regions was worked out by the Nordic Council of Ministers in 1984. This project was carried out to meet the need for basic documentation to prepare for conservation of typical and representative natural settings. Today these Regions are fundamental for nature conservation planning in the Nordic countries. The Physical Geographical Regions of *Finland, Norway* (mainland) and *Sweden* are mainly based on vegetation zones since the vegetation reflects the dependence on the environmental conditions. The basis for the main regions of *Iceland* is also based on vegetation zones, but sub-regions have been founded on geomorphological conditions, due to the geological history of the island, and the mountain-birch line. The Nordic countries (Norway without Svalbard) have been divided into 76 main Physical Geographical Regions. Twenty-four of the main regions cover the area defined as Arctic. For *Greenland* and Svalbard, a simplified and rough system is used. It divides Greenland into five areas (Glacier, High, Middle and Low Arctic and a small percentage in Northern Boreal zone) and Svalbard into three areas (Glacier, High and Middle Arctic). The Physical Geographical Regions of the Nordic countries and Greenland are illustrated in Figure 2.1.

Figure 2.1



CAFF Conservation of Arctic Flora and Fauna

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The State of Protected Areas in the Circumpolar Arctic 1994

Physical Geographical Regions Classifications

North American Ecolgical Areas

- 11 Arctic Cordillera
- 10 Northern Arctic
- 8 Southern Arctic
- 1 Alaska Tundra
- 2 Brooks Range Tundra
- 6 Pacific Maritime Mountains
- 3 Alaska Boreal Interior
- 4 Taiga Cordillera
- 7 Taiga Plain
- 9 Taiga Shield
- 12 Hudson Plain

Landscape types/ landuse of Russia

- 1 Glacier
- 19 Arctic Mountainous Desert
- 13 Arctic Desert and Tundra Plains
- 14 Subarctic Tundra Plains
- 8 Tundra Plains of Sparse Utilisation
- 20 Mountainous Tundra
- 21 Mountainous Sparse Forest
- 15 Northern Taiga Plains
- 9 Taiga of Limited Exploitation
- 16 Alluvial Meadows and Deltas
- 17 Wetlands
- 5 Grasslands and Hayfields

Flora units of Svalbard

- 1 Glacier
- 2 High Arctic
- 3 Middle Arctic

Physical Geographical Regions in the Nordic Arctic

- 11 Glacier
- 1 Arctic - Alpine zone
- 2 Alpine zone
- 3 Northern Boreal zone
- 4 Northern-Southern Boreal zone
- 5 Middle Boreal zone
- 6 Oceanic Middle Boreal zone

Floristic zones of Greenland

- 1 Glacier
- 2 High Arctic
- 3 Dry Low Arctic
- 4 Humid Low Arctic
- 5 Northern Boreal Zone

Legend numbers refer to codes in the table of all protected Areas given in part II of the report

Southern limit of Arctic data as provided by member countries

Arctic Circle (Latitude: 66° 33′ North)

Source data supplied by CAFF member countries:

Canada · Finland · Greenland/Denmark · Iceland · Norway · Russia · Sweden · USA

Compilation and map production by:

Norway · UNEP · WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area.

UNEP/GRID-Arendal August 1994.

2.1.3 Russia

The Physical Geographical Regions of Russia are mainly based on vegetation zones encompassing various classifications of all tundra types, wetlands, forested areas, polar desert and taiga. See Figure 2.1.

2.1.4 United States of America (Alaska)

The main regions in the Alaskan Arctic were extracted from "Major Ecosystems of Alaska" (Joint Federal-State Planning Commission for Alaska 1973). They consist of various classifications of tundra and spruce forest. See Figure 2.1.

2.2 Habitat Types in The Arctic - By Country Classification

The eight Arctic countries analyze and divide their habitats quite differently. Some countries also have components of "uncategorized habitat". This makes it difficult to summarize or compare data from the whole defined Arctic (13.2 million km²). The information therefore is presented by country only (Tables 2.1 - 2.8).

Table 2.1 - The Ecozones of the Canadian Arctic.

HABITAT TYPES (ECOZONES)	TOTAL KM²*/**
Tundra Cordillera	384,163 *(07.6%)*
Hudson Plains	371,113 *(07.3%)*
Taiga Plains	548,664 *(10.9%)*
Taiga Shield	1,312,176 *(25.9%)*
Southern Arctic	739,660 *(14.6%)*
Northern Arctic	1,450,814 *(28.7%)*
Arctic Cordillera	253,304 *(05.0%)*
Total	**5,260,777**

* Size of each zone within the Arctic. Source: Terrestrial Ecozones of Canada.
** Excludes Marine Waters.

*Table 2.2 - Habitat Types in the Finish Arctic.**

HABITAT TYPES	KM²
Forests on mineral soil	29,442 *(37.0%)*
Forests on turf soil	9,417 *(11.8%)*
Habitations	44 *(00.1%)*
Fields	264 *(00.3%)*
Open areas (mires, mountain tops etc.)	35,490 *(44.6%)*
Water	4,594 *(05.8%)*
Other (uncategorized)	296 *(00.4%)*
Total	**79,547**

* Land use and tree cover analysis using Landsat satellite pictures have been the basis for defining habitat types in the Finish Arctic. A map of forest and barren ground areas of northern-most Finland exists. Detailed vegetation maps exist from three protected areas.

*Table 2.3 - A Rough Estimate of Habitat Types in Greenland(in approximate percentages).**

HABITAT TYPES	PERCENTAGE OF TOTAL LAND AREA
Glacier/Ice Sheet	~ *86%*
Tundra/Wetlands	~ *10%*
Scrub/Woods	~ *01%*
Other	~ *03%*

* Further refinement is needed.

Table 2.4 - A Rough Estimate of Main Habitat Types in Iceland.

HABITAT TYPES	KM²
Vegetated land	25,100 *(24.4%)*
- Wetlands	8,000 *(07.8%)*
- Heath	14,000 *(13.6%)*
- Birch scrub/woods	1,300 *(01.3%)*
- Grassland (cult.)	1,800 *(01.7%)*
Non-Vegetated	63,200 *(61.4%)*
- Barren soils	40,000 *(38.8%)*
- Glacial sands	15,000 *(14.6%)*
- Lava fields	8,200 *(08.0%)*
Lakes & rivers	2,800 *(02.7%)*
Glaciers	11,900 *(11.5%)*
Total	**103,000**

Table 2.5 - A Rough Estimate of Main Habitat Types in the Norwegian Arctic.

HABITAT TYPES	KM²
Cultivated land	1,000 *(00.6%)*
Coniferous forests	5,000 *(03.1%)*
Broadleaf forests	17,000 *(10.4%)*
Mire & Bog	1,400 *(00.9%)*
Polar desert, tundra, mountain areas, lakes & unspecified areas	80,622 *(49.3%)*
Glaciers	58,500 *(35.8%)*
Total	**163,522**

Table 2.6 - Habitat Types in the Russian Arctic.

HABITAT TYPES	KM²
Polar deserts	102,600 *(01.6%)*
Tundra (lowland)	2,021,320 *(31.8%)*
Mountain tundra	1,843,650 *(29.0%)*
Forest tundra & northern taiga	1,522,835 *(23.9%)*
Northern Pinus pumila	140,625 *(02.2%)*
Northern Larix siberica	718,750 *(11.3%)*
Total	**6,349,780**

Table 2.7 - Habitat Types in the Swedish Arctic.

HABITAT TYPES	KM²
Bare mountain & sub-mountain birch forest	50,000 *(52.6%)*
Mire	20,000 *(21.1%)*
Coniferous forest	20,000 *(21.1%)*
Lakes	5,000 *(05.2%)*
Total	**95,000**

Table 2.8 - The Major Ecosystem Types in the Alaskan Arctic (USA).

HABITAT TYPES	KM²
Moist tundra	256,522 *(43.40%)*
Wet tundra	115,830 *(19.60%)*
Alpine tundra	155,932 *(26.40%)*
Lowland spruce - hardwood forest	828 *(00.14%)*
Upland spruce - hardwood forest	3,992 *(00.70%)*
High brush	53,098 *(09.00%)*
Low brush - muskeg - bog	200 *(00.03%)*
Freshwater	3,107 *(00.53%)*
Glaciers	1,044 *(00.20%)*
Total	**590,553**

3. NATURE PROTECTION IN THE ARCTIC

3.1 A Short History

The world's first National Park, Yellowstone, was established in Wyoming, USA. in 1872. The first American protected areas in the Arctic were established at the beginning of this century. One example is "Yukon Delta Reservation" which was established by Executive Order as a "preserve and breeding ground for native birds" in 1909. Later many pieces were added over the years to what is now known as Yukon Delta National Wildlife Refuge. The famous Mt. McKinley was designated a National Park in 1916 (later expanded and today known as Denali National Park). In Canada, Wood Buffalo National Park was established in 1922. A part of the park is in Canada's defined Arctic.

In Scandinavia, Sweden was the first country to protect arctic areas with several National Parks in the Province of Norbotten being established in 1909. A proposal for a Nature Park on Svalbard was discussed in 1914, but it was not until 1971 that two large Nature Reserves and three National Parks covering some 60% of the archipelago were established. In northern Finland, Malla area was first protected by the decision of the Governor of Oulu Province in 1916. It was designated as a strict nature conservation area in 1938 together with Pallas-Ounastunturi and Pyhätunturi national parks.

Iceland established its Thingvellir National Park in 1928, and the first reserve in the Russian Arctic, Laplandsky, was established in 1930. The world's largest nature protection area, North and East Greenland National Park was established in 1974 (700,000 km^2). In 1988 the Park was further expanded and now has an area of 972,000 km^2.

The development (1909-1993) of the existing Arctic Protected Areas System is visualized in Figure 3.1 (Note that only areas >10 km^2 are included).

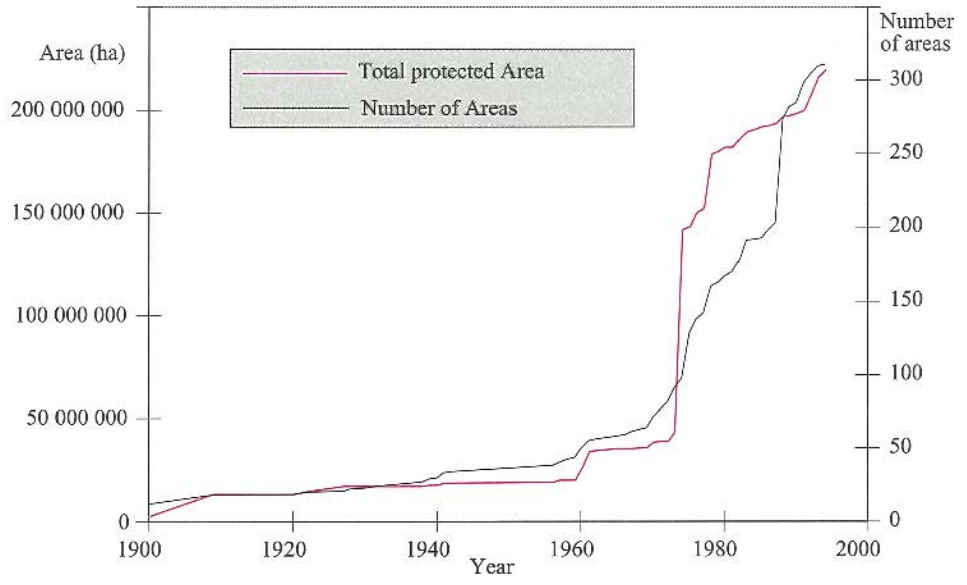

Figure 3.1 - The Development of Protected Areas in the Arctic.

3.2 The United Nations (UN) List and the World Conservation Union (IUCN) Protected Areas Management Categories

The Arctic Protected Area System varies considerably from one country to another, depending on needs and priorities, and on differences in legislative, institutional and financial support. Also, Arctic Protected Areas have been set up to meet different management objectives and some are not compatible with others. This has led to the emergence of a wide range of protected area designations and definitions. However, most countries have chosen to apply a version of the IUCN system of Management Categories. A list of Protected Areas meeting certain criteria of the IUCN Management Categories has been developed by the UN and is termed the UN List.

Criteria for Inclusion in the UN List

There are three criteria which govern whether or not a Protected Area is included in the UN List:

1. *Size:* Only protected areas of over 1,000 hectares are included, with the exception of offshore or oceanic islands of at least 100 hectares where the whole island is protected.

2. *Management objectives:* A series of Protected Area management categories, defined by management objective, are identified by IUCN's Commission on National Parks and Protected Areas in the paper on *Categories, Objectives and Criteria for Protected Areas* published in the World National Parks Congress held in Bali. The definitions of each category are provided below in Table 3.1, further specified in Table 3.2. Nationally designated sites are allocated to the relevant IUCN Categories, on the basis of their legally defined management objectives, and implementation of those objectives.

3. *Authority of the management agency:* Only those sites managed by the "highest component authority" are included within the UN List, i.e. the highest appropriate level of government.

*Table 3.1 - IUCN Protected Areas Management Categories (as of 1993).**

IUCN cat.	*DEFINITION*
I	***Strict Nature Reserve/Scientific Reserve.*** To protect nature and maintain natural processes in an undisturbed state in order to have ecologically representative examples of the natural environment available for scientific study, environmental monitoring, education, and for the maintenance of genetic resources in a dynamic and evolutionary state.
II	***National Park.*** To protect outstanding natural and scenic areas of national or international significance for scientific, educational, and recreational use. These are relatively large natural areas not materially altered by human activity where extractive resource uses are not allowed.
III	***Natural Monument/Natural Landmark.*** To protect and preserve nationally significant natural features because of their special interest or unique characteristics. These are relatively small areas focused on protection of specific features.
IV	***Managed Nature Reserve/Wildlife Sanctuary.*** To assure the natural conditions necessary to protect nationally significant species, groups of species, biotic communities, or physical features of the environment where these may require specific human manipulation for their perpetuation. Controlled harvesting of some resources can be permitted.
V	***Protected Landscapes and Seascapes.*** To maintain nationally significant natural landscapes which are characteristic of the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal life style and economic activity of these areas. These are mixed cultural/natural landscapes of high scenic value where traditional land uses are maintained.
VI	***Resource Reserve.*** To protect the natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning. This is a 'holding' category used until a permanent classification can be determined.
VII	***Anthropological Reserve/Natural Biotic Area.*** To allow the way of life of societies living in harmony with the environment to continue undisturbed by modern technology. This category is appropriate where resource extraction by indigenous people is conducted in a traditional manner.
VIII	***Multiple Use Management Area/Managed Resource Area.*** To provide for the sustained production of water, timber, wildlife, pasture and tourism, with the conservation of nature primarily oriented to the support of the economic activities (although specific zones may also be designated within these areas to achieve specific conservation objectives).
IX	***Biosphere Reserve.*** To conserve for present and future use the diversity and integrity of biotic communities of plants and animals within natural ecosystems, and to safeguard the genetic diversity of species on which their continuing evolution depends. These are internationally designated sites managed for research, education and training.
X	***World Heritage Site.*** To protect the natural features for which the area is considered to be of outstanding universal significance. This is a select list of the world's unique natural and cultural sites nominated by countries that are Party to the World Heritage Convention.

* These original management categories was made out in 1978. The IUCN is issuing a new six category system of guidelines for Protected Areas in 1994, but they are not applied in this document.

Table 3.2 - IUCN Management Categories - Methodology for Selection (as of 1993).

Purpose for Protection	Decision Matrix			Recommended Status	IUCN category
Protection of nature highest priority	Visitor use disturbing or of low priority	Visitor use and active management undesirable	Primarily for preservation	Strict Nature Reserve	I
			Primarily for research	Scientific Reserve	I
		Zoned visitor use and/or some management desirable	Biologically valuable	Managed Nature Reserve	IV
			Geophysically or biologically spectacular	Natural Monument	III
	Visitor use high priority	Not for consumptive use	Global priority	World Heritage Site	X
			National priority	National Park	II
			Local priority	Provincial Park	II
		Consumptive uses for local people	Global interest	Biosphere Reserve	IX
			Regional interest	Anthropological Reserve	VII
Protection of nature secondary priority	Water catchment vital	High visitor potential		Protective Recreation Forest	VIII
		Low visitor potential		Hydrological Protection Forest	VIII
	Water catchment not vital	Hunting or harvesting value high	Hunting a priority	Hunting Reserve	VIII
			Traditional use a priority	Wildlife Management Zone	VIII
		Hunting or harvesting value low	Essentially natural	Agro-forestry Reserve	VIII
			Essentially agricultural	Protected Landscape	V

Abridged from: IUCN (1984). Categories, Objectives and Criteria for Protected Areas. In: McNeely, J.A. and Miller, K. R. (Eds.), National Parks, Conservation and Development: The Role of Protected Areas in Sustaining Society. IUCN/Smithsonian Institution Press, Washington, D.C.

4. THE ARCTIC PROTECTED AREAS SYSTEM

This section summarizes the background of today's Arctic Protected Areas and discusses Protected Areas relative to the IUCN Categories for conservation management. Protected Areas are analyzed by habitat type, where applicable.

4.1 The Basis For Protection - By Country

In this section, the approach to protecting areas used in each country is described, including criteria for evaluation of conservation value where such criteria have been adopted. Two questions of interest were: (1) *to what degree protected areas are based on systematic inventories and evaluations, e.g. of habitat types such as wetlands or other vegetation societies*, or (2) *if protected areas are mainly designated on a case by case study and evaluation*. If criteria for evaluating conservation value have been adopted, these have been included.

4.1.1 Canada

Area protection in Canada's Arctic is provided by eight jurisdictions (federal, two territorial and five provincial) under a variety of legislations. The level of protection can differ from one jurisdiction to another. The isolation of many of the Arctic protected areas and the sparse human population ensures that many of the "comparable" regulations enforced in the south need not be rigidly applied.

Existing *IUCN Category I sites* in the Canadian Arctic are held under provincial jurisdiction. (Exception is Polar Bear Pass National Wildlife Area which is under federal jurisdiction). Protection of such sites as Ecological Reserves (Manitoba) or similar protection in the form of Nature Reserves (Ontario) are established to: serve as benchmarks for long-time scientific research and education use; preserve representative examples of plant and animal communities; serve as habitats recovering from modification caused by human activity; protect rare and endangered plants and animals in their natural habitat; and preserve unique rare zoological, botanical or geological phenomenon. Sites and areas are surveyed and inventoried to meet the above objectives and to move towards the completion of protected area networks, generally on a case by case study and evaluation. Frequently, protection is governed by the availability of specific land holdings (crown land and purchase) in targeted areas.

The Canadian Parks Service (federal) conducts broad systematic inventories of flora and fauna prior to an area's being established as a national park *(IUCN Category II sites)*. Inventories are updated casually or systematically depending upon capabilities of staff and resources available. There is no system of Natural Landmarks/Monuments (*IUCN Category III)* in Arctic Canada.

Key habitat may also be protected by the Canadian Wildlife Service as National Wildlife Areas or Migratory Bird Sanctuaries. The protection of key habitat sites is viewed as a population management tool by the Canadian Wildlife Service. The effectiveness of National Wildlife Areas or Migratory Bird Sanctuaries *(IUCN Category IV)* is dependent upon the biology of the species using the site. Sites that support at least one percent of the national population of a particular species are considered to be Key Habitat Sites. (Where appropriate, formal designation is sought for certain Key Habitat Sites). Establishment of Wildlife Sanctuaries has

been conducted by the Government of the Northwest Territories and the provinces on a case by case basis, to protect certain wildlife species or groups in specific areas. Reasons for establishing a sanctuary have included protection of remnant populations of rare species, protection of an introduced population of a threatened species and protection of a breeding habitat for concentrations of wildlife.

An inventory of *Category VI Sites* has been undertaken by the Yukon Territorial government but options for protection have not been finalized. Wildlife management areas in Quebec and Manitoba are managed resource areas *(IUCN Category VIII)* and have been established mainly on a case by case study and evaluation of wildlife and habitat needs.

Indigenous peoples have been and continue to be involved in the process leading up to the creation of protected areas. In many areas, specific proposals for habitat protection and conservation have come from indigenous peoples. Examples include: the Inuvialuit of the Western Arctic proposed the creation of the Northern Yukon national park in their land claim proposal; the Inuit of Clyde River have proposed the creation of a marine protected area at Isabella Bay; the Tungavik Federation of Nunavut proposed a number of protected areas in its comprehensive land claim.

4.1.2 Finland

Protected area programmes are based on a comprehensive survey of the types of areas or habitats to be protected. Assessment criteria have varied from wider criteria of National Parks (conservation, cultural and human living condition), to more specific criteria of e.g. Protected Mires. The Protected Mires Program has used as criteria general features; representativeness within a region or the whole country; occurrence of particular types of mires in a mire-complex; bird fauna; occurrence of endangered species; merits for research and education; and landscape-value.

4.1.3 Greenland/Denmark

Greenland's protected area program is based primarily on species' needs and the uniqueness of the area. Three areas are protected under the Nature Conservation Act for Greenland (1974). The National Park of North and East Greenland, the largest park in the world at 972,000 sq.km was established in 1974 as a "generous contribution from Greenland and the Danish Realm to the preservation of original and virginal environments". It forms a "wildlife sanctuary and a biological bank, the interest of which might accrue to the adjoining hunters' communities". The Melville Bay and Arnangarnup Qoorua Protected Areas were established, in part, to protect important polar bear habitat and denning sites and important birch stands in Greenland, respectively. In addition to areas protected under the Nature Conservation Act, eleven sites have been designated as Ramsar sites, two of which are included in the National Park. Nine were designated using Montreux criteria 1B (particularly good representative example of a natural or near-natural wetland, common to more than one biogeographical region). All sites were also chosen for their international importance for certain waterfowl species including White-fronted Goose, Arctic Tern, Brent Goose, Barnacle Goose, King Eider. A third component of Greenland's protected area program is its network of caribou reserves. At eleven ice-free communities in south-west Greenland, twenty percent of the land is set aside, usually the

important calving grounds. At these sites, hunting is not allowed as a means of protecting this important subsistence resource from over-exploitation. See also chapter 8.

4.1.4 Iceland

The aims are to protect the most important sites representing different habitat and landscape types. Area protection has not been based on systematic inventories, but mainly on a case by case evaluation. However, in recent years, area protection has relied increasingly on comparative surveys of particular areas and habitat types (e.g. freshwater systems, coastal lagoons, waterfalls, hot-springs). The criteria adopted vary, but are still rather arbitrary and depend to a large extent on the practical possibilities of having individual sites proclaimed as "protected".

4.1.5 Norway

Establishment of nature reserves *(IUCN Category I)* is mainly executed by the protection plans of each individual county, which are separated into different thematic plans based on systematic inventories and evaluations. The thematic protection plans include: bogs, coniferous forests, deciduous woodland, wetland, seabird habitat and occurrences of scientifically interesting geological sites. National parks *(IUCN Category II)* are primarily based on national plans proposed by the State Council for Nature Protection. The first plan (1964) addressed primarily alpine areas on state land. In 1986, a new national plan was presented, based on an evaluation of the quality of remaining large untouched areas. This new national plan which was adopted by the Norwegian Parliament in 1993, and which proposes areas including additional types of physical geographical regions, implies establishment of national parks also on private lands. Protected areas for landscape have so far not been based on systematic inventories, but mainly on a case by case study and evaluation.

4.1.6 Russia

New terrestrial or aquatic nature reserves and sanctuaries in the Russian Arctic are created to protect the habitat of rare and endangered species (walrus, polar bear, snow goose), or valuable hunting species habitat (reindeer, elk), or to protect unique ecosystems. In recent years, protection has been given to parts of the biosphere that have special ecological or historic cultural value for indigenous or local people. In 1994, Russia approved a plan for a Protected Area network to the year 2000, which is based primarily on biodiversity and ecosystem conservation. As part of the process, extensive wildlife and habitat mapping and inventory-taking has been underway.

4.1.7 Sweden

The Protected Areas in the Swedish Arctic are based mainly on the results of the *national virgin forest inventory* and *the mountain protection plan*. In the new National Park Plan physical geographical regions are used to point out proposed protected areas.

4.1.8 United States of America (Alaska)

Area protection in Alaska is based on both systematic inventories and evaluations, and a case by case study and evaluation. ANILCA - The Alaska National Interest Lands Conservation Act (1980) placed more than 393,000 km^2 of Alaska into new or expanded parks and refuges. It also protected 25 free-flowing Alaskan rivers in their natural state, and classified 227,000 km^2 of these lands as Wilderness. The Act broke new ground in a number of ways as a deliberate effort was made to give entire ecosystems protection status. Alaska Maritime Refuge includes major seabird colony sites and marine mammal rookeries throughout much of coastal Alaska, including most of the Aleutian Island. Along the Alaska Peninsula an effective continuity of wildlife habitat lands was created utilizing a variety of land classifications. Similarly, in the Brooks Range, protected habitats now extend from the Canadian border to the Bering Sea. Also, most of the Porcupine caribou herd's migration route lying within Alaska is protected.

4.2 Protected Areas in the Arctic - By Country and IUCN Category

The Protected Area situation in the eight Arctic nations is shown in Table 4.1, and Figure 4.1 - 4.5. All together some 280 protected areas, covering some 2 million km² or some 14% of the defined Arctic, have been designated. Those are areas >10 km^2 or isolated islands, all qualified for the UN-List, and corresponding with the IUCN Management Categories I-V. There are large differences both in the criteria between the IUCN Management Categories and in the way each country is using them, this item was discussed in detail at the second CAFF Working Group meeting in Fairbanks (May 1993). It was agreed in the Habitat Protection Working Group that only areas corresponding with the IUCN Categories I-V and >10 km^2 would be included in this report (it means that e.g. caribou reserves in Greenland are not included).

Table 4.1 - Protected Areas in the Arctic - By Country. Includes only areas qualified for the UN-list >10 km^2 (IUCN management categories I-V).

COUNTRY	NO. OF AREAS CATEGORY I-V	TOTAL AREA (KM²) CATEGORY I-V	% OF ARCTIC LAND AREA
Canada	46	440,801	8.4
Finland	52	25,905	32.6
Greenland/Denmark*	14	993,025	45.6
Iceland	23	9,159	8.9
Norway	36	41,611	25.4
Russia	25	214,121	3.4
Sweden	43	19,623	20.7
USA (Alaska)	41	331,425	56.1
Total	**280**	**2,079,616**	**14.0**

*Eleven areas are designated as Ramsar Sites. Two of these are within North and East National Park, nine are not protected according to Greenland's Nature Conservation Act. The protected areas in category I-V constitute 982 500 km² without the Ramsar-sites.

Note: The North and East Greenland National Park constitutes roughly half of the Protected Area of the Arctic. The USA has the largest area under protection with 56.8% of the Alaskan Arctic on the IUCN List. Canada and Russia have the least with respectively 8.0% and 3.4%.

4.3 Protected Areas By Habitat Type or Ecological Function - By Country

This section gives an overview of Protected Areas related to habitat types in each country.

4.3.1 Canada

Protected Areas and Habitats in Canada.

HABITAT TYPE/ ECOLOGICAL FUNCTION	NO. OF PROTECTED AREAS	PROTECTED AREAS (KM^2)	% OF TOTAL ARCTIC AREA
Wetlands	23[1,2]	83,975	1.6
Marine Areas	-	-	-
Forests	-	-	-
Important for Certain Species	22[1,2]	113,444	2.1
Geologically Interesting	-	-	-
Total	**45**	**197,419**	**3.7**

[1] Areas reported are National Wildlife Areas, Migratory Bird Sanctuaries, or Territorial (Yukon and NWT) Wildlife Sanctuaries and do not include all protected areas. All protected areas located in the Hudson Bay Plain Ecozone have been included under the wetlands habitat type (this zone ranges from 75% to 100% wetlands).

[2] Areas are listed under the primary category only. For example, although most Migratory Bird sanctuaries are established for certain species, they also contain marine areas, or wetlands etc.

4.3.2 Finland

The occurrence of forest (1992) is the only up-to-date overview for any habitat type of Protected Areas. For the Finnish Arctic two vegetational sub-areas have been used, namely orohemiarctic and northern boreal. The situation of protected forests is as follows:

In Orohemiarctic : 16,100 ha
In Northern boreal : 366,770 ha

Together these Protected Areas cover some 9.9% of Finland's "Arctic forests". (The percentage of forest conserved in Middle- and South Finland is considerably lower). About 85% of northern protected forests are over 100 years old (compare with about 20% for the rest of the country). An inventory of old-growth forests is in preparation for the southern part of Lapland.

4.3.3 Greenland/Denmark

Protected Areas and Habitats in Greenland.

HABITAT TYPES/ ECOLOGICAL FUNCTION	NO. OF PROTECTED AREAS	KM^2	% OF TOTAL ARCTIC AREA
Wetlands (Ramsar sites)	11*	10,445	0.5
Multi Purpose / Coastal	3	982,580	45.1
Total	**14***	**993,025**	**45.6**

*Nine Ramsar sites are not protected according to Greenlands Nature Conservation Act (two are inside North and East National Park)

4.3.4 Iceland

A division of protected areas into ecological groups or habitat types is in preparation.

4.3.5 Norway

Protected Areas and Habitats in the Norwegian Arctic.

HABITAT TYPES	PROTECTED AREAS KM²	% OF TOTAL ARCTIC AREA
Treeless, mainland	2,940	1.80
Glaciers, mainland	370	0.20
Glaciers, Svalbard	22,000	13.50
Tundra, Svalbard	12,900	7.90
Freshwater, mainland	168	0.10
Birch forest	797	0.50
Coniferous forest	99	0.06
Fjord/coastal area, mainland	60	0.04
Not specified	2,277	1.40
Total	**41,611**	**25.40**

4.3.6 Russia

Protected Areas and Habitats in the Russian Arctic.

HABITAT TYPES	NO. OF PROTECTED AREAS (IUCN I-V)	KM²	% OF TOTAL ARCTIC AREA
Glacier and polar desert	1	42,000	0.7
Tundra of all types	15	195,530	3.1
including:			
- arctic tundra	3	70,440	
- moss-lichens tundra	10	91,000	
- bush tundra	2	33,460	
Mountain tundra	1	18,870	0.3
Forest tundra & northern tayga	4	4,660	0.1
including:			
- forest-tundra (northern sparse growth of trees)	1	1,280	
- northern tayga	3	3,378	
Not specified	4	11,180	
Total	**25**	**272,240**	**4.3**

There are some discrepancies in the table due to the difference in the division of habitat types used for the main overview of the Russian Arctic and the overview of Protected Areas.

4.3.7 Sweden

Protected Areas are concentrated in the mountain/pre-mountain regions, and consist of natural landscapes of mountain, submountain birch forests, wetlands (mires), virgin coniferous forests, lakes and streams (the largest Protected Area is Vindelfjällen Nature Reserve - 5,500 km^2).

4.3.8 United States of America (Alaska)

A GIS approach has been used to prepare the table of habitat types in the Alaskan Arctic described by IUCN. Note that the table does not show area for IUCN category III lands. All these lands are included in category II or IV, because those are the categories that provide protected area status. Nature Landmarks in the U.S. have no protection status when they are within a park or refuge.

Protected Areas and Habitats in U.S. Arctic (Alaska).

ECOSYSTEM	Area (ha) IUCN II (and % of total Arctic)	Area (ha) IUCN IV (and % of total Arctic)	Area (ha) IUCN II+IV (and % of total Arctic)
Moist Tundra	934,841 (1.57)	9,235,255 (15,47)	10,170,096 (17.03)
Wet Tundra		6,022,657 (10,09)	6,022,657 (10.09)
Alpine Tundra	2,566,823 (4.30)	8,305,861 (13,91)	10,872,684 (18.21)
High Brush	424,341 (0.71)	2,090,670 (3,50)	2,515,011 (4.21)
Low Brush - Muskeg - Bog		19,321 (0.03)	19,321 (0.03)
Water	11,733 (0.02)	441,109 (0.74)	452,842 (0.76)
Glacier	104,862 (0.17)	115,598 (0.19)	220,460 (0.37)
Total	**4,042,600 (6.77)**	**26,230,471 (43.93)**	**30,273,071 (50.70)**

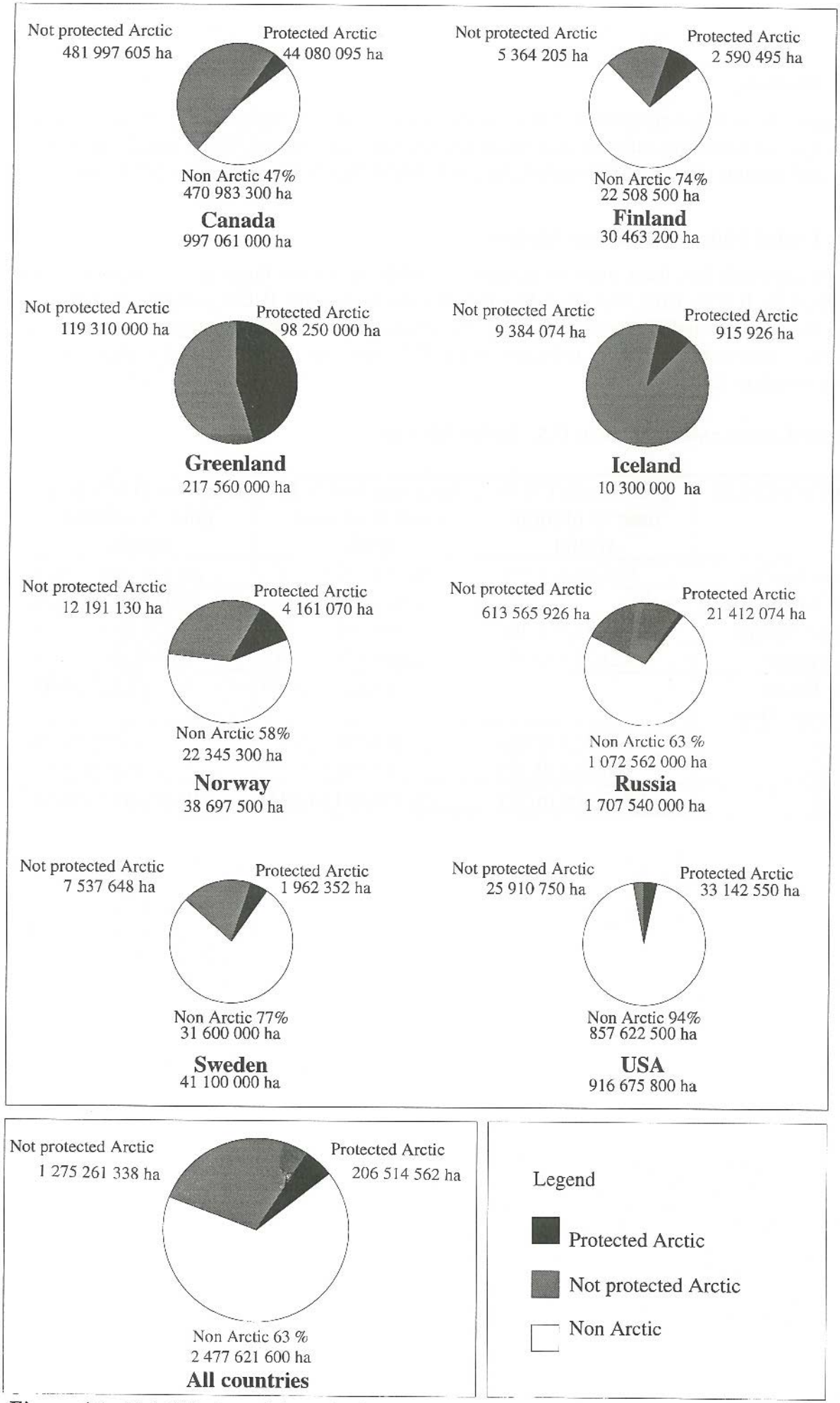

Figure 4.1 - Total Protected Area in the Arctic Displayed by Country

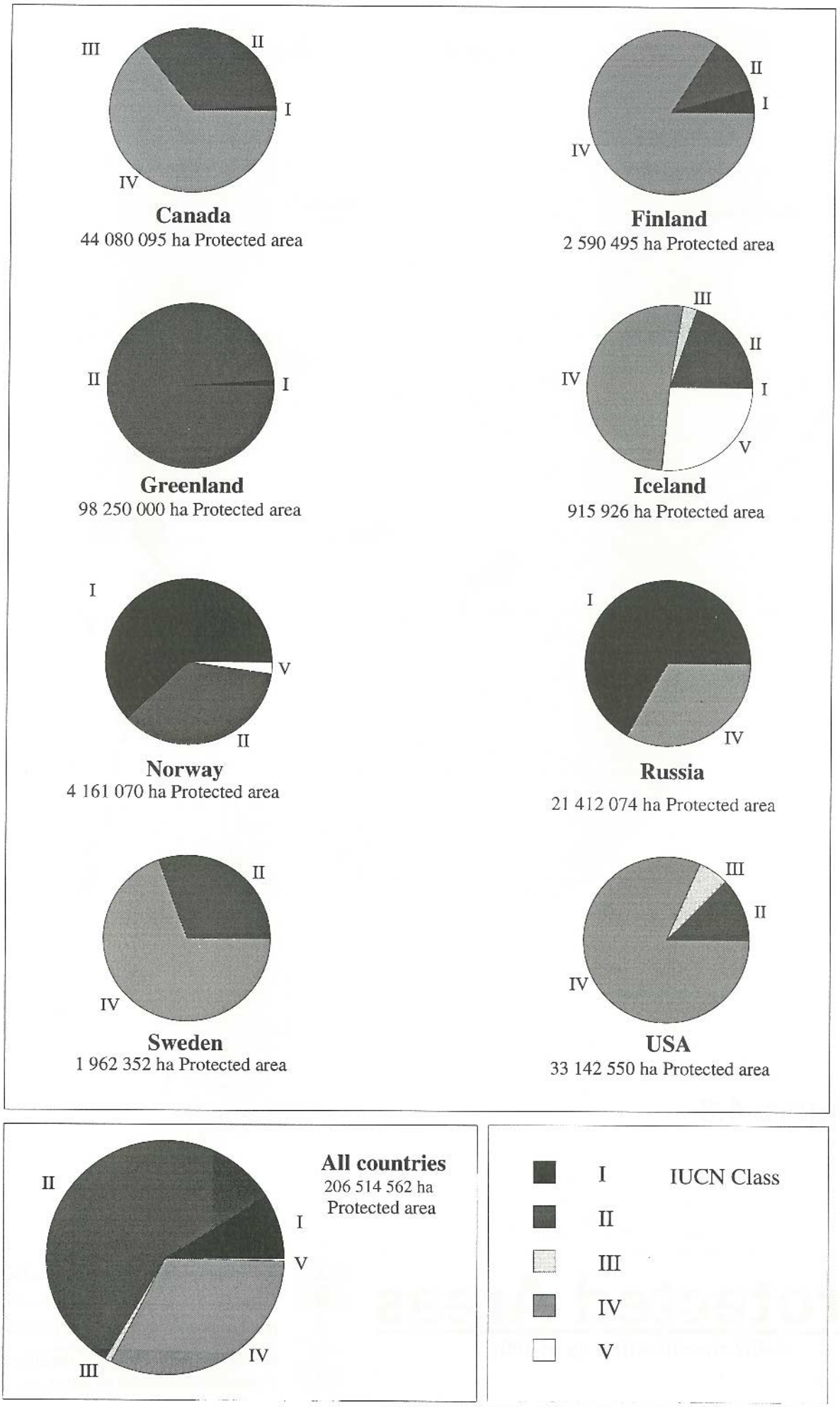

Figure 4.2 - Total Protected Area in the Arctic Displayed by IUCN Category and Country

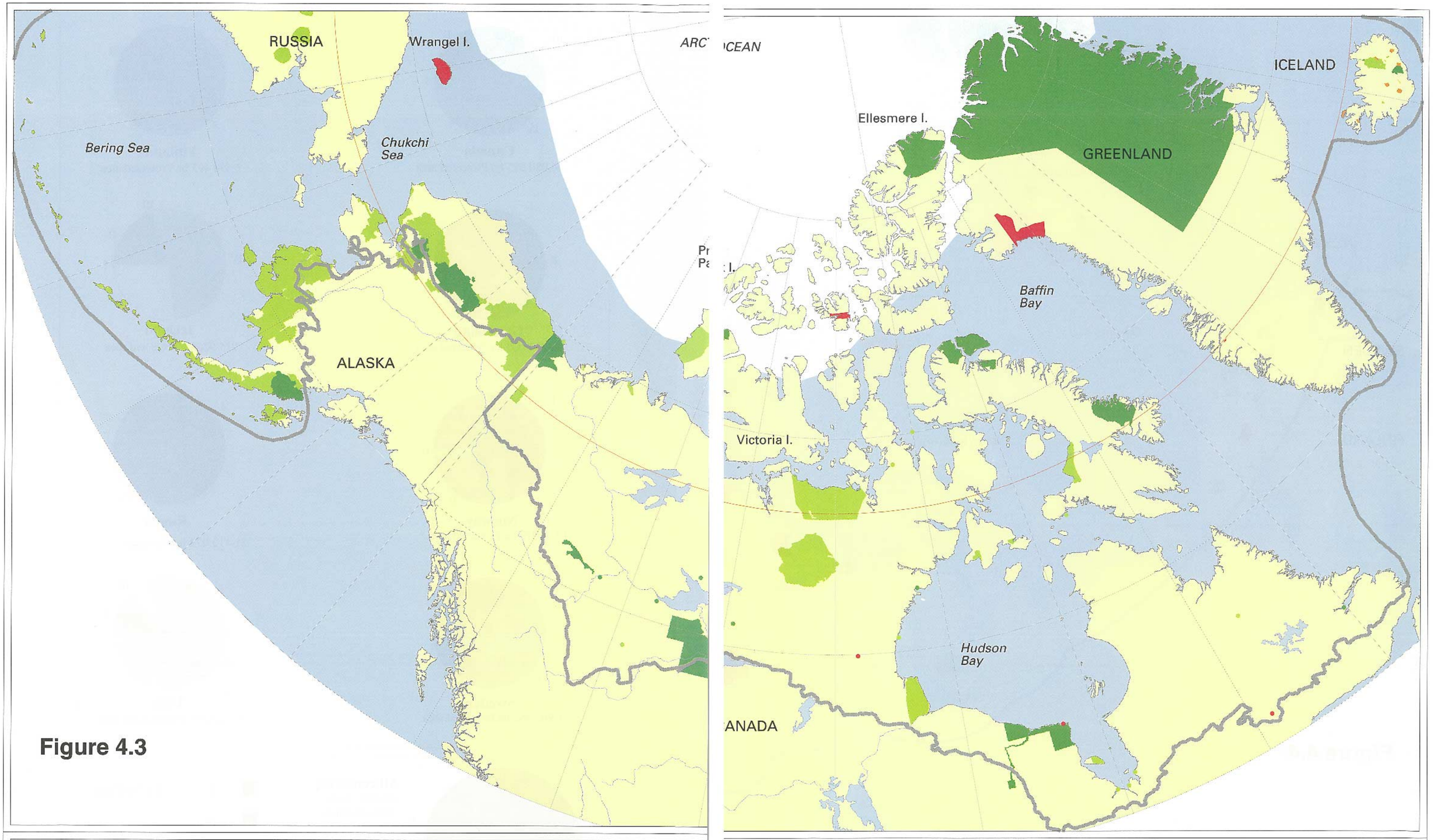

Figure 4.3

Protected Areas

IUCN classification as of 1993

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.

I	Strict Nature Reserve, Scientific Reserve
II	National, Provincial or Territorial Park
III	Natural Monument, Natural Landmark
IV	Nature Conservation Reserve, Managed Nature Reserve, Wildlife Sanctuary
V	Protected Landscape or Seascape
	Southern limit of Arctic data
	Arctic Circle (Latitude: 66° 33′ North)

Compilation and map production by:

Norway

UNEP

WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area.
UNEP/GRID-Arendal August 1994.

ARCTIC ENVIRONMENT **CAFF** Conservation of Arctic Flora and Fauna

Habitat Conservation report No. 1
The State of Protected Areas in the Circumpolar Arctic 1994

Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

GREENLAND

Svalbard

NORWAY

SWEDEN

FINLAND

Barents Sea

Franz Josef Land

Novaya Zemlya

Kara Sea

Figure 4.4

CTIC OCEAN

Chukchi Sea

Bering Sea

Wrangel I.

New Siberian I.

Severnaya Zemlya

Okhotsk sea

RUSSIA

Protected Areas

IUCN classification as of 1993

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Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

Figure 4.5

CAFF Conservation of Arctic Flora and Fauna

ARCTIC ENVIRONMENT

Habitat Conservation Report No. 1

The State of Protected Areas in the Circumpolar Arctic 1994

Protected Areas

IUCN classification as of 1993

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Southern limit of Arctic data as provided by member countries

Arctic Circle (Latitude: 66° 33′ North)

Source data supplied by CAFF member countries:

Canada, Finland, Greenland/Denmark, Iceland, Norway, Russia, Sweden, USA

Compilation and map production by:

Norway (Directorate for Nature Management) — UNEP — World Conservation Monitoring Centre

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.

4.4 Protected Areas in the Arctic and International Agreements

4.4.1 The Ramsar Convention

The Convention on Wetlands of International Importance (Ramsar 1971) provides a framework for international cooperation for the conservation of wetland habitats. It places general obligations on contracting party States relating to the conservation of wetlands throughout their territories, with special obligations pertaining to those wetlands which have been placed on the List of Wetlands of International Importance. See Table 4.2 and Figure 4.6.

All eight Arctic nations have signed the Ramsar Convention.

Table 4.2 - Ramsar Sites in the Arctic - By Country.

COUNTRY	NO. OF SITES	AREA(km^2)
Finland	1*	314
Canada	9	123,516
Greenland/Denmark	11**	10,445
Iceland	2	575
Norway	6	21
Russia	1	70
Sweden	5	2,547
USA (Alaska)	2	1,299
Total	**37**	**138,787**

* Designed as a Ramsar Site but not protected according to National Nature Conservation Act.
** Nine designated as Ramsar Sites but not protected under the Nature Conservation Act (two sites are within North and East National Park.

Actions Underway and Planned
In Finland as of early 1994, plans were about to be finished to nominate seven new Ramsar sites in the Arctic which would cover a total area of 2,383 km^2. Norway has a plan for designation of a number of new Ramsar sites, and expects to fulfill its obligations to the Ramsar Convention by the turn of this century. During 1994/95 two new sites will be designated in the Norwegian Arctic. Russia intends to propose for inclusion on the Ramsar-list: Lena-Delta Nature Reserve, Purinsky Sanctuary, islands in the delta of the Ob River and two territories in the Nenezky district (Archangel region) - "Russian Zavorot" and "Haypudirskaya Bay".

4.4.2 The UNESCO Man and the Biosphere Reserve (MAB) Programme

Biosphere Reserves differ from the preceding types of sites in that they are not exclusively designated to protect unique areas or important wetlands but instead have a range of objectives which include research, monitoring, training and demonstration in addition to conservation roles. In most cases the human component is vital to the functioning of the biosphere reserve, which does not necessarily hold true for either World Heritage or Ramsar sites. There is a stated aim to develop a biosphere reserve network representative of the world's ecosystems.

The establishment of biosphere reserves is part of an international scientific programme, *the UNESCO Man and the Biosphere (MAB) Programme* and is not covered by a specific convention. The objectives of the network of biosphere reserves, and the characteristics which biosphere reserves might display, are identified in the Action Plan for Biosphere Reserves published in 1984.

Iceland does not have any Biosphere Reserves. Neither Finland nor Canada have Biosphere Reserves in the Arctic. In Greenland, North and East Greenland National Park is a designated Biosphere Reserve. The U.S.A. and Russia have considerable area in Biosphere Reserves. See Table 4.3 and Figure 4.6.

Table 4.3 - Biosphere Reserves in the Arctic - By Country.

COUNTRY	NO.	NAME OF AREA	KM²
Canada	-		
Finland	-		
Greenland/Denmark	1	North and East Greenland National Park	972,000
Iceland	-		
Norway	1	North-east Svalbard NR	19,030
Russia	1	Laplandsky NR	2,684
Sweden	1	Lake Torne Trask	965
USA (Alaska)	2	Aleutian Islands, Noatak	44,437
Total	**6**		**1,039,116**

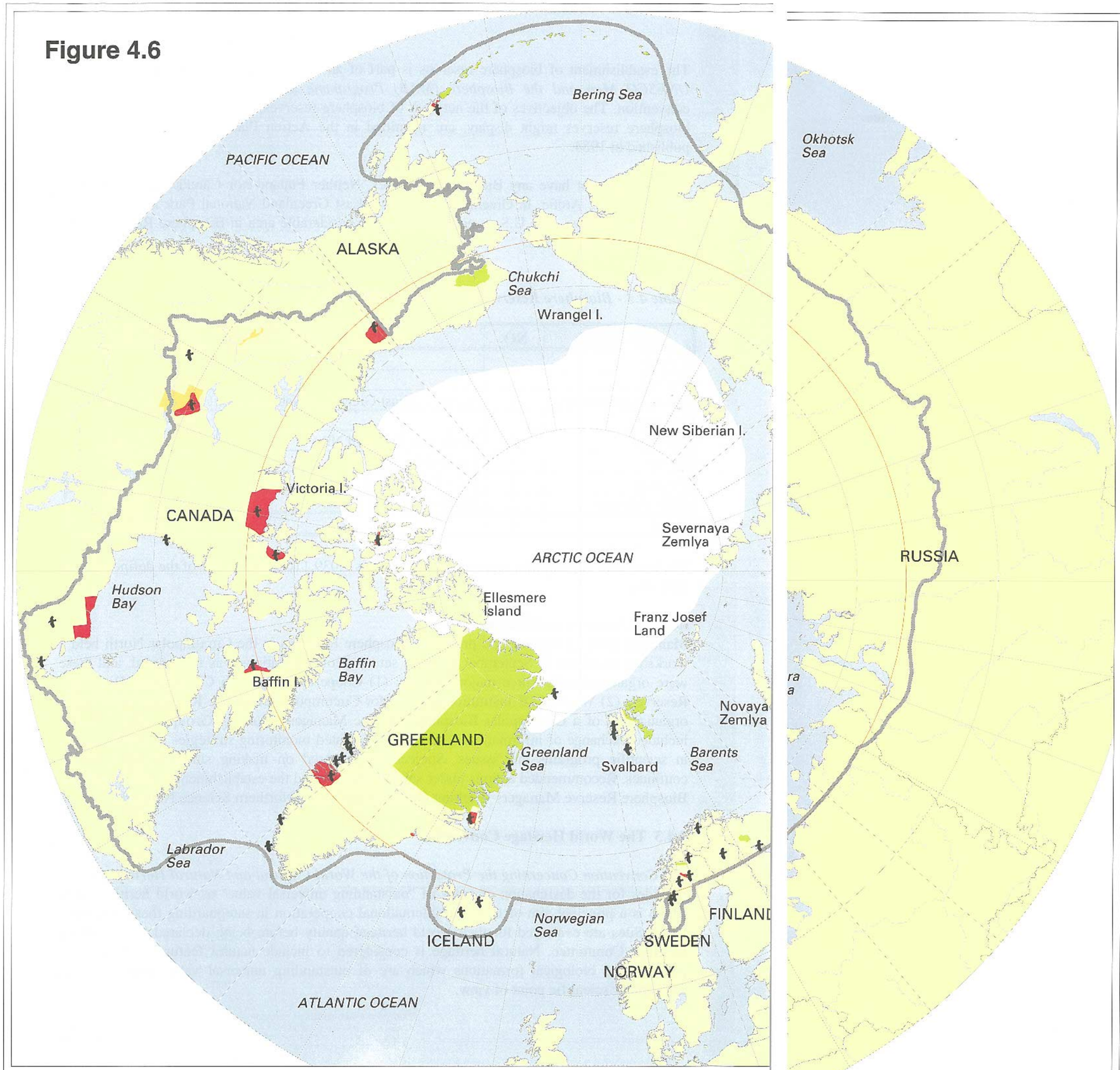
The total area of biosphere reserves in the Arctic is 1,039,116 km^2 or 7.0% of the defined Arctic land area.

Actions Underway and Planned
Managers from 12 existing and proposed Biosphere Reserves in the Circumpolar North held a workshop in Alaska in September 1992. A set of recommendations was formulated, and these were organized under three major subjects: (1) Cooperation between Circumpolar Biosphere Reserves; (2) What MAB Institutions can do for Circumpolar Biosphere Reserves; and (3) the organization of a Circumpolar Biosphere Reserve Managers Working Group. As to (1), this included exchange of information, developing integrated monitoring strategies and engagement in scientific programs and issues. Subject (2) centered on making sure information flow continues. Recommended actions under subject (3) included the establishment of a Circumpolar Biosphere Reserve Managers Working Group as part of the Northern Science Network.

4.4.3 The World Heritage Convention

The Convention Concerning the Protection of the World Cultural and Natural Heritage (1972) provides for the designation of areas of "outstanding universal value" as world heritage sites. There is a principal aim of fostering international cooperation in safeguarding these important areas. Sites are evaluated for their world heritage quality before being declared by the World Heritage Committee. Natural heritage is considered to include natural features consisting of physical and biological formations which are of outstanding universal value from either an aesthetic or scientific point of view.

Figure 4.6



CAFF Conservation of Arctic Flora and Fauna

ARCTIC ENVIRONMENT

Habitat Conservation Report No. 1

The State of Protected Areas in the Circumpolar Arctic 1994

Ramsar Sites, Biosphere Reserves and World Heritage Sites

- Ramsar Sites
- Biosphere Reserves
- World Heritage Sites
- Arctic Circle (Latitude: 66° 33′ North)
- Southern limit of Arctic data as provided by member countries

Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

Compilation and map production by:

Norway — UNEP — WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.

The World Heritage Convention has been ratified by all Arctic Nations except Iceland. However, only Canada has natural sites inscribed by the Committee of the Convention. See Table 4.4 and Figure 4.6.

Table 4.4 - World Heritage Sites in the Arctic.

NAME OF AREA	(Year)	KM²
Wood Buffalo National Park *	(1983)	*44,807*
Nahanni National Park Reserve	(1978)	*4,766*
TOTAL		**49,573**

* Only part of the park (9,450 km²) is located in the Arctic. Total area given is for the entire park.

Together these two sites cover some 14,216 km^2 in the Arctic - or approximately 0.3% of Arctic Canada.

Actions Underway and Planned
Finland is preparing a proposal for World Heritage Sites. Among them, under consideration is Lake Inari with surrounding mire and forest areas. Through a Nordic Council of Ministers, Arctic sites in several Nordic countries will be considered nominated.

5. PROTECTED AREA LEGISLATION, ADMINISTRATION AND MANAGEMENT

This Chapter provides an overview of the legal and administrative mechanisms in place to establish and manage Arctic Protected Areas in each country.

5.1 Canada

Protected Areas in Canada are established under a variety of legislations, and eight jurisdictions govern the Protected Areas. National Parks, National Wildlife Areas and Migratory Bird Sanctuaries are under Federal jurisdiction. The other categories of Protected Areas (except Ramsar sites and World Heritage Sites) are under the jurisdiction of territories or provinces. Ramsar sites and World Heritage Sites may be under joint jurisdiction.

Regulations and restrictions

Due to the variety of jurisdictions and legislation, the level of protection can differ greatly from one area to another. Generally, development activities are prohibited, and public activities are permitted on a non-consumptive, non-motorized basis. With few exceptions, aboriginal people are allowed to continue traditional activities. In some areas hunting and fishing are allowed for people other than aboriginal. Such activities are conducted under a set of regulations and licenses. For example, in parks under the *Parks Act* in Saskatchewan Province, the multiple use concept is followed and mineral exploration and forest harvesting can occur but require special permits.

Management authorities

The Federal Government (Canadian Parks Service and Environment Canada) have administrative responsibility in areas under Federal jurisdiction (in National Landmark areas it is in cooperation with local and regional authorities). In provinces and territories, Protected Areas are managed by different departments and ministries at the provincial/territorial level.

5.2 Finland

Nature Protection Areas in Finland are established according to the Nature Conservation Act (1923). Twelve Wilderness Areas are designated according to the Wilderness Act (1990) (chapter 9). Protection of rapids has been accomplished using the Law on Protection of Rapids and the Law on the Special Protection of Ounasjoki Watershed Area (1988) (chapter 9).

Regulations and restrictions

Any kind of human interference is prohibited in the *Strict Nature Reserves* (IUCN Category I). Access of visitors is allowed only by special permission. However reindeer herding is allowed in all but one reserve (Malla SNR). In *National Parks* (IUCN Category II and IV) all activities which can alter the natural state of the area are prohibited. Visitor access is allowed by foot,

skis and rowing. Regulations concerning the fishing and hunting rights (of local residents) vary in different parks. In *Protected Mire Areas* (IUCN Category IV) only those activities which affect the natural water balance are prohibited.

Management authorities

At the national level, the Ministry of the Environment has the overall authority. The Finnish Forest and Park Service (FFPS) and the Finnish Forest Research Institute (FFRI) have the overall responsibility. On the provincial and local levels, both FFPS and FFRI are involved.

5.3 Greenland/Denmark

The North and East National Park, Melville Bay and Arnangarnup Qoorua (Paradise Valley) were established under the *Nature Conservation Act* which was adopted by the Greenland Home Rule Government in 1980. It was followed in June, 1987 by parliamentary regulations on the protection of the environment. Many are based on old traditions for local management of fish and game stocks (practices that were prevalent as early as, or pre-date, colonial times). The regulations consist of a mosaic of central Home Rule Government regulations and decentralized local authority rules. Other relevant legislation are the Landsting Acts numbers 11, 15 and 5.

Regulations and restrictions

In 1989 and 1992 the Greenland Home Rule Government issued regulations for its National Park (17 June 1992), Melville Bay (17 May 1989) and Arnangarnup Qoorua (20 October 1989). In the National Park, animals and birds are totally protected and the park cannot be physically disturbed without prior permission of the Greenland Home Rule Government. The public has access to the National Park if certain safety and security requirements are met and permission is granted by the Home Rule Authority. The Home Rule Government's National Park Committee monitors this. In the National Park and in most of the Ramsar protected areas, hunting is permitted subject to local authority regulations. For example, in the National Park, hunters from Thule and Scoresbysund municipalities have free access at any time to carry on traditional hunting from dog sledge, kayak or motor boat. Greenland also has a system in place at the local community level to protect caribou herds. At least 20% of the land area around the ice-free local communities in southwest Greenland must be set aside and where no hunting is permitted. The location of these protected sites is negotiated between the local authorities and the Greenland Home Rule Government. Greenland also has regulations in place to protect its wood stands. It also fully protects the marine zone along the North and East National Park to a distance of three nautical miles. In Greenland, all seabird colonies (defined as having ten or more breeding pairs) are protected against all human disturbance (e.i. noise, encroachment) using a species-specific system. For example, no activity is allowed within five nautical miles of a murre colony. No activity is allowed within 200 metres of an eider colony. Enforcement of Greenland's regulations on hunting and access, however, is difficult.

Management authorities

Within Greenland, the Greenland Home Rule is the central authority.

5.4 Iceland

The provision for environmental protection in Iceland is made in the *Nature Conservation Act (no. 47/1971)*. The areas protected by that Act, together with the *Myvatn-Laxa Nature Conservation Area Act (no. 36/1974)* and the Geysir area (1991), are mandated to the Nature Conservation Council on behalf of the Ministry of the Environment. (Thingvellir National Park is declared a national heritage by special law (act no. 59/1928) as a common heritage of the Icelandic nation, mandated to a parliamentary committee on behalf of the Prime Minister). The following categories of the Nature Conservation Act are the basis for area protection: *National Parks* (2 areas), *Nature Reserves* (29 areas), *Natural Monuments* (29 sites) and *Country Parks* (9 areas).

Regulations and restrictions

Three principal rules are valid for most areas protected by the Nature Conservation Act: 1) Public access will be in accordance with the limitations set for each area, 2) All construction is subject to the Nature Conservation Council's permission, 3) Provision of traditional uses is valid, e.g. grazing and hunting. In addition to these principles, regulations in conservation areas may vary by site and protection category.

Management authorities

In addition to the Nature Conservation Council, Iceland has a system of local Nature Conservation Committees and County Park Committees. *National Parks* (on state-owned land only) are administered and managed by the Nature Conservation Council (NCC) under the auspices of the Ministry of Environment. However one park (Thingvellir) is administered directly by a parliamentary committee. *Nature Reserves* and *Natural Monuments* are also the responsibility of the NCC. Counties each have Nature Conservation Committees and the NCC can entrust Nature Conservation Committee of the relevant county to manage parks. *Country Parks* are managed by the relevant local authorities which appoint their representatives to a County Park Committee, which administers the area. *Myvatn-Laxa Nature Conservation Area* is administered by a rural district council, but construction projects cannot be undertaken without prior consultation with the NCC and the Myvatn Research Station.

5.5 Norway

Two Acts are important for the establishment of Nature Protection Areas in the Norwegian Arctic: The Nature Conservation Act (revised 1970) for the Norwegian mainland and the Svalbard Act (1925) for Svalbard.

Regulations and restrictions

In National Parks on the mainland, there are no restrictions on public access except by motorized traffic which is generally forbidden (there are exceptions for the Sami People). As a general rule, grazing and hunting (according to the Wildlife Act) are permitted as well in several parks. The level of restrictions in the Nature Reserves vary - e.g. recreational traffic is allowed only at certain periods of the year. In Protected Areas in Svalbard, there are strict regulations on motorized traffic.

Management authorities

The overall administrative responsibility for all areas granted protection under the Nature Conservation Act is vested with the Directorate for Nature Management. The County Governor is responsible for the management of all areas, and the State-Owned Land and Forest Company has the practical day-to-day management of National Parks and some of the other protected areas on behalf of the County Governor. The protected areas on Svalbard are managed by the local County Governor (Sysselmannen) in direct consultation with the Ministry of Environment.

5.6 Russia

Protected areas in the Russian Arctic are established according to the Law of the Russian Federation "On Environmental Protection" (19.12.1991), and regulations about state nature reserves in the RSFSR (Governmental Act of 18.12.1991).

Regulations and restrictions

In areas of IUCN Category I, activities are prohibited, except for scientific and research activity. Some limited amount of resource use may be permitted for educational or household purposes and for traditional nature management by indigenous people. In the areas of category IV, VI and VII, traditional forms and types of natural resource use are allowed.

Management authorities

The Zapovedniks (Strict Nature Reserves) are managed on a national level. Other Protected Areas have provincial management. Several sanctuaries are managed on the federal level.

5.7 Sweden

National Parks and Reserves (IUCN Category II and IV) are established according to the Nature Conservation Act. Crown Reserves (Category VI) are protected administratively by the landowner.

Regulations and restrictions

The National Parks are totally protected against exploitation, but reindeer grazing, snowmobiling and some hunting by the Sami people is allowed. The same rules for reindeer grazing and hunting occur on the Reserves, except that hunting is permitted according to the Hunting Law. Forestry is not allowed on Crown Reserves.

Management authorities

National Parks (IUCN Category II) and Reserves (Category VI) are managed by county administrative boards. The Crown Reserves (Category VI) are owned by the State (large areas in the mountain and premountain region) and are also managed by the county administrative boards. Areas in the lowland are managed by the landowner (Doman AB).

5.8 United States of America (Alaska)

Protected Areas in Arctic Alaska are established according to legislation provided by two jurisdictions: Federal and State. Federally protected areas include National Wildlife Refuges, National Parks, National Preserves and National Monuments. Federal lands in Alaska having broad, "multiple-use" designations are not included as Protected Areas in this report. The Alaska National Interest Lands Conservation Act (ANILCA) of 1980, placed more than 393,000 km² of Alaska into new or expanded parks and refuges. Prior to ANILCA, refuges were established according to several Executive Orders. State lands comprise Game Refuges, Critical Habitat Areas and Game Sanctuaries. The Protected Areas (State) were established according to varying Alaska Statutes.

Regulations and restrictions

Most National Parks established by ANILCA permit subsistence activities for local, rural residents where such use occurred prior to 1980. This is true for all the National Parks considered in this report except for Katmai National Park. In National Preserves, sport hunting, fishing and some trapping activities are permitted. In lands within the national wildlife refuge system, land uses other than wildlife protection, (e.g. hunting, fishing and trapping) may be permitted under appropriate regulations. At the discretion of the Secretary of the Interior, refuges may be opened to oil and gas exploration and leasing. A special area permit is required for any habitat altering work, including any construction activity, in a designated state refuge, critical habitat area or sanctuary. The only State Park (Wood-Tikchik SP) is classified into three land use zones (recreational, natural and wilderness) with different restriction levels.

Management authorities

The overall management authorities are National and State. Agencies that administer protected Federal Land in Arctic Alaska are the U.S. National Park Service, the US Fish and Wildlife Service and the Bureau of Land Management. At the State level, management is the responsibility of the Alaska Department of Fish and Game and the Department of Natural Resources. (See Appendix II for additional information on Alaska).

5.9 Summary

The necessary legislation for nature protection in the Arctic seems to be available in all Arctic nations. The level of restrictions in the protected areas varies. In some areas (e.g. Strict Nature Reserves in Finland and areas of IUCN category I in Russia) all types of human interference are prohibited without special permission (mainly granted for scientific activities). However, in most Protected Areas there are practically no restrictions on public access, except for the use of motorized vehicles.

As a general rule, some form of regulated hunting in Protected Areas is permitted in the Nordic countries and in Greenland. In Alaska, hunting, trapping and fishing are generally allowed in Protected Areas, except for State Game Sanctuaries and some National Parks. There is also a subsistence harvest priority given to rural residents of Alaska, including both Natives and non-Natives, whenever it is necessary to restrict harvest of fish and wildlife populations. In the other Arctic nations, hunting is permitted for aboriginal peoples according to special rights. Grazing

and reindeer herding is allowed in the protected areas of the Nordic countries and in the Bering Land Bridge National Preserve in Alaska.

The type of structure in place to manage Protected Areas varies among the Arctic countries and often among different categories of protected area within a country. In most cases, there is some sort of "hierarchical model" with some areas and regulations administered and managed by central authorities and others, by local authorities.

6. HUMAN ACTIVITIES AND FACILITIES IN ARCTIC PROTECTED AREAS

6.1 Research and Monitoring - By Country

6.1.1 Canada

Examples of research and monitoring activities which take place in Canadian protected areas under various jurisdictions are briefly described with reference to IUCN Categories. IUCN Category I (Manitoba): Sporadic research activities have been conducted under permit, and reserves are monitored infrequently - ref. Manitoba Ecological Reserve Act. IUCN Category II (Newfoundland): There is not an established program for research or monitoring in provincial parks in Newfoundland. Greater emphasis is placed on creation of ecological reserves. Federal: Most of the research in the northern National Parks pertains to the management of the parks themselves e.g. wildlife and visitor impact studies, archeological surveys. Hydrological studies that contribute to a broad regional understanding are also undertaken. IUCN Category III (Various): Considerable research on terrain features has previously been completed. However none is currently underway although the sites are considered important benchmarks for global warming. IUCN Category IV (Federal): Bird Sanctuaries are foci for considerable migratory bird research because they usually contain significant concentrations of one or more species. Several sites contain rustic buildings of cultural value. In Wildlife Sanctuaries in the Northwest Territories research activities vary from none to year-round intensive studies. (In the Mackenzie Bison Sanctuary research is conducted on bison, furbearers, moose and their habitats). Sanctuaries may contain basic research facilities, i.e. rustic accommodations. IUCN Category V & VI (Federal): Some monitoring of the local wildlife is undertaken in Category V. No research has been undertaken in Category VI.

6.1.2 Finland

Research activities are concentrated at university biological research stations close to protected areas. In addition some research activities are conducted in the three national parks *Pallas-Ounastunturi, Pyhatunturi* and *Urho Kekkonen*. Monitoring of air pollution takes place in *Pallas-Ounastunturi National Park*. Multi-disciplinary comprehensive monitoring takes place in *Kevo Strict Nature Reserve*. There are two research stations inside protected areas in Finland (Kevo Strict Nature Reserve and Varrio Strict Nature Reserve). A multi-disciplinary monitoring station in Kevo SNR belongs to the UNECE International Cooperative Programme on Integrated Monitoring.

6.1.3 Greenland/Denmark

The Natural Resources Office deals with regulations for fisheries and biological research. The Natural Resources Office works in close consultation with scientists at various research institutions and with relevant international organizations. Several research projects (wildlife biology, botany and archaeological studies) are executed within the North and East National Park and other protected areas. Several vegetation projects are being carried out, including GIS mapping and extensive field work. One involves the establishment of a monitoring site for

flowering plants, bryophytes and sun lichens along a 6.6 km transect from shore to an elevation of 600 m (being expanded to 1,050 m). The site encompasses a river system and drainage area. Muskoxen and caribou populations are monitored and the results are used in establishing hunting regulations. There are several weather stations inside Greenland's Protected Areas and plans are underway to establish a biological research station in the National Park. In 1994, the Greenland Parliament approved a Greenland-based Institute of Nature and Environment which will conduct research on natural resources and the environment.

6.1.4 Iceland

Research activities are allowed in all protected areas in Iceland, but must be approved by the Nature Conservation Council or the committee that the council has entrusted to manage the protected area. Major nature and environmental research projects have been undertaken in the *Thingvellir National Park* and in the *Myvatn-Laxa Nature Conservation Area.* Systematic monitoring takes place only in the *Myvatn-Laxa Nature Conservation Area*, and Myvatn Research Station is sited here.

6.1.5 Norway

Research activities in protected areas must be approved by the County Governor's Environment Department. Research activities and monitoring is carried out in several National Parks and Nature Reserves in the Norwegian Arctic. Some examples: In Dividalen National Park there is monitoring projects concerning precipitation, soil, epiphytic lichens and vegetation (in permanent analysis plots), and monitoring of populations and reproduction of arctic foxes, small rodents, passerines and raptors. In Jav'reoaivit Nature Reserve research is carried out regarding effects on flora from grazing by reindeer. Research activities are also carried out in several seabird reserves. Monitoring of effects from air pollution on soils, vegetation and forest trees are carried out in Pasvik National Park and Pasvik Nature Reserve. As regards research projects on Svalbard, some of the samplings are executed in protected areas.

6.1.6 Russia

Regular research activities and monitoring are undertaken concerning wildlife, vegetation and ecosystems in all protected areas of IUCN Category I. In areas of IUCN Categories IV, VI and VII there is only a case by case study and evaluation. Systematic (annual) inventories and evaluations (so called Chronicles of Nature) allow follow up on the positive and negative changes occurring in protected areas. In the Russian Federation, Arctic research is carried out through the Ministry of Protection of the Environment and Natural Resources, Moscow State University, the Research Institute of Nature Conservation and Reserves, the Komarov Botanical Institute, the Centre of Studies of Integrated Problems of the North, and others. Research is being carried out at the species level (flora and fauna) and the ecosystem level. Extensive biodiversity mapping projects are underway.

6.1.7 Sweden

A research centre is situated in Abisko National Park. Monitoring activities are concentrated in Vindelfjällens Nature Reserve. The Swedish Arctic national parks were originally established among others to facilitate research in virgin areas. Particularly during the last decades, several research projects on e.g. large carnivores and relations between carnivores and semi-domestic reindeer have been carried out in the parks.

6.1.8 United States of America (Alaska)

Research activities and baseline investigations occur on a regular basis on both Federal and State lands. These cover a broad spectrum of natural and cultural resource issues (ecological processes, wildlife biology, flora, plant communities, vegetation mapping, air quality, ethnography, and archeology). The University of Alaska conducts long-term studies on Bureau of Land Management Land at *Toolik Lake ACEC* (Area of Critical Environmental Concern). Monitoring is performed on a regular basis by biologists, other scientists, and the management staff of conservation units. Some of these people also have collateral law enforcement officers who work for either a particular federal land management agency or for the State of Alaska as Fish and Wildlife Protection Officers.

6.2 Specific Rights of Indigenous or Local People - By Country

6.2.1 Canada

Canada has recognized the rights of indigenous peoples to lands and resources, and to practice their traditional way of life, including hunting, fishing and trapping. Consequently, indigenous peoples have been and continue to be involved in the processes leading to the creation of protected areas. Moreover, the legal foundation of protected areas within land claim settlement regions is to be found in the agreements made between Canada and aboriginal peoples, and the legislation which recognizes and gives authority to these governments. These agreements also frequently establish co-management regimes, both for protected areas, and for non-designated areas to ensure habitat protection and resource conservation. Co-management regimes also provide a basis for shared responsibility for research and monitoring initiatives. Examples include the Fisheries Joint Management Board created under the Inuvialuit Settlement Act, and the Inuvialuit Game Council. In non-designated areas, the right to hunt and fish for food is clearly established by law.

6.2.2 Finland

Reindeer herding is allowed for local residents in Protected Areas (there is one exception). Hunting is allowed to local people inside their home communes. The right includes hunting for game in nearly all the protected areas. Local people who have the right to a subsistence livelihood may also have some special rights, e.g. to build huts for hunting and fishing in Protected Areas. Permission will, however, be granted on a case by case basis by authorities.

6.2.3 Greenland/Denmark

There are extensive rights for native people to hunt and exercise traditional hunting practices in the North and East National Park of Greenland. (See Section 4.1.3)

6.2.4 Iceland

There are no specific rights of local people in the Protected Areas as such, but usually the landowner maintains the rights to hunt (within the framework of general laws relating to hunting), to grazing livestock, and to fishing.

6.2.5 Norway

The Sami People have specific rights concerning reindeer herding in the National Parks. In general, hunting and fishing is allowed in most Protected Areas in Arctic (mainland) Norway (regulated by the Wildlife Act). There is no native population in the Svalbard Archipelago, and the few local residents have no specific rights in the Protected Areas.

6.2.6 Russia

Interests of indigenous people are usually taken into account when designing nature reserves. In the existing Reserves, in the cases of emergency it is possible to mark special small zones where reindeer can graze. The same is possible in Sanctuaries. Legislation does not specifically regulate this question.

6.2.7 Sweden

The Sami people have specific rights (reindeer herding, hunting, fishing, off road transport etc.) in several of the Protected Areas. Construction of buildings as well as other exploitation as part of range management activities within Protected Areas, has to be separately examined by the County Administrative Board.

6.2.8 United States of America (Alaska)

The Alaska National Interest Lands Conservation Act, which established or expanded all of the federally managed Protected Areas in Alaska, makes no distinction between Natives and non-Natives. Rather, the opportunity for continuation of subsistence use is based on rural residency. Hunting, fishing, and trapping are generally allowed in Protected Areas, except for state game sanctuaries and some national parks. In situations where harvest of fish and wildlife populations must be restricted, a preference is granted for subsistence use based on the following criteria: 1) customary and direct dependence upon the populations as the mainstay of livelihood; 2) local residency; and 3) the availability of alternative resources. Federal land management agencies are also required to consider subsistence in making land use decisions. Any proposed action must be evaluated to determine its effect on subsistence uses and needs, the availability of other lands to achieve the same purpose, or other alternatives to the proposed action. If it is found that the proposed action would significantly restrict subsistence, a whole series of public notice

requirements must be met before the proposed action could be implemented. The Marine Mammal Protection Act of 1972 exempts Alaska Natives from the moratorium on taking marine mammals, provided the taking is conducted for the sake of subsistence or for the purpose of creating and selling authentic native articles of handicraft and clothing. This law must be re-authorized periodically.

6.3 Management Staff (Wardening) - By Country

6.3.1 Canada

All National Parks are staffed with Park Wardens, as well as nature interpretive staff. All staff are well qualified. Training consists of at least a two-year diploma program, but many have university degrees in biology or resource management. National Parks are regularly patrolled. National parks in the Eastern and Western Arctic, in particular, are increasingly staffed by Inuit. Opportunities for indigenous peoples in national parks are expected to increase, as the demand for wardens and guides grows in response to eco-tourism. The provincial/territorial park systems in most cases follow the federal example. In contrast, wildlife sanctuaries or ecological reserves, particularly if they are located in remote areas, may not be under constant surveillance by the agencies responsible. Such areas are visited as a need arises e.g. for purposes of survey, research or to inspect the activities of tourists.

6.3.2 Finland

Wardening of all the Protected Areas has been arranged both by the Finnish Forest and Park Service and the Finnish Forest Research Institute.

6.3.3 Greenland/Denmark

There is no formal wardening system in place in Greenland. However, Greenland Home Rule Government is proposing a corps of game wardens to protect animal life in Greenland.

6.3.4 Iceland

According to the Nature Conservation Act, wardens shall be placed in National Parks and other Protected Areas that are overseen by the Nature Conservation Council (NCC). The role of wardens is to patrol the areas and to offer the visitors guidance, environmental education and interpretation. The NCC has only been able to fulfill this part of the act on a few Reserves due to financial limitations.

6.3.5 Norway

The State-Owned Land and Forest Company (Statskog) has the responsibility for day-to-day management and wardening of National Parks (mainland). Most staff execute wardening duties combined with other activities. In Svalbard, wardening is executed by the Governor of Svalbard.

6.3.6 Russia

Wardening is on a regular basis in the Protected Areas of IUCN Category I. In Categories IV, VI and VII there is only a case by case control.

6.3.7 Sweden

The County Administrative Boards in the three northernmost counties have a total of 20 people employed for year-round work in the National Parks, Nature Reserves and along tourist walking/skiing trails. They work as game wardens and also have maintenance and information duties.

6.3.8 United States of America (Alaska)

Rangers and fish and wildlife protection officers perform wardening duties on a non-regular basis.

6.4 Visitors Facilities and Access - By Country

6.4.1 Canada

Air access is allowed to remote parks as is motorized boat access in some areas. Basic visitor facilities such as unserviced campsites, emergency shelters and trails are frequently available in most parks.

6.4.2 Finland

There is free access (without motorized vehicles) to most of the Protected Areas. Permission is needed to visit Strict Nature Reserves, except for two areas where free access is allowed along marked trails. A system of trails and cabins for visitors is established in national parks.

6.4.3 Greenland/Denmark

There are no visitor facilities in Greenland's Protected Areas. The public has full access to the North and East National Park provided they receive permission from Home Rule authorities.

6.4.4 Iceland

The Nature Conservation Council provides necessary sanitary facilities, camp sites, footpaths and other facilities in the National Parks in order to make the area accessible for the public and to prevent damage to the natural environment. It is the aim to establish visitor-centres in the protected areas. Brochures are published about the most popular nature conservation areas.

6.4.5 Norway

A simple system of trails and cabins for visitors is established in some of the National Parks (mainland). Motorized vehicles are forbidden in all Protected Areas without special permits (Sami People have special rights connected to reindeer herding). Visitors facilities are essentially absent in the Protected Areas in Svalbard. Special permits have to be granted for air access to these areas.

6.4.6 Russia

Visitor facilities are practically absent in all categories of Protected Areas.

6.4.7 Sweden

Protected Areas are open for visitors. A system of trails and cabins for visitors is built up in the mountain region.

6.4.8 United States of America (Alaska)

Visitors facilities are essentially absent in most remote Protected Areas. Access by airplane, snowmachine or motorboat is generally allowed.

6.5 Summary

All Arctic nations have research activities in some of their Protected Areas in the arctic region, and also have monitoring programmes or activities in Protected Areas, but this varies extensively from country to country. The Arctic nations cooperate in some research and monitoring programmes, although this does not always involve activities within Protected Areas.

When Protected Areas are established, the Arctic nations have taken into account the traditional activities of aboriginal peoples. This means that subsistence activities of aboriginal peoples are allowed within most protected areas in the Arctic. In some cases, special rights are also granted to local rural residents. In the case of Alaska, the Alaska National Interest Lands Conservation Act makes no distinction between Natives and non-Natives and continuation of subsistence use is based on rural residency.

There are visitor facilities in all countries except Greenland. However, the extent of facilities ranges from the provision of trails, cabins and other amenities in Iceland and Finland to practically none in Russia.

7. GAPS IN THE ARCTIC PROTECTED AREA NETWORK

This section examines the gaps countries have identified in their protected area coverage. Some of the questions used to determine whether there are gaps might be: Are habitat types sufficiently represented in each country's Arctic Protected Areas System? Have the announced goals for representative Protected Areas covering physical geographical regions, ecozones and natural regions been fulfilled?

The gaps, if they are identified, are first briefly described and possible actions underway or planned by the respective countries are outlined. Finally concrete proposals for new Protected Areas are listed for some of the countries.

7.1 Identified Gaps and Proposed Action (where applicable) - By Country

7.1.1 Canada

Identified gaps

Federal, provincial and territorial governments, as well as two NGOs - The Canadian Council on Ecological Areas (CCEA) and World Wildlife Fund (Canada) - have surveyed and reported on gaps in the protected area network. As well the Inuit Circumpolar Conference (ICC) began work on an environmental strategy for the Arctic in 1983. Ultimately this led to development of the Inuit Regional Conservation Strategy (IRCS). One element of the IRCS is a network of protected areas.

Actions underway and planned

Federal

Canada's Green Plan (1990), called for the protection of 12% of Canada's territory within a network of Protected Areas in order to protect representative samples of the nation's ecosystems by either the Canadian Parks Service or the Canadian Wildlife Service (CWS). The Canadian Parks Service has identified 39 natural regions in Canada and is committed to represent each region through a national park (IUCN Category II) by the year 2000.

In the ***Yukon***, the Territorial Fish and Wildlife Service Branch in cooperation with the Canadian Wildlife Service and Ducks Unlimited have identified 47 key wetland habitats important to migratory birds and furbearers. Only six of these have so far been included as special areas. However, the Yukon Government is committed to establishing a system of protected areas through its Conservation Strategy, Territorial Parks Act, and provisions in the Umbrella Final Agreement on land claims of its aboriginal peoples. Over 80 key habitat sites are found in ***NWT*** of which only 22 enjoy any form of formal protection. The designation of further sites is an ongoing process. Priority will be given for the next few years to identification and protection of key marine habitat sites for migratory birds.

Provinces

The province of ***Ontario*** has offered for discussion a draft of *A Natural Areas Strategy for Ontario*: Responding to the Endangered Spaces Challenge. This draft describes methods for

protecting natural heritage areas and suggests a timetable for completing a Protected Areas System by the year 2000. In the province of ***Quebec*** a 5-year plan outlining an implementation strategy for provincial parks was announced in 1992. The province of ***Newfoundland*** has committed itself to making every effort to complete a Protected Areas System by the year 2000. In ***Saskatchewan***, a comprehensive provincial Protected Areas Study evaluating all types of Protected Areas and protected lands is underway. The province of ***Manitoba*** has established a policy of designating selected areas representative of all Manitoba's natural ecosystems.

New Protected Areas - Concrete Proposals in Canada (not complete).

Name	
Arctic Circle Crossing Park	Katannilik
Bear Cave Mountain	Leaf River
Beechey Island	Mallik Island
Bishop's Residence	Marble Island
Bjorne Peninsula	Mealy Mountains
Bloody Falls	Meliadine River
Bluenose	Mission Island
Bylot Island/North Baffin	Nastapoka
Campbell Hills	Nitsutlin River Delta
Canol Trail	Okak Bay
Central Bathurst Island	Old Crow Flats
Churchill	Old Fort Rae/North Arm
Coburg Island	Ram Plateau
Dodo Canyon	Richmond Gulf
East Arm of Great Slave Lake	Thomsen River/Banks Island
Fort Franklin	Torngat Mountains
George River/Koksoak River /Caniapiscau River	Vuntut
Harp Lake	Wager Bay
Isabella Bay	

New Protected Area proposals in the Canadian Arctic are shown in Figure 7.1.

7.1.2 Finland

Identified gaps

The following gaps are focused upon in the Finnish Arctic: Old growth forests in the southern part.

Actions underway and planned

Plans exist for filling the gaps and extending the Protected Area Network through the surveys going on for new protected area programmes of *Valuable Cultural Landscapes*. The national programme to protect waterfowl areas, the mire protection programme (wetland protection) and programme to protect groves are already approved, but are not yet fully implemented due to complicated land ownership and lack of money for buying areas for the state. The most important new Protected Area activity in the Finnish Arctic concerns the Koitelaiskaira Ramsar site (Figure 7.1). The area has been proposed as a Strict Nature Reserve and its status has been discussed for many years because of chrome ore and copper findings in the area. A transnational

Protected Area is planned between Norway, Russia and Finland. From the Finnish side this could include parts of Lake Inari and Vatsari Wilderness Area.

7.1.3 Greenland/Denmark

Identified gaps

North and East Greenland National Park and Melville Bay Nature Reserve cover only the High Arctic region of Greenland. Only one area in southwest Greenland is protected under the Nature Conservation Act. Nine of the eleven designated Ramsar sites are not protected under the Nature Conservation Act of 1980. Nevertheless, according to Greenland's 1993 Ramsar report, immediate threats to these sites are few and most are in an undisturbed state. However, there is growth in the ecotourism industry and this could increase the pressure on sensitive areas.

Actions underway and planned

Although seabird colonies are under protection and many sites are protected at the local community level in the ice-free communities, no formal plans are in place to fill any gaps in Greenland's network of protected areas within the immediate future. However, there are proposals to increase the percentage of caribou grounds protected against hunting at the local community level from 20% to 40%. There are many areas that could eventually benefit from a "Protected Area" status of some type but more extensive research and surveys are needed.

7.1.4 Iceland

Identified gaps

Four major gaps in the Protected Area network have been defined in Iceland. These are:

- Marine parks (e.g. benthic communities on soft and hard substrate and adjacent shores)
- Volcanoes (e.g. caldera, fissures, shield volcanoes, table mountains, maars)
- Vegetation communities (e.g. bryophytes, lichens, fungi, salt marshes, birch woods)
- Rivers and their watershed

Also staging and roosting sites of waterfowl and waders (e.g. White-fronted and Brant Geese) are mentioned as more specific gaps requiring attention, mainly at coastal sites and wetlands.

Action underway and planned

No action plan for filling the gaps is described, but the Nature Conservation Council compiles a national register of sites and areas of special nature conservation interest. The register holds 330 sites and areas (of which 72 are protected) which is under continuous revision and relies increasingly on comparative research surveys. Presently (spring 1994) at least nine concrete proposals are being worked on for new Nature Reserves, large and small, one new National Park and enlargement of another. Among these is a large marine reserve (Breidafjördur) and several wetlands of importance for staging waterfowl.

7.1.5 Norway

Identified gaps

There are major gaps in the Protected Areas System in the Norwegian Arctic, especially on the mainland. As nearly 60% of the Svalbard Archipelago is protected as National Parks or Nature Reserves there are probably few extensions needed there. However the isolated island of Jan Mayen (380 km^2) and Bear Island (178 km^2) remain unprotected. Norway has indicated it has an international responsibility to protect the following identified habitats: Coastal areas, fjord systems and northern/oceanic coniferous forests, and northern alpine areas. The first three of these habitats, along with marine areas, have to be described as gaps.

Actions underway and planned

The new National Park Plan is part of a long-term policy to establish large protected areas in every physical geographical sub-region. The plan proposes 13 new large protection areas and enlargement of six of the eight existing National Parks in the Arctic, to be fulfilled by the year 2010. On a county level there are systematic conservation programmes for different priority habitats: Wetlands, mires and bogs, seabird colonies, rich deciduous forests and coniferous forests. Protection plans will be fulfilled by 1995 and, together with the National Park Plan, will secure maintenance of terrestrial biodiversity and natural landscapes. A national plan for protection of marine areas is planned.

New Protected Areas > 10 km²- Concrete Proposals in Norway.

NAME	HA
Bear Island (sea birds, geology)	17 800
National Park Plan:	
-Varanger Peninsula (arctic landscape)	180 000
-Seiland (island, glacier)	8 000
-Øvre Pasvik (wetland, coniferous forest)*	13 000
-Stabbursdalen (wetland, forest, geology)	45 000
-Øvre Anarjohka (wetland, conifer forest)*	16 720
-Øvre Dividal (coniferous forest, geology)*	3 000
-Kvænangsbotn (valley)	12 000
-Goatteluobbal (wetland)	33 500
-Lyngsalpene (alpine mountains)	86 000
-Ånderdalen (fjord, coastal landscape)*	5 000
-Rebbenesøy (island system)	15 000
-Sørdalen-Isdalen (valleys)	24 000
-Indrefjord-Øksfjord (fjord)	12 000
-Svellingsflaket (island system)	23 000
-Tysfjord-Hellemobotn (fjord landscape))	100 000
-Røstøyene (island system)	12 000
-Misfjorden-Valnesfjord (fjord landscape)	40 000
-Junkerdal-Balvatnet (vegetation)	35 000
-Sundfjordfjella (karst)	1 000
Other proposals:	
-Store Sametti (coniferous forest)	1 340
-Skjelvatnet (coniferous forest)	3 100
-Grunnfjorden (wetland)	1 470
-Målselvutløpet (delta)	1 290
-Risøya (archipelago)	1 430
Total	**690 650**

* Extensions of established National Parks

7.1.6 Russia

Identified gaps

Protected Areas exist in all main types of Arctic landscapes, but some landscapes of lower ranks are not covered by Protected Areas.

Actions underway and planned

A plan to develop and implement the Protected Area Network in the Russian Arctic has been approved to the year 2005. It will cover all major geophysical regions, key habitat and vegetation zones. It is a biodiversity-based system.

New Protected Areas - Concrete Proposals in Russia (not complete).

ADMINISTRATIVE REGION	IUCN CATEGORY	NUMBER	KM²
Murmansk	I	1	3 000
Murmansk	II	6*	8 000
Arkangelsk	I	2	12 000
Arkangelsk	II	2	8 000
Tyumen	I	2	23 000
Yakutia	I	2	17 000

* Including four on the base of existing sanctuaries

7.1.7 Sweden

Identified gaps

The protected area network has gaps in wetlands and forests in the southern and north-eastern part.

Actions underway and planned

Two planned large reserves will probably fill the southern gap before 1995. More forests and wetlands ought to be protected in the north-eastern part, but there are no actual plans for this.

New Protected Areas - Concrete Proposals in Sweden (not complete).

NAME	HA
Tavvavuoma (mire/wetland)	40 000
Kirunafjällen (mixed mountain system)	430 000

7.1.8 United States of America (Alaska)

Identified gaps

No gaps are identified. Inventories are underway to analyze protection needs of privately-owned land within the boundaries of federally protected areas. The U.S. Fish and Wildlife Service developed the Acquisition Priority System, a GIS-based model, to assess protection needs of private inholdings in national wildlife refuges.

Actions underway and planned

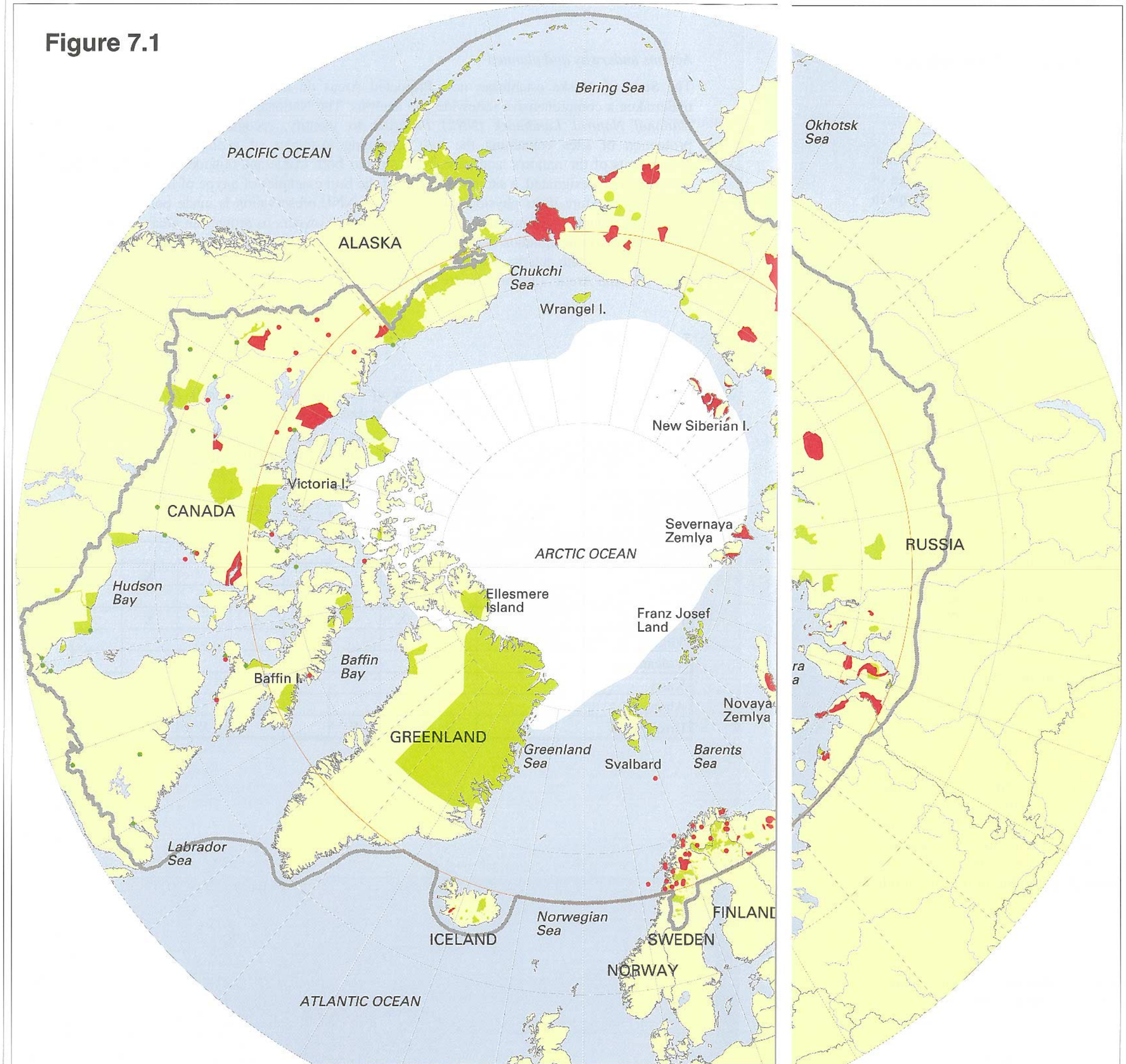
The State of Alaska establishes new Protected Areas on a case-by-case basis, but has not undertaken a comprehensive statewide gap analysis. The National Park Service administers the *National Natural Landmark (NNL) Program* to identify, recognize, and encourage the protection of sites containing the best remaining examples of ecological and geological components of the nation's landscape. NNL's occur both inside and outside the protected area system. To be designated, a site must be one of the best examples of a type of biotic community or geologic feature in its physiographic province. NNL preservation is made possible through long-term, voluntary commitment of public and private owners to protect an area's outstanding values. However designation is not a land withdrawal, does not change the ownership of a site, and does not dictate activity. Currently there are eleven National Natural Landmarks designated in the Alaskan Arctic. (All but one are under federal or state management).

7.1.9 Summary

Table 7.1 - Summary Table: Main Types of Habitats or Geologically Interesting Areas Needing Representation in the Arctic Protected Areas Network.

COUNTRY HABITAT TYPE	CAN	FIN	GRE	ICE	NOR	RUS	SWE	USA
Isolated islands					X			
Marine areas	X			X	X			
Coast/Fjords (east & south)				X	X			
Polar desert						X		
Wetlands		X					X	
Rivers and watersheds				X				
Forests		X			X		X	
Vegetation communities				X				
Volcanoes				X				
Karst					X			
Alpine					X			
Unspecified	X		X			X		

Figure 7.1



CAFF Conservation of Arctic Flora and Fauna

Habitat Conservation Report No. 1

The State of Protected Areas in the Circumpolar Arctic 1994

Existing and Proposed Protected Areas in the Arctic

- Existing Protected Areas IUCN Category I - V
- Proposed Protected Areas (Large)
- Proposed Protected Areas (Small)
- Arctic Circle (Latitude: 66° 33′ North)
- Southern limit of Arctic data as provided by member countries

Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

Compilation and map production by:

Norway UNEP WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.

7.2 Representativeness in the Light of Natural or Physical Geographical Regions - By Country

7.2.1 Canada

The percentage of Protected Areas in Canada (IUCN Category I-V) by ecozones are shown in Figure 7.2, and it brings into focus the regions with no protection or a very low percentage of protection. Although Canada has some large Protected Areas in the Arctic, there are still gaps in most ecozones. Only the Arctic Cordillera and the Hudson Plains reach the recommended 12% protection.* The Tundra Cordillera has so far no Protected Areas according to IUCN Category I-V, but there is a proposed new Protected Area scheme for this zone. Zones like the Northern Arctic, the Taiga Plains, and the Taiga Shield are only poorly represented. The situation in the Northern Arctic should, according to proposed Protected Areas, be improved. This is also the case for the Taiga Plains and Taiga Shield, but here the proposed areas are relatively few and small. The Southern Arctic is in a better position (5-10% protection*), and proposed new areas could strengthen the level of protection in this zone.

7.2.2 The Nordic Countries and Greenland/Denmark

The percentage of protected areas in the Nordic Countries and Greenland (IUCN Category I-V) by Physical Geographical Regions are shown in Figure 7.2, and it brings into focus the regions with no protection or very low percentage protection. The Norwegian fjord systems influenced by the Gulf Stream are unique, and especially so in an Arctic context. Norway accepts an international responsibility to protect these habitats. Plans for new Protected areas could improve the situation if they are realized, but still large coastal areas in Norway are missed in the protection system. This refers both to coastal areas in the oceanic middle boreal zone and in the Low Arctic zone. The general insufficient protection of the low arctic zone should also be noted. Some new Protected Areas are proposed in this zone in Norway and Sweden. The Arctic part of the middle and northern-southern boreal zones are only represented by a few, small Protected Areas. In these zones no proposals for new Protected Areas in the Arctic have been reported. However, in Sweden, areas are protected as Crown Reserves by the Forest Service (IUCN Category VI). Glaciers, The High Arctic, Middle Arctic, Alpine and Northern Boreal zones seem to have reasonable level of protection*.

7.2.3 Russia

The percentage of Protected Areas in Russia (IUCN Category I-V) by Physical Geographical Regions are shown in Figure 7.2, and it brings into focus the regions with no protection or a very low percentage of protection. Some major Physical Geographical Regions are insufficiently protected. Only tundra (e.g.; forested tundra and mountain tundra) seems to have reasonable protection level. Establishing the now-approved Protected Areas Network will improve the protection in the lowlands, in the low altitude-mountain pastures, in tundra, in forested tundra zones and in the northern sparsely forested zones.

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*Note: However, this does not necessarily translate into adequate protection of habitat on a species by species basis since flora and fauna may have need of habitat protection unrelated to percentage targets.

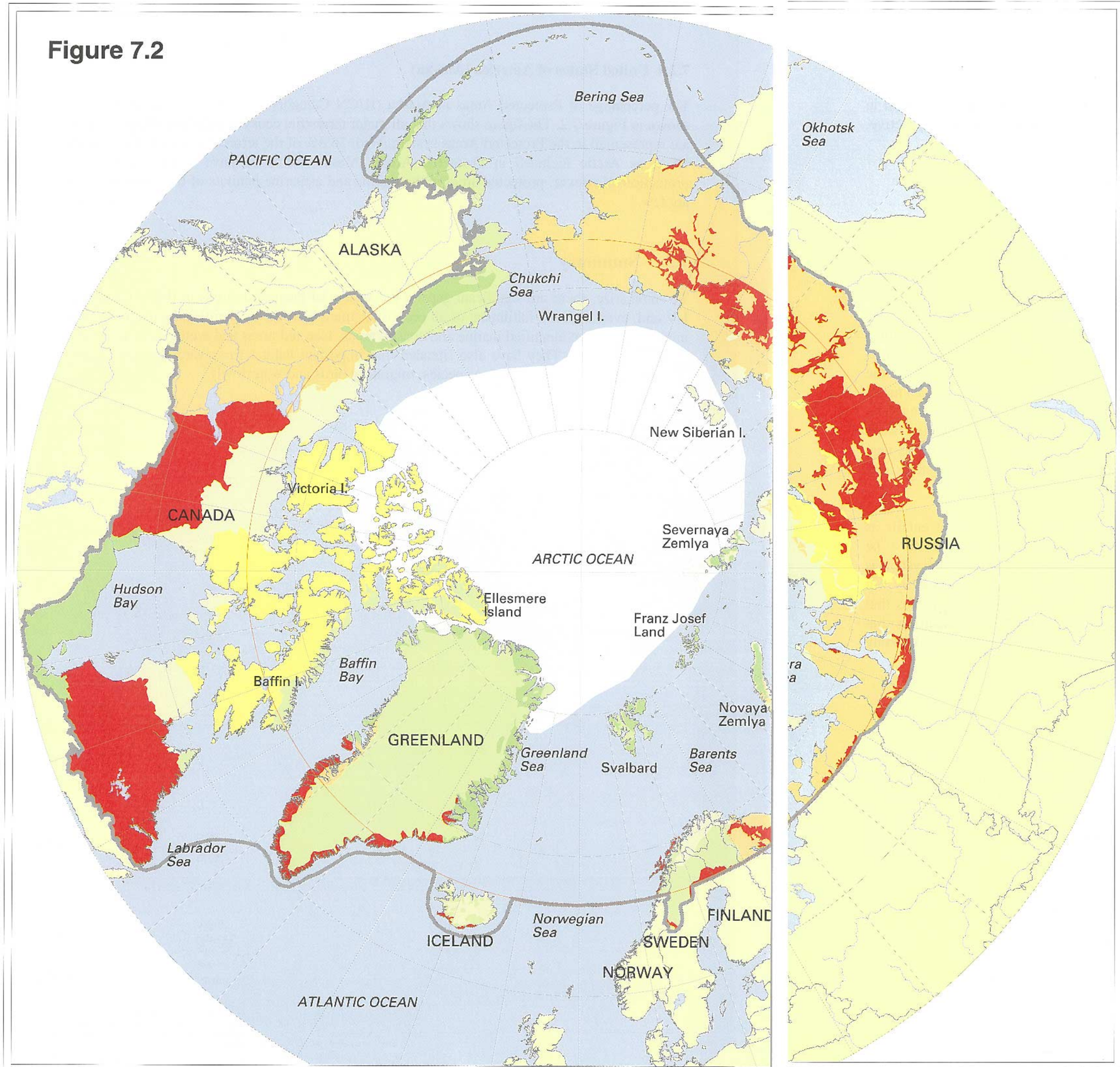
7.2.4 United States of America (Alaska)

The percentage of Protected Areas in Alaska (IUCN Category I-V) by major ecosystems are shown in Figure 7.2. The figure shows that all major terrestrial ecosystems in the Alaskan Arctic are represented in the Protected Areas system. With 56.8% of the terrestrial area defined, by the USA, as Arctic included in Protected Areas, Alaska seems to have a satisfactory level protection. However, protected areas in the marine and estuarine habitats of the Alaskan Arctic are few.

7.3 Summary

To summarize, there are significant gaps in the system of Protected Areas in IUCN Categories I-V and, even with the fulfillment of all proposals, there will still be significant gaps. Countries, in particular, have identified marine and coastal areas, forested areas and wetlands as in need of further protection. They have also signaled that important habitat for several species requires protection (e.g. - caribou, marine species, migratory birds and waterfowl).

Figure 7.2



CAFF Conservation of Arctic Flora and Fauna

ARCTIC ENVIRONMENT

Habitat Conservation Report No. 1

The State of Protected Areas in the Circumpolar Arctic 1994

Protection Levels in the Arctic

% area protected derived from Physical Geographical Regions Classifications

- > 50 % of area protected
- 20 - 50 % of area protected
- 10 - 20 % of area protected
- 5 - 10 % of area protected
- 2 - 5 % of area protected
- <2 % of area protected

Southern limit of Arctic data as provided by member countries

Arctic Circle (Latitude: 66° 33′ North)

Source data supplied by CAFF member countries:

Canada Finland Greenland/Denmark Iceland Norway Russia Sweden USA

Compilation and map production by:

Norway UNEP WORLD CONSERVATION MONITORING CENTRE

Projection: Lambert-Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.

7.4 Implications for Conservation

As shown in this Report, the question of setting aside areas as "protected" can be tackled in several ways. When dealing with the issue from a natural resource conservation perspective, there are several common methods used. Some are:

- by representativeness (sites can be chosen because they represent good examples of geophysical structures or systems),

- by biological/ecological significance (sites can be set aside because of their importance to threatened animal and plant species, or for their importance as key-areas for certain species).

According to the objectives to the Brundtland Commission, the countries should set aside 15% of their territory as Protected Area. CAFF's primary objective is to conserve Arctic flora, fauna, their diversity and their habitats. Therefore, for adequate species and habitat conservation, it is important not to rely exclusively on any one method since by doing so, there is a risk that the goal may not be achieved. For example, there is no automatic correlation between species needs and percentage of territory protected unless those needs are factored into the planning. The same line of reasoning holds true for protection by representativeness if what is protected is not also important and suitable for wildlife. Also, looking exclusively at flora and fauna needs may be inadvisable because that could jeopardize legitimate economic development initiatives and other environmentally compatible natural resource uses.

Nevertheless, conservation of biological diversity in the Arctic region, and all that entails, is CAFF's priority and to ensure quality survival, their food supplies and habitat must be safeguarded. The animal and plant life that can survive in the wild in the Arctic ecosystem is unique, highly adapted and, with very few exceptions not confined to any one country but distributed throughout the circumpolar region. To adequately protect their habitat means that the Arctic countries should act in concert to provide adequate protection by ensuring that identified gaps are filled, at both the national and circumpolar ecosystem levels, without unduly hindering the sustainable development of the peoples of the north.

7.5 Further Action by CAFF

CAFF has agreed to pursue the establishment of a network of Protected Areas throughout the Arctic as one of the most important tools for species and habitat conservation at the circumpolar, ecosystem level. A plan for the network will be developed by 1995 for approval by the Ministers of Environment of the Arctic countries at their Arctic Environmental Protection Strategy Conference. The Plan will take into account the requirements of Arctic flora and fauna, including migratory species in the Arctic, and the needs and development aspirations of local and indigenous populations with whom they co-exist.

8. CONSERVATION OF ARCTIC HABITAT OUTSIDE THE PROTECTED AREAS SYSTEMS

The following Chapter provides a preliminary overview of some of the measures in place within the Arctic countries to conserve Arctic habitat outside their Protected Areas Systems.

8.1 Canada

With the exception of lands under indigenous peoples ownership, Arctic lands are primarily under the administration of the federal government. In addition, the Northwest Territories and the Yukon Territory, the provinces of Newfoundland and Labrador, Quebec, Ontario, Manitoba and Saskatchewan have legislation which impacts on the use of the Arctic lands within their jurisdiction (see appendix I). In addition to legislation, a number of measures have been put in place to deal with potential threats from various activities on the land and sea. The following processes may apply depending upon the scope and magnitude of the proposed activity:

Land Use Permits: set conditions under which the land may be used, and regulate the land use activities of government agencies, industry, and the public. Conditions relevant to habitat protection primarily address pollution, erosion control, and general environmental protection. Regional Environmental Review Committee: representatives from federal and territorial agencies undertake an initial assessment of proposed development projects to determine if a further review is required. Environmental Assessment and Review Process (EARP): is the federal government's process for the screening and reviewing project proposals. EARP applies to proposals that are undertaken or financed by government, located on federal lands, or which may have an environmental effect on an area of federal responsibility. Initial assessment is carried out by the initiating federal department to determine the potential environmental and directly related social impacts. If the potential adverse environmental impacts will be significant, or if there is sufficient public concern, the proposal is referred to the Minister of Environment for a public review by an independent panel. Arctic Waters Advisory Committee: provides a focal point for government agencies and native organizations to review and assess all projects, proposals, and industrial operations in Arctic waters to ensure that they are conducted in an environmentally acceptable manner as prescribed by the Arctic Waters Pollution Prevention Act and Regulations and other applicable environmental legislation. Ocean Dumping Advisory Committee: provides an opportunity for government agencies to review and draft terms and conditions to be incorporated into permits pertaining to ocean dumping activities under the Ocean Dumping Regulations incorporated in the Environmental Protection Act. Canadian Heritage River System: is a co-operative system of federal , provincial and territorial governments to recognize Canadian rivers for natural and/or cultural heritage values and/or recreational potential. Canadian Heritage Rivers are managed by the responsible jurisdiction and may or may not be located within a protected area.

Beyond the boundaries of the specific Protected Areas, indigenous peoples have maintained their right to conserve arctic habitat. In the Yukon and Northwest Territories, this underlying management and conservation responsibility is reflected within the Canadian governmental framework by the federal role of the Department of Indian Affairs and Northern Development and land claim organizations as land managers in the Territories; of the department of Fisheries and Oceans as fish and ocean managers; of the Department of the Environment as wildlife and habitat managers; and of Heritage Canada as manager of National Parks.

8.2 Finland

Thirteen rapids or watershed areas in the Province of Lapland are protected (1987) from construction of power plants and other hydroelectric development. A special law (1988) prohibits hydroelectric development in the Ounasjoki River and its watershed. The Forest Zones Protection Act (1922) is aimed at the prevention of erosion of northern forest areas. It provides for the establishment of protected forest zones in the archipelago, along the coastline and in all areas where the forest has been a shelter for settlement and agriculture against wind erosion. It also states that it is forbidden to cut trees close to the shores of lakes, rivers and the sea if such woods are seen as important for breeding fish. The National Board of Forestry has also exempted forests growing under severe climatic conditions, such as highlands in northern Finland (over 300 m above sea level) from economic exploitation. The Recreation Act (1973) regulates the establishment of (municipal) recreation routes, the creation of (state) hiking areas in places that could not be protected under the Nature Conservation Act.

8.3 Greenland/Denmark

In Greenland, the Protected Area System consists of three areas officially designated under the Nature Conservation Act as well as a series of Ramsar sites, caribou reserves and other areas which are not officially "designated" but nevertheless, are subject to regulations. Some of the measures in place are:

- in the southern-most parts of West Greenland, in whole valleys tree-cutting is prohibited,
- use of motorboats is prohibited in several fjords until September 1,
- use of bottom-gillnets for fisheries is prohibited in several fjords,
- all bird cliffs and breeding colonies (defined as 10 breeding pairs or more) in general have a surrounding protective zone of 5 km to 200 m. The radius of protection is determined on an individual species basis. Here disturbance and encroachment are prohibited or strictly regulated,
- surveys of biological resources and habitat are carried out in areas that may be subject to mineral exploration and extraction,
- the marine zone (three nautical miles) along the coast of the North and East National Park is protected as is the marine zone of Melville Bay.

8.4 Iceland

Please see Chapter 5, section 5.4.

8.5 Norway

In the Norwegian Protection Plan for River Systems, 111 river courses have been protected against hydroelectric exploitation in the Norwegian Arctic. National instructions are being prepared to avoid devastating encroachments (other than hydroelectric exploitation) in these river courses. The instructions aim at concretizing national objectives for the management of the rivers, and they form conditions for planning activities consistent with conservation values. They will also form the basis for determining priorities between conservation interests and other interests.

The Planning and Building Act allows for political regulations to be made for defined area or objects such as rivers to prevent destruction of their natural quality. Areas such as wetlands can be given temporary protection for four years where major conflicts of land use arise. Smaller natural areas such as bays and marshes can be regulated for nature conservation purposes at the municipal level. The Act prohibits constructions of buildings, fences etc. within 100 meters along the coast. Other legislation includes the Forest Production and Protection Act. This Act authorizes the designation of specific forest areas of particular importance for nature conservation or open-air recreation. Regulation of forestry practices may also be laid down for these areas. The Act provides for the establishment of protected forest zones. This refer to forests protecting other forests, cultivated land or buildings, or forests growing under severe conditions. According to the Wildlife Act and the Salmon and Freshwater Fisheries Act , due consideration shall be given to salmon and freshwater fish and wildlife in planning land use. In areas of major value to fish and wildlife, installations, construction work and other activities may be prohibited when this is necessary in order to preserve the natural environment of fish and wildlife. The Open-Air Recreation Act deals with the creation and maintenance of recreation areas and states the right of free public access to all uncultivated areas with no buildings. The state has purchased a number of areas which are termed public recreation areas. Although these areas are not designated primarily for conservation purposes, they are clearly of conservation value. The Cultural Heritage Act authorizes the protection of a zone around an ancient or historic monument in so far as this is necessary to preserve the effect of the monument in the landscape or in the environment. The Concession Act gives state and municipal preemption of land area, e.g. to favor conservation and recreation interests.

Particular regulations applied to Svalbard (The Svalbard Act) aim at protecting nature and territorial waters against pollution, refuse-dumping and other influences which can harm humans, plants and animal wildlife and the environment, or which seem to spoil the appearance or shape of the landscape.

8.6 Russia

In Russia, conservation measures outside protected areas include:

- legislative norms on natural resources use,
- seasonal prohibition on certain activities,
- protective measures for endangered species habitats,
- protection of "green zones" around cities,
- restrictions of economic activities in recreational areas and health resorts,
- regulations of cultural activities in the interests of habitat conservation,
- environmental impact assessment.

8.7 Sweden

In addition to the Protected Areas covered under the Nature Conservancy Act, provisions for nature conservation are also included in forestry legislation. The Forestry Act (1979) contains provision for "forests difficult to regenerate and protected forests", the cutting of trees within these forests is restricted, and requires permission. A more general requirement of the same law is that conservation interests should be considered by all landowners undertaking forestry activities. According to "prescriptions and general advice" issued by the National Board of Forestry, limitations should be placed on the area that is to be clear-felled. The Environmental

Protection Act (1969) provides for specific areas against pollution. The Natural Resources Act (1987) provides a limited form of protection to wide areas of the country; it deals with long-term use of natural resources and it attempts to strike a balance between differing interests. Designated areas may be for recreation or nature conservation, and areas so declared will often obtain a degree of protection for their natural value. The Act protects continuous mountain areas against physical exploitation such as buildings and constructions. Other enterprises in these areas are allowed only if they do not affect the character of the area. Several large rivers are protected against hydroelectric exploitation (e.g. Torne River, Kalix River, Pite River and Vindel River). Since 1986 permission is needed for drainage of wetlands. If a wetland is classified as a site of high nature value, the County Administrative Board can reject the project. Drainage of wetlands is controlled and can be prohibited in valuable areas. Lakes and streams have a zone of protection against building (100 meters). According to The Reindeer Management Act, the County Administrative Board decides the maximum number of semi-domestic reindeer within a given area. In such decisions other interests should be considered. Further, the reindeer management sector has to consider the conservation interests.

8.8 United States of America (Alaska)

The Alaska State Legislature classified certain areas as being essential to the protection of fish and wildlife habitat. These areas are designated as either a refuge, critical habitat, or sanctuary. Here a special area permit is required for any habitat altering work, including any construction activity. *The Fish Habitat Permit* affords some protection to the habitat of fish streams. Its purpose is to conserve Alaska's fish and game populations and their habitats within anadromous fish streams. There are a large number of Federal laws governing natural resources outside protected areas:

The Alaska National Interest Lands Conservation Act (1980), gave Wild and Scenic River classification to a number of streams. For Arctic regions, there are two outside of designated preservation units: Alagnak and Unalakleet. The criteria for Wild and Scenic Rivers are based on scenic features, wilderness characteristics and other recreational opportunities that would be impaired by alteration, development, or impoundment, and float trip possibilities. The Migratory Bird Treaty Act of 1918, as amended established Federal responsibility for the protection of migratory birds and gave effect to treaties with Canada, Mexico, Japan and the Soviet Union. The act is basic to protecting populations and habitats of migratory birds, managing their distribution, ecological diversity, introduction and restoration, and guiding research programs. The Fish and Wildlife Conservation Act of 1980, as amended in 1988 recognized the value of non-game migratory species and the need to plan for and manage non-game resources. It provided for financial assistance to states for developing non-game conservation plans and programs and instructed all Federal agencies to conserve non-game fish and wildlife and their habitats. In November 1988, the act was amended to include among its purposes the monitoring of all non-game migratory bird populations and identification of effects of environmental changes and human activities on non-game migratory birds. The Driftnet Impact Monitoring Assessment and Control Act of 1987 stipulated that the United States would pursue agreements with Japan, Republic of Korea, and Taiwan to establish an observer program to document the mortality of marine mammals, seabirds, and other marine resources in their high-seas squid driftnet fisheries. This was the first legislation expressing the United States' concern for mortality of seabirds in fishing gear and that the mortality should be monitored. The Marine Mammal Protection Act, as amended in 1988 establishes, with certain specified exemptions, a moratorium on the taking and importation of marine mammals as well as products taken from

them, and establishes procedures for waiving the moratorium and transferring management responsibility to the States. The law authorized establishment of a Marine Mammal Commission with specified advisory and research duties and required establishment of an observer program to monitor the incidental mortality of marine birds and mammals in selected domestic fisheries. Indians, Aleuts, and Eskimos are generally exempt from the moratorium on taking provided that taking was conducted for the sake of subsistence or for the purpose of creating and selling authentic native articles of handicraft or clothing. The International Agreement on the Conservation of Polar Bears and their Habitat prohibits taking of polar bears except: for scientific purposes; for conservation purposes; to prevent serious disturbance of the management of other living resources; by local people using traditional methods in the exercise of their traditional rights; or wherever polar bears have or might have been subject to taking by traditional means by its nationals. The agreement also discusses general research and conservation provisions, and specifies that skins and other items of value are not to be used commercially. The Federal Land Policy and Management Act (1976) allows designation and management through land use planning. The Clean Air Act and the Clean Water Act regulate polluting emissions in air and water and control the discharge of dredge and fill material. The Endangered Species Act (1973) provides for conservation of endangered and threatened species and their habitat. The coastal states are encouraged to develop and implement coastal zone management plans through the Coastal Zone Management Act (1972). The National Environmental Policy Act (1969) ensures that unquantified environmental values are given appropriate consideration, along with economic and technical considerations. The Estuary Protection Act (1968) highlighted the values of estuaries and the need to conserve their natural resources. It authorizes the Secretary of the Interior to enter into cost-sharing agreements with States and subdivisions for permanent management of estuarine areas in their possession. The Secretary was required to establish conditions to ensure the permanent protection of estuaries, including a condition that the lands not be disposed of without the prior approval of the Secretary. The Federal Power Act regulates the development of water power and resources. It requires incorporation of fish and wildlife concerns in licensing, re-licensing and exemption procedures. The Rivers and Harbors Act of 1938 provides for wildlife conservation to be given "due regard" in planning Federally funded water resources projects.

For other relevant Federal laws, see Appendix II.

8.9 Summary

Most Arctic Nations have legislative tools which can be used to conserve wildlife and habitat outside the Protected Areas system, and some nations have given protection to some of their threatened habitats (e.g. untouched rivers and wilderness areas) outside the system. The protection given varies, but generally some human activities are permitted.

8.10 Further Action by CAFF

In parallel with its preparation of a Network of Protected Areas Plan for the circumpolar Arctic, CAFF is initiating further study on the question of habitat conservation outside the protected area systems in anticipation of developing appropriate recommendations for the Ministers of the Environment.

9. POTENTIAL OR ACTUAL THREATS TO ARCTIC HABITATS AND SPECIES

The ecosystems and the biodiversity of the Arctic can be threatened by many human activities and the Arctic countries have identified several of particular concern in their respective countries or the region, as a whole. Major threats to Arctic habitats are primarily related to activities associated with the exploitation of natural resources, development of infrastructure, increased public use, and pollution. Individual threats and potential negative consequences, are outlined in this chapter:

9.1 Potential or Actual Threats - A Survey

Hydropower Developments

The development of hydropower plants has altered, and will be altering, many watercourses in all countries in the Arctic area; e.g. the province of Quebec is proposing to flood an extensive area of Northern Quebec as part of a large-scale hydroelectric development. This could have a significant impact on the hydrological and local climatic conditions of Hudson Bay area and subsequent loss of key terrestrial and aquatic habitats.

Mining Activities

Mining occurs in Russia, Canada, Alaska and the islands of Svalbard. The installations and the physical encroachment can have a great impact on the environment. Offshore mining if carried out improperly could potentially, for example, bury seabird feeding grounds or cause pollution from metals that occur naturally in the sediments, such as mercury, arsenic, cadmium, and lead. Mining of rock and gravel from outcrops for use in construction can destroy cliff and talus habitats (but, paradoxically, may also have positive consequences of creating desirable habitat). Recent discoveries of diamonds in the central Canadian Arctic resulted in a diamond-rush where over 130 000 square kilometers were staked. During the winter of 1993/94, two exploratory mining operations were undertaken in the area. The initial results of small core drilling programs indicate that at least one of the operators will be submitting an application to the federal government in late 1994 or early 1995 for development of a full-scale mining operation. Several options for developing all-weather road access to the area, which was previously accessible by air and winter road only, are as of mid-1994 being considered by the territorial government. The Red Dog mine in Alaska is an example that successful mitigation is possible. Seepage from this open pit mine initially raised heavy metal levels in nearby surface waters; problems were resolved in 1991 by rerouting the stream away from pit seepage and by collecting and treating all seepage before discharge.

Petroleum Exploration and Development Activities

Impacts within developed oil fields may include direct habitat loss due to gravel placement for roads and work pads, and indirect loss due to alteration of drainage patterns, dust deposition and contaminants.

Regionally, the relatively flat, continuous wetland landscape is altered by a network of roads, pipelines, and facilities. Activity and the physical presence of facilities can influence caribou movement and may cause avoidance of some areas by waterfowl. Scavengers, including Arctic foxes and gulls, are attracted to potential food sources (garbage). Impacts due to exploration

may include localized habitat loss or terrain disturbance from exploratory wells. Access to exploratory wells is generally by ice roads in the winter, resulting in minimal habitat impacts. Polar bears have been attracted to coastal and offshore exploratory sites. Future development is planned in Canada, Russia and the United States. Exploration continues along the coast of Canada and offshore areas in the Beaufort Sea, in the Barents Sea and the Sea of Okhotsk, and along the Alaska coast and offshore in the Beaufort, Chukchi and Bering Sea and in Shelikof Strait. Future petroleum development in the Canadian Western Arctic also includes inshore areas such as the Mackenzie Valley. For example, a proposal exists for the development of gas pipelines to transport gas to northern Alberta from the Beaufort Sea coast.

Oil Spills

Continuing exploration, production and transportation pose the threat of a major oil spill in an area of very high biological productivity. A spill of any size could have a significant negative impact. Spills of crude oil and refined fuels from ships and from onshore and offshore oil facilities are significant threats to marine wildlife. There is routine spillage and bilge pumping from smaller vessels. Different types of oil have different impacts; for example, diesel is initially more toxic, but disperses faster than crude oil. Species with small populations and limited ranges are extremely vulnerable to catastrophic events involving petroleum. Many seabirds fall into this category. Also, oil breakdown in the Arctic region is much slower than in temperate zones and the effects of a spill last far longer.

Ocean Dumping

Since 1975, 37 ocean dumping permits have been issued for the Arctic, authorizing oil spill experiments and the disposal of dredge spoils, scrap metal and freeze-accelerating additives used in construction of ice islands. There are no immediate solutions to the problem of land-based waste disposal of scrap metal accumulated from communities and oil and gas operations. It is often less expensive to dump equipment and supplies into the ocean rather than haul them to other locations for reuse. Ocean disposal causes floating debris and the release of toxic substances into the marine ecosystem.

Transportation and Infrastructure

With increasing demands for the development of northern industry and communities, and the rapid expansion of the ecotourism business, an associated infrastructure is essential. Numbers of pipe lines, runways, roads etc. will undoubtedly increase or expand, directly affecting the natural environment through easier access, and indirectly through wildlife habitat fragmentation. Cumulative damage from off-road vehicle (ORV) use, including snowmobiles and four wheelers, increasing numbers of people, and circumstances where the vegetation cover is damaged and wildlife displaced or eliminated are other potential negative impacts.

Forestry/deforestation/planting

The expansion of modern forestry in the Arctic has drastically increased threats to forest species of plants and animals. Effects of modern forestry can be 1) decrease of the amount of deciduous trees, 2) decrease in the amount of dead and decaying timber, 3) decrease of old-growth forests, which affects species specialized in this habitat, 4) fragmentation of forests and 5) lack of big trees, which affects big birds of prey by reducing nesting trees. Fragmentation of habitats can lead to species loss and endangerment and reduction of genetic diversity since the smaller size

and increased distances between remnants reduces recolonization. Plaughing of soil destroys mychorhizza and liberates aluminum from the soil. Clear-cutting and planting replaces the multi-layered structure with a uniform structure and same-age trees and threatens biodiversity. The lack of continuity and of dead wood in the taiga threatens mosses, lichens and fungi more than it does vascular plants. The greatest threat against vascular plants in the taiga is the drainage of wet and moist forest by digging ditches. In fauna, the effects are greatest on invertebrates, e.g. beetles and butterflies and birds (species nesting in tree holes and species of old-growth forests like siberian jay and capercaille), as well as some larger vertebrates (predators) which are affected by human disturbance. In many cases the most threatened species are not or are only scarcely represented in the protected areas. A reason may be that these species are restricted to productive forests, and such forests are among the most expensive habitats to conserve.

Wetland drainage and conversion

Wetland habitats are exposed to a multitude of human activities. This has become a serious problem because wetlands function as key habitats for the survival of many species of flora and fauna and serve many biophysical purposes.

Overgrazing

Overgrazing by reindeer is an increasing problem in all the Scandinavian countries and in Russia. When the lichen is all consumed, there is no vegetation left on the ground. This starts a soil erosion problem, which creates great problems with reestablishing the vegetation. There are also indications that caribou may be overgrazing some of their habitats in North America. Overgrazing has occurred by cattle, sheep, reindeer and caribou, and by voles and ground squirrels in some areas. The rapid expansion of Lesser Snow Goose populations in recent years has led to overgrazing of certain coastal lowland habitats in Canada. Although the problem is localized at this time, it could become a bigger problem if populations continue to increase.

Fisheries Practices

Over-fishing disrupts marine food-chains and populations of seabirds. In the last decades this has caused a serious problem for both the marine ecosystem and the fisheries, especially in the Norwegian Sea, the Barents Sea, the Bering Sea and in Alaska's coastal zone. Over-fishing of capelin, cod, herring and pacific sandlance have either led to or been a contributing factor to reduced populations of seabirds in some of these regions. There have been crashes in the cod population off Canada's east coast and this may, in turn, lead to over-fishing of capelin and other alternate fish stocks. Another problem that can be encountered is inadequate disposal or treatment of fisheries waste which can lead to overabundance of certain "nuisance" species.

Alaskan waters are the only places within the world ranges of capelin and sandlance where these species are not commercially fished, although both Japan and Iceland have recently expressed an interest in the Alaskan capelin fishery. These developments point to possible conflicts between commercial fisheries and seabirds in Alaska. Throughout the Arctic certain fishing activities have resulted in incidental mortality of seabirds. The major causes of this mortality are drowning through entrapment in nets, bird strikes on structural features of fishing vessels, and shooting of birds from vessels. The situation is complicated because most seabirds depend on resources beyond protected territorial waters. In addition to seabirds, marine mammals such as pennipeds and whales are also very dependent upon this resource. Summer feeding areas for these

mammals are concentrated in many parts of the Arctic and over-fishing may have serious impacts on their fragile population structure.

Rapid Expansion of Tourism

The cumulative impacts of the burgeoning tourism industry including formal and informal transportation infrastructure, waste, noise and increased population, could be substantial. For example, wildlife species that frequent riparian habitats (including large prey) could be affected if large numbers of tourists are concentrated along riverine areas. In the Arctic the vulnerable vegetation easily shows signs of wear in areas where traffic is increasing. In addition, recreational impacts can increase with increased visitation, e.g. hunting, fishing, fuel caching, and wheeled, fixed-wing aircraft landings. It is possible to minimize these impacts by carefully managing use; for example, the State of Alaska has a highly successful brown bear viewing program in McNeil River State Game Sanctuary. Greenland, Finland and some other countries have strict regulations for visitors to their National Parks and other Protected Areas. However, lack of adequate surveillance can undermine the legal initiatives.

Noise

Concerns have been raised, particularly by native hunters of wildlife and by the scientific community, that there is a potential negative effect of noise on wildlife. The concern is directed at both underwater and land-based noise created by human activities such as marine traffic, aircraft overflights, and oil and gas drilling on artificial islands.

Over-exploitation of Wildlife Resources/Hunting Pressures

Native and non-Native residents and visitors of the Arctic hunt, fish, and trap a variety of wildlife species for consumptive purposes. Increased hunting pressure on some wildlife populations is a significant area of concern in many parts of the region. Over-exploitation of certain wildlife species (e.g. seabirds) can result when other species are in decline (e.g. cod, caribou). Also, industrial development or local expansion of transportation infrastructure can provide greater access to wildland areas. This in turn can contribute to habitat fragmentation, terrain damage and further increased access to sensitive areas. The effects of increased access as a result of development can be mitigated somewhat by development companies; for example, possession of guns and hunting is strictly prohibited for oil company employees on Alaska's North Slope. Also, when facilities come on line, or are being developed, allowances for protection/enforcement can be part of the overall budget.

Introduced Species

There are several examples of the sorts of problems that can arise when species are introduced either intentionally or inadvertently. In the case of seabirds predation and habitat destruction by animals introduced to islands has been the largest factor in the reduction or extirpation of seabird populations in many parts of the world. For example, historically, the impact of introduced mammals on Alaskan seabird populations has been greater than that from any other human activity. In most parts of the Arctic new introductions of exotic species may occur in the future, such as the potential escape of rats from wrecked ships, with potentially disastrous effects on seabirds.

In the Scandinavian countries productive birch forests are replaced by spruce. Spruce-planting in these areas is a serious encroachment on the original ecosystem, and in many cases it is a large-scale introduction of an alien species. *Pinus contorta* has been introduced to many areas in the Swedish arctic and so has *Festuca ssp* as a road-side plant. The latter is a cultivated form that can interbreed with natural species. Introductions of new (exotic) species have destroyed original fish populations in many lakes and streams in Northern Finland. Introductions also increase the threat from fish diseases and parasites, e.g. spread of *Gyrodactylis salaris*.

Atmospheric Deposition

Concern has increased over the threat of long distance transport of airborne pollutants, such as sulfur compounds, metals, and organic compounds from northern Europe, Russia, and Asia.

*Airborne Contaminants**

Recent studies have shown that there are significant levels of organic contaminants in certain marine mammal species. It has been determined that a significant portion of these contaminants are carried to the Arctic by prevailing wind systems. The contaminants are then magnified through the various aquatic trophic levels ending up in marine mammals. This is a significant concern to people, particularly the Inuit, who rely on marine mammals for a large part of their diet.

*Waterborne Contaminants**

Many of the watersheds on the arctic mainland drain northward to the Arctic Ocean. Most contaminants that are deposited into these water systems ultimately find their way into northern water systems. Active and abandoned military sites are leaching toxic wastes into fresh- and saltwater systems. There is considerable concern about the impacts of industries such as hardrock and placer mining, and several pulp and paper plants. Contaminants that may be deposited into riverine systems by these activities, could accumulate in fish and other aquatic species that form a large part of the northern peoples native diet.

*Both air and waterborne contaminants may be having significant impacts on the flora and fauna, as well as upon the indigenous peoples. For example, in Canada and Svalbard the general quality of polar bear health appears to be declining and reproductive rates are down. Further research is required to identify stresses that contaminants place on both flora and fauna communities. There is also the consideration of pollution from waters of one industrial country to another. Although standards from one country may be different from that of another, there may be impacts on wildlife which are unrelated to defined sources of pollution.

Nuclear Waste

Many nuclear waste disposal sites have recently been discovered in the north-western part of Russia (Norilsk, Kola, Novaya Semlya) and in the vicinity of Ogotoruk Valley near Cape Thompson in Alaska. The site in Alaska was established in the early 1960s during studies conducted for the Atomic Energy Commission's Project Chariot program. The U.S. Department

of Energy and Alaska Department of Environmental Conservation completed cleanup of this site, to the satisfaction of local residents, during the summer of 1993.

Toxic Waste

Toxic chemicals have been discovered in waste dumps at abandoned and active military sites on Amchitka, Attu, Great Sitkin, and other islands in the Aleutian Islands Sub-Unit of Alaska Maritime National Wildlife Refuge; and Yukon Delta and Togiak national wildlife refuges. Contaminants include petroleum fuels, solvents, and some metals. Polychlorinated biphenyls (PCB's) at some sites are moderately toxic and can accumulate in bird tissues.

Climate Change

The potential negative impacts of climate change are many. Any long-term warming of northern climates could be critical if it leads to a significant rise in sea levels. Extensive areas of coastal lowland, which are important habitats for breeding waterfowl and shorebirds, could be flooded. Warmer temperatures could have a serious impact on the permafrost regime and Arctic plant communities which have developed unique adaptations to excessive cold. Ecological effects of global warming will be more apparent in arctic ecosystems because of their greater sensitivity to climate change and the relative magnitude of warming in the Arctic. Climate models predict warming at high latitudes from two to three times the global average. Arctic and taiga (evergreen forest of northern latitudes) ecosystems contain approximately 20-25 percent of the world's terrestrial carbon in dead organic matter in the seasonally thawed layer and in permafrost. Long-term warming would facilitate decomposition and drying, thus potentially releasing vast quantities of methane and carbon dioxide, further amplifying warming. Oxidation of this soil organic matter, as a result of climate change, could cause an injection of carbon equal to two-thirds of the current atmospheric content. (While northern soils are normally active sinks for carbon, sequestering and storing dead organic material, recent results show that tundra studied in Alaska no longer serves as a carbon sink, but has begun to release significant quantities of carbon.) Temperature changes, especially warming, are likely to have major effects on arctic marine ecosystems. These systems are adapted to the presence of sea ice, and any reduction in ice cover inevitably would cause disruption. Ice-related organisms dominate at all levels in the food chain, from ice algae to ringed seals, arctic foxes and polar bears, all of which depend on the availability of ice as a platform for growth (ice algae), hunting (e.g. polar bears and arctic foxes) and reproduction (ringed seals). All the birds of the High Arctic depend on ice-related food. Furthermore, much of the richness of the far northern seas depends on the particular ocean structure generated by contact between polar, ice-dominated water and warmer North Pacific or Atlantic water. Whereas in some arctic shallow continental shelf areas, the productivity of the sea would increase with a reduction in ice cover, in many areas it would be more likely to decrease and the world's major fishery areas would doubtless undergo major changes.

9.2 Summary

There are many categories of threats to terrestrial, limnological and marine habitats in the Arctic, some actual and some potential. The threats are directly and indirectly related to the consequences of human activities. Exploitation of hydropower, petroleum, minerals, forests etc. are examples of considerable human encroachment, which can have significant negative impacts on the natural environment and proper functioning of the Arctic ecosystems, if improperly or unsustainably managed. Other threats are related to the development of human societies, including urban development, expansion of transportation systems and increased public use of nature. Over-fishing and overgrazing are negative consequences of human over-exploitation of biological resources or use of improper methods. Introductions of alien species, use of breeding domestic animals, and planting alien species, can also pose serious threats to the balance in the ecosystems. Pollution and waste from motorized traffic, power plants, mining and other industries, increasing urbanization, etc. can have direct and indirect consequences for all kinds of Arctic habitats, and on climatic conditions. The Arctic area can also be negatively affected by military activities, both on land and in the sea.

All these threats constitute a great challenge to the management of Arctic nature and its resources. There are some good models on ways to minimize threats and/or mitigate the negative consequences and together, through the CAFF process, countries and other stakeholders are coming together to share information and ideas on how to conserve Arctic flora and fauna in conjunction with sustainable use of northern latitude ecosystems.

Table 9.1 - Threats to the Arctic Habitats and Species (Actual or Potential) - a Preliminary Overview.

	CAN	FIN	GRE	ICE	NOR	RUS	SWE	USA
Climate Change	X	X	X	X	X	X	X	X
Mineral/Petroleum Expl. and Development	X	X	X		X	X		X
Hydropower Development	X			X	X		X	
Rapid Urbanization	X	X		X	X	X	X	
Roadways/Infrastructure/Habitat Fragmentation	X	X			X	X	X	
Motorized Vehicles	X	X		X	X	X	X	X
Rapid Expansion of Tourism	X	X	X	X	X	X	X	X
Forestry Practices/Deforestation		X		X	X	X	X	
Fisheries Practices/By-catch	X		X	X	X	X		X
Wetland Drainage		X		X	X	X	X	
Erosion				X	X	X		
Overgrazing	X	X	X	X	X	X	X	
Introduction of Species	X	X		X	X	X	X	X
Over-Exploitation of Species/Hunting Pressures	X	X	X	X		X	X	X
Oil Spills				X	X	X		X
Ocean Dumping	X		X	X	X	X		X
Noise	X					X		X
Airborne Contaminants	X	X	X		X	X	X	X
Waterborne Contaminants	X		X			X		X
Nuclear Waste	X		X			X		X
Toxic Waste	X		X			X		X

9.3 Further Action by CAFF

The information gained as a result of preparing this Report is serving as an introduction, and preliminary overview for the work CAFF has begun in carrying out further in-depth analysis of various threats to the Arctic ecosystem and its' wildlife. As announced and endorsed at the 1993 Nuuk conference of Arctic Environmental Protection Strategy Ministers of Environment, CAFF will prepare a report and recommendations for the Ministers as a component of its continuing work on threats.

PART 2

A DIRECTORY OF

PROTECTED AREAS IN THE ARCTIC

KEY TO THE DIRECTORY OF PROTECTED AREAS IN THE ARCTIC

IUCN-categories

The Roman numeral (I-VIII) refer to the IUCN management categories, (see Table 4.1, Part 1).

Registration Number

The registration number has two parts: One letter code for each country, and a number for each area, (e.g. ALA001).

Letter codes:

CAN	= Canada	NOR	= Norway
FIN	= Finland	RUS	= Russia
GRE	= Greenland	SWE	= Sweden
ICE	= Iceland	ALA	= Alaska (USA)

Area Name

Name and national designation of the protected area.

National designations:

CP	=	Country Park
LPA	=	Landscape Protected Area
NCA	=	Nature Conservation Area
NM	=	National Monument
NNL	=	National Natural Landmark
NPark	=	National Park
NPres	=	National Preserve
NR	=	Nature Reserve
NWA	=	National Wildlife Area
SCHA	=	State Critical Habitat Area
SGR	=	State Game Refuge
SGS	=	State Game Sanctuary
SP	=	State Park

Year

Referring to the year the area was officially protected.

Area

Protected areas in hectare (ha).

Ramsar Site

This area have been designated to the List of Wetlands of International Importance. (The Convention on Wetland of International Importance, Ramsar 1971.)

Latitude and Longitude

This state the latitude and longitude of the centre of the protected area.

Physical Geographical Regions

Physical Geographical Region systems in the Arctic vary considerably from one country to another. Therefore, there are special codes for each country.

Canada and Alaska (USA):

Code		Physical Geographical Region
NA1	=	Alasak Tundra
NA2	=	Brooks Range Tundra
NA3	=	Alaska Boreal Interior
NA4	=	Taiga Cordillera
NA6	=	Pacific maitime Mountains
NA7	=	Taiga Plain
NA8	=	Southern Arctic
NA9	=	Taiga Shield
NA10	=	Northern Arcitc
NA11	=	Arctic Cordillera
NA12	=	Hudson Plain

Nordic Countries:

Code		Physical Geographical Region
NC1	=	Arctic - Alpine Zone
NC2	=	Alpine Zone
NC3	=	Northern Boreal Zone
NC4	=	Northern-Southern Boreal Zone
NC5	=	Middle Boreal Zone
NC6	=	Oceanic Middle Boreal Zone
NC11	=	Glacier

Svalbard (Norway):

NO1	=	Glacier
NO2	=	High Arctic
NO3	=	Middle Arctic

Greenland:

Code		Physical Geographical Region
GL1	=	Glacier
GL2	=	High Arctic
GL3	=	Dry Low Arctic
GL4	=	Humid Low Arctic
GL5	=	Northern Boreal Zone

Russia:

Code		Physical Geographical Region
RU1	=	Glacier
RU5	=	Grasslands and Hayfields
RU8	=	Tundra Plains of Sparse Utilisatio
RU9	=	Taiga of Limited Exploitation
RU13	=	Arctic Desert and Tundra Plains
RU14	=	Subarctic Tundra Plains
RU15	=	Northern Taiga Plains
RU16	=	Alluvial Meadows and Deltas
RU17	=	Wetlands
RU19	=	Arctic Mountainous Dessert
RU20	=	Mountainous Tundra
RU21	=	Mountainous Sparse Forest

Owner Ship

States the formal owner ship of the protected area.

P	=	Private
M	=	Municipality
C	=	County
S	=	State

Canada:

TE	=	Territorial Government
PR	=	Provincial Government
FE	=	Federal
AB	=	Aboriginal Lands

Management Authority

Management authority responsible for the formal management of the protected area.

L	=	Local
C	=	County
S	=	State

Canada:

AB	=	Aboriginal Lands
EC	=	Ecological Reserve/Area
HI	=	Historic Area or Park
MB	=	Migratory Bird Sanctuary
NA	=	National Park
NW	=	National Wildlife Areas
PV	=	Provincial Area or Park
RA	=	Ramsar Wetland Site
WA	=	Wilderness Area
WD	=	Wilderness Area
WM	=	Wildlife Management Area
WP	=	Wildlife Protection Area

Main Habitat Type

Main habitat types constituting the protected area. The remarks describe particularities of the area.

Main/Special Ecological Function

Indicates ecological function(s) of the protected area. For example, main living area of certain species, or wintering site of seabirds.

CANADA

Canada

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: isol. island	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/lambing
IUCN Categoty I																											
CAN001	Baralzon Lake Ecological Reserve	1990	39,000	59 55	98 00	NA9		PR	EC																		
CAN002	Polar Bear Pass Reserve NWA	1982	262,400	75 39	98 52	NA10	R	FE	NW		X					X							X				X
										Numerous ponds, lakes and vegetated stream valleys.										Musk ox, Peary caribou, Aretic fox.							
CAN003	Louis-Babel Ecological Reserve	1991	23,540	51 27	68 41	NA9		PR	EC																		
CAN006	Cape Henrietta-Marie Wilderness Area	1970	58,320	55 07	82 37	NA12		PR	WA																		
4 areas in IUCN CategoryI			**383,260 ha, total**																								
IUCN Categoty II																											
CAN004	Aulavik NPark	1992	1,220,000	73 46	119 45	NA10		FE	NA																		
CAN005	Grand Lake Provincial park Reserve	0	1,505	53 34	60 11	NA9		PR	PV																		
CAN007	Ivvavik NPark	1984	1,016,840	69 10	139 40	NA2 NA1		AB	NA																		
CAN008	Lady Evelyn Territorial Park	1986	1,364	60 57	117 20	NA7		TE	PV																		
CAN009	Meliadine Esker Territrial Park	1993	1,000	62 52	92 07	NA8		TE	PV																		
CAN010	North Baffin NPark	1992	2,220,000	72 00	76 55	NA11 NA10		FE	NA																		
CAN011	Pontoon Lake Territorial Park	1983	1,906	62 34	114 00	NA9		TE	PV																		
CAN012	Auyuittuq National Park Reserve	1976	2,146,940	67 28	66 13	NA11 NA10		FE	NA		X					X											
										1141 km2 marine component																	
CAN014	Blackstone Territorial Park	1982	1,430	61 05	122 55	NA7		TE	PR																		
CAN015	Ellesmere Island NPark	1982	3,777,500	81 46	71 02	NA10 NA11		FE	NA							X	X					X					
										Arctic desert.										Peary caribou, Musk ox, Arctic hare, Wolves.							
CAN017	Nahanni National Park Reserve	1976	476,560	61 34	125 49	NA7 NA4		FE	NA			X				X							X				
										Alpine tundra, river canyons, karstland.										E.g. Dall sheep, Black and Grizzly bear, Wolves.							
CAN019	Wood Buffalo National Park	1922	1,344,210	59 23	113 03	NA7		FE	NA		X	X											X				X
																				The worlds largest woodbison herd. Whooping crane.							
CAN020	Polar Bear Provincial Park	1970	2,408,700	55 04	84 43	NA12	R	PR	PV		X															X	X
										75% of the surface area is wetland.										Special value for maintaining genetic diversity.							
CAN021	Powder Point Territorial Park	1969	1,900	61 05	109 15	NA9		TE	PV																		
CAN022	Vuntut NPark	1993	434,500	68 22	139 50	NA3 NA2		FE	NA																		
CAN023	Winisk River Provincial Park	1969	173,530	53 28	87 17	NA12		PR	PV																		
16 areas in IUCN CategoryII			**15,227,885 ha, total**																								
IUCN Categoty III																											
CAN018	Bloody Falls Territorial Park	1969	1,550	67 44	115 23	NA8		TE	HI																		
1 area in IUCN CategoryIII			**1,550 ha, total**																								
IUCN Categoty IV																											
CAN024	Akimiski Island Migratory Bird Sanctary	1941	336,700	52 59	81 08	NA12		FE	MB		X					X							X				X
										Mudflats,sedge marshlands, permafrost hummocks, beach ridges										Important for the Polar bear in the summer.							

Canada

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type	Ecological function
										iso.isl. wetland marine forest geolog. tundra glacier alpine cultural delta	breeding nesting feeding resting wintering living moulting calv/lambing
CAN025	Anderson River Delta Migratory Bird Sanc	1961	108,300	69 35	128 47	NA8		FE	MB	River delta.	Waterfowls and a large diversity of passerine birds.
CAN026	Banks Island No.1 Migratory Bird Sanct	1961	2,051,800	72 44	123 19	NA10		FE	MB	Several rivers,deltas,sand, gravel cover much of the areas.	Large colony of Lesser snow geese. Wintring: Peary Caribou.
CAN027	Banks Island No.2 Migratory Bird Sanct	1961	14,200	74 00	119 45	NA10		FE	MB	Thomson River dominates the area.	Lesser snow geese Black grant, Musk ox, Arctic fox.
CAN028	Bowman Bay Wildlife Sanctuary	1957	107,900	65 30	73 40	NA10		MU	WP		
CAN030	Bylot Island MBS	1965	1,087,800	73 13	78 39	NA11 NA10		FE	MB		
CAN031	Cape Dorset Migratory Bird Sanctuary	1958	25,900	64 15	76 00	NA10		FE	MB	Three disjunct groups of rocky islands.	
CAN032	Dewey Soper-Res. Migratory Bird Sanct	1957	815,900	66 01	73 40	NA10	R	FE	MB	Extensive sedge lowland. A tidal zone up to 15 km inland.	The worlds largest goose colony.
CAN033	East Bay Migratory Bird Sanctuary	1959	116,600	64 05	82 12	NA8 NA10		FE	MB	Flat sedge meadows.	
CAN034	Harry Gibbons Migratory Bird Sanctuary	1959	148,900	63 50	85 55	NA8		FE	MB	Boas R. flows through an extensive sedge lowland.Tidal flats	
CAN035	Kendall Island Migratory Bird Sanctuary	1961	60,600	69 13	135 19	NA8		FE	MB		
CAN036	McConnell River Migratory Bird Sanct	1960	32,900	60 40	94 20	NA8	R	FE	MB		
CAN037	Prince Leopold Island MBS	1992	5,040	70 02	90 00	NA10		FE	MB	One island. Vertical cliffs on all sides of the island.	A major seabird community. Marine mammals.
CAN038	Rasmussen Lowlands	1982	300,000	68 40	93 00	NA10	R	TE	RA		
CAN039	Queen Maud Gulf MBS	1961	6,278,200	66 55	101 04	NA8		FE	MB		
CAN040	Old Crow Special Management Area	1993	612,000	66 29	139 32	NA4	R	FE			
CAN041	Hay-Zamma Lake	1982	50,000	58 30	119 00	NA7	R	PR	RRA		
CAN042	Hershel Island Territorial Park	1989	11,200	69 36	139 20	NA1		TE	PV		
CAN043	Thelon Game Sanctuary	1927	2,396,000	63 56	102 49	NA8 NA9		MU	WP		
CAN044	Twin Islands Wildlife Sanctuary	1939	142,500	53 06	79 53	NA12		MU	WP	The biggest island is mainly unconsolidated sand and gravel	Polar bear: Summer retreats and maternity denning areas.
CAN045	Hanna Bay Migratory Bird Sanctuary	1939	29,800	51 20	79 38	NA12		FE	MB	Coastal marsh, tidal flats.	
CAN046	Moose River Migratory Bird Sanctuary	1958	1,450	51 20	80 25	NA12		FE	MB		
CAN047	Boatswain Bay Migratory bird Sanctuary	1941	17,700	51 50	78 55	NA12		FE	MB	Coastel mud flats, sedge grass lowland, willow and spruce.	Very import.for variety of migrating and moulting waterbirds
CAN049	Cape Churchill Wildlife MGMT Area	1978	13,707,210	57 47	93 29	NA12		PR	WM		
CAN055	Intowin Wildlife Sanctuary	1976	8,800	56 15	67 00	NA9		PR	WM		
25 areas in IUCN CategoryIV			**28,467,400 ha, total**								
46 areas in IUCN Category I - V			**44,080,095 ha, 8.4% of total Arctic area in Canada**								

Canada

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	mang.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/lambing
IUCN Categoty VII																											
CAN013	Waskaganish	1975	78,476	51 09	78 20	NA12		AB	AB																		
CAN016	Wemindji	1975	51,282	53 00	78 49	NA9		AB	AB																		
CAN048	Inukjuak	1975	56,120	58 27	78 06	NA8		AB	AB																		
CAN051	Akulivik	1975	55,830	60 48	78 12	NA10		AB	AB																		
CAN052	Aupaluk	1975	63,040	59 21	69 41	NA9		AB	AB																		
CAN054	Chisasibi	1975	130,956	53 47	78 53	NA9		AB	AB																		
CAN057	Eastmain	1975	48,953	52 11	78 10	NA12		AB	AB																		
CAN058	Inujivik	1975	52,491	56 25	77 55	NA9		AB	AB																		
CAN060	Kangiqsuajuaq	1975	60,670	61 36	71 58	NA8		AB	AB																		
CAN061	Kangiqsualujuaq	1975	62,980	58 41	65 57	NA8		AB	AB																		
CAN062	Kangirsuk	1975	62,960	60 01	70 02	NA8		AB	AB																		
CAN063	Kawawachikamach	1975	32,634	54 52	66 46	NA9		AB	AB																		
CAN064	Kiggaluk	1975	4,510	53 30	78 13	NA9		AB	AB																		
CAN065	Killinik	1975	29,100	60 25	64 50	NA10		AB	AB																		
CAN066	Kuujjuaq	1975	63,070	58 06	68 24	NA9		AB	AB																		
CAN067	Kuujjuarapik	1975	1,535	55 17	77 45	NA9		AB	AB																		
CAN068	Povungnituk	1975	62,657	60 02	77 17	NA8		AB	AB																		
CAN069	Quaptak	1975	58,240	61 02	69 37	NA8		AB	AB																		
CAN070	Salluit	1975	62,570	62 13	75 59	NA10		AB	AB																		
CAN071	Tasiujak	1975	63,390	58 42	69 56	NA9		AB	AB																		
CAN072	Umiujak	1975	57,100	56 57	76 34	NA8		AB	AB																		
21 areas in IUCN CategoryVII			**1,158,564 ha, total**																								
IUCN Categoty VIII																											
CAN029	Whapmagoostui	1975	31,620	55 17	77 45	NA9		AB	AB																		
CAN050	Cape Tatnam Wildlife Managment Area	1973	522,267	57 10	90 58	NA12		PR	WM																		
CAN053	Fort George Wildlife Sanctuary	1976	1,816,600	54 15	78 00	NA9		PR	WM																		
CAN056	Nouveau Comptoir Wildlife Sanct	1976	752,100	53 00	78 00	NA9		PR	WM																		
CAN059	Post de la Baleine Wildlife Sanct	1976	535,400	55 17	77 45	NA9		PR	WM																		
5 areas in IUCN CategoryVIII			**3,657,987 ha, total**																								
26 areas in IUCN Category > V			**4,816,551 ha, 0.9% of total Arctic area in Canada**																								

Canada

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: isol.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/lambing
72 areas in Canada			**48,896,646 ha protected Arctic area (all classes)**																								
	9.3% protected Arctic area of 526,077,700 ha total Arctic area																										
	4.9% protected Arctic area of 997,061,000 ha total land area																										

FINLAND

Finland

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calvlambing
IUCN Categoty I																											
FIN005	Kevo	1956	71,170	69 31	26 35	NC3		S	S				X					X									
										Forest; mainly birch. Wetland; mires. Canyon.										Untouched area.							
FIN006	Malla	1938	3,088	69 04	20 41	NC1		S	S								X										
										Calcium rich soil.										Very rich flora.							
FIN007	Maltio	1956	14,686	67 24	28 41	NC3		S	S				X														
										Mainly spruce.																	
FIN008	Sompio	1956	17,912	68 10	27 25	NC3		S	S				X				X										
										Forest; mainly spruce and birch.										Bear, otter, golden eagle.							
FIN009	Vaerrioe	1982	12,412	67 43	29 38	NC3		S	S				X				X										
										Forest, mainly birch.																	
5 areas in IUCN CategoryI			**119,268 ha, total**																								
IUCN Categoty II																											
FIN001	Lemmenjoki NPark	1956	285,484	68 42	25 39	NC3		S	S				X				X										X
										Forest, spruce, pine, birch. Wetland, mainly bogs.										Untouched forest area. Bear, wolf, wolverine, geese, swans.							
FIN003	Pyhatunturi NPark	1938	4,231	67 01	27 08	NC3		S	S				X														
										Forest; spruce; pine. Wetland; mires.																	
2 areas in IUCN CategoryII			**289,715 ha, total**																								
IUCN Categoty IV																											
FIN002	Pallas-Ounastunturi NPark	1938	49,558	68 03	23 53	NC3		S	S				X				X										
										Forest, spruce, pine, birch. Wetland, mainly bogs.																	
FIN004	Urho Kekkonen NPark	1983	253,719	68 14	28 26	NC3		S	S				X				X										
										Forest; spruce, pine, birch. Wetland; mires.										Untouched area.							
FIN010	Mustaoja-Nunaravuoma	1988	1,036	67 40	25 23	NC3							X														
										Mire																	
FIN011	Haikara-aapa-Vitsikkoaapa	1988	1,298	66 56	26 53	NC3							X														
										Mire																	
FIN012	Ahvenvuoma	1988	1,382	67 35	25 01	NC3							X														
										Mire																	
FIN013	Jietanasvuoma	1988	1,510	68 27	22 34	NC3							X														
										Mire																	
FIN014	Silmasvuoma	1988	1,609	67 34	25 35	NC3							X														
										Mire																	
FIN015	Siukatanjarvi	1988	1,935	68 11	25 01	NC3							X														
										Mire																	
FIN016	Leppavuoma-Mustavuoma	1988	2,038	67 47	24 38	NC3							X														
										Mire																	
FIN017	Sotkavuoma	1988	2,190	68 22	23 16	NC3							X														
										Mire																	
FIN018	Uura-aapa	1988	2,279	67 54	28 54	NC3							X														
										Mire																	
FIN019	Terstojanka	1988	2,318	69 04	26 40	NC3							X														
										Mire																	
FIN020	Tollovuoma-Vasanvuoma	1988	2,365	67 36	25 17	NC3							X														
										Mire																	
FIN021	Piessuo-Luomusjoki	1988	2,593	69 23	26 05	NC3							X														
										Mire																	
FIN022	Peran Marinjanka	1988	2,610	69 25	27 12	NC3							X														
										Mire																	
FIN023	Sota-aapa	1988	2,848	68 18	27 12	NC3							X														
										Mire																	

Finland

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/ambing
FIN024	Kaarreramia-Kellovuotso	1988	2,869	67 31	28 55	NC3					Mire																
FIN025	Vaaranaapa	1988	3,460	68 05	27 41	NC3					Mire																
FIN026	Hanhijanka-Pierkivaaranjanka	1988	3,973	69 12	27 09	NC3					Mire																
FIN027	Lamsanaapa-Sakkala-aapa	1988	4,164	67 18	27 42	NC3					Mire																
FIN028	Poyrisvuoma	1988	4,270	68 42	23 60	NC3					Mire																
FIN029	Loukisen latvasuot	1988	4,277	67 50	25 33	NC3					Mire																
FIN030	Teuravuoma-Kivijarvenvuoma	1988	4,290	67 19	24 03	NC3 NC5					Mire																
FIN031	Viiankivuoma	1988	4,404	67 31	26 50	NC3					Mire																
FIN032	Kuortanovuoma-Saivinvuoma	1988	5,855	67 60	24 49	NC3					Mire																
FIN033	Raakevuoma-Vuossijanka	1988	6,831	68 12	24 26	NC3					Mire																
FIN034	Naatavuoma-Sotkavuoma	1988	7,180	67 25	25 23	NC3					Mire																
FIN035	Naatsukka-aapa	1988	8,894	68 13	25 55	NC3					Mire																
FIN036	Joutenaapa-Kaita-aapa	1988	10,290	67 02	28 48	NC3					Mire																
FIN037	Saaravuoma-Kuoskisvuoma	1988	15,460	68 29	24 30	NC3					Mire																
FIN038	lataseno-Hietajoki	1988	43,640	68 41	22 21	NC3 NC1					Mire																
FIN039	Pomokaira-Tennioaapa	1988	43,785	67 50	26 27	NC3					Mire																
FIN040	Sammuttijanka-Vaijoenjanka	1988	51,812	69 29	27 44	NC3					Mire																
FIN042	Hammastunturi	1991	220,625	68 31	26 34	NC3																					
FIN043	Kaldoaivi	1991	293,643	69 42	27 53	NC3 NC1																					
FIN044	Kemihaara	1991	30,597	67 57	28 41	NC3																					
FIN045	Käsivarsi	1991	293,643	69 00	21 39	NC1																					
FIN046	Muotkatunturi	1991	156,772	69 10	26 12	NC3																					
FIN047	Paistunturi	1991	181,878	69 43	26 25	NC3 NC1																					
FIN048	Pulju	1991	61,434	68 18	24 41	NC3																					
FIN049	Pöyrisjärvi	1991	127,797	68 36	24 15	NC3																					
FIN050	Tarvantovaara	1991	66,590	68 36	22 53	NC3																					
FIN051	Tsarmitunturi	1991	15,268	68 41	28 25	NC3																					
FIN052	Tuntsa	1991	21,183	67 38	29 32	NC3																					
FIN053	Vätsäri	1991	155,340	69 09	28 28	NC3																					

45 areas in IUCN CategoryIV **2,181,512 ha, total**

52 areas in IUCN Category I - V **2,590,495 ha, 32.6% of total Arctic area in Finland**

Finland

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: isol.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/lambing
Ramsar sites																										
FIN041	Koitelaiskaira	1980	34,400	67 15	26 53	NC3	R	S	S																	
1 Ramsar site			**34,400 ha, total**																							
1site			**34,400 ha, 0.4% of total Arctic area in Finland**																							

53 areas in Finland **2,624,895 ha protected Arctic area (all classes)**

33.0% protected Arctic area of 7,954,700 ha total Arctic area

8.6% protected Arctic area of 30,463,200 ha total land area

GREENLAND/DENMARK

Greenland

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tun.ra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/lambing	
IUCN Categoty I																												
GRE013	Melville Bay NR	1977	1,050,000	76 21	60 31	GL1										☒												
GRE014	Arnangarup Qoorua	1989	8,000	66 30	51 21	GL3																						
2 areas in IUCN CategoryI			**1,058,000 ha, total**																									
IUCN Categoty II																												
GRE012	Northeast Greenland NPark	1974	97,200,000	72 33	23 20	GL1 GL2					☒					☒										☒	☒	
										Mainly glacier.										E.g.Polar bear, musk ox, geese.								
1 area in IUCN CategoryII			**97,200,000 ha, total**																									
3 areas in IUCN Category I - V			**98,258,000 ha, 45.2% of total Arctic area in Greenland**																									
Ramsar sites																												
GRE001	Aqajarua-Sullorsuaq	1988	30,000	69 42	52 00		R				☒										☒							
																				Waterfowls.								
GRE002	Qinguata marraa - Kuussuaq	1988	6,000	69 56	54 17		R				☒																☒	
																				Waterfowls.								
GRE003	Kuannersuit Kuussuat	1988	4,500	69 40	53 17		R				☒														☒		☒	
																				Waterfowls.								
GRE004	Kitsissunnguit	1988	16,000	68 50	51 50		R				☒										☒						☒	
										Group of flat, rocky islands, large shallow area.										Waterfowls.								
GRE005	Naternaq	1988	150,000	68 20	52 00		R				☒																☒	
																				Waterfowls, and also of great botanically interest.								
GRE006	Eqalummiut Nunaat - Nassuttuup Nunaa	1988	500,000	67 25	50 30		R				☒										☒				☒		☒	
GRE007	Ikkattoq	1988	35,000	62 35	49 50		R				☒														☒		☒	
										Shallow fjord area.										Waterfowls, importet moulting area for Mergus serrator.								
GRE008	Ydre Kitsissut	1988	8,000	60 45	48 25		R				☒										☒						☒	
										Rocky islands.																		
GRE009	Heden	1988	125,000	71 00	24 00		R				☒										☒				☒		☒	
																				Waterfowls, inc. Anser brachyrhynchus and Branta leucopsis.								
GRE010	Hochstetter Forland	1988	140,000	73 30	20 00		R	S	S		☒										☒				☒		☒	
GRE011	Kilen	1988	30,000	81 15	13 30		R	S	S		☒										☒						☒	
11 Ramsar sites			**1,044,500 ha, total**																									
11 sites			**1,044,500 ha, 0.5% of total Arctic area in Greenland**																									
14 areas in Greenland			**99,302,500 ha protected Arctic area (all classes)**																									

45.6% protected Arctic area of 217,560,000 ha total Arctic area

45.6% protected Arctic area of 217,560,000 ha total land area

ICELAND

Iceland

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calvlambing
IUCN Categoty I																											
ICE012	Surtsey NR	1965	0,270	63 20	20 35	NC6		S	S					X													
										Volcanic island										Lifeform settlement and succession monitoring							
ICE025	Eldey NR	1940	0,002	63 42	23 00	NC6		S	S																		
										Island										Birdcliffs, large gannet colony							
2 areas in IUCN CategoryI			**0,272 ha, total**																								
IUCN Categoty II																											
ICE003	Jökulsargljufur NPark	1973	15,100	65 54	16 32	NC3 NC1		S	S					X													
										Canyon, craters, birch wood																	
ICE004	Skaftafell NPark	1967	160,000	64 16	17 08	NC11 NC3		S	S					X		X											
										Birch wood																	
ICE005	Thingvellir NPark	1928	5,000	64 15	21 04	NC1 NC3		S	S					X													
										Geological formations																	
3 areas in IUCN CategoryII			**180,100 ha, total**																								
IUCN Categoty III																											
ICE013	Alftaversgigar NM	1975	3,650	63 30	18 30	NC6 NC3		P	S					X													
										Volcanic craters																	
ICE014	Askja i Dyngjufjöllum NM	1978	5,000	65 03	16 47	NC1		P	S					X													
										Volcanic crater																	
ICE015	Lakagigar NM	1971	16,000	64 06	18 11	NC1 NC11		S	S					X													
										Volcanic craters																	
ICE016	Skogafoss NM	1987	2,204	63 33	19 30	NC1 NC11		S	S																		
										Waterfall																	
4 areas in IUCN CategoryIII			**26,854 ha, total**																								
IUCN Categoty IV																											
ICE001	Myvatn-Laxa	1974	440,000	65 22	16 41	NC1 NC3	R	PS	S		X			X												X	
										lake, river, and surrounding wetlands, geological formations										Waterfowl							
ICE007	Flatey NR	1975	0,100	65 21	22 50	NC3		S	S																		
										Island																	
ICE008	Geitland NR	1988	11,750	64 41	20 37	NC11 NC1		P	S		X																
ICE010	Kringilsarrani NR	1975	8,500	64 45	15 55	NC1 NC11		S	S		X			X													
										Morains																	
ICE011	Miklavatn NR	1977	1,550	65 43	19 34	NC1 NC3		P	S		X																
ICE020	Hvannalindir i Krepputungu NR	1973	4,300	64 51	16 19	NC1		S	S		X																
6 areas in IUCN CategoryIV			**466,200 ha, total**																								
IUCN Categoty V																											
ICE002	Thjorsarver NR	1981	37,500	64 38	18 46	NC1 NC11	R	M	S		X															X	
																				Breeding area of Pink-footed Geese							
ICE006	Fjallabak NR	1979	47,000	64 01	19 10	NC1		M	S							X											
										Mountain; volcanoes,geothermal activity,lava,sands,rivers.																	
ICE009	Herdisarvik NR	1988	4,000	63 52	21 51	NC6		S	S					X													
										Coastal area, lavafields																	
ICE017	Esjufjöll NR	1978	27,000	64 13	16 30	NC11		M	S							X											
										Nunatak																	

Iceland

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	Manag.	Main habitat type: isolat.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/lambing
ICE018	Herdubreidarfridland NR	1974	17,000	65 17	16 08	NC1		M	S					☒													
														Lavafields													
ICE019	Hornstrandir NR	1975	58,000	66 23	22 36	NC1		PS	S					☒													
																				Birdcliffs, seabird colonies							
ICE021	Lonsöraefi NR	1977	32,000	64 35	15 11	NC1 NC11		S	S				☒			☒	☒										
														Birch wood, rivers													
ICE022	Vatnsfjördur NR	1975	20,000	65 37	23 06	NC1 NC3		S	S			☒	☒														
														Fjord with birchwood													
8 areas in IUCN CategoryV			**242,500 ha, total**																								

23 areas in IUCN Category I - V **915,926 ha, 8.9% of total Arctic area in Iceland**

IUCN Categoty VIII

ICE023	Blafjöll CP	1973	8,400	64 00	21 40	NC6		C	SC																		
ICE024	Reykjanesfolkvangur CP	1975	30,000	63 55	21 58	NC6		C	SC																		
2 areas in IUCN CategoryVIII			**38,400 ha, total**																								

2 areas in IUCN Category > V **38,400 ha, 0.4% of total Arctic area in Iceland**

25 areas in Iceland **954,326 ha protected Arctic area (all classes)**

9.3% protected Arctic area of 10,300,000 ha total Arctic area

9.3% protected Arctic area of 10,300,000 ha total land area

NORWAY

Norway

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geobg.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calvlambing
IUCN Categoty I																											
NOR002	Storlia, NR	1989	2,400	66 33	14 58	NC2		SP	S				X														
										The northernmost natural spruce forest, rich birch forest.										Complex subalpin forest system with intact flora and fauna.							
NOR003	Semska-Stødi, NR	1976	1,300	66 37	15 24	NC2		S	S		X																
										Mixed wetland, includes also morain areas.										Complex wetland area with intact flora and fauna.							
NOR007	Bliksvær NR	1970	0,350	67 14	13 57	NC6			S				X														
										Coastel area with many small islands.																	
NOR008	Karlsøyvær NR	1977	0,800	67 34	14 39	NC6		P	S				X								X	X					X
										Coastal area with many small islands.										Important waterfowl area.							
NOR011	Skogvoll NR	1983	2,800	69 09	15 53	NC6			S		X																
										Mainly mixed mires.																	
NOR016	Javreoaivit NR	1981	3,000	69 32	21 12	NC1			S								X										
																				Unique flora.							
NOR018	Nord-Fugløy NR	1975	2,130	70 16	20 15	NC6			S				X														X
										One island.										Bird cliff.							
NOR022	Reinøya NR	1981	1,300	70 16	25 17	NC1			S					X													
										Porsanger-dolomitt.																	
NOR023	Ovdaldasvarri NR	1983	1,430	69 58	26 58	NC1			S					X													
										Fossil sand dune.																	
NOR024	Makkaurhalvøya NR	1983	11,350	70 37	30 09	NC1		S	S					X													X
										Steep cliffs.										Important bird cliff.							
NOR025	Blodskytodden-Barvikmyran NR	1983	2,650	70 25	30 54	NC1		S	S		X			X													
										Shore meadows and mires.																	
NOR028	Færdesmyra NR	1972	1,200	69 44	29 15	NC1			S		X																
										Mixed bogs.																	
NOR033	North-east Svalbard NR	1973	1,903,000	79 36	24 48	NO1 NO3		S	S							X	X										
										Mainly glaciers.																	
NOR034	Moffen NR	1983	1,600	80 02	14 29	NO2		S	S																		
																				Walrus							
NOR035	South-east Svalbard NR	1973	638,000	77 41	25 05	NO3 NO1		S	S							X	X										
NOR036	Pasvik NR	1993	1,910	69 09	29 12	NC3		PS	S		X										X						X
										Bogs and bogs with pinetrees, lake										Waterfowl							
16 areas in IUCN CategoryI			**2,575,220**	**ha, total**																							
IUCN Categoty II																											
NOR001	Saltfjellet-Svartisen, NPark	1989	210,500	66 39	14 28	NC2 NC11							X	X													
										Includes birch forests, lime-rich areas, caves.										Complex mountain area with intact flora and fauna.							
NOR010	Rago NPark	1971	16,720	67 26	15 58	NC2 NC3		S	S								X										
NOR012	Øvre Dividal NPark	1971	74,280	68 41	19 46	NC1		S	S		X		X				X										
										Mainly moutain area. Also pine and birch forests and mires.										Complex landscape with rich flora and fauna.							
NOR013	Ånderdalen NPark	1970	6,900	69 13	17 18	NC3 NC6		S	S				X				X										
										Mountain, pine and birch forests.										Natural oceanic pine and birch forests.							
NOR014	Reisa NPark	1986	80,300	69 14	22 00	NC1		S	S				X				X										
										Vegetation zones from lowland to high altitude, rich flora.										Untouched mountain and vally area.							
NOR019	Øvre Anarjokka NPark	1975	139,870	68 50	24 38	NC3		S	S				X				X										
										Birch forests, bogs, treeless plateaus.										Large varied unspoilt forest and plateau.							
NOR021	Stabbursdalen NPark	1970	9,820	70 07	24 29	NC1			S				X				X										
										The nothernmost pine forest of the world (10 km2).																	
NOR029	Øvre Pasvik NPark	1970	6,660	69 06	28 56	NC3		S	S				X														
										Virgin forest area, mainly pine forest.																	

Norway

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl. / wetland / marine / forest / geolog. / tundra / glacier / alpine / cultural / delta	Ecological function: breeding / nesting / feeding / resting / wintering / living / moulting / calving/moulting
NOR030	South-Spitsbergen NPark	1973	530,000	76 55	15 36	NO1 NO2		S	S	65 % glacier.	Sea birds.
NOR031	Forlandet NPark	1973	64,000	78 33	11 14	NO2		S	S	Mainly tundra, from shore to mountain, many small glaciers.	Common seal and sea birds.
NOR032	North-west Spitsbergen NPark	1973	356,000	79 24	11 05	NO2 NO1		S	S		Sea birds, walrus, svalbard reindeer.
11 areas in IUCN CategoryII			**1,495,050 ha, total**								

IUCN Categoty V

NOR004	Saltfjellet, LPA	1989	50,800	66 40	15 35	NC2 NC3		S	S	Mixed Forest	In connection with RegNo.: NOR001, NOR002, NOR005
NOR005	Gåsvatnan, LPA	1989	12,000	66 59	15 04	NC3		P	S	Subterranean river, areas with very rich flora.	
NOR006	Østerdalen LPA	1983	2,700	67 09	15 16	NC3			S	Bogs, small lakes, rivers. Rich deciduous forests.	Rich and div. flora and fauna.
NOR009	Strandå-Os LPA	1983	1,670	67 31	14 57	NC6			S		
NOR015	Raisduottarhaldi LPA	1986	8,000	69 20	21 22	NC1			S		
NOR017	Skipsfjord LPA	1978	4,200	70 09	19 49	NC6			S		
NOR020	Vassbotndalen LPA	1991	7,550	69 59	22 46	NC1				Gray alder.	
NOR026	Brannsletta LPA	1983	1,880	69 58	29 13	NC1		S?	S	Quartergeology.	
NOR027	Garsjøen LPA	1983	2,000	69 53	28 54	NC1		S	S	Quartergeology.	
9 areas in IUCN CategoryV			**90,800 ha, total**								

36 areas in IUCN Category I - V — **4,161,070 ha, 25.4% of total Arctic area in Norway**

36 areas in Norway — **4,161,070 ha protected Arctic area (all classes)**

25.4% protected Arctic area of 16,352,200 ha total Arctic area

10.8% protected Arctic area of 38,697,500 ha total land area

RUSSIA

Russia

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calvlambing	
IUCN Categoty I																												
RUS001	Kandalakshsky NR	1932	70,527	66 25	33 48	RU8 RU15			S			X	X															North taiga, wetland. 5 distinct areas. Important for the genofond of wild northern animals.
RUS002	Laplandsky NR	1930	268,400	67 60	31 55	RU15			S																			Very varied landscapes and habitat types.
RUS003	Pasvik NR	1992	14,600	69 18	29 25	RU15			S			X	X															Mixed wetland.
RUS004	Taimyrsky NR	1979	1,348,708	72 24	101 54	RU14			S							X												
RUS005	Putoransky NR	1988	1,887,300	69 15	93 25	RU20 RU21			S							X		X										
RUS006	Lena Delta NR	1985	1,433,000	72 12	127 19	RU8												X	X									The reserve consist of two parts.
RUS007	Wrangel Island NR	1976	795,700	71 23	175 42	RU13			S									X										
RUS018	Franz Josef Land NR	1994	4,200,000	81 04	55 49	RU1 RU19		S	S							X	X											Large populations of endangered rare arctic biota species.
RUS022	Great Arctic NR	1993	4,169,200	72 60	79 04	RU15 RU9						X				X				X								Waterfowls, Reindeer, Wolf, Polar bear
RUS026	Magadansky NR (Seimohanski part)	1982	117,839	63 46	153 08	RU21																						
10 areas in IUCN CategoryI			**14,305,274 ha, total**																									
IUCN Categoty IV																												
RUS008	Nenets Sanctuary	1987	440,000	68 37	53 29	RU8			S																			
RUS010	Murman tundra Sanctuary	1987	295,000	67 39	38 07	RU8 RU15			S																			
RUS011	Lower Ob-river Sanctuary	1987	128,000	66 40	69 54	RU8			S																			
RUS012	Chaigurgino Sanctuary	1983	2,375,600	69 15	158 59	RU8			CS																			
RUS013	Purinsky Sanctuary	1990	787,500	72 24	87 09	RU14 RU13			S																			
RUS014	Vaigach Sancyuary	1983	270,000	70 01	59 29	RU8			C																			
RUS015	Yamal Sanctuary	1977	1,402,000	68 05	71 15	RU8			C																			
RUS016	Messo-Yakhinsky Sanctuary	1976	103,500	68 48	78 48	RU8			C																			
RUS017	Ust-Yansky Sanctuary	1979	185,600	71 28	135 52	RU8			C																			
RUS020	Kan-Lake Sanctuary	1989	65,700	67 00	34 25	RU9			S																			
RUS021	Tulomsky Sanctuary	1989	33,700	67 02	34 24	RU9			S																			
RUS023	Lebedinkys Sanctuary	1987	50,200	65 08	171 25	RU8		S	S																			
RUS024	Tundorovyi Sanctuary	1971	500,000	64 03	175 54	RU8		M	L																			
RUS025	Ust-Tanyrersky	1974	450,000	65 03	174 10	RU8 RU21		M	L																			
RUS027	Teyukuul Sanctuary	1971	20,000	66 31	177 35	RU20																						
15 areas in IUCN CategoryIV			**7,106,800 ha, total**																									
25 areas in IUCN Category I - V			**21,412,074 ha, 3.4% of total Arctic area in Russia**																									

Russia

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	mang.	Main habitat type: isol.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	culturel	delta	Ecological function: breeding	resting	feeding	resting	wintering	living	moulting	calvlambing
IUCN Categoty VI																											
RUS019	Novo-Siberia islands	1992	3,840,000	74 50	142 40	RU13			C																		
1 area in IUCN CategoryVI			**3,840,000 ha, total**																								
IUCN Categoty VII																											
RUS009	Beringia ethno-nature park	1993	3,053,300	65 56	173 46	RU8 RU20			C																		
1 area in IUCN CategoryVII			**3,053,300 ha, total**																								
2 areas in IUCN Category > V			**6,893,300 ha, 1.1% of total Arctic area in Russia**																								

27 areas in Russia **28,305,374 ha protected Arctic area (all classes)**

4.5% protected Arctic area of 634,978,000 ha total Arctic area

1.7% protected Arctic area of 1,707,540,000 ha total land area

SWEDEN

Sweden

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/ambing
IUCN Categoty II																											
SWE001	Vadvetjakka NPark	1920	2,630	68 33	18 25	NC1							X				X	X									
										Birch.										Birds, flora, caves.							
SWE002	Abisko NPark	1909	7,700	68 19	18 42	NC1 NC2							X				X										
										Mainly birch, extreme rich flora.																	
SWE003	Stora Sjøfallet NPark	1909	127,800	67 31	17 57	NC2							X				X										
										Mixed mountain, virgin pine forest.																	
SWE004	Sarek NPark	1909	197,000	67 21	17 34	NC2							X				X	X									
										Mixed alpine area, birch forest.																	
SWE005	Padjelanta NPark	1962	198,400	67 26	16 41	NC2											X										
										Alpine heaths, great lakes.																	
SWE006	Muddus NPark	1942	49,340	67 01	20 08	NC3 NC5						X	X															
										Vast mire complex, extensive virgin pine and spruce forests.										Rich wildlife.							
SWE007	Peljekaise NPark	1909	15,340	66 18	16 58	NC3 NC2							X				X										
										2/3 mountain birch. Alpine heaths, lakes.																	
7 areas in IUCN CategoryII			**598,210 ha, total**																								
IUCN Categoty IV																											
SWE008	Stordalen NPres	1980	1,000	68 21	19 03	NC1																					
SWE009	Alajaure NPres	1980	17,000	68 10	20 12	NC3																					
SWE010	Pakketanjaure NPres	1988	21,000	68 09	20 23	NC3																					
SWE011	Vittangi-Soppero NPres	1988	18,800	67 56	21 16	NC3																					
SWE012	Rautusakkara NPres	1988	1,200	67 52	21 04	NC3																					
SWE013	Pessinki NPres	1988	51,500	68 01	22 25	NC3																					
SWE014	Kaitum NPres	1988	40,100	67 36	20 36	NC3																					
SWE015	Lina NPres	1988	8,600	67 19	20 30	NC3																					
SWE016	Stubba NPres	1988	8,300	67 06	20 04	NC3																					
SWE017	Dundret	1986	5,500	67 05	20 38	NC3																					
SWE018	Sjaunja	1986	285,000	67 26	19 25	NC2 NC3																					
SWE019	Kartevare	1966	2,400	66 57	19 30	NC3																					
SWE020	Harrejaure	1988	26,700	67 01	18 46	NC2 NC3																					
SWE021	Parlalven	1988	56,600	66 48	18 13	NC2 NC3																					
SWE022	Kallovaratjeh	1974	2,235	67 07	16 47	NC2																					
SWE023	Serri	1970	3,687	66 35	20 13	NC5																					
SWE024	Palkåive	1988	1,400	66 18	19 24	NC5																					
SWE025	Nuortap-Antivaratj	1988	7,600	66 22	18 53	NC3																					
SWE026	Arvesjåkkå	1988	8,000	66 31	18 20	NC3																					
SWE027	Tjeggelvas	1988	32,100	66 27	17 57	NC3																					
SWE028	Långsjøen	1974	2,200	66 21	18 19	NC3																					

Sweden

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/rearing
SWE029	Hornavan	1988	12,000	66 16	17 47	NC3																					
SWE030	Plassa	1988	1,200	66 21	16 12	NC2																					
SWE031	Palja	1988	4,300	66 13	19 19	NC5																					
SWE032	Bårgå	1988	4,100	66 14	18 16	NC3																					
SWE033	Nimtek	1988	4,400	65 59	18 29	NC3																					
SWE034	Tjadnesvare	1988	4,000	65 48	18 37	NC3																					
SWE035	Delikalven	1988	8,800	65 60	17 09	NC3																					
SWE036	Nalovardo-Storgidna	1988	4,400	65 46	17 28	NC3																					
SWE037	Vindelfjallen	1974	550,630	65 48	15 25	NC2 NC3																					
SWE038	Marsfjallet	1988	86,000	65 07	15 27	NC3 NC2																					
SWE039	Gitsfjallet	1988	40,000	64 50	15 28	NC3																					
SWE040	Bjuralven	1982	2,290	64 55	14 06	NC2																					
SWE041	Daimadalen	1990	28,400	64 49	14 36	NC2 NC4																					
SWE042	Oxfjallet	1988	1,700	64 40	15 24	NC3																					
SWE043	Blaikfjallet	1988	11,000	64 30	16 14	NC3																					
36 areas in IUCN CategoryIV			**1,364,142 ha, total**																								
43 areas in IUCN Category I - V			**1,962,352 ha, 20.7% of total Arctic area in Sweden**																								

43 areas in Sweden **1,962,352 ha protected Arctic area (all classes)**

20.7% protected Arctic area of 9,500,000 ha total Arctic area

4.8% protected Arctic area of 41,100,000 ha total land area

UNITED STATES OF AMERICA

(ALASKA)

USA

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	mang.	Main habitat type: iso.isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calvlambing
IUCN Categoty II																											
ALA016	Gates of the Arctic NPark	1978	2,458,700	67 50	153 00	NA2		F								☒											
																				Indigenous people follow patterns of life.							
ALA017	Katmai NPark	1978	1,384,000	58 30	155 00	NA6		F								☒				☒			☒				
										Lakes, rivers, glacier, coastline of cliffs and islets.										Cretical for the Brown bears survival in Alaska.							
ALA019	Kobuk Valley NPark	1978	275,400	67 15	159 00	NA2		F								☒							☒				
										Large active sand dune field.										Remnant flora. Great caribou herds.							
3 areas in IUCN CategoryII			**4,118,100 ha, total**																								
IUCN Categoty III																											
ALA013	Walker Lake NNL in Gates of the Arctic NPark	0	32,700	67 15	154 33	NA2		F																			
ALA021	Walrus Island NNL in ADP&G Walrus Island SGS	0	3,600	58 40	160 22	NA6		S																			
ALA033	Unga island NNL in Shumagin Village Corp.	0	1,200	55 22	160 45	NA6		F																			
ALA034	Aniakchak Crater NNL in Aniakchak NM	0	8,300	56 54	158 06	NA6		F																			
ALA035	Arrigetch Peaks NNL in Gates of the Arctic NP	0	14,300	67 23	154 03	NA2		F																			
ALA036	Bogoslov Island NNL in Alaska Maritime NWR	0	0,050	53 55	168 02	NA1		F																			
ALA037	Clarence Rhode NNL in Yukon Delta NWR	0	1,281,100	60 36	164 39	NA1		F																			
ALA038	McNeil River NNL in McNeil River SGS	0	280,700	58 45	154 15	NA6		S																			
ALA039	Mt. Veniaminof NNL in Alaska Peninsula NWR	0	324,200	56 00	159 30	NA6		F																			
ALA040	Shishaldin Volcano NNL in Alaska MaritimeNWR	0	25,700	54 40	163 40	NA6		F																			
ALA041	Simeonof Island NNL in Alaska Maritime NWR	0	4,400	54 54	159 15	NA6		F																			
11 areas in IUCN CategoryIII			**1,976,250 ha, total**																								
IUCN Categoty IV																											
ALA001	Alaska Maritime NWR	1909	2,037,900	54 00	170 00	NA1 NA6		F				☒															
										Approximately 2.400 islands, rocks, reefs etc.										Diverse range of seabirds and wildlife.							
ALA002	Alaska Peninsula NWR	1980	1,817,000	56 15	159 00	NA6		F								☒				☒							
										Diverse landscape with volcanos, lakes, rivers, coastline.										Diverse mammals, sea mammals and birds							
ALA003	Arctic NWR	1960	5,056,900	69 00	144 00	NA2		F								☒											
										The most northern of all refuges.										Porcupine caribou, other mammals, migratory waterfowl.							
ALA004	Kodiak NWR	1941	695,100	57 45	153 00	NA6		F																			
ALA005	Becharof NWR	1978	588,900	57 50	156 00	NA6		F				☒															
										Becharof lake and wetlans dominate, also hills and volcanoes										Salmon spawning streams attract brown bears.							

USA

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: iso.isl.	wetland	marine	forest	geology	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/ambing
ALA006	Izembek NWR	1960	118,400	55 15	162 30	NA1	R	F				X								X	X	X					
										Also tundra, glaciers, volcanoes										Import. for Black grant and Empire geese during migration.							
ALA007	Selawik NWR	1978	958,000	66 45	159 00	NA1		F			X									X	X						X
										The tundra wetlands are the most prominent.										Situated where the Bering Land Bridge once existed.							
ALA008	Togiak NWR	1978	1,864,700	59 30	160 00	NA6		F																			
ALA009	Yukon Delta NWR	1909	8,516,400	61 30	164 00	NA1		F			X								X	X							X
										The Yukon and Kuskokwim Rivers dominate the landscape.										56 Yupik villages in the refuge depend on wildlife resouces.							
ALA010	Aniakchak NM	1978	55,500	56 55	158 10	NA6		F													X						
										Volcanic features, hot springs.																	
ALA011	Aniakchak NPres	1978	188,000	56 50	157 45	NA6		F													X						
										Volcanic features, hot springs.																	
ALA012	Bering Land Bridge NPres	1978	1,091,300	66 00	164 00	NA1		F			X					X											
ALA014	Cape Krustenstern NM	1978	262,800	67 30	163 30	NA1		F			X																
										Gravel beachscape.										Archaeological sites. Beach ridges describe land growth.							
ALA015	Gates of the Arctic NPres	1978	133,200	67 45	155 00	NA2		F								X											
																				Indigenous people follow traditional patterns of life.							
ALA018	Katmai NPres	1978	129,100	58 30	155 00	NA6		F								X											
										Lakes, rivers, glaciers, coasline of cliffs and islets.										Cretical for the Brown bears survival in Alaska.							
ALA020	Noatak NPres	1978	2,622,700	68 00	159 00	NA1 NA2		F													X						
																				Large untouched river basin. E.g.carnivores,dall sheep,birds							
ALA022	Tugidak Island SCHA	1988	64,100	56 30	154 45	NA6		S																			
ALA023	Cape Newenham SGR	1960	3,600	58 47	161 42	NA6		S			X										X	X					
										Vast eelgrass beds.										Ducks, geese, shorebirds. Critical to Black brant.							
ALA024	Cinder River SCHA	1972	7,600	57 22	158 00	NA1		S			X										X	X					
										Large vegetated, intertidal areas.										E.g.ducks,geese,shore bird, particul.import.to Canada geese.							
ALA025	Egegik SCHA	1972	1,800	58 09	157 09	NA1		S			X										X	X					
										Extensive areas of tideflats, wetlands and nearshore waters.										Waterbirds.							
ALA026	Izembek SGR	1960	73,000	55 20	162 53	NA1		S			X										X	X					
										One of the world's largest eelgrass beds.										Millions of watwerfowl							
ALA027	McNeil River SGS	1967	160,500	59 10	154 30	NA6		S																			
ALA028	Pilot Point SCHA	1972	30,100	57 30	157 50	NA1		S			X					X					X	X					
										Extensive tideflats and flat lowland tundra.										Large flocks of waterbirds.							
ALA029	Port Heiden SCHA	1972	27,600	56 48	158 55	NA1		S			X										X	X					
										Extensive estuarine enviroment of tideflats and wetlands.										Large flocks of waterbirds.							
ALA030	Port Moller SCHA	1972	49,800	55 55	161 00	NA1		S			X										X	X					
																				Large flocks of waterbirds.							
ALA031	Walrus Islands SGS	1960	79,200	58 42	160 18	NA6		S			X										X						X
										7 craggy islands fronted by rocky beaches and steep cliffs.										Regularly land-based walrus haulout. Seabirds.							
ALA032	Wood-Tikchik SP	1978	415,000	60 00	159 00	NA6		S																			
										Diversed area; from boreal forest to arctic tundra.																	

27 areas in IUCN CategoryIV **27,048,200 ha, total**

41 areas in IUCN Category I - V **33,142,550 ha, 56.1% of total Arctic area in USA**

USA

CAFF Code	Name	Year	Area ha	Lati-tude	Longi-tude	geo.unit primary/ secondary	ramsar	owner	manag.	Main habitat type: isl. isl.	wetland	marine	forest	geolog.	tundra	glacier	alpine	cultural	delta	Ecological function: breeding	nesting	feeding	resting	wintering	living	moulting	calv/ambing
41 areas in USA			**33,142,550 ha protected Arctic area (all classes)**																								
	56.1% protected Arctic area of 59,055,300 ha total Arctic area																										
	3.6% protected Arctic area of 916,675,800 ha total land area																										

PART 3

LITERATURE

APPENDICES (I - IV)

ANNEX

LITERATURE

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* Canada Wildlife Act and Regulations.

* Migratory Birds Convention Act and Bird Sanctuary Regulations.

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* Manitoba Ecological Reserves Act and Regulations.

* Manitoba Wildlife Act.

* Newfoundland Provincial Parks Act.

* Newfoundland Wilderness and Ecological Reserve Act.

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APPENDIX I

Management practices and regulations in Canada:

1) Legislation under which protected areas in the Arctic have been established:

Federal

National Parks - *National Parks Act.*, National Historic Parks - *National Parks Act*
National Wildlife Areas - *Canada Wildlife Act* and *Wildlife Area Regulations*
Migratory Bird Sanctuaries - Migratory Birds Convention Act and Bird Sanctuary

Regulations:

Territories

Northwest Territories/Yukon: Game Sanctuaries - *Wildlife Act* (Northwest Territories) and *Wildlife Act* (Yukon)

Provinces

Manitoba: Ecological Reserves - *Ecological Reserves Act and Regulations (1981),* Wildlife Management Areas - *Wildlife Act (1980)*

Newfoundland: Provincial Parks - *Provincial Parks Act,* Ecological Reserves - *Wilderness and Ecological Reserves Act (1980).* Not yet represented in the Arctic

Ontario: Provincial Parks & Nature Reserves - *Ontario Provincial Parks Act (1980),* Wilderness Areas - *Wilderness Areas Act (1980)*

Quebec: Wildlife Sanctuaries - *Wildlife Conservation Act*

Saskatchewan: Provincial Parks - *Parks Act (1986)*

International

Ramsar Sites - No legislation (International Convention)
World Heritage Sites - UNESCO World Heritage Convention

2) Regulations/restrictions pertaining to different categories of protected areas:

Federal

National Parks, National Historic Parks, National Wildlife Areas, Migratory Bird Sanctuaries.

Wildlife Sanctuaries - Hunting and collection of wildlife, nests and eggs (except with appropriate approvals) are prohibited under the *Canada Wildlife Act* (Section 29). Native

people may still hunt for subsistence purposes (e.g. food) except in the Thelon Game Sanctuary where all hunting and trapping activities are prohibited.

Provinces

Manitoba: The Manitoba *Ecological Reserve Act* (IUCN Category 1) prohibits all access and uses without a Ministerial permit. Where access is provided it is usually by foot. Development activities are prohibited.

Newfoundland. The Newfoundland *Provincial Parks Act* (IUCN Category 11) controls access by Ministerial permit. Development is not permitted (hydro, forestry, mining etc.)nor is hunting. Public activities such as camping, angling, berry picking photography are allowed.

Ontario: The *Provincial Parks Act* provides for 6 classes of parks: wilderness, Nature Reserve, Historical, Natural Environment, Waterways and Recreation.

The Act prohibits logging, hunting, trapping, mineral exploration and hydroelectric development in wilderness and recreation class parks. Tourism is permitted on a non-consumptive, non-motorized basis. Status Indians are allowed to continue traditional activities on lands in provincial falling with their treaty areas. e.g. trapping and hunting.

No trapping, mining or hydroelectric development is permitted in any of the other provincial parks.

Quebec: The *Wildlife Conservation Act* provides for the creation of wildlife sanctuaries. Sanctuaries are multiple use and serve a variety of purposes. Hunting, trapping, fishing however, are the dominant activities. Utilization of the resource is fixed primarily on conservation of the wildlife. Activities are conducted under a set of regulations and licences which set out limits and standards.

Saskatchewan: Parks under the *Parks Act* are managed principally for outdoor- recreation purposes. Recreation development however, is restricted to core areas. The multiple use concept is followed. Mineral exploration and forest harvesting can occur but require special permits. Fishing is by license as is hunting if the park is opened for hunting by the provincial government.

3) Management Authorities:

Federal

National Parks - Federal Government, Canadian Parks Service, Environment Canada
National Landmark - Federal Government in cooperation with local and regional authorities
National Wildlife Areas - Federal Government, Canadian Wildlife Service, Environment Canada.
Migratory Bird Sanctuaries - Federal Government, Canadian Wildlife Service, Environment Canada.

Territories

Wildlife Sanctuaries - Territorial Governments, Department of Renewable Resources.

Provinces

British Columbia: Ecological Reserves - Ministry of Environment, Lands and Parks

Manitoba: Ecological Reserves - Department of Natural Resources Wildlife Management Areas - Department of Natural Resources

Newfoundland: Provincial Parks and Ecological Reserves - Department of Tourism and Parks

Ontario: Provincial Parks and Wilderness Areas - Ministry of Natural Resources

Quebec: Wildlife Sanctuaries - Ministry of the Environment

Saskatchewan: Provincial Parks - Department of the Environment

APPENDIX II

Management practices and regulations in United States of America (Alaska)

I. Legislation under which protected areas in the Arctic are established:

Federal Lands

National Park Service and U.S. Fish & Wildlife Service - The Alaska National Interest Lands Conservation Act of 1980 (16 U2SC 410hh-3233, 43 USC 1602-1784).

(1) Alaska Maritime National Wildlife Refuge

(a) Bering Sea Refuge by Executive Order 1037 on February 27, 1909,
(b) Bogoslof Refuge by Executive Order 1049 on October 23, 1909,
(c) Pribilof Islands Refuge by Executive Order 1044 of February 27, 1909,
(d) Chamisso Island Refuge by Executive Order 1658 on December 7, 1912,
(e) Aleutian Islands, partially revoked in 1928, by Executive Order 4592 of February 21, 1927 and 1733 of March 3, 1913,
(f) Semidi Islands Refuge by Executive Order 5858 of June 17, 1932;

(2) Arctic National Wildlife Refuge [Public Land Order (PLO) 82 of January 22, 1943 and PLO 2214 of December 9, 1960];

(3) Izembek National Wildlife Refuge (PLO 2216 of December 6, 1960); and

(4) Yukon Delta National Wildlife Refuge

(a) Nunivak Island Reservation by Executive Order 5095 of April 15, 1929,
(b) Yukon Delta Reservation by Executive Order 1041 of February 2, 1909,
(c) Hazen Bay Migratory Waterfowl Area by Executive Order 7770 of December 14, 1937,
(d) Clarence Rhode National Wildlife Refuge by PLO 4584 of January 20, 1969.

National parks established before ANILCA and its enabling legislation is included under:

(1) Katmai National Park and Preserve (Presidential Proclamations No. 1127 of September 24, 1912, 10 Stat. 1855; No. 1950 of April 24, 1931, 17 Stat. 2453; No. 2177 of June 15, 1936, 19 Stat. 3523; No. 2564 of August 4, 1942, 56 Stat. 1977; No. 3890 of January 20, 1969)

(2) National Park Service Organic Act of 1916 as amended (16 USC 1)

State Lands

(1) Alaska Department of Fish and Game
(a) State Game Refuges (Alaska Statutes 16.20.010 - 16.20.080);
(b) Walrus Island and McNeil River state game sanctuaries (Alaska Statutes 16.20.090 - 16.20.162);
(c) Fish and Game Critical Habitat Areas (Alaska Statutes 16.20.500 - 16.20.690)

(2) Department of Natural Resources
Wood-Tikchik Lakes State Park (Alaska Statute 41.21.161)

II. Annotated list of some important Federal laws

a. Alaska National Interest Lands Conservation Act of 1980 (16 USC 410hh-3233, 43 USC 1602-1784)

b. Alaska Native Claims Settlement Act (43 USC 16011624)

c. The Federal Land Policy and Management Act of 1976 (FLPMA), as amended (43 USC 1701 et seq.)

III. State of Alaska Regulations

a. Alaska Department of Fish and Game:

The Alaska State Legislature classified certain areas as being essential to the protection of fish and wildlife habitat. These areas are designated as either a refuge, critical habitat area, or sanctuary. Management of these special areas is the responsibility of the Department of Fish and Game (Alaska Department of Fish and Game 1991).

A special area permit is required for any habitat altering work, including any construction activity in a designated state refuge, critical habitat area, or sanctuary. Legislation pertaining to these lands may be found in Alaska Statutes Title 16, Chapter 20.

b. Department Natural Resources :

Wood-Tikchik State Park is the only state park in Arctic Alaska. The park is classified into three land use zones: recreational, natural, and wilderness. Recreational was established within the park to meet the more intensive recreation needs of the public by providing public access points, campgrounds, guided activities, information services. Natural provides moderate to low impact, cluster and dispersed forms of recreation and may ideally act as a buffer between the recreation development zone and the wilderness zone. Wilderness was established to promote, perpetuate, and where necessary, to restore the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration and primitive recreational opportunities. Alaska Statutes 41.21.162 - 41.21.167 describe management responsibility, establish a Management Council and management plan, regulations, and incompatible uses. Area protection is thus based on the park's Management Plan which established acceptable public uses and management goals.

The statuary mandates for Wood-Tikchik Lake State Park and the management philosophy of the Division of Parks and Outdoor Recreation are summarized by the following goal statements:

(1) Protect fish and wildlife resources in the park, including management of natural habitats and support systems;

(2) Protect and manage park resources to ensure continued traditional subsistence use activities, including Native allotment rights;

(3) Provide for the outdoor recreation needs of visitors to the park, appropriate to the park's values and regional setting;

(4) Protect and manage areas of significant scientific or educational value, visual quality, cultural or historic value, and areas of special significance; and

(5) Establish management practices which correspond to regional and statewide recreation and tourism demands.

IV. U.S. Federal Laws that Relate to Wildlife and Other Trustee Resources

Airborn Hunting Act	Federal Aid in Wildlife Restoration Act
Alaska Native Claims Settlement Act	Fish and Wildlife Coordination Act
Anadromous Fish Conservation Act	Fishery Conservation and Management
Bureau of Land Management Authorities	Fur Seal Act
Coastal Barrier Resources Act	Historic Preservation Act
Coastal Wetlands Planning, Protection and Restoration Act	Land and Water Conservation Fund
	Migratory Bird Conservation Act
Comprehensive Environmental Response Compensation and Liability Act	National Wildlife Refuge Acts
	Pacific Salmon Treaty Act
Corps of Engineers Projects	Refuge Recreation Act
Emergency Wetlands Resources Act	Rivers and Harbors Act of 1938
Federal Aid in Sport Fish Restoration Act	Water Resources Planning Act

APPENDIX III

QUESTIONNAIRE ON HABITAT PROTECTION IN THE ARCTIC

General introductory items

Name of country:

Land area:

Total Land area of the country:

Which part of the country is considered as part of the Arctic, and should be included in the review? (Please indicate on a map)

Land area in the Arctic:

Overview of habitat types in the Arctic:

Please list main habitat types, and if possible the total area (km2) of each type.

If maps showing vegetation zones, habitat types etc have been prepared, please enclose these, together with any available statistics on habitats in the Arctic for your country.

Overview of threats to Arctic habitats

Please describe briefly the treats.

A. Overview of existing protected areas in the Arctic

Overview following IUCN's protected areas categories:

Cateory	No of areas	Total area	% of land area
I			
II			
III			
IV			
V			
VI			
VII			
VIII			

I Scientific Reserve/Strict Nature Reserve
II National Park
III Natural Monument/Natural Landmark
IV Nature Consercation Reserve/Managed Nature Reserve/Wildlife Sanctuary
V Protected Landscape or Seascape
VI Resource Reserve - Interim Conservation Unit
VII Natural Biotic Area/Anthropological Reserves
VIII Multiple Use Management Areas/Managed Resource Area

(see enclosed copy from 1990 United Nations List of National Parks and Protected Areas)

Is area protection based on systematic inventories and evaluations, e.g. of habitat types such as wetlands, or mainly on a case by case study and evaluation?

If yes, please describe briefly the approach used, including criteria for evaluating conservation value, if such criteria have been adopted:

Overview of protected areas by habitat type or ecological function:

If information is available, please give an overview of protected areas of different habitat types or ecological function (e.g. wetlands, marine areas, forests, sites of importance for specific wildlife, geologically interesting sites, etc):

Hab.type/ecol.funct.	No of areas	Total area	% of land area

International designations

Please list, map and give size of internationally designated sites:

- World Heritage Sites
- Ramsar Sites
- Biosphere Reserves
- Other

B. Management practices and regulations

Legislation under which protected areas in the Arctic are established:

Overview of regulations/restrictions pertaining to different categories of protected areas:

Management authorities (national, provincial, local?):

Research activities, monitoring, wardening, visitors facilities in protected areas (please give brief overview):

Human activities and utilization normally allowed to take place in the protected areas, eventually as specific rights of local/aboriginal people:

C. Gaps in protected area coverage in the Arctic

Have gaps been identified in the protected area network of your country? If so, please indicate the gaps.

Does your country have a plan for filling the gaps/extending the protected area network in the Arctic?

D. Examples of habitat conservation measures outside protected areas

Please list and describe briefly examples of habitat conservation measures outside protected areas, e.g. as is done in the enclosed copy of a Recommendation adopted by the Bern Convention Standing Committee.

Please send the information to:

Directorate for Nature Management

Tungasletta 2, N-7005 Trondheim, NORWAY

APPENDIX IV

Protected Areas Data Base

The report presents the contents of the protected areas database through maps and a table of protected areas. In addition, the database contains several other datasets used for reference.

The three main parts of the database are:

1. A tabular database giving information on the protected areas. The tabular database is identical to the table of protected areas. The digital tabular database exists as a Microsoft Access database than can easily be exported to other formats including common spread sheet formats. The key of this tabular database is the CAFF No, a arbitrary selected sequence number consisting of a 3 letter country part and a 3 digits serial number part. A few countries have unique national codes for protected areas, these are included in the database when available, but not shown in the table.
2. A Geographical Information System (GIS) database that contains the polygons containing the outline of the protected areas. In the GIS database each polygon is given its corresponding CAFF No for identification. A mapping from the GIS system's CAFF No to the number in the tabular database is used to assign colour code for IUCN class etc. The data are managed with the GIS software ARC/Info from ESRI. A separate polygon cover with protected areas exist for each country.
3. GIS databases with various reference data. This includes proposed protected areas, Ramsar sites, various arctic lines, etc. These datasets are only included for reference and have varying quality.

The Directorate For Nature Management has been responsible for compiling and updating the tabular database. UNEP/GRID-Arendal has compiled the GIS databases and the WCMC has contributed with several key datasets. In addition USGS/EROS-Alaska has been a particular valuable source for reference data.

The following sections describe the data that are included in the maps as shown in the report. For each map each data layer is presented with a reference to its source(s), formats, scale, GRID-Arendal processing and a comment on quality.

Vegetation Greenness in the Arctic

Data Set	Source Institution	Source Format	Approx. Nominal Scale	GRID-A Processing	Comments on Quality
Normalized Diffrence Vegetation Index (NDVI)	Global NDVI, July 1991, projected to Arctic projection. USGS/EROS-Alaska	Digital	1.1 km cells	Reprojected	
Sea ice	Arctic CD Interactive. Mean ice cover Sept. 1967. USGS	Raster	1:50 mill	Simplified	
Physiography	ARC World, ESRI	CD-ROM	1:25 Mill	Projection	Source for coast line, country borders, rivers and lakes.
Southern limit of Arctic data.					
USA	Based on Ecoregions of Alaska. USGS/EROS-Alaska	Digital	1:5 Mill	Extraction	
Canada	Based on North American Ecological Areas. Environment Canada, US-EPA, USGS/EROS-Alaska	Digital	1:25 Mill	Extraction	
Norway	Arctic circle				
Sweden	Arctic circle + northern treeless areas.	Paper	1:50 Mill	Digitised	Poorly defined line
Finland	Arctic circle				
Russia	Various descriptions	Paper	1:50 Mill	Digitised	Poorly defined line

This reference map focus on the global NDVI data made available from USGS/EROS. The NDVI give a general impression of the vegetation intensity in the Arctic. The data consists of optimal values for a 10 days period, some areas may be wrong classifies due to clouds etc.

The Arctic data limit is defined as given above. It is of importance to note that each country have different approaches to the definition of the southern limits of data relevant for CAFF. Some of the lines are based low resolution descriptions and thus of low quality.

The Arctic Region

Data Set	Source Institution	Source Format	Approx. Nominal Scale	GRID-A Processing	Comments on Quality
10° July isotherm	EPA's Global Climate Research Programme and NOAA-NGDC Global Change Database Programme	CD-ROM	1:50 Mill	Interpolated	
Phytogeographical boundary	Yurtev,B.A. 1994, Florisitic Subdivision of Circumpolar Arctic	Paper	1:50 Mill	Digitised	Low printing quality source paper map
Floristic boundary	Yurtev,B.A. 1994, Florisitic Subdivision of Circumpolar Arctic	Paper	1:50 Mill	Digitised	Low printing quality source paper map
Permafrost	Washburn 1979 and various other sources	Paper	1:50 Mill	Digitzed, adjusted	Better data from International Permafrost Association was not ready

This reference map displays various definitions of the Arctic.

Physical-Geographical Regions Classifications

Data Set	Source Institution	Source Format	Approx. Nominal Scale	GRID-A Processing	Comments on Quality
Scandinavia and Iceland	Naturgeografiska Regioner i Norden, Nordic Council of Ministers NU 1983:2	Paper map	1:3 mill	Digitised	Several classes combined in the presentation
Svalbard	GRID-Arendal	Digital	1:10 mill	Based on vegetation maps	Simplified from various sources
Greenland	Danish National Atlas, Plantebælter Grønland	Paper	1:10 mill	Digitised	Poor precision
Ecosystems of North America	USGS, State of the Environment Canada	Digital	1:25 mill	Projected	
Landuse and Landscapesystems in Russia	National Conservation Activities in the former USSR	Paper map	1:4 mill	Digitised	Only land use, landscape type shown, protection priority not shown.

This maps is a composite of various landscape or ecological based classifications of the Arctic. This maps first of all highlights the need for a set of uniform and agreed upon reference maps of this kind in the Arctic. The Circumpolar Arctic Vegetation Mapping initiative and an initiative to extend the North American Ecological systems map into a circum polar dataset are two existing initiatives focusing on this problem.

Protected Areas (3 maps)

Data Set	Source Institution	Source Format	Approx. Nominal Scale	GRID-A Processing	Comments on Quality
Canada	State of the Environment Canada	Digital and paper		Projected, digitised	Many areas have no polygons, they are plotted as points.
USA, Alaska	US Fish & Wildlife Service, USGS/EROS - Alaska	Digital		None	
Greenland	Hjemmestyrelsen på Grønland. WCMC and Danish National Atlas	Digital + Paper	1:10 mill	Several corrections.	
Iceland	Protected Areas and sites of special interest of Iceland. Nature conservation Council 1991	Paper	1:750 000	Digitised	

Norway	Directorate for Nature Management / The Norwegian Mapping Authority	Digital	mostly 1:250 000	None	
Sweden	Naturvårdsverket	Digital	1:50 000	Projected	
Finland	Environmental Data Center/ MoE Finland	Paper/Digital	1:50 000 - 400 000	Digitised	
Russia	WWF Russia, I. Lyssenko	Digital	1:1 Mill	Projected	Most IUCN Class I areas.
Russia	WCMC	Digital	1:4 Mill	Projected	Some IUCN Class IV areas.
Russia	MoE Russia, WWF International	Paper	1:25 Mill	Digitised	Many IUCN Class IV areas very low precision.

This is they key dataset in this report. As can be seen from the above table the GIS data precision and quality various allot and even lacks for many of the Canadian areas. The maps has only IUCN class I - V areas plotted but the GIS database also contains polygons or points for IUCN class VI - X areas in the tabular database. For some of the countries the GIS data also include polygons for protected areas not included in the CAFF report.

Ramsar Sites, Biosphere Reserves and World Heritage Sites.

Data Set	Source Institution	Source Format	Approx. Nominal Scale	GRID-A Processing	Comments on Quality
Biosphere reserves					
Russia	WCMC, WWF, Other	Digital, Paper		Combined, Digitised	Low precision
Sweden	Directorate for Nature Management	Paper		Digitised	Low precision
Greenland	WCMC + Various	Digital / Paper		Digital data adjusted based other data	Low precision
Svalbard Norway	Directorate for Nature Management	Paper		Digitised	
Alaska	US Fish & Wildlife Service	Digital		Projected	
Ramsar Sites					
All Arctic	WCMC, Ramsar database	Digital point data		Projected	
Sweden	Directorate for nature Management	Paper		Digitised	
Greenland	Directorate for nature Management	Paper		Digitised	
Alaska	US Fish & Wildlife Service	Digital		Projected	
Canada	State of the Environment Canada	Digital		Projected	

The major input to this database is the Ramsar point database from WCMC. This is supplied with some polygon data. The polygon data on this map has not been changed since the second draft version of this report as no edit comments were received.

Existing and Proposed Protected Areas in the Arctic

Data Set	Source Institution	Source Format	Approx. Nominal Scale	GRID-A Processing	Comments on Quality
Existing areas	Summarised above				
Proposed areas					
Canada	State of the Environment Canada	Paper	1:25 Mill	Digitised	Low precision
Iceland	Icelandic Museum of Natural History	Paper	1:1 Mill	Digitised	
Norway	Directorate for Nature Management	Paper	1:5 Mill	Digitised	Some point data
Sweden	Directorate for Nature Management	Paper	1:25 Mill	Digitised	
Finland	Environmental Data Center, MoE	Digital		none	
Russia	MoE Russia, WWF Russia, I. Lyssenko., WWF International P. Prokosh.	Paper, Digital	1:50 Mill 1:1 Mill	Digitised	

Protection Levels in the Arctic

Data Set	Source Institution	Source format	Approx. Nominal scale	GRID-A Processing	Comments on Quality
	The Landscape map and the table of protected areas in this report	Digital	Various	Calculated.	Corrected to fit official areas.

The purpose of the map is to identify areas with low degree of protection. The natural-geographical units map was used as a simplified (and poor) delineation of ecosystems than should be protected to some level. Most relevant changes of such reference map will in any case give a similar result. The general trend show low degree of protection in southern areas and higher degree of protection in northern areas. The map was produced using the following steps.

1. Only IUCN class I - V areas are included. For US class III areas was excluded.
2. The areas of the protected areas as given in the table of protected areas was assigned to the geographical unit(s) according to the codes given in the table. For areas covering two geographical units the area was divided proportionally. From this the total protected area of each geographical unit was calculated.
3. The area of each physical-geographical unit was calculated using the GIS - system. These areas were corrected to fit the official Arctic area for each country as given in the report (in most cases < 2% deviation).
4. Each physical-geographical unit was then shaded using the ration of protected area over total area.

ANNEX I

SUBMISSION BY THE NON-GOVERNMENT ORGANIZATIONS (NGO'S) FOR HABITAT PROTECTION IN THE ARCTIC

In preparation of this Report, non-government organizations (NGO's) were provided with an opportunity to contribute. This Annex outlines the views of NGO's in the USA and Norway and of the World-Wide Fund for Nature (WWF), and their proposals for an expanded Arctic Protected Areas System. Many non-government organizations in the Arctic nations are engaged in activities respecting the protection of Arctic ecosystems, and several organizations have banded together to cooperate in this work. The NGO's point out serious threats to the Arctic environment, and they put forward recommendations of action to meet these threats. They support an international system of large-scale protected ecosystems, in terrestrial as well as nearshore and marine areas, and it is pointed out that marine areas are least protected by existing systems.

Some NGO's mention that circumpolar systems of protected areas where traditional uses still occur can foster protection of ecosystems and a way of life. The U.S. Arctic Network believes that indigenous people must be active participants in the decision-making of any international agreement that affects them including the Arctic Environmental Protection Strategy (AEPS). They also advocate that a comprehensive survey of contaminants that appear in the Arctic food chain be completed, with special consideration on bioaccumulation and the health of humans who practice a subsistence lifestyle.

NGO's in USA point out that the opportunity exists at this time to protect biodiversity at the landscape scale which will be more difficult to maintain under future development pressures throughout the Arctic. They mean that the U.S. Fish and Wildlife Service's definition of Arctic is too narrow. They also say it is critical to integrate Arctic protected areas with other aspects of the AEPS, such as contamination from sources from beyond the borders, global warming and ozone depletion.

WWF-Norway believes it is vital that indigenous peoples participate in the CAFF process, and that it is important to develop a convention on protection and sustainable development in the Arctic.

According to WWF, the Russian Arctic should be considered as the key region where protected area development needs international support. Such support may be given by direct use of funds, cooperation and involvement of NGOs, partnerships or twinning projects between Russian and reserves in other countries, use of "Western" research funds and resources and bilateral environmental agreements. WWF means that a protocol on *Conservation of Arctic Flora, Fauna and their Habitat* should be connected to a proposed framework "Convention on conservation and sustainable development of the environment of the Arctic region". WWF has drafted some elements for such a protocol.

NGO's in USA propose five Arctic conservation areas:

"Arctic Ring of Life" International Marine Biocultural Reserve
This encompasses the dynamic and productive region shoreward of the permanent arctic ice cap or the zone of leads and polynyas beyond (see Figure 1). This environment provides critical habitat for feeding, staging, resting, reproduction and migration of birds and marine mammals. The polar ice supports the basis of the arctic marine food web that are the foundation for rich populations of fish, marine birds and mammals that dwell along the ice edge. The lead system has been used for thousands of years by Native peoples of the Arctic for access and as hunting areas for essential subsistence resources.

The Arctic Ring of Life is particularly vulnerable to large-scale industrial activity resulting from oil and gas development, mining, shipping, military operations, nuclear-powered transportation and nuclear waste disposal. The NGO's mean that because case-by-case consideration of mitigating measures for development activities is already falling short of the extent of protection that is warranted for the Arctic Ring of Life, this proposal for a biocultural marine reserve is necessary. According to the NGO's, the AEPS should immediately begin a full exploration and consideration of the variety of tools available for protecting of the Arctic Ring of Life.

Bering Sea Ecosystem (see Figure 1)
This highly productive marine area provides at least 10% of the world's fish and shellfish harvest and its living resources support the traditional culture and economies of indigenous peoples and other residents. Major crashes in populations of marine mammals, seabirds and fish in recent decades portend an ecosystem collapse. Populations of Steller sealions, listed as threatened under the Endangered Species Act, Northern Fur Seals and harbor seals have dramatically declined. Murres and two species of kittiwakes in the Central Bering Sea continue a decline first evident in the mid-1970's, and continue to have periodic reproductive failures. The stocks of pollock fish, a major food source for seabirds and marine mammals are declining at a rate of 10% per year.

The NGO's mention high seas drift nets and bottomtrawls, oil spill and other pollution from shipping, offshore oil exploration and over-exploitation of fish stocks pose as being threats to the Bering Sea Ecosystem. According to the NGO's, an international marine conservation area for the Bering Sea ecosystem is immediately needed.

Proposed transnational protected areas - terrestrial

Caribou Commons Biocultural Reserve (see Figure 2)
The first large-scale international wilderness reserve for wildlife in the circumpolar Arctic is comprised of the adjoining Arctic National Wildlife Refuge (U.S.) and Ivvavik (Northern Yukon) and Vuntut National Parks (Canada). This is a world-class wilderness resource. The NGO's mean that although the Porcupine Caribou Herd Agreement already recognizes the joint responsibilities the United States and Canada share for conservation of this international herd, the further step of establishing the Caribou Commons Reserve is needed.

The boundaries of the reserve would encompass the entire ecosystem supporting the Porcupine caribou herd and extend beyond the core protected areas of Iwavik and Vuntut Parks and the

Figure 1 - Proposed Marine Conservation Areas.

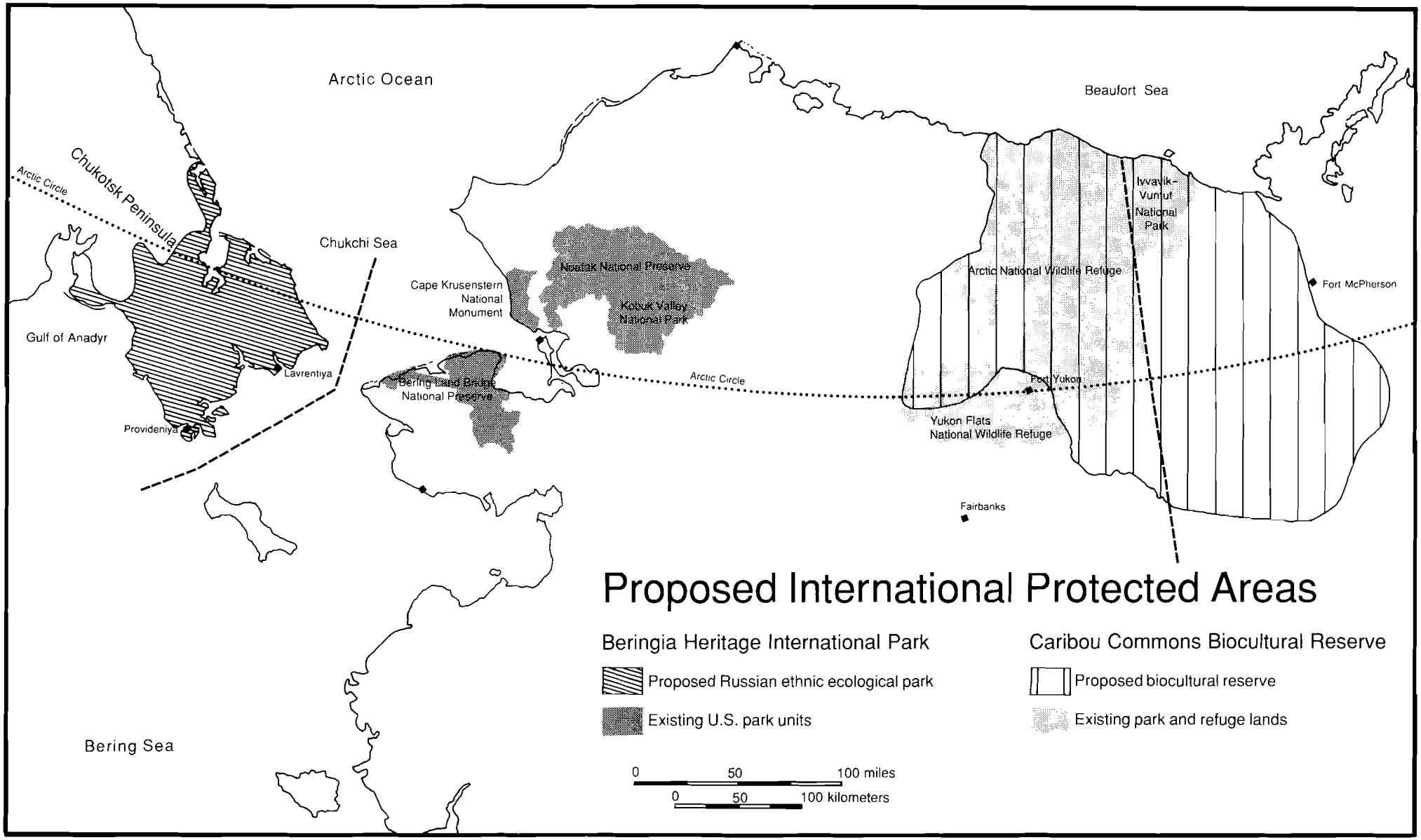


Figure 2 - Proposed International Protected Areas

Arctic Refuge (where, the NGO's say, the critical calving and post-calving grounds of the coastal plain threatened by oil development still need to be protected as wilderness by the U.S. Congress). Additional security for Canadian lands will also be needed to protect the entire 96,000 square-mile range of the herd, acceding to the NGO's. On both sides of the border, the coastal plain ecosystem also provides critical fall staging grounds for lesser snow geese and, in Alaska, supports arctic char, wolverine, and high densities of denning polar bears.

Beringia Heritage International Park (see Figure 2)
Formation of an international park along the Bering Land Bridge was endorsed by the presidents of the U.S. and Russia at their 1990 and 1992 summits. The existing Bering Land Bridge National Preserve, Cape Krustenstern National Monument, Noatak National Preserve, and Kobuk Valley National Monument in the NANA Region will make up the US contribution, while a new ethnic ecological park has been proposed on the Chukotsk Peninsula in Russia to protect a shared cultural and natural heritage.

The marine and near-shore environments of Bering Strait region continue to serve as an international crossroads for wildlife and indigenous people as well as being the most biologically productive ecosystems in the region. It is a treasure trove for world paleoecology, anthropology, archeology, and history. Member nations of the IUCN passed a resolution in February, 1988 urging the two nations to designate this rich and diverse environment as a World Heritage Site.

WWF means that the Beringia Heritage International Park is the most important development at the present time, and points out that it should be assured that the international park includes the preservation of cultural as well as natural values.

Proposed marine protected area - Alaska:

Kasegaluk Lagoon
This proposed protected area along the Chukchi Sea coast in northwest Alaska contains one of the largest coastal lagoon-barrier island systems in the world (see figure 3). The lagoons provide great productivity, including what is likely the most expansive salt marsh in arctic Alaska, and are an extraordinary concentration area along the migratory corridor for marine mammals and many arctic nesting birds as well as summer visitors. This area is extremely important for subsistence by indigenous peoples.

According to a recent study, it "supports special habitat used by vertebrates that are not duplicated in lagoon habitats elsewhere in the Alaskan Arctic...." About 100 species of birds use this area, and it is an important fall staging area for brant, northern pintails, western and semi-palmated sandpipers, long-billed dowitchers and phalaropes. Over 40% of brant using the Pacific flyway have been observed staging in Kasegaluk Lagoon, making it distinct from other arctic lagoon systems in Alaska. Up to 3,500 beluga whales use the lagoon for feeding, calving, and molting. Although small areas of the barrier islands are within the Alaska Maritime National Wildlife Refuge, most of this highly productive system of lagoons, barrier islands and associated uplands is not yet in a protected area.

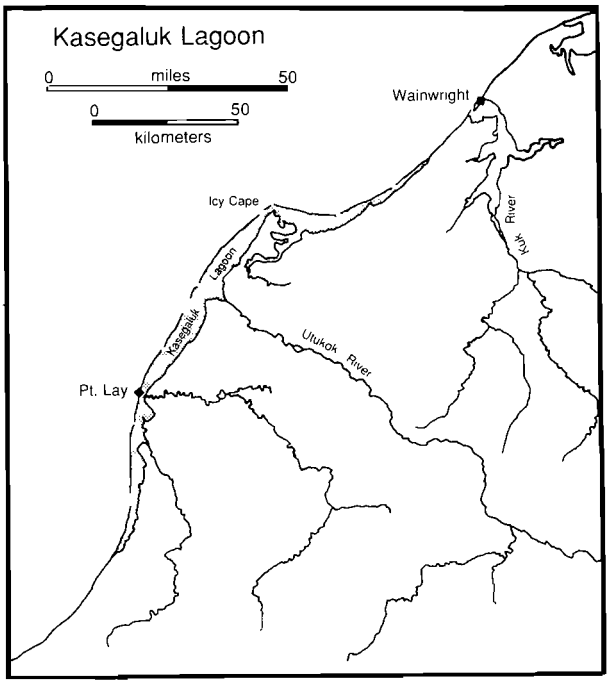


Figure 3 - Proposed Marine Protected Area in Alaska - Kasegaluk Lagoon.

Barents Sea International Park

Norwegian NGO's have proposed a plan for an *international park in the Barents Sea* to secure the last great wilderness in Europe. The proposal comprise Bear Island, Svalbard, Novaja Semlja, Frans Josefs Land and the sea area between these islands (see figure 1).

According to the NGO's, this area is one of the most productive in the Arctic. It is an important growing and feeding area for the rich stocks of fish farther south. In the summer, there is probably 13-15 million seabirds in the area. Some 55 000 whales live here, as do 1.2 million seals and several thousand polar bears. The park should have the proposed size to encompass the whole ecosystem. The NGO's emphasizes that the protected area must include the important biological processes taking place where ice meet sea. It must also cover the seasonal fluctuations of the ice.

Oil and gas exploration and development, increased marine traffic through the area and dumping of nuclear wastes are serious threats to the environment in the Barents Sea.

Significant gaps in U.S. Arctic Ecosystem protection as stated by U.S. NGO's

Arctic National Wildlife Refuge Coastal Plain

A critical 1.5 million acre coastal plain area of the 19 million acre Arctic National Wildlife Refuge is threatened by oil leasing and developmenent. According to the U.S. Fish and Wildlife Service, the coastal plain is the most biologically productive part of the Arctic Refuge and is the center of wildlife activity. It is a critical area for the International Porcupine caribou herd used for extremely high density calving and post-calving. The Department of the Interior concluded in its environmental impact statement that oil development in the coastal plain

would have major effects on the Porcupine caribou herd, muskox, water quality and quantity, subsistence, recreation, and wilderness. Although the area is off-limits to development unless the U.S. Congress approves it, according to NGO's there has been intense pressure for this to happen. Environmentalist NGO's and the Gwich'in people are working to have this 1.5 million acre area added to the National Wilderness Preservation System.

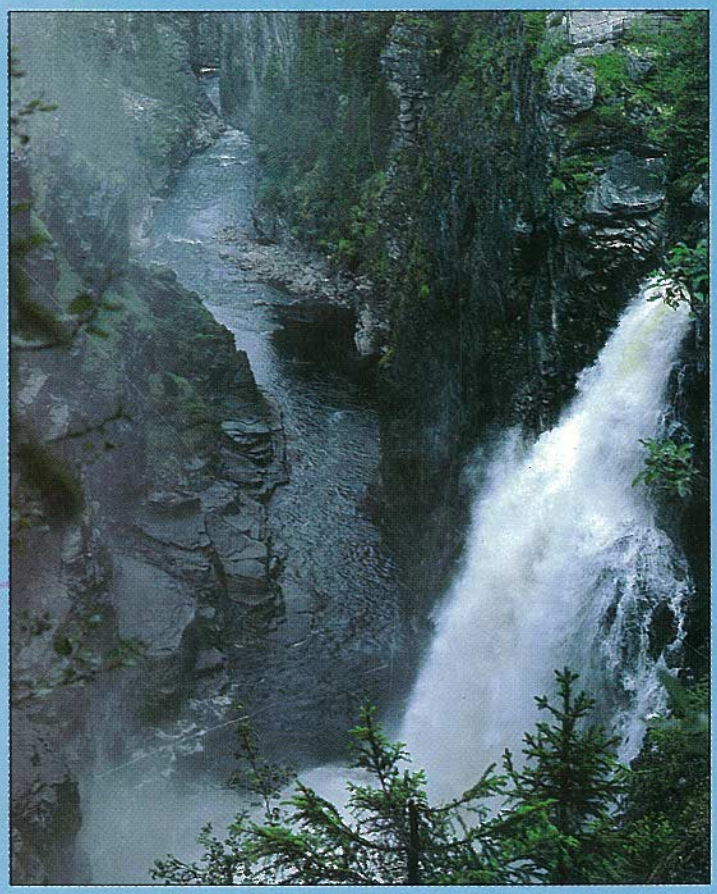
Designation of New Wilderness Areas

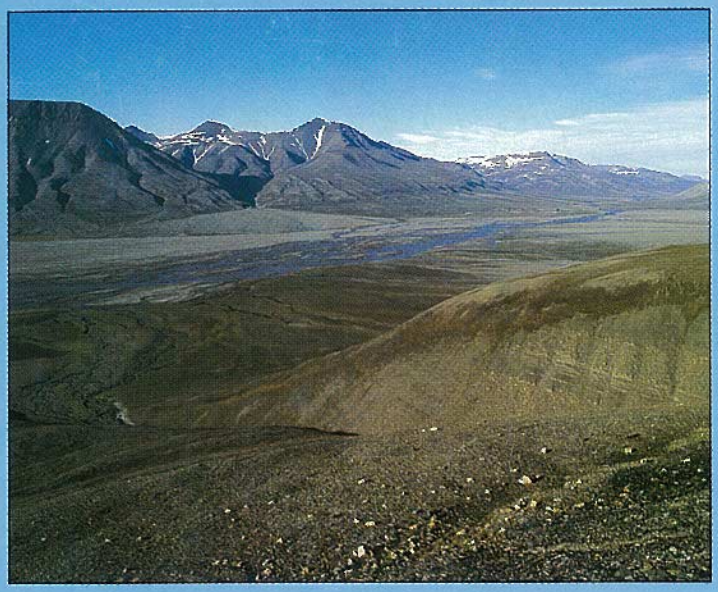
The NGO's point out that virtually all of the national parks and refuges in Alaska established under the Alaska National Interest Lands Conservation Act (ANILCA) were concieved of as wilderness parks and refuges with the primary goal of retaining intact ecosystems for their biological diversity. According to the NGO's, less than half of the acreage in national parks, preserves and wildlife refuges in Alaska was added to the National Wilderness Preservation System by ANILCA, and very little of the productive wildlife habitat north of the Arctic Circle has been designated wilderness. The Fish and Wildlife Service and National Park Service studied the suitability of areas in refuges and parks for wilderness designation as required by ANILCA, concluding that more than 67 million additional acres were suitable in Alaska.

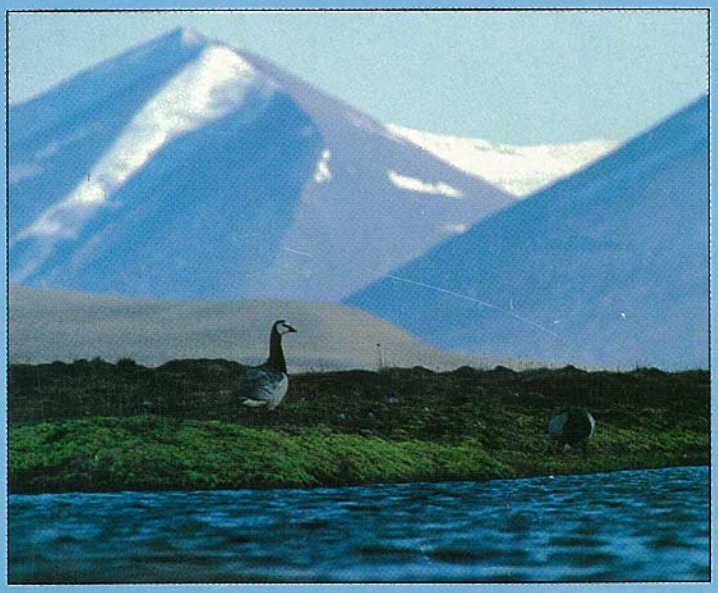
National Petroleum Reserve - Alaska

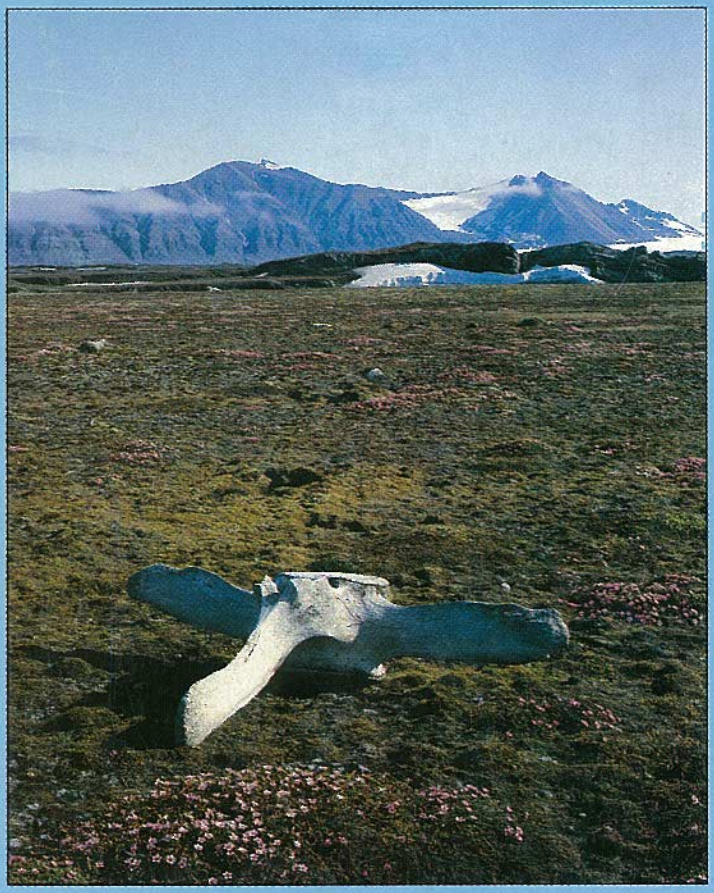
This 23 million acre area managed by the Bureau of Land Management has oil and gas exploration as its primary purpose, and the NGO's believe that it has inadequate protection for biodiversity. The area has great ecological, archeological, and wilderness values that need to have some regime for protection. Spanning north from the crest of the Brooks Range to the Beaufort and Chukchi Seas, the National Petroleum Reserve - Alaska contains rolling foothills and extensive coastal plain wetlands. The Colville River's rich riparian zones, including cliffs, provide extraordinary habitat for moose, nesting and prime feeding areas for peregrine falcons, gyrfalcons and other raptors and important archeological sites. The Colville and Utukok Rivers have been proposed for addititons to the Wild and Scenic River System. The Utukok area includes the calving grounds and migration routes of the Western Arctic caribou herd, grizzly bear, wolverine, and wolf habitat. The area provide habitat for over five million waterbirds, including spectacled and steller's eiders, rare yellow-billed loons, and other waterfowl and shorebirds. Diverse wetlands in the area are a globally significant molting and staging area for brant, Canada, white-fronted and Wrangel Island snow geese.

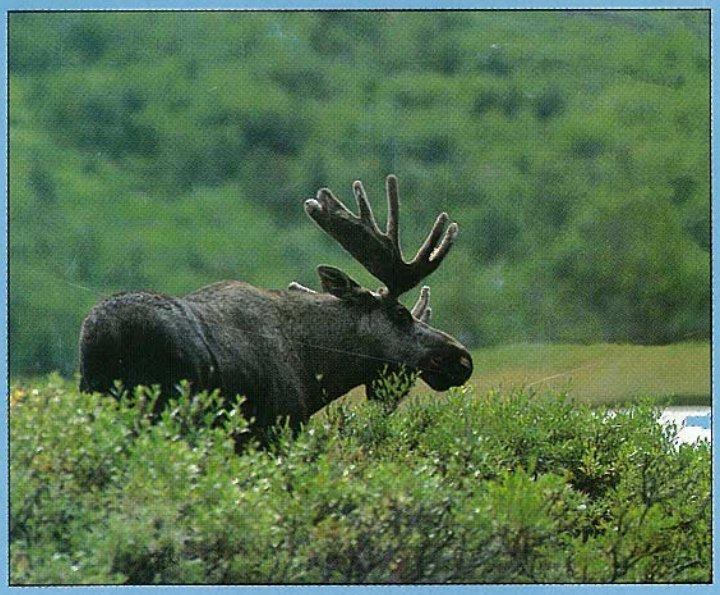
According to the NGO's, the Department of the Interior in 1982 authorized exchange of 5ooo critical acres to petroleum development interests, and subsequently some of the area considered a "Special Area" was leased to the oil industry. The NGO's point out that studies have documented significant behavioral effects to brant from helicopter overflights in the area.











DIREKTORATE FOR NATURE MANAGEMENT
NORWAY

UNEP

WORLD CONSERVATION
MONITORING CENTRE