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Module 13

Conservation in the Arctic

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Key Terms and Concepts

- species and habitat conservation
- protected areas
- the World Conservation Union (IUCN)
- environmental impact assessment (EIA)
- protected area management categories
- species threats categories
- co-management
- international conservation conventions and treaties
- Arctic Council

Learning Objectives

Upon completion of this module, you should be able to

1. explain why conservation is needed, and identify the forms it takes.
2. discuss the various types and purposes of protected areas and their distribution in the Arctic.
3. recognize IUCN protected area management categories and species threats categories.
4. discuss how the approach to species and habitat conservation has been changing in recent years and why.
5. explain what co-management is and how it differs from other approaches to conservation.
6. explain what an EIA is and its purpose.



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7. name at least three globally endangered species of birds, mammals, and fish in the Arctic.
8. name the main international conservation conventions and treaties.
9. explain the structure of the Arctic Council and discuss its importance.

Reading Assignments

CAFF (2001), “Conservation,” in *Arctic Flora and Fauna: Status and Conservation*, 77–109, [online] <http://www.caff.is/>.

CAFF (2001), “The Tundra and the Polar Desert,” in *Arctic Flora and Fauna: Status and Conservation*, 147–150, [online] <http://www.caff.is/>.

Overview

In this module we explore various approaches to nature conservation with a focus on habitat and species conservation, co-management, and environmental impact assessments. Protected areas represent the most common habitat conservation approaches worldwide. The network of protected areas in Arctic countries is described and discussed as well as species conservation instruments, such as Red Lists. On a global and regional Arctic scale, there are several intergovernmental conventions and treaties that aim to protect biodiversity in its various forms. These are briefly identified, with a focus on the recently established Arctic Council, which provides a forum for the Arctic nations to discuss environmental protection and sustainable development initiatives in the region.

Lecture

Introduction

Environmental protection incorporates two main components: nature/biodiversity conservation and pollution control. The goal of nature/biodiversity conservation is to safeguard all aspects and levels of biodiversity—landscapes, ecosystems, habitats, species, and populations—and to ensure its viability, adaptability, and evolutionary capacity for generations to come.

A few decades back, nature conservation primarily built on aesthetic, cultural, and philosophical values according to the belief that all aspects of nature have



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their own right to exist. Nowadays, biodiversity conservation is based on scientific information and methods, including habitat classification schemes, population counts, trends analyses, protection criteria, geographic information systems, and so on. The aim is to identify ecosystems, habitats, and species that need protection and then to ensure protection of a representative sample of biodiversity elements.

Conservation, as understood today, is not about protecting nature at all costs; rather, it fully acknowledges the use of nature, with the important qualification that the use must be sustainable. Sometimes, however, as in the case of rare species or severely depleted stocks or populations, any use will be unsustainable and the only alternative is a total protection until the stock or population has recovered.

Habitat Conservation: Protected Areas

Organisms can't be protected in the wild unless their living space—their habitat—is also protected. Therefore, the establishment of protected areas of various types is one of the most common conservation approaches worldwide.

A generally accepted definition of protected areas by the World Conservation Union (IUCN) is as follows:

A protected area is an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means. . . . (IUCN 1994, as cited in Borrini-Feyerabend 1997)

The main rationale behind protected areas is that they restrict human influence, allowing species, natural processes, or particular outstanding ecosystems to evolve without the direct interference of humans. In practice, however, the purpose of establishing and maintaining protected areas is to

- preserve species and genetic diversity
- maintain environmental services, e.g., river catchments
- protect specific natural and cultural features
- aid scientific research, i.e., in order to compare natural and human-managed ecosystems
- protect wilderness
- enhance tourism and recreation
- educate
- ensure sustainable use of resources from natural ecosystems



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- maintain cultural and traditional attributes, e.g., traditional lifestyles, sacred sites

Some protected areas incorporate one or a few functions, while others encompass a range of functions. Depending on their exact roles, protected areas can be of many types: national parks, national forests, wildlife refuges, special habitat areas, sites of scientific interest, national monuments, traditional-use areas, sacred sites, and so on. Decades ago, each country had more or less developed its own classification system of protected areas. However, in 1994, in order to enable regional and global comparison of such areas, IUCN established a classification scheme of protected areas based on defined management categories (see box 13.1). This scheme is now widely used.

Box 13.1 IUCN Protected Areas Management Categories (IUCN 1994)

IUCN has defined a series of protected area management categories based on management objective. . . . These six categories are:

CATEGORY Ia: Strict Nature Reserve: protected area managed mainly for science

Definition: Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.

CATEGORY Ib: Wilderness Area: protected area managed mainly for wilderness protection

Definition: Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.

CATEGORY II: National Park: protected area managed mainly for ecosystem protection and recreation

Definition: Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.



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CATEGORY III: Natural Monument: protected area managed mainly for conservation of specific natural features

Definition: Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

CATEGORY IV: Habitat/Species Management Area: protected area managed mainly for conservation through management intervention

Definition: Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

CATEGORY V: Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation

Definition: Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.

CATEGORY VI: Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

Definition: Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

Protected Areas in the Arctic

By 2000, there were 405 protected areas (including Ramsar sites—see below) in the Arctic, giving formal protection to approximately 2.5 million square kilometres of mostly terrestrial habitat, or 17% of the land area of the Arctic (see table 13.1). Close to half of the total protected Arctic land, however, lies within a single national park, the North and East Greenland National Park, which covers 972,000 km² and is by far the largest national park in the world.

The protected areas in the Arctic are distributed unevenly across countries and biogeographic zones. It is noteworthy that unproductive zones such as glaciated areas and polar deserts enjoy the highest protection—27%—while only 5.4% of the northern boreal forest and less than 3% of the more productive coastal areas



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are protected (see fig. 13.1 and fig. 13.2). Clearly, it is easier for governments to establish protected areas in remote, hostile, and unproductive environments, with few human or commercial interests, than in highly productive areas inhabited by humans. The percentage of own territory protected by each Arctic country ranges from 9.5% in Canada to 50% in the United States (Alaska). Within the Arctic Council's Conservation of Arctic Flora and Fauna (CAFF) program, the Circumpolar Protected Areas Network (CPAN) has been established to support and promote protected areas in the Arctic region (see fig. 13.3).

Table 13.1 Protected areas in the Arctic classified in IUCN categories I–V, plus Ramsar international wetland sites, as of 2000. Areas smaller than 10 square kilometres are not included. (CAFF 2001, 78)

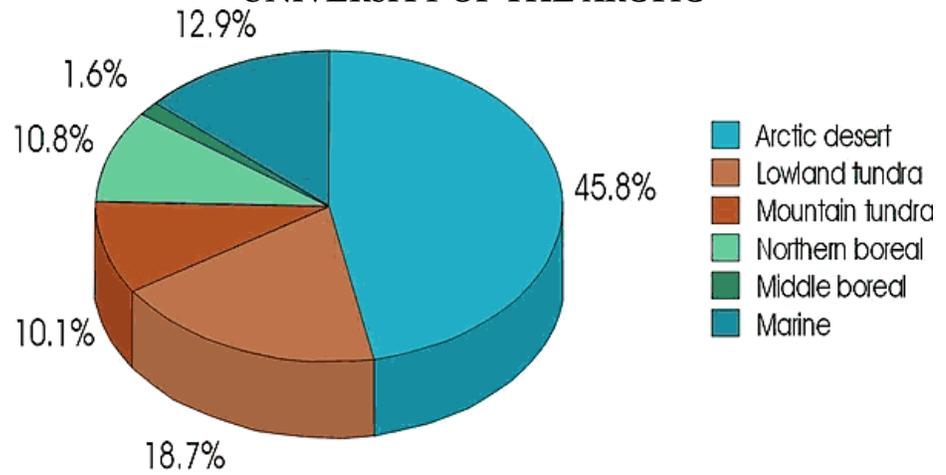
| Country | Number of Areas | Total Area (km ²) | % of Arctic Land Area of the Country |
|--------------|-----------------|-------------------------------|--------------------------------------|
| Canada | 61 | 500,842 | 9.5 |
| Finland | 54 | 24,530 | 30.8 |
| Greenland | 15 | 993,070 | 45.6 |
| Iceland* | 24 | 12,397 | 12.0 |
| Norway** | 39 | 41,380 | 25.3 |
| Russia* | 110 | 625,518 | 9.9 |
| Sweden | 47 | 21,707 | 22.8 |
| USA (Alaska) | 55 | 296,499 | 50.2 |
| Total | 405 | 2,515,943 | 17.0 |

* Large marine components and several large protected areas in Russia included in this table have been designated on a regional level but not endorsed by federal authorities.

** Most of the area protected is located in Svalbard, only about 7% of the Arctic mainland is protected.

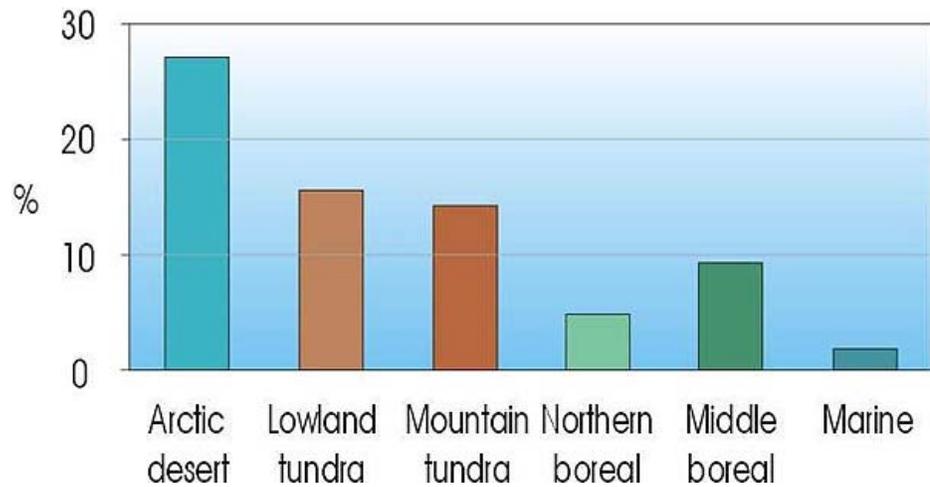


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Source: CAFF 2001, 79

Fig. 13.1 Percentage of the total protected area in the Arctic located in each biome

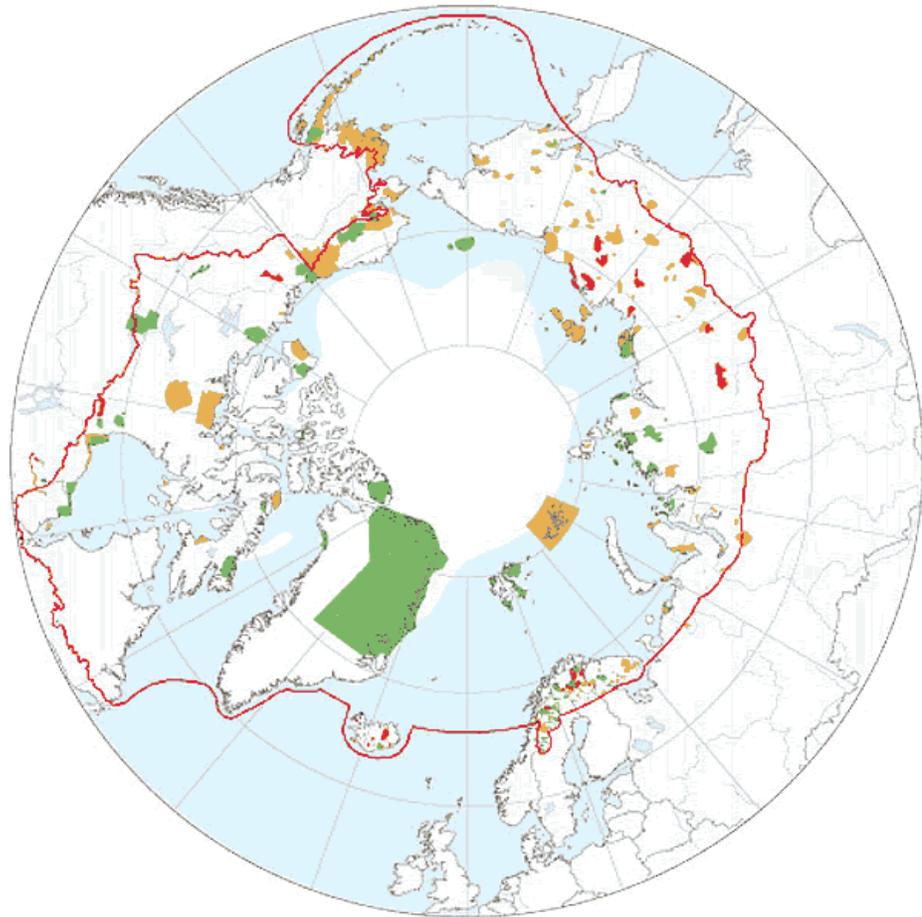


Source: CAFF 2001, 79

Fig. 13.2 Percentage of the territory of each protected Arctic biome



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- I Strict Nature reserve/Wilderness area
- II National park
- III Natural monument
- IV Habitat/species management area
- V Protected landscape/seascape
- VI Managed resource protected area
- CAFF boundary

Source: Compiled by UNEP-WCMC and cited in CAFF 2001, 80

Fig. 13.3 The Circumpolar Protected Areas Network (CPAN) in 2001: Areas in the Arctic protected by IUCN categories I–VI

In addition to nationally designated protected areas, several international conservation treaties and organizations promote and request the establishment of protected areas as a way of reaching their conservation goals. Ramsar sites, for example, are designated to protect wetlands under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (declared in 1971 and amended in 1982 and 1987; see <http://www.ramsar.org/>). Networks



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have been established along the flyways and staging areas of migratory birds, for example, through BirdLife International's Important Bird Areas (IBAs; see <http://www.birdlife.net/action/science/sites/index.html>). The international Man and the Biosphere Programme under UNESCO (see <http://www.unesco.org/mab/>) establishes biosphere reserves for research, monitoring, and training, as well as for conservation. The World Heritage Sites, named under the 1972 Convention Concerning the Protection of World Cultural and Natural Heritage (see <http://whc.unesco.org/nwhc/pages/home/pages/homepage.htm>), recognize areas of "outstanding universal value." In 2000, there were 44 Ramsar sites, six biosphere reserves, and three World Heritage sites in the Arctic.

Within the European Union (three of the Arctic nations—Denmark, Sweden, and Finland—are members of the European Union), the legally binding Habitat Directive, and its accompanying Natura 2000 project, calls for member countries to establish a network of protected areas to secure the systematic protection of Europe's species and habitats. The Emerald Network, under the Berne Convention—to which most European nations are parties, including Iceland, Denmark, Norway, Finland, and Sweden—serves a similar function to Natura 2000 to conserve European wildlife and natural habitats, but it is not legally binding.

Mainstreaming Protected Areas

Previously, the identification, establishment, and management of protected areas was more or less only governed by national governments, through their conservation or parks agencies, and without much consultation with local people or authorities. The establishment of protected areas, especially IUCN categories I–III, usually meant severe restrictions with respect to traditional and commercial uses of these areas, and activities in them. For example, the establishment of *zapovedniks* (strictly nature reserves) in Russia were frequently accompanied by forced relocation of inhabitants—often indigenous peoples—from these areas, followed by a total ban on all human use. As a result, local and indigenous communities did not benefit much from these areas or feel any specific ownership of them.

This attitude is changing, however, and recently designated protected areas are only established after thorough consultations with—or at the initiative of—indigenous peoples and local inhabitants. Recently protected areas, therefore, usually include provisions for traditional hunting, fishing, trapping, and gathering. This trend recognizes the ways in which humans may function as an integral part of the system being protected and has been coined "mainstreaming." A more flexible approach to the concept of protected areas has meant a greater willingness to accept them in many regions. In Canada's Northwest Territories, for example, indigenous peoples have proposed protected areas, such as the Horn Plateau in the late 1990s. Protected areas have also been sought for the



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benefit of local interests, such as the preservation of sacred sites, an issue of particular interest in the Russian Arctic.

Protected Areas Are Not Enough

Protected areas cannot by themselves conserve the Arctic environment. Actions outside a protected area and even outside the Arctic—particularly regarding migratory species—can undermine the significance of a particular protected area. Global problems like pollution and climate change do not stop at national boundaries or the boundaries of protected areas. The displacement or overabundance of wildlife can cause local habitat changes, even within protected areas. To be effective in the long run, conservation must, therefore, use other approaches in addition to conventional habitat protection.

Student Activity

Is conservation needed in the Arctic? What, in your opinion, are the main benefits and/or damages arising from international environmental protection organizations?

Species Conservation

Wildlife

Wildlife has provided Arctic inhabitants with food, clothing, shelter, fuel, tools, and other cultural items since the beginning of time. Reindeer and caribou (*Rangifer tarandus*) are the most important wildlife for most inland dwelling peoples, while marine mammals are of primary importance in coastal areas (see Modules 10 and 11). Birds and fish are also important for subsistence in most Arctic environments.

Many people who live outside of the Arctic also value wildlife in the Arctic. This may be for various reasons related to tourism, such as wildlife-watching and photography (especially whales, seabirds, polar bears, and caribou), or for sport and trophy hunting. Sometimes the reasons are purely philosophical or sentimental: many people who have never visit the Arctic still hold a fascination for its wildlife, especially for whales and polar bears, because of their intrinsic value. Therefore, management and conservation of wildlife in the Arctic is the responsibility not only of Arctic residents, but of the global community as well.



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Wildlife Management

Managing consumptive use—fishing, hunting, gathering—is the oldest form of conservation. In hunter-gatherer societies, where overexploitation would lead to shortage and suffering, some limitations on use were explicit, for example, specifying the number of eggs to be left in bird nests during egg-gathering. Explicit rules were uncommon, however, and traditional hunting rules and ethics were more commonly based on spiritual relationships between the hunter and the prey rather than on biological concerns.

Especially in the late nineteenth and early twentieth centuries, many parts of the Arctic region experienced wildlife declines owing to overexploitation (see Modules 10 and 11). The governments of Arctic countries responded with well-meaning but sometimes insufficiently explained explicit regulatory systems for wildlife management, especially for wildlife-hunting. These regulations included seasonal restrictions (e.g., a ban on spring and summer hunting) and harvest limits and quotas. They were designed by national governments, based on advice of governmental scientists, but largely ignored local knowledge and practices. The regulations often emphasized hunting as a threat, which alienated indigenous and local hunters. Negative feelings still influence discussions about government-imposed hunting regulations, although changing attitudes to management methods and structures in recent years may be improving relations between governments and hunters.

During the last decades of the twentieth century, wildlife management regulations began to reflect the distinct needs and values of indigenous peoples and other local users. The increasing political force and autonomy of indigenous peoples through self-governance and settlement of land claims, particularly in Greenland and North America, have spurred this process and established new management regimes that give hunters and local users a more direct say in wildlife management. As a consequence, wildlife management (especially in North America) has become increasingly tailored to the needs of traditional users. For example, swimming caribou on the Kobuk River in northwest Alaska can be hunted again, recognizing a practice that has existed for millennia.

Co-Management

One of the most notable recent innovations with respect to wildlife management is co-management, which is designed to involve the hunters or fishers directly in management decisions. Co-management is the sharing of decision-making with respect to the management of a common resource among local communities, users, and government agencies. Decision-sharing can be through informal relations (e.g., between regional biologists and local hunters), or as a result of formal agreements, or both. Co-management differs with both conventional government-imposed management systems—which are bureaucratically



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organized and driven primarily by scientific data—and local control—in which the users pursue self-determination largely independent of others.

In the Canadian Arctic, formal co-management has become a common feature of the political landscape, either through land-claim agreements or as stand-alone arrangements. Implementation of these agreements is typically directed through boards comprising users and agency representatives who are advisory to government ministers, agencies, local communities, and various indigenous governance bodies. In most cases, co-management agreements have been struck to specify community rights to hunting and provide a meaningful role for indigenous subsistence users in management decision-making. In several cases they have proven to be critical in achieving compliance when facing scarcity of resource stocks. Examples of co-management in the Arctic include the Inuvialuit Game Council (see <http://www.taiga.net/>); the Alaska Eskimo Whaling Commission; the Kola Sami Reindeer Breeding Project; and the Wildlife Management Advisory Council (North Slope; see <http://www.taiga.net/wmac/about.html>).

In addition to harvest for individual and community subsistence use, several wildlife species are harvested commercially in the Arctic. These include caribou, muskox, fur-bearers, some marine mammals, and some birds (see Modules 10 and 11). Commercial fishing, however, is the most important harvest, both economically and biologically, and is the most elaborately managed harvest of all (see Module 11). Fisheries-management measures essentially fall into three categories:

- input regulations in the form of licensing schemes restricting access to a fishery (most fisheries in the North Atlantic are now under some such limited-entry regime)
- output regulations, consisting of fish quotas that limit the amount of fish that fishers or fishing companies are entitled to bring on land in any given season
- technical measures specifying, for example, the type of fishing gear that must be used in a particular fishery, fishing season, and area

Such schemes are underpinned by extensive scientific stock-monitoring and stock-assessment methods, including gathering information on spawning success of the particular stock, growth of juveniles, age distribution of the stock, catch per fishing effort, and so on. By these methods, scientists can come close to the actual status of each commercial stock and thus guide the harvest. However, there is often enormous pressure on politicians from the resource users and a tendency to, for example, set higher quotas than the scientists recommend.



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Managing Rare and Endangered Species

Not all species conservation is concerned with managing harvest or consumptive use. In the case of species or populations that are too rare to sustain human use, or depleted—for example, Peary caribou (*Rangifer tarandus pearyi*), and the lesser white-fronted goose (*Anser erythropus*)—management is rather directed towards recovery of that particular species. In the simplest case, harvest may be banned in the hope that the species or population will recover on its own. In other cases, elaborate recovery programs, including rearing of juveniles in captivity and reintroductions into nature, may be necessary.

As a means to identify and manage rare or endangered species, all Arctic countries—and indeed most countries in the world—create national lists, so called Red Lists, of these species. Red Lists commonly include several categories of endangerment, from “low risk” to “critically endangered” and set management or recovery goals for these categories. Definitions and uses of threats categories may vary among countries. Also, the same species may be critically endangered in one country while common in another country. The World Conservation Union (IUCN) (see <http://www.iucn.org/>) has proposed a set of threats categories for global use (see box 13.2) to simplify comparison across countries and regions. (Note that a taxon is a species or population; taxa is the plural of taxon.)

Box 13.2 IUCN Categories for Rare and Endangered Species (IUCN 2001, 5, 14–15)

A representation of the relationships between the categories is shown in Figure 1.

EXTINCT (EX)

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat . . . throughout its historic range have failed to record an individual. . . .

EXTINCT IN THE WILD (EW)

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat . . . throughout its historic range have failed to record an individual. . . .

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered . . . , and it is therefore considered to be facing an extremely high risk of extinction in the wild.



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ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered . . . , and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable . . . , and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT)

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. . . . Data Deficient is therefore not a category of threat. . . .

NOT EVALUATED (NE)

A taxon is Not Evaluated when it . . . has not yet been evaluated against the criteria.

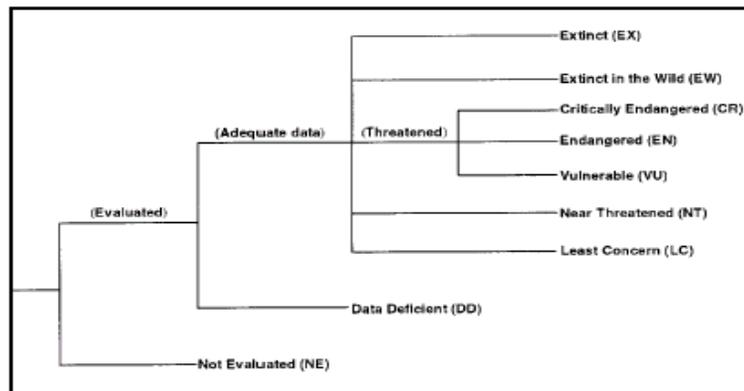


Figure 1. Structure of the categories.



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The IUCN also constantly upgrades databases on species that are globally threatened. In 2000, 144 species of mammals, birds, fish, and plants (including specific populations or stocks) were threatened within the Arctic, out of 11,835 threatened species worldwide (see table 13.2).

Table 13.2 Globally threatened species in the Arctic in 2001, according to IUCN (compiled from CAFF 2001)

| Group | No. Threatened in the Arctic | No. Threatened globally |
|--------------|------------------------------|-------------------------|
| Plants | 73 | 7299 |
| Mammals | 43 | 1806 |
| Birds | 16 | 1913 |
| Fish | 12 | 817 |
| Total | 144 | 11,835 |

Sometimes, recovery programs are so successful that they create problems. For example, conservation actions in wintering areas outside the Arctic, together with changing land uses in these areas, have triggered population explosions in some North American geese, especially in the greater snow goose (*Chen caerulescens atlantica*), which has led to severe grazing impacts in Canada around Hudson Bay (see the Northern Prairie Wildlife Research Center's webpages on this problem at <http://www.npwrc.usgs.gov/resource/othrdata/snowprob/snowprob.htm>).

Student Activity

1. How many protected areas have you visited? Do you believe in the merits of protected areas? Argue for your answer.
 2. Name a few endangered species in your area, and discuss what, if anything, is being done to protect them.
-

Balancing Conservation and Development

Environmental Impact Assessments (EIAs)

All development activities, large and small, will leave their marks—their impact—on the natural environment. Mining, oil and gas development, and hydroelectric dams and their associated roads, pipes, lines, and deep-sea ports can cause intense local disturbances as well as fragmentation of large, intact areas and habitats. The same applies for many activities related to exploitation



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of living nature, such as clear-cutting of forests, life-stock grazing, afforestation programs, and drainage of wetlands (see Modules 9–11). Environmental impact assessments (EIAs) are meant to reconcile development and exploitation, that is, to ensure sustainable development. They provide a process that aims to identify, communicate, predict, and interpret information regarding the potential effects of a proposed activity on the environment—including the associated human activities—in a report form (see box 13.3) and thus provide a basis for informed decision-making. Is the proposed activity environmentally justifiable or not? EIAs form the basis for decisions by local or governmental authorities to allow, alter, or reject particular development proposals.

Box 13.3: EIA Report (Arctic Environment Protection Strategy 1997)

An environmental impact assessment document should be prepared and provided to all involved parties. The document describes the project and the likely impact upon the environment of the proposed activity.

The information should include:

1. A description of the proposed project and its alternatives, including information about the location and the design and size or scale of the project. This includes physical, technical and engineering characteristics of the proposed development, and land use requirements during the construction and operational stages. It should state the main characteristics of the development processes proposed, including the type and quantity of resources to be used;
2. A description of the environment that could be affected by the proposed project or alternatives. This should also include a description of the baseline state with which predicted changes are to be compared;
3. The data and other information that have been used to identify and assess the main effects which the project is likely to have on the environment, including a description of the traditional knowledge incorporated into the EIA. The documentation of traditional knowledge should be carried out in cooperation with the community;
4. The estimated type and quantity of expected impact factors resulting from the proposed project when in operation;
5. The methods used in the assessment such as identification and forecasting of any effects on the environment, descriptions of the use, assessment and evaluation of available traditional knowledge, and methods used to compare alternatives. Difficulties such as uncertainties or problems in compiling specified data, should also be reported;
6. Based on the above, an identification of the impact area;



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7. The likely significant impacts (see definition in section 5.1, page 18) on the environment of the proposed activity and its alternatives. The effects may result from activities including the use of natural resources, the emission of pollutants, the creation of nuisances, and the elimination of waste;
8. Where significant adverse effects are identified, a description of the measures proposed to avoid, reduce or rectify these effects taking into consideration the slow recovery and regeneration factors in the Arctic. This should also include a description of monitoring programs to detect unforeseen impacts, and that could provide early warning of any adverse effects, in addition to dealing promptly and efficiently with accidents;
9. An evaluation of the different alternatives, including the alternative of no action;
10. A description of the integration of EIA, public participation and public consultation into planning and decision-making throughout the process; and
11. A summary in non-technical language, assisted with figures and diagrams, of the information specified above. If need be, other means of displaying this information should be based on the cultural heritage of the local and indigenous people. The non-technical summary should be presented in national and local language(s).

EIAs are limited by the difficulty of predicting the complex ecological consequences of human activities over time and across different activities. Cumulative EIAs, which analyze combined effects of several development activities, past and present, are a recent innovation to try to address this difficulty.

One benefit of EIAs has been their encouragement for developers to minimize impacts. For example, directional drilling allows more oil to be reached from a single pad or platform. Monitoring of caribou migrations allows mining operations to be timed in such a way that they minimize disturbances to the animals. Still, EIAs and mitigation measures cannot entirely prevent the effects, and so industrial development remains a serious threat to the Arctic environment.

Voluntary management policies and guidelines are another way of promoting conservation. Tourism has several consequences for the environment, including trampling of sensitive vegetation and soils; disturbance to wildlife; and waste-disposal problems. Several efforts are underway to develop effective



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management policies and guidelines for tourism in the Arctic, focusing on minimizing its effects and respecting local cultures. (See box 13.4.)

Box 13.4: WWF's Ten Principles for Arctic Tourism (from WWF)

1. Make Tourism and Conservation Compatible

Like any other use of the environment, tourism should be compatible with and a part of international, national, regional, and local conservation plans.

- Encourage tourism planning that supports conservation efforts and incorporates conservation plans.
- Cooperate with environmental organisations and other groups working to protect the environment.
- Support monitoring of and research on the effects of tourism.

2. Support the Preservation of Wilderness and Biodiversity

Vast areas of wilderness without roads or other traces of development are a unique characteristic of the Arctic. These areas are both environmentally valuable and one of the main reasons why tourists come to the Arctic.

- Support nature conservation throughout the Arctic, including the protection of wildlife, habitat and ecosystems, both marine and terrestrial.
- Support efforts to stop and, where possible, reverse the physical fragmentation of the Arctic landscape since fragmentation both reduces the quality of the tourism experience and degrades the environment.
- Support the further development of the Circumpolar Protected Area Network (CPAN).

3. Use Natural Resources in a Sustainable Way

Conservation and the use of natural resources in a sustainable way are essential to the long-term health of the environment. Undeveloped areas in the Arctic are a non-renewable resource—once developed, it is impossible to return them to their original state.

- Encourage uses of natural resources that are sustainable, including undeveloped areas.
- For areas that are already developed, encourage uses that are



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sustainable and environmentally friendly.

4. Minimise Consumption, Waste and Pollution

Reducing pollution and consumption also reduces environmental damage. This improves the tourism experience, and reduces the high cost of cleaning up the environment.

- Encourage the use of waste disposal technologies with the least impact on the environment, such as recycling and waste management systems. Where communities have recycling systems, use them; where they do not, help develop them.
- Dispose of waste in a safe and appropriate way, for example, by compacting your garbage and taking it with you.
- Use biodegradable or recyclable product packaging.
- Minimise the consumption of fossil fuels, avoid motorised transport where possible, and do not use motorised transport (snowmobiles, etc.) for purposes other than getting from one place to another.
- Support the development and use of lodgings that conserve energy, recycle, and dispose of waste and garbage in appropriate ways.
- Support efforts to clean up and restore areas where the environment has been damaged.

5. Respect Local Cultures

Tourism should not change the lifestyles of peoples and communities unless they want it to do so.

- Respect the rights and wishes of local and indigenous peoples.
- Ask for permission before visiting sites that communities currently use, such as churches and other holy places, graveyards, camps, and fishing sites.

6. Respect Historic and Scientific Sites

Archaeological, historic, prehistoric and scientific sites and remains are important to local heritage and to science. Disturbing them diminishes their value and is often illegal.

- Respect the value of these sites and remains and promote their protection.

7. Arctic Communities Should Benefit from Tourism



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Local involvement in the planning of tourism helps to ensure that tourism addresses environmental and cultural concerns. This should maximise benefits and minimise damage to communities. It should also enhance the quality of the tourism experience.

- Seek and support local community involvement and partnership in tourism.
- Promote the recruitment, training, and employment in tourism of local people.

8. Trained Staff Are the Key to Responsible Tourism

Staff education and training should integrate environmental, cultural, social, and legal issues. This type of training increases the quality of tourism. Staff should be role models for tourists.

- Encourage staff to behave responsibly and encourage tourists to do so as well.
- Familiarise staff with applicable laws and regulations.

9. Make Your Trip an Opportunity to Learn About the Arctic

When tourists learn about communities and the environment, tourism provides the most benefits for all concerned and does the least damage. Knowledge and a positive experience enable tourists to act as ambassadors for Arctic environmental protection.

- Provide information about environmental, cultural, and social issues as an essential part of responsible tourism.
- Apply the codes of conduct as a way to promote responsible tourism attitudes and actions.

10. Follow Safety Rules

The Arctic can be a treacherous environment and everyone involved in Arctic tourism needs to exercise caution and follow safety rules and practices. Failure to do [so] can result in serious injury and costly rescue or medical intervention that burdens communities.

- Ensure that your actions follow accepted safe practices and comply with regulations.
- Ensure that everyone involved in Arctic tourism receive information and training about safety procedures.



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Science, Understanding, and Co-operation

Effective conservation and management requires solid and timely information. The population status (numbers) and trends (stable, declining, increasing) must be known both for species managed for consumptive use as for those rare species managed for recovery. Similarly, habitat types and other natural features must be classified and mapped in order to provide quantitative information for conservation. Such information is obtained through scientific research and monitoring. Traditional knowledge of indigenous and local inhabitants can underpin and support this type of research by providing observations, insights, and details of the workings of nature that are hard to obtain through scientific methods.

Although it is essential to understand the environment, it is equally essential to make appropriate decisions. The best information is of little use if it is not made available to end-users or is ignored. Too often, this is where conservation fails. Politicians and decision-makers are often driven by short-term interests and the understanding between local users, researchers, and decision-makers is often insufficient. Education can help to build support for conservation by creating awareness of what needs to be conserved and why. Such efforts can demonstrate the values—monetary and intrinsic—of the natural world. Adaptive management and co-management activities require and also foster better coordination between researchers, managers, and users. Improving such ties is a major challenge in Arctic conservation.

Conservation in Global and Arctic Contexts

Global Conservation Instruments

There are several global agreements and instruments that lay the modern groundwork for nature conservation. Some important ones are these:

- The United Nations Convention on Biological Diversity (CBD), from 1992 (see <http://www.biodiv.org/default.aspx>), which has three objectives: global conservation of biodiversity, sustainable use of biological resources, and the fair and equitable sharing of benefits arising from the use of genetic resources. Its clauses cover a range of topics, from the requirement to establish protected areas to the promotion of indigenous practices and knowledge relevant to conservation and sustainable use.
- The United Nations Convention on Law of the Sea (UNCLOS), from 1982 (see <http://www.unclos.com/>), defines ocean jurisdiction zones, including the exclusive economic zone (EEZ); establishes rules governing all uses of the oceans and their resources; and extends the rights of non-



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coastal states to benefit from such uses. It defines fish and other marine biodiversity outside the EEZ as the “common heritage of mankind.”

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), from 1973 (see <http://www.cites.org/>), is designed to conserve wildlife species by controlling international trade in endangered flora, fauna, their parts, and derivative products through a system of import and export permits.
- The International Convention for the Regulation of Whaling, governed by the International Whaling Commission (IWC) since 1946 (see <http://www.iwcoffice.org/>), seeks to protect whales from overharvesting and to regulate the international whale fishery to ensure proper conservation and development of whale stocks. It also provides for the creation of international whale sanctuaries.
- The Convention on the Conservation of Migratory Species of Wild Animals (CMS), from the Bonn Convention of 1983 (see the World Conservation Monitoring Centre’s webpage, <http://www.wcmc.org.uk/cms/>), aims to protect endangered migratory species and migratory species with an unfavourable conservation status. It facilitates species agreements among countries within the range of that species.
- The Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention, or WHC), from 1972 (<http://whc.unesco.org/nwhc/pages/home/pages/homepage.htm>), calls on parties to designate natural areas and cultural sites of outstanding universal value and to preserve them. There are proposals to establish transboundary world parks under the WHC.
- The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), from 1971 (see <http://www.ramsar.org/>), calls on parties to protect migratory stocks of water birds and their wetland habitats and to apply the principle of “wise use,” as defined by the convention. Under the Ramsar Convention, countries designate wetlands of international importance as Ramsar sites.

Regional Conservation Instruments

Regional biodiversity instruments, which are geographically focused, include the following:

- The Agreement on the Conservation of Polar Bears (1973), signed by Canada, Denmark, Norway, the Soviet Union, and the United States, prohibits the killing or capture of polar bears except for scientific, conservation, or traditional purposes. The agreement also contains habitat protection provisions.



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- The Porcupine Caribou Herd Management agreements (various dates) between Canada and the United States regulate hunting and protect the migratory route and breeding grounds of this large herd that moves between Alaska and the Yukon Territory. They are implemented through several management plans.
- The Berne Convention on European Wildlife and Natural Habitats (1979) is intended to conserve wild European flora and fauna and their natural habitats, with particular emphasis on rare and endangered species. Iceland, Denmark, Norway, Sweden, and Finland are parties.
- The North American Waterfowl Management Plan (1998), to which Canada and the United States are party, is designed to conserve habitat for waterfowl through incentives for conservation and management plans concerning selected waterfowl species.

The Arctic Council

The Arctic Council was established in 1996 as a high-level intergovernmental forum for addressing the common concerns and challenges faced by the Arctic governments and the people of the Arctic. Priorities of the Arctic Council are protection of the Arctic environment and the promotion of sustainable development as a means of improving the economic, social, and cultural well-being of Arctic residents.

The members of the Arctic Council are Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States of America. The Russian Association of Indigenous Peoples of the North (RAIPON), the Inuit Circumpolar Conference (ICC), the Saami Council, the Aleutian International Association (AIA), the Arctic Athabaskan Council, and the Gwich'in Council International (GCI) are Permanent Participants in the Arctic Council. Several non-Arctic states, intergovernmental and inter-parliamentary organizations, and non-governmental organizations are Observers to the Arctic Council.

The environmental protection work of the Arctic Council builds on the Arctic Environmental Protection Strategy (AEPS), which was adopted by the Arctic states through a ministerial declaration at Rovaniemi, Finland, in 1991. The Arctic Council has currently seven working groups to address its priorities:

- **AMAP** (Arctic Monitoring and Assessment Programme; see <http://www.amap.no/>) provides reliable and sufficient information on the status of, and threats to, the Arctic environment from contaminants. It also provides scientific advice on actions to be taken in order to support Arctic governments in their efforts to take remedial and preventive actions relating to contaminants.



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- **CAFF** (Conservation of Arctic Flora and Fauna; see <http://www.caff.is/>) addresses and provides advice on the needs of Arctic species and their habitats. It is a forum for scientists, conservation managers and groups, and indigenous peoples of the North to tackle a wide range of Arctic conservation and sustainable use issues at the circumpolar level.
- **EPPR** (Emergency Prevention, Preparedness and Response; see <http://eppr.arctic-council.org/>) evaluates the adequacy of existing emergency and prevention arrangements in the Arctic to improve co-operation for mutual aid in case of accidents and to recommend necessary co-operative mechanisms.
- **PAME** (Protection of the Arctic Marine Environment; see <http://www.pame.is>) addresses policy and non-emergency pollution prevention and control measures related to the protection of the Arctic marine environment from both land- and sea-based activities. These include coordinated action programs and guidelines complementing existing legal arrangements.
- **SDWG** (Sustainable Development Working Group; see <http://www.arctic-council.org/sdwg.asp>) was established at the first Arctic Council ministerial meeting, in 1998, to oversee programs and projects aimed at protecting and enhancing the economies, culture, and health of the inhabitants of the Arctic in an environmentally sustainable manner.
- **ACAP** (Arctic Council Action Plan to Eliminate Pollution of the Arctic; see <http://www.arctic-council.org/f2000-acap.html>) was adopted in 2000 to strengthen, support, and encourage national actions that reduce emissions and other releases of pollutants.
- **ACIA** (Arctic Climate Impact Assessment; see <http://www.acia.uaf.edu/>) was adopted in 2000 “to evaluate and synthesize knowledge on climatic variability, climate change, and increased ultraviolet radiation and their consequences” for Arctic ecosystems and societies.

Student Activities

1. How do you see the Arctic Council evolving over the next decade or so? What is and what will be its main importance for Arctic residents?
 2. Having read all of the modules in this course, what, in your opinion, are the main challenges and opportunities facing the Arctic region in terms of conservation and sustainable development?
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