

Canadian Wildlife Service
Arctic Ecology Map Series
Critical Wildlife areas

Descriptive report

How to use the Arctic Ecology Map Series

Canadian Wildlife Service
Arctic Ecology Map Series
Descriptive Reports

Second edition

Data added for Eureka Sound, Robeson Channel, Jones Sound,
Ballantyne Strait, Rowley River, Quoich River, Kogaluk River,
Koksoak River, Fort George, River Davis Strait.

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CANADIAN WILDLIFE SERVICE

THE ARCTIC ECOLOGY MAP SERIES

ACKNOWLEDGEMENTS

Compilation of the Arctic Ecology Map Series was made possible through information obtained in interviews with many individuals having wide experience in the Arctic. Although persons who provided valuable information or observations are too numerous to mention here, their contributions are greatly appreciated. Without them, the map series would have required years instead of months. References to data sources are made specifically in the descriptive legend for each map sheet.

INTRODUCTION

The ecological effects of increasing exploration and development by oil and mining industries in the north are causing great concern. The Canadian Arctic contains valuable wildlife populations which depend on specific habitat areas for their survival and propagation. In many cases Arctic wildlife have international importance, and represent a vital

resource to indigenous peoples. The Canadian Wildlife Service viewed the delineation of such specific habitat areas as a prerequisite to safeguarding important wildlife resources, and contracted with Renewable Resources Consulting Services Limited to produce the Arctic Ecology Map Series.

The main purpose of this program was to identify and map important and critical wildlife areas of the Canadian Arctic where human activities can have an adverse or destructive impact on wildlife populations. The objectives were two-fold: to bring together as much data as possible on habitats utilized by a wide range of species; and to provide a planning tool for both government and industry to help preserve these wildlife areas.

The maps are not designed to portray the distribution of species per se, but to document key areas of particular importance.

Since the Canadian Arctic is a vast, largely unknown area, the maps must be considered preliminary. Interviews with many observers and specialists on arctic wildlife, combined with a review of published literature and unpublished documents formed the basis for the information presented.

Information is detailed for some areas and sparse for others. For this reason, users of the maps and reports are invited to provide the Canadian Wildlife Service with

any supplementary information they may possess which could be incorporated in future revisions. Because knowledge of our arctic wildlife is far from complete, it is hoped that the Arctic Ecology Map Series will engender further surveys and research, particularly in those areas not yet well documented.

INTERPRETATION OF THE MAPS

Important and Critical Areas

These two categories of "important" and "critical" areas represent the fundamental map units of the Arctic Ecology Map Series. The coded units and the descriptive report which accompanies each map sheet together tell why each particular unit has been identified as important or critical, in regard to both the wildlife species utilizing it and, where possible, its abundance. Thus the maps may be used by themselves, or when more complete information is required, in conjunction with the written reports.

Both important and critical areas represent habitat necessary to the maintenance or survival of wildlife populations. The maps show areas of habitat utilized by large numbers of animals (concentration areas) at specific

periods of their life cycle, such as breeding, wintering or year-round. An exception is made in the case of such endangered species as the peregrine falcon, where critical areas may support only small numbers of individuals, which nonetheless constitute a significant portion of their population. In the case of migratory waterfowl, delineated areas refer to the summer life cycle, since very few birds winter in the Canadian Arctic.

Critical areas have attributes which render them particularly susceptible to permanent damage by man's activities. Deleterious activities may include habitat destruction, or simply harassment of wildlife. For example, aircraft flying low over colonies of nesting geese may cause adult birds to desert their nests and their young. Excessive predation and possible loss of the entire breeding cycle of that colony may result. When one considers that the Canadian Arctic supports most of the world population of such species as muskoxen, or that it holds a significant proportion of the North American breeding populations of white geese*, the impact of habitat destruction or breeding failure becomes evident.

This inventory is based on the premise that all interests are willing to co-operate in the national effort to

* A striking example is Ross's Goose. The entire North American population of this species breeds in the vicinity of Queen Maud Gulf.

minimize the ecological impact of human activities in the Arctic. The proposed guidelines will not unnecessarily hamper exploration, but will provide a range of alternatives leading to the reconciliation of different objectives for resource utilization. Objective reliable information, which provides the basis for sound resource strategies, as well as guidance for industries and people operating in the north, is the key to achieving the various ends.

A problem exists in the implementation of conservation policies at the field level. Company policies often acknowledge the need for environmental conservation and some sectors of industry have shown a willingness to adjust their methods of operation to reduce environmental damage. However, adequate information programs and supervision at the field level are necessary to ensure that environmental policies are implemented. Unless the bulldozer operator, the helicopter pilot and the seismic crew chief are adequately informed and aware of their responsibilities, they can unwittingly harm the environment and wildlife.

It is very common for someone in an unfamiliar pristine environment to assume it is "rugged wilderness" capable of withstanding any kind of abuse. What is considered an undesirable activity in a particular wildlife area depends

not only on its nature, but also on the time of year and the wildlife species in question. For those reasons the map symbols incorporate not only the identification of each species but the time of use of the area and habitat function it serves. Area boundaries are shown on each map. The types of human activities that are intolerable to wildlife generally are those that alter or destroy habitat, although these are not the only ones to be considered. For a better understanding of those activities which should be curtailed on important and critical areas, the following guidelines discuss human activities in relation to the species (or groups of species) and the type of habitat they occupy, as well as the critical periods of their life cycles. Suggested restrictions refer to the requirements necessary to avoid harm to animal populations and their habitat.

ADVERSE ACTIVITIES

Waterfowl

This category includes ducks, geese and swans.

Disturbances to nesting colonies during the breeding season (May 15 to September 1) can be seriously damaging and travel by foot or vehicle in nesting areas should be avoided entirely.

Low level flying by aircraft is also harmful, so a minimum ceiling of 2,000 feet should be maintained over critical waterfowl breeding areas.

Although harassment by boat or aircraft should be avoided on moulting or staging areas, normal transportation activities do not constitute a significant hazard to waterfowl. Generally those activities which do not result in habitat destruction or repeated harassment are not unduly harmful in staging or moulting areas or in breeding areas during the winter season; however, nesting habitat can be destroyed, even in winter, by tracked vehicles and some other kinds of transport capable of crushing the hummocks of vegetation common in goose nesting areas. Pollution, particularly by oil, can be catastrophic in any area used by waterfowl, and action can be taken under the Migratory Bird Convention Act to ensure removal of such hazards.

Sea-birds

Sea-bird colonies are generally located in precipitous or rocky terrain and harassment during their breeding season should be avoided. The birds usually feed within a 30-mile radius of their nests and the most serious hazard to sea-bird colonies would be pollution of their feeding grounds,

particularly by oil. Current and wind movements are factors to be considered in the event of oil spills close to major sea-bird breeding colonies.

Rare and Endangered Species

Areas marked "RE" on maps are those important primarily to birds of prey. Peregrine falcons and gyrfalcons, as well as whooping cranes, are in a most precarious position at present. For a species facing extinction any form of disturbance poses a danger to survival. Although these species breed in only a few small areas they are widely scattered and great care should be taken to avoid them entirely during spring and summer.

Barren-Ground Caribou

The most critical areas are spring calving grounds, which for some of the larger herds of caribou are most extensive. Human activity in such areas must avoid disturbance or harassment of the animals during the main calving period from late May throughout June. Following that time, human activities in these areas do not present a hazard unless they entail wide-scale destruction of habitat or the construction

facilities that will disturb the animals in subsequent years.

Although circumstances are such that disturbance is not normally a factor on major caribou winter ranges, fires which destroy the lichen forage can pose a threat. Since half a century or more is required for regeneration of a lichen range, summer fires on caribou ranges can be extremely serious. Human activities in such areas at any time of year should entail stringent safeguards to prevent forest fires. Although such safeguards should be observed everywhere within the tree line in the Arctic and Subarctic, they are particularly important in areas of caribou winter range.

Caribou migration routes are vulnerable both in spring and fall, because they represent traditional routes between summer and winter ranges. During spring migration, timing is critical for the caribou herds which must reach their traditional calving areas before the break-up of frozen river and lake crossings. Traditional water crossings are important during both spring and fall migrations because narrow places in lakes and rivers have been used for centuries in order to overcome such geographic barriers as the 120-mile-long Aberdeen Lake system.

Any activity which creates a barrier or deflection of herds along major migration routes is undesirable. This

includes primarily the construction of facilities, or intensive human activity on routes during the spring and fall migration period.

Migration routes are somewhat variable from year to year because herds may move in a broad front, utilizing a series of parallel valleys, or alternatively, they may follow one particular valley. In the latter case deflections create delays or cause failure of the herds to reach key habitat. The route indicated on the maps represent the generalized movements which occur within a region.

Woodland Caribou

Woodland caribou require a protection similar to that needed by barren-ground caribou, although the former are not nearly as migratory in nature. The most important hazard to this species would be habitat destruction of key ranges, especially winter ranges.

Muskoxen

The remnant herds of muskoxen, now found only in Arctic North America and Greenland require particular care. The number of muskoxen in the Canadian Arctic in 1965 was

estimated at 10,000. In recent years the population has been slowly increasing and recovering from severe hunting in the past, though some areas have shown an inexplicable decline which has caused concern. More remains to be learned regarding the ranges of particular muskox populations. Their movements and specific habitat requirements, such as calving areas, need to be better defined. The hatched areas on maps refer primarily to muskoxen concentrations.

Harassment of this species, both during the spring breeding season and during the winter period when cows are pregnant, may be the most harmful human influence. Harassment, such as by low-flying aircraft may, conceivably, affect the reproductive and survival rates of this species. Injury and death of terrified animals stampeded by aircraft have been known to occur. Despite the interest we all have in viewing and photographing muskox herds, low-level harassment by aircraft must always be avoided.

While the habitat requirements are particularly critical during the winter, any wide-scale disturbance of a muskox range is potentially harmful. Artificial barriers or gullies caused by erosion may keep herds from their critical arctic ranges which are of limited extent.

Dall Sheep and Mountain Goat

Barring extensive habitat destruction, these species are not nearly as vulnerable to exploration activities as the other species mentioned. However, construction of access roads in some areas could lead to excessive hunting of mountain goats.

Arctic Fox

To safeguard Arctic Fox populations dens must not be destroyed during exploration activities. Because of permafrost, foxes can dig only shallow den systems in sites of well-drained loose soils that thaw out early. Such dens are normally found in eskers or river banks, which may unwittingly be used as a source of road fill, or otherwise disturbed during road construction. A second danger is the attraction of foxes to garbage dumps and to camps where they are intentionally fed. Arctic Foxes are unwary animals, and their concentrations near human habitations may lead to unfortunate attempts to shoot them for sport or fur.

Polar Bear and Grizzly Bear

Both species are normally wide ranging and not

particularly vulnerable to man's activities. Two exceptions occur. Denning sites are critical because they represent winter habitat for hibernation, and for the birth of the young. Denning areas often contain concentrations of hibernating bears which may represent most of the population from a vast area. All dens should be left completely undisturbed. While travel through denning areas is not harmful in itself, the establishment of camps or long continued activity in close proximity to dens should be avoided.

The second factor of great significance to bear populations may be termed the "garbage dump syndrome". Both species of bears will be attracted from a wide area to open garbage dumps. In such cases human-bear conflicts are inevitable, with the eventual result that bears will be destroyed. Even in the absence of danger to human life, the proximity of bears to human habitation is often used as a pretext to obtain a prized bear pelt without reference to game seasons or hunting regulations. Neither species is sufficiently numerous to withstand such needless destruction. Adequate garbage disposal by removal or incineration can prevent these encounters.

Muskrat and Beaver

Both species occur in the Canadian north because of

the shelter and food provided to them by relatively stable and deep water conditions. Frost bites deep in the Arctic so any alteration of water levels through dam or road construction is probably the most significant aspect of human activities to be considered. Oil spills in key areas could have a disastrous impact, not only on the animals themselves, but also on their habitat.

Marine Mammals: Whales, Seals, Narwhal and Walrus

Oil pollution perhaps represents the most serious threat to marine mammals. Although oil does not necessarily result in direct decimation of marine mammals through contact and poisoning, contamination or destruction of their food supply is a distinct possibility.

Underwater seismic blasts must also be considered potentially damaging, although more research is required to assess the importance of this factor.

Harassment by boat and aircraft, or on foot, is undesirable in "calving areas" (river estuaries for white whales), concentration areas (river estuaries for narwhal) and "hauling out grounds" (islands and sea ice for walrus). The main impact of harassment would be the separation of young from their mothers during the nursing period and the

possibility of driving animals from important habitat.

Anadromous Fish

While a great deal remains to be learned of the habitat requirements or spawning runs of anadromous fish, certain requirements are clear. Arctic char, for example, spawn during September and October in clear deep pools, possessing suitable gravel bottoms, in rivers and lakes. Braided river channels or silted waters, such as occur on the lower Mackenzie delta are unsuitable for char spawning. For that reason siltation due to seismic line construction, road-building or erosion caused by other exploration activities must be avoided. Gravel removal from spawning areas can be totally destructive to fish runs and should be prohibited in areas designated as important for anadromous fishes.

Pollution by either domestic or industrial effluents is a self-evident deleterious factor.

General

As may be seen from the foregoing discussion, a wildlife area's vulnerability to human activity depends on a number of factors. In many cases more information is needed before the protective measures required by each species

can be defined exactly. However, it is clear that any activity which results in specific habitat destruction is undesirable. In those areas delineated on maps, the potential for adverse effects arising from certain human activities is particularly great.

The Arctic Ecology Map Series represents a compendium of information for a wide range of species over a vast geographic area. While it will be of interest to wildlife agencies and will serve to systematize a large body of observations, the information on which it is based is rarely definitive. Above all, the maps are working documents which we hope will be helpful in resolving problems of maintaining wildlife populations in the face of increasing human activity. Arctic wildlife remains vital to northern peoples and in addition plays an important part in satisfying the demands of waterfowl hunters of southern North America. Because the Canadian Arctic is increasingly being called upon to satisfy other wants of our resource-hungry civilization, the Arctic Ecology Map Series is designed to help define specific wildlife habitats of concern in the interplay of resource interests.

MAPPING CONVENTIONS


In the mapping of critical and important wildlife

areas various conventions have been used to provide supplementary data, to impose clarity, or to indicate areas where the data are fragmentary. The following are the conventions used, with some examples of cases in point.

1. Dotted boundary lines have been used as follows:
 - (a) To indicate hypothetical extensions of critical or important areas;
 - (b) When extended out to sea, to indicate the probable radius encompassing feeding grounds of sea-bird colonies. Although these lines are somewhat arbitrary, feeding grounds which occur offshore from sea-bird colonies are vital to the maintenance of the colony, and the dotted lines serve to point out this fact.

2. Double-ended migratory route arrows indicate routes used both ways, i.e., during spring and fall migrations.

3. Migratory routes outlined by a double line indicate a migration front encompassing a fairly wide area (e.g., through river valleys or on a broad front through straits and channels).

4. Concentration areas for marine mammals occur landward of the indicated line e.g., .
Marine mammal concentration units by necessity do not normally

consist of a closed unit. Therefore, as in the example above, the unit extends to the arrow at either end of the line and inshore from the line. Such lines represent the area where observations have been made.

5. Where the same unit description number has been given to two units, data are identical for both units.

6. Symbols and unit numbers placed in land or marine areas, but not associated with boundaries, indicate the occurrence of indicated species within the general areas because boundary limits cannot be firmly established. In such cases observations made at specific points within the general area are noted in the descriptive report.

7. All wildlife sanctuaries have been designated as critical areas. Delineation of specific areas within the sanctuaries has not been made. Where data on the occurrence of species within sanctuaries are available, the sanctuary has been designated by a unit description number, and details are provided in the descriptive section of the report of the map sheet.

8. On complex sheets, to facilitate reference to specific units, numbering of units is clockwise on the map sheet.

SYMBOLIZATION CONVENTIONS

1. Where two or more symbols occur within an area, both species occur within that area.
2. Where symbols for more than one habitat function are superimposed e.g., w_1^b the symbol indicates that both functions occur within the area.
3. Omitting part of a symbol, for example time of use, indicates a lack of data pertaining to the function.
4. Some data on species not included in the initial terms of reference have been obtained during the course of the study. The symbol "H" for Harp Seals is available in the legend, but the same symbol has been used for other species in the group, each of which is defined in the descriptive narrative. Thus the Harp Seal symbol also is used for Bearded and Ringed Seals, and "BW", the Beluga Whale symbol, is used for Bowhead Whales as well.
5. Areas where information from the literature is generalized, or where species additional to those being mapped occur, are mentioned in the general description for each map sheet.

THE DESCRIPTIVE NARRATIVE

1. Where information is available references have been keyed to specific map units in the descriptive narrative either as personal communication or as a particular report or publication. In some cases, however, publications refer to general areas only and constitute a general reference to knowledge about wildlife within the map sheet.