

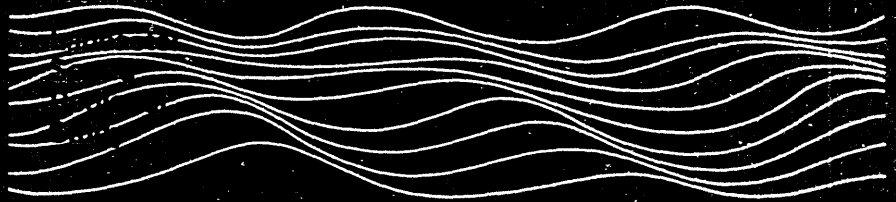
**LEGISLATIVE ASSEMBLY OF THE  
NORTHWEST TERRITORIES  
9<sup>TH</sup> ASSEMBLY, 4<sup>TH</sup> SESSION**

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**TABLED ON FEBRUARY 6, 1981**

# The Lancaster Sound Region 1980-2000

**Draft Green Paper**



Draft Green Paper

TD 4-81(1)  
Tabled on Feb. 6, 1981

**The Lancaster Sound  
Region: 1980-2000**

Perspectives and Issues on Resource Use

prepared by  
The Working Group on the Lancaster  
Sound Regional Study

Edited by H.J. Dirschl

December 1980

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This paper is intended to stimulate public discussion and comment on the future use of the Lancaster Sound region in the eastern Canadian Arctic. It has been prepared from individual and joint contributions by the members of the Working Group on the Lancaster Sound Regional Study and reviewed by the Interdepartmental Steering Committee for the Study. The paper is now being made available in draft form to enable the public to contribute effectively to the determination of management options for the region.

Readers will have an opportunity to express their views, comments, and suggestions directly by participating in public workshops, or in meetings in the regional communities, to be held in early 1981. Alternatively, readers may wish to write to:

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## Lancaster Sound: A Challenge for all Canadians

Lancaster Sound, a magnificent part of Canada's High Arctic, poses a great challenge for Canadians in planning for the future uses of our natural resources. Ecologically, the Sound is possibly the richest, most productive area in all the Arctic. Certainly, the long-term health of this special, indeed unique, environment is an important concern to us all. The Sound is also the entrance to the famous Northwest Passage, and as such, is a potential transit route for increased shipping if industrial development of any kind proceeds in the Arctic. Since the Sound also holds a hydrocarbon potential, we have important decisions to make about the safety of possible oil and gas exploration and development here as we pursue our national objective of energy self-sufficiency. And weighing heavily in the balance of our considerations for future uses of Lancaster Sound are the interests of the native Inuit who continue to depend on the area's resources.

A wide range of potential future activities have been identified for this critical area, each of which could have far-

reaching consequences for us all. We present here a brief description of the region, and the issues that we consider to affect it, in the hope of receiving the readers' thoughtful comments in return. This is to help the Canadian public to participate in a planning process, to help make decisions, by responding in an informed manner to the question:

"WHAT DO YOU BELIEVE WOULD BE OUR BEST  
PLAN FOR THE LANCASTER SOUND REGION?"

The Working Group on the  
Lancaster Sound Regional Study.

LANCASTER SOUND, a deep marine channel on the north side of Baffin Island, is an important geographic feature of the

Significance of the Lancaster Sound Region in the Context of the Circumpolar North • ᐅᐅ ᐅᐅᐅ ᐅᐅᐅᐅᐅᐅᐅ  
ᐅᐅᐅᐅᐅᐅ ᐅᐅᐅᐅᐅᐅᐅ ᐅᐅᐅᐅᐅᐅ • Importance de la région du détroit de Lancaster dans l'ensemble du Nord  
circumpolaire



circumpolar Arctic (Figure 1). A major passage in the Canadian Arctic archipelago, the Sound is 400 km long and 75 to 120 km wide, with a flaring mouth open to Baffin Bay on the east. On the west, it is connected to Barrow Strait and the network of straits and passages of the central archipelago (Figure 2).

The Sound acts as a funnel for various marine currents which interact to produce high nutrient cycling and biological productivity while varied ice conditions and the particular coastal and underwater topography provide nesting and breeding sites for many species of marine birds and mammals in close proximity to their feeding grounds. As a result, a significant part of the marine-associated wildlife of the eastern Canadian Arctic concentrates in the Sound and the contiguous marine channels during some part of the year. For example, 40 percent of North America's white (beluga) whales and 85 percent of narwhals pass into or through the Sound in the summer and, out of a total of 8.3 million

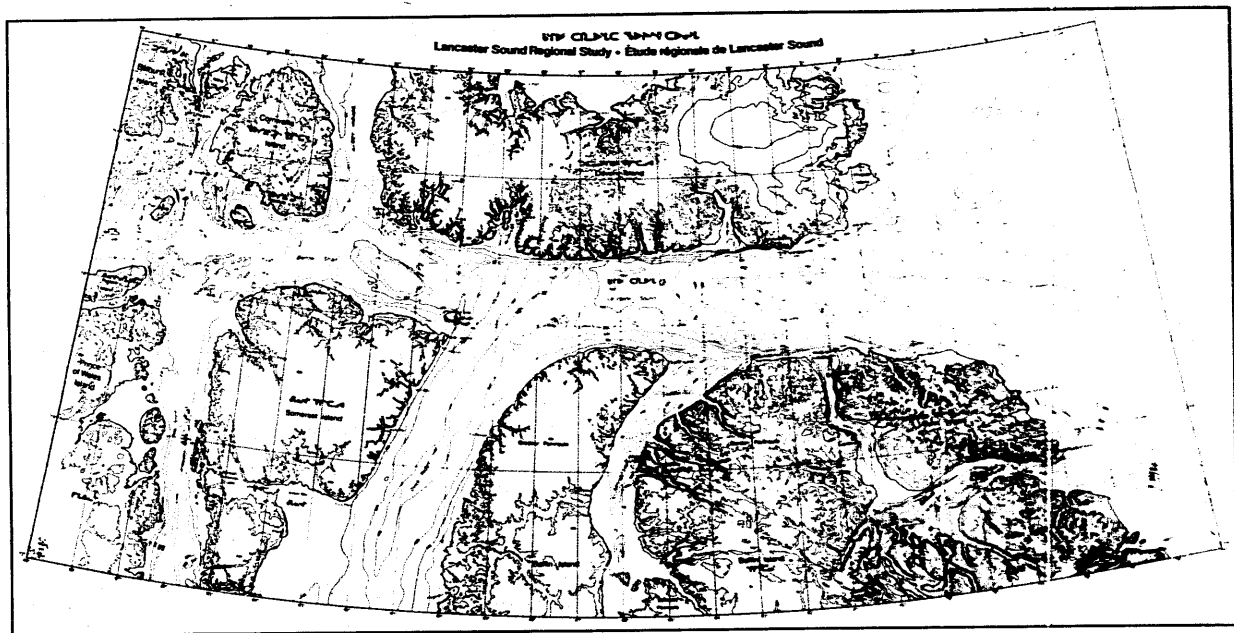
colonial seabirds in eastern Canada, three million nest in the Lancaster Sound region.

The adjacent coastal zones and uplands of Devon, Bylot, Cornwallis and Somerset islands, and the northern peninsulas of vast Baffin Island, also contribute to the region's biological richness with populations of snow geese, caribou, muskoxen, and other species.

Abundant marine and terrestrial animal life here has provided food and shelter for the Inuit for several thousand years. Wildlife continues to be important to the Inuit residents of Arctic Bay, Pond Inlet, Resolute and Grise Fiord, providing them with food as well as cash income.

In addition to its magnificent scenery and abundant animal life, the Lancaster Sound region has become significant in ways that will also affect the many Canadians who live a great distance away. The Sound forms the eastern entrance

# The Study Area • ᑲᑭᑦᑲᑦᑲᑦᑲᑦᑲᑦᑲᑦᑲᑦ • La région d'étude



Map of Lancaster Sound Regional Study Area  
Scale: 1:50,000  
Projection: UTM  
Datum: NAD 83  
Elevation: Contours at 100m intervals  
Water: Shaded blue  
Settlements: Shaded grey  
Roads: Solid black lines  
Rivers: Solid black lines  
Lakes: Solid black outlines  
Coastline: Solid black line  
Grid: Dashed lines  
North Arrow: Located in the upper right corner

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to the Northwest Passage, a corridor of navigable water connecting the Atlantic and Pacific oceans which was first explored by Europeans during the 19th century. Ships have used the Sound for more than 150 years, beginning with the European explorers, followed by whalers and traders and, more recently, by re-supply ships, scientific vessels, and ore carriers. However, all these ships have been forced to limit operations to the short open-water season which extends from mid-July to late October. Now, with the current crisis in the world energy situation and Canada's determination to regain self-sufficiency in oil supplies, this situation may change radically.

An industry proposal is under review calling for the year-round shipping of liquefied natural gas (LNG) in powerful ice-breaking tankers from Melville Island through Lancaster Sound to eastern Canada. Even larger ice-breaking tankers are being considered to carry crude oil from the Beaufort Sea through the Northwest Passage to refineries on the East Coast. It has been estimated that during the 1980's,

ship traffic in the Sound could increase from the present level of about one ship per day during the short open-water season to perhaps three per day year-round.

In addition to the likelihood of becoming a corridor for the transport of oil and gas from points farther west, Lancaster Sound has a hydrocarbon potential of its own. A number of promising geological structures have been identified in the Sound and in the adjacent part of Baffin Bay. Although the government has withheld approval of the initial application for permission to drill an exploratory well, further proposals are under preparation. Exploration and subsequent development of the reservoirs that may be discovered would have a significant influence on the Lancaster Sound region and its Inuit communities through the construction of onshore installations and ports, the presence of a relatively large work force, and the threat of a blowout or large oil spill.

Clearly, each of these potential developments would bring definite impacts to the natural environment of the region

and would affect the lives of the Inuit residents whose lifestyle has already undergone rapid changes during the past half century. It is apparent, too, that these developments would bring substantial economic benefits to the residents of the region, the Northwest Territories, and to Canada as a whole. However, the significance of these implications cannot be fully assessed until we make a detailed examination of all the regional, territorial and national costs and benefits.

This public discussion paper (Green Paper) outlines the physical, biological, social, and economic make-up of the region. It discusses the regional and national implications of a wide variety of uses, individually and in combination, and presents the major issues as seen by the members of the Working Group on the Lancaster Sound Regional Study.

Few quantitative data have been included in this draft so that the discussion may focus on issues and perspectives rather than on the validity of the statistics provided.

Additional reference material is available (see Appendix III for a complete listing) for those who wish to examine the situation in greater detail.

# The Lancaster Sound Regional Study

## BACKGROUND AND PURPOSE

The Lancaster Sound Regional Study evolved from the public hearings held in 1978 to examine an application by Norlands Petroleum Ltd. for permission to drill an exploratory well in Lancaster Sound. The panel of officials set up under the federal Environmental Assessment and Review Process (EARP), to conduct the hearings, concluded that a meaningful assessment of the environmental and socio-economic impacts of exploratory drilling in Lancaster Sound could not be made in isolation from the broader issues that affect all uses of the area. The panel therefore recommended that a comprehensive review of the complex resource use problems in the Lancaster Sound region should be done by the Department of Indian Affairs and Northern Development as the principal federal coordinating and planning body for the North. This recommendation was accepted by the Minister of Indian and Northern Affairs.

Accordingly, the Department has set up the Lancaster Sound Regional Study to initiate comprehensive planning for the future of the region. This is being done in con-

junction with the Government of the Northwest Territories and the federal departments of Energy, Mines and Resources, External Affairs, Environment, Fisheries and Oceans, National Defence, and Transport.

In a message to the Baffin Regional Council, dated 17 October 1979, the then Minister of Indian Affairs and Northern Development explained that this Green Paper was not intended as a "blueprint for development" of the Lancaster Sound region but, rather, as a means of initiating public discussion on how the region should be managed in future. He spoke of the great variety of uses the region might accommodate and noted that some might be incompatible with one another or with the environment. He also referred to the importance of preserving the traditional culture and way of life of the Inuit who lived there and stated that factors such as environmental protection and oil and gas must be considered. In order to enable informed decisions to be made on the use and management of Lancaster Sound, the Minister stressed the need for a clear perception of the issues involved.

## THE REGIONAL PLANNING APPROACH

It seems reasonable to conclude that change in the Lancaster Sound region is inevitable over the next twenty years, that even in the absence of new industrial development, natural population increases alone will, by the year 2000, place new demands on services and the fish and game resources, and create under-employment. It is also clear that the uncoordinated introduction of the various proposed industrial and commercial development projects, or of environmental conservation efforts, could result in major impacts on community life.

With the onset of each new activity, no matter how well regulated, additional demands will be placed on the people and on the environment. If we accept that changes are inevitable, then we must ensure that those changes which take place are in the best interests of the residents of the region, the Northwest Territories, and the rest of Canadian society.

Until now, there has been only one type of review process in

the North - that associated with the environmental and socio-economic impact assessment of individual development projects. Usually these impact assessments take place when a project is in an advanced state of planning. Obviously, there is a need for this type of assessment, to examine individual activities in detail and recommend specific terms and conditions under which they may proceed. However, as the EARP panel realized while considering Norland Petroleum's application, there should also be a process by which such development proposals can be assessed on a regional, territorial and national scale in the context of many other events and uses, over a long period of time, and from a variety of perspectives.

We believe that the most appropriate process, and the one which would best serve the interests of the public, is a Regional Planning Approach as illustrated in Figure 5. The Lancaster Sound Regional Study is intended to carry out the first three of the four planning phases shown (see also Appendix I to III for further detail). These three phases



**Figure 3. Generalized Regional Planning Strategy for Lancaster Sound**

Elements of Lancaster Sound Regional Study leading to the initiation of a Regional Planning Approach

Refinement of Regional Planning Approach leading to the adoption of a regional plan and the development of management strategies

Phase I

Definition of Goals & Objectives  
 Information and Data Collection  
 Analysis of Information and Identification of Conflicts and Compatibilities  
 Identification of Examples of Alternative Strategies or Options

Phase II

Public Discussion Review of Draft Green Paper and Development of Options

Phase III

Preparation of Final Green Paper based on Results of Phase II. Submission to Minister, DIAND

Phase IV

Evaluation of Alternatives & Selection of Preferred Alternatives or Options  
 Statement of Plan  
 Plan Review  
 Adoption and Implementation of Plan  
 Development of Management Guidelines and Practices

Activities in Development of Green Paper

Activities subsequent to presentation of Green Paper

of the Study include the following:

- . Compilation of a detailed data base on the region in the form of a *Preliminary Data Atlas* and a series of technical *Background Reports*; incorporation of data summary and analysis in a draft Green Paper as a means of stimulating public discussion of the issues.
- . Public review of the draft Green Paper and other project documents.
- . Updating of the data base and preparation of a final Green Paper which will include the results of the public review and will identify options for the future use and management of the region.

The final Green Paper will be submitted to the Minister of Indian Affairs and Northern Development for his consideration and that of his colleagues. It will thus be an important document in the decision-making process on the future of the Lancaster Sound region.

## YOUR REACTION IS IMPORTANT

As you read about the Lancaster Sound region in the following pages, we ask that you give careful thought to all the issues, the possible directions, and the possible ramifications. How do you feel the interests of all Canadians can best be served? What can you suggest that would allow work to be carried out within this dynamic, yet fragile, environment to achieve the best use of its resources?

Do you think that the region's biological richness and diversity should be preserved through setting up national parks and wildlife areas or other forms of reserves?

In view of the need to identify and, if necessary, develop arctic petroleum resources at this time, do you think we should include Lancaster Sound in exploration plans or omit it for the present and explore elsewhere in the Arctic or on the Continental Shelf?

Do you feel that we should proceed with oil and gas exploration and development now, while continuing research into

the prevention and management of oil spills in arctic waters? Or do you believe that government and industry should work together beforehand to develop the safer technology to cope with the arctic environment before operations begin in Lancaster Sound?

Do you think that year-round shipping for all kinds of commodities should take place through the Sound?

More questions and discussions appear at the end of this paper for your consideration to help you formulate and express your opinions.

## Lancaster Sound: The Present Picture

In the Lancaster Sound region, the relationships among climate, natural processes, and economic activity are intricate. The harsh climate, for example, sets severe restrictions on industry, communications, and transportation. Industrial activities in turn may bring ecological impacts to the land and offshore areas, and may have a profound influence on the preferred lifestyle and aspirations of the region's Inuit inhabitants. Any process of planning for the future use of this unique environment, therefore, must be based on an understanding of its physical and biological characteristics, and of the human activities that are carried on at present.

At this time, we are still a long way from a complete understanding of these factors and their interrelationships. While some aspects have been studied intensively, others have been given very little attention in past research programs. Though unbalanced, the current level of knowledge about the Lancaster Sound region enables a broad review of potential uses of the region. Additional know-

ledge, as it becomes available, can be incorporated into the planning process to provide for better design for future projects or activities.

The following discussion briefly outlines the present state of knowledge of Lancaster Sound, as it relates to the regional planning objectives. We begin by looking at the physical make-up of the region, followed by a review of biological features, hunting, fishing and trapping, current commercial activities, and social and economic considerations. Together all these constitute "the present picture" of Lancaster Sound. Later we will look at potential activities and the influence they would be expected to have on the region.

We have found it convenient to describe this complex region according to typical conditions encountered during winter and summer. Winter corresponds roughly to the period from October to May when the marine channels are ice-covered. Summer is represented by the open-water season from June to September. This simplification does not influence the

results of the analysis which take into account the seasonality and variability so characteristic of the region.

The various regional characteristics discussed in this section have been illustrated in coloured "composite maps" which have been derived from superimposed maps of individual variables. The smaller maps accompanying the composite maps have been taken from the *Preliminary Data Atlas* and illustrate some of the more important individual components that have been incorporated into the composites.

#### THE LAND AND THE SEA

The region's most prominent physiographic features are the rugged mountains of Bylot, eastern Devon, and northeastern Baffin Islands which rise to 1500 metres above the sea and are covered by glaciers and icecaps (see Figure 2). In the central part of the study area, vast plateaus grade from 700 metres in southern Brodeur Peninsula to 300 metres further west on Somerset and Devon islands. This gradual lowering

of the relief continues on the islands west of Somerset where lowlands are extensive and ridges do not exceed 230 metres above sea level.

The lowlands throughout the area are sparsely covered with lichens, mosses, grasses, sedges, and a few stunted dwarf shrubs. Slopes and upland plateaus, exposed to severe winds, are virtually devoid of vegetation.

The marine channels and inlets are bordered mostly by steep coastal cliffs and numerous fiords. Lancaster Sound itself is a smooth, broad trench with depths of 900 metres at its eastern entrance, becoming gradually shallower towards the west until reaching a 180-metre sill in Barrow Strait.

Marine sediments consist mainly of gravel and sands in Barrow Strait and nearshore zones, grading progressively to finer silts and clays towards the mouth of Lancaster Sound and Baffin Bay.

## THE REGION IN WINTER

### The Physical Environment

Three months of continuous darkness, from late November to early February, characterize the winter environment. The annual snowfall, which represents the main element of the area's relatively low precipitation, is about one metre. However, 1.5 metres or more may fall on the rugged mountains of Bylot, Devon, and northern Baffin islands.

Snow cover persists in the region from mid-September to late May or June. Baffin Bay to the east has a moderating influence on air temperature, causing a noticeable gradient in mean annual temperature from east ( $-24^{\circ}\text{C}$ ) to west ( $-32^{\circ}\text{C}$ ).

Winds, currents, and ice-cover are extremely variable within the region and often unpredictable between seasons, years, and localities. Nonetheless, a number of general descriptive trends with significance to a regional study have been identified, with those suitable for mapping illustrated in Figures 4 and 5.

Ocean freeze-up begins along the shores by early October and, by December, the channels are normally ice-covered. Two distinct ice-cover regimes form which strongly influence this winter environment. The sea ice of Baffin Bay and Lancaster Sound is unconsolidated throughout the winter; that is it remains mobile, responding to currents, winds, and tides. As illustrated in Figure 4, ice drifts eastward in Lancaster Sound at average speeds of 5-10 km/day. The amount of unconsolidated ice-cover varies greatly, owing to continuous opening and refreezing of cracks, leads (long narrow openings), and patches of open water.

The second regime is represented by the winter sea ice in Barrow Strait, a relatively stable, consolidated mixture of new and multi-year ice which is landfast for six months or more annually. The ice edge that separates these two regimes usually appears near Prince Leopold Island across east Barrow Strait (near longitude  $90^{\circ}\text{W}$ ). However, the position of the ice edge can vary considerably to the west or east.

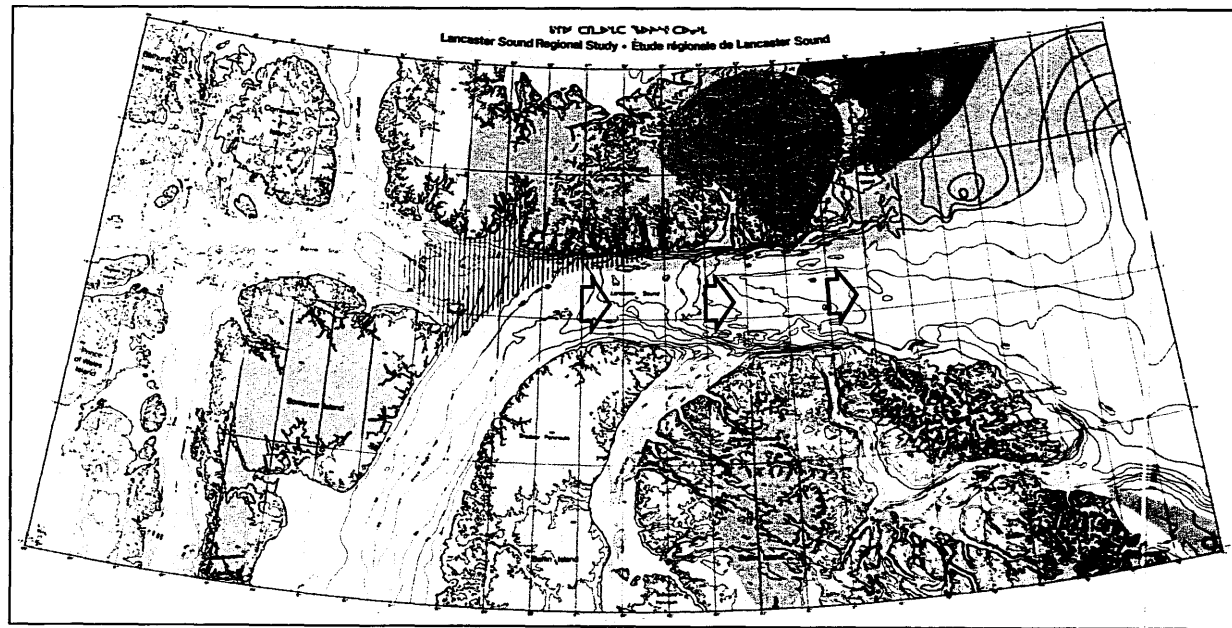
In the vicinity of Resolute near Barrow Strait, the prevail-

# Physical Environmental Characteristics: Winter • ᓄᓇᓂᓪ ᓂᓴᓇᓂᓪ ᓴᓂᓪᓴᓪ ▷▷ᓴᓴᓪ • Caractéristiques physiques et environnementales: hiver

Sea ice conditions range from complete ice cover (white) to open water (dark blue). Arrow = general ice movement. Position of fast-ice edge usually in hatched zone. Blue areas on land receive most snow.

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Les conditions de la mer de glace varient de l'état de couverture de glace (blanc) à l'état d'eau libre (bleu foncé). La flèche = mouvement général de la glace. Les zones hachurées indiquent habituellement l'emplacement de la lisière de glace stable. Les zones bleues sur terre sont celles qui reçoivent le plus de neige.



Map of Lancaster Sound showing sea ice conditions in winter. The map includes a grid, a hatched zone indicating the fast-ice edge, and blue areas on land indicating high snowfall.

Map of Lancaster Sound showing sea ice conditions in winter. The map includes a grid, a hatched zone indicating the fast-ice edge, and blue areas on land indicating high snowfall.

Map of Lancaster Sound showing sea ice conditions in winter. The map includes a grid, a hatched zone indicating the fast-ice edge, and blue areas on land indicating high snowfall.

Map of Lancaster Sound showing sea ice conditions in winter. The map includes a grid, a hatched zone indicating the fast-ice edge, and blue areas on land indicating high snowfall.

# Physical Environmental Characteristics: Winter • $\Delta L \Delta C \Delta L \Delta C$ : $\Delta P \Delta T$ • Caractéristiques physiques et environnementales: hiver

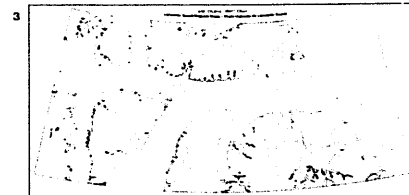
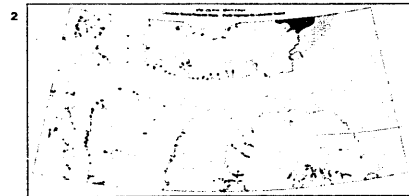
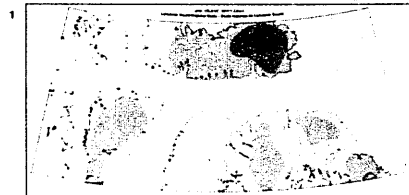
## Selected Components • $\Delta C \Delta L \Delta C$ • Composantes choisies

1 Mean Annual Snowfall -  $\Delta C \Delta L \Delta C$  • Précipitations annuelles moyennes de neige

2 Median Ice Cover -  $\Delta C \Delta L \Delta C$  • Couverture de glace médiane

3 Consolidated Ice Edges: 1964-1979 •  $\Delta C \Delta L \Delta C$ : 1964-1979 • Lisères de glaces consolidées: 1964-1979

4 Ice Drift: Winter -  $\Delta C \Delta L \Delta C$ :  $\Delta P \Delta T$  • Glaces à la dérive: hiver





ing winds are from the north, northwest, or southeast. However, no weather observations are taken in the Sound proper during winter and data from the eastern land stations are influenced by local topography.

#### Wildlife

The Lancaster Sound region is one of the most important areas in the Canadian High Arctic for abundant and diverse wildlife. In the winter, the ice regimes as described in the previous section play a major role in determining the distribution, movements, and abundance of many species of birds and mammals.

We have mentioned that the ice edge between consolidated (landfast) ice and unconsolidated (drifting) ice typically lies across Barrow Strait and extends eastward along the shores of Devon and Baffin islands. As Figures 6 and 7 illustrate, this edge provides a critical habitat for many species of animals. The ringed seal, for example, feeds and hauls out along the ice edge where it is also hunted by its

main predator, the polar bear. The arctic fox frequents the same area, hunting and scavenging seal carcasses. Birds, and to some extent whales, also congregate and feed along the fast-ice edge, particularly along the coast of south-eastern Devon Island, from April to June. The ice edge forms a barrier to these animals, thus limiting their westward movements in spring.

From October to June, the drifting ice with its many cracks, leads, and patches of open water, provides valuable habitat for ringed seal, polar bears, and arctic fox. It is here that hundreds of thousands of birds converge during April and May to feed and rest while waiting for the landfast ice to break up.

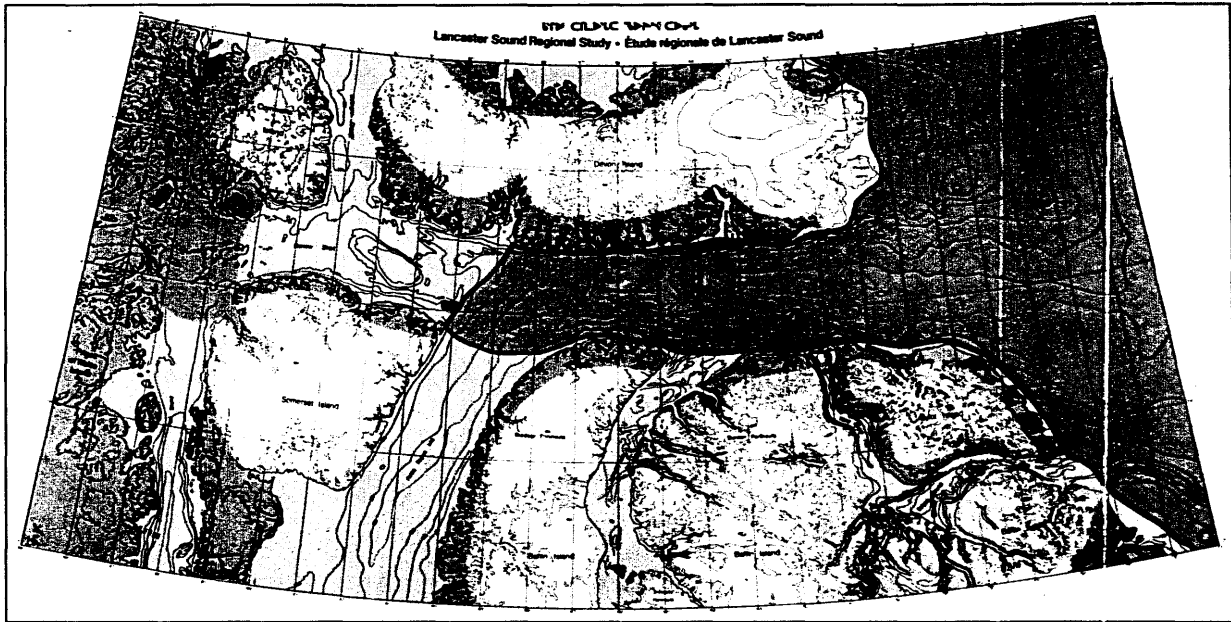
The consolidated ice of the central and western Barrow Strait and the adjoining channels provides a platform where arctic fox, Peary caribou, and muskoxen cross throughout the winter. Areas of weak ice, often associated with zones of snow accumulation between pressure ridges or amongst rubble

# Biological Resources Characteristics: Winter • ▶◀◃◅ ⌒ⓂⓃⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ◃◅: ▶▶◃◅ • Caractéristiques des ressources biologiques: hiver

Five levels of important habitats are shown for major species. Dark green areas are critical habitats for species that concentrate and feed along fast-ice edge. White areas are general range of one or two species.

ⓂⓃⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ. ⓂⓃⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ. ⓂⓃⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ. ⓂⓃⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ ⓆⓇⓈⓉⓇⓈⓉ.

Cinq niveaux d'habitats importants sont indiqués pour les principales espèces. Les zones en vert foncé sont des habitats critiques pour les espèces qui se concentrent et s'alimentent le long de la frange de glace fermée et les zones blanches représentent une aire générale fréquentée par une ou deux espèces.



Map Scale: 1:50,000  
 Map Date: 1984  
 Map Project: Lancaster Sound Regional Study

Map Scale: 1:50,000  
 Map Date: 1984  
 Map Project: Lancaster Sound Regional Study

Map Scale: 1:50,000  
 Map Date: 1984  
 Map Project: Lancaster Sound Regional Study

Map Scale: 1:50,000  
 Map Date: 1984  
 Map Project: Lancaster Sound Regional Study

Map Scale: 1:50,000  
 Map Date: 1984  
 Map Project: Lancaster Sound Regional Study

ice, are used by ringed seal for pupping and feeding.

Another feature that affects wildlife patterns is the formation of snow banks along the coastlines of the region. Particularly on southern Devon and northern Somerset islands, snow banks are used extensively as maternity denning areas by polar bears and their cubs from mid-November to early April.

Other animals that winter in the region are muskoxen and caribou. Muskoxen are mainly found on northeastern Prince of Wales Island, but small populations on Somerset, Cornwallis, Bathurst, and Devon islands use the limited areas of well-vegetated lowlands found on these islands. Peary caribou move between Prince of Wales and Somerset islands during winter, some may also cross Barrow Strait.

As the lowlands become free of snow in spring, they are occupied by shorebirds and waterfowl. Colonial seabirds, however, are little affected by ice cover, while nesting on

coastal cliffs in various locations from late April until September. The two largest nesting colonies are on Prince Leopold Island and at Cape Hay.

#### **Hunting, Fishing, and Trapping**

As the wildlife of the region is finely adapted to the dynamics of this harsh land, so too the native hunter must be attuned to seasonal change in the natural environment to earn his livelihood. Hunting, trapping, and fishing have been, and remain, important pursuits for the region's Inuit.

Except for the months of December and January when darkness and extreme cold interfere, winter is the most important period for Inuit hunters and trappers. Figures 8 and 9 show where hunting, fishing, and trapping may occur in this season. With the snowmobile, hunters can cover extensive areas of snow-covered land and sea-ice. The harvested animals include ringed seal, narwhal, caribou, muskoxen, polar bear, arctic fox, and small game. Arctic char fishing through the ice also takes place.

**Biological Resources Characteristics: Winter • ᐅᐱᐸᐸ ᐅᐱᐸᐸᐸ ᐸᐸᐸᐸ ᐸᐸᐸᐸ ᐸᐸᐸᐸ ᐸᐸᐸᐸ • Caractéristiques  
des ressources biologiques: hiver**

**Selected Components • ᐅᐸᐸ ᐸᐸᐸᐸᐸᐸᐸᐸ • Composantes choisies**

1 Polar Bear • ᐸᐸᐸ • Ours blanc

2 Ringed Seal • ᐸᐸᐸ • Phoque anneau

3 Arctic Fox • ᐸᐸᐸ ᐸᐸᐸᐸᐸᐸ • Renard arctique

4 Marine Mammals: Spring Migrants • ᐸᐸᐸᐸᐸ ᐸᐸᐸᐸᐸ ᐸᐸᐸᐸ  
ᐸᐸᐸᐸᐸᐸ • Mammifères marins: migration printanière

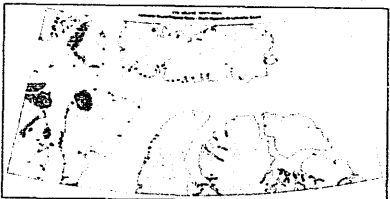
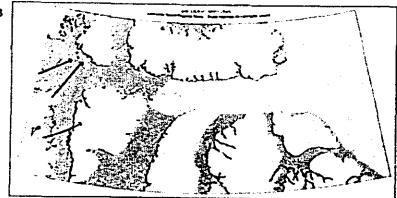
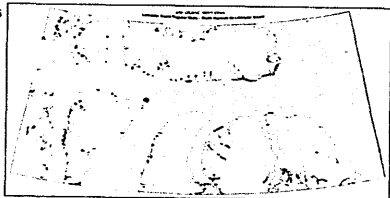
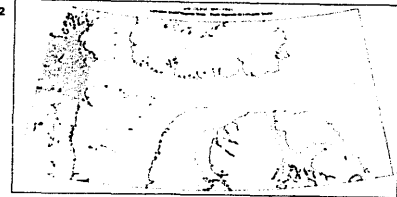
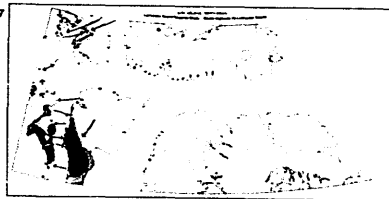
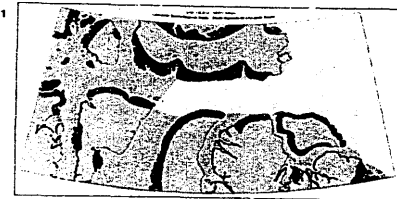
5 Colonial Seabirds • ᐸᐸᐸᐸ ᐸᐸᐸᐸ • Oiseaux coloniaux

6 Muskoxen • ᐸᐸᐸᐸ • Boeuf musqué

7 Peary Caribou • ᐸᐸᐸᐸ ᐸᐸᐸᐸ • Caribou de Peary

8 Barren-Ground Caribou • ᐸᐸᐸᐸᐸᐸᐸᐸ ᐸᐸᐸᐸ • Caribou de la toundra

9 Vegetation • ᐸᐸᐸᐸᐸᐸᐸ • Végétation





Hunting, Fishing and Trapping Patterns: Winter • ᐱᐃᑦᐱᑦ ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ ᓄᐅᓐᓂᑦ  
ᐱᐃᑦᐱᑦ ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ ᓄᐅᓐᓂᑦ • Chasse, pêche et piégeage: hiver

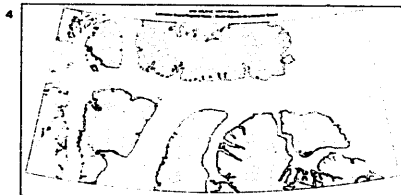
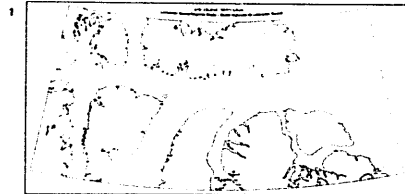
Selected Components • ᐃᐅᑦ ᓂᐅᓂᑦᓂᑦᓂᑦᓂᑦᓂᑦ • Composantes choisies

1 Seal Hunting - ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ - Chasse au phoque

2 Polar Bear Hunting - ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ - Chasse à l'ours blanc

3 Caribou Hunting - ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ - Chasse au caribou

4 Trap Lines - ᓄᐅᓐᓂᑦ ᐱᐃᑦᐱᑦ - Lignes de piégeage



Ringed seals are hunted at breathing holes and ice cracks in fast ice areas during winter, and on sea ice or along leads and ice floes in April, May and June. This is the most important resource species during this period as it is abundant and highly valued for its meat and pelt.

In late June, the Inuit of Pond Inlet begin hunting the narwhal along the floe edge about 75 km east of the community, near Cape Graham Moore and Button Point. As the whales continue westward, they are hunted by residents of Arctic Bay and Resolute. The narwhal is hunted both for the valuable ivory of its tusk and for its muktuk.

Caribou, are hunted as a preferred food source. The hunt takes place in the early and late winter months (November and March to May) when travel and light conditions are amenable. Hunters travel long distances, Pond Inlet residents going southwest to Eclipse Sound, Arctic Bay people to southern Admiralty Inlet, and Resolute Bay people to Somerset and Prince of Wales islands.

Muskoxen, too, have recently become a source of both food and income for Resolute people who harvest a small quota on Devon and Prince of Wales islands.

Polar bear are hunted for their hides on the sea ice and along the floe edges. Quotas on polar bear are established by the Government of the Northwest Territories in consultation with local hunter and trapper associations.

Inuit trappers tend their arctic fox traplines most of the winter on landfast ice and along the coast. Depending on the abundance of the animals and the current price of their fur, arctic fox trapping is an important source of income in all native communities.

Small game such as arctic hare, ptarmigan, seabirds, and migratory waterfowl adds welcome variety to the Inuit diet, so these species are eagerly hunted.

Fishing through the ice of freshwater lakes for arctic char

begins in May and continues into the summer along coastal margins and in the mouths of rivers and streams. Small-scale commercial fishing for this fish is carried out for sale in the settlements.

#### Current Commercial Activities

Current commercial activities in the winter are mining of lead and zinc at Nanisivik and air transportation operations serving Resolute, Nanisivik, and Pond Inlet (Figures 10 and 11).

Mining at Nanisivik on Strathcona Sound began in 1976 and presently employs 225 people. Inuit constitute 25 percent of this work force. The mining facilities occupy an area of only 10 km<sup>2</sup>, including storage and operating facilities, townsite, and associated activities such as shipping docks, roads, airstrip, and tailings disposal site. This represents approximately 0.003 percent of the study area. Operations here are year-round with the concentrates stockpiled until the open-water season.

In 1978, Nanisivik produced 128 500 tonnes of zinc concentrate and 11 900 tonnes of lead concentrate, representing about 7.1 and 2.4 percent of the Canadian production, respectively. The mine has a life expectancy of about nine more years unless another economic ore body is discovered nearby.

The Arvik mine on Little Cornwallis Island is scheduled to start production in 1982. Annual exports of about 209 000 tonnes of zinc concentrate and 45 000 tonnes of lead concentrate are anticipated.

Air transportation is essential to the communities and mines for re-supply of perishable foods and urgently needed cargoes as well as inter-community travel. Important medical, dental, and educational services in Frobisher Bay and southern Canada can only be reached by air while technical personnel to operate and maintain important equipment can only enter the region by air. Scheduled flights are available several times a week.



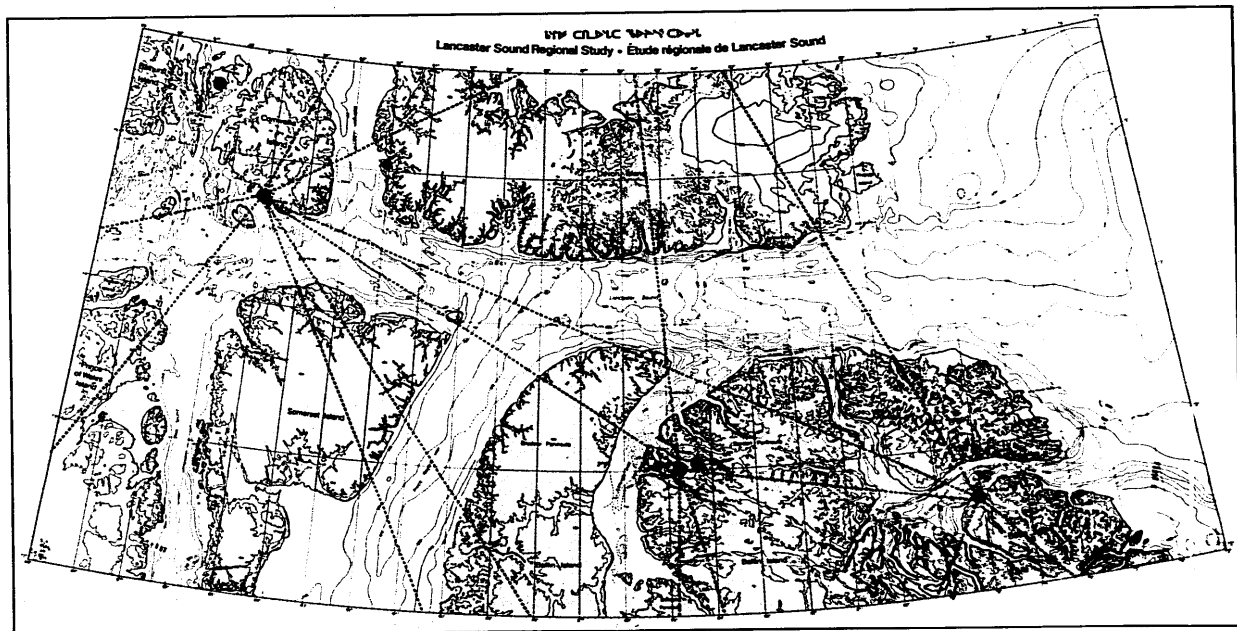
**Current Commercial Activities: Winter • ᑭᐸᓐ ᑭᓐᓂᓐᓂᐸᓐ**

**ᑭᓐᓂᓐᓂᐸᓐ ᑭᓐᓂᓐᓂᐸᓐ ᑭᓐᓂᓐᓂᐸᓐ: ᑭᓐᓂᓐᓂᐸᓐ • Activités commerciales actuelles:  
hiver**

Commercial activities include mining of lead-zinc ore and air transportation operations.

ᑭᓐᓂᓐᓂᐸᓐ ᑭᓐᓂᓐᓂᐸᓐ ᑭᓐᓂᓐᓂᐸᓐ ᑭᓐᓂᓐᓂᐸᓐ  
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Les activités commerciales comprennent l'exploitation minière du plomb et du zinc ainsi que des opérations de transport.



Map Scale: 1:50,000  
Scale bar: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 km  
Scale bar: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 miles

Map Projection: UTM  
Datum: NAD 83

Map Symbols: Shaded relief, Contours, etc.

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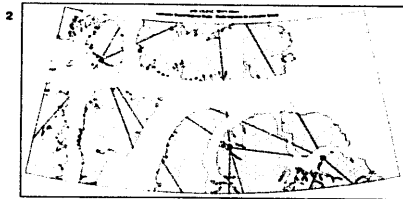
Map Symbols: Shaded relief, Contours, etc.

**Current Commercial Activities: Winter • ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ • Activités commerciales actuelles: hiver**

**Selected Components • ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ • Composantes choisies**

1 Mining • ᐱᓐᓂᓐᓂᓐ • Mines

2 Air Transport • ᐱᓐᓂᓐᓂᓐ ᐱᓐᓂᓐᓂᓐ • Transport aérien



## THE REGION IN SUMMER

### The Physical Environment

The arctic summer brings continuous daylight from early May to early August, but the mean daily temperature rises only slightly above freezing in July and August because of the influence of the cold surface water. For about two to three months, the Lancaster Sound region experiences open water but the length of the period varies greatly from year to year for various locales according to prevailing weather and ocean conditions.

Most of the rainfall occurs in July and August with the average summer total being only 75 mm throughout the region except for slightly higher amounts in the eastern mountainous areas of Devon Island. Extensive fog is common over the marine channels, particularly in late summer.

At this time of year, winds prevail from a north to north-west direction in the western end of the Sound near Resolute, whereas in the Sound proper they are generally east-west because of channelling between the mountainous islands at

its eastern entrance.

The circulation of surface waters in the Sound is predominantly from west to east but a persistent eastward current follows its southern margin. This flow is complicated by a number of incursions at most channels (such as Prince Regent and Admiralty inlets) and by the presence of mid-channel eddies, as shown in Figures 12 and 13. At the Sound's exit into Baffin Bay, a large anticlockwise intrusion of Baffin Bay surface water penetrates, sometimes as far westward as 100 km.

In May, the unconsolidated ice in the Sound loosens. An open water area which starts to develop along southern Devon Island, normally becomes continuous through to Baffin Bay by mid-June. The consolidated ice further west is slower to decay as is that of the inlets and bays adjoining the Sound. Regardless of the geographic position of the consolidated ice edge, however, its breakup generally commences in mid-July. Lancaster Sound is nearly always ice-free during August and September.

Icebergs, numbering in the hundreds and greatly varying in size, drift into the eastern entrance of Lancaster Sound, but like the intrusive current in which they drift, seldom penetrate more than 100 km before returning to Baffin Bay.

Summer in the Lancaster Sound region is thus characterized by highly variable weather and ice conditions, complex surface water circulation patterns, and the presence of numerous icebergs in the eastern portion of the Sound. The earlier ice breakup and the relatively longer open-water season in the eastern part of the Sound, together with the complex surface water currents, contribute to the overall biological productivity of this marine environment.

#### Wildlife

During the brief summer season, abundant plant and animal life is evident throughout the marine area and much of the coastline (Figures 14 and 15). The region's channels, well-vegetated lowlands, valleys, and shorelines are then used by more than fifty species of birds during migration and

feeding, breeding, and moulting. Nine major seabird colonies are occupied by murrelets, fulmars, kittiwakes and guillemots which, together with a number of other species, total a third of Eastern Canada's 8.3 million breeding colonial seabirds. Tens of thousands of eider and oldsquaw ducks, snow geese, loons, and shorebirds appear here.

The abundant ringed seal, which are permanent residents of these waters, are joined in summer by the endangered bowhead whale, most of the world's narwhal population, a third of North America's white whales, as well as by walrus, harp and bearded seal. Arctic char are found in several streams, lakes and rivers, while arctic cod are abundant throughout the marine areas.

In summer, there is also considerable wildlife activity on land (see Figure 14). The coastal lowlands, in particular, are occupied by nesting waterfowl and shorebirds, polar bear who favour these locations as summer retreats, as well as caribou and muskoxen. Barren-ground caribou are found in



Physical Environmental Characteristics: Summer • ᓄᓇᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ • Caractéristiques physiques et environnementales: été

Selected Components • ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ • Composantes choisies

1 Rivers and Lakes • ᓄᓴᓪ ᓄᓴᓪ • Cours d'eau et lacs

2 Ice Cap • ᓄᓴᓪ ᓄᓴᓪ • Calotte glaciaire

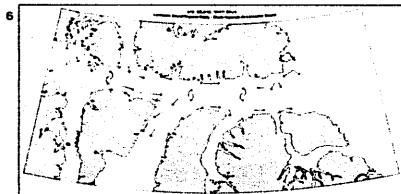
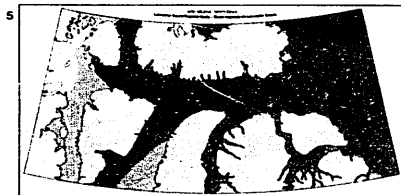
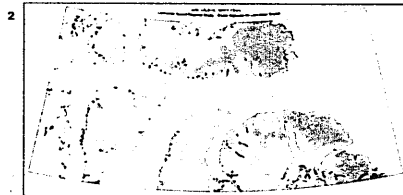
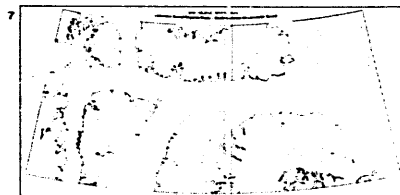
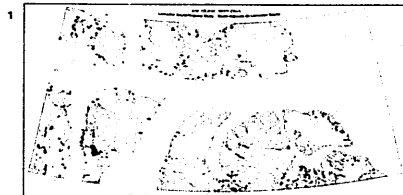
3 Mean Annual Rainfall • ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ • Précipitations annuelles moyennes de pluie

4 Surface Water Circulation • ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ • Courants de surface

5 Median Ice Cover • ᓄᓴᓪ ᓄᓴᓪ • Couverture de glace médiane

6 Ice Drift: Summer • ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ ᓄᓴᓪ • Glaces à la dérive: été

7 Icebergs • ᓄᓴᓪ ᓄᓴᓪ • Icebergs

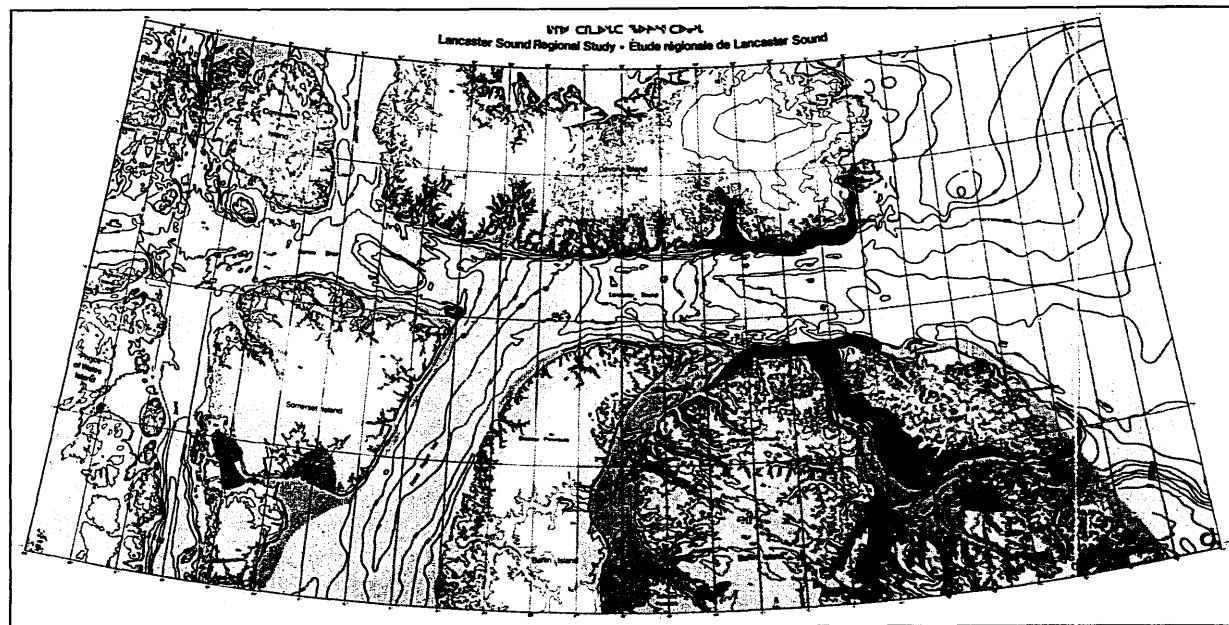


# Biological Resources Characteristics: Summer • **▲** Caractéristiques des ressources biologiques: été • **▲**

Five levels of important habitats are shown for major species.  
Darker green areas indicate an increasing overlap of important habitats. White areas are general range of one or two species.

Cinq niveaux d'habitats importants sont indiqués pour les principales espèces. Les zones en vert foncé indiquent un chevauchement de plus en plus prononcé d'habitats importants. Les zones blanches sont généralement fréquentées par une ou deux espèces.

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**Map and Symbols:**  
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small numbers on northern Baffin Island, while Peary caribou range on Prince of Wales and northwestern Somerset islands, and to a lesser extent on northern Cornwallis and Bathurst islands. Muskoxen occupy, year-round, the well-vegetated lowlands on Prince of Wales, Devon, Cornwallis, and Bathurst islands.

Although it is important to recognize the importance of the whole region as wildlife habitat, there are some areas which merit special mention. The coastal lowlands and nearshore waters of southeastern Devon Island and Philpots Island, together with the coastal areas and adjacent waters of Borden Peninsula and Bylot Island, are perhaps the most important habitats in the region in terms of species diversity as well as bird and mammal population densities. The north and east coasts of Somerset Island, the Creswell Bay area, the southwest coast of Devon Island, Admiralty Inlet, and McDougall Sound are also of major importance to ducks, geese, colonial seabirds, and marine mammals. Prince Leopold Island is a particularly important nesting location for colonial seabirds.

On the other hand, the Devon Island plateau, central Somerset Island, and the Brodeur Peninsula are very sparsely used by wildlife.

#### **Hunting and Fishing**

Hunting activities are intensive during the brief summer period, with many families dispersing to seasonal camps, located at varying distances from the communities. Areas where hunting or fishing may occur during the summer are shown in Figures 16 and 17. Comparison of the composite maps for winter and summer (Figures 8 and 16) shows that the area hunted in summer is much smaller. This is, in part, related to difficulties of travel overland and over open water.

Marine mammals are hunted in the coastal waters of Bylot and northern Baffin islands as well as in the coastal areas of Cornwallis and southern Somerset islands. Ringed seal are consistently available and are used for food, clothing, and sale of skins. They are hunted offshore from small boats near the communities and from seasonal camps. Resolute

people hunt principally around Cornwallis Island and McDougall Sound, but some families, camping on Somerset Island, hunt along the island's coastal areas. The Arctic Bay people work from the floe edge north of Admiralty Inlet and, after the ice retreats, hunt throughout the inlet. Some also hunt at Fitzgerald Bay, when the outpost camp on the west side of Brodeur Peninsula is occupied. Pond Inlet people hunt at the floe edge, near Button Point and Cape Graham Moore until the ice recedes, when they use Eclipse Sound and Navy Board Inlet. Other species such as bearded and harp seals are taken by Inuit whenever encountered.

White whale and narwhal are hunted from boats during the open-water season. Numbers taken vary considerably from year to year. White whales are more available in Resolute and Creswell Bay and the western part of the Lancaster Sound region. Narwhal are hunted intensively from Pond Inlet, Arctic Bay, seasonal camps, and the outpost camp at Creswell Bay. The Inuit do not use the meat but consume the muktuk. Although walrus ivory is used for carvings, the meat is not

valued for human consumption and is no longer needed for dog food.

Since travel over the tundra in summer is arduous, caribou hunting is confined to short distances inland from shorelines that are accessible by boat from settlements or seasonal camps. Caribou meat is a preferred component of the Inuit summer diet. However, owing to the irregular movements of the caribou herds, availability varies considerably from year to year. In addition to the caribou's value as a food source, warm winter travelling clothes are made from the skins. Generally, Pond Inlet Inuit hunt around Eclipse Sound, Arctic Bay hunters use the southern portion of Admiralty Inlet, whereas Resolute people hunt on Somerset Island.

During hunting excursions for caribou and other animals, Inuit also take small game, particularly migratory waterfowl, as well as ptarmigan and seabirds. Summer camps are often at favourable sites for catching arctic char.





### Current Commercial Activities

During summer, a variety of commercial activities takes place in the Lancaster Sound region including mining, shipping, scientific surveys, tourism, and air support operations. Although much of eastern Lancaster Sound is held under oil and gas permits, there is no drilling underway at present. As Figures 18 and 19 show, most commercial activities occur in the eastern part of the region.

Mining involves the extraction and concentration of lead and zinc ores, and their export by ship to Europe. The Nanisivik mine has been in operation since 1976 and the Arvik mine, currently being developed on Little Cornwallis Island, is scheduled to begin production by 1982.

Shipping activities also serve to bring supplies to communities. At present, there are about 70 ship transits each year, servicing both the communities and the mining operation at Nanisivik. In 1978, 1 685 tonnes of dry cargo, and 5 199 tonnes of bulk fuels were transported in eight

re-supply voyages. During the same year, six shiploads of ore were exported from the Nanisivik mine. An increased number of voyages were made in 1980 to support the construction of the Arvik mine. Supply ships and ore-carriers are often accompanied by Canadian Coast Guard icebreakers.

Other vessels are involved in survey projects and a few usually travel through the Northwest Passage each summer. The Vessel Traffic Centre in Frobisher Bay, operated by the Canadian Coast Guard, is responsible for monitoring ship movements and enforcing prescribed standards.

Government and industry scientists conduct terrestrial and marine surveys to ascertain resource potentials or to investigate environmental characteristics. In the 1979-80 season, 74 field teams were involved in research and surveys, most of which dealt with biological or geological topics.

As discussed in "The Region in Winter," air transportation is important for inter-community travel and the transporta-

tion of residents to medical, dental, and educational services in Frobisher Bay or southern Canada. Aircraft also supply perishable foods and urgently required supplies, as well as provide access to the area for technical personnel who are required to maintain equipment or machinery. Most of the tourists who visit the region in summer arrive by air.

Tourism is a growing component of the region's economy. It is already a major activity in Pond Inlet with the attraction of arctic char fishing on the nearby Robertson River and adjacent Koluktoo Bay. Sport fishing could also become more important to other communities. Resolute currently serves as a staging point for occasional tours to Ellesmere Island and the North Pole. Tourism is a source of seasonal income to the communities and residents, generating jobs related to accommodation, meals, and guiding services.

In 1960, oil and gas exploration began in the Arctic Islands when oil and gas permits were issued over most of the

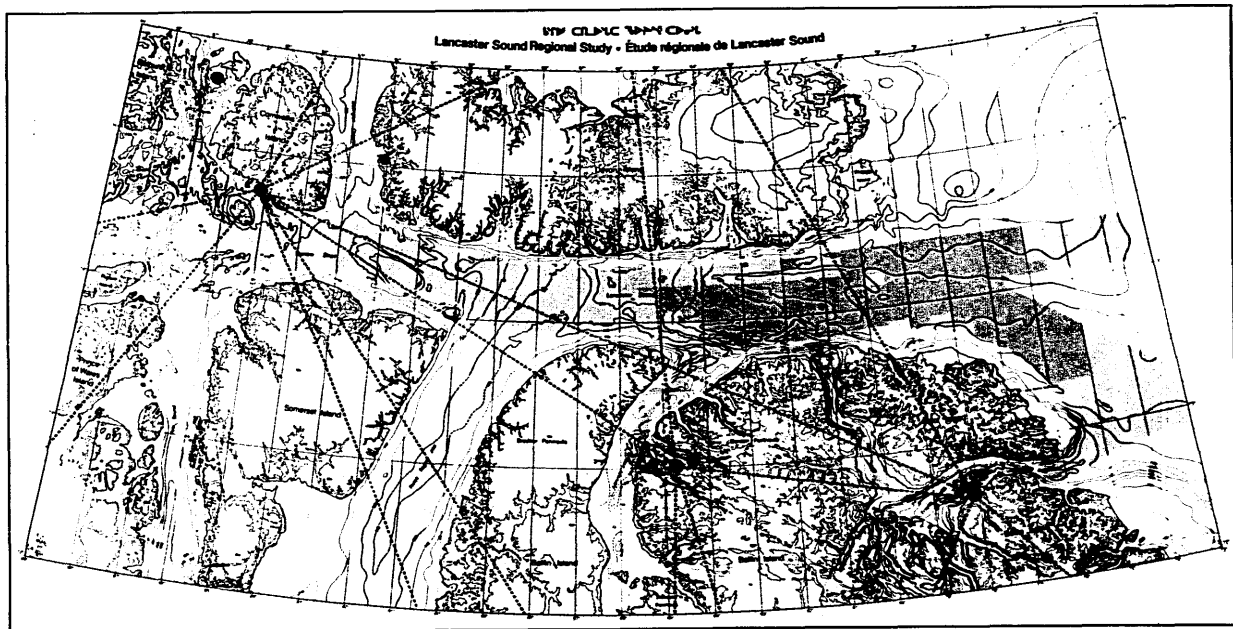
archipelago. Initial drilling on Cornwallis Island took place in 1962, and on other islands in the study area during the 1970's. No exploratory drilling is underway at present.

# Current Commercial Activities: Summer • Activités commerciales actuelles: été

Commercial activities include shipping of lead-zinc ore, resupply shipping, scientific surveys, tourism, and air transport. Dark red indicates spatial coincidence of activities.

Les activités commerciales comprennent le transport maritime des minerais de plomb et de zinc et des resapprovisionnements, les études scientifiques, le tourisme et le transport aérien. Les zones en rouge foncé indiquent la coïncidence d'activités au même endroit.

Commercial activities include shipping of lead-zinc ore, resupply shipping, scientific surveys, tourism, and air transport. Dark red indicates spatial coincidence of activities.



Map of Lancaster Sound showing commercial activities in summer. The map includes a coordinate grid and various activity zones. A legend at the bottom explains the symbols used for different types of activities.

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**Current Commercial Activities: Summer • L'été** • Activités commerciales actuelles: été

**Selected Components • Composantes choisies**

1 Mining • Mines

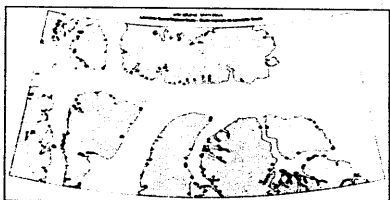
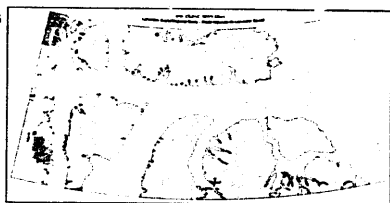
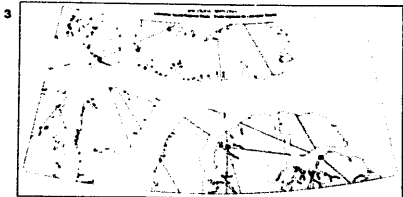
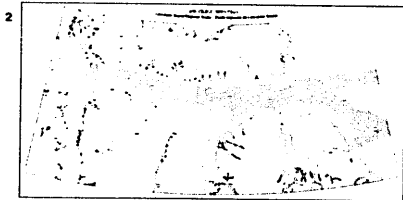
2 Shipping Corridors • Transport maritime corridors

3 Air Transport • Transport aérien

4 Tourism • Tourisme

5 Oil and Gas Permits • Pétrole et gaz: permis

6 Communities • Communautés





## SOCIO-ECONOMIC CHARACTERISTICS

### Communities

During the past two decades, the attractions of schools, housing, and medical services have induced Inuit to abandon camp life and move into communities. Today, there are three organized communities within the Lancaster region: Arctic Bay (population 380), Pond Inlet (population 660), and Resolute (population 150). Both Arctic Bay and Pond Inlet are hunting communities with predominantly Inuit populations. Both began to develop as trading centres in the 1920's.

The settlement of Resolute was established in 1953 with an immigrant population of Inuit from Pond Inlet and Port Harrison in northern Quebec. The settlement is eight kilometres distant from a non-native area, locally referred to as "the base", which has grown up around the airport, the transportation hub of the High Arctic. Because of its location, Resolute has usually offered more opportunities for wage employment, but hunting is still an important activity.

The unorganized community of Nanisivik (population 360), a

mining community located on Strathcona Sound, 27 kilometres from Arctic Bay, developed in the mid-1970's because of the lead-zinc deposit there; its population is predominantly non-native.

North of the study area is the small settlement of Grise Fiord (population 85). Like Resolute, it was established in 1953 with an immigrant Inuit population from Port Harrison and Pond Inlet. Although they live outside the study area, residents of Grise Fiord hunt within the region on northern Devon Island. Accordingly, some reference is made to Grise Fiord in the following sections.

### Local Political Structures

Each of the three organized communities in the region has a local political structure. Organized as a settlement, Resolute is unincorporated but annually elects a council which is, in a strict sense, an advisory body. In practice, however, the settlement council does exert significant influence over decisions taken by the federal and territorial

governments on matters affecting the community. Grise Fiord is also a settlement.

Pond Inlet and Arctic Bay are incorporated as hamlets. A hamlet council has limited authority and may pass by-laws to regulate certain activities within the hamlet's boundaries. This includes responsibility for municipal services, road maintenance, zoning, and community planning. These essential services are mainly financed by operating contributions from the Government of the Northwest Territories. Less than 10 percent of their operating budgets are raised directly by the hamlets of Arctic Bay and Pond Inlet through licensing of businesses, rental of equipment and the sale of services, including water delivery, and garbage and sewage removal.

The communities of the region have often identified social services, education and management of lands outside their boundaries as areas of critical importance to them. However, these programs are not generally under direct local control.

As mentioned, the senior levels of government generally consult with settlements and hamlets on matters which affect and concern them. The communities recognize, however, that consultation and control are not synonymous, and view the many proposals for development in the region with considerable concern. They are anxious for more authority at the local and regional levels.

#### Population

For most of the last decade, the communities in the region experienced a steady growth in population through natural increase.

In the last few years, however, Arctic Bay, Resolute and Grise Fiord have experienced some decrease in population. For Resolute and Grise Fiord, the cause for this decrease may be found in the artificiality of the communities: many residents have returned to their former homes in Pond Inlet and northern Quebec. For Arctic Bay, the decline may be attributed to the out-migration of some who had moved in to take advantage of employment opportunities when Nanisivik

was under construction. In addition, some families from Arctic Bay have moved to Nanisivik.

Of the native communities, Pond Inlet alone has experienced steady growth. Nanisivik, where the non-native population forms a substantial majority, has increased considerably in population since 1976.

Assuming that the population decreases of the last few years were in response to specific short-term factors, and that average population growth rates of the last decade will continue, the Inuit population in the region will increase substantially over the next twenty years. Younger age groups predominate in the Inuit population and thus natural increase will be a major factor in population growth.

#### **Harvesting Wildlife**

Most male Inuit consider themselves hunters on either a full or part-time basis. Currently, permanent employment is available to 35-40 percent of the male labour force; the

rest depends on a combination of casual or seasonal employment and hunting. Even for those permanently employed, part-time hunting remains a means of supplementing their food supplies. Within extended family groups, there is substantial sharing of cash resources from wage employment and of food resources from the hunt.

During 1978-79, hunting and trapping generated an estimated total cash income of \$302 400 from fur, sealskin, and ivory sales for General Hunting Licence holders, all of whom were Inuit. Over a 5-year period, edible meat available averaged 190 400 kg (420 300 lbs) per year, with an imputed annual value of \$1.2 million. These figures include those for Grise Fiord.

The area of harvest is larger in winter when sea-ice forms a generally stable avenue of access to distant hunting territories from communities and permanent camps. In late spring and summer, generally before break-up, people from the communities disperse to traditional camps in favourable

hunting areas. Families remain at their campgrounds through break-up and most of the summer, returning to the communities usually in late August or September. During the ice-free period when transportation is by boat, the population is dispersed over a wide area, but individual hunting ranges are not nearly as extensive as in winter and spring.

Hunting activities may be hindered by transportation difficulties especially during freeze-up and break-up and also by the winter darkness prevailing in December and January. Hunters must also abide by laws establishing harvesting seasons and quotas, and many spend part of their time in wage employment when it is available. Cash is necessary to provide supplies, especially fuel for snowmobiles. Hunters can also be hindered by the biological characteristics of certain prey species, for example, by irregular movement patterns.

Northwest Territories Government game returns and Department of Fisheries and Oceans data for 1978-79 indicate that

1 714 ringed seal, 1 509 arctic fox, 1 124 caribou, 241 narwhal, 123 polar bear, 32 walrus and 17 white whale (beluga) are known to have been harvested by Inuit in the Lancaster Sound region. Although these figures are considered incomplete because of the failure of some hunters to report their wildlife take, and other statistical problems, they provide some indication of the size of the wildlife harvest in the region.

Modern technological innovations, especially the snowmobile, have had a dramatic effect on hunting as a means of livelihood. In particular, it is the extensive use of snowmobiles during the ice-covered period of the year which has drastically disrupted the tenuous balance that formerly existed between Inuit and their prey. The snowmobile has greatly increased the extent of the winter hunting range but decreased the duration of hunting trips. Unlike the hunt by dog-team, in which one product of the hunt fueled the means of transport, the hunt by snowmobile requires that the cash proceeds from the sale of skins are used to purchase fuel

for the vehicle, or to pay for the vehicle itself. High fuel and equipment prices, therefore, lead to increased harvests, and serious wastage of meat occurs.

In purely cash terms, hunting by snowmobile is uneconomical and casual or seasonal wage employment, for those who are primarily hunters, subsidizes the increased cost of hunting by this means. But the hunt continues to provide large quantities of "country food" at costs estimated to be much less than those for comparable imported food-stuffs available in local retail outlets.

The hunt has, moreover, important values other than the economic ones. One is the marked preference of Inuit for "country food" over that sold in local stores. Estimates of "country food" available from harvested animals in each community have generally neglected cultural preferences for certain foods. At best, such estimates indicate availability of food resources, not their consumption. Attempts to impute a cash value for "country food" face similar

problems, for it has proven difficult to describe, in monetary terms, the nutritional and cultural importance of the consumption of locally-harvested game. These cultural preferences, rather than solely economic criteria, have kept hunting a prestigious activity.

In recent years, the Government of the Northwest Territories has initiated an Outpost Camp Program to financially assist families wishing to adopt or continue a hunting lifestyle on the land. At present there are four assisted permanent camps in operation in or adjacent to the region, involving a total of 35 people. The Program has been judged a success by the territorial government, and has attracted considerable interest from community residents. The Program may well continue and expand in future years.

#### **Wage Employment**

Until the 1970's, wage employment opportunities were severely limited. At Pond Inlet and Arctic Bay they consisted mainly of the provision of labour for the local

trader and for government. At Resolute, opportunities were greater, primarily in labour positions at the base. At all locations, minimal opportunities existed for employment of women, usually as housekeepers.

In 1972, Panarctic began to hire Inuit men from Arctic Bay and Pond Inlet to work as well-paid, though unskilled labourers at exploration sites in the High Arctic Islands. This program is still in operation. In 1974, men from Arctic Bay and other locations found additional employment in construction at Nanisivik.

The effects of industrial employment and high wages included increased consumption of material goods and a generally higher standard of living, coupled with higher expectations which often could not be maintained. Because much of the employment was away from the communities, family stability for some became threatened. For some, increased cash also brought a higher consumption of alcohol. The availability of permanent employment at Nanisivik has had a detrimental

effect on community leadership in Arctic Bay: of the five families that moved to the minesite from Arctic Bay, four are headed by former long-term councillors in Arctic Bay.

In the organized communities, employment opportunities include positions such as municipal service workers, clerks, mechanics, teaching assistants, and administrators. Other opportunities exist further afield in the form of support jobs for oil and gas exploration and mining development projects. Some permanent employment is also available when these projects are operational.

More opportunities are available for skilled labour, but few Inuit from the region enter the high school in Frobisher Bay and fewer still graduate. In the local schools, education is available to the grade eight or nine level. The Inuit have not recognized the value of a sound education in a decade that has provided many well-paid job opportunities for unskilled labour, and parental support for higher education is often lacking.

### Income

Levels of income in the region, in cash or kind, have been relatively high. Employment in non-renewable resource development and exploration offers wages considerably higher than those paid for jobs in the communities. Wage employment and hunting both generate cash incomes and hunting, as mentioned, also provides a potentially large supply of "country food". Many incomes are supplemented by the production and sale of art objects and handicrafts, notably soapstone and whalebone carvings. Women, as well as men, earn money in this manner.

In Pond Inlet, tourism has become an important industry. The local co-operative operates a hotel in the community and a summer fishing camp at Koluktoo Bay that provide job opportunities for many residents. Tourism is as yet undeveloped in the rest of the region. In Pond Inlet, Arctic Bay, and Resolute, local co-operatives also operate retail stores. In each community, one or two entrepreneurs operate small businesses, including coffee shops, billiard rooms,

taxi and freight haulage services, and small retail stores.

Government transfer payments, especially family allowance benefits, are an important supplement to most family incomes. Social assistance payments in the region are not generally high, but levels fluctuate considerably.

The Northwest Territories Housing Corporation provides rental homes in all communities. Monthly rental charges which include all municipal services, electricity, and fuel oil, are heavily subsidized by government and this contributes to the generally high standards of living. Food and transportation costs in the region are not subsidized, however, and are high.

### Residents' Perceptions

Residents of the communities in the region are increasingly aware of the magnitude of the proposals for development which may directly affect them and their lifestyles. Most feel that development will occur and some support it, but

all insist that development projects should not proceed without guarantees of real benefits to the region's residents.

Definitions of desired benefits from industrial projects include business opportunities, training, jobs, control over working and operating conditions, and receipt of royalties. The residents' concern about proposals for the protection of natural areas and the region's biological productivity is that no additional restrictions be placed on their hunting activities. The settlement of land claims is also a high priority. It is becoming increasingly common in the region to hear the comment: "We do not oppose non-renewable resource development, but we are against projects being started before the land claims are settled."



## Lancaster Sound: Potential and Future Uses

In this part of the paper our attention is directed to the activities which could take place in certain parts of the Lancaster Sound region during the next twenty years. We begin by looking at those major industrial ventures that are already being actively pursued (mining) and those that have been proposed for possible implementation in the near future, (year-round shipping, hydrocarbon exploration and development). Further detail on some proposed industrial activities is provided in Appendix V. Also dealt with are such uses proposed for the region as the establishment of national parks and other forms of conservation areas. Finally, we look at the future of those activities which are more closely related to the present lifestyle of the Inuit residents such as the development of community-based tourism and the harvesting of fish and wildlife.

The reader is asked to examine each of these activities, to look at the benefits which the proposed industrial ventures would bring for the local residents and the Canadian economy as a whole. At the same time, he should keep in mind the

implications which they may have for the social conditions and the environment of the region. While some changes and associated effects appear inevitable, others may or may not be acceptable.

In addition to considering each proposed activity separately, it is also necessary to examine the interactions among various activities, and the cumulative effects which may result from the joint implementation of several activities. To facilitate this review, a composite map (Figure 20) has been compiled to show the spatial relationships of the various potential activities. Most of these activities would occupy restricted locations within the region, and would take place in the summer seasons. The darker areas on the map highlight zones where activities might occur simultaneously. From the composite map, we can see that the eastern end of the Lancaster Sound region shows the greatest concentration of potential activities. This sharing of space could be beneficial for the activities concerned if, for example, it would permit joint use of facilities. In



other cases, spatial overlapping of activities may be detrimental to one or more of the pursuits.

In the following, the major features of each activity are described, together with a brief assessment of its likely economic, social, and environmental implications. From this review, some major issues emerge that must be addressed with regard to the future use and management of the region.

In preparing these activity descriptions, we have assumed that all future development activities will be subject to existing regulatory controls to minimize environmental and social impacts. Although the implications of a land claims settlement have not been examined, it may be assumed that any such settlement would have a significant effect on social and economic circumstances in the Lancaster Sound region. Other assumptions underlying each of the activities described are listed in Appendix IV.

It should be recognized that a great deal of what might be described as "socio-economic impact" is government-induced, through policies on native employment, local business opportunities and the like. These policies are a direct response to requests from northern communities that northerners obtain benefits from resource development.

## SHIPPING

Any non-renewable resource development in the Arctic will depend on safe and reliable shipping. Today, shipping occurs during the summer only, for re-supply operations, ore shipments, marine surveys, and icebreaker support operations.

These uses are expected to continue over the next twenty years with an additional modest growth or a trend to larger carriers to meet the demands of a growing population for fuel, accommodation, and vehicles. Ore shipment from Nanisivik will decline during this period, but because of the new mine at Arvik, total shipments of ore tonnage through Lancaster Sound will increase. Summer shipping corridors will not change appreciably.









An important change from the established pattern of shipping in summer only to year-round shipping through the Northwest Passage would occur with the use of large Arctic class tankers carrying oil or liquefied natural gas (LNG). Although such tankers have not yet been constructed, legislative authority exists for the construction, operation,

and regulation of icebreaking tankers designed to move through ice thicknesses of up to three metres at slow speeds. The potential frequency of year-round shipping through the Sound over the next twenty years, based on representative data, ranges from one transit every second day to a maximum of three transits per day by the end of the period. This compares with six tankers daily in the Alaskan port of Valdez or an average of 36 ships per day passing through the St. Lawrence River.

Summer and winter shipping corridors as well as potential ports and harbours in the region are shown in Figure 21. Some of the proposed hydrocarbon transportation projects are outlined in Appendix V.

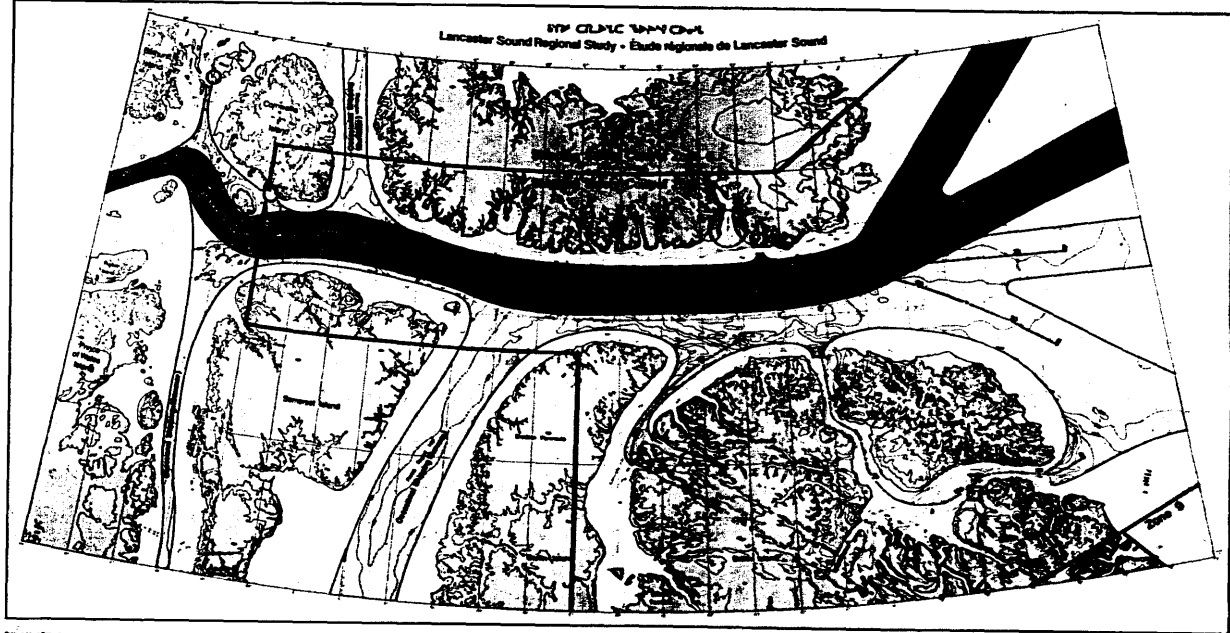
Regulation of year-round shipping would require the institution of a mandatory vessel traffic management system, reliable arctic radio communications, and a year-round means of surveillance. Although legislation for these matters exists, government would have to provide the necessary funding to establish these services.

# Shipping: Potential Corridors • Transport maritime: corridors possibles

-  Shipping Corridor (Summer) • Corridor de navigation (été)
-  Shipping Corridor (Winter) • Corridor de navigation (hiver)
-  Shipping Safety Control Zone Boundary • Limite de la zone de contrôle de la sécurité de la navigation
-  Distance (nautical miles) • Distance (milles nautiques)
-  Harbours • Ports de mer
-  Ports • Ports
-  Proposed Racon Beacon • Balise
-  Potential Ports • Ports éventuels

Note: A harbour is a place which provides good anchorage for the purposes of temporary shelter or for the loading and unloading of cargoes. A port is a place for the loading or unloading of ships that is supervised by public or private authorities.

Un port de mer est un havre naturel et un endroit de mouillage pour l'embarquement ou le débarquement de matériel. Un port (maritime) est un endroit d'embarquement ou de débarquement des navires sous la surveillance d'une autorité privée ou publique.



Map of Lancaster Sound showing shipping corridors, harbours, and safety zones. The map is titled 'Lancaster Sound Regional Study • Étude régionale de Lancaster Sound'.

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Winter shipping would be confined to a narrow east-west lane along the northern portion of the Sound so as to take advantage of the extensive floe-edge lead present in most years (see Figure 21). This winter shipping corridor would extend westward to the Beaufort Sea via the Northwest Passage (Prince of Wales Strait route). Strict control over the use of this corridor would be required to minimize damage to biologically or environmentally sensitive areas in the Sound and elsewhere within the Passage.

### Implications

Shipping hydrocarbons through Lancaster Sound would assist Canada in achieving its goal of energy self-sufficiency. It would do so by reducing reliance on oil imports, by fostering the development of additional reserves in the Arctic, by proving out the technologies required for further arctic developments, and by encouraging gas-for-oil substitution in eastern Canada.

Shipping activity involving the transport of minerals,

hydrocarbons and other commodities would lead to the development of new technologies in the marine industries, and thereby generate a significant number of jobs in various industries throughout the country. Canadian advances in marine technologies would promote the potential of Canada to become a world leader in these fields.

Employment in the region could also be increased through the training of Inuit to serve as crew members on Canadian vessels operating in the Arctic. Employment, business, and training opportunities would also be available through the operation of port facilities and other support services. These increased activities would generate higher revenues and income in the communities of the Lancaster Sound region. As well, more frequent shipping could be expected to lower transportation costs of essential goods for the communities such as fuels, food stuffs, and housing materials.

Year-round shipping could bring with it the following environmental effects: Ship tracks through consolidated ice

cover would refreeze at varying rates during the year and not at all in the spring. Slow-freezing or unfrozen ship tracks could interfere with inter-island crossings by caribou, arctic fox, and Inuit hunters. Migratory whales could become entrapped in ship tracks. Ringed seals could be disturbed and, in some cases, destroyed during the breeding and pupping seasons in east Barrow Strait. There could also be disruption of the migrations of some sea mammals and birds that normally move through or concentrate in Lancaster Sound.

World-wide experience with risks inherent in tanker transport suggests that the projected level of shipping over the 20-year period could be expected to result in at least one major oil spill and possibly one LNG-fire, attributable to tanker accidents, somewhere in the Northwest Passage. The extent of oil spill damages would depend on the location of the accident, the amount of oil released, the season, the dispersion by wind and currents, the clean-up response time, and the capabilities of the clean-up equipment used.

Oil spills in winter would be restricted initially to the ship track, but residual oil would be distributed by winds and currents when ice cover broke and melted. A large oil spill in Lancaster Sound would be very serious biologically and would also have serious economic repercussions in the communities.

Although LNG is not a pollutant, there is a slight possibility that an LNG tanker accident could result in an extensive plume of ignited natural gas. This could be lethal to colonies of birds or groups of mammals if the incident occurred close to them.

Effective monitoring, control, and support of year-round arctic shipping would result in increased costs. These costs would have to be met by the ship operators, the cargo owners, the tax payers, or by some agreed combination of these as determined by government. The capabilities and limitations of available pollution clean-up equipment and the technology applicable to arctic clean-up operations are important considerations.

## OIL AND GAS EXPLORATION

The rising costs of imported oil prompted the federal government's "need-to-know" policy in 1976 to assess systematically the petroleum potential of the North. To the present, approximately 150 exploratory wells have been drilled in the arctic islands and the Davis Strait area.

Geologically, the areas under the waters of Lancaster Sound and Baffin Bay offer the best prospects in the region for future exploration: nearly thirty potential hydrocarbon-bearing structures have been identified. Up to fifty wildcat exploratory wells (to demonstrate the presence or absence of oil and gas) and delineation wells (to estimate the structures' reserve and size) could be drilled offshore for extensive exploration of these structures. Some of the activities associated with potential oil and gas exploration in Lancaster Sound are shown in Figure 22. (Further description of two drilling proposals can be found in Appendix V.)

Exploratory drilling in Lancaster Sound would require

commitment of two drillships operating each year during the open-water season. Four to twelve supply ships would be needed for re-supply, fuel transfer, ice reconnaissance, and towing of icebergs. Shore-based and port facilities, possibly located on southeastern Devon Island so as to be close to the offshore drilling operations, would occupy about twenty hectares and comprise a dock area, a bulk storage area, an airstrip, and roads. Support aircraft would be used intensively during drilling operations.

Increased aircraft traffic would be expected in the vicinity of Pond Inlet and Nanisivik, and over southern Devon Island, Bylot Island, Navy Board Inlet, and Eclipse Sound. Crew transfers and re-supply between shore-based facilities and offshore drillships could involve two helicopters making two to four trips per day, and a Twin Otter making three to four trips per week from a logistic centre such as Pond Inlet or Nanisivik. Vessel traffic between drillships and shore-based facilities would be light to moderate, involving perhaps four to five trips per week. Icebreaking of land-





fast ice would be required in Croker Bay or Dundas Harbour during July and early August if a shorebase were located there.

### Implications

Benefits associated with hydrocarbon exploration in the region would include fulfilment of the "need-to-know" policy about northern energy resources, thereby aiding national energy decision-making. Such exploration could result in the finding of significant new reserves which would be within easier reach of markets than those of the Melville or Beaufort areas and, particularly, much closer to the import-dependent East Coast market.

Additional seasonal employment opportunities for skilled and semi-skilled workers would be available to residents of Pond Inlet, Arctic Bay, and Resolute Bay. Other indirect large job opportunities would also be created in other parts of the country through these exploration activities. Regional benefits would include local business opportunities

as well as job opportunities on supply ships and barges, and at land bases such as Pond Inlet, Nanisivik or Resolute. Local economic benefits are important because of a shrinking northern labour force.

Larger airports, new port facilities, and increased air and ship traffic for re-supply could be expected to result in cheaper freight rates from southern Canada as well as in greater mobility for residents in the region. In addition, increased private investment within the communities could provide a wider range of services and facilities available for the residents.

Oil and gas exploration in Lancaster Sound would, however, also bring with it potentially detrimental environmental effects:

The impact of the construction and operation of shore bases and dock facilities, and particularly the movement of supply boats, on thousands of migrating white whales and narwhals

In Croker Bay and Dundas Harbour needs to be assessed carefully. Also, potential disturbance to migrating walrus along the Croker Bay ice edge in the month of July, and of harp seals and feeding polar bears from July to September, needs to be examined.

Increased human activities in narrow coastal areas would affect animal populations which are concentrated there. Animals such as whales and seals could be temporarily displaced while walrus could be permanently displaced. Polar bears could remain in the area and become a source of physical danger to the workers. Local disturbances caused by shore facilities could affect large populations of eiders and guillemots that rest and rear broods in the surrounding coastal lowlands. In addition, increased aircraft movements between land-based facilities and drill sites could disturb wildlife and, in some cases, lead to habitat abandonment.

Noise and discharges from drilling operations could cause local disruption to migrating narwhals in eastern

Lancaster Sound during May, June and September, and to feeding bowhead whales throughout the drilling season. This may not be a significant problem, however, as the drillships, support vessels, and aircraft would be localized offshore, and rapid dilution of operational drilling wastes would occur in the Sound's deep waters and strong currents.

If an accidental oil spill from an uncontrolled subsea blowout were to occur, this could produce severe impacts, particularly in the coastal waters of southeastern and southern Devon Island, and of northern Eylot Island. These impacts would depend on the magnitude of the accident and on the season in which it occurred. Possible results could include the loss of large numbers of migrating birds in the offshore and nearshore waters of eastern Lancaster Sound and on the shores of northwestern Baffin Island, from May to October. Pollution in offshore and coastal waters could threaten thousands of feeding and breeding ringed seals while pupping in the spring or moulting in early summer. Considerable numbers of feeding polar bears would also be

threatened in the spring and late summer. A reduction or displacement of the marine mammal resources would cause hunting efforts to focus more on terrestrial wildlife populations, thus possibly leading to their overexploitation.

The Arctic Waters Pollution Prevention Act assigns financial liability for clean-up costs to exploration companies and provides legal recourse for compensation to anyone suffering loss or damage as a result of an oil spill. Clean-up of oil spills, however, may not always be possible because of the magnitude of the spill, the absence of effective technology, or through interference by extreme environmental conditions of ice, wind, and cold. The principal disruption and inconvenience would be suffered by the residents of the region.

## OIL AND GAS DEVELOPMENT AND PRODUCTION

At this time, there are no production systems in existence which could be employed to provide safe and reliable year-round operations in the event of discovery of oil and gas fields in Lancaster Sound. Current technology precludes the development of fields in water depths greater than 350 metres. However, rapid technological progress in various parts of the world can be expected to provide appropriate production systems during the next twenty years.

The development phase would include the installation and operation of oil production facilities (Figure 23). All major construction would take place in southern Canada, followed by trans-shipment and installation on site. Facilities would include warehousing, fuel storage, jet aircraft, an oil tanker terminal, an oil tank farm, a gas liquefaction plant, and some permanent staff housing. This phase would require a labour force of several hundred, plus substantial quantities of gravel, sand, and other construction aggregates, as well as a number of cargo ships to transport components from southern Canada.

The production phase would involve a direct labour force of 100 to 150 people on a year-round basis. The estimated production rate would require one oil tanker every three days, and one LNG tanker per week throughout the year. This could mean twenty to thirty tanker transits through eastern Lancaster Sound per month to and from a marine terminal, likely to be situated at Craker Bay or Dundas Harbour. This tanker traffic would be in addition to the transits through Lancaster Sound to and from points further west, as mentioned in the previous section entitled "Shipping".

### Implications

Oil and gas development and production in Lancaster Sound would bring with it various economic benefits. It would contribute to Canada's energy self-sufficiency and lead to the development of improved technologies in the oil and gas industry. A producing oil field would contribute to the security of Canada's supply of oil and, by reducing reliance on imports, improve Canada's balance of payments.

Depending on production capabilities of the fields and on the provisions of the royalty scheme, oil and gas production could generate very significant revenues. In addition, both federal and territorial governments could collect corporate, personal and other taxes.

The production phase would provide some job opportunities to the region on supply ships and barges and at the land-based facilities. Development of local service industries would also create some employment and business opportunities for residents. The infusion of more money into the communities by the presence of these support services may lead to a reduction in social assistance payments. Transportation charges for basic goods for the communities could be reduced as shipping volume to the area increases.


The construction and operation of a shore-based marine terminal would have similar implications for the environment as those mentioned in regard to the exploration phase. However, being regular, year-round and permanent over a

period of twenty to thirty years, the movement of ships and onshore activities would pose ongoing, long-term disruption of seabirds and mammals. Animals potentially affected would include migrating white whales, summering walrus, breeding or moulting ringed seal, denning polar bears, and summering muskoxen.

The construction and operation of the offshore production facilities would create impacts similar to those of the exploratory drilling and associated activities referred to previously, but would be of far greater intensity. However, the continuous normal operation of subsea production equipment with its associated noise, physical presence, etc., would not be expected to be a hazard to marine life because of the great water depths and the assumed high levels of ambient underwater noise in Lancaster Sound.

Oil development and production are considered to be more hazardous than the exploration phase because of the probability of a major oil spill either through a blow-out from

# Oil and Gas: Potential Development • : Pétrole et gaz: développement possible

● Airports and Crew Rotation Sites •  • Aéroports et lieux de roulement des équipes de travail


■ Marine Tanker Terminals •  • Terminals pour les pétroliers

Re-supply Routes •  • Routes d'approvisionnement

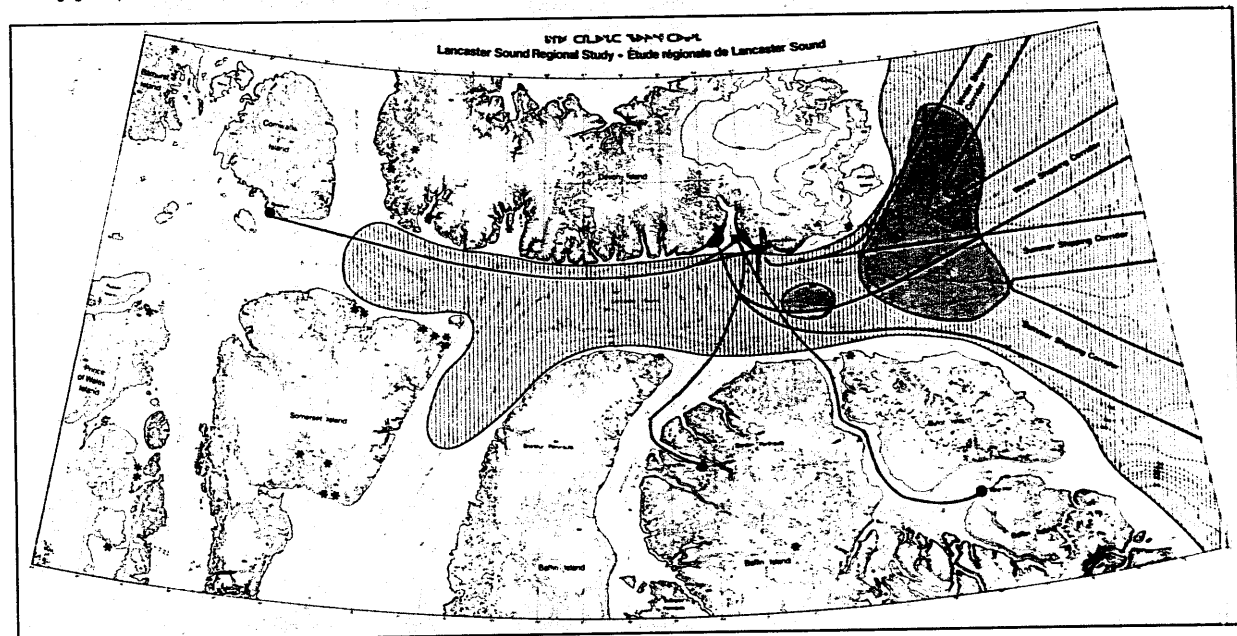
■ Land-based Facilities •  • Installations terrestres

\* Staging Airstrips •  • Principales pistes d'aviation d'étape

■ High Potential Development Areas •  • Zones à potentiel de développement élevé

■ Low/Moderate Potential Development Areas •  • Zones à potentiel de développement faible à modéré

Note: Area operators have not submitted viable production systems for our consideration. •  : Les opérateurs locaux n'ont pas soumis des systèmes de production adéquats pour notre considération.



The map was prepared by the Department of Indian Affairs and Northern Development, Ottawa, Ontario. The map shows the potential for oil and gas development in the Lancaster Sound region. The map is based on data provided by the Geological Survey of Canada.

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one of the many wells drilled during the development phase, from a tanker accident during the production phase, or from small, but frequent, operational discharges.

Large-scale crude oil spills from a damaged tanker, subsea production platform, or underwater pipeline would pose the most serious threat to the offshore and coastal marine life. Driven by variable currents and winds, this pollution would be a potential environmental hazard almost anywhere in the Lancaster Sound and northwestern Baffin Bay areas, especially where the oil is likely to concentrate on the shorelines, in coastal waters, or along the landfast ice edges of southern and southeastern Devon Island and northern Bylot Island.

Hunting and trapping patterns may not be directly affected by the physical disturbances of development and production activities since Inuit do not now hunt off southeastern Devon Island nor in eastern Lancaster Sound during the open-water season. However, if previous hunting patterns which did include these areas were resumed, conflicts could arise.

In any case, resulting indirect displacement of animals or population fluctuations may necessitate changes in Inuit hunting patterns. The ringed seals, seabirds, and marine mammals in the Arctic Bay and Pond Inlet hunting areas would be particularly susceptible to such year-round disturbances. Intensity of hunting could consequently increase significantly on terrestrial wildlife populations, possibly leading to overexploitation. If wildlife scarcity developed for this reason or because of pollution, special subsidies or compensation payments to residents of Arctic Bay and Pond Inlet could be needed.



## MINING

Based on mineral exploration activities to date, two areas geologically favourable for the occurrence of lead and zinc minerals have been delineated in the Lancaster Sound region. One is at Strathcona Sound and the other on Little Cornwallis Island (Figure 24).

Within these favourable areas, three deposits of economic significance have been outlined. One is presently in production at Nanisivik in Strathcona Sound, another, the Polaris deposit on Little Cornwallis Island is being developed, and, the third, Eclipse, also on Little Cornwallis Island, represents a potential producer. (Further description of some mining prospects are given in Appendix V.) Exploration activities will tend to concentrate in those geographically very restricted areas where there is a good possibility of other economically viable deposits being discovered. Exploration activities for other base metals, coal and uranium will also continue in the region.

As previously mentioned, the only producing mine at the

present time, Nanisivik, will phase out of production in approximately nine years unless other economic ore deposits are discovered in the immediate area. The Polaris Project (Arvik Mine) may, however, be the beginning of major mineral development activities in the Lancaster Sound region. If the project can overcome difficult operating conditions, and if lead-zinc prices increase, there is the possibility of additional operating mines in the period under review.

If new mining operations were to begin, they would require construction of on-site storage and operating facilities, and possibly a townsite, as well as associated facilities such as shipping docks, roads, airstrips, and areas for tailings disposal.

### Implications

Direct job opportunities at the mines would exist during both the development and production phases. Employment and business opportunities would be available locally and would tend to increase incomes, create jobs in associated activities,

and reduce dependency on government transfer payments. Associated activities such as marine transport of supplies to the mines, or aircraft chartered for rotational movements of work crews, would improve transportation and communications and create additional employment and business opportunities within the region and the shipping industry. Furthermore, communities in the region would benefit from the reduced freight rates associated with the additional transport facilities available to the mines.

Direct and indirect revenue through corporate and personal income taxes and royalties would accrue to both the federal and territorial governments. Canada's balance of payments as well as knowledge of the North would be strengthened through increased northern mineral activity under Canadian control.

Environmental concerns connected with mining in the Lancaster Sound region include the following:






Exploration activities may cause some disturbance to the





currently small populations of caribou and muskoxen on Cornwallis and Little Cornwallis islands, or the few barren-ground caribou now present in the Strathcona Sound area. Disruption of their seasonal movements may further endanger the survival of these local populations.

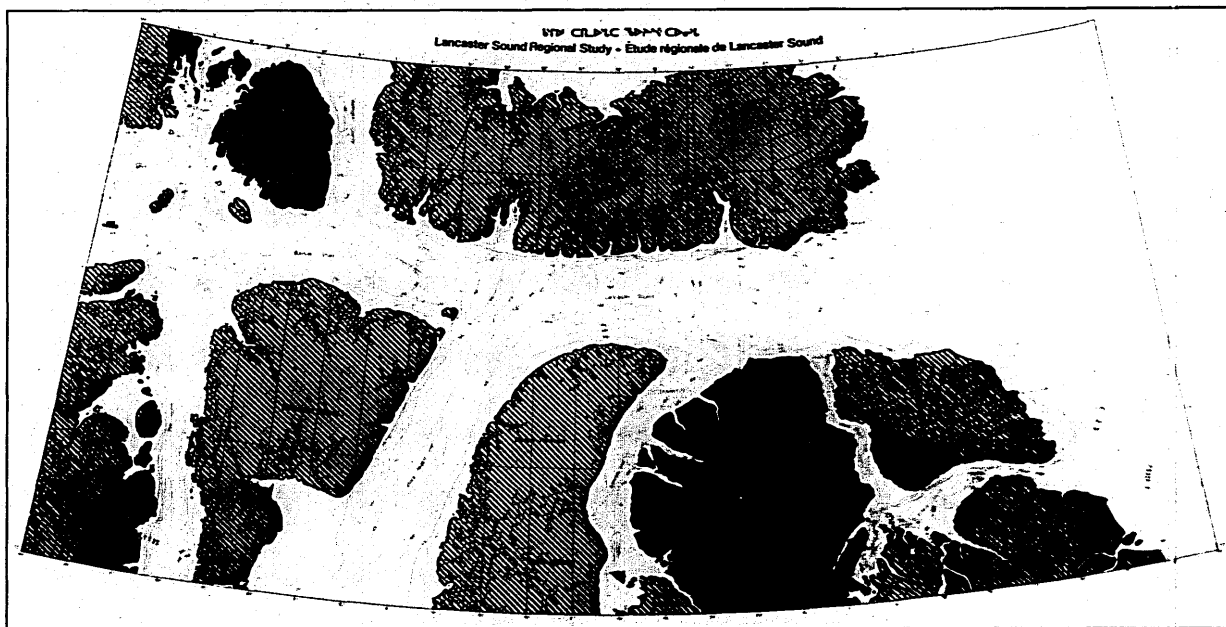
Development and production activities associated with the Arvik mine site may perhaps cause disturbance of the walrus population in McDougall Sound. In particular, nearby ship movements and low-level overflights in summer may interfere with the use of the Brooman Point haul-out site, located about 12 km from the mine site. These activities could also disrupt the migratory movements of caribou and muskoxen between Bathurst, Cornwallis, and Little Cornwallis islands during the winter. In addition, passing ore carriers may occasionally disrupt sea mammal hunts by Resolute hunters in McDougall Sound.

Social stability could be threatened if families move out of the community to take up wage employment at the new mines or if family heads are absent on rotational employment, as is planned for Arvik in response to requests by the communities.

# Mining: Potential • ᐃᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Exploitation minière: potentiel

-  Unknown Mineral Potential • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Potential mineral inconnu
-  Favourable Geology and/or Limited Mineral Resources • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Géologie favorable ou ressources minérales limitées
-  Mineral Deposits and Favourable Geology • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Gisements minéraux et géologie favorable
-  Coal-bearing Rocks • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Roches carbonifères
-  Coal Occurrences • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Venues carbonifères

-  Lead and Zinc • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Plomb et zinc
-  Producing Mine: Nantivik • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Mine productive: Nantivik
-  Near-term Producer (1982): Arvik (Polaris Deposit) • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ (1982): ᓄᓐᓂᓐ (ᓄᓐᓂᓐ ᓄᓐᓂᓐ) • Mine productive à court terme (1982): Arvik (gisement Polaris)
-  Potential Producer: Arvik (Eclipse Deposit) • ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ ᓄᓐᓂᓐ • Producteur éventuel: Arvik (gisement Eclipse)



Map of Lancaster Sound Regional Study showing mining potential. The map displays various landmasses and water bodies, with different patterns indicating mining potential. A legend at the top identifies the patterns: diagonal hatching for unknown potential, cross-hatching for favorable geology/limited resources, solid black for mineral deposits, stippled for coal-bearing rocks, and small black squares for coal occurrences. Specific mining sites are marked with circles and dots, including Nantivik, Arvik (Polaris Deposit), and Arvik (Eclipse Deposit).

## PRESERVATION OF NATURAL AREAS

There are several programs aimed at designating land and marine areas in Lancaster Sound to protect outstanding natural features and critical biological resources. Parks Canada may set aside national parks and Canadian landmarks. The International Biological Programme (IBP) has identified a number of significant ecological sites for protection (Figure 25) which could be preserved under existing Canadian legislation. The Canadian Wildlife Service has selected critical wildlife habitats, covering, in part, the same areas as those identified by IBP; these could be designated as National Wildlife Areas under the Canada Wildlife Act. The Bylot Island Migratory Bird Sanctuary already exists to protect the snowgoose colony there.

Parks Canada activities include the identification and setting aside of marine and terrestrial areas for purposes of preservation, recreation, and education. This could, in some cases, preclude non-renewable resource development and certain other uses. However, it is current Canadian government policy to assess the non-renewable resource potential

of an area prior to the establishment of a national park. Designated Natural Areas of Canadian Significance (NACS) include those areas which encompass the greatest diversity of themes representative of the various natural regions of Canada. Three such terrestrial areas were identified in the Lancaster Sound region and are shown in Figure 26.

Parks Canada completed a detailed examination of these three NACS in the Lancaster Sound region during 1979-80. The study ranked the three areas in importance according to the extent that each represented the natural themes characteristic of the eastern Arctic. The Bylot Island-Eclipse Sound NACS was considered the most representative, followed by Creswell Bay, and finally the Western Borden Peninsula NACS. Parks Canada is interested in incorporating one of these NACS in the system of national parks with first preference for Bylot Island-Eclipse Sound.

Several marine areas of interest, representing geological, oceanographic, and biological themes of the Eastern Arctic

Marine Region have also been identified in Lancaster Sound. Their possible designation as NACS is being studied.

Priority has initially been given to the marine area encompassing the eastern entrance of Lancaster Sound, Eclipse Sound and Navy Board Inlet (see Figure 26).

Natural Sites of Canadian Significance (NSCS) such as Prince Leopold Island are also being identified on the basis of their uniqueness and significance both nationally and internationally. These sites are generally smaller than NACS.

The selection of IBP sites is a separate undertaking from the Parks Canada program. Sites which have been identified include unique plant associations, rare or endangered bird and mammal populations as well as critical breeding, feeding, and staging habitat. These sites would be set aside for the protection of wildlife, for scientific research, and to ensure the continuance of unique ecosystems and ecosystem processes.



There would be no encouragement of tourist or recreational uses of these sites.

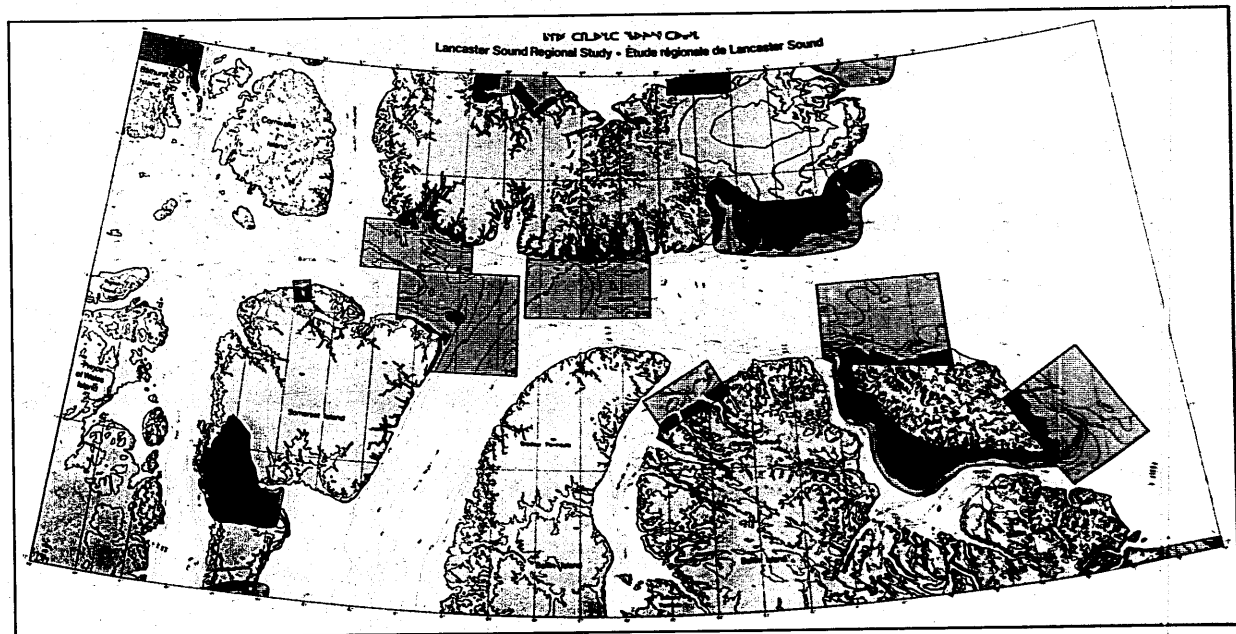
Not all areas of biological or ecological importance have been included in existing preservation proposals. Some areas such as the southern end of Admiralty Inlet and Steensby Peninsula, and the coastal waters of northern Brodeur Peninsula, are biologically important areas, but so far have not been identified for possible protection by any of the above programs.

#### Implications

Allocation of selected parts of the region as national parks, as well as other types of conservation lands, could serve to preserve significant natural, cultural, and historic resources of national importance. In some cases, such action could aid Canada's national and international obligations to preserve representative and unique areas. For example, the International Agreement on the Conservation of Polar Bears, the Migratory Birds Convention, and the Inter-

# Ecological Sites (I.B.P.) • ስፍራዎች ጠቅላይ ስርዓት (ፊ.ፊ.ፊ) • Sites écologiques (P.B.I.)

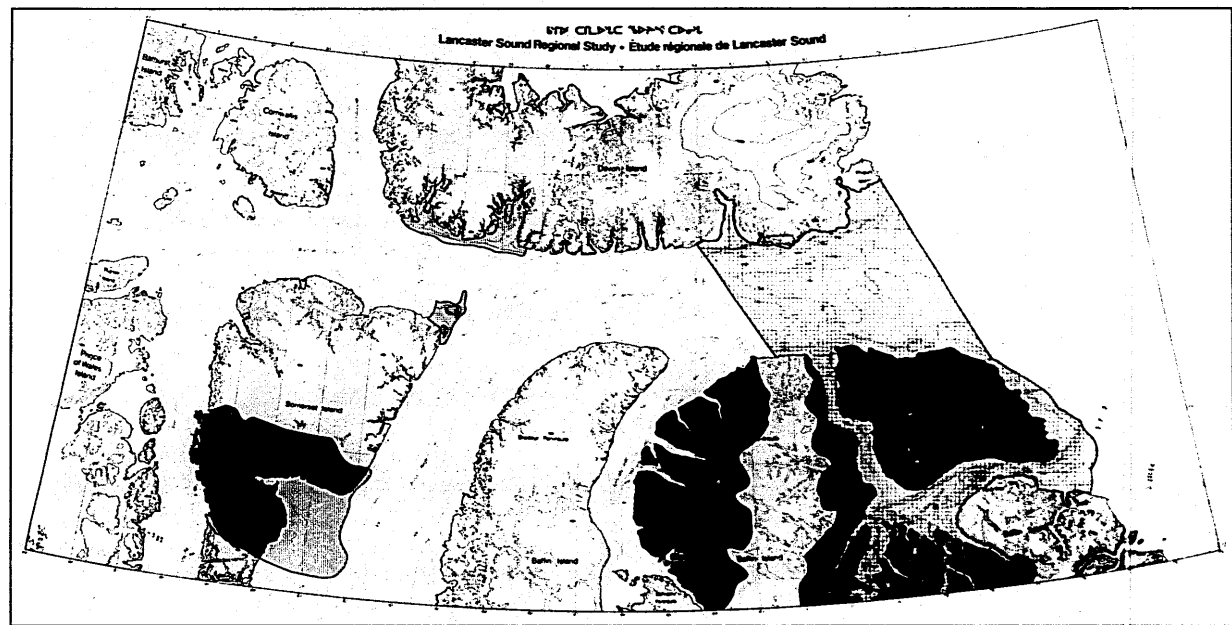
-  Significant Ecological Sites • ስፍራዎች ጠቅላይ ስርዓት • Importants sites écologiques
-  IBP Designated Numbers • ፊ.ፊ.ፊ ቁጥሮች ለስፍራዎች ጠቅላይ ስርዓት • Nombres désignés par le PBI



This map was prepared by the Department of the Environment, Planning and Lands, Government of the Northwest Territories, Yellowknife, N.W.T. It is based on data provided by the Department of the Environment, Planning and Lands, Government of the Northwest Territories, Yellowknife, N.W.T. and the Department of the Environment, Planning and Lands, Government of the Northwest Territories, Yellowknife, N.W.T. It is not intended for use as a navigational aid. The Department of the Environment, Planning and Lands, Government of the Northwest Territories, Yellowknife, N.W.T. is not responsible for any errors or omissions.

# Parks Canada's Areas of Interest • **ᑲᓄᑕᐅᑦ ᑲᑭᓐᓄᓐᓂᐱᑦᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ.** Régions d'intérêt de Parcs Canada

- Terrestrial Natural Areas of Canadian Significance • **ᑲᓄᑕᐅᑦ ᑲᑭᓐᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ** • Régions terrestres naturelles d'importance nationale  
 ▨ Natural Site of Canadian Significance • **ᑲᓄᑕᐅᑦ ᑲᑭᓐᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ** • Zones naturelles d'importance nationale  
 ▤ Marine Natural Area of Canadian Significance • **ᑲᓄᑕᐅᑦ ᑲᑭᓐᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ** • Régions marines naturelles d'importance nationale  
 □ Marine Areas of Interest • **ᑲᓄᑕᐅᑦ ᑲᑭᓐᓂᐱᑦ ᑲᑭᓐᓂᐱᑦ** • Régions d'intérêt marin



The map shows the distribution of natural areas of Canadian significance and interest in the Lancaster Sound region. The areas are shaded according to the legend. The map is based on data provided by the Department of Indian Affairs and Northern Development and the Department of the Environment.

This map is a reproduction of the original map. It is not to be used for any other purpose. The map is based on data provided by the Department of Indian Affairs and Northern Development and the Department of the Environment.

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national Convention for the Regulation of Whaling commit Canada to protect the species involved.

Lancaster Sound is also a potential World Heritage Site to be designated under the Convention concerning the Protection of the World Cultural and Natural Heritage (UNESCO 1972). The recent World Conservation Strategy, prepared by the International Union for the Conservation of Nature and Natural Resources (IUCN), includes Lancaster Sound in a biogeographical province where establishment of protected areas should have high priority.

Renewable resource harvesting in national parks by local Inuit would be the subject of agreements to be worked out between Parks Canada and the native people. Generally, food-hunting and domestic fishing traditions would be honoured, but sport hunting would not be permitted. Controlled sport fishing of naturally regenerating populations of native species could be permitted within parks. Non-renewable resource development would be constrained in parks and nature reserves.

Tourism-related activities would be expected to expand with the development of parks, creating employment and business opportunities for local Inuit. As further outlined in the following section, such activities could include outfitting, guiding, transportation, accommodation, and sales of arts and crafts. As has been the experience with other northern parks, the number of park visitors would be expected to increase steadily from year to year.

A possible consequence of increased tourist activities is, however, that they could cause degradation of sensitive habitats and detrimental impacts on wildlife populations. To eliminate such threats, land use zoning and other strict controls would be applied within parks.

The designation of a number of potential preservation areas, together with a program for assessing their resource potential, may require increased government expenditures. Areas may, however, be tentatively set aside for protection purposes prior to carrying out detailed evaluation of the resource potential.



## TOURISM AND RECREATION

Within the Lancaster Sound region today, Pond Inlet is the only community with an active tourist business; arctic char fishing is the main attraction at nearby Robertson River. Some travellers visit Bylot Island and other mountainous islands for climbing, hiking, and sightseeing during the summer months. Interest in "package tours" has grown considerably in recent years and some tour packages within the Lancaster Sound region are already available.

In the hope of increasing tourism in the future, the Government of the Northwest Territories is studying new tourist promotions that may one day be implemented. Natural history tours involving ship excursions, aircraft overflights, and observational camps would focus on the spectacular scenery and wildlife areas of Admiralty Inlet, northern Bylot Island, Creswell Bay, the Devon Island ice cap, and other locations (Figure 27). Glacier skiing and mountain climbing could be exciting adventures on Devon, Bylot, and northern Baffin islands. Seals, whales, polar bears, and icebergs could be viewed from small boats

travelling the coastal waters of Eclipse Sound and Navy Board Inlet. Historic sites such as the camps and cairns of explorers and the ancient Thule settlements are also potential tourist attractions.

Industrial facilities and operations such as mine sites, oil and gas production bases, harbours, and ports could also be possible tourist attractions, especially in remote areas where new engineering technologies are featured. Conversely, a major oil spill could produce serious and long-lasting damage to the pristine physical environment and abundance of wildlife on which tourism in the Arctic is based.

Promotion of arctic tourism would have to be directed toward people interested in special or unusual experiences. It would therefore be a mistake to confine such promotion to southern Canada, particularly since the majority of visitors to the Canadian Arctic are Europeans and Americans.

### Implications

An important benefit of tourism in the region would be an increase in job opportunities. Employment from tourism and recreation, available to residents, could include positions as tour guides, cooks, park attendants, and boat operators. Many related jobs would also be based in the communities. Moreover, if tourism could be extended over a longer period of the year through off-season tours or other activities, jobs and other economic benefits could continue for most of the year.

Regardless of the season, the production and sale of skin and fur handicrafts, bone and stone carving or local souvenirs could offer steady employment and a source of cash income for native artists, craftsmen, distributors, and store owners. Local cooperatives and small businesses could be encouraged by incentive grants or loans. Such measures would help to ensure that the tourist industry did not become dominated by non-resident commercial interests.

Arctic tourism appears relatively compatible with community life and preferred Inuit lifestyles. There could be considerable control by the Inuit over the tourist industry which may well have a longer life span than non-renewable resource extraction projects. A flourishing tourist industry could contribute to long-term community stability and security.

There are, however, some environmental concerns associated with an enlarged tourist industry. For example, overfishing of arctic char populations by tourist sportsmen could result unless the fishery is carefully managed through catch limits and seasonal restrictions. Locales of domestic fishing would often be the same as those favoured by tourists so that integrated management of fish stocks would be needed to ensure the long-term viability of both domestic and sport fishing.

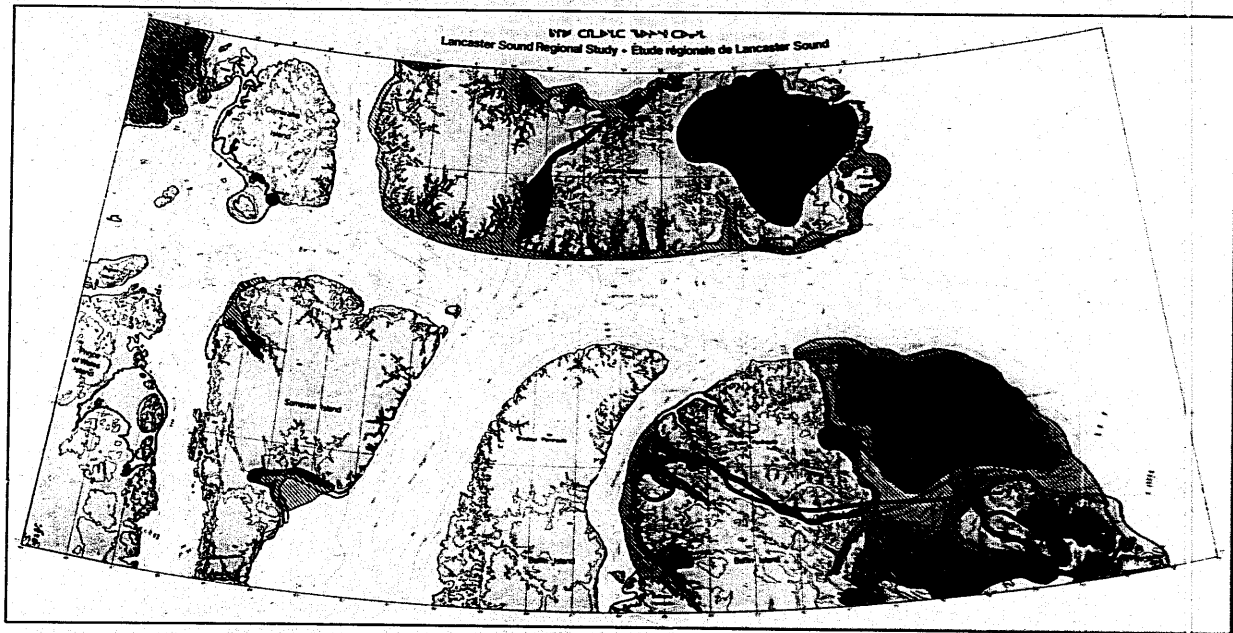
Hunting and trapping by Inuit would probably suffer little from expanded tourist activities. Presently, non-residents

# Tourism: Potential • ᐱᓂᓕᐱᓐ ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ: ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ

## Tourisme: potentiel

- Tourism Staging Points • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Haltes touristiques
- Sports Fishing: Existing • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Pêche sportive: actuelle
- Sports Fishing: Potential • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Pêche sportive: potentiel
- Boating: Existing • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Canotage: actuel
- Boating: Potential • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Canotage: potentiel

- Nature Viewing: Existing • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ ᓂᐱᓕᐱᓐ • Observation de la nature: actuelle
- Nature Viewing: Potential • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ ᓂᐱᓕᐱᓐ • Observation de la nature: potentiel
- Mountain Climbing • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Escalade
- Camping/Hiking • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ ᓂᐱᓕᐱᓐ • Camping/escursions
- Cross-Country Skiing Routes • ᐱᓂᓕᐱᓐ ᓂᐱᓕᐱᓐ • Sentiers pour le ski de fond



Map prepared by the Department of Tourism, Culture and Recreation, Government of Newfoundland and Labrador, St. John's, Nfld.

Map prepared by the Department of Tourism, Culture and Recreation, Government of Newfoundland and Labrador, St. John's, Nfld.

Map prepared by the Department of Tourism, Culture and Recreation, Government of Newfoundland and Labrador, St. John's, Nfld.

Map prepared by the Department of Tourism, Culture and Recreation, Government of Newfoundland and Labrador, St. John's, Nfld.

Map prepared by the Department of Tourism, Culture and Recreation, Government of Newfoundland and Labrador, St. John's, Nfld.

are entitled to hunt a few species such as the polar bear, but only under very restricted conditions. Special care would, however, be required to reduce the possible conflicts between sightseer-photographers and Inuit during the annual hunts.

## HUNTING, FISHING AND TRAPPING

Hunting, fishing and trapping are expected to continue as integral parts of Inuit lifestyles in the Lancaster Sound region. Levels of wage employment, where available, will probably increase and pay for the higher costs of sophisticated equipment such as snowmobile purchases and aircraft charters. A growing number of Inuit may also seek employment outside the region for varying periods to maintain current lifestyles based on a combination of hunting and employment.

The major issue related to hunting, fishing and trapping is the continued viability of these activities. The potential loss of habitat through incompatible industrial activities or major oil spills, the loss of access to hunting areas through the creation of conservation lands, and increasing hunting and fishing pressures, resulting from human population growth, are all factors to be taken into account.

### Implications

Even if some young Inuit leave the area permanently to seek

opportunities elsewhere, hunting pressures on the fish and wildlife resources near the communities will increase as the human population continues to grow. Some species may become locally or seasonally scarce. However, one preferred species, the ringed seal, can probably withstand greater hunting pressure because of its abundance throughout the region. An increase in the use of outpost camps and chartered aircraft may result in larger harvests of animals in areas remote from the settlements.

"Country food" will continue to be important to the Inuit of the Lancaster Sound region. The projected growth of the Inuit population could require a substantial increase in current harvests by the year 2000.

To keep pace with the expected needs of this population, more complete use of marine mammals such as narwhal, beluga and walrus will likely be necessary. Intersettlement trade of the products and by-products of the hunt could provide a partial solution to the present incomplete use of resources.

Additionally, schemes to harvest alternate food species such as arctic cod could be instituted. Cooperative projects by Inuit and government, including the development of appropriate harvesting technologies, would be needed to make such a scheme successful.

To ensure sustained yields of caribou, a preferred food species, careful management would be required. Immediate steps would have to be taken to determine accurately herd sizes and sustainable harvest levels on North Baffin, Somerset and Prince of Wales islands.

The economic viability of trapping and hunting of furbearing animals is affected by unpredictable fluctuations in fur prices. Floor prices on furs to cushion the northern economy against these fluctuations would be helpful.

The establishment of parks and reserves may limit Inuit hunting in certain areas. However, by protecting important wildlife habitat, such reserves would help to maintain game

stocks in the region, thereby assuring continued renewable resource harvesting for the Inuit. In fact, if the Inuit lifestyle in the Lancaster Sound region is to be based on a combination of resource harvesting and wage employment, increased efforts for the conservation of wildlife resources will be mandatory.

Government assistance will be required for effective management to prevent environmental degradation, to help develop new harvesting technologies and alternative food uses, and to market by-products of the hunt.

## Lancaster Sound: Questions About Future Directions

By the year 2000, significant changes will have taken place in the Lancaster Sound region whether there is industrial development or not. Changes will be brought on by the growth alone of the Inuit population which is expected to increase substantially over the next two decades. More profound effects on the communities would be expected, of course, if large-scale developments did occur. The key to managing activities of the future is in careful planning.

In this draft paper we have described the character of the region, mentioning the regional and national implications of a variety of present and potential uses and outlining the major issues which follow from them. Before we can identify what options for the future use and management of the region should be evaluated in deciding on a course of action, it is necessary to hear from the public.

It is, of course, apparent that there is no single public view, but rather that a spectrum of different perspectives and values exists within Canadian society. However, there

appear to be four main concerns which, to varying degrees, play a role in all these viewpoints. These concerns may be briefly described as follows:

### *The National Interest*

The concern for the national interest rests on the notion that all Canadians should share the country's resource wealth. Accordingly, future use of the Lancaster Sound region should not be considered in isolation from economic developments and requirements in other parts of the country.

### *Protection of the Environment*

This concern is based on the belief that all Canadians have an obligation to ensure the continued viability and beauty of our natural environments. The uniqueness of the Lancaster Sound region would therefore demand that protection of the environment be an important consideration in determining the best uses for the future.

### *Lifestyle Flexibility*

The opportunity for people to select or maintain a satisfying lifestyle, is another concern. Within this context, the Inuit of the Lancaster Sound region should be able to continue developing and following lifestyles of their choice.

### *Use of Appropriate Technology*

According to this concern, all forms of industrial activities should proceed as long as appropriate technologies are in place to prevent accidents or disasters, or to minimize their impact to an acceptable level. The development of these technologies for Lancaster Sound region should form an integral part of project evaluation, design, and implementation.

As mentioned, to be able to determine the best uses for the Lancaster Sound region, it is essential that these different perspectives be voiced during public discussion so that all concerns may be given careful attention. There are many gaps in the present knowledge of socio-economics and arctic

ecosystems. In addition, the design of appropriate technology for this uncertain environment is still in its early stages. Therefore, a major goal in planning for the region's future must be to manage land and water use in a manner that allows us to retain as many options as possible until our knowledge increases.

To help the public make suggestions for the use and management of the Lancaster Sound region for the next twenty years, we have raised some basic questions about the directions which might be taken in regard to the future development of the region. With each question, we have included an outline of relevant implications, and a brief evaluation according to the four concerns that we have mentioned. These questions are seen only as the starting point for public discussion in workshops and community meetings. It is hoped that the discussions during the public review phase will help to identify a clear-cut set of options to be evaluated in deciding on the future uses of the Lancaster Sound region.



**QUESTION 1: Should new major industrial development be deferred until safer technology and greater understanding of environmental, social and economic relationships are available?**

Deferring large-scale industrial projects would mean a slow pace to development of the Lancaster Sound region. The present Inuit lifestyle which is a combination of wildlife harvesting and wage employment would continue, as would all current commercial activities. Government agencies would continue their work in identifying and seeking local support for the setting up of parks and reserves in the region. In addition, new small-scale enterprises, such as those related to tourism, could come into existence. Wage employment opportunities would be available from these new enterprises, existing commercial activities and government functions.

The course of action implied by this question would affect the main concerns as follows:

#### *The National Interest*

- . The hydrocarbon potential of the region would remain

unknown and the national interest in gaining access to these energy reserves would not be satisfied.

- . Preventing the shipping of hydrocarbons through Lancaster Sound may result in the adoption of alternative transport systems with potentially more serious social, economic, and environmental implications elsewhere in the Canadian north.
- . In view of the considerable investment in hydrocarbon development elsewhere (e.g. Beaufort Sea, Hibernia), it could be considered in the best national interest to postpone oil and gas exploration in the Lancaster Sound region.

#### *Protection of the Environment*

- . This direction would allow time for careful review and selection of outstanding natural features as parks and reserves.
- . Deferred development would not present any new threats to ecological processes, but hunting pressure on some animals such as whales, narwhals, walrus, and bearded

seals may become excessive as the human population increases over the next twenty years. This may cause an imbalance in the food web.

#### *Lifestyle Flexibility*

- . Deferring industrial activities would ensure that the Inuit have continued access to wildlife resources and can pursue a traditional lifestyle unimpeded by negative social, economic or environmental impacts of major development activity.
- . Inuit residents would be allowed time to adjust to the rapid increase in industrial activity that has taken place in recent years, and to the technological changes that have accompanied it.
- . No new major economic activity may mean limited job opportunities and, therefore, government would be required to continue subsidizing the increasing needs of a growing population.

#### *Use of Appropriate Technology*

- . Deferring industrial activities would provide time for government to conduct baseline research on arctic ecosystems and to monitor the impacts of current activities.
- . Research and development (R&D) activities in the area by private enterprise would, however, be limited because of uncertain prospects for major industrial activity.

**QUESTION 2: Should parks and reserves be formally designated before new industrial development is allowed?**

Identification and formal designation of protected areas in the Lancaster Sound region, on a timely basis, would require the formulation of a regional conservation strategy. This would involve the establishment of various levels of protection for land and water areas and the effective implementation of legislation and regulations. For example, there might be an integrated system of national parks, marine national parks, national wildlife areas, wildlife sanctuaries and other types of ecological reserves, according to the significance of particular areas for wildlife populations, habitats or ecosystem processes.

Implied in such a conservation strategy is a conservative approach to economic development. This means that any other activities could take place as long as they conform to the intent of the conservation strategy. Therefore small-scale commercial endeavours would proceed in areas where it is judged that conservation values would not be compromised.

Traditional hunting, fishing and trapping, crafts, recreation, tourism, and scientific research would continue as would extractive activities such as quarrying and mining. Major new industrial endeavours such as year-round shipping of oil and gas through the Sound or exploration for hydrocarbons within the Sound would have to be shown to conform to the regional conservation strategy before they could proceed.

This course of action would affect the major concerns as follows:

*The National Interest*

- . Formal designation of protected areas would serve to hold natural, cultural, and historic resources in trust for future generations of Canadians and, at the same time, would fulfil Canada's international obligation to preserve representative or unique ecosystems.
- . The action would delay hydrocarbon exploration or limit exploration to parts of the region. This may

preclude the development of oil and gas reserves in the region in the near future with undesirable implications for the Canadian economy.

- This course of action may restrict shipping of oil through Lancaster Sound, and could consequently result in the adoption of alternative transport systems with potentially more serious social, economic, and environmental implications elsewhere in the Canadian North.

#### *Protection of the Environment*

- The development of an integrated network of protected areas would ensure the maintenance of species diversity and abundance while permitting sustainable hunting, fishing, and trapping.
- Implementation of a conservation strategy could be a major international achievement and a prototype for other nations.

#### *Lifestyle Flexibility*

- Protection of areas of special biological significance

would ensure the continuation of Inuit hunting, fishing, and trapping.

- Current commercial activities would continue; additional activities would be permitted where they would not compromise conservation objectives.
- The regional economy would be enhanced through the development of tourism and recreation associated with parks.
- Implementation of the conservation strategy would bring with it opportunities for the Inuit to take part in the organization and management of parks and reserves, local businesses associated with tourism, arts and crafts, and service industries. It would however, restrict their opportunities for participating in major industrial activities during the near future.

#### *Use of Appropriate Technology*

- Applied research in protected areas would serve in developing environmental monitoring programs and therefore help in determining acceptable performance

standards for future activities.

- . Limited exploration and development activities would contribute to the development of safer operating procedures.

**QUESTION 3: Should shipping be expanded at this time to include year-round transportation of oil and gas?**

Lancaster Sound is the eastern gateway to the Northwest Passage, a sea route with potential for major international patterns of trade and commerce in future years. The feasibility of year-round shipping has already been demonstrated in the Soviet North, through the Northeast Passage. Canadian capability in Arctic transport is developing rapidly and the feasibility of year-round shipping in the Northwest Passage may well be demonstrated within a few years.

Assuming that the Arctic Pilot Project (see Appendix V) was given approval and was successful, year-round shipping of LNG would follow. This development may also open the way for year-round shipping for Beaufort Sea oil and gas through the Northwest Passage to the East Coast. Other shipping activities such as the transport of ore and re-supply services would increase.

This course of action would affect the main concerns as follows:

#### *The National Interest*

- . Year-round shipping would permit development of a major shipping route with consequent benefits to northern economic development, international trade, and control of arctic waters.
- . It would provide major spin-off benefits to Canada such as the improvement of Canadian shipyards to handle refits and repairs as well as the construction of icebreaking tankers.
- . Transport of oil and gas from the Arctic Islands and the Beaufort Sea to the East Coast would reduce the need for imported oil in that region of the country. It would thus help to improve Canada's balance of payments.

#### *Protection of the Environment*

- . The information gained through technical and environmental research for the shipping corridor would be useful in preparing a regional conservation strategy and in managing resource harvesting.

- Careful implementation of shipping through ice-covered waters would result in actual experience that could be translated into environmentally safer operating systems.
- Despite the institution of a strict regulatory regime and careful management, there remains the possibility that ship accidents will occur and cause environmental damage.

#### *Lifestyle Flexibility*

- The institution of year-round shipping through Lancaster Sound would provide additional wage employment and business opportunities in the region. At the same time, it would allow present hunting, fishing, and trapping activities to continue. Thus expanded shipping would enlarge the choices in lifestyle available to the region's Inuit residents.

#### *Use of Appropriate Technology*

- Year-round shipping and associated safety requirements would introduce new incentives for scientific research on accident prevention and monitoring of ship pollution, resulting in a vigorous R & D effort.

**QUESTION 4: Should there be a determined program to explore and develop the resources of the Lancaster Sound region?**

Such a program would be based on the view that economic development in Lancaster Sound is desirable and that, if properly controlled, the needs and standards of residents of the area, and of Canadian society as a whole, could be met. Emphasis would be placed on proceeding with resource development but with an aggressive research and development policy that would make possible the safe development of these resources with consideration for the environment and the people of the region.

Under such a program, oil and gas exploration would proceed rapidly throughout the region, and production would follow after commercial discoveries have been developed, and technology is in place to provide safe and secure operations. At the same time, mining activities would follow the trends described earlier. The facilities at Nanisivik would possibly be used for other industrial activities after the depletion of known ore deposits.

The increased demands for tourism and recreational facilities from the enlarged workforce could result in the expansion of related commercial activities. Under such a program, the identification and setting aside of special areas, parks, and reserves would likely be deferred until the most attractive sites for industrial development were delineated. Traditional hunting, fishing, and trapping would continue, but a displacement of these activities could occur.

A coordinated approach to carry out such a program would require the establishment of a broadly-based resource management group to guide decision-making. The participation of both levels of government, industry and local representatives would be needed for this group.

***The National Interest***

- The delivery of oil and gas to market at an early date would help Canada attain its objective of energy self-sufficiency.



- . Employment in the ship building and petroleum industries would be generated.
- . Government revenues would increase.
- . Effective support/control systems would be installed in advance of international use of the Northwest Passage.
- . An aggressive research and development program would be developed to demonstrate an Arctic marine technology for the production and shipping of oil.

#### *Protection of the Environment*

- . Carefully planned development would encourage the evolution of environmentally safe technologies, and would facilitate long-term monitoring of environmental and social impacts.
- . Despite vigorous research and development efforts, there would be a risk of serious pollution within the next twenty years if hydrocarbon development were to proceed in Lancaster Sound.
- . An aggressive pursuit of northern economic development would demand trade-offs in wildlife protection and in

- the allocation of lands for conservation and recreation.
- . There would be some detrimental environmental effects connected with aggressive non-renewable resource exploitation.

#### *Lifestyle Flexibility*

- . Increases in economic activity, no matter how well controlled, would inevitably have some detrimental effect on the environment and thus on the traditional lifestyle of the region's people. The Inuit would have little time to adjust to the pace of this activity.
- . Hunting, fishing, and trapping activities in the region could be impaired while the demand for wildlife in the vicinity of settlements and around development locations would likely increase.
- . New industrial projects would provide increased wage employment opportunities for local Inuit.
- . Residents of the region would have a role in guiding the extent and pace of development through the resource management group.

### *Use of Appropriate Technology*

- . Commitment to a determined resource development program could establish an overall planning framework for the region, within which private industry could undertake efficient project design and implementation. In this way a strong incentive for vigorous research and development by industry could be created.

## May We Have Your Comments

After having read this paper, you may wish to take part in the difficult process of determining how the Lancaster Sound region should be used and managed in the future. In that case, your participation in the public meetings that will take place in the communities of the region or the public workshop to be held in Ottawa would be valuable. However, if you can not attend one of these sessions, or if you prefer to provide your comments or suggestions on paper, please write to the address given at the front of the paper.

All input provided during the study's public review phase will be carefully reviewed, and will effectively contribute to the development of the final version of the Green Paper. This final document is expected to assume a significant role in the formulation of a regional plan for Lancaster Sound.

# Appendix I

## METHODOLOGY

The Lancaster Sound Regional Study is organized into three main phases. The first phase involves the preparation of the Draft Green Paper with its associated maps and reports. The second phase of the study consists of the public review of the draft documents. The third phase comprises the preparation of the final Green Paper, including the incorporation of the results of the public review.

### PHASE ONE: PREPARATION OF THE DRAFT GREEN PAPER

#### Data Collection

During the first phase of the study, Working Group members compiled and summarized all available information relevant to the project. As a first step, Background Reports were prepared on the following topics: Selected Physical Characteristics; Selected Biological Characteristics; Socio-economic Characteristics and Conservation Interests; Non-renewable Resources and Transport; Jurisdictions and Legislation. A complete breakdown of the contents of the five reports is given in Appendix III.

Concurrently, information on the Lancaster Sound region was also summarized in map and written form in a Preliminary Data Atlas with accompanying Map Descriptions. This atlas contains 83 thematic maps at the scale of 1:2 million. The maps deal with important coastal and oceanic processes, animals and their habitats and functions, resource harvesting areas, and commercial activities. They also illustrate potential activities in the region over the next 20 years such as shipping, hydrocarbon exploration, and the establishment of parks and reserves. All the maps can be quickly up-dated, if necessary, to incorporate new data obtained during the public review process.

The information summarized in the Background Reports and presented in the Preliminary Data Atlas provides the background for preparing the Draft Green Paper. These documents are being distributed in Inuktitut as well as the official languages. They are being made available for reference to interested agencies and institutions, the general public, and the residents of the region for their review and comments.

### Data Analysis

Approach. Following the compilation of the data base, existing and potential activities in the region were analysed using a variety of methods and tools. A systematic mapping and planning approach, developed by James Dobbin, was used by the Working Group to examine the relationships among biological, physical, and socio-economic factors, and potential activities within the Lancaster Sound region. The approach also called for the preparation of map overlays. These overlays provided a flexible and efficient means of using selected information from the Data Atlas to identify and illustrate key features of the region, to verify or test certain assumptions about the region, and to refine the analyses. In some cases, the mapped and written information was sufficiently detailed to allocate weightings in various colour intensities to reflect the relative importance of specific data, e.g. critical habitats for various animals. The approach also enabled members of the Working Group to consider characteristic seasonal patterns.

Establishing the Existing Regional Framework. During the preliminary analysis by Working Group members, the overlays were combined in order to arrive at composite maps, illustrating physical environmental characteristics, critical habitats, resource harvesting and commercial activities in ice-covered and open-water seasons.

Analysing Potential Activities. Members of the Working Group proceeded with the analysis by considering potential future activities. Detailed written profiles were prepared on activities such as shipping, oil and gas exploration and development, mining development, and preservation of natural areas. Projections of the nature and scope of these activities were prepared for the years 1980-2000. Changes in the environment, the economy, harvesting patterns, and the communities as a result of each activity were identified by relating the future activities to the existing regional framework. Areas of likely conflict were highlighted when overlays representing potential activities were superimposed upon the regional framework maps. A

further analysis suggested key issues to be addressed in decision-making on the future use and management of the region.

#### **Data Synthesis**

The Working Group examined current government policies and various perspectives in regard to northern development. From this review, four questions about future directions were selected.

#### **PHASE TWO: PUBLIC REVIEW PROCESS**

The second phase of the Lancaster Sound Regional Study is recognized as an essential component of the development of the Green Paper. It began with two newsletters, circulated in January and May 1980. Informal northern community meetings by Working Group members in March and April, 1980 familiarized the residents of Lancaster Sound with the study organization, its purpose and process. An Information Brochure, released in the fall of 1980, will initiate the

public review process on a nation-wide scale. A member of the Working Group will visit the Inuit communities in the Lancaster Sound region during the fall and winter of 1980-81 to explain and discuss the documents associated with the study.

With the release and distribution of the Draft Green Paper, all interested persons and organizations will be provided an opportunity to discuss issues and options for the future of the Lancaster Sound region. Community meetings will be held in Arctic Bay, Grise Fiord, Pond Inlet, and Resolute to provide a forum for discussion by the residents of the region.

Industrial organizations and public interest groups, including conservation and native organizations, and the concerned public at large, are also encouraged to contribute to the discussion. Two public workshops, to be held in Resolute and Ottawa, will be an important vehicle for this exchange of ideas.

### PHASE THREE: PREPARATION OF THE GREEN PAPER

During the third phase of the Lancaster Sound Regional Study, the Draft Green Paper will be refined and modified to take into account the contributions arising from the public review meetings and other comments to the Working Group. New data and corrections will be incorporated into the Data Atlas and amendments will be made to the regional framework and the potential activities discussed in the Draft Green Paper. This will lead to the refinement of options for the future of the Lancaster Sound region. The Green Paper, in its final form, is scheduled to be submitted to the Minister of Indian Affairs and Northern Development during 1981.

# Appendix II

## STUDY ORGANIZATION

The Lancaster Sound Regional Study is a project of the Northern Affairs Program of the Department of Indian Affairs and Northern Development (DIAND), undertaken in collaboration with the departments of Environment (DOE), Fisheries and Oceans (DFO), Energy, Mines and Resources (EMR), and Transport (DOT), and the Government of the Northwest Territories (GNWT). Because of the interdepartmental nature of the study, a two-tiered organization has been set up comprising a Steering Committee and a Working Group. The Steering Committee, made up of representatives of these agencies and chaired by M.J. Ruel, Director General of Northern Environment, DIAND, gives general direction to the study. Membership of the Committee is as follows:

M.J. Ruel, Northern Environment, DIAND - Chairman  
J.A. Carruthers, Parks Canada, DOE  
M.P. Klein, Northern Economic Planning Branch, DIAND  
O.H. Löken, Northern Environmental Protection Branch, DIAND  
A.H. Macpherson, Western and Northern Region, DOE  
W.D. Mills, Northern Pipelines, DIAND

M.J. Moore, Executive Committee Office, GNWT  
R. Paterson, Fisheries Management, DFO  
A. Redshaw, Northwest Territories Region, DIAND  
R.G. Skinner, Office of Environmental Affairs, EMR  
C. Stephenson, Canadian Coast Guard, DOT  
H.W. Woodward, Northern Non-renewable Resources Branch, DIAND  
K.B. Yuen, Ocean and Aquatic Sciences, DFO  
H.J. Dirschl, Northern Environment, DIAND - Secretary.

Permanent observers on the Steering Committee are:

M. Freeman, DIAND  
J. Reiskind, Department of External Affairs  
K. Rorison, Department of National Defence

The responsibility for the conduct of the study has been given to a Working Group, directed by H.J. Dirschl, Coordinator, Renewable Resources Planning, DIAND, and composed of the following members.



D. Bissett, DIAND - Socio-economics  
B.J. Britton, GNWT - Socio-economics  
J.A. Dobbin, James Dobbin Associates Ltd. Coastal and  
Ocean Planners. Toronto  
A. Geddes, DOT - Marine transportation  
B.A. Gibson, DIAND - Legislation and regulations  
J.T. Inglis, DIAND - Terrestrial biology  
S.A. Kanik, DIAND - Non-renewable resources  
J.S. Loch, DFO - Marine biology  
D.C. McKay, DGE - Climatology  
G.G. McLean, DOE - Preservation of natural areas  
J.N. Parker, DIAND - Regional economic planning  
B.R. Pelletier, EMR - Geology and geomorphology  
B.D. Smiley, DFO - Oceanography

Consultant services to the Working Group have been provided by:

A.M. Ault - Environmental planning  
James Dobbin Associates Limited - Coastal and ocean planning

K. Harper - Community liaison and socio-economics  
H.M. Myers - Research assistance.

Typing and secretarial functions were carried out by  
N. Saab.

The Working Group's task has included gathering and summarizing all available information relevant to the project and analysing marine and land use patterns. This has involved the compilation of a data base, consisting of a Preliminary Data Atlas and of 12 Background Reports (see Appendix III for a complete listing).

The Working Group also prepared an initial draft text of the Green Paper which was reviewed by the Steering Committee. The recommended revisions were then initiated by the Project Manager, H.J. Dirschl, who also was responsible for the final editing of the text. Individual members of the Working Group contributed substantially to the revision and finalization of specific parts of the paper, and provided comments on the manuscript as it was being edited.

## Appendix III

### SUPPORTING DOCUMENTS OF THE LANCASTER SOUND REGIONAL STUDY

The data base for this study consists of the following documents:

1. A data atlas of 83 thematic maps at scale 1:2 million with map titles and legends in English, French, and Inuktitut.

The atlas is accompanied by a set of map descriptions (also in the three languages) which outline, for each map, relevance to the study, key information presented, and quality or completeness of the data.

2. Five background reports, including 12 individual papers, provide more detailed information, particularly on topics unsuited for cartographic representation. The background reports are also in the two official languages and Inuktitut, except for those on geology and oceanography where the scientific terminology made translation into Inuktitut unfeasible.

#### LIST OF DATA MAPS

- 1.1 Geology
- 1.2 Earthquake Epicentres
- 1.3 Physiography
- 1.4 Coastal Geology
- 1.5 Coastal Geomorphology
- 1.6 Coastal Slope
- 1.7 Marine Sediments
- 1.8 Rivers and Lakes
- 1.9 Mean Annual Rainfall
- 1.10 Mean Annual Snowfall
- 1.11 Mean Annual Precipitation
- 1.12 Mean Surface Wind Roses
- 1.13 Mean Surface Wind Roses
- 1.14 Surface Water Circulation: Summer
- 1.15 Mean Tidal Range: Spring
- 1.16 Consolidated Ice Edges: 1964-1979
- 1.17 Median Ice Cover: May 28
- 1.18 Median Ice Cover: June 25

- 1.19 Median Ice Cover: July 23
- 1.20 Median Ice Cover: August 20
- 1.21 Minimum Ice Cover: August 30
- 1.22 Maximum Ice Cover: August 20
- 1.23 Median Ice Cover: September 17
- 1.24 Median Ice Cover: October 1
- 1.25 Median Ice Cover: October 29
- 1.26 Minimum Ice Cover: October 29
- 1.27 Maximum Ice Cover: October 29
- 1.28 Ice Drift: Winter
- 1.29 Ice Drift: Summer
- 1.30 Icebergs

- 2.1 Phytoplankton: Summer Standing Stock
- 2.2 Polar Bear: Winter
- 2.3 Polar Bear: Spring and Summer
- 2.4 Ringed Seal
- 2.5 Bearded Seal
- 2.6 Harp Seal

- 2.7 Walrus
- 2.8 White Whale (Beluga)
- 2.9 Narwhal
- 2.10 Bowhead Whale
- 2.11 Killer Whale
- 2.12 Colonial Seabirds
- 2.13 Fish
- 2.14 Vegetation
- 2.15 Arctic Fox
- 2.16 Muskoxen
- 2.17 Peary Caribou
- 2.18 Barren-Ground Caribou
- 2.19 Snow Goose
- 2.20 Birds

- 3.1 Communities
- 3.2 Tourism
- 3.3 Shipping: Corridors
- 3.4 Air Transport

- 3.5 Scientific Research: 1979-1980
- 3.6 Archaeological/Historical Sites and Bird Sanctuary
- 3.7 Polar Bear Hunting
- 3.8 Walrus Hunting
- 3.9 Seal Hunting
- 3.10 Whale Hunting
- 3.11 Muskoxen Hunting
- 3.12 Caribou Hunting
- 3.13 Wildfowl Hunting
- 3.14 Fishing
- 3.15 Trap Lines
- 3.16 Mining
- 3.17 Oil and Gas: Permits

- 4.1 Tourism: Potential
- 4.2 Shipping: Potential Corridors
- 4.3 Shipping: Potential Marine Pollution: Winter
- 4.4 Shipping: Potential Marine Pollution: Summer
- 4.5 Air Transport: Potential

- 4.6 Parks Canada's Areas of Interest
- 4.7 Ecological Sites (IBP)
- 4.8 Mining: Potential
- 4.9 Sand and Gravel: Potential
- 4.10 Oil and Gas: Potential
- 4.11 Oil and Gas: Exploration
- 4.12 Oil and Gas: Potential Development
- 4.13 Oil and Gas Activities: Potential Marine Pollution:  
Winter
- 4.14 Oil and Gas Activities: Potential Marine Pollution:  
Summer
- 4.15 Representative Oil Spill Trajectories (a): Summer
- 4.16 Representative Oil Spill Trajectories (b): Summer

#### LIST OF BACKGROUND REPORTS

#### I. SELECTED PHYSICAL CHARACTERISTICS OF THE LANCASTER SOUND REGION

Geology and Physiography

Climate  
Ice Climatology  
Physical and Chemical Oceanography

**II. SELECTED BIOLOGICAL CHARACTERISTICS OF THE LANCASTER SOUND REGION**

Marine Life  
Terrestrial Vegetation and Wildlife

**III. SOCIO-ECONOMIC CHARACTERISTICS AND CONSERVATION INTERESTS OF THE LANCASTER SOUND REGION**

A History of Human Occupation  
An Overview of Socio-economic Conditions  
Conservation Interests

**IV. NON-RENEWABLE RESOURCES AND TRANSPORT OF THE LANCASTER SOUND REGION**

Non-Renewable Resources

Shipping

**V. JURISDICTIONS AND LEGISLATION OF THE LANCASTER SOUND REGION**

A Review of International Rules, Federal and Territorial Legislation as it Relates to Use Options.

# Appendix IV

## ASSUMPTIONS FOR ACTIVITY ANALYSES

### SHIPPING

1. There is a possibility of at least one major oil spill and one LNG - fire, attributable to tanker accidents, to occur during the next 20 years somewhere in the Northwest Passage.
2. Underwater noise caused by ship propellers may adversely affect the orientation or habits of some sea mammals located in the Lancaster Sound region.
3. The Coast Guard will have effective facilities to monitor and control ship movements, safety, and pollution standards.
4. The Coast Guard has the capacity to respond to an oil or LNG crisis, but clean-up capability is limited by current technology.

### MINING

1. Ore concentrates will continue to be shipped from Nanisivik until 1990; shipping from Arvik will commence in 1982 during summer navigation seasons only.
2. Market conditions for lead, zinc, and iron will remain relatively stable over the time-frame.
3. No additional mines will be brought into production prior to the year 2000.
4. Surface exploration will continue at the current rate over most of the region but will increase on Cornwallis and Devon Islands.
5. Exploration activities and shipments of ore concentrates will be confined to the summer months.

## OIL AND GAS EXPLORATION

1. There is a possibility of a blowout resulting in release of oil into the environment, however, the probability is low.
2. Exploration (drilling and seismic) will essentially be restricted to marine areas in the future.
3. All exploratory drilling will be undertaken in summer, within the 100 day drilling window (July, August, September).
4. Existing settlements will be used for transfer of personnel to drill sites.
5. Base camps will be constructed close to exploratory drilling sites. Camps will be approximately 25 ha in size, containing airstrip, sleeping accommodation, water supply, fuel storage, communications centre, and warehouses. Operational staff will be about 30 people.
6. During the time-frame, 30-50 wildcat wells may be drilled with an additional 10-16 delineation wells drilled to estimate the structures' reserve and size.
7. During any one drilling season, a minimum of two, and a maximum of four, drillships may be active in the area. One seismic ship will be operating in the region every second year.
8. Specifications for each drillship operation:
  - . on-board personnel = 100
  - . number of 70-metre support vessels = 3
  - . helicopter trips to each rig = 2-4/day
  - . fixed-wing flights from base camp to personnel transfer point = 3/week.
9. Fuel and re-supply will be from St. John's, Newfoundland, or ports in Greenland.

10. Drilling fluids and cuttings will be dumped at concentrations below toxic levels. Oil-stained fluids and other material such as garbage will be separated and combustibles will be incinerated.

#### OIL AND GAS DEVELOPMENT AND PRODUCTION

1. There are no production systems now in existence that can be supplied directly to provide safe and reliable year-round operations in the region. It is anticipated, however, that the required technology will be developed prior to the year 2000.
2. Development wells will be drilled from drillships or semi-submersible drilling platforms.
3. Development will continue to be confined to the ice-free season.
4. At least 3-10 large fields will have been outlined by exploratory drilling.

5. Shore-based facilities will provide the necessary separation, storage, shipping, and transmission of products.
6. Production will be on a year-round basis.
7. Total cost of all systems will exceed \$5-7 billion and provide continuing employment to several hundred persons.

#### PRESERVATION OF NATURAL AREAS AND TOURISM

1. The unique environmental characteristics of the Lancaster Sound region are worth preserving, and Canada has a national and international responsibility to preserve them.
2. One of the terrestrial or marine National Areas of Canadian Significance, or a combination of them, will form the basis for a national park in the region.



3. Management guidelines will be developed for each of the national parks and for other types of conservation areas to regulate resource development and minimize environmental degradation.
4. In new national parks, those rights recognized in native land claims settlements will be honoured, and extractive activities which are the subject of such rights can only be terminated after agreement has been reached with the native people concerned.
5. All levels of government and native organizations will be consulted in establishing and enforcing management rules for conservation areas.
6. Tourism, which may be promoted by parks and reserves, can contribute to the economy of the region.
7. Commercial exploration, extraction, or development of natural resources will not be permitted in a national park.

#### RENEWABLE RESOURCE HARVESTING

1. Hunting, fishing and trapping activity will increase with increasing population.

## Appendix V

### EXISTING PROJECTS AND CURRENT PROPOSALS FOR NON-RENEWABLE RESOURCE EXPLOITATION AND TRANSPORTATION.

#### 1. HYDROCARBON TRANSPORTATION PROPOSALS FOR THE NORTHWEST PASSAGE

Various proposals have been made for year-round marine transportation of oil and natural gas through the Northwest Passage. Although these hydrocarbons originate outside the Lancaster Sound region, their transport has implications for planning future uses of the region. The details of each project are not completely known, however, and may be subject to change because of technological advances or other considerations.

THE ARCTIC PILOT PROJECT application has been jointly filed by Petro-Canada, Dome Petroleum, NOVA (formerly Alberta Gas Trunk Line Company Limited), and Melville Shipping Limited. This pilot project would involve construction of a natural gas pipeline, barge-mounted storage and liquefaction facilities, and tanker transport of liquefied natural gas (LNG). The system would use a 56 cm diameter pipeline to transport gas 160 km

from the Drake Point field on Melville Island to Bridport Inlet on the Island's south coast. At Bridport Inlet, the gas would be liquefied and shipped by tanker to regasification facilities in eastern Canada. Two ice-breaking Arctic Class 7 tankers of 135 000 tonnes with a capacity of  $139\ 909\ \text{m}^3$  (0.88 million barrels) would be built. They would each make 14 round trips per year. The system would be capable of moving 7 million  $\text{m}^3$  (250 million cubic feet) of gas per day. Project costs are estimated at \$1.76 billion and project start-up is planned for mid-1985. The gas would be destined for the Canadian market, but it has been proposed that twice the equivalent volumes should be released to the U.S. market from other Canadian sources in order to pay for the project. An EARP panel has completed hearings on the project and a report is expected later this year. The NEB expects to hold hearings in early 1981.

DOME PETROLEUM has suggested, on the basis of early planning, that by 1987, its Beaufort Sea operation

would consist of one production platform and a fleet of two tankers moving 15 898 m<sup>3</sup> (100 000 barrels) of oil per day. The magnitude of the operation would be gradually increased until 1990, to twelve production platforms and a fleet of 24 tankers moving 190 785 m<sup>3</sup> (1.2 million barrels) per day. The tankers would probably follow the Northwest Passage (M'Clure Strait, Parry Channel), but a destination for the oil has not been indicated. Early estimates by Dome suggest that this huge undertaking would require an investment of \$25 billion by 1990.

**TRANS-CANADA PIPELINES PROJECT.** An application is expected in 1980 for the project which would involve a 77 km long pipeline on Ellef Ringnes Island, natural gas liquefaction facilities on King Christian Island, and three 75 000 deadweight tonne vessels of Arctic Class 10 icebreaking capability for yearround operation. Project cost has been estimated at \$2.4 billion (in 1984 dollars). The origin of the gas would be

Ellef Ringnes Island, King Christian Island, and other sources, but its destination is presently uncertain. The projects proponents, Trans-Canada Pipelines and Dome Petroleum, have indicated that project construction might begin in 1986. One of the routes being examined passes through Wellington Channel, Barrow Strait, Prince Regent Inlet, and through Hecla and Fury Strait to Foxe Basin.

**SEATRAN** is an American scheme for moving oil from Alaska's North Slope to east coast markets via the Northwest Passage, using a fleet of three Class 8 ice-strengthened tankers. Initial estimates call for each of these tankers to make an average of 15 round trips annually.

**GLOBTIK TANKERS LTD.** has proposed another American scheme which would carry Alaskan oil to the U.S. east coast via the Northwest Passage, using ice-strengthened tankers in the 350 000 tonne range. No information is

available on the icebreaking capability of the vessels. Each of these huge tankers would be capable of carrying  $397\,469\text{ m}^3$  (2.5 million barrels) of North Slope oil to Conception Bay, Newfoundland, where it would be transhipped in smaller tankers to U.S. ports. The initial complement of six tankers would give a system capacity of  $79\,493\text{ m}^3$  (500 000 barrels) per day; the fleet would be increased to 24 tankers with a corresponding increase in system capacity.

GLOBTIK TANKERS LTD. has also advanced the concept of transporting liquefied natural gas (LNG) from Alaska and the western Canadian Arctic, by way of the Northwest Passage, to American and eastern Canadian markets. Using four Class 10 icebreaking tankers, 11 million  $\text{m}^3$  (400 million cubic feet) of gas per day would be transported. The system capacity could be rapidly expanded by increasing the number of tankers to 20. Globtik indicates the cost of transporting Prudhoe Bay gas by tanker would be \$11 billion compared to \$17.5 billion for the planned Alaska Highway Pipeline.

## 2. HYDROCARBON EXPLORATION

The offshore area of Lancaster Sound contains geological structures with significant potential for oil and gas. Three companies - Norlands Petroleum, Petro-Canada, and Shell Canada hold the oil and gas permits to approximately 3.2 million hectares. No exploratory drilling has yet occurred. Norlands applied for permission in 1976 to drill an exploratory well, but their drilling program was deferred by the government, on the recommendation of the Environmental Assessment and Review Panel that reviewed the application in October 1978. An application is expected from Petro-Canada in 1981 to drill three or four exploratory wells in western Baffin Bay and eastern Lancaster Sound. Drilling for both programs would involve dynamically positioned drill ships operating during the open water season, and both operations would entail marine, land, and air support.

### 3. MINING

Commercially viable lead-zinc and iron ore deposits have been identified in the Lancaster Sound region.

Nanisivik, a lead-zinc operation located at Strathcona Sound on Baffin Island, began production in October 1976. The mine produces 150 000 tonnes of ore annually, which is concentrated on site and stockpiled for shipment during the open water season. With proven reserves of about 8 million tonnes, the mine has an expected life span of 12-15 years. The operation employs approximately 225 persons, and supports a permanent community of about 325 people. Associated facilities include airstrip and a marine terminal.

The Arvik Mine (Polaris deposit) is located on the southern part of Little Cornwallis Island. With ore reserves estimated at 23 million tonnes, Arvik will have a life span of at least 25 years. It will be the eleventh largest lead-zinc producer in the world. Preliminary construction acti-

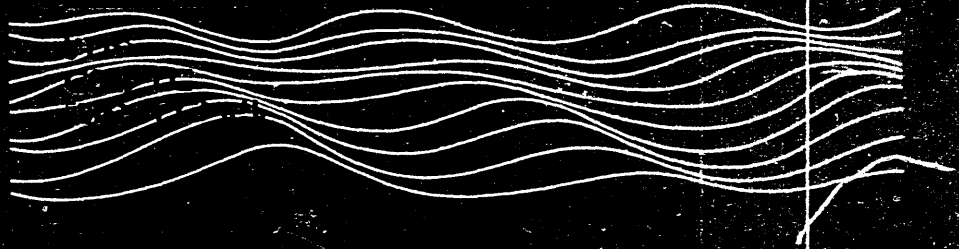
vities are currently underway and the mine is expected to begin operation in 1982. Cominco's present plans call for the production of 2 050 tonnes per day, to be concentrated and stockpiled for shipment during open water season. The mine will employ about 240 persons who will be accommodated in bunkhouse facilities. No permanent community is planned. Although only the Polaris deposit is under formal development consideration at this point in time, the Eclipse deposit, located on the north end of Little Cornwallis Island, also contains significant amounts of lead and zinc. Future development of the Eclipse as well as other adjacent deposits is a possibility.

The Mary River iron ore deposits have been identified on Baffin Island, south of Milne Inlet. They contain approximately 130 million tonnes of high grade ore. Although exploration, metallurgical and economic work has been done, no current plans exist for the development of these reserves.

Coal Mining was carried out by the Inuit of Pond Inlet at two separate mine sites on the Salmon River until 1964. In the decade prior to the sea lift, an average of 125 tonnes of coal was mined each year. As oil and gas prices continue to rise, coal mining will likely resume as a source of local energy at reasonable costs.

סאָם אַרבעטן  
1980-2000

אַרבעטן פֿון  
אַרבעטן



רצוננו להודיע לך כי

השירותים שלנו זמינים

1980-2000

אנחנו מציעים לך את כל

השירותים שלנו במחירים

הנמוכים ביותר.

מאז 1980



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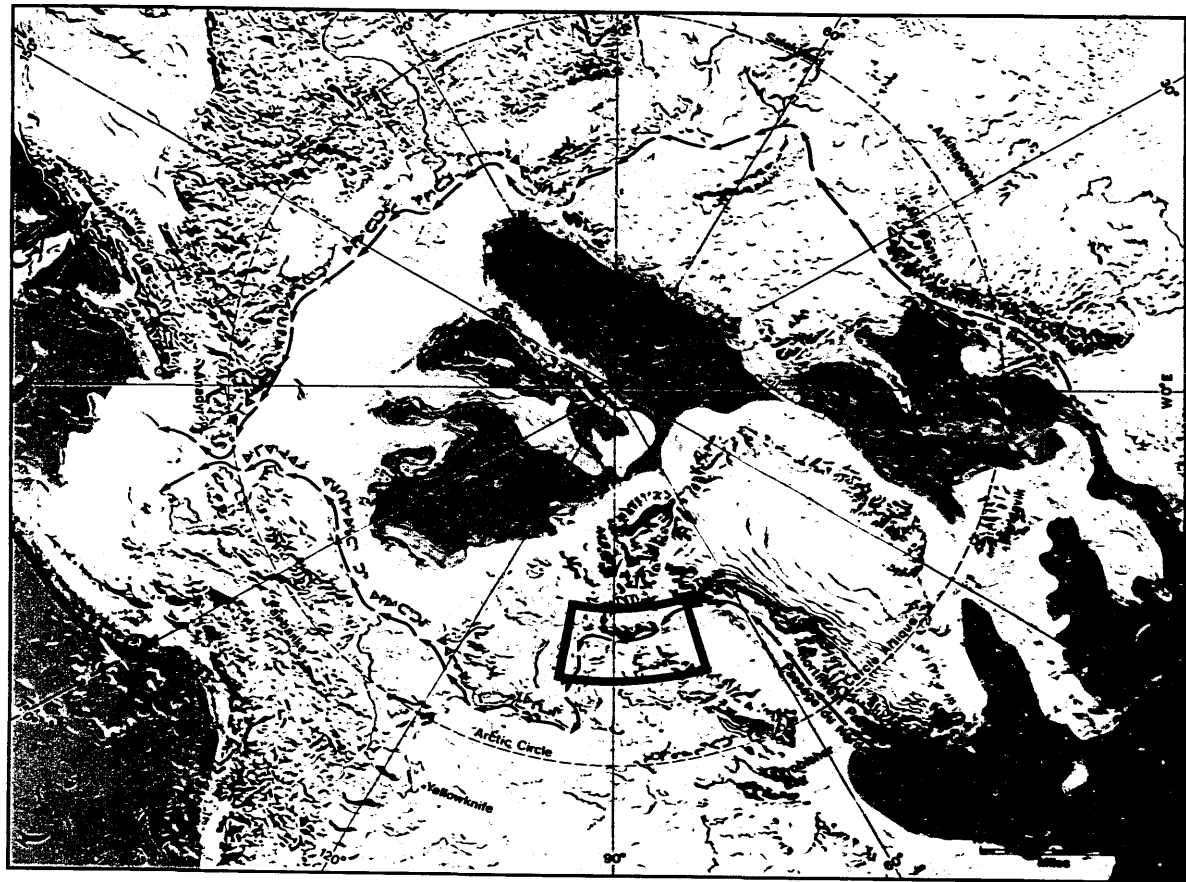
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4. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	15	17. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	36
5. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	16	18. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	39
6. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	18	19. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	40
7. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	19	20. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	52
8. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	21	21. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	55
9. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	22	22. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	59
10. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	26	23. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	65
11. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	27	24. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	68
12. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	29	25. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	72
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		27. ስራ ላይ ለመገባት ለመገባት ለመገባት ለመገባት ለመገባት	77



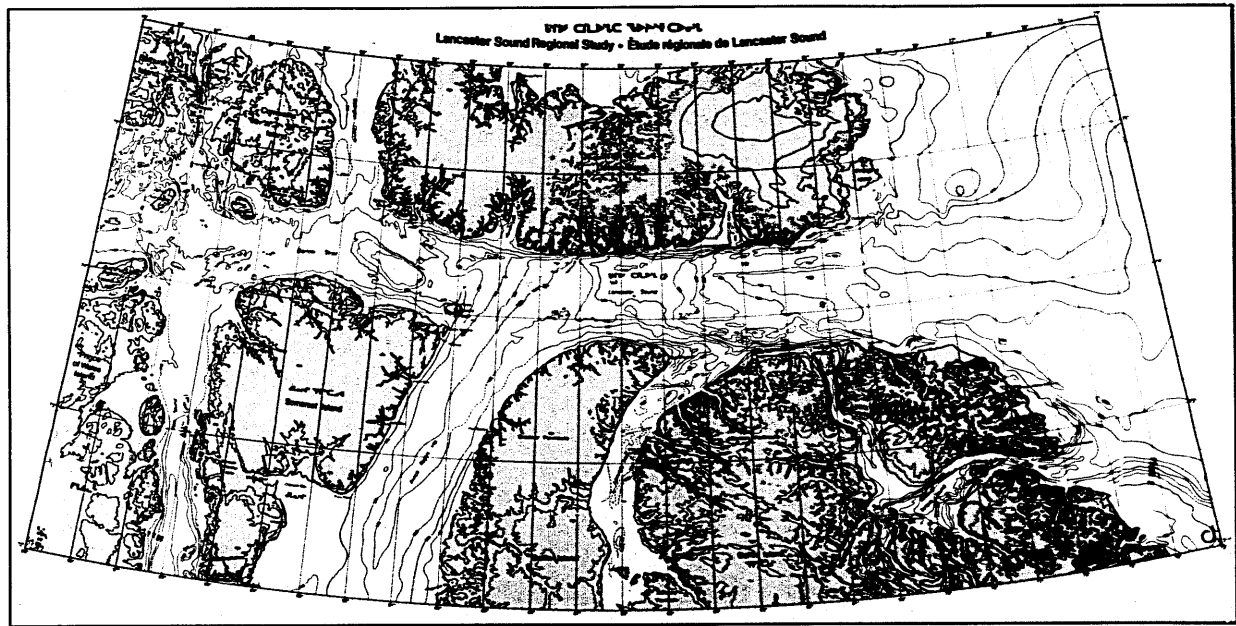
Significance of the Lancaster Sound Region in the Context of the Circumpolar North • ᐅᐅ ᐅᐅᐅᐅ ᐅᐅᐅᐅᐅᐅᐅᐅ  
 ᐅᐅᐅᐅᐅᐅᐅ ᐅᐅᐅᐅᐅᐅᐅᐅᐅ ᐅᐅᐅᐅᐅᐅᐅᐅ • Importance de la région du détroit de Lancaster dans l'ensemble du Nord  
 circumpolaire







The Study Area • ᖃᖅᐅᖅᓴᖅᐅᖅᓴᖅᐅᖅ • La région d'étude



Scale: 1:250,000  
 Date: 1988  
 Author: [illegible]  
 [illegible text]

[illegible text]

[illegible text]

[illegible text]





ኒው ጆርጅያ ሙዚየም የስፔላራሪዮች

ሥራ ለሚከተለው ጥያቄ ስራ ይደረጋል

ኒው ጆርጅያ የስፔላራሪዮች ለገደብ ስራ ድጋፍ ለሚሰጡ ሆይ  
 ሲሆን ለስራው ስምምነት ለማስገኘት 1978-ህዳር ወር ለአገልግሎት  
(Norlands Petroleum Ltd.) ለገደብ ስራ ስምምነት ለማስገኘት  
 ለገደብ ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ጥያቄ ስራ ይደረጋል ለሚከተለው የስፔላራሪዮች  
 የምርመራ ስራ (Environmental Assessment Review Pro-  
cess) ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም

CL ብሔራዊ ስራ ስምምነት ለሚከተለው ስራ ስምምነት ለማስገኘት  
 ሙዚየም የስፔላራሪዮች ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም

የስፔላራሪዮች ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም  
 ስራ ለሚከተለው ስራ ስምምነት ለማስገኘት ኒው ጆርጅያ ሙዚየም



מסעוֹלֵהוּ 3 : - אַבְדֵי הַיָּמִים וְהַיָּמִים אֲחֵרֵי הַיָּמִים

אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים

אֲחֵרֵי I

אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים

אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים

אֲחֵרֵי II

אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים

אֲחֵרֵי III

אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים

אֲחֵרֵי IV

אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים  
 אֲחֵרֵי הַיָּמִים



ዴሞክራሲያዊ ልማት ለማረጋገጥ

የሕግ ልማት ለማረጋገጥ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት።

ለሕግ ልማት ማረጋገጫ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት።

በሌሎች ደረጃዎች ላይ ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት።

ለሕግ ልማት ማረጋገጫ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት።

ለሕግ ልማት ማረጋገጫ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት።

ለሕግ ልማት ማረጋገጫ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት። ለዚህም ማረጋገጫ ለማድረግ ለሚያስፈልጉት ሁሉም ደረጃዎች ላይ ማረጋገጥ አለበት።







መ ስድስት

መጠን ለሰጠው የጠቅላይ

አካላት ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል።

የሰላይ ግድግዳዎች ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል።

ግድግዳው ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል።

የሰላይ ግድግዳዎች ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል።

ግድግዳው ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል።

ግድግዳው ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል። ለግምገማችሁ ማለጋገጥ ይቻላል።

መብቶች ለማረጋገጥ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል።

በዚህ ጉዳይ ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል።

በዚህ ጉዳይ ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል።

Barrow Strait-ክፍለ-ቀበሌ (Resolute), ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል።

በዚህ ጉዳይ ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል።

Barrow Strait-ክፍለ-ቀበሌ ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል። ለዚህም ማረጋገጫ ለሚያስፈልጉት ሁሉም ጉዳዮች ላይ ለሚገኙ ሰነዶች ላይ ማረጋገጥ ይቻላል።



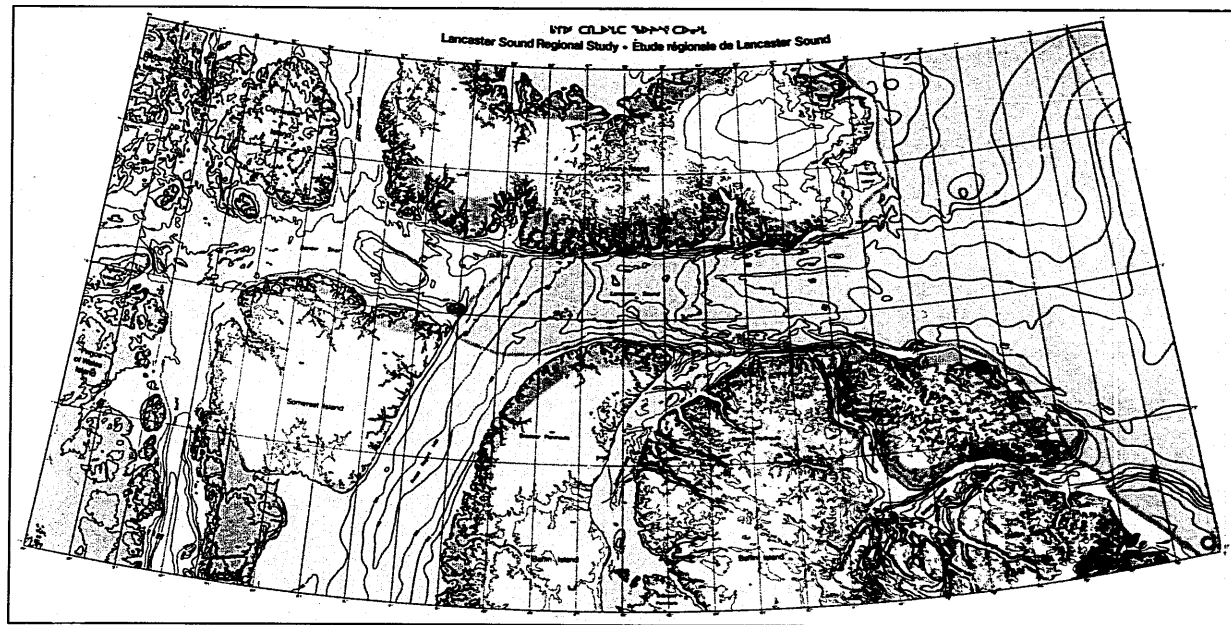


## Biological Resources Characteristics: Winter • ΔLΔΔ Caractéristiques des ressources biologiques: hiver

Five levels of important habitats are shown for major species. Dark green areas are critical habitats for species that concentrate and feed along fast-ice edge. White areas are general range of one or two species.

Cinq niveaux d'habitats importants sont indiqués pour les principales espèces. Les zones en vert foncé sont des habitats critiques pour les espèces qui se concentrent et s'alimentent le long de la frange de glace ferme et les zones blanches représentent une aire générale fréquentée par une ou deux espèces.

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Prepared by a Working Group of the Department of Fisheries and Aquaculture, Government of Northwest Territories, Yellowknife, N.W.T., Canada.

Map scale: 1:50,000. Contour interval: 20 m. Elevation: 0 to 1000 m. Contour lines are shown at 20 m intervals.

Map scale: 1:50,000. Contour interval: 20 m. Elevation: 0 to 1000 m. Contour lines are shown at 20 m intervals.

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Hunting, Fishing and Trapping Patterns: Winter • ᐱᐅᐸᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸ  
 ᐱᐸᐸᐸᐸ ᐱᐸᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸ • Chasse, pêche et piégeage: hiver

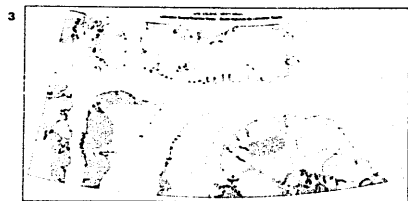
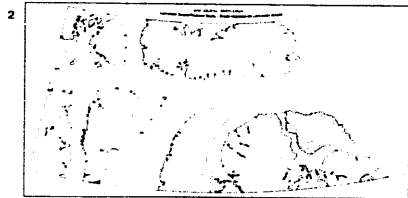
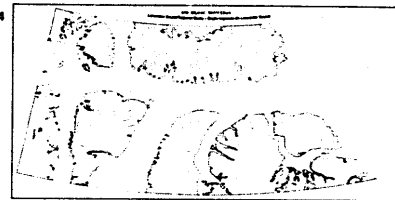
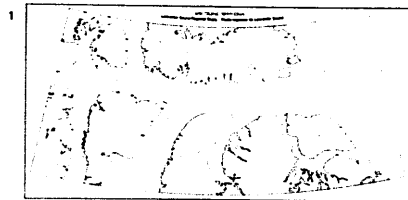
Selected Components • ᐱᐸᐸᐸ ᐱᐸᐸᐸᐸᐸᐸᐸᐸᐸ • Composantes choisies

1 Seal Hunting - ᐱᐸᐸᐸᐸᐸᐸ - Chasse au phoque

4 Trap Lines - ᐱᐸᐸᐸᐸᐸᐸ - Lignes de piégeage

2 Polar Bear Hunting - ᐱᐸᐸᐸᐸᐸᐸ - Chasse à l'ours blanc

3 Caribou Hunting - ᐱᐸᐸᐸᐸᐸᐸ - Chasse au caribou





ሥርዓታዊ ሐዲሶ ልማት ለሁለት ወር ለውጥ ማድረግ ይቻላል።

ገንዘብ ልማት ለማድረግ ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል። 1982-83 ስርዓት-  
ገንዘብ ልማት ለውጥ ማድረግ ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል።  
45 000 ስርዓት ልማት ማድረግ ይቻላል።

በሥራ ስርዓት ለውጥ ማድረግ ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል።  
ለውጥ ማድረግ ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል። ለውጥ ማድረግ  
ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል። ለውጥ ማድረግ ለሥራ ስርዓት  
ለውጥ ማድረግ ይቻላል። ለውጥ ማድረግ ለሥራ ስርዓት ለውጥ ማድረግ  
ይቻላል። ለውጥ ማድረግ ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል።  
ለውጥ ማድረግ ለሥራ ስርዓት ለውጥ ማድረግ ይቻላል።









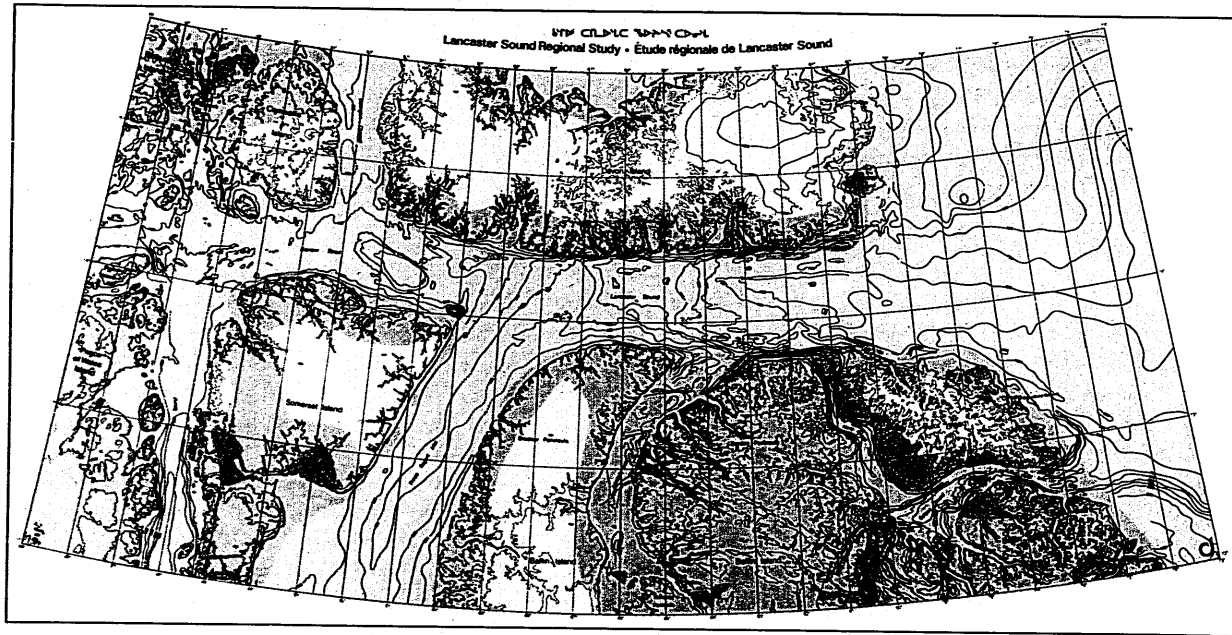


# Biological Resources Characteristics: Summer • Biological Resources Characteristics: Summer • Caractéristiques des ressources biologiques: été

Five levels of important habitats are shown for major species. Darker green areas indicate an increasing overlap of important habitats. White areas are general range of one or two species.

Les cinq niveaux d'habitats importants sont indiqués pour les principales espèces. Les zones en vert foncé indiquent un chevauchement de plus en plus prononcé d'habitats importants. Les zones blanches sont généralement fréquentées par une ou deux espèces.

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Physical Environmental Characteristics: Summer • الفيزيائية والبيئية: الصيف • Caractéristiques physiques et environnementales: été

Selected Components • المكونات المختارة • Composantes choisies

1 Rivers and Lakes - الأنهار والبحيرات • Cours d'eau et lacs

2 Ice Cap - القبة الجليدية • Calotte glaciaire

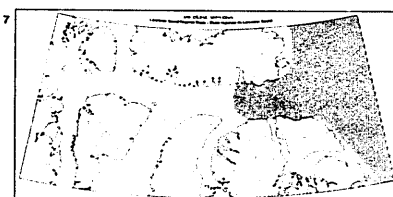
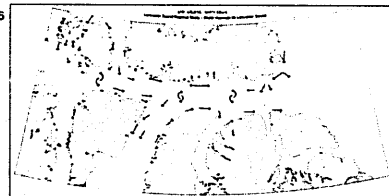
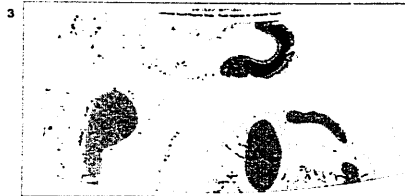
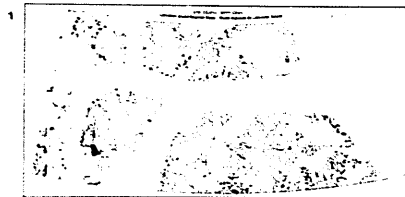
3 Mean Annual Rainfall - هطول الأمطار السنوي المتوسط • Précipitations annuelles moyennes de pluie

4 Surface Water Circulation - دوران المياه السطحية • Courants de surface

5 Median Ice Cover - التغطية الجليدية المتوسطة • Couverture de glace médiane

6 Ice Drift: Summer - الجليد العائم: الصيف • Glaces à la dérive: été

7 Icebergs - الجليديات العائمة • Icebergs



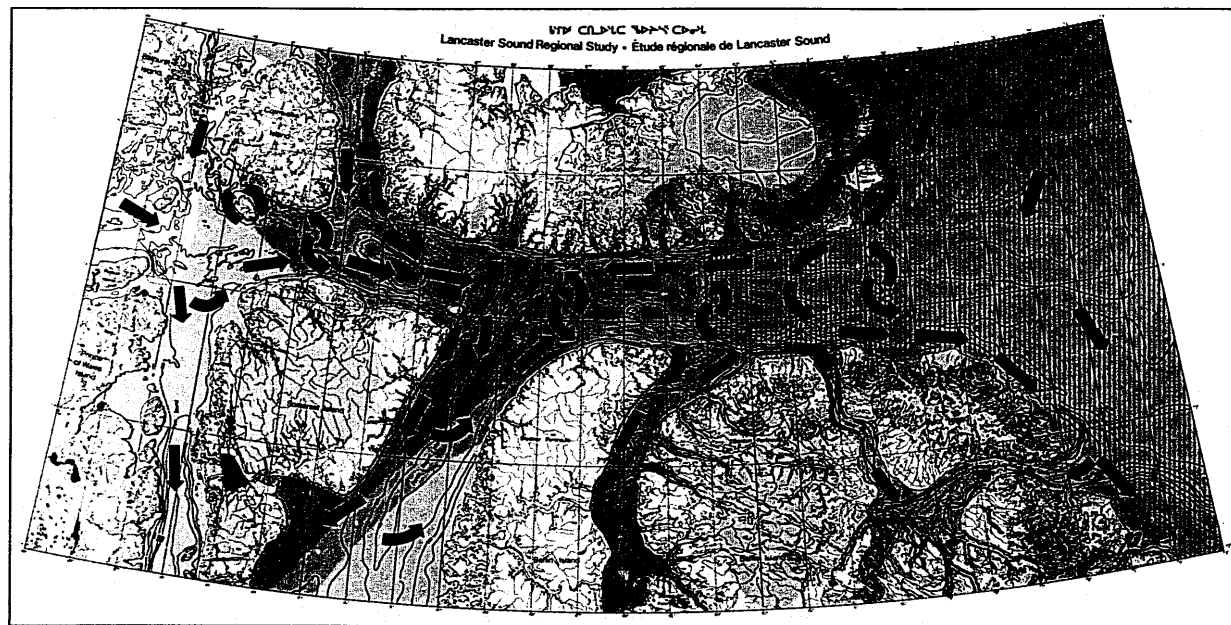
# Physical Environmental Characteristics: Summer •

## • Characteristics physiques et environnementales: été

Sea ice conditions range from partial ice cover (light blue) to open water (dark blue). Icebergs are most frequent in hatched areas. Surface water currents are shown by arrows. Blue areas on land receive most rainfall.

Les conditions de la mer de glace varient de l'état partiel de couverture de glace (bleu clair) à l'état d'eaux libres (bleu foncé). Les icebergs se trouvent le plus fréquemment dans les zones hachurées. Les flèches indiquent les courants d'eau de surface. Les zones bleues sur terre sont celles qui reçoivent le plus souvent des précipitations.

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Map prepared by the Department of Fisheries and Oceans, Ottawa, Ontario, Canada, under the leadership of the Lancaster Sound Regional Study. The map is based on data collected by the Department of Fisheries and Oceans, and other sources. The map is not to be used for navigation purposes. The map is a generalization of the actual conditions and should not be used for detailed studies.

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ከግንባታው በፊት ገደብ ለማሰጠት ማድረግ ሲቻል ነው። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል።

ገደቡ ለማሰጠት ማድረግ ሲቻል ነው። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል።

ገደቡ ለማሰጠት ማድረግ ሲቻል ነው። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል።

ገደቡ ለማሰጠት ማድረግ ሲቻል ነው። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል።

ገደቡ ለማሰጠት ማድረግ ሲቻል ነው። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል። ለዚህም ምሳሌ ይህ ደብዳቤ ይሆናል።

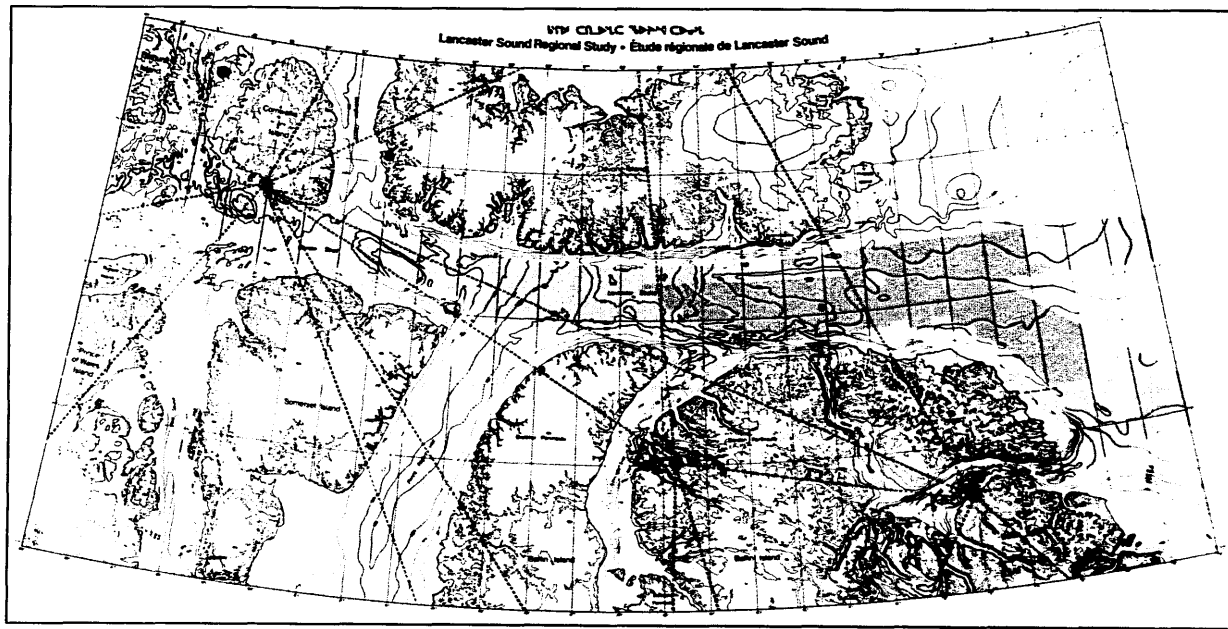
# Current Commercial Activities: Summer • L'été

## Actualités commerciales actuelles: été

Commercial activities include shipping of lead-zinc ore, resupply shipping, scientific surveys, tourism, and air transport. Dark red indicates spatial coincidence of activities.

Les activités commerciales comprennent le transport maritime des minerais de plomb et de zinc et des reapprovisionnements, les études scientifiques, le tourisme et le transport aérien. Les zones en rouge foncé indiquent la coïncidence d'activités au même endroit.

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Prepared by the Department of Northern Development and Technical Services, Ottawa, Ontario, Canada. The map is a reproduction of the original map prepared by the Department of Northern Development and Technical Services, Ottawa, Ontario, Canada.

Map scale: 1:50,000. The map is a reproduction of the original map prepared by the Department of Northern Development and Technical Services, Ottawa, Ontario, Canada.

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**Current Commercial Activities: Summer • L'activité commerciale actuelle: été**

**Selected Components • Composantes choisies**

1 Mining • L'exploitation minière • Mines

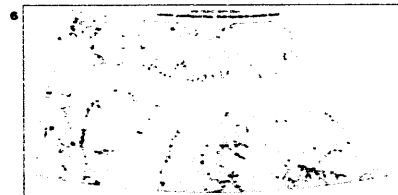
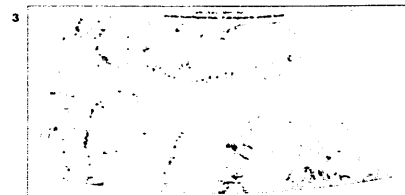
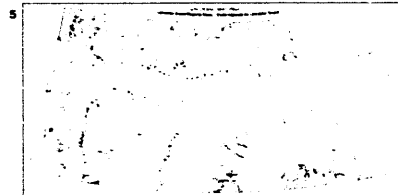
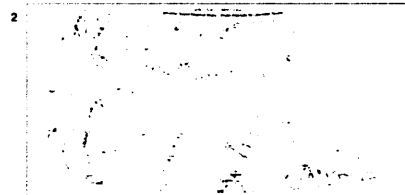
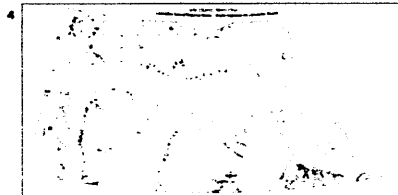
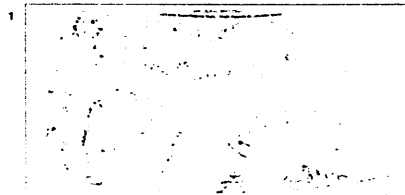
2 Shipping Corridors • Les corridors de transport maritime • Transport maritime corridors

3 Air Transport • Le transport aérien • Transport aérien

4 Tourism • Le tourisme • Tourisme

5 Oil and Gas Permits • Les permis pétroliers et gaziers • Pétrole et gaz: permis

6 Communities • Les communautés • Communautés

















መገለጻ ለሰው ሲሆንም ንብረት ለሰው ሆኖ የሚሰጥ ሊሆን ይችላል።  
ከዚህ ለሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።

1973-ህዳር 19 ጋጠሙ በሰላም (Panarctic) ለውስጥ ሆኖ ሊሰጥ ይችላል።  
አሁንም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
1974-ህዳር 19 ጋጠሙ በሰላም ለውስጥ ሆኖ ሊሰጥ ይችላል።

ርዕሰ ስርዓቱ ለውስጥ ሆኖ ሊሰጥ ይችላል።  
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አሁንም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።

ውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
አሁንም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።

ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
አሁንም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
አሁንም ለውስጥ ሆኖ ሊሰጥ ይችላል።

ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
አሁንም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
ሌሎች ምሳሌዎችም ለውስጥ ሆኖ ሊሰጥ ይችላል።  
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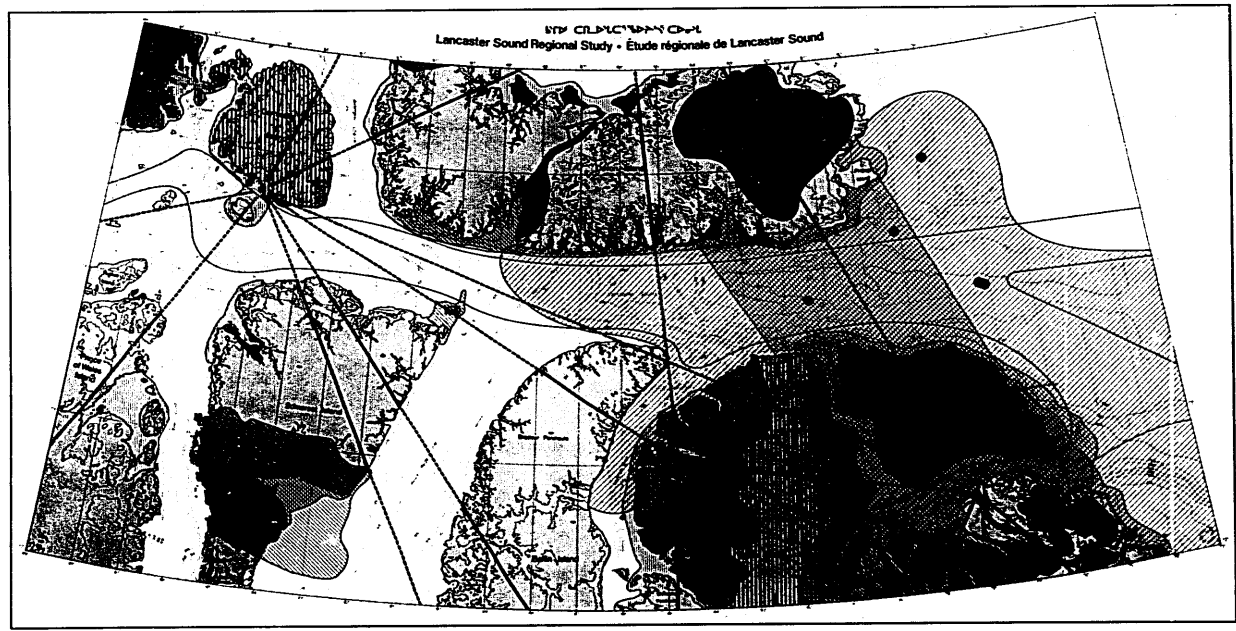






# Potential Activities · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Activités possibles

- Shipping Corridor · ᐅᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Corridor de navigation
- ⋯ Favourable Geology and/or Limited Mineral Resources · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Géologie favorable ou ressources minérales limitées
- Near-term Producer (1982): Arvik Polaris Deposit · ᐅᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ (1982): ᐱᓕᓕᓐᓂᓐ (ᐅᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ) · Mine productive à court terme (1982): Arvik (gisement Polaris)
- ▲ Potential Producer: Arvik (Eclipse Deposit) · ᐅᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ (ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ): ᐱᓕᓕᓐᓂᓐ (ᐱᓕᓕᓐᓂᓐ) · Producteur éventuel: Arvik (gisement Eclipse)
- Proposed Drilling Sites · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Lieux de forage proposés
- Land-based Facilities · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Installations terrestres
- ▨ Potential Extent of Accidental Oil Pollution · ᐅᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ (ᐱᓕᓕᓐᓂᓐ) · Étendue possible de pollution accidentelle
- ⋯ Air Routes · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Routes aériennes
- ▨ Parks Canada's Areas of Interest · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Régions d'intérêt de Parcs Canada
- Tourism · ᐱᓕᓕᓐᓂᓐ ᐱᓕᓕᓐᓂᓐ · Tourisme



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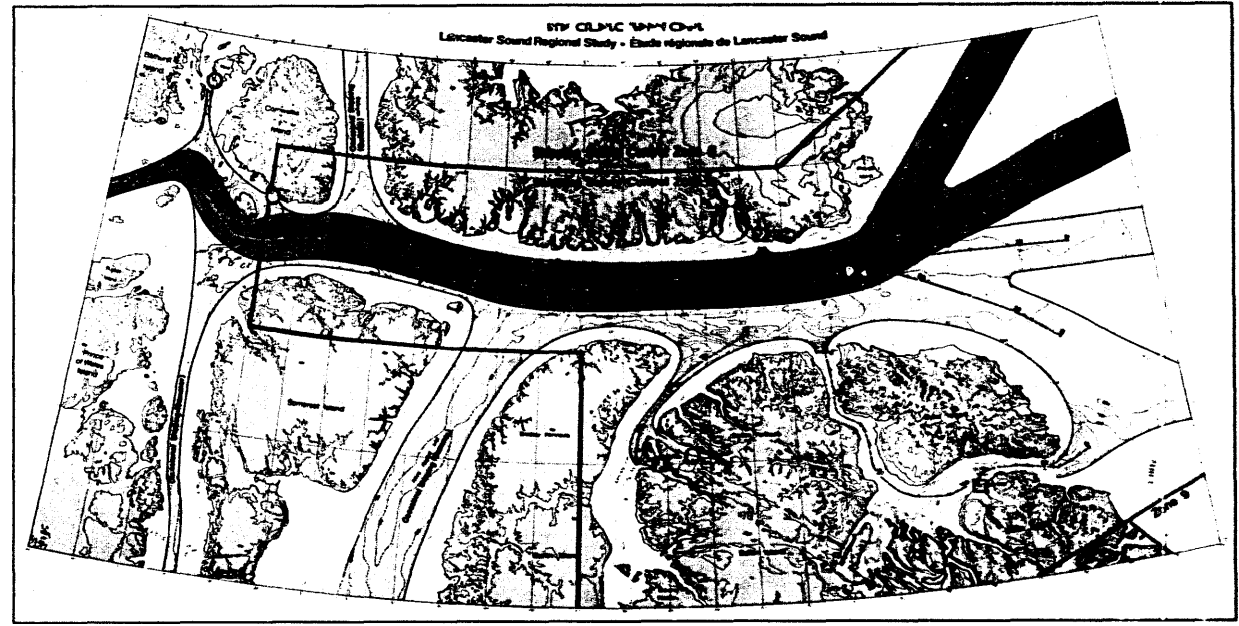




# Shipping: Potential Corridors · ΔΓΑΔΔΔΔΔΔΔ ΔΓΑΔΔΔΔΔΔΔ ΔΓΑΔΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ · Transport maritime: corridors possibles

- Shipping Corridor (Summer) · ΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ (ΔΔΔΔ) · Corridor de navigation (été)
- Shipping Corridor (Winter) · ΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ (ΔΔΔΔ) · Corridor de navigation (hiver)
- Shipping Safety Control Zone Boundary · ΔΔΔΔΔΔ ΔΔΔΔΔΔ ΔΔΔΔ · Limite de la zone de contrôle de la sécurité de la navigation
- Distance (nautical miles) · ΔΔΔΔΔΔ ΔΔΔΔΔΔ ΔΔΔΔ · Distance (milles nautiques)
- Harbours · ΔΔΔΔΔΔΔΔ · Ports de mer
- Ports · ΔΔΔΔΔΔ · Ports
- Proposed Racon Beacon · ΔΔΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ · Balise

Note: A harbour is a place which provides good anchorage for the purpose of temporary shelter or for the loading and unloading of cargoes. A port is a place for the loading or unloading of ships that is supervised by public or private authorities.  
 Un port de mer est un havre naturel et un endroit de mouillage pour l'embarkement ou le débarquement de navires. Un port (général) est un endroit d'embarquement ou de débarquement des navires sous la surveillance d'une autorité privée ou publique.



**Map Symbols**  
 Shipping Corridor (Summer) · ΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ (ΔΔΔΔ) · Corridor de navigation (été)  
 Shipping Corridor (Winter) · ΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ (ΔΔΔΔ) · Corridor de navigation (hiver)  
 Shipping Safety Control Zone Boundary · ΔΔΔΔΔΔ ΔΔΔΔΔΔ ΔΔΔΔ · Limite de la zone de contrôle de la sécurité de la navigation  
 Distance (nautical miles) · ΔΔΔΔΔΔ ΔΔΔΔΔΔ ΔΔΔΔ · Distance (milles nautiques)  
 Harbours · ΔΔΔΔΔΔΔΔ · Ports de mer  
 Ports · ΔΔΔΔΔΔ · Ports  
 Proposed Racon Beacon · ΔΔΔΔΔΔΔΔ ΔΔΔΔΔΔΔΔ · Balise

ፎርሞላ ይገልጻል። ስለዚህ ይህ ስራ ለሌሎች ማሳሰቢያ ሆኖ ሊያገለግል ይችላል። ሌሎች ስራዎችን ለማጠናቀቅ ይህ ስራ ሊያገለግል ይችላል።

የሌሎች ስራዎች

ይህ ስራ ለሌሎች ማሳሰቢያ ሆኖ ሊያገለግል ይችላል። ሌሎች ስራዎችን ለማጠናቀቅ ይህ ስራ ሊያገለግል ይችላል።

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አዲስ አበባ ሊቀሳቤስ ለግብርና ሚኒስቴር. ለዚህ ስልጠና ይዘት ላይ  
ጠቃሚ መረጃ ለማስገኘት ማድረግ ይቻላል. ርዕይ ለማሳካት ለሚችሉ  
ሰዎች.

ግብርና ለዚህ ስልጠና (ግብርና) ማድረግ

ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ  
ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ  
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ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ  
ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ

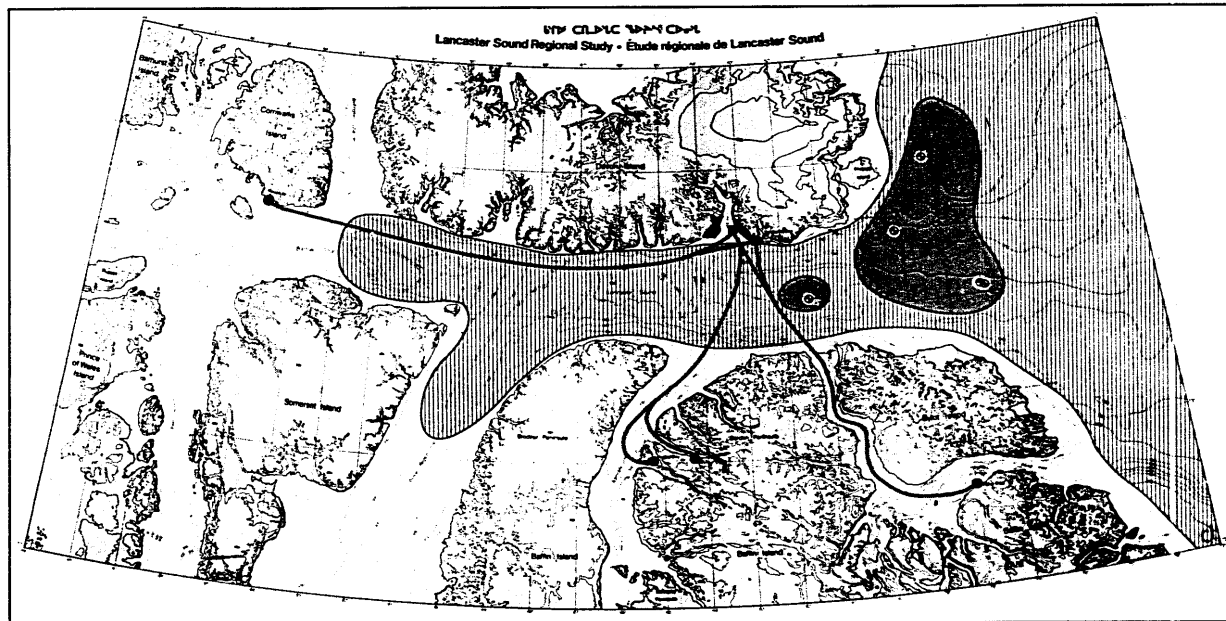
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ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ  
ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ  
ግብርና ለዚህ ስልጠና ለማድረግ ለሚችሉ ሰዎች ለማድረግ

# Oil and Gas: Exploration • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Pétrole et gaz: exploration

- Airports and Crew Rotation Sites • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Aéroports et lieux de roulement des équipes de travail
- Re-supply Barges • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Barges d'approvisionnement
- Re-supply Routes • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Routes d'approvisionnement
- Proposed Drilling Sites • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Lieux de forage proposés
- Land-based Facilities • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Installations terrestres

- High Potential Exploration Areas • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Zones à potentiel exploratoire élevé
- ▨ Low/Moderate Potential Exploration Areas • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • Zones à potentiel exploratoire faible à modéré

Map represents a five-year projection. • ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ ᐅᑦᑲᑦᑲᑦᑲᑦ • La carte représente une prévision de cinq ans.



Approved by the Department of Natural Resources Canada, Ottawa, Ontario. This map is a reproduction of the map titled "Lancaster Sound Regional Study" prepared by the Department of Natural Resources Canada, Ottawa, Ontario. The map is a reproduction of the map titled "Lancaster Sound Regional Study" prepared by the Department of Natural Resources Canada, Ottawa, Ontario. The map is a reproduction of the map titled "Lancaster Sound Regional Study" prepared by the Department of Natural Resources Canada, Ottawa, Ontario.



የዕንጣሊያ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 የደቡብ አፍሪካ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 የደቡብ አፍሪካ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 የደቡብ አፍሪካ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።

በግንባታ ስራ ላይ ለሚገኝ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 በግንባታ ስራ ላይ ለሚገኝ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 በግንባታ ስራ ላይ ለሚገኝ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።

ይህ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 ይህ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 ይህ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።

የዕንጣሊያ ስጦታ

የዕንጣሊያ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 የዕንጣሊያ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።  
 የዕንጣሊያ ስጦታ ስር ወይም ሌላ ማንኛውም ማዕከላዊ ለውጥ ለማድረግ ሊገቡት ይችላሉ።



የፌዴራል ገቢዎች ለማረጋገጥ ያስፈልጋል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።  
በፌዴራል ገቢዎች ለማረጋገጥ ያስፈልጋል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።

የደንበኞች ምርመራ ለማድረግ ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።  
የደንበኞች ምርመራ ለማድረግ ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።

የሥራ ለማድረግ ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።  
የሥራ ለማድረግ ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።

ለገንዘብ ለማዘጋጀት ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።  
ለገንዘብ ለማዘጋጀት ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።

ለገንዘብ ለማዘጋጀት ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።  
ለገንዘብ ለማዘጋጀት ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።

ለገንዘብ ለማዘጋጀት ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።  
ለገንዘብ ለማዘጋጀት ይረዳል። የሚከተሉትን ደንብ ለማረጋገጥ በሚገባ ገንዘብ ለማዘጋጀት ይረዳል።

ፎቶግራፍ ላይ ሲገባ (ከተለይ) ለጠቅላይ ግብር

ግብር ላይ ሲገባ ለግብር ጋር ገቢ ሲገኝ፣ ለግብር ሲገኝ  
ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ

ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ

ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ  
ግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ ለግብር ሲገኝ







ታሪክ ሙያዎች በታሪክ ሰነድ ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው።

የታሪክ ሙያዎች በታሪክ ሰነድ ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው።

ለምሳሌ የታሪክ ሙያዎች በታሪክ ሰነድ ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው።

ወይን ስርዓቶች

ፊት ለፊት የወይን ስርዓቶች ላይ ለሚገኙት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው።

የወይን ስርዓቶች ላይ ለሚገኙት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው።

ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው። ለዚህ ዓይነት ልዩ ስርዓቶች ላይ ባለው ጥንቃቄው በሙሉ የተገለጸው ነው።





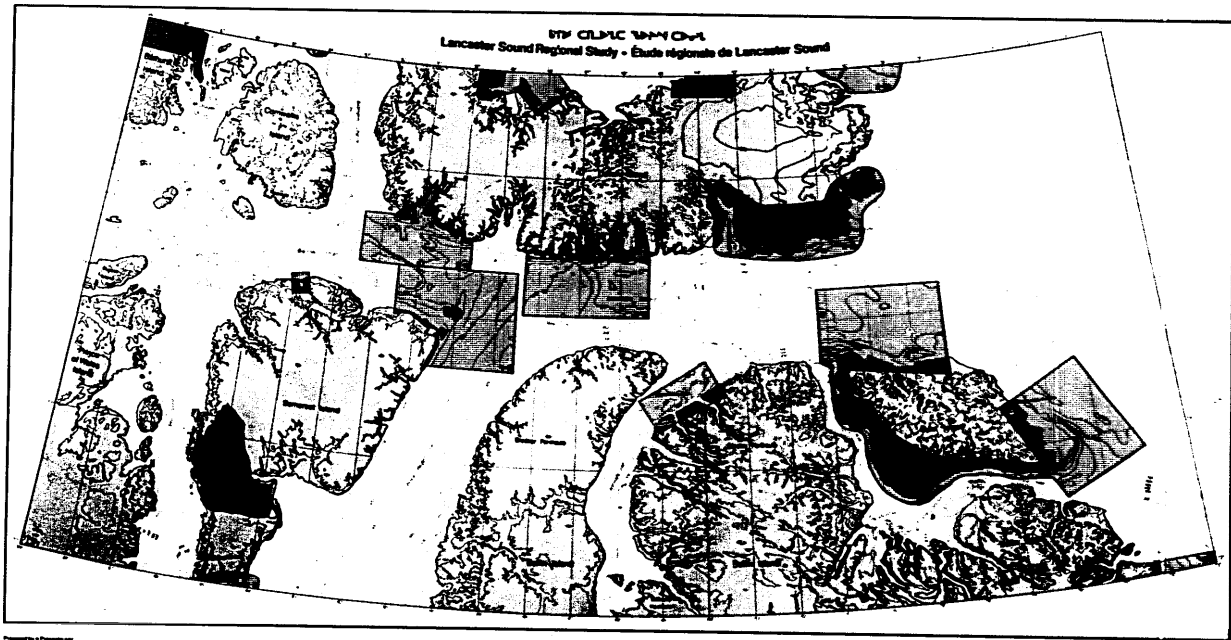






# Ecological Sites (I.B.P.) • ᐅᑦᑲᐱᑦ ᓂᑦᐅᑦᐅᑦ ᓂᑦᐅᑦᐅᑦ (ᓂᑦᑲᐱᑦ-ᐅᑦᐅᑦ) • Sites écologiques (P.B.I.)

□ Significant Ecological Sites • ᓂᑦᐅᑦᐅᑦ ᓂᑦᐅᑦᐅᑦ ᓂᑦᐅᑦᐅᑦ • Importants sites écologiques  
 IBP Designated Numbers • ᓂᑦᑲᐱᑦ ᓂᑦᐅᑦᐅᑦ ᓂᑦᐅᑦᐅᑦ • Nombres désignés par le PIB



**Scale** 1:100,000  
 Map of the Lancaster Sound Regional Study, showing the distribution of ecological sites and the location of the study area within the Northwest Territories.





**Legend**  
 Shaded areas represent significant ecological sites.

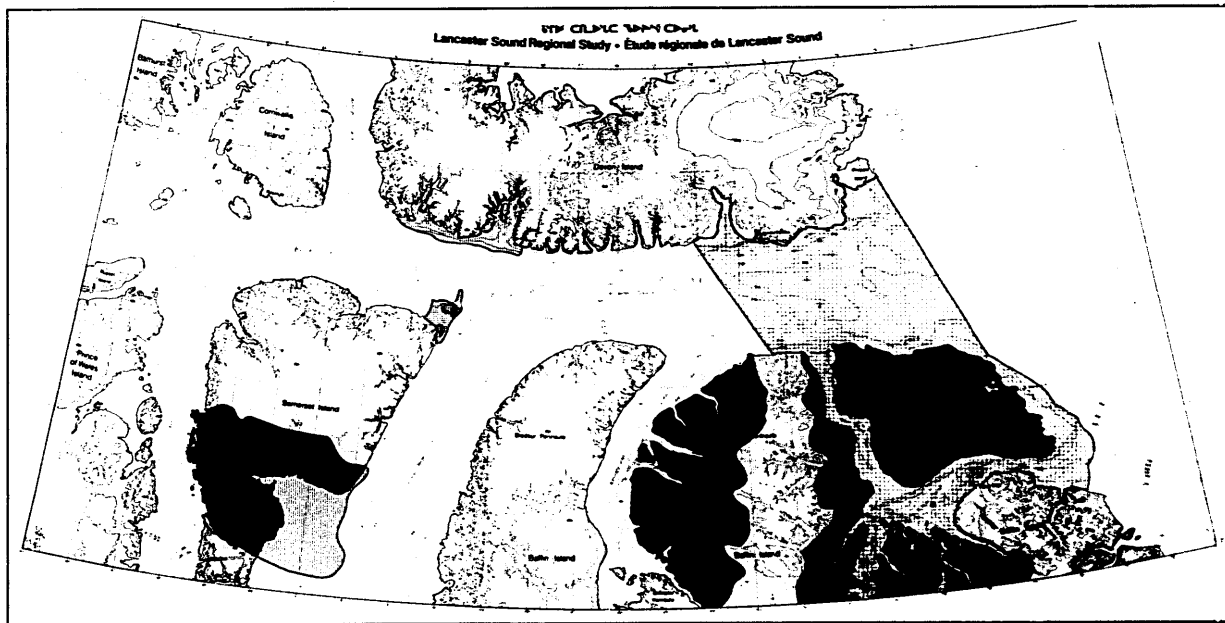
**IBP Designated Numbers**  
 A list of the IBP Designated Numbers for the sites shown on the map.

**Map Information**  
 Date of publication: 1991  
 Author: Canadian Wildlife Service

**Scale** 1:100,000  
 Map of the Lancaster Sound Regional Study, showing the distribution of ecological sites and the location of the study area within the Northwest Territories.

# Parks Canada's Areas of Interest • ᑲᓚᑕᑦ ᑲᓄᓐᓇᓄᓐ-ᑎᓚᓐᓄᓐ ᐱᑭᑎᓐᓇᓄᓐ . Régions d'intérêt de Parcs Canada

-  Terrestrial Natural Areas of Canadian Significance • ᑲᓚᑕᑦ ᑲᓄᓐᓇᓄᓐ-ᑎᓚᓐᓇᓄᓐ • Régions naturelles d'importance nationale
-  Natural Site of Canadian Significance • ᑲᓄᓐᓇᓄᓐ-ᑎᓚᓐᓇᓄᓐ • Zones naturelles d'importance nationale
-  Marine Natural Area of Canadian Significance • ᑕᓚᑎᑦ ᑲᓄᓐᓇᓄᓐ-ᑎᓚᓐᓇᓄᓐ • Régions marines naturelles d'importance nationale
-  Marine Areas of Interest • ᑲᓄᓐᓇᓄᓐ-ᑎᓚᓐᓇᓄᓐ ᑕᓚᑎᑦ • Régions d'intérêt marin



Prepared by the Regional Office  
 of Parks Canada  
 1000 Lakeshore Drive, Ottawa, Ontario  
 K1A 0S3  
 Inquiries should be directed to the Regional Office  
 at the above address or to the National Office  
 at the above address.

Map Symbols		Map Scale		Map Orientation	
[Symbol]	Terrestrial Natural Area of Canadian Significance	[Symbol]	1:50,000	[Symbol]	North
[Symbol]	Natural Site of Canadian Significance	[Symbol]	1:100,000	[Symbol]	North
[Symbol]	Marine Natural Area of Canadian Significance	[Symbol]	1:200,000	[Symbol]	North
[Symbol]	Marine Area of Interest	[Symbol]	1:500,000	[Symbol]	North

Informational Material  
 on the map is available  
 on request.







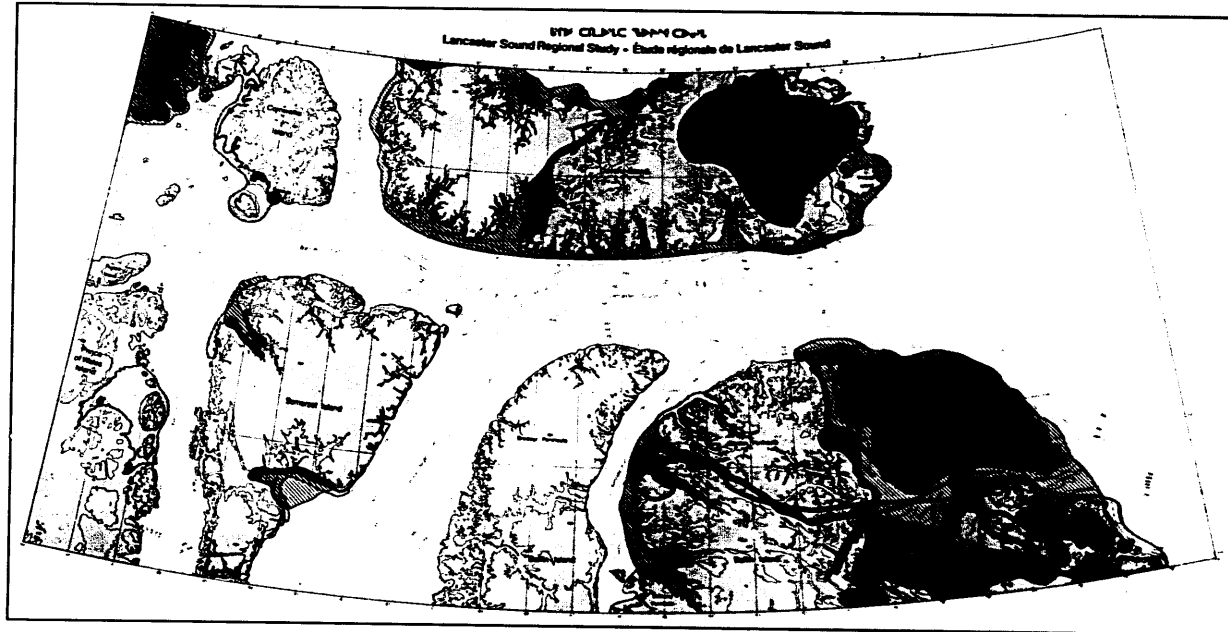


# Tourism: Potential · ᐱᓂᓴᑦ ᐱᓂᓴᑦ ᐱᓂᓴᑦ: ᐱᓂᓴᑦ ᐱᓂᓴᑦ.

## Tourisme: potentiel

- Tourism Staging Points · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Haltes touristiques
- Sports Fishing: Existing · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Pêche sportive: actuelle
- Sports Fishing: Potential · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Pêche sportive: potentiel
- Boating: Existing · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Canotage: actuel
- Boating: Potential · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Canotage: potentiel

- Nature Viewing: Existing · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Observation de la nature: actuelle
- Nature Viewing: Potential · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Observation de la nature: potentiel
- Mountain Climbing · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Escalade
- Camping/Hiking · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Camping/escalators
- Cross-Country Skiing Routes · ᐱᓂᓴᑦ ᐱᓂᓴᑦ · Sentiers pour le ski de fond



Map prepared by the Department of Environment, Planning and Development, Lancaster Sound Regional Study, 1987. The map is based on aerial photographs and ground surveys.

Map prepared by the Department of Environment, Planning and Development, Lancaster Sound Regional Study, 1987. The map is based on aerial photographs and ground surveys.

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Map prepared by the Department of Environment, Planning and Development, Lancaster Sound Regional Study, 1987. The map is based on aerial photographs and ground surveys.











ገለጻ ለሰጠው ሆኖ ይታወቃል። ለእርሷ ማንኛውንም ማሳሰቢያ ላይ ተጠቃላችኋል። ለዚህ ምክርቤት ለእርሷ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለእርሷ ማንኛውንም ማሳሰቢያ ላይ ተጠቃላችኋል።

እርሷ ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል።

እርሷ ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል።

እርሷ ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል።

እርሷ ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል።

እርሷ ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል።

እርሷ ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል። ለዚህ ምክርቤት ለሰጠው ሆኖ ይታወቃል።





-ለርብሰብንሃይላት ግንባታና ጥበቃ አሰጣጥ ለማድረግ የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል። የሥራ ማድረግ ለማስቻላት የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል።

ልማትና ልማታዊ ጥያቄ

-ለርብሰብንሃይላት ግንባታና ጥበቃ አሰጣጥ ለማድረግ የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል። የሥራ ማድረግ ለማስቻላት የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል።

-ልማታዊ ጥያቄ ለማስፈጸም ለሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል። የሥራ ማድረግ ለማስቻላት የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል።

-መርጫ ለርብሰብንሃይላት ግንባታና ጥበቃ አሰጣጥ ለማድረግ የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል። የሥራ ማድረግ ለማስቻላት የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል።

ሥራ ማድረግ ለማስቻላት

-ርብሰብንሃይላት ግንባታና ጥበቃ አሰጣጥ ለማድረግ የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል። የሥራ ማድረግ ለማስቻላት የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል።

-ጥበቃ ጥያቄ ለማስፈጸም ለሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል። የሥራ ማድረግ ለማስቻላት የሚያስፈልጉትን ገንዘብ ለማግኘት ጥረት ማድረግ ላይ ይገኛል።







CL<sup>0</sup> a ሥራ ስር ማለት ለሁሉም ለሚገኙትም፡

ከሌሎች ጋር አካባቢ

-ሰፊ ስርዓት ወይንም ለሰፊ ስርዓት ማግኘት ማለት ነው፡፡  
አካባቢ ላይ ስርዓት ለማሳካት ማለት ነው፡፡ ለሌሎች ጋር  
ሰፊ ስርዓት ማለት ማለት ነው፡፡

-ለሌሎች ጋር ሰፊ ስርዓት ማለት ማለት ነው፡፡ ከሌሎች ጋር  
ሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር ሰፊ ስርዓት  
ማለት ማለት ነው፡፡

-ሌሎች ጋር ሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር  
ሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር ሰፊ ስርዓት  
ማለት ማለት ነው፡፡

ቀን. CL<sup>0</sup> ስር ማለት ማለት ነው፡፡ ከሌሎች ጋር ሰፊ ስርዓት  
ማለት ማለት ነው፡፡

ሌሎች ጋር ሰፊ ስርዓት

-ለሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር ሰፊ ስርዓት  
ማለት ማለት ነው፡፡ ለሌሎች ጋር ሰፊ ስርዓት ማለት ማለት ነው፡፡

-ሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር ሰፊ ስርዓት  
ማለት ማለት ነው፡፡

-ለሌሎች ጋር ሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር  
ሰፊ ስርዓት ማለት ማለት ነው፡፡ ለሌሎች ጋር ሰፊ ስርዓት  
ማለት ማለት ነው፡፡



























ገ.ቡ. ልጅ (J.T. Inglis) DIAND - ልዎርብሎ ስራ - ለገዢነት  
ሥ.ላ. ኔሎ (S.A. Kanik), DIAND - ለገዢነት ስራ ለገዢነት  
ገ.ሥ. ሎክ (J.S. Loch), DFO - ርብረብ ለገዢነት ስራ  
ቡ.ሥ. ሊቅ (D.C. McKay), DOE - ስራ ለገዢነት ስራ  
ገ.ገ. ሊቅ (G.G. McLean), DOE - ስራ ለገዢነት ስራ  
ገ.ሥ. ገር (J.N. Parker), DIAND - ስራ ለገዢነት ስራ

ላ.ሩ. ሊቅ (B.R. Pelletier), EMR - ስራ ለገዢነት ስራ  
ገዢነት ስራ

ላ.ቡ. ሲሙሊ (B.D. Smiley), DFO - ርብረብ ስራ

ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ

ላ.ሊ. ሲት (A.M. Ault), ርብረብ ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ

ሥ. ዘርጅ (K. Harper), ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ

ዘ.ሊ. ማይ (H.M. Myers) - ገዢነት ስራ ለገዢነት ስራ

ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ

(N. Saab).

ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
(ርዕይ ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ)

ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ  
ገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ ለገዢነት ስራ



- 1.11 የፋሽያ ሥልጣን ላይ የሚገኝ የግንባታ ስራ
- 1.12 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.13 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.14 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.15 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.16 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.17 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.18 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.19 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.20 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.21 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.22 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.23 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.24 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.25 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.26 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ

- 1.27 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.28 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.29 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 1.30 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.1 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.2 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.3 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.4 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.5 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.6 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.7 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.8 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.9 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.10 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ
- 2.11 የግንባታ ስራ ላይ የሚገኝ የግንባታ ስራ

2.12 በገጠና ጠባብረዎችን ለማጠናከር የሚደረግ ጥረት

2.13 ልዩ ልዩ

2.14 ለሥራ ማጠናከሪያ

2.15 በባለሙያዎች

2.16 የገጠማዊ

2.17 ለገጠማዊ ድጋፍ

2.18 ድጋፍ ለሥራ ማጠናከሪያ

2.19 ለሥራ

2.20 በገጠማዊ

3.1 ልዩ ልዩ

3.2 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.3 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ

3.4 በገጠማዊ ለሥራ ማጠናከሪያ

3.5 የገጠማዊ ለሥራ ማጠናከሪያ: 1979-1980

3.6 ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ/ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

4.1 በገጠማዊ ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.7 ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.8 ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.9 ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.10 ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.11 የገጠማዊ ለሥራ ማጠናከሪያ

3.12 የገጠማዊ ለሥራ ማጠናከሪያ

3.13 በገጠማዊ ለሥራ ማጠናከሪያ

3.14 ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.15 በባለሙያዎች ለሥራ ማጠናከሪያ (የገጠማዊ ለሥራ ማጠናከሪያ)

3.16 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ ለሥራ ማጠናከሪያ

3.17 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ (የገጠማዊ): ለሥራ ማጠናከሪያ

4.1 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ: የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ

4.2 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ: የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ

4.3 የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ: የገጠማዊ ድጋፍ ለሥራ ማጠናከሪያ

4.4 ስርዓት ለመፈፀም: ሥነምግባር አድካሚዎች: ቁጥጥር

4.5 ስርዓት ወይንም ለሌሎች ሁኔታዎች: ህዝብ ለመደገብ ይጠቀሙልን

4.6 ሌሎች ሁኔታዎች ለተጠቃሚዎች ሁኔታዎች ለማስታወሻ

4.7 ለሁለተኛው ሰባት ስራዎች (IBP)

4.8 ስራዎች: ሆስፒታል ይጠቀሙልን

4.9 ስራዎች ስራዎች: ሆስፒታል ይጠቀሙልን

4.10 ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

4.11 ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

4.12 ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

4.13 ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

4.1 ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

4.15 ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

4.16 ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች (ሆስፒታል): ሆስፒታል ይጠቀሙልን

ሆስፒታል ይጠቀሙልን ስራዎች ስራዎች

I. ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች

ስራዎች ስራዎች ስራዎች ስራዎች

ስራዎች ስራዎች

ስራዎች

ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች

II. ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች ስራዎች

ስራዎች ስራዎች

ስራዎች ስራዎች ስራዎች

III. ልዕሎች ልዩ-ልዩ ልዩ ልዩ ደርጅታዎች ለመለካት ጥረት ሊያደርጉ

ሚችሉበት ሁኔታ ላይ ማስፈጸም ይገባል።

ርዕዮተኛ ለውጥ ለማስፈጸም

ጥረት ሊያደርጉ ለልዩ-ልዩ ልዩ ልዩ ደርጅታዎች

ሚችሉበት ሁኔታ ላይ ማስፈጸም

IV. ለውጥ ለማስፈጸም ጥረት ላይ ማስፈጸም ማስፈጸም

ሚችሉበት ሁኔታ ላይ

ጥረት ላይ ማስፈጸም

ሚችሉበት ሁኔታ ላይ

V. ለውጥ ለማስፈጸም ጥረት ላይ ማስፈጸም ማስፈጸም

ጥረት ላይ ማስፈጸም ማስፈጸም ማስፈጸም

ጥረት ላይ ማስፈጸም ማስፈጸም ማስፈጸም

ጥረት ላይ ማስፈጸም ማስፈጸም ማስፈጸም









3. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
4. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
5. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
6. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
7. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።

የሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።

1. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
2. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
3. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።
4. ለሥራ ለማስፈጸም የሚያስፈልጉትን ሰነድ ለጥቅም ላይ ማውሰድ ነው።













እስካሁን ቁጥር የሚገኘው 1982-ሳይኔኒ. ከገጽ ፩ (Cominco) ምሁር ለዓለም ርዕይ  
ሆኖ ይገኛል። ለዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል።

ለምሳሌ ገራገራ ገጽ ላይ የተገኘው የ1964-ህዝብ ጋ. ወጥቶ ለዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል።

እስካሁን በዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል።

ለምሳሌ ገራገራ ገጽ ላይ የተገኘው የ1964-ህዝብ ጋ. ወጥቶ ለዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል። ለዚህም ስምምነት ይገኛል።