

INUIT KNOWLEDGE AND PERCEPTIONS OF THE
PROPOSED GREAT WHALE RIVER
HYDRO-ELECTRIC PROJECT
ON THE ENVIRONMENT, ECOLOGY
AND SUBSISTENCE ECONOMY OF
KUUIJJARAPIK

Submitted to
Kativik Environmental Quality Commission

By
William B. Kemp
march 21, 1983

LIST OF TABLES AND FIGURES

	Page
Table 1. Historical Individual Land Use Preference by Region, Species and Season	8
Table 2. Current Individual Land Use Preference for Critical Impact Areas by Species and Season	9
Table 3. Harvest Levels - Kuujjuarapik	11
Table 4. Harvest Levels from Critical Impact Areas	12
Figure 1 - Outer Boundaries (Land and Water Use) by Inuit of Kuujjuarapik	3

SUMMARY OF THE APPROACH AND FINDINGS

This report summarizes the findings from an interview-based study that was carried out in Kuujjuarapik on behalf of the Kativik Environmental Quality Commission. The purpose of this study was to evaluate the knowledge and perceptions of Inuit hunters about the impact of the proposed Great Whale River hydro-electric project on the environment, resources and subsistence economy of Kuujjuarapik. The Commission requested that at least ten "non-directed" interviews be conducted with experienced hunters. The Commission formulated a series of questions that they wanted answered and these served to define the specific objectives of the study. The interviews were supplemented by findings from previous field work in the community. Information on land use patterns, harvest levels and traditional ecological knowledge was most significant and it facilitated the collection and interpretation of the interview data. Seventeen interviews were conducted between August 23 to 28, 1982. The best method for obtaining information was to have three to four people available at each session. Discussions, rather than specific interviews, were most productive, since it encouraged hunters to exchange information and opinions about the project and its impacts. In all interviews, maps were the essential tool used to animate discussion, and it was here that findings from previous field studies were most effectively used.

The report is divided into three sections. Section I is a review of information on the patterns of land use and hunting territory. Section II is a brief statement on harvest levels and it contains a discussion of Inuit information about important species. Section III contains the Inuit response to the specific questions of the K.E.Q.C. It is hoped that the information in Sections I and II provide background and context for the responses set out in Section III.

The findings from the three sections are summarized below. The first group relates to the general problems that must be overcome if the community is to play an active role in assessing project impacts. The second group of findings briefly summarizes the response of hunters to the questions raised by the K.E.Q.C.

Summary of General Concerns

1. The hunters of Kuujjuarapik are concerned about the potential impacts from the proposed hydro-electric development. Within the community, however, there are differing points of view and levels of understanding on how the environment, resources and people will be affected. Individual opinion has not yet consolidated into well-formulated positions about the project and its impacts, and the concerns of hunters tend to focus on very specific events rather than on more generalized impacts or chains of impacts.
2. Hunters are perfectly capable of working out chains of cause and effect when given the information, the range of possibilities, and the proper atmosphere for discussion and debate. It must be noted, however, that causes and impacts may be defined from a perspective quite different from that of scientists.

3. At the present time, it is simply not possible to expect the community of Kuujjuarapik to take an active role in debating the environmental and social impacts of such a major project. The reasons for this are important and, from general observations in the community, four are most significant.
 - i) The community still does not have a detailed picture of the project, and many of the impacts are really not known.
 - ii) Individuals or groups have met to exchange information and points of view, yet seldom in a way that encourages a systematic expression of Inuit opinion. People fly in and fly out, different faces, different problems, different mandates - and with discussion always taking place under an atmosphere of uncertainty as to whether the project will or will not become a reality and usually stressing priorities or concerns of the people from outside.
 - iii) There is no structure within the community to accommodate the needs that are required to develop a systematic point of view about the entire project; to establish an information base appropriate for community use; to identify the network of organizations, individuals, and mandates that the community must interact with; and to encourage initiative within this network that will allow for the community to take action and establish objectives and priorities of their own rather than always being asked to respond to the objectives and initiatives of others.
 - iv) The effort required to change this situation will take time and it must be remembered that the community does not comprehend how to effectively utilize a formal structure such as the K.E.Q.C. An effort must be made to resolve this problem or it will result in yet another situation where the attitudes and actions of the recipients of outside-induced change are blamed for the consequences of this change on their environment and society.
4. Because it is not yet resolved, major contradictions in the Inuit arguments or approach must be expected, and the reasons they retreat from cooperative work and debate must be understood. At this point, the only safety Inuit feel is within the political process, since it is here that they have been most effective and have developed some expertise of their own. The K.E.Q.C. is to be a neutral and independent body. This is a difficult concept to explain and it requires the development of new principles for working together.
5. A major reason that has served to confuse the issues associated with the project and its impact, is the fact that many of the hunters intend to relocate to a new settlement near Richmond Gulf. Since many individuals think of the project in terms of relocation, there is a different level of concern about how they will cope with the project.

The implications of relocation and the distinction between Richmond Gulf and the present community are complex. To many individuals, the relocation will serve to isolate the community from the project, leaving those individuals who remain at Kuujjuarapik to deal with the impacts. The point of view most often expressed is that the project will tend to "push" both marine and land mammals further north and the people will follow partly to preserve access to animals, but partly to avoid negative social impacts from the project itself. This division is reinforced by the selection of Category I and II lands in the Richmond Gulf area.

Summary of Specific Findings

1. A total of 30 species are presently harvested by the Inuit of Kuujjuarapik for a yield of potential food of .98 pounds per person per day. The average yield for the other Inuit communities is 3 pounds of potential edible food per day. Marine mammals are most important, followed by migratory birds. These harvest figures demonstrate the precarious nature of the Great Whale River subsistence economy and illustrate the potential for significant impact from the project.
2. The maintenance of at least the present level of harvesting activity is essential to the physical and social health of the community. If the proposed project has a severe impact on the current level of subsistence activity, then there could be serious nutrition, economic and social repercussions.
3. Manitounuk Sound will be affected in winter and summer. In winter, the freshwater will probably make the ice unsafe in the GB-1 area, thus making safe winter travel more complicated or even preventing it.
4. Freshwater intrusions into the Sound may change the feeding patterns of seals, especially of bearded seals in the fall but it is not certain if the changes will be for the worse. The increase in fresh water will increase loss of seals from sinkage during summer hunting.
5. The Little Whale River is seen to be impacted to the extent that it will not support any estuary marine resources, especially beluga whale and certainly no freshwater fish. Ptarmigan may remain, but without the other resources they are not important.
6. The money and time costs of hunting will be changed if the project is developed. Hunters that remain in Kuujjuarapik will have to travel much further, especially in summer and fall. The costs of this travel are substantial and it will limit people who do not have the available equipment and income to support the equipment. It will also affect the time available when employed hunters will be free to travel.

7. The impact of the project on the cost of winter hunting is less certain in the mind of the hunters, who feel that both the pattern and productivity may not be greatly affected. It should be noted, however, that winter hunting does not yield large quantities of food.
8. The hunters view resettlement in Richmond Gulf to be the best means for lessening the cost of hunting and for increasing the availability of country food in all seasons.
9. Hunters do not expect to use the roads to gain access to resources, or to use roads to open up new hunting areas. It is thought that roads lead inland, and thus the Cree will gain most from them. There was no desire to use the road to Bienville for access to hunting territory, but they felt that the road connection to Val Dor will have beneficial economic effects.
10. The impact from the project in terms of noise and changes in habitat or ecology will have both local and regional impacts on the resources, but it will be particularly difficult for those people wishing to live and hunt from Kuujjuarapik, and especially those who utilize Manitounuk Sound in spring and fall.
11. The Inuit will not move inland into Cree territory, but they fear an increase of Cree activity in the northern region, especially Cree fishing activity in Richmond Gulf and near the Nastapoka River. There is not a clear idea of how inland areas (especially caribou areas) may be affected, but there is a general feeling by Inuit that Cree activity along the northern coast will intensify, because of changes inland.
12. The impact of the projects on currents within the Sound and to the south is not clear, and the Inuit do not wish to predict the changed patterns and its consequences.

I. LAND USE AND HUNTING TERRITORY

The patterns of seasonal economic activity and land use for the Inuit of Kuujjuarapik can be divided into four seasons, each of which is defined by a particular condition of the land, freshwater, marine and sea ice environment; by the availability, abundance and accessibility of specific resources, and by the type of hunting activity that is required to harvest these resources. In addition to environmental and resource considerations, the social and historical factors that linked family groups to particular living sites and hunting territory are reflected in patterns of land use. This linkage between people and place is fundamental for developing the information base that is needed to hunt successfully, and it ensures that social relationships are an essential part of life on the land.

In earlier times, it was essential to maintain the sequence of places and activities that comprised the seasonal cycle. The territory exploited and the levels of harvest for one season created a set of conditions that would affect the type, scheduling and organization of activity in other seasons. Prior to the centralization of the population in Kuujjuarapik, social groups tended to adjust the location of their seasonal villages in order to minimize the time, distance and energy required for daily travel to hunting areas. Today, the situation has changed. Hunters tend to minimize seasonal relocations and maximize their daily or short term trips to hunting areas. This factor has had an impact on the choice of technology which has led to a concentration of activity in particular areas. Today, hunters rely on motorized transport in both winter and summer, and this has brought about a distancing of people from the day to day observations of events in the natural world. As well, new linkages have formed between hunters and the money economy so that it is now essential to maintain a source of income in order to maintain the capacity to hunt.

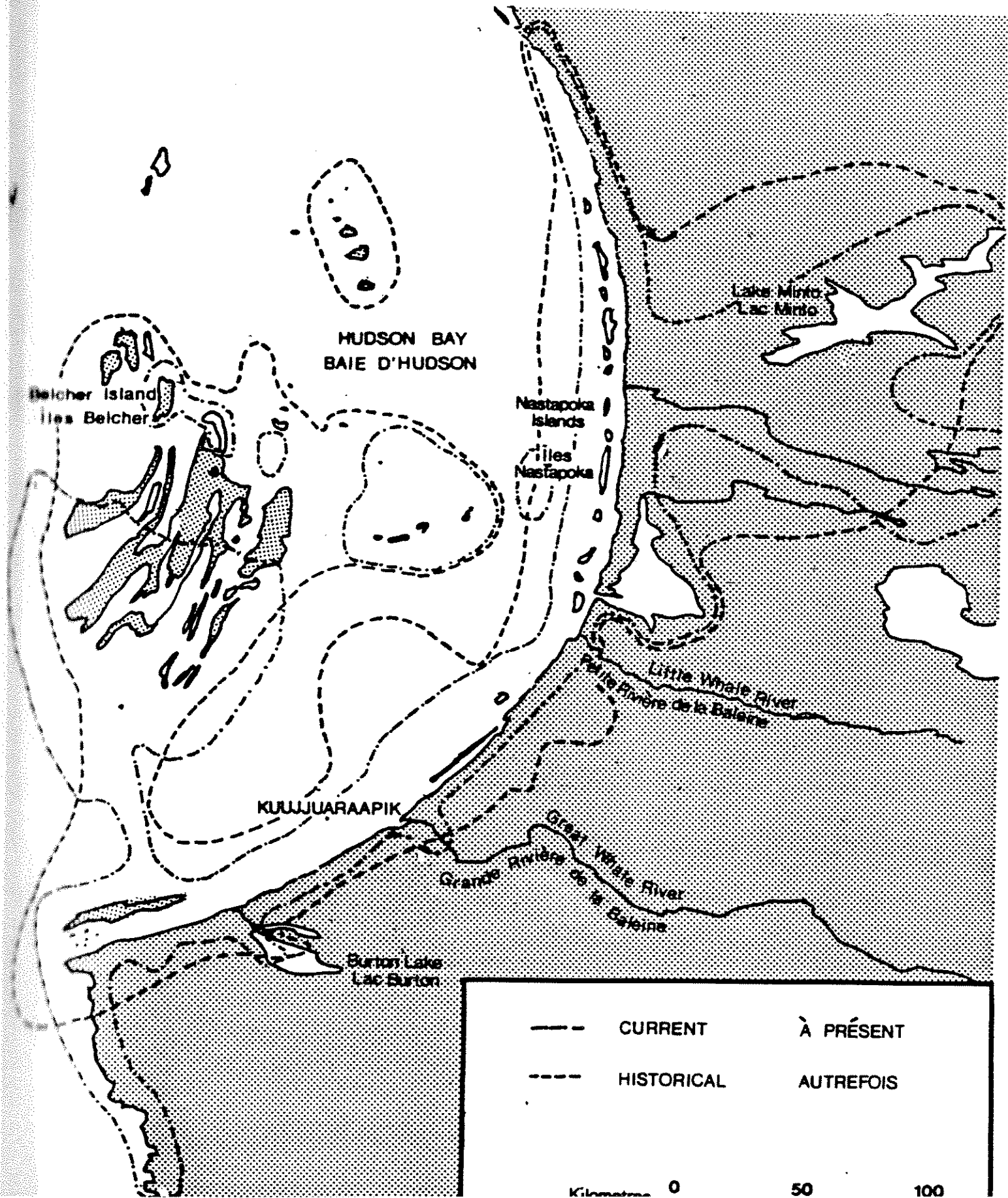
Families may occasionally spend extended periods of time in camps away from the community and, in particular, traditional spring and fall

camping sites remain important. For individuals who are bound to the routines and schedule of employment or other responsibilities, it is difficult to establish camps for long periods of time, especially when faced with the difficulty of advanced planning for an activity that can be easily disrupted by bad weather or by the unpredictability of ecological events. This situation is overcome by a reliance upon faster forms of transport which facilitate quick trips to more distant areas but which significantly increase the cost of hunting. It also means that certain areas in close proximity to the community will be exploited by more people on a regular basis and consequently there is usually a decline in hunting productivity in these zones.

The general configuration of the hunting territory for the Inuit now residing in Kuujjuarapik is shown on Figure 1. This map denotes the outer boundary of land use in the Great Whale River area for historical and current times. Historical land use was integrated with a pattern of semi-permanent seasonal living sites and the recent land use is supported by particular spring, summer and fall camping areas and by the technology of motorized travel.

The seasonal land use and harvesting of Kuujjuarapik is concentrated in three primary areas. The region north of Little Whale River, the region centering on the community itself and the region stretching south of the community to the vicinity of Long Island. Although the hunting area is continuous for both past and present times, the three subdivisions represent a segmentation of the southwestern Hudson Bay Inuit into loose regional groups, that tended to focus their activity patterns and the social relationships associated with a hunting economy within particular territories. Thus, certain individuals or family groups are considered to have special knowledge or insights about an area, but this does not mean they have any exclusive use of that area. The social organization of the Inuit in this region is similar to other areas in northern Québec and the Northwest Territories where certain places are identified with particular social groups, but there are no exclusive boundaries; land and resources may be used by everyone.

OUTER BOUNDARIES (LAND AND WATER USE) BY INUIT OF KUJJUARAAPIK
EXPLOITÉES PAR LES INUIT DE KUJJUARAAPIK (LIMITE DES TERRES ET DES EAUX)



Richmond Gulf North

This region extends from the estuary of the Little Whale River north to the Nastapoka River. The center of activity, both past and present, is in Richmond Gulf. The region also includes the major area of inland hunting that begins south of the Nastapoka River and stretches to the north and east of Lake Minto. The region is often difficult to reach from Kuujjuarapik since the ice north of Manitoumuk Sound is not safe for travel before early January, and it begins to deteriorate in April. Travel north of Richmond Gulf is made difficult by the bad ice at Gulf Hazard which can extend 30 miles seaward. Inuit note, however, that the currents of the Little Whale River and Nastapoka River do not affect the quality and stability of the sea ice in their estuaries.

The northern region provided opportunities for marine and land resources and, especially, the only important areas for arctic char. Richmond Gulf was the site of a small trading post, and there were at least three permanent winter settlements in the area. It was possible to travel to the northern end of the Gulf for caribou, in both winter and summer. In August, hunters would walk inland to Lake Minto to harvest a larger number of caribou which would be cached and removed by sledge in winter.

The beluga whale which was hunted in late spring and summer was an important source of food, and the surplus was stored for use by the dogs in winter. The fall hunting of seals provided meat that could be stored for human consumption during the winter. Geese were important in spring and fall, with the best areas located along the southern reaches of Richmond Gulf and in the Nastapoka Islands. In spring, some families would move into the Nastapoka Sound area to combine goose hunting with the hunting of basking seals which was considered to be best in this area.

In summer, travel along the coast occurred, in search of belugas at the estuaries, for seals along the coast, and for fishing for brook trout and whitefish at the mouths of the rivers.

Manitounuk Sound Region

Manitounuk Sound and the Great Whale River estuary is a critical harvesting area for the people of Kuujjuarapik. The Manitounuk Sound area has been important to the regional hunting economy long before the development of the present community and sites in the region, but not all of them would be occupied in any one year. At present the Sound is used for hunting activity in all seasons of the year and it is especially used for short periods of camping during the spring and summer months. The Sound is easily reached by canoe, so that hunting can take place after working hours or on weekends. In good weather, individuals that are employed will often begin or end their day with several hours of hunting in this area.

A decline in the number of marine mammals over the past few years was noted by the hunters, who attributed the cause to noise and other activity and not to the depletion of resources from hunting. As shown in Table 4, hunting activity has produced on average approximately 14,726 pounds of food, but this figure is probably an underestimate of the total harvest from the region. One important aspect of the harvest from this area is that all of the harvest is consumed, since there are no problems with transporting the meat to the community. A conclusion drawn from the information and opinions of hunters is that the number and seasonal occurrence of animals has declined somewhat, but hunting pressure has remained constant.

Manitounuk Sound is described by Inuit as being shallow "like a lake" with a smooth sandy bottom. The surface of the marine water is protected from severe storms and it provides safe travel by canoe. The Sound is the first marine area to freeze in winter, and it is considered to be a good ice surface from freeze-up in early December, until sometime late in April. The sea ice forms first in the north end, and then spreads south. Currents in the Sound keep the waters adjacent to Paint Island open usually until Christmas. While boat and Schooner openings seldom freeze, this open water does not affect the strength of the

surrounding ice. Great Whale River estuary is the last place to freeze. It stays open until the entire Sound is frozen and then the sea ice moves against the shore near the river, so that the entire area can be used for travel and hunting.

The fewest number of seals within the Sound are found during summer, although people continue to hunt the area, particularly along the western shore where beluga whales are occasionally encountered as they move south. Seal hunting begins to improve in late summer, and early fall. When the geese return to rest and feed along the eastern shore of Manitounuk Sound, there is also good common seal hunting which continues until freeze-up begins. As well, bearded seal gather in the north end, just before freeze-up. At this time, seals tend to move out of the Sound since there are few breathing holes established in this region. With the coming of ice in early December, traps are set along the shore, and one individual reported an income of \$4,000 from traps set in this area. After freeze-up, hunting activity tends to concentrate in the area seaward from the Great Whale River and along the leads to the west of the Manitounuk Islands. In April and early May it is still possible to travel on the ice of the Sound, so hunters are able to reach the goose resting or nesting areas and to hunt basking seals. After break-up, activity once again stresses marine mammals.

The Long Island Region

The area south of Great Whale River lead a different pattern of land use, since the harvesting zones were spread along the coast. The major living sites occurred at the mouths of the rivers, where brook trout and whitefish were important, and where, it was noted, seals tended to feed. There was no active whaling in the south of Great Whale River except along the western shore of Long Island where belugas gathered in the fall. On occasion, belugas could also be found trapped in the ice as it formed in Long Island Sound.

The southern part of the territory began to freeze in early January, and once solid ice had formed, it supported travel until early May. In present times, people travel south of Kuujjuarapik by snowmobile in late April or May, and return by canoe after the spring goose season. In winter, some polar bear hunting took place to the west of the southern tip of Long Island. In winter as well, there was some caribou hunting in the Burton Lake region, and brook trout, lake trout and whitefish were plentiful enough to support a winter habitation in the north-west sector of Burton Lake.

Impacts on Individuals

The harvest of individuals that most frequently exploit the areas that are to be directly affected by the Hydro project are identified in Table 1 for historical times and in Table 2 for current times. These two tables are an indication of the number of hunters who have consistently harvested these areas and they provide a means for establishing the relative intensity of activity by season and species. The actual harvest that is produced by the individuals shown for current land use (Table 2) is described in Table 4. The tables identify the actual people who will have their harvesting activity most affected by the project, and it provides a means by which members of the Environmental Quality Commission can, in the future, identify individuals that they need to have direct contact with.

There is a remarkable consistency between the users of historical and current times, for these three areas. The table, however, does not illustrate other changes that have been taking place in the region, between past and present times. In particular, there has been an important shift in hunting activity and especially late winter and spring activity in the Richmond Gulf region. This area lost population with the development of Kuujjuarapik in 1980's and it has not been actively settled since that time. The region south of Great Whale River never was quite as important and the intensity of its use does not appear to have changed significantly between the historical and current period of land use.

TABLE 1

HISTORICAL INDIVIDUAL LAND USE PREFERENCE
 (Number of Hunters who reported harvesting
 in areas of Project impact, by Species and Season)

	NASTAPOKA RIVER				LITTLE WHALE RIVER				MANITOUNUK SOUND AND GREAT WHALE RIVER AREA			
	WINTER	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER	FALL
Ad Seal	3	3	4	3	10	10	14	8	16	19	32	19
Red Seal	3	2	4	4	9	9	10	9	12	12	22	15
Wolverine	-	1	10	1	-	4	22	1	-	3	24	1
Black Bear	-	-	-	-	-	-	-	-	-	-	1-got one once	-
Walrus	-	-	1	-	-	1	10	-	-	2	19	1
Arctic Char	1	1	-	-	-	1	1	1	-	-	2	-
Trout	1	1	2	2	-	-	2	1	1	1	1	-
Salmon Trout	-	-	-	-	1	2	8	2	-	1	7	2
Arctic Char	4	-	1	4	5	-	-	3	19	-	-	8
Trout	1	-	1	-	-	-	-	-	1	-	-	-
Arctic Char	-	3	3	3	-	5	5	5	-	8	11	11
Goose	-	1	-	1	-	3	1	2	-	26	4	24
Goose	-	1	-	1	-	1	-	2	-	8	1	26
Goose	8	-	2	-	1	1	-	1	-	-	-	-
Goose	5	3	2	2	9	2	2	1	33	17	3	8
Goose	1	-	-	-	-	-	-	-	12	1	-	-

TABLE 2

CURRENT INDIVIDUAL LAND USE PREFERENCE
 (Number of Hunters who reported harvesting
 in areas of Project impact, by Species and Season)

	NASTAPOKA RIVER				LITTLE WHALE RIVER				MANITOUNUK SOUND AND GREAT WHALE RIVER AREA			
	WINTER	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER	FALL
Red Seal	2	1	3	1	8	8	16	9	19	22	39	19
Red Seal	1	2	1	2	6	6	6	6	14	11	19	14
Wolverine	-	1	17	-	-	2	21	-	-	2	19	-
Caribou	-	-	-	-	-	-	-	-	-	-	1	-
Arctic Char	-	-	4	-	-	3	13	3	1	1	12	2
Arctic Char	-	-	2	-	-	-	-	-	-	-	1	-
Arctic Char	-	-	2	-	-	-	5	-	2	-	1	-
Arctic Char	-	-	5	-	-	2	10	1	1	1	13	3
Arctic Char	7	-	-	3	6	-	-	2	18	1	-	6
Arctic Char	2	-	1	-	-	-	-	-	2	1	-	-
Arctic Char	-	2	3	1	-	3	5	2	-	14	9	15
Arctic Char	-	1	1	1	-	2	-	2	-	27	4	28
Arctic Char	-	1	-	1	-	1	-	3	-	11	1	32
Arctic Char	8	-	4	-	-	-	-	-	-	-	-	-
Arctic Char	6	2	1	1	7	3	2	2	35	21	1	3
Arctic Char	-	-	-	-	-	-	-	-	7	-	-	-

II. HARVEST LEVELS AND SPECIES ECOLOGY

The information in this section has been drawn from the results of two studies: a five-year analysis of the level of harvesting that was carried out within all of the Inuit communities in northern Québec. The information on the patterns of behavior and ecology for each species was drawn from a series of interviews that documented Inuit knowledge about the movements, milieu and behavior of animals, and it reflects the basic information that hunters accumulate from observing animals. Inuit knowledge represents both factual knowledge or informed opinion and it is accumulative so that changes in species behavior, number and distribution over time are an integral part of the Inuit system of ecological knowledge.

Hunting activity as defined in the land use maps also requires an estimate of the production from the harvest of resources. Table 3 illustrates the level of harvest for each of the major species that were obtained by the hunters of Kuujjuarapik, and represents the entire community harvest for all regions. In Table 4, the harvest level and food value derived from this harvest have been estimated for three of the areas most likely to have a direct impact from the project. The means used to establish this figure was based upon the combined use of harvest and land use information. That is essentially a quantification for Table 2. The methods used to determine these levels tend to be conservative, since only those harvests that could be verified for a particular area were included.

This baseline data is essential for the evaluation of impact, since it is one of the few quantitative measurements of Inuit life on the land. It is critical, however, to remember that harvest levels represent more than a strict quantitative measure of production. It is also an indicator of choices and the allocation of time and skill to a life style that has an important social significance.

Most animals are harvested for food, although some income can be derived from the sale of seal and fox skins. In order to give a

TABLE 3

HARVEST LEVELS - KUJJUARAPIK

SPECIES	1976	1977	1978	1979	1980	Average	
						Number	Edible weight
Ringed Seal	3,276	2,114	1,282	1,375	1,452	1,898	59,787
Hooded Seal	107	66	42	92	111	83.6	18,133
Narwhal Seal	2	2	0	8	5	3.4	323
Ringed Seal	1	0	2	-	-	0.6	37
Beluga Whale	60	55	51	63	75	60.8	38,121
Walrus	2	0	0	-	-	0.4	163
Polar Bear	9	1	8	4	3	5	1,750
Caribou	384	140	212	238	235	241.8	30,950
Wolf	4	3	6	7	6	5.2	--(1)
Arctic Fox	208	32	115	39	210	120.8	399
Snow Geese	1,314	600	577	7,528	4,610	2,925.8	10,240
Canada Geese	5,292	4,992	3,870	5,914	3,787	4,771	22,423
Crane	-	-	-	707	250	478.5	669
Ducks	2,849	3,686	3,164	3,354	3,270	3,664.6	6,229
Loon Eggs	1,543	4,538	963	373	602	1,603.8	368
Goose Eggs	-	-	-	19	-	9.5	2
Gulls	11	45	84	25	21	37.2	37
Skua	192	45	92	26	38	78.6	63
Loons	682	316	360	537	306	440.2	1,628
Arctic Hare	44	82	18	51	43	47.6	243
Lemming/Ptarmigan	9,471	8,325	11,478	10,588	9,868	9,946	6,962
Snowy Owl	14	8	17	61	13	22.6	79
Arctic Char	1,423	1,499	695	334	381	866.	3,899
Salmon	54	184	66	-	2	61.2	520
Lake Trout	1,631	1,180	231	643	40	745	5,215
Codfish	4,782	3,276	1,832	1,361	1,154	2,481	6,203
Whitefish	7,227	3,301	1,496	3,905	4,491	4,064	6,096
Brook Trout	6,947	5,346	1,672	3,262	4,241	4,293.6	8,587
Arctic Char	5,777	3,306	5,073	3,862	4,200	4,443.6	2,222
Land-Locked Char	0	93	0	371	7	94.2	236

(1) Not consumed.

231,584

TABLE 4

CURRENT HARVEST LEVELS IN AREAS OF DIRECT IMPACT
 For the years 1978 and 1980
 (Expressed in numbers and edible weight)

Species	Manitoumuk Sound & Gr. Whale River		Little Whale Estuary and River		Nastapoka Estuary and River		Total	
	Number	Weight	Number	Weight	Number	Weight	Number	Weight
Ringed Seal	191	6,017	6	189	2	63	199	6,268
Bearded Seal	10	2,169	.2	43	0	0	10.2	2,212
Beluga Whale	4	2,508	5	3,135	4	2,508	13	8,151
Polar Bear	0	0	0	0	0	0	0	0
Whitefish	101	152	33	50	5	8	139	210
Arctic Char	2	9	0	0	0	0	2	9
Lake Trout	0	0	5	35	0	0	5	35
Brook Trout	94	188	35	70	0	0	129	258
Arctic Fox	30	99	.3	1	5	17	35	117
Wolf	0	0	0	0	0	0	0	0
Ducks	165	281	6	10	3	5	174	296
Canada Geese	248	1,116	0	0	0	0	248	1,116
Snow Geese	155	543	4	14	0	0	159	557
Caribou	0	0	0	0	8	1,024	8	1,024
Ptarmigan	2,350	1,645	28	20	19	13	2,397	1,678
Arctic Hare	0	0	0	0	0	0	0	0
Totals (weight)		14,726		3,567		3,638		21,931

relative value to each species taken by the Inuit of Kuujjuarapik, the number of animals harvested have been translated into edible weight. Pounds of edible meat thus become the common denominator among all species. Edible weight enables a comparison to be made between species in terms of their relative importance to the total diet and it provides a rational means to help determine the cost of hunting and the economic cost of subsistence resources.

During the years 1976 to 1980, the Inuit of Kuujjuarapik harvested an annual average of 231,584 pounds of food. In 1980, the Inuit population was 644. Therefore, the harvest provided .98 pounds of food, per person, per day. This is a maximum figure that represents potential food considering that some wastage may occur. Compared to other northern communities where as much as 3 pounds of food per person per day is derived from the land, Kuujjuarapik's harvest is low. This is because large quantities of any one species, with the exception of geese in the spring and fall, are not present. There is no large herd of caribou in close proximity to the community and no large runs of anadromous Arctic char in the rivers of the region. The harvest is very diversified and dependent on small concentrations of animals in specific regions. Any disruption in the availability or quantity of these resource would mean a significant decline in food production in regions presently used for harvesting.

Marine Mammals

Marine mammals comprise the largest portion of the total subsistence harvest. An average annual harvest of 1898 ringed seals provides 60,000 pounds of food. An average of 60 beluga whales are killed, which provides 38,000 pounds. Bearded seal provides 18,100 pounds. Other marine species such as ranger seal, harp seal, walrus and polar bear provide an average of 2,300 pounds of food annually.

Ringed Seal. Ringed seal can be found anywhere along the Hudson Bay coast throughout the year. In late spring, after the ice breaks up, they congregate close to the shore to feed. When the ice begins to clear, they form larger groups and move further out into the bay. Once they are in the bay, they tend to congregate in the shallow waters around islands. In the fall, they once again move back towards the coast. In the winter when there is heavy ice cover, ringed seals maintain breathing holes along the coast or remain out at the floe edge and in open leads.

The ringed seal mates in the fall, close to the shore. The males will stay with the females until the pups are born in the spring. The young are born under the ice in areas where the ice cover is solid. Later in the spring, when the sun is high, seals bask on top of the ice and they also stop feeding. Therefore, the seals lose fat and often sink when they are shot.

The Inuit feel the ringed seals have no particular migration pattern other than the seasonal movements towards and away from the shoreline. They tend to follow the currents in Hudson Bay and can be found just about everywhere. In late spring, there may be a "drift" of seals north following the ice. Ringed seals can be hunted from Pointe Louis XIV to McTavish Island during the summer. In late spring, hunting occurs place up to 35 or 40 miles from shore, depending on the wind and the ice cover. Open water hunting in summer occurs in an area from 10 to 15 miles from shore, unless it is in conjunction with travel to outer islands. Seal hunting in the summer also occurs while travelling to and around the outer islands; as far as the Sleeper and Marcopeet Islands, some 120 miles from the nearest point on the mainland and approximately 200 travel miles from the community.

In the winter, breathing hole hunting takes place from Long Island Sound north to Le Goulet (the entrance to Richmond Gulf). Breathing holes are maintained in landfast ice with the usual area exploited averaging 12 miles from shore. In December and January hunting takes

place at the floe edge, which is continually advancing. By February, there is usually an ice cover right across to the Belcher Islands and so that the entire expanse of sea ice between the mainland and the Belcher Islands can be hunted. The most important areas, however, are the open leads.

Bearded Seals. Bearded seals move into the eastern part of Hudson Bay in the fall from the north and then begin to travel south in large groups usually from shore just before the ice begins to form. They will pass by the western side of Long Island, moving into James Bay where they will winter in the pack ice. Also in the fall, the bearded seals that have remained in the open water outside of the coastal islands of the Kuujjuarapik hunting territory will move closer to shore and feed in the shallow waters of river mouths. This is particularly noticed in Little Whale River, where the bearded seals will move upstream to feed near the rapids.

In the winter, except for a few stragglers, bearded seals are not found in the area. They keep breathing holes, which can be distinguished from those of the common seal when caught in the land fast ice, but the Inuit do not specify any particular places where these are regularly found. Bearded seals mate in the spring in the southern Hudson Bay area, off the floe edge, where there is constant pack ice. The pups are born in the following spring. Before full break up, bearded seals begin to move northward, close to the shore. At this time, they bask on the ice and it is here that they acquire their summer coats. In early summer, they travel in small groups and feed in the shallow coastal waters. After break up in the summer, they continue to move northward with the floating ice into northern Hudson Bay. A few bearded seals, however, can always be found in the Kuujjuarapik area, mainly in the shallow water around the coastal islands and in river mouths. Bearded seals are bottom feeders and mainly consume crabs, clams, snails and starfish. In the river mouths, they feed on fish. In the spring they are hunted on the ice while basking in the sun. In the summer, they are harvested close to the shore, as they move northwards. Two important

open water hunting areas are along the west coast of Long Island and the north end of Manitounuk Sound and in the Little Whale River.

Beluga Whale. Beluga whales enter the Hudson Bay area from the north in June. By July or as soon as the ice is gone, they move south towards the Kuujjuarapik area. Somewhere north of the King George Islands, the whales will divide into two groups, one group moving southwest to the Belcher Islands, while the other group continues close to the shore on the inner side of the coastal islands. While there is still heavy ice cover, they congregate around Duck Island. As the waters clear of ice, they begin to move towards the shore. They will then move north and south into the estuaries of the Nastapoka River, the Little Whale and Great Whale rivers and into Richmond Gulf. Some whales move into the north end of Manitounuk Sound and then south along the west side. Whales are thought to move first to the Nastapoka and then to Richmond Gulf. Older whales will leave first. Large groups enter the area in July and then the migration splits into smaller groups which congregate in the river mouths. Beluga will remain in these shallow and relatively warm waters while shedding their skins. It is while they are in the estuaries that the whales are most actively hunted. In Richmond Gulf it is noted that after the whales first congregate in the eastern bays of the Gulf, they tend to keep moving in and out of the area. Each time, they leave, fewer return until in the fall, there are only very few whales. They eat very little at this time, feeding mainly on sculpin, cod and some char. Once their skins are shed, they move out into the sea and continue south in small groups into James Bay.

As they prepare to move north again in September, they start to congregate close to the shore around Long Island. Most beluga migrate, although some may linger near Long Island and may become trapped by the ice, especially in the strait between Long Island and the mainland. These whales will keep small areas ice free by their movements and will overwinter. While migrating, they will feed heavily on cod and sculpin. By October, they are moving north to Hudson Strait. On their northern

migration, beluga move quickly, in small groups on the seaward side of the coastal islands. It is thought that they move from Long Island directly north to the Belchers, although a few will move north closer to shore.

There is no consensus among the hunters as to the mating time of belugas. Some Inuit feel that the whales are pregnant when they arrive in the area and that they have their young in June and July along the shore. Others believe that they can have their young at any time.

In July, the belugas are hunted mainly in the mouth of the Nastapoka River, Little Whale and Great Whale rivers. Some hunting also takes place around Long Island and in Richmond Gulf. In the fall, during the northward migration, they are hunted further offshore, with an average distance of 5 to 8 miles. The beluga population of southeastern Hudson Bay was heavily exploited for commercial purposes by the Hudson Bay Company in the 1850's. In 1854, 423 whales were taken from the Little Whale River and in 1856, there was a reported harvest of 743. In 1857, 1,043 were reported harvested from the Great Whale River. In 1860, 1,500 whales were harvested from the Little Whale River and 800 from the Great Whale River. In all, the Hudson Bay Company had a total reported commercial harvest of 4,509 belugas from 1853 to 1860 (Finley et al. 1982:16).

Walrus. In the spring, walrus move from the southern Hudson Bay area into the central Hudson Bay area, where they will summer in proximity to the many islands. Important summering areas and hauling out spots can be found on the southern Sleeper Islands, the Marcopet Islands and the southern Belcher Islands. A few stragglers can usually be seen close to the shore on the seaward side of the Nastapoka Islands and the islands that form Manitounuk Sound.

After freeze up in the early winter, walrus remain at the floe edge where there is persistent pack ice. Some walrus winter in the vicinity of the King George Islands, where the bay is not frozen, while others

move further south towards Long Island of the floe edge. Normally the bay is frozen from the mainland across to the Belcher Islands and therefore walrus are only found north and south of the zone of continuous ice. The Kuujjuarapik Inuit have never seen walrus south of Long Island.

Walrus mate during the winter on the pack ice and have their young in early spring before the ice breaks. The young will travel with their mothers throughout the summer.

Waterfowl

Waterfowl and seabirds are the next major species group. The various species of geese and ducks harvested in the spring are an important resource as they provide a boost to the local food intake after a lean winter. An average of 7,696 Canada geese and snow geese are harvested annually in the spring and fall for a total of 32,660 pounds of food. Various species of ducks, principally the eider and pintail, provide an average of 6,560 pounds. Brant, murre, guillemot and loons contribute an average of 2,400 pounds.

Canada Geese. Canada geese arrive in the spring and tend to converge on the Long Island area at the southern end of the Kuujjuarapik hunting territory. From Long Island, the geese divide, some flying over water to the Belcher Islands then north, the others going north along the Hudson Bay coast which essentially includes the entire hunting territory of the Inuit. Geese groups establish nests along the coast and on coastal islands; inland, they group around lakes and on the islands. Nesting begins in mid-May and soon after mid-June, both young and eggs are found in the nesting areas. Canada geese are easier to hunt in spring because they migrate and nest along the entire shoreline and also they are easier to attract by calling in the spring. In the fall, Canada geese begin to move south earlier than Snow geese. Again, they converge on the Hudson Bay shoreline, some coming from the north,

others from across Hudson Bay. They converge along the coastline and congregate in feeding areas for one or two weeks. Since Canada geese leave the nesting grounds before the young have developed their strength, there is a high mortality and sometimes very many young birds are found dead.

Snow Geese. The Snow geese enter the territory at Cape Jones and then almost all fly across the water to and beyond the Belcher Islands. For those Snow geese that fly along the shore, they tend to stay further from shore and they continue to fly north to nesting grounds that are far north of Kuujjuarapik hunting territory. In fall, Snow geese come a bit later than the Canada goose, and their young are stronger flyers. They move into the Kuujjuarapik hunting territory in September and land on the small lakes several kilometers inland. They then fly to the coast to feed and then return inland. This pattern continues for about three weeks. Although the total harvest of Snow geese is less than that of Canada geese, the species is considered very important by Inuit, possibly as a general indicator of fluctuation or change in the goose population as a whole.

Eider and other Ducks

The Eider Duck of Hudson Bay resides in the region throughout the year. The Inuit note their wintering area to be southwest of the Belcher Islands, and near James Bay. In mid-April the eiders begin to move north to their nesting areas along the coast and on coastal islands. From mid-April to mid-May, ducks begin to pair up. In the Nastapoka Islands they gather between the islands where the current first causes open water to appear and then the ducks move closer to the coast, following the advance of open water.

When the females have young, they may move to the coast or stay close to the islands to feed. Inuit consider the ducks in this area to be well fed, and they note that gulls are not important predators

because they have adequate food. The males spend the summer on the outer islands and remain there until they leave for the wintering areas. It is the females and young that stay near the coast and in the late fall there are often large groups of eiders. The females do not molt until after they nest, so that is why they stay later than the males. Inuit also note that the non-mating ducks are the first to molt in the spring, and they are the first to leave in the fall. When the shore ice starts to form, the females depart for the wintering grounds.

Land Mammals and Small Game

Caribou is the major food source from land mammals. An annual annual harvest of 242 animals can provide 30,950 pounds of food. Caribou could provide more food, however the distance of the herd from Kuujjuarapik is great and the cost involved is high. Caribou are generally harvested in a few organized hunts in winter when money, equipment and manpower are pooled to make the hunt as efficient as possible. Wolves are not normally consumed, and arctic fox provide an average of 399 pounds of edible meat per year. Fox are regularly eaten, depending upon their fat content. Small game such as willow ptarmigan, rock ptarmigan, grouse and arctic hare provide 5,470 pounds of food annually.

Caribou. The caribou herds that occupy the west coast of the Ungava peninsula are thought to be distinct from those that comprise the large George River herd of the Québec Labrador peninsula. Inuit note, however, that there is some form of contact between the caribou of Ungava and those of Hudson Bay, probably in the interior zone northwest of the Leaf River. They also think that some of the animals from the Hudson Bay coast probably migrate all the way to the western portion of the peninsula.

The Inuit point out, however, that there are always caribou inland from Richmond Gulf and in the Lake Minto region. These smaller herds

tend to remain separate and to move further north in the summer and south in the winter. As the herds increase in size, they begin to spread their summer movement to the coast or to higher exposed places inland. In winter, the herd distribution is further south, the caribou locate in valleys and they may also approach the coast in winter. Prior to 1965, Inuit did not encounter caribou, except occasionally along the coast and in small inland groups. After that date, caribou began to appear in the Richmond Gulf area, especially the north side, in the summer.

In September, the caribou move inland up the valleys or move north along the coast. Inuit state that there are more caribou around in winter than in summer. In winter they come down (coastal) from the east and in summer, some move back to the higher land, some scatter along the coast. In summer, hunters see more males than females. It is thought by some hunters that perhaps females remain inland while the males wander around in singles or in pairs. In October the males and females get back together, the winter groups are larger than in summer (10-15). It is said that males and females though moving together travel in separate groups.

THE K.E.Q.C. QUESTIONS

The preceding sections of this report provide a description of the seasonal land use and harvesting activity of the Inuit of Kuujjuarapik. This approach is essential to the establishment of an information base-line against which community knowledge, perceptions and concerns about the Hydro projects can be evaluated. Without such an understanding, there are no criteria for judging direct impacts or for evaluating alternative courses of action.

A particular approach to the field study and hunter interviews was developed in order that the questions could be addressed in a manner that would encourage hunters to consult and work with the maps. It was impossible to simply discuss the impacts from the project without first indicating what the project actually involved and then linking this to a discussion of particular and more general impacts. Contact with the hunters was based on a series of discussions rather than interviews. Some were formally arranged, while others were more spontaneous. The series of ecological and hunting maps were displayed in the office and meeting room of the Landholding Corporation, and an announcement was made over the community radio. The Landholding offices are frequently used for meetings, so that it was possible for many individuals to review and discuss the maps.

The discussions held in the community are set out in reference to the particular questions posed by the Commission. In many cases, there was an overlap between questions and this is reflected in the presentation of the hunter's response.

Question 1

Do you use islands to search for the breathing holes of seals?

This question brought a wide range of comments from an explanation of the process of breathing hole sealing to a discussion of when and how islands are useful to seal hunting. Basically, the answer to this

question is no. Breathing hole sealing is not carried out in close proximity to the islands of Manitounuk Sound, and the islands themselves are not considered to be important for winter hunting either inside the Sound or on the Hudson Bay side. Traplines are set on the islands and during the early part of the winter, hunters tend to search for breathing holes in conjunction with their trapping activity. At this time (mid-December to early January), the ice of Manitounuk Sound is newly formed and not covered with deep snow. Consequently, breathing holes can be found more easily. As the ice thickens and the snow cover increases, Manitounuk Sound loses its advantage for breathing hole hunting.

Hunters pointed out that most of their hunting at the breathing holes takes place in two areas. One is a zone paralleling the shore and coastal islands, about 12 miles from land. This zone is most intensively used in an area that stretches from the southern end of Manitounuk Sound north to Duck Island. The other zone extends northwest from the community of Kuujjuarapik for approximately 25 to 30 miles onto the sea ice. As hunters travel into this area in search of open water of the floe edge or leads, they will sometimes find, and hunt at breathing holes. Both of these zones are far removed from any direct association with the islands. It also implies that the winter hunting preference is for open water at the floe edge or at leads in the ice. Hunters note that it is more difficult to hunt at the breathing holes, especially later in the winter, without use of dogs to locate them. It was not determined in these interviews if the breakup and refreezing of leads occurs, and if it does, whether or not breathing holes are found and hunted on this new ice

Hunters point out that the islands that define Manitounuk Sound sometimes have leads or open water near their tips and these are good for hunting. In some cases, hunters use the islands to wait for seals to appear in the adjacent open water areas. An important use of the islands is in the spring as vantage points for spotting the seals that

move onto the ice to bask. This facilitates the decisions of where to hunt in respect to the location and abundance of the prey, the direction of the wind and the condition of the ice. Since hunters like to approach seals from a dark background, the coloration and relief of the islands is important.

Question 2

Enquire as to the ice quality in Manitounuk Strait after the end of the project because this will influence all marine animal life (and even caribou hunting since the hunters use the sea to reach their hunting territories).

Questions of this type drew a very tentative response from hunters. They have almost no information about these secondary impacts, and consequently there is neither individual opinion or group consensus. After discussion, however certain ideas were put forward. First, Inuit hunters noted the importance of Manitounuk Sound in the formation of winter ice. It is considered as a safe winter corridor and hunting area as much as it is considered to be a more sheltered water for summer travel and hunting. Ice forms first in the Sound and this allows access to the shoreline between the head of the Sound and Little Whale River, usually by the end of December.

One concern raised with respect to the continual flow of water through GB-1 was whether or not this fresh water flow would coalesce with the open water that is usually present at Schooner Opening, thus forming an area of open water or dangerous ice that would stretch across the Sound. The hunters raised the point about the relationship between freshwater ice and sea ice and they questioned how these two surfaces might interact with each other. Inuit worried about the extent of freshwater ice, noting that it was hazardous to travel on in late spring since freshwater ice cracks without warning whereas sea ice "bends" and thus provides an important margin of safety for the hunter. A comparison between this type of "man-made" situation and the natural occurrence

of bad ice caused by the currents and islands near Gulf Hazard was raised, but no conclusions were reached.

Hunters were very uncertain about the impact of the freshwater intrusion on the marine life of Manitounuk Sound. Comments were made about whether or not open water would increase the numbers of seals in winter, or if it would, in fact, have an adverse effect on the food supply and therefore on the seals.

The point was also raised about the impact of increased freshwater discharge into Manitounuk Sound on the summer hunting of seals. The loss of fat in the spring and summer means that seals are not as buoyant as in the winter. Thus when shot, they sink very quickly. The less saline the water, the more quickly the seals sink. Consequently, it was felt that the freshwater discharge into Manitounuk Sound could create a change in the water of the Sound which would affect the behaviour and perhaps the physiology of the ringed seal.

Question 3

Enquire as to the ecology of the Little Whale River and on the effect of reducing its flow.

Ecological information for the Little Whale River is limited to the estuary and inland along the river itself for approximately 10 miles. The estuary and river are considered to be important and dependable resource areas, although it is not an area that has been consistently exploited by a large number of people. The area is presently the spring, summer and early fall camping place for two or three families, and it is an area often visited for possible hunting, fishing and overnight camping by people travelling north or south along the coast. In the past, a few families have spent entire winters at Little Whale River.

The river supports brook trout and whitefish. Brook trout are fished in the late spring when they move downstream, and again in the fall. Whitefish are caught in summer by rod and by net in the fall.

Nets are most commonly used to increase the harvest of estuary fish but they are not used upstream. The Inuit have seldom penetrated far inland, although there is an old travel route that parallels the river for several miles and then turns north towards Richmond Gulf. The river is not used by Inuit for access to caribou hunting, but the dense willows along the shore are said to be excellent for ptarmigan in the spring. When families overwintered at the estuary, ptarmigan provided a very important source of food on a day to day basis, sometimes being the primary source of food for long periods of time.

The most critical components of the marine ecology are beluga whale and bearded seal. Beluga move into the Little Whale River in groups that may sometimes reach 60 animals, though Inuit note that they usually spot groups of less than 20. The whales enter the estuary from north and south, moving into the freshwater of the river itself. Whales have been observed out from the mouth of the river in the spring before the ice has moved out, but most of the whales are found there in the first part of August. In addition to the beluga whales, bearded seals enter the estuary in the fall (September) and move upstream to the rapids. This behavior is confined to the fall and is related to feeding as they gather below the rapids. When the weather becomes colder, the bearded seals move out from the river and then move south towards James Bay. The Inuit interviewed represented families that have utilized the Little Whale River for several generations, and they stated that the project will completely destroy the whitefish and brook trout fishery. Although other small rivers that flow to the sea south of the Little Whale also contain fish, this river was spoken of as being most important. In addition to fish, Inuit expressed even greater concern over the impact on beluga whale and bearded seals. Fish were considered to be somewhat replaceable in the seasonal economy, but the loss of habitat for beluga and bearded seals was felt to be more significant. The Inuit talked about the fact that the Little Whale River was one of the few dependable spots for hunting bearded seals in the fall, and it was noted that the harvest is important at that time, since bearded seals are not normally accessible in winter.

The concern with the beluga whale focused on the deterioration of its habitat in the estuary, and it was felt that this would cause the belugas to abandon that section of the coast. Concern was expressed over the fact that the beluga's summer estuary habitat would now be limited to the Richmond Gulf area and the Nastapoka. Hunters said that they were not sure how the whales would adapt, but probably they would simply stop moving to south of Richmond Gulf. The hunters mentioned that this would increase the distance and cost of hunting whales, but they also expressed their concern that it could create problems with overhunting if they were not as spread out. This argument was countered by others who felt that although the Little Whale river was critical habitat, its destruction might mean that lesser used areas, such as the northeastern section of Richmond Gulf might become more important to the summering belugas.

When questioned about ptarmigan and changes in its ecology, the hunters had little information about how the diversion of the waters would affect the distribution of willows. They felt that if the willows were not affected, then the ptarmigan should continue to be numerous in the valley. They did comment, however, on the fact that the increased activity around the project would cause the ptarmigan to move further north and that the southern segment of their north (summer) south (winter) movement might shift.

Question 4

Try to evaluate the cost in time and energy of a normal hunting trip, and what this cost will be when the project is completed.

An evaluation of the cost of hunting is very difficult to derive, since so many factors influence the direct and indirect costs of harvesting activity. It is difficult to define a normal hunting trip since there is a wide range of activity types, each having particular costs. The cost of hunting must eventually include the capital costs of winter and open water transportation, as well as the direct costs of

gasoline and spare parts. In Kuujjuarapik the cost of a freighter canoe is \$3,400 to \$3,600 (1982); the cost of the 35 horsepower engine is \$2,500 to \$2,700 (1982) and snowmobiles cost \$4,000 (1983). In 1983, five gallons of gas cost \$17.00 plus \$1.50 for oil. In order for a hunter to be equipped with snowmobile, freighter canoe and outboard motors, he must make an initial investment of at least \$10,000. In addition, snowmobiles must be replaced at least every two years while outboard motors are more durable and need replacement much less often.

Every trip in the north is unique: the conditions of the water or of the ice, the wildlife encountered while travelling, or the mechanical failures that are always occurring, especially in the winter for snowmobiles. In spite of these possible variations, the following figures are considered to be reasonable approximations of what the Inuit hunter assumes he needs for travel to the three major resource areas:

Kuujjuarapik - Richmond Gulf - return:

snowmobile - 25 gallons plus oil
\$92.50

canoe with two 35 h.p. engines - 60 gallons plus oil
\$222.00

Kuujjuarapik - Lake Minto - return:

snowmobile - 65 gallons plus oil
\$241.50

Kuujjuarapik - Cape Jones - return:

snowmobile - 20 gallons plus oil
\$75.00

canoe with two 35 h.p. engines - 40 gallons plus oil
\$148.00

These estimates are for the direct trip, and hunters indicate that gas is needed to carry out hunting once they arrive at their destination. In addition there is the cost of ammunition. A consensus among hunters is that a day of active hunting by canoe will consume 4 to 6 gallons of gasoline and oil (\$14.50 to \$21.50); for snowmobile hunting

the average day of hunting may consume 7 to 10 gallons of gasoline and oil (\$25.30 to \$37.00). Ammunition expenditures are much harder to estimate. Canoe hunting from an unstable platform against a very small moving target can take many shots. To conserve ammunition, the first shots at seals are usually with a 22 calibre rifle. Once the seal is tired, large calibre ammunition is used. The hunting of birds can be more expensive, especially when shotguns are not used. Land hunting and the hunting of basking seals on the ice are the most economical hunting methods. Large calibre rifles are always used, but few shots need to be fired.

Question 5

Find out if sites, roads, airports and all activities related to construction may bar access to areas rich in game, which would not otherwise have been affected by the project.

The response to this question is similar to the discussion of the problems of ice and travel in Manitounuk Sound. It is the creation of GB-1 and the coastal road from Kuujjuarapik to GB-1 which is considered to be the primary barrier to travel. The problems with bad ice, the problem of year-round discharge at GB-1 and the position of the road along the coast are the only aspects of infrastructure that concern Inuit and their access to game. This problem is viewed as being concentrated in the Manitounuk Sound region.

Questions 6 and 8

Inquire if hunters intend to use the new roads in order to reach their hunting territories, and in particular, the road of Bienville Lake towards areas where caribou are abundant.

Ask what will be the effect of keeping the river open at GB-1, on hunters' movements. Will the north-south trail be closed or will trips be considerably lengthened?

The Inuit interviewed were ambivalent about the impact of roads on

their economic and perhaps cultural life, and they are basically unconcerned about the use of roads for travel to hunting areas.

The road connection to the south is considered important for reducing the cost of goods in the community and for enabling heavy supplies to be brought north by means other than the sea lift. It is also considered to perhaps be important economically (in terms of the cost of materials) to have a road linkage between Kuujjuarapik and Val Dor. The feelings on this subject are not strong, however, and it does not appear as though the alternative costs have actually been established. The road to Lac Bienville has not been directly considered in terms of access to caribou hunting grounds. The Lac Bienville road goes through Cree territory, but the lake itself is primarily in the Inuit area of primary interest, because it is north of the 55th parallel. However, the Crees have recognized harvesting rights north of the 55th parallel based on traditional activities. Specific boundaries have yet to be defined in an agreement between the Crees and the Inuit, and Lac Bienville may well be included in this agreement. Historically, the Lac Bienville area has not been actively used by Inuit, yet in the discussions with Inuit they said that Lac Bienville may someday be important for the harvest of caribou. They then talked about access to this area being by airplane, not ground transport. It must be realized that the ideas about the use of the Lac Bienville road will evolve over time, in response to the realities of Cree and Inuit policies and to the developing food needs of both groups. There is no specific idea about the use of the road to GB-1. The proposed route closely parallels the shore and it was noted that they might use it to transport canoes into Manitounuk Sound, especially if the weather is bad. In the winter the road would probably be heavily used by people travelling north for fox trapping or for trips into Manitounuk Sound and Richmond Gulf. It was not viewed as important to have the road, simply a pragmatic acknowledgement that, if it is there, it may be convenient.

The only real concern that people had was the condition of ice, and especially the effect of the GB-1 discharge on ice formation in December

which will have the most direct impact on the use of the north-south trail through Manitounuk Sound. It is not possible for hunters to seek alternate snowmobile routes over the sea ice in the early part of the season, since travel on the Hudson Bay side of the islands cannot be done until at least two weeks after freeze-up in Manitounuk Sound. The Inuit have always raised objections to the creation of a coastal road to GB-1 and they preferred for the road to be located farther inland. They express concern with the location of the road, especially for the fall goose hunt, since that part of the Manitounuk coast is a high density nesting area for Canada geese. It is also important for some fox trapping, especially in the early part of the winter before the ice in Manitounuk Sound is fully formed. The details of the impact on travel from the open river at GB-1 are discussed in terms of ice formation in question 2.

Question 7

Try to discover whether Cree hunters are expected to prevent Inuit hunters from going to territories which they might consider are reserved for their own use.

This is a complex issue that appears to have both real and symbolic implications. The James Bay Agreement acknowledges that the Cree have an area of traditional harvesting interest north of the 55th parallel, and the Inuit have a similar area of interest to the south. The Cree area extends north into the Lake Minto region, and they also tend to fish in Richmond Gulf and as far north as the Nastapoka River. The Inuit, on the other hand, use the Long Island and Burton Lake area. The major problem that will arise is in the Lake Minto region; Inuit are not worried about the Cree preventing them from entering the area, but they fear that significant harvests may be taken by the Cree. The same problem exists at Richmond Gulf where the arctic char fishery is important but limited. Again the Inuit feel that there may be too much harvesting pressure.

The fear expressed by Inuit is that the project is going to "push" animals north and to limit the potential in much of the Cree area. Consequently they fear that the Cree will tend to exploit the northern sector of the territory more and more and this is where the problem is. Thus, it may become a question of when and how Inuit will tend to block access by the Cree.

Question 9

Ask people to evaluate the effects of airport activities on the feeding and nesting habits of migratory birds.

The Inuit expressed concerns with the Hydro project in relationship to goose hunting. They were very uncertain about direct impacts, but they thought that the spring nesting and fall feeding areas along the east coast of Manitounuk Sound would be significantly disturbed south of GB-1 and they were unsure how this disturbance might affect the areas further north; either by increasing the concentrations of geese (especially in the fall) or by causing a relocation to other nesting sites. Specifically, they felt that the fall feeding sites in the Little Whale River would be completely disrupted.

Three ideas were raised and discussed, but no consensus was reached. The first questioned whether the project might tend to increase the number of Canada geese that fly to the Belcher Islands. If this occurs, then the Inuit fear that there will be a significant impact on the geese because of the mortality that occurs when they fly long distances over water. Second, the Inuit feel that the entire system of spring nesting and fall feeding would move further north, citing their general feelings that there has been a shift in wildlife activity and range towards the north. Finally, the opinion related to the formation of reservoirs inland and to the activity on the coast. This, it was thought, could result in more geese moving to inland nesting sites, thus reducing the number of geese that frequent the coast and perhaps influencing the level of both spring and fall harvest.

Question 10 and 11

Evaluate the project's influence on the currents in the gulf as well as its effects on marine animal-life and navigation.

Ask if the area south of Kuujjuarapik will be affected by the cumulative effects of the currents of the Great Whale and La Grande projects.

The Inuit are not prepared to discuss these two questions in any detail. They are not sure if there are any noticeable impacts from the project on the currents, and there is not any real concern with problems of navigation, other than the changes that will occur from not moving their canoes up the Great Whale River for landing. In particular there is no real idea about how the currents might be affected and what, in turn, the impact would be from the cumulative effects of the Great Whale and La Grande projects.

The major concern of Inuit is with the impact of the project on currents in a way that will affect the supply of food for marine mammals. The areas that are indicated for this impact are the estuaries of the Great Whale and Little Whale Rivers. There were no specific comments on what would happen, only a concern that something will happen. The idea is that marine mammals will be driven away, probably to the west towards the Belcher Islands.

Question 12

Using the hunting and fishing map, ask hunters to evaluate the global and detailed effects of the projects on hunting and fishing activities.

The primary comments on this question involved Inuit concern with geese and marine mammals. Although there was an equal level of concern over these species, they had a very specific idea about geese, and a more general idea about marine mammals. The impact on geese is noted in the answer to question 9, while problems with marine mammals were never treated as a separate question. The basic concern in terms of beluga whales is the destruction of their habitat in the Great Whale, Little Whale and Nastapoka Rivers. The results of this destruction are not clear, but it is assumed that the Richmond Gulf area will become more important.

This proposed increased emphasis on Richmond Gulf by beluga is viewed by Inuit as the leading edge of other game animals that will tend to utilize this region. They feel that the Richmond Gulf area is their escape from the cumulative impact of the project, and that this area will be out of any direct zone of change. There are problems, however. It is felt that the hunting pressure will increase on this zone and that this could create serious resource problems. They also feel that these problems will intensify if there are Cree people. One comment of great interest was that the animals will seek shelter in Richmond Gulf and that if the Inuit also seek refuge from the project in this area, there will eventually be problems. People have discussed the idea of large boats to move them to the outer islands in summer, and they have noted problems if they move too far to the north which is basically the hunting territory for Inukjuak.

Problems were also raised about the people who will continue to live in Kuujjuarapik. It is thought that they will probably tend to increase their intensive harvesting activity in the south, and will rely on the Manitounuk Sound for day to day harvest needs in summer. There is a feeling that in spite of the project, the decrease in overall hunting pressure will enable them to maintain an adequate harvest for their household needs.

BIBLIOGRAPHY

- FINLEY, K.J., G.W. MILLER, M. ALLARD, R.A. DAVIS and C.R. EVANS
1982 The belugas (Delphinapterus leucas) of northern Québec: distribution, abundance, stock identity, catch history and management. Can. Tech. Rep. Fish. Aquat. Sci. 1123: v + 57 p.

HYDRO-QUÉBEC

- 1981 Complexe Grande-Baleine. Rapport Final sur les études d'avant-projet. Volume 1 - Le Complexe, Tome 5 - Recueil des planches.

KEMP, William B.

- 1980 A Program of Inuit Knowledge and Land Use, Resource Ecology and Habitat: An Arctic Prototype. A proposal submitted to the IUCN.
- 1981 Inuit Land Use and Ecological Knowledge. A report on the first phase of a research project carried out among the Inuit of Northern Québec.

MAKIVIK CORPORATION

Kuujuaraapik Land Use Maps and Ecological Notes.

NATIVE HARVESTING RESEARCH COMMITTEE

- 1979 Research to Establish Present Levels of Native Harvesting. Harvests by the Inuit of Northern Québec. Phase II (Yr. 1976).
- 1982 Research to Establish Present Levels of Native Harvesting. Harvests by the Inuit of Northern Québec. Phase II (Yrs. 1977 and 1978).
- 1982 Research to Establish Present Levels of Native Harvesting. Harvests by the Inuit of Northern Québec. Phase II (Yrs. 1979 and 1980).