Co Management of Beluga Whales in Nunavik (Arctic Quebec), Canada

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1. INTRODUCTION

One of the goals of the anthropological study of renewable resources is the examination of various strategies or alternative ways for human societies to develop and use resources in a sustainable manner. As the utility of individual resources varies from culture to culture, from period to period, and from area to area, we need to study both the ecological conditions in which a particular resource is exploited by particular groups and the sociocultural contexts in which it is distributed and used [AKIMICHI 1997: 168]. Thus, to achieve this goal, it is necessary to investigate the actual conditions of use and management of various resources in each area.

In this paper, I describe the contemporary co-management of beluga whales[1)] in Nunavik, identify problems associated with it, and propose changes to alleviate these problems.

2. THE ECOLOGY, NUTRITIONAL AND SOCIOCULTURAL IMPORTANCE OF BELUGA WHALES IN NUNAVIK (ARCTIC QUEBEC)

2.1. The Ecology of Beluga Whales

The beluga whale (*Delphinapterus leucas*) is found in the waters along several Arctic coasts in North America. It is also called "white whale" in English and "*qilalugaq*" in Inuktitut. It is a comparatively small whale, with males approximately 4 to 6 meters in length, and females approximately 4 meters [GRAVES and HALL 1988: 26]. Males weigh up to 1,000 kg and females up to 700 kg. Beluga tend to occur in groups and migrate seasonally. From summer to fall, they form several groups composed of a few individuals to several hundred and move from calving to wintering locations during this period.

An adult beluga whale provides approximately 200 kg of meat, 50 kg of *maktaq* (skin parts with some associated fat), and 300 litters of fat oil [REEVES n.d.]. Inuit living along the Arctic coasts used to consume the meat, fat and *maktaq* as a food resource and used the fat as fuel. Although beluga in the Arctic regions as a whole are not endangered, they are rare in several regions including Ungava Bay and eastern Hudson Bay.

Beluga in Nunavik comprise three groups, one each in eastern Hudson Bay, western Hudson Bay and Ungava Bay, all of which apparently winter in Hudson Strait. At present, there is no commercial hunting of beluga in Nunavik. Hunting is restricted to Inuit for subsistence purposes.

Several thousand beluga whales were harvested by the Hudson's Bay Company for commercial purposes in Hudson Bay and Ungava Bay from approximately 1850 to 1900. While this would have caused some reduction in stocks, the Department of Fisheries and Oceans (DFO) suggests further depletion of the stocks in this region has resulted from contemporary over-hunting by Inuit, such that there are now few beluga in these bays. As DFO researchers as well as local Inuit hope to avoid further depletion of beluga in the region, they established a new beluga co-management program in 1996.

It should be noted that beluga whales are not under regulation by the International Whaling Commission. These animals are the only sea mammals presently under a resource management program in Nunavik.

2.2. The Nutritional and Cultural Significance of Beluga Whales as an Inuit Food Resource

Increasingly large quantities of 'southern' foods such as bread, canned soups, vegetables, eggs, meat, chicken, pork, milk, etc. have been transported into the Arctic regions of Canada and consumed by Inuit since the 1960s. Several studies on food consumption conducted in the Keewatin and Nunavik regions show a general trend of young Inuit becoming increasingly dependant upon store-bought food, and thus decreasingly dependant on local food obtained through hunting and fishing [THOUEZ et al. 1989; MOFFATT et al. 1994; KUHNLEIN et al. 2000].

While these 'southern' foods tend to be rich in carbohydrates and saturated fats, indigenous food is rich in various vitamins, minerals and protein [KUHNLEIN et al. 2000]. In addition, many Inuit still prefer local food to the 'southern' food in terms of taste and 'cultural satisfaction'.

Thus, indigenous food obtained through hunting and fishing is still important to Inuit in Nunavik in nutritional and cultural terms [SANTE QUEBEC 1995; WEIN et al. 1996].

In the contemporary Inuit village of Akulivik in Nunavik (see Map 1), the following local wild animals are, among others, used as food resources: ringed seals (*natsiq*), bearded seals (*ujjuq*), beluga whales (*qilalugaq*), walrus (*aiviq*), polar bear (*nanuq*), caribou (*tuttuq*), arctic char (*iqaluppik*), white fish (*kavisilik*), lake trout (*isiuralittaaq*), ptarmigan (*aqiggiq*), Canada geese (*nirliq*), snow geese (*kanguq*), and eider duck (*mitiq*). The Inuit also harvest birds' eggs, berries, seaweed, shellfish and sea urchins. The annual harvesting cycle of the Akulivik Inuit is summarized in Figure 1.

Among the local food, *maqtaq* of beluga whales, which contains various nutrients such as the minerals zinc and sodium, and ascorbates and vitamins, is highly valued among the Akulivik Inuit.

2.3. The Sociocultural Significance of Beluga Whales to Inuit

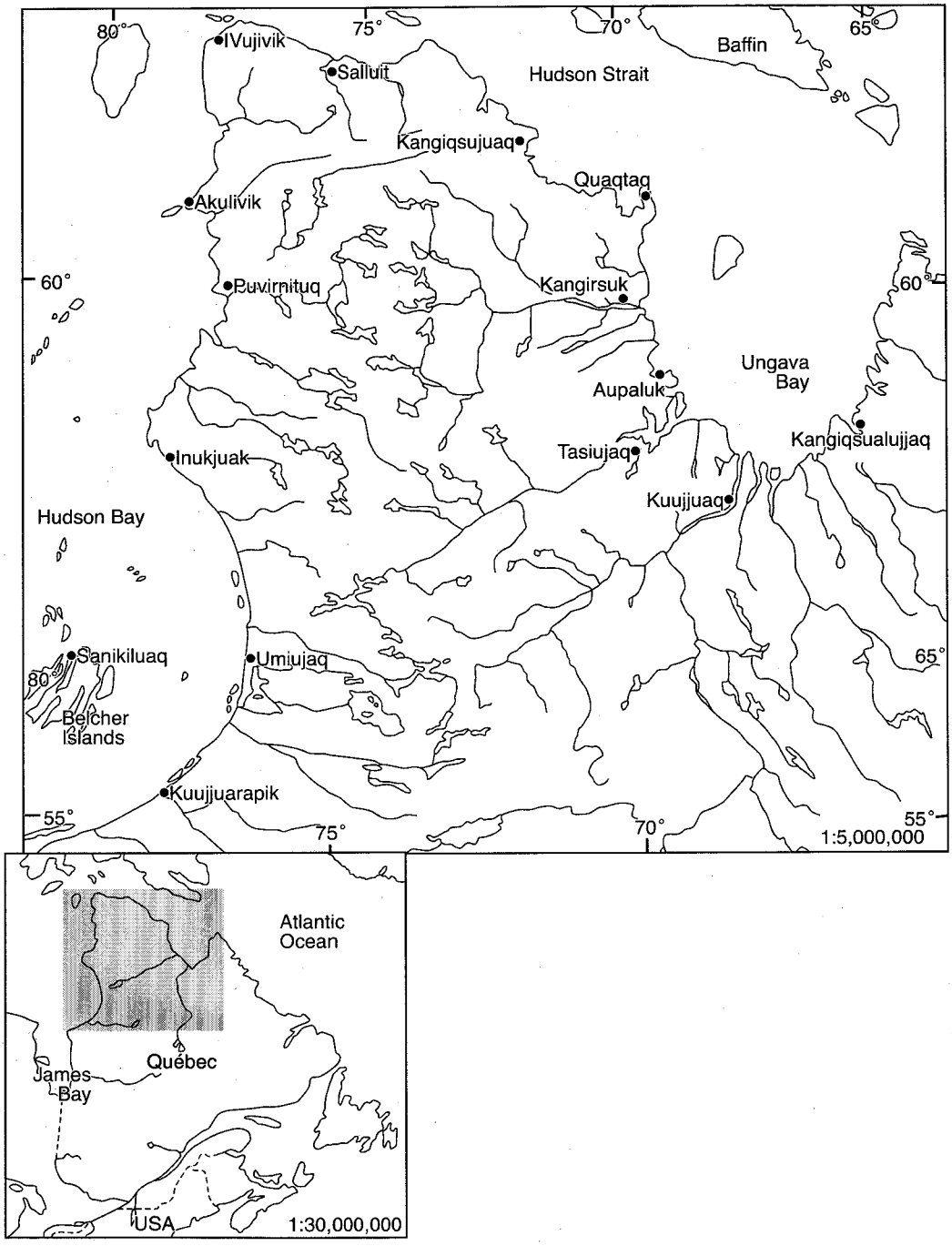
Inuit subsistence is characterized as "a long-term relationship between a community and its land and resource base, rather than a strictly economic activity" [HUNN 1999: 30]. Subsistence as well as other activities are organized in the context of Inuit social relationships [DAHL 1989; WENZEL 1991; NUTTALL 1992], and beluga hunting among the Inuit is no exception.

As Freeman and others [FREEMAN 1993; FREEMAN et al. 1998; WEIN et al. 1996] have pointed out, belugas are regarded not only as a highly valued food resource, but also as a socioculturally important resource, to Inuit and Inuvialuit in Arctic Canada. Below, I discuss the social importance of beluga whales in the context of Inuit food sharing practices.

Food sharing has several economic functions such as mutual assistance and the maintenance of equality. Generally, the *maktaq* and meat of a beluga whale are shared among hunters and other villagers. This sharing of *maktaq* and meat is a reoccurring theme among Inuit villagers. While the food is shared on the basis of particular social relationships, those relationships are activated, reconfirmed and reproduced by the food-sharing practices. These relationships include, in particular: social relationships between hunters, between hunters and their kinsmen, between hunters and their neighbors, between hunters and their friends, between hunters and their namesake persons (*sauniq*), and between hunters and their symbolic midwives (*sanajik*)[2]. Through second and third phases in the distribution of the meat and *maqtaq*, kinship and neighbor relationships are further activated and reproduced [KISHIGAMI 2000].

In addition, Inuit food sharing practices reproduce a self-image of Inuit who help each other, as well as a sense of community. In several communities in Nunavik, food sharing at the entire village level is organized by the Hunter Support Program[3] under the James Bay and Northern Quebec Agreement (JBNQA), and also confirms, maintains and strengthens a sense of community or village and that of being Inuit [KISHIGAMI 2000].

In the rapidly changing political and economic circumstances of Inuit life, food sharing practices are closely related to the economic function of mutual assistance as well as the reproduction of Inuit social relationships and a sense of community [NUTTALL 1991; COLLINGS et al. 1998]. In sum, the hunting and sharing of beluga whales is economically, nutritionally and socioculturally important to the contemporary Inuit of Canada which makes the management, conservation and sustainable use of beluga whales in the long term extremely important to



Map 1 Nunavik, Canada.

them.

	Month (1–12 = January to December)											
	1	2	3	4	5	6	7	8	9	10	11	12
game												
Arctic Char	○	○	○	○	○	○	◎	◎	○	○	○	○
Land-locked Char	◎	◎	○	○	○	○	○	○	○	○	◎	◎
White Fish	◎	◎	○	○	○	○				○	◎	◎
Ringed Seal	○	○	◎	◎	◎	○	○	○	○	◎	○	○
Bearded Seal	○	○	○	○	○	○	○	○	○	◎	○	○
Beluga Whale						○	○	○	◎	◎		
Walrus								○	◎	○		
Polar Bear	◎	◎	○	○	○	○	○				◎	◎
Caribou	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○
Snow Geese						○	○	○	○			
Canada Geese					○	○	○	○	○			
Eider Duck				○	○	○	○	○	○	○		
Birds' Eggs						○						
Ptarmigan	○	○	○	◎	◎	○	○	○	○	○	○	○
Berries								○	○			

Game means 'primary' game. ○ means a harvesting month. ◎ means the best harvesting month.

Figure 1 Annual Cycle of Subsistence Activities in Akulivik, Nunavik, Canada (2000)

3. THE HISTORY AND CURRENT STATE OF BELUGA WHALE CO-MANAGEMENT IN NUNAVIK

In the late 1970s, soon after establishing the James Bay and Northern Quebec Agreement, the Makivik Corporation (the former Northern Quebec Inuit Association) became concerned about the conservation of beluga stocks in Nunavik. Since the 1980s, researchers from the Makivik Corporation and DFO, and local Inuit, have engaged in several research projects in Ungava and eastern Hudson Bay investigating the population size, migration routes, habitats, breeding locations, behavior habits, genetic composition[4)] and Inuit ecological knowledge of beluga whales in Nunavik [REEVES n.d.; SMITH 2000a, b]. This led to the establishment of a new co-management process for beluga in Nunavik in 1986, the purpose of which is to maintain the beluga stocks at a sustainable level. It is reported that the Nunavik Inuit hunted 2,327 belugas from 1986 to 1995.

The Hunting, Fishing and Trapping Coordination Committee (HFTCC) was established in 1976 to determine and implement several policies concerning hunting, fishing, and trapping activities under the James Bay and Northern Quebec Agreement. This committee is made up of eight representatives from the Cree, Inuit and Naskapi native groups and eight government officials from the federal and Quebec governments. The function of the committee is to review and supervise the management of wildlife resources in Northern Quebec.

The HFTCC meetings on indigenous subsistence activities are held four or more times a year to establish regulations on wildlife management. The committee also makes recommendations to the governments concerned and disseminates information to both the native and governmental organizations. Furthermore, it has the authority to issue hunting and fishing licenses, research permits, and to manage hunting rights. Legally, it is a co-managing body of the federal government.

The beluga whale co-management project was planned and implemented under the HFTCC [DROLET et al. 1987]. Initially, the DFO indicated to the Nunavik Inuit the necessity for beluga management, based on the results of a series of research projects. It approached two Inuit organizations, the Makivik Corporation and Anguvigaq. The Makivik Corporation is a political and economic organization representing Nunavik Inuit interests while Anguvigaq is a regional organization of local hunting, fishing, and trapping associations (HFTAs). As a result of discussions among representatives from the DFO, Makivik Corporation, and Anguvigaq, an agreement was reached whereby both Scientific Ecological Knowledge (SEK) and Traditional Ecological Knowledge (TEK) would be considered in the conservation of beluga stocks for sustainable use. The agreement also indicated that it would be essential for local hunters to participate in the management for effective conservation. Thus, the DFO allowed local hunters to participate in the management of the beluga, in cooperation with the local Nunavik village HFTAs. The original plan included, in particular, (1) a prohibition against hunting female belugas, (2) regulation of hunting techniques to ensure low hunting losses, and (3) creation of several special areas to protect critical habitats for birthing and feeding. After agreement to the plan by the local villages and resolution by the local HFTAs, the plan was approved and implemented by the HFTCC. Afterwards, quota systems and several other prohibition measures were introduced into the plan.

3.1. Co-Management of Beluga Whales from 1996–2000

In Nunavik in 1996, a five year co-management plan was instituted by Inuit and the DFO. DFO researchers estimated that approximately 240 beluga whales were harvestable per year in Nunavik, and proposed this total to municipalities in Nunavik, and to Anguvigaq and the local HFTAs. DFO officials negotiated the quota of each community with the HFTAs. The agreed upon quota was reported to and approved by the HFTCC[5]. The quota of beluga for each community is summarized in Figure 2.

As Figure 2 indicates, the total annual quota for the region for 1996–2000 was 243 beluga whales. It should be noted that this quota was a kind of bylaw not associated with mandatory penalties. It was recommended that all communities along the Hudson Bay coast harvest beluga whales in the area north of Inukjuak in August or later, or after harvesting the whales up to their quotas.

In addition to community quotas, several measures such as the prohibition against hunting juvenile belugas were established to conserve the beluga population. Because juvenile beluga aggregated at the mouth of Macalic River in Ungava Bay, harvesting was prohibited there. In Ungava Bay, Inuit were allowed to harvest the beluga whales in the area to the north of Quaqtaq. And, because juvenile beluga whales congregated at the mouth of Nastapoka River in Hudson Bay, harvesting was prohibited there in July. Moreover, the Makivik Corporation warned local

Community	Population in 1996	Annual Quota of Beluga Whales (1996–2000)	Annual Quota of Beluga Whales (2001–2003)
Aupaluk	159	10	25
Tasiujaq	191	10	25
Kuujjuaqq	1726	10	25
Kangiqsualujjuaq	648	10	25
Kangirsuk	394	10	25
Quaqtaq	257	29	30
Kangiqsujuaq	479	29	30
Salluit	929	30	30
Ivujivik	274	30	30
Akulivik	411	15	25
Puvirnituq	1169	15	25
Inukjuaq	1184	15	25
Umiujaq	315	15	25
Kuujjuarapik	579	15	25
Total		243	370

Figure 2 Inuit Population and Quota of Beluga Whales for Each Community in Nunavik (population in 1996 and quotas starting in 1996 and in 2001)

Inuit to limit the consumption of aged beluga since those individuals have much higher concentrations of POPs (Persistent Organic Pollutants) and mercury in their bodies than younger individuals.

3.2. Co-Management of Beluga Whales from 2001–2003

In the fall of 2000, the five-year co-management plan ended. From February to March 2001, the DFO, Anguvigaq and local HFTAs consulted 14 Nunavik communities about the next co-management project, and then held general meetings in Kuujjuaq in April and May 2001, with the assistance and participation of community representatives. The total allowable catch of the beluga as well as the establishment of community quotas and other management and implementation measures were discussed at these meetings.

During the meetings, many communities expressed the view that their quotas were too small. For example, one village in Ungava Bay wanted to withdraw from the co-management program because it felt that the quota was too low. After several additional meetings, it was agreed that the total quota for Nunavik should be raised from 243 per year to 370 per year, although it appears that initially the DFO was reluctant. The HFTCC and the Nunavut Wildlife Management Board (NWMB) were informed of this decision and the new co-management project was initiated in July, 2001. Because some beluga populations constitute a shared resource between Quebec Inuit and Nunavut Inuit communities, the Nunavut Wildlife Management Board was kept informed of the management plans.

Under the 2001–2003 co-management plan, Nunavik was divided into three zones: Ungava

Bay, Hudson Strait and Hudson Bay. The Ungava Bay zone was composed of the villages of Kangiqsualujjuaq, Kuujjuaq, Tasiujaq, Aupaluk and Kangirsuk; the Hudson Strait zone was composed of the villages of Ivujivik, Salluit, Kangiqsujuaq and Quaqtaq; and the Hudson Bay zone was composed of the villages of Kuujjuarapik, Umiujaq, Inukjuak, Puvirnituq and Akulivik.

The following general conditions were set for all three zones.

1. Hunters should not kill a beluga calf or an adult beluga accompanied by a calf;
2. Hunters should not kill a juvenile beluga (that is, a gray beluga whale);
3. Netting should only be done within a community's hunting regions under certain conditions;
4. Hunters would be encouraged to harpoon a beluga before shooting it;
5. Appropriate rifles would have to be used (222 and smaller calibers);
6. Beluga not retrievable by the hunters were not to be hunted; and
7. Hunters were not to waste the meat or *maktaq* of the beluga. They were encouraged to share them with other Inuit.

In addition to these conditions, other conditions specific to each zone were also applied. For example, in the Ungava Bay zone, the quota for each community was set at 25, and Inuit in this zone could not harvest beluga in Ungava Bay but only in Hudson Strait. The Mucalic Sanctuary was closed to beluga hunting and other disturbances year round. In the Hudson Strait zone, the quota for each community was set at 30 and in the eastern Hudson Bay zone, the quota of each community was set at 25. In the eastern Hudson Bay zone, the Nastapoka and Little Whale River estuaries were closed for beluga hunting during July, and the maximum beluga harvest in these estuaries was 15 each. The maximum beluga harvest in James Bay was 30. The remaining portion of the quota (65 beluga whales) could be taken in Hudson Strait by the Nunavik Inuit.

3.3. Revision of Co-Management of Beluga Whales for 2002

DFO officials argued that the results of their aerial surveys in the summer of 2001 showed fewer than 200 beluga whales in Ungava Bay and only 1,200 in the eastern part of Hudson Bay [REEVES and MITCHELL 1989; FISHERIES and OCEANS CANADA 2002; HAMMILL et al. 2004]. This implies that the beluga population has declined since the 1980s. It was in 1989 that while the Committee on the Status of Endangered Species in Canada (COSEWIC) listed the eastern Hudson Bay summer beluga stock as "threatened," they listed the Ungava Bay summer beluga stock as "endangered." "Threatened" means that if the current level of harvesting is maintained, the population will decrease and become endangered. "Endangered" means that this stock may face extinction if not well protected. In 2001, 395 beluga were reported killed by Inuit hunters, but the real figure may be much higher [HAMMILL 2002]. According to the DFO, if harvesting levels remained unchanged, the beluga population of the eastern Hudson Bay could disappear within 15 years. DFO officials insisted that rigorous management measures were required.

The DFO proposed a revised management plan in the fall of 2001. The Angugaviq, the local HFTAs, the Makivik Corporation and the DFO discussed modification of the management program between February and June, 2002. During these meetings, the total allowable catch was discussed. Inuit in Nunavik accepted the DFO proposal, although apparently very

reluctantly.

There was no substantial revision in general procedures applied to the whole Nunavik region. However, the quota for each community and hunting areas under the new plan were changed as follows:

1. Each of the 14 Nunavik communities could harvest a maximum of 15 beluga whales;
2. Hunting of the beluga was prohibited in Ungava Bay and the eastern part of Hudson Bay;
3. Inuit could hunt beluga in Hudson Strait and James Bay only; and
4. The quotas and hunting areas of beluga for each community are summarized in Figure 3.

As Figure 3 indicates, Nunavik Inuit could harvest 55 beluga whales in James Bay, 30 in Long Island (James Bay North) and 125 in Hudson Strait. Quotas for each community were decreased from 30 or 25 to 15. Also, each of the four Ungava communities had to go to James Bay to catch ten of their beluga whales and to Hudson Strait to catch the other five. Each of the three Eastern Hudson Bay communities had to go to James Bay to catch five of the beluga and to the Long Island area to catch the other ten. These changes created two major difficulties for these communities. One was that they had to make extended trips to reach these hunting areas. The second was that both the James Bay and Long Island areas are not traditional Inuit hunting grounds, and thus there is little traditional ecological and geographical knowledge of these areas. As a result, in practice, it would be extremely difficult for the Inuit of the four Ungava Bay communities and three eastern Hudson Bay communities to harvest their fifteen beluga whales.

It is clear that this plan was developed by DFO officials who were not very familiar with

Community	Hudson Strait	James Bay	Northern James Bay (Long Island)
Aupaluk	5	10	0
Tasiujaq	5	10	0
Kuujjuaqq	5	10	0
Kangiqsualujjuaq	5	10	0
Kangirsuk	15	0	0
Quaqtaq	15	0	0
Kangiqsujuaq	15	0	0
Salluit	15	0	0
Ivujivik	15	0	0
Akulivik	15	0	0
Puvirnituq	15	0	0
Inukjuaq	0	5	10
Umiujaq	0	5	10
Kuujjuarapik	0	5	10

Figure 3 Revised Annual Quota and Permitted Hunting Areas of Beluga Whales for 2002

traditional Inuit hunting practices in this region. Moreover, it does not appear to have resulted from a mutual agreement between the DFO and Inuit on the basis of sound consultations. Rather, it appears that the DFO forced the Inuit to accept the revised management plan.

Because of the reduced quota, the Makivik Corporation negotiated with the DFO for financial compensation. As a result, the DFO provided Nunavik Inuit with $50,000. The Makivik Corporation then purchased 5,000 pounds of *maktaq* from Arviat, Nuanvut and distributed it to the four Ungava communities and three eastern Hudson Bay communities in early October, 2002. Each Inuit household in Kuujuaq, for example, obtained one piece of *maktaq* (30 x 20 cm).

3.4. Inuit Responses to the 2002 Modified Plan

While many Inuit people feel the need to conserve beluga stocks for future generations, they are dissatisfied with the contemporary quotas and the co-management regime. According to the Inuit, they observe and catch fewer beluga near their communities than a few decades ago. They argue that the beluga are still abundant, but that the whales now avoid the communities due to engine noise and other human activities. DFO researchers, on the other hand, suggest that there are fewer beluga whales in Nunavik than a few decades ago due to over-harvesting by Inuit hunters.

The Nunavik Inuit were very annoyed with the modified 2002 management plan. However, as noted, the 2002 management plan was based on the DFO's aerial survey results in eastern Hudson Bay and Ungava Bay in the summer of 2001. But, the Inuit stated that they were not involved in that research at all and that the aerial surveys were carried out solely by DFO researchers, only over a short period, and that only one survey of each of the two bays was involved. Because many Inuit saw many beluga migrating near camping sites in Ungava Bay in the summer of 2002, they questioned the results of the aerial surveys.

In one community on Hudson Strait, several elders told their villagers through the community FM radio that the number of beluga had not decreased but were avoiding the Inuit communities due to noise produced by humans. They also emphasized to middle-aged and young Inuit that once Inuit hunters stopped hunting beluga, the whales would avoid the area completely and finally disappear. They further appealed to other villagers, encouraging them to hunt beluga even if it meant going to jail. The elders stressed the necessity of maintaining reciprocal relationships between Inuit and their game animals. However, it should be noted that while several hunters expressed their opposition to the new management plan, other hunters felt the need for the quota system to conserve the beluga stocks.

While a majority of communities in Nunavik reluctantly agreed to the modified quotas, some disagreed. Some of the communities that agreed to the quotas still expressed dissatisfaction with the implementation of the quota system. For example, hunters in Puvirnituq suggested that each community's quota should be determined according to its population size. On the other hand, hunters in Kuujjuarapik insisted that all the communities should have the same quota regardless of population [Doidge et al. 2002: 4, 6–7, 8].

This quota system also resulted in conflicts among Inuit within communities and between communities. Because *maktaq* is a culturally valued but scarce resource for contemporary Inuit, it tends to be hidden rather than shared with other Inuit in a large village. In addition, some

conflicts have arisen between communities located near the hunting areas and those that are more distant. For example, many hunters in eastern Hudson Bay and Ungava Bay travel to Hudson Strait to hunt beluga whales every October. They hunt them near Ivujivik, Salluit or Quaqtaq. Inuit in these communities accuse them of leaving garbage and discarding materials at their camping and hunting sites. These and other types of behavior of hunters coming from other communities are often criticized through FM radio broadcasts throughout Nunavik. This tendency toward territoriality appears to be a result of sedentarization and the James Bay and Northern Quebec Agreement (1975) [cf. NADASDY 2002].

Finally, tension is also apparent between Nunavut and Nunavik communities. For example, Saniqiluaq Inuit administratively belong to Nunavut Territory and have no restrictions on hunting beluga whales in eastern Hudson Bay. On the other hand, hunters from Inukjuak, Umiujaq and Kuujjuarapik, belonging to the Kativik Regional Government in Nunavik, are restricted under the quota system that prohibits hunting beluga in eastern Hudson Bay. Hunters in Nunavik often complain about this situation.

It is apparent, then, that the current co-management system, especially the quota system has brought about considerable conflict among Inuit of Nunavik. In order to resolve these conflicts, the contemporary co-management system should be restructured.

4. PROBLEMS OF NUNAVIK CO-MANAGEMENT AND PROPOSED SOLUTIONS

4.1. Conditions for Conservation in Nunavik

Before discussing in further detail the serious problems relating to contemporary Nunavik co-management, I will examine beluga conservation practices in Nunavik. Smith and Wishnie [2000: 505] define conservation as "practices that are designed to prevent or mitigate species depletion or habitat degradation". They point out five theoretical conditions under which conservation is likely to occur [SMITH and WISHINIE 2000: 505–506];

1. Controlled or exclusive access (stable land rights);
2. Distinct or confined resource populations (to which controlled access can apply);
3. Resource populations that are resilient or rapidly renewing (and hence likely to respond to management controls);
4. Low discount rates, such that the value of sustained yields exceed the value of immediate yields; and
5. Social parameters (e.g. small group size and stable membership) and institutions (monitoring and sanctioning) that counter "free-riding".

In addition, they discuss six conditions that make deliberate and effective conservation much less likely to emerge or to be stable [SMITH and WISHINIE 2000: 506].

6. High demand from external markets;
7. Rapid human population growth;
8. Acute resource scarcity;
9. Inadequate substitutes for threatened resources;
10. Acquisition of novel technology or migration into novel habitats; and
11. Ease in relocating production (expandable frontiers, mobile capital).

While beluga co-management in Nunavik does not seem to be functioning effectively, it does appear to be doing so in the Western Arctic [IWASAKI 2002]. In the Mackenzie area since 1973 and at Paulatuk since 1989, local hunters have actively participated in a series of beluga-monitoring research programs. Also, Inuvialuit hunters have played a vital role in collecting biological information on beluga whales [HARWOOD, et al 2002]. It is estimated that 32,500 beluga whales live in the western Arctic region, of which approximately 200 are caught annually by hunters in Alaska and the Western Canadian Arctic [HARWOOD and SMITH 2002: 84–85]. As the annual harvest accounts for less than 0.6 % of the total population, beluga are not over-hunted and the harvest is sustainable [HARWOOD and SMITH 2002: 85][6].

Following Smith and Wishnie, I will compare conservation processes between Nunavik and the Western Arctic regions. The comparison, summarized in Figure 4, illustrates that there are no substantial differences between the two regions except that belugas are far more abundant in the Western Arctic.

4.2. Problems in the Co-Management of Beluga Whales in Nunavik

The basis of co-management is the sharing of power and responsibility between resource users and government. In this section, I will describe and examine some of the problems in Nunavik co-management of beluga whales.

The quota system from 1996 to 2000 was rarely adhered to in Nunavik. Although local hunters were aware of relevant quotas, this was not reflected in their hunting patterns. Both the research department of the Makivik Corporation and DFO thought that the belugas were being depleted and consequently warned local communities against over-hunting. On the other hand, many local hunters were of the opinion that beluga were still abundant in the Nunavik region,

Conditions	Western Arctic	Nunavik
Controlled or exclusive access	Yes	Yes
Distinct or confined resource populations	Yes	Yes
Resource populations that are resilient or rapidly renewing	No	No
Low discount rates	Yes	Yes
Social parameters and Institutions that counter free-riding	Yes	Yes
High demand from external markets	No	No
Rapid human population growth	Yes	Yes
Acute resource scarcity	No	Yes/ No
Adequate substitutes for threatened resources	No	No
Acquisition of novel technology or migration into novel habitats	Yes/No	Yes/No
Ease in relocating production	No	No

Figure 4 Comparison of Conservation Conditions between Nunavik Region and Western Arctic Region

and did not understand why the quota systems had been introduced. Also, the municipalities did not thoroughly monitor the number of beluga harvested by local hunters. For example, in a village whose quota was 15 per year, local hunters caught far more than 15 beluga in October and November, 1999. Although this harvest was not illegal because quota violations were not subject to legal penalties, this harvest far exceeded the quota agreed to by both the DFO and local Inuit in 1996.

In establishing the new 2001–2003 conservation project, and as noted previously, the DFO and Nunavik Inuit discussed beluga quotas on several occasions in early 2001. However, the local Inuit were forced to accept the DFO proposal on the revised quota. Also, my interviews with several Inuit from the Makivik Corporation and the Angavigaq showed that there seemed to be some problems concerning the negotiation processes between the DFO and local Inuit. The James Bay and Northern Quebec Agreement did specify HFTCC as the co-manager with the DFO in Nunavik. However, DFO officials also had to discuss the revisions with various groups or representatives, such as the Makivik Corporation, Angugaviq and the HFTAs, the Kativik Regional Government, the Quebec government, the regional Landholding Corporation and the local Landholding Corporations and representatives from 14 local communities. As a result, it was very unclear as to who was responsible for the co-management of belugas with the DFO, thus revealing structural problems within the negotiation process. Which group or groups should represent Inuit in the negotiation process?

This situation led to disagreement between Inuit and the DFO regarding beluga management. Local Inuit did not actively participate in the co-management as a partner with DFO. If we compare co-management practices between Nunavik and the Western Arctic regions, we find one crucial difference. It is that Inuvialuit hunters in the Western Arctic participate in co-management far more actively than Inuit hunters in Nunavik [IWASAKI 2002]. As Pinkerton [1989] points out, co-management does not function effectively without the active cooperation and participation of the actual resource users. It is my opinion that the contemporary co-management system of Nunavik should be revised so as to promote Inuit participation at the local level.

4.3. Prospects for Improving Co-Management in Nunavik

Resource management, which is a deliberate attempt by humans to control particular resources, is a very non-Aboriginal type of concept. The Inuit and Alaskan Yupiit believe that it is crucial for them to maintain proper relationships between people and animals for a successful harvest [FIENUP-RIORDAN 1983; NUTTALL 1991; STAIRS and WENZEL 1992]. The critical elements in Inuit hunting are proper attitude and intentions towards the animals. These intentions have two aspects. First, the hunter must intend to utilize the remains of the animal for food. Second, food from harvested animals should not be for the exclusive use of the individual hunter [STAIRS and WENZEL 1992: 5]. Because animals give themselves up to hunters, it is incumbent on the hunters to give them in turn to other people [FIENUP-RIORDAN 1983: 346; NUTTALL 1991: 219]. We may regard taboos and several of the ceremonial practices in maintaining these relationships as a form of management in a broad sense. However, I do not think that the Inuit and Yupiit traditionally had a concept of intentional or artificial management of animal populations [FIENUP-RIORDAN 1983, 2000; OMURA 1999]. However, it is interesting to note that contemporary Inuit

and Yupiit do express the necessity for wildlife conservation for the benefit of future generations [DROLET et al 1987; FIENUP-RIORDAN 2000; ZAVALET 1999].

I would argue that, as management is a social process, it should be developed and revised through trial and error. Thus, co-management is a social institution whereby resource users and the government set particular goals and attempt to reach these goals on the basis of shared power and responsibility. The resource users and government should participate in the process of creating the management systems on a case by case basis.

How should we improve the current co-management regime in Nunavik region? In this paper, I would like to suggest some revisions to improve its effectiveness in conserving beluga whales. First, we assume that beluga whales are one of the resources of the commons in Nunavik. According to Berkes [2002a], the commons are generally associated with problems of exclusion and subtractability. However, if a community using a common resource is able to limit access by outsiders and control its own harvest, these problems can be solved by community-based resource management. Berkes [2002a] argues that promising practices include the sharing of management rights and responsibilities by communities and governments. Furthermore, he advocates a new approach focusing on linking institutions horizontally (across geographical space) and vertically (across levels of organization) [BERKES 2002b]. The simplest example is the partnership of local-level management with government-level management.

Berkes' idea is applicable to Nunavik co-management of beluga whales because of two favorable conditions. First, it is only Inuit who use beluga as a food resource and who are permitted to hunt them under the James Bay and Northern Quebec Agreement, and there is little external market demand for beluga products. Second, the majority of contemporary Nunavik Inuit hope to conserve beluga for sustainable use by future generations, and thus feel the need to implement some form of management. This implies that once they agree to a management system, they will self-regulate the harvesting of beluga. These two conditions would thus seem to favor the employment of community-based resource management.

Berkes [2002b] examines forms of management in terms of cross-scale institutional linkages both horizontally and vertically, and summarizes the co-management arrangements of "The James Bay and Northern Quebec Agreement" as shown in Figure 5. In accordance with Figure 5, contemporary co-management arrangements of beluga whales in Nunavik is indicated in Figure 6.

Under the current management plan, Nunavik hunters harvest beluga not in eastern Hudson Bay where Nunavut hunters freely harvest them, but in James Bay, which is included in Cree territory. Thus, Nunavik Inuit and the DFO need some arrangement for harvesting the beluga with Nunavut Inuit and Cree in order to avoid possible conflicts over resource harvesting and territory use. One serious problem with the current management arrangement is that it is unclear who should be responsible for managing the whales with the DFO. As illustrated in Figure 6 and discussed previously, representatives from the following Inuit organizations sit at the same table to negotiate management issues with the DFO: the Quebec and Kativik Regional Governments, the Makivik Corporation, regional Landholding Corporation, local Landholding Corporations, Angugaviq, the local HFTAs, and representatives from 14 communities. Although it is important for Inuit and the various governments to each have opinions on management issues, the system becomes unwieldy when attempts are made to incorporate all opinions into

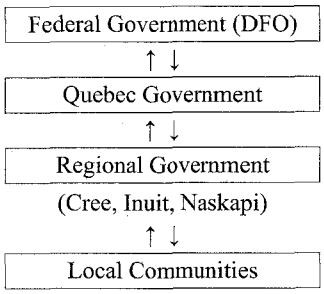


Figure 5 The Co-Management Arrangements of The James Bay and orthern Quebec Agreement

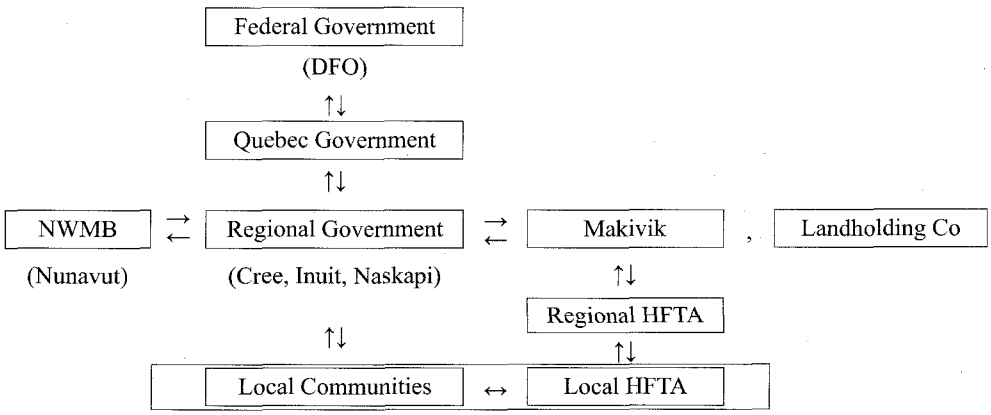


Figure 6 The Contemporary Co-Management Arrangement of Beluga Whales in Nunavik.

the management process.

I suggest the establishment of a much simpler co-management system with fewer formal levels and organizations and where each has its own definite roles and functions. In addition, the system should formally incorporate opinions of local hunters and include them in a co-management role with the DFO. Following these two principles, I propose that the Angugaviq and the local HFTAs be the primary beluga whale co-managing body with the DFO. Also, these associations should be given much more power in decision-making and their functions should be expanded, while the decision making power of the DFO should be decreased and its functions limited.

Other Inuit and governmental bodies should function as advisors and technical supporters to the Angugaviq and the local HFTAs and the DFO. So long as local hunters do not self-regulate their harvesting activities, the co-management system will not function effectively [PINKERTON 1989]. While the DFO aims to conserve beluga whale stocks to maintain biodiversity of marine species, local Inuit hope to conserve them as a food resource. They share a common goal to conserve the stocks, but for different reasons. The form of the co-management I propose is

summarized in Figures 7 and 8.

First, the Angugaviq and the local HFTAs should have the authority to determine harvesting regulations and quotas, and the DFO should be an advisor rather than a co-decision maker on these matters. Second, while the DFO carries out biological and monitoring research of beluga whales in cooporation of other Inuit and governmental organizations, Angugaviq and the local HFTAs should also be involved in this research, which should be organized and conducted on a regular basis.

Third, the primary function of the DFO should be that of coordinating various opinions and conflicts over resource management between Nunavik communities, between different

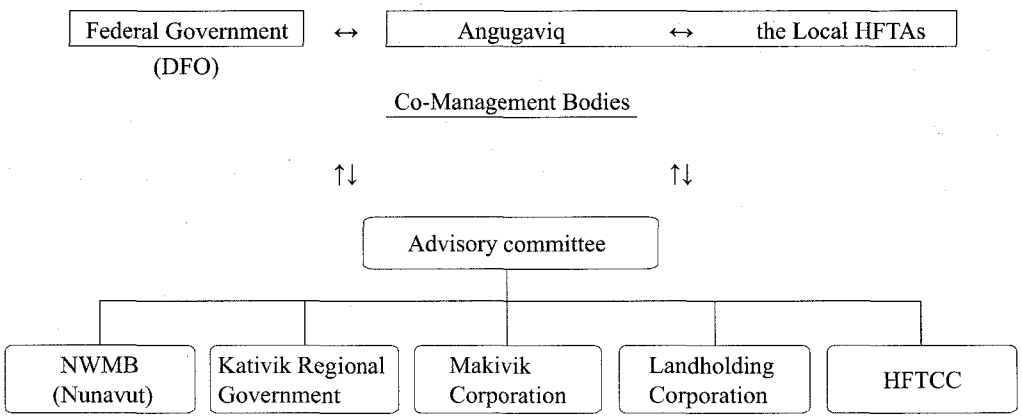


Figure 7 Proposed Form of Co-Management

	Co-Management Body (1)	Co-Management Body (2)	Advisory Committee
Organizations	Anguvigaq and Local Hunting, Fishing and Trapping Associations	DFO	Makivik Corporation, Kativik Regional Government, Local Communities, Landholding Corporation
Primary Roles	to establish harvesting regulations and quota	to organize and conduct biological and monitoring research with HFTs and to coordinate various opinions and conflicts over beluga whales between different regional bodies	to advise and to help about co-management and research to HFTs and DFO
Secondary Roles	to participate monitoring research project as a co-operator	to advise about harvesting regulations and quota to HFTAs	communication liaison

Figure 8 Roles of Inuit and Governmental Organizations in Co-Management

regions, between Kativik regional government and the Nunavut government, and between the Kativik and Cree regional governments. Fourth, all other governmental and Inuit organizations should be advisers and/or provide technical assistance in the management and in biological research. Also, these organizations should act as liaisons regarding co-management between their members and the Angugaviq and the local HFTAs / DFO.

Angugaviq and the local HFTAs should determine quotas through trial and error, in consultation with the DFO. At present, there is no clear proof of the accuracy of the whale populations sizes based either on scientific research or on Inuit experience. This proposal to determine quotas through trial and error treats conservation policies as hypotheses and management practices as experiments from which managers can learn [BERKES 2002b: 312].

I also propose that a new project of community-based co-management should be undertaken for five years under the form of the co-management system suggested here. If co-management fails to conserve beluga whale populations under this system, it is my opinion that the Inuit would willingly listen to and cooperate with DFO researchers to revise the system.

5. CONCLUSION

In this paper, I discussed problems associated with the co-management of beluga stocks in Canada and suggested strategies for this management. Because hunting activities in Inuit society reflect and maintain special relationships between Inuit and animals or between Inuit and their culturally defined environments, these activities are culturally important to the Inuit. Also, for Inuit, the *maktaq* of a beluga whale is a highly valued nutrient source. Furthermore, the sharing and distribution of the *maktaq* and meat in Inuit communities contributes to maintaining and reproducing Inuit social relationships, a sense of community and Inuit identity. A beluga whale is a culturally, economically, nutritionally and socially important resource to the Inuit. Thus, it is crucial for contemporary Inuit to use the beluga whale resource sustainably, especially given its relative scarcity.

Since 1996, the DFO and Nunavik Inuit have carried out co-management of beluga to conserve them for sustainable use. However, as I have described, the management has thus far failed to accomplish its goals. Through my research in Nunavik, I found that there are two serious problems with the current management system. One is the institutional complexity or functional ambiguity in the sharing of responsibilities and power between local Inuit and the DFO. The other is that Inuit do not actively participate in co-management practices or play a vital role in the co-management. In order to overcome these problems, I have proposed a new form of co-management.

Institutionally, Anguvigaq and the local HFTAs should act as co-managers with the DFO. Other horizontal and vertical Inuit and governmental organizations should act as advisors and technical assistants to the co-managing bodies. Functionally, Anguvigaq and the local HFTAs should have much greater responsibilities and powers in determining quotas and other hunting regulations than the DFO. The DFO should organize and carry out biological and monitoring research of the beluga whales in conjunction with Anguvigaq and the local HFTAs on a regular basis. The DFO should play a vital role in coordinating the various opinions and conflicts over the beluga whales across the numerous organizations and communities concerned. Furthermore,

power and responsibilities over beluga whale management should be given to local hunters and their representatives for a five-year period. Because Inuit hope to use the beluga whale resource sustainably and conserve them for the future generations, it can be suggested that they will self-regulate their harvesting activities and manage the resources in a sustainable manner.

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NOTES

1) Regarding beluga whales in the Arctic, there have been a variety of studies carried out: biological studies [BORN et al. 1994; HEIDE-JORGENSEN et al. 1998; RICHARD, P.R. et al. 1998a, b; HUBBARD et al. 1999], archaeological and ethnohistorical studies [LUCIER and VANSTONE 1995; SAVELLE 1995], indigenous knowledge [MACDONALD, ARRAGUTAINAQ and NOVALINGA compiled in 1997; KILUBAK 1998; HUNTINGTON, et al. 1999; MYMRIN 1999], and studies of hunting and co-management [ADAMS, et al. 1993; RICHARD and PIKE 1993; MORSETH 1997; SEJERSEN 2001]. In this paper, I do not deal with contaminant problems relating to beluga whales. In this regard, see e.g., Barrie et al. [1992], Dewailly et al. [1994], Ayotte [1995], Egede [1995], Kinoloch [1995], Kuhnlein [1995], Wormworth [1995], O'Neil et al. [1997], Smith and McCarter [1997], Nuttall [1998], Canada [1999], McGinn [2000], and Kishigami [2002].
2) On the east coast of Hudson Bay in Nunavik, a symbolic midwife refers to a person who puts the first clothing on a newborn baby while whispering his/her wish to the baby. A man or woman can be the midwife. The midwife and his/her baby establish a special relationship. The midwife teaches the child over the course of its childhood and offers many presents on several occasions. On the other hand, the child has to give all of her/his first animal harvested or handicraft produced to the midwife [GUEMPLE 1965; KISHIGAMI 1998: 141–143].
3) The purpose of the program is to favor, encourage and perpetuate subsistence activities of the Inuit as a way of life, and to guarantee Inuit communities a supply of produce from these activities. The program was established in 1983, through Bill 83 of the Quebec Provincial Government, under the James Bay and Northern Quebec Agreement [1975]. See Kishigami [2000] regarding the use of the program in Akulivik. In Kuujuaq, the hunter support program is primarily used to subsidize (at 50% cost) the purchase of hunting and camping equipment by Inuit.
4) Genetic analysis of harvested beluga whales is currently being undertaken by biologists to determine relationships between the various beluga subgroups being hunted [SMITH 2000].

5) Hunters in each Nunavik community form a local Hunting, Fishing and Trapping Association (HFTA). There are 14 local HFTAs in Nunavik. As a headquarters for all local associations, the regional HFTA "Anguvigaq", was established in Kuujjuaq with the assistance of the Makivik Corporation. This association represents Inuit at the community level in all matters dealing with wildlife use and management. One of the primary functions is to give direction to the Inuit members of the Hunting, Fishing and Trapping Coordinating Committee (HFTCC) and to act as liaison between the committee members and the communities.
6) There is some problem relating to beluga whales in western Arctic. A conflict is emerging between hunting beluga and beluga watching as a tourist activity which can be a main cash source in a mixed economy [DRESSLER et al. 2001].

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