

**Caribou Commercialization Project  
Environmental Impact Study : Phase 2**

Project Coordinator : Robert Lanari, Anthropologist

Researcher : Jacinthe Boileau, Anthropologist

Support Team :

Adams Lewis, GIS Analyst  
George Masty, Intepreter, Whapmagoostui  
Myva Niviaxie, Interpreter, Kuujuaraapik  
Marie-Cécile Brasseur, Editing  
Paule Lamarche, Layout

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Resource Development Department

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## Summary

The report entitled *Caribou Commercialization Project: Environmental Impact Study, Phase 1* was submitted to the Kativik Environmental Quality Commission in December 2001. It defined and justified the Project, described the environmental and social milieu as well as the status of the caribou herd, discussed impacts of the Project, and proposed mitigation and monitoring measures.

This report describes the second phase of the environmental impact study. The study was originally scheduled to take place during the caribou harvest of February–March 2002. For reasons beyond the scope of this study, the harvest did not take place as foreseen. Nevertheless, a biologist went to Lake Mollet in July 2002 in order to assess the environmental impacts of the disposal site, which was easier to access and view in the summer season. A more thorough consultation was carried out in August 2002 with the communities of Kuujjuaraapik and Whapmagoostui.

This report submits the findings of the second phase of the study with respect to the disposal site and its environmental impacts, Cree land use, as well as the views and concerns of both the Cree and Inuit communities. It also presents further recommendations pertaining to mitigation measures.

Cree and Inuit respondents alike were in favor of the Project. In their opinion, the positive impacts seem to outweigh the negative ones. Furthermore, with the proper involvement of both communities, these positive impacts could be easily increased while the negative impacts are minimized.

The positive impacts are mostly economic in nature: jobs for members of the communities and benefits for Native businesses. It is also felt that a commercial hunt is a good caribou management scheme and that the disposal site may have positive impacts on other animals, the soil and plants.

On the other hand, the Cree hunt mostly inland and the commercial harvest takes place within the area of two of the 26 trapping territories belonging to the Cree of Whapmagoostui. The use of helicopters and snowmobiles to hunt may create stress, reduce the reproduction rate, affect the health of the caribou and, most importantly, change its migration routes. If the caribou population declines or if the caribou changes its migration routes, subsistence hunting will become more difficult and will have to be practiced further inland.

Sport hunting, which is a very lucrative business in Nunavik, may also be affected if the herd decreases or if migration routes change. Seen from the point of view of a subsistence hunter, sport hunting is yet another activity that “disturbs” the herd: “Even if there is no commercial hunt going on, there is still some disturbance with the caribou.

Sport hunters are also disturbing caribou so there is not as much caribou as usual" (Cree elder).

Another area of concern is the huge quantity of "good" food being wasted as well as the skins and the antlers being thrown away.

To increase positive impacts and minimize negative ones, the respondents made recommendations on various subjects. The waste disposal site being a main concern, it was suggested that the area surrounding the Project be monitored on a regular basis. As well, caribou migration patterns, the health of the herd and the impact of sport hunting should be monitored by Native hunters. Finally, in order to prevent valuable caribou parts from going to waste, there should be stricter harvest and butchering regulations.

Greater cooperation between both communities would diminish or eliminate these previously mentioned impacts and better ways of proceeding with the harvest could be found. More jobs could be created if processing was carried out in the communities. The costs of bringing more meat to the communities could be paid for by the sale of handicrafts made of skins and antlers.

Finally, we should add that in order to avoid further psychological distress in the communities, there should be a Cree and Inuit public meeting prior to the next harvest. The purpose of such a meeting would be to explain and provide information about the Project as well as discuss issues like local meat processing, disposal of carcasses, skinning and meat distribution in the communities.

## Résumé

Le rapport intitulé *Projet de commercialisation du caribou : étude d'impact sur l'environnement, phase 1* a été soumis à la Commission de la qualité de l'environnement Kativik en décembre 2001. Ce rapport définissait et justifiait le projet, décrivait le milieu naturel et social dans lequel il se déroulait, de même que l'état du troupeau de caribous, discutait de son impact sur l'environnement et proposait des mesures d'atténuation et de surveillance.

Le présent rapport décrit la deuxième phase de l'étude d'impact sur l'environnement, qui devait au départ être réalisée pendant la période de chasse au caribou allant de février à mars 2002. Toutefois, pour des raisons qui dépassent la portée de l'étude, la chasse n'a pas eu lieu comme il était prévu. Un biologiste s'est néanmoins rendu au lac Mollet en juillet 2002 afin d'évaluer les impacts du lieu de décharge brut sur l'environnement, lequel était d'ailleurs plus accessible en été. Une consultation plus complète a également été réalisée en août 2002 auprès des populations des communautés de Kuujuaapik et de Whapmagoostui.

On trouve dans le présent rapport les résultats de la deuxième phase de l'étude, lesquels portent sur le lieu de décharge brut et ses impacts sur l'environnement et l'utilisation des terres faites par les Cris, de même que sur les opinions et les préoccupations des communautés crées et inuites. Y sont également présentées d'autres recommandations au sujet des mesures d'atténuation.

Les participants à la consultation, tant crés qu'inuits, étaient en faveur du projet. À leur avis, les retombées positives l'emportent sur les impacts négatifs. De plus, si l'on enjoint les deux communautés à jouer un rôle actif dans le projet, les retombées positives seront d'autant plus importantes, alors que les impacts négatifs, quant à eux, pourront être atténués.

Les retombées positives sont surtout d'ordre économique : création d'emplois pour les membres des communautés et bénéfiques pour les entreprises autochtones. Par ailleurs, on estime que l'exploitation du caribou à des fins commerciales constitue un bon mécanisme de gestion du caribou et que le lieu de décharge brut peut avoir un impact positif sur les autres animaux, le sol et les plantes.

Cependant, les Cris de Whapmagoostui chassent surtout à l'intérieur des terres et l'exploitation du caribou à des fins commerciales se déroule dans deux de leurs vingt-six territoires de piégeage. L'utilisation d'hélicoptères et de motoneiges pour chasser le caribou peut créer un stress sur la faune et réduire le taux de reproduction, nuire à la santé des caribous et, fait le plus important, changer les routes de migration du troupeau. Si la population de caribous diminue ou si le troupeau change sa route de migration, la chasse de subsistance deviendra plus difficile et il faudra que les chasseurs se déplacent davantage à l'intérieur des terres.

D'autre part, la chasse sportive, une entreprise très lucrative au Nunavik, pourrait elle aussi en subir le contrecoup. Du point de vue d'un chasseur de subsistance, la chasse sportive « dérange » elle aussi le troupeau : « Même si le caribou n'est pas exploité à des fins commerciales, le troupeau est tout de même perturbé. Les chasseurs récréatifs dérangent le troupeau et il n'y a pas autant de caribous qu'avant ». (Paroles d'un aîné cri.)

Une autre source de préoccupation est la quantité considérable de « bonne » nourriture qui est gaspillée, sans compter la peau et les bois qui sont mis au rebut.

Les participants à la consultation ont formulé diverses recommandations afin d'accroître les retombées positives et d'atténuer les impacts négatifs. Comme le lieu de décharge brut est l'une des grandes préoccupations, ils suggèrent de surveiller régulièrement les lieux où se déroule le projet. Ils proposent également que ce soient les chasseurs autochtones qui surveillent les routes de migration du caribou, la santé du troupeau et les impacts de la chasse sportive. En outre, afin d'éviter que des parties précieuses du caribou ne soient mises au rebut, il faudrait élaborer des règlements d'exploitation et de dépeçage plus stricts.

Une plus grande collaboration entre les communautés aurait pour effet de diminuer, voire éliminer, les impacts négatifs susmentionnés et permettrait de mettre en place des méthodes d'exploitation plus judicieuses. Un plus grand nombre d'emplois pourraient être créés si la transformation de la viande se faisait dans les communautés. Il serait possible de compenser les coûts du transport de la viande dans les communautés par la vente de produits d'artisanat faits de peau et de bois de caribou.

Pour terminer, il serait important que les Cris et les Inuits assistent à une réunion publique avant la prochaine chasse à des fins commerciales afin de ne pas créer davantage d'inquiétudes au sein des communautés. Une telle rencontre permettrait de communiquer des renseignements au sujet du projet et de l'expliquer plus en détail, de même que de discuter de questions telles que la transformation de la viande dans les communautés, la mise au rebut des résidus d'abattoir, de même que la récupération des peaux et la répartition de la viande dans les communautés.

## TABLE OF CONTENTS

### SUMMARY

<b>1.</b>	<b>INTRODUCTION.....</b>	<b>1</b>	
	1.1 Purpose of the Study.....	1	
	1.2 Methodology.....	2	
<b>2.</b>	<b>WHAPMAGOOSTUI LAND USE.....</b>	<b>4</b>	
<b>3.</b>	<b>INUIT AND CREE POINTS OF VIEW .....</b>	<b>6</b>	
	3.1. Environmental Impacts.....	6	
	3.1.1 Disposal Site.....	6	
	3.1.2 Helicopters.....	8	
	3.2 Impacts on the Caribou.....	8	
	3.2.1 Potential Impacts of Herding.....	10	
	3.3 Economic Impacts.....	11	
	3.4 Social Impacts.....	13	
	3.4.1 Waste Recovery.....	14	
	3.4.2 Psychological Impacts.....	15	
	3.4.3 Subsistence Activities.....	15	
	3.4.4 Skill Acquisition.....	16	
	3.4.5 Information on the Project.....	17	
<b>4.</b>	<b>MITIGATION MEASURES.....</b>	<b>18</b>	
	4.1 Respondents Recommendations.....	18	
	4.2 Other Mitigation Measures.....	20	
 <b>MAPS</b>			
	Map 1 Cree of Whapmagoostui Trap Line Areas.....	5	
	Map 2 Cree Camps, Hunting Grounds and Commercial Hunting Areas...	7	
 <b>REFERENCES.....</b>			<b>21</b>
 <b>APPENDIX 1. Questionnaire.....</b>			<b>22</b>



## 1. INTRODUCTION

### 1.1 Purpose of the Study

In 1998, 1999 and 2000, Nunavik Arctic Foods Inc. (1998) ("NAF") conducted an experimental caribou harvest at Lake Mollet, near the community of Kuujjuaraapik-Whapmagoostui, Nunavik, in order to assess the commercial viability of such a project.

Given the experimental nature of the project, the Kativik Environmental Quality Commission (KEQC) exempted it at the time from an environmental impact assessment study. After three years of operations, however, the KEQC directed that such study be conducted prior to any further caribou harvesting, and to this end, issued the guidelines entitled *Recommendations on the Scope and Content of the Impact Assessment Statement* in February 2000.

No harvesting was carried out in 2001 and 2002, and a decision is yet to be made for the 2003 season. Nevertheless, in response to the KEQC guidelines, NAF decided to undertake a study to identify the social and economic impacts of the Caribou Commercialization Project (the "Project") on the communities directly affected by it, as well as environmental impacts in the Lake Mollet area and the caribou population itself.

As proposed to the KEQC in a letter dated November 2001 (Appendix 1, Phase 1) the impact study was to be carried out in two phases, the first of which was completed in December 2001. A report entitled *Caribou Commercialization Project. Environmental Impact Study: Phase 1* was then submitted to the KEQC, to define and justify the Project, describe the environmental and social milieu as well as the status of the caribou herd, discuss impacts and propose mitigation measures and monitoring programs.

This report concerns the second phase of the study, which was originally scheduled to take place during the caribou harvest of February-March 2002. For reasons beyond the scope of this study, the harvest did not take place as foreseen. Nevertheless a biologist went to Lake Mollet in July 2002 in order to assess the environmental impacts of the disposal site, which was easier to access and view in the summer season. Further consultations were also carried out in August 2002 with the communities of Kuujjuaraapik and Whapmagoostui.

This report submits the findings of the second phase of the study with respect to the disposal site and its environmental impacts, Cree land use, as well as the views and concerns of both the Cree and Inuit communities. It also presents further recommendations pertaining to mitigative measures.

## 1.2 Methodology

To meet the goals of the second phase of the impact study, the following steps were taken:

A biologist visited Camp Mollet in July to assess contamination levels, if any, at the disposal site and in surrounding lakes;

From July 29 to August 9, the Whapmagoostui-Kuujjuaraapik Cree and Inuit communities were consulted. A questionnaire (see Appendix 1) had been prepared to serve as a guide and reminder of matters to be covered by the semi-directive interviews;

The preceding week, calls were placed to David Masty, Chief of the Whapmagoostui Cree Band Council, Lucassi Inukpuk, Mayor of Kuujjuarapik and Alec Tuckatuck, President of the Sakkuq Landholding Corporation (SLHC), to inform them about the forthcoming community consultation on the Project;

Upon arrival of the study team, separate meetings took place with Lucassi Inukpuk, Alec Tuckatuck and David Masty to find interpreters and set up interviews with respondents;

On July 31 and August 1, three group interviews took place with a total of 11 Cree participants, including elders, hunters and Camp Mollet workers of both genders;

To obtain information on the Whapmagoostui Cree land use, a map was used so that the Cree respondents could indicate the locations of Cree camps in the area (see map no 2). Moreover, a Cree who hunted at Lake Mollet indicated on the map the area covered in past commercial harvests;

From August 5 to August 8, thirteen individual interviews were conducted, some with the help of interpreters, with Inuit hunters, tourist guides, and Camp Mollet workers of both genders;

The land use section of the Hydro-Quebec Grande-Baleine Complex impact study pertaining to the Cree area was reviewed;

The report prepared circa 1995 by Marty Weinstein on the land use and ecological knowledge of the Whapmagoostui Cree could not be provided by the Grand Council of the Crees (Quebec), nor by the Chief of Whapmagoostui. Therefore, we were not able to include its information in this report.

At the time of finalizing this document, the biologist who had visited Mollet Lake, had not yet finalized and submitted his report. As soon as it is received it will be forwarded to the KEQC.

## 2. WHAPMAGOOSTUI LAND USE

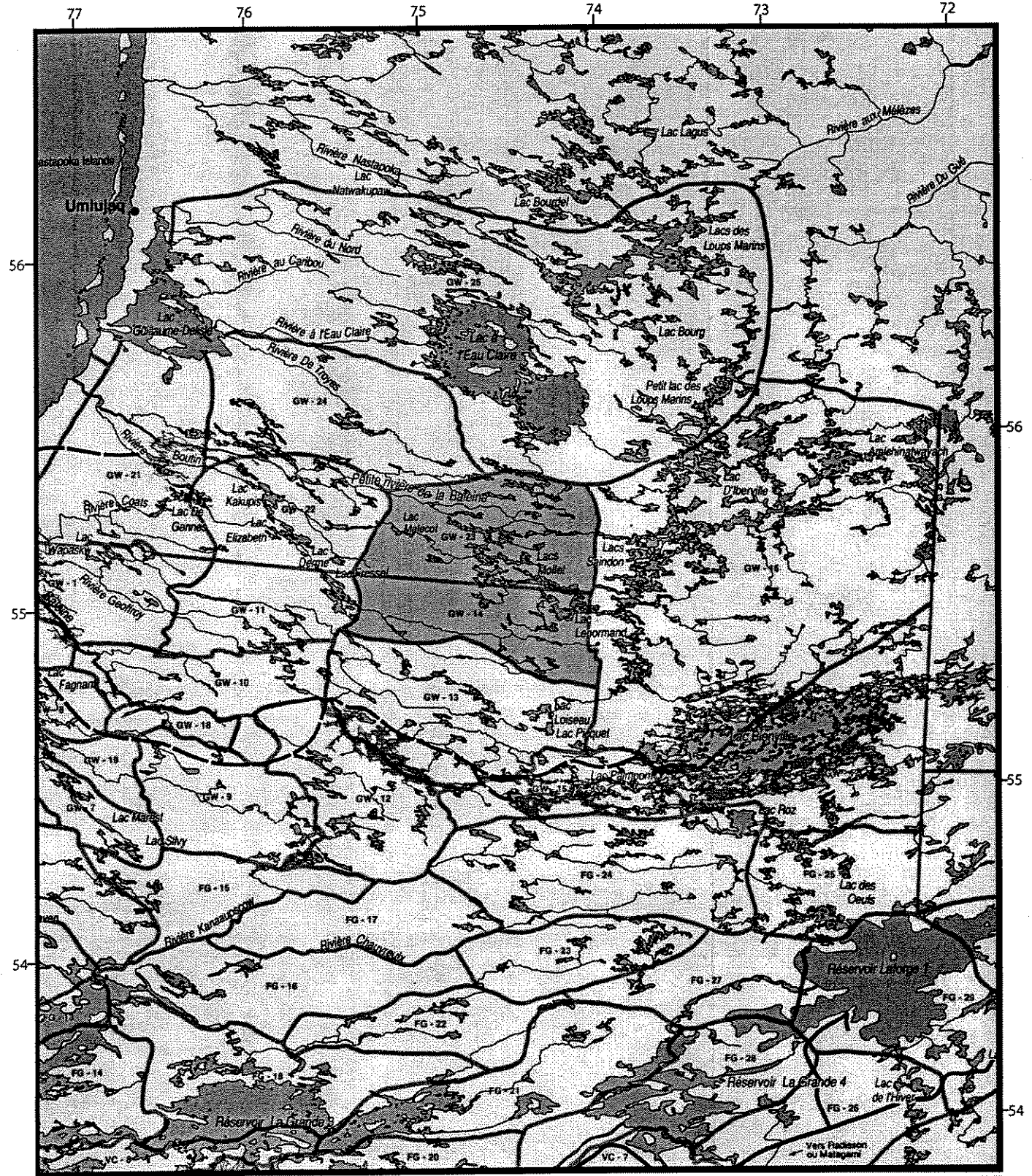
Accurate information pertaining to land use is required to understand the social impacts of the Project. The land use of the study area by the Inuit of Kuujjuaraapik was detailed in the first phase of the study. To complete the land use around Lake Mollet, information on the Whapmagoostui Cree who hunt, trap and fish in the surrounding areas is also necessary to assess the impacts of the Project. In this regard, Hydro-Quebec's impact study regarding the Great-Whale River Hydroelectric Complex of 1993 was reviewed, and during the interviews, questions were asked about land use, including hunting camp locations and areas used for commercial hunting around Lake Mollet.

According to the study carried out by Hydro-Quebec, the Whapmagoostui Cree operate 26 trapping territories, two of which are near Lake Mollet (map 1) and include the area where commercial harvest has taken place (Hydro-Quebec 1993: 173). The said report (186, 187 and 190) also makes the assumption that this area has two functions: the first one, as just mentioned, is linked to trapping, and the second one corresponds to caribou and small game hunting.

To complement and update this information, questions as to the land use around Lake Mollet were asked to Cree respondents. Ten hunting and fishing camps were identified, and Cree subsistence as well as commercial hunting areas were also mapped out.

Map no 2 shows hunting camp locations, hunting and fishing areas (blue circles) as well as commercial hunting grounds (red circles) covered by the workers during their stay at Lake Mollet.

Of the ten hunting camps, two (nos. 5 and 10), are close to Nunami Outfitter. In fact, as indicated by one of the blue circle, Nunami is within their area of hunting and fishing. Moreover, as indicated by one of the red circles, the Cree workers carried out a commercial hunt within this subsistence area.



### Cree Trap Line Areas

Sourced from:  
 Complexe Grande-Baleine  
 Feasibility Study: Part 2  
 Book 10, Volume 2  
 Plate 111

- |   |                                   |   |                  |
|---|-----------------------------------|---|------------------|
|  | Cree Trap Line Areas              |  | Existing Routes  |
|  | Cree Trap Line - Lake Mollet Area |  | Projected Routes |

### 3. INUIT AND CREE POINTS OF VIEW

From July 29 to August 9, 2002, interviews were conducted in Kuujjuaraapik-Whapmagoostui pertaining to the perception by Cree and Inuit people of the Project positive and negative impacts on the environment, the caribou herd and their community.

#### 3.1 Environmental Impacts

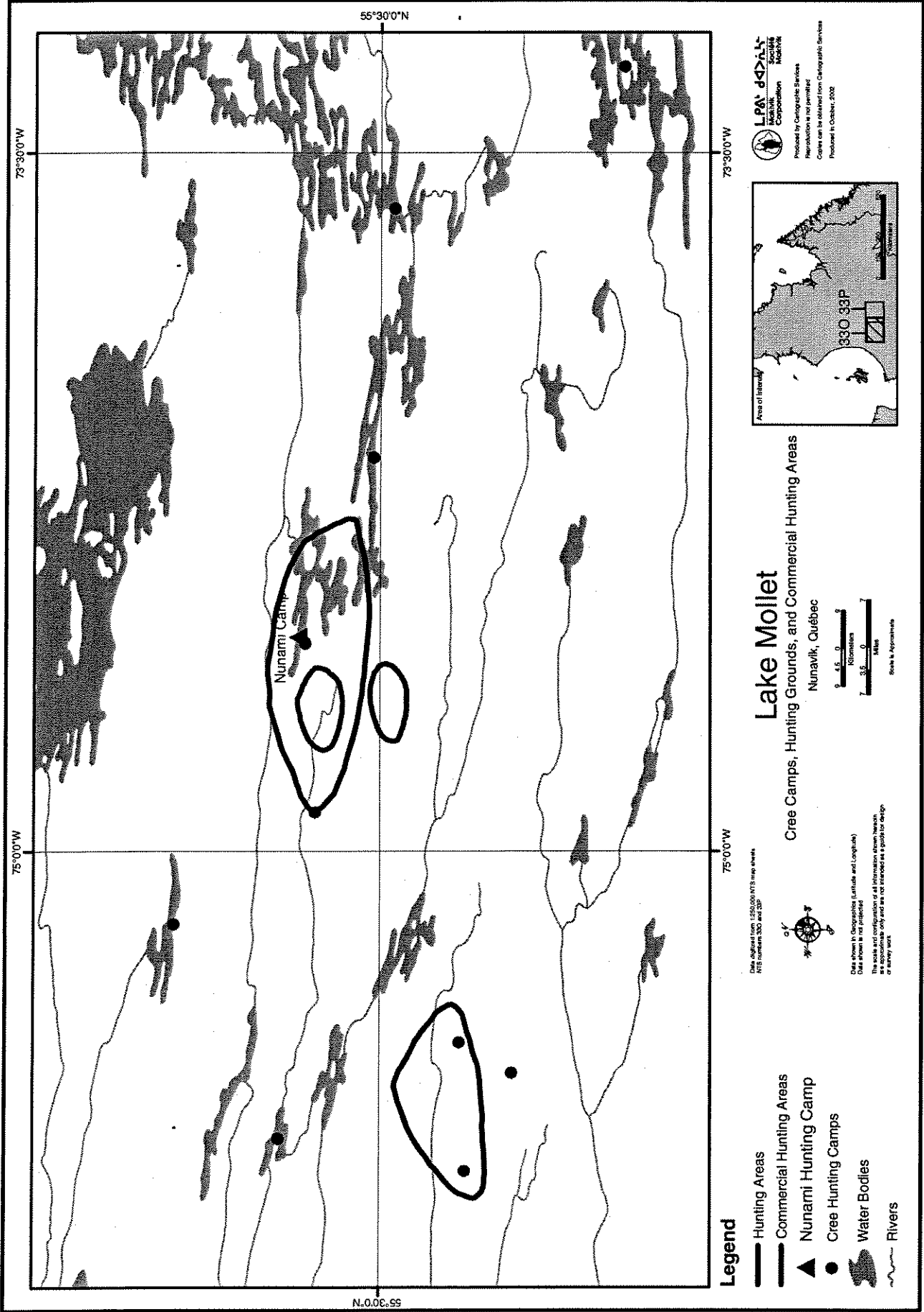
In regard to environmental impacts, the main points raised during the interviews were the disposal site, the use of helicopters and the impact of the harvest on caribou. Both Cree and Inuit, however, stated that more time must elapse before it would be possible to assess all the effects of the commercial hunt on the environment.

##### 3.1.1 Disposal Site

For many of the Inuit interviewed, the disposal site has a positive impact on the animals, the soil and the plants: fish, black bear, wolves, foxes and smaller animals all benefit from the disposal site as they feed on caribou offal.

The plants and the soil also benefit from nutrients imparted by the offal. Moreover, since no chemicals were used during the entire process, decomposition is "natural". On this point, however, different views as to the pace of decomposition were put forward. One worker said that "the effects were gone by June", while another maintained that "even now the bones are not decomposed".

On the negative side, another worker asserted that the disposal site is too close to the camp and lake. "It attracts bears to the camp and substantially increases the number of flies," said one hunter, adding "the smell was very bad for a while but with the scattering of the offal by animals it is getting back to normal."



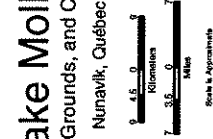
**Legend**

- Hunting Areas
- Commercial Hunting Areas
- ▲ Nunami Hunting Camp
- Cree Hunting Camps
- Water Bodies
- Rivers

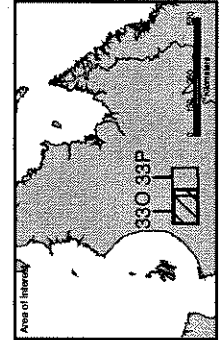
Data obtained from 1:50,000 NTS map sheet  
 NTS numbers 330 and 33P



Data shown in Geographic Latitude and Longitude  
 Data shown in UTM projection  
 The scale and configuration of all information shown herein  
 is approximate only and is not intended as a guide for design  
 or survey work.



**Lake Mollet**  
 Cree Camps, Hunting Grounds, and Commercial Hunting Areas  
 Nunavik, Québec



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75°00'W

Cree respondents were more cautious in their judgments, indicating that they don't know how the disposal site affects the animals. They wonder if there are negative effects for animals having too much food at once and if it might cause diseases.

### 3.1.2 Helicopters

As reported below, it was mentioned several times by both Cree and Inuit respondents that helicopters affect caribou health and migration routes because of the stress they create in the animals. Inuit respondents mentioned that the same could be true of other animals.

## 3.2 Impacts on Caribou

Some respondents were not comfortable with the commercial hunt in that they felt that slaughtering all these animals was like putting a curse on the caribou population. However, most respondents felt that the commercial hunt didn't seem to have a negative effect on the caribou population. In fact, they see the commercial hunt as a good caribou population management technique. An Inuit respondent mentioned that when there are too many caribou, "they get more diseases or get leaner because they compete for food. So the commercial harvest seems like a good way of keeping the caribou population at a healthy level."

However, there were some perceived negative impacts: stress, injuries, reduction in reproduction, changing migration routes and general health of the herd were all matters of concerns.

The first concern raised was about the stress generated by helicopters and snowmobiles. Most Inuit and Cree respondents agreed on the fact that caribou were lean: "When they are chased by hunters, caribou lose their energy and fat by running and they have less time to eat and prepare for winter." However, the commercial hunt may not have been the sole explanation for this



observation. As one Inuit hunter put it: "Commercial hunters were not chasing caribou but ambushing them like the elders taught them."

A second negative impact were injuries commercial hunters may cause to the caribou. An Inuit hunter mentioned that he "saw wounded caribou that eventually died somewhere on the land or even in lakes." According to him, they were injured by the commercial hunters and managed to escape.

A third negative impact brought up by an Inuit respondent was that caribou that are killed won't reproduce themselves, which could have a long term negative impact on the total caribou population.

A fourth perceived impact was about caribou migration routes. It is unclear how or why exactly caribou migration routes change, but most agree that they do so. As to where caribou migrate, various scenarios were offered. Cree respondents presented three different views: 1) caribou migrate much further south than before; 2) the southern migration is cut short and swings towards the north ; and 3) caribou simply go further inland. The Inuit respondents tended to agree that caribou go much further inland than before, and are therefore more difficult to find. Their reasons for this are as follows.

Caribou are being chased further inland by snowmobiles and helicopters.

Carcasses of dead caribou drive the remaining caribou away: "This is why elders don't leave behind the carcasses and the guts of the animal killed." However, Inuit elders said of the disposal site that "Carcasses do not stay long on the ground as they are rapidly eaten up by other animals." (Makivik 2001 : 40).

Butchering land animals on a frozen lake surface (as done at Lake Mollet) is not "culture wise" for Inuit, and by itself could drive the remaining caribou away. An employee asserted,

however, that no caribou parts other than a little bit of blood were left on the ice after butchering.

Caribou go where food is abundant. Some people wonder about the food supply around Camp Mollet: "Moss takes a long time to grow back and there does not seem to be much left around Lake Mollet."

A fifth impact is on caribou health. Inuit respondents mentioned that they don't have much information about caribou health. Since caribou go inland much more frequently than in the past, Inuit hunters have to rely on their Cree counterparts to obtain information on the whereabouts of caribou. In this context it is "difficult for us to know about the health of the caribou herd and the effects of the commercial hunt on it. The caribou population should be monitored by [both Cree and Inuit] hunters and a better exchange of their respective observations should be promoted."

To end this section, a few points of interest should be mentioned. Inuit respondents either did not believe that there was any difference between the various caribou herds, or did not know how to differentiate them. On the other hand, Cree respondents did recognize a difference between the herds, as they mentioned that the George River and the Leaf River herds met around Lake Mollet, with caribou from the George River being smaller.

Cree elders made an interesting comment : "Even if there is no commercial hunt going on, there is still some disturbance with the caribou. Sport hunters are also disturbing caribou so there is not as much caribou as usual."

### 3.2.1 Potential Impacts of Herding

Over the past years, various techniques have been used for commercial hunting. Herding is a new technique being discussed by NAF, because it is seen as more cost-effective than previous methods using snowmobiles. Respondents were asked to contribute to this discussion.

The Cree respondents in general felt that such technique may affect the migration patterns, while Inuit respondents stated that more information was required before forming an opinion on the subject but held that herding should be allowed on a trial basis in order to observe and learn.

As for possible impacts, it is thought, on the one hand, that herding would reduce the time caribou spend running: "They would lose less energy and would not be as stressed, which would result in greater meat quality." Also, herding could give commercial hunters more control over shooting and could make it easier to pick a male or a female, assuming that males and females could be fenced together because they are usually apart at that time of year.

On the other hand, some think that herding implies more running and more stress for caribou, which would be a negative factor both for the animal and the quality of the meat: "Running makes the meat harder and less tasty. Hunters would then have to wait for a couple of days before shooting the caribou, when muscle flesh would be back to normal."

Finally, some respondents think that herding can be done properly if it is well planned and recommended to planners to give careful thought to "how they're going to feed the caribou while they remain in the fenced area: moss takes a long time to grow and there is not much left around Lake Mollet anymore because of the caribou."

### 3.3 Economic Impacts

Although the communities see some positive impacts, such as job creation, there is a sense that all is not well with the Project, but that solutions could be found with proper consultation and involvement of the population .

A positive impact mentioned by some of the Inuit respondents, and to a lesser extent by Cree interviewees, were wages. "Wages were also beneficial for the workers' families and their community, when that money was spent locally."

Many mentioned the scarcity of jobs during the winter, and hence welcomed new jobs, even though members of the communities filled only a few temporary and low paying positions. The main benefits mostly went to helicopter companies, pilots, and non-native people.<sup>1</sup>

To solve many of the financial difficulties encountered by the Project and to increase community benefits, it was pointed out that NAF's operations should be more transparent and that both communities should be involved in all aspects of the Project. The interviews can be summarized in the following terms:

The population should be kept informed regarding the economics and organization of the project as well as its marketing strategies. With proper consultation, solutions could be provided to solve financial difficulties encountered by the Project, wasting of meat could be avoided and more benefits could go to the communities. It was suggested to run the business more locally. Many of the steps could be done at the local level and this would create more jobs.

For its part, SLHC is still ambivalent about the economics of the Project and the uncertainties of the harvest. This ambivalence was reported in Phase 1 in the following terms:

On the one hand, it appreciates the income provided by such a venture, on the other hand, it wants to develop adventure tourism [for the months of March to May]. But tourists may not like to see caribou being slaughtered and it is difficult to see how these two activities can be practiced at the same time and place. (Makivik 2001 : 39, 41)

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1-It is interesting to note that the Phase 1 report indicated that in 2000, workers received up to \$9000 each in salary (Makivik 2001:40)

Caribou migration patterns are also an unknown: if it changes, "there will be an obvious affect on sport and trophy hunting." (Makivik 2001 : 41) On the other hand, positive impacts could come from the disposal site, "since the animals who go there to feed are easy targets for sport hunters". A last point raised was a reduction in costs for SLHC: "NAF used planes to bring caribou meat to LG2. Those planes were coming back empty from LG2, so the SLHC was able to fill them up with fuel for the helicopters".

Finally, the uncertainty surrounding the commercial harvest of caribou is a major issue for SLHC/Nunami Outfitters<sup>1</sup> and the Kuujjuaraapik-Whapmagoostui community. As mentioned in Phase 1: "This situation seems to be created by the fact that it is very difficult, if not impossible, for NAF to plan for the long term.

The economics of the Project are too unpredictable, the cost of the harvest is high, market demands fluctuate and the caribou herd is unpredictable." (Makivik 2001: 41).

### 3.4 Social Impacts

In relation with the total caribou population, most of the interviewees agreed that a commercial harvest of 5000 caribou (quota for 2002) is not excessive. Cree and Inuit respondents alike were in favour of the Project providing the caribou population remains healthy, quotas are established and respected, and some of the meat is distributed to the communities.

While skill acquisition is seen as positive, there are concerns pertaining to the waste of food, skins and antlers, and the psychological distress caused by such a massive hunt being carried out without much consultation as to the impacts it may have on subsistence hunting.

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1- As a reminder, Nunami Outfitters Inc is a subsidiary of SLHC.

### 3.4.1 Waste Recovery

Almost all of the respondents talked about the wasting of food. The quantity of waste, most of it the results of bad gunshots, was a concern expressed by workers. Others wondered why most of the innards, fat, bones and other unused parts of the caribou were thrown away instead of being given to the community: "These are delicacies for the Crees."

The waste of caribou skins was another issue. It was mentioned that caribou skins are thinner in February but its hair is thick and perfect for the making of mattresses. Although fewer Inuit women now use them, these skins could still be put to good use, even though they may have larva holes. Some skin pieces were brought to the community, "but they were still attached to caribou parts, which is not the normal native way. The entire skin is usually taken off the caribou in one piece, so as to make better use of it." It was therefore suggested to skin the caribou before cutting it into parts, so people can use the skin afterwards.

A third concern was the waste of antlers, which could be used to make carvings and jewelry (pins). As mentioned in the first report : "Antlers were provided to Inuit carvers on request." (Makivik 2001: 35). It seems however that such distribution was not publicized enough.

With respect to wastage, one Inuit respondent wondered whether there was a well-thought out plan for carrying out the work and disposing of the waste, asking whether people were working too fast and whether enough people had been hired for the job to be done right. He suggested to better plan and monitor operations at Lake Mollet. It was also suggested that there should be strict guidelines to control and avoid excessive wastage.

SLHC President, Alec Tuckatuck, explained that the skins and other parts of the caribou are left behind due to the high costs of transporting them back to the community by helicopter. In

response to this statement some respondents suggested that such transportation costs could be offset by the sale of the products made from the skins, furs and the antlers. It was further suggested that, "Cree women are very good at making carvings and jewelry (pins) from antlers and could teach Inuit women".

#### 3.4.2 Psychological Impacts

Cree respondents felt frustrated by the lack of involvement of their community in the Project. They seemed to believe that their help was solicited only whenever problems arose. One interviewee put it in the following terms:

When the camp opened, the manager told a Cree family who had a camp near Nunami Outfitters that he would accommodate them as much as possible. They could build their camp nearer the Nunami camp so they could go there to work: her son as a hunter and her husband as a guide. The manager did not keep his promise to give them a job: only the father was asked to look after the camp and to pick out Cree hunters to work at the Camp Mollet when it first started and he got little pay for that. The mother and her son were not asked to get involved after the father passed away. So they were asked to get involved at first but not anymore, and they don't understand why, because it is their hunting territory. Her husband hunted where the disposal site is now and where they did the commercial hunt. Also, he used to trap in the same area that commercial hunters used.

As previously mentioned the disposal site is a source of concern. As well, it was stated that employees were home sick, communication with the camp was difficult, and there were frictions between employees and management.

#### 3.4.3 Subsistence Activities

According to Phase 1 of this impact study, "Inuit fishing and hunting activities will not be directly affected by the harvest." As well, "the proposed area for the commercial hunt is [...]"

relatively far from the trails known to be used by Inuit people.” That is also true for the Umiujaq community. (Makivik 2001 : 39, 43)

However, the Lake Mollet area is part of Cree hunting and trapping grounds (see section 2 : Whapmagoostui land use). It is therefore possible that commercial hunting could come into conflict with Cree activities. According to some Inuit elders, “The Crees hunt much further inland than the Inuit and they did complain regarding the harvest.” (Makivik 2001 : 40)

Some Crees felt that commercial hunting had negative effects on their activities. Hunters were concerned about caribou that are being butchered around Lake Mollet. They say carcasses drive the remaining caribou away, and that, consequently, they must go further inland to hunt, which is more costly and time consuming. Another impact discussed was the possible decline of the total caribou population in the long term.

The owner of camps no 2 & 3 answered “no” when asked whether he had encountered commercial hunters around his camps. He had heard, however, that commercial hunters went near camps no 5, 7 and 10. The owner of camp no 5 did not see any hunters but said that “there were remains of caribou left near his camp.”

#### 3.4.4 Skill Acquisition

A respondent mentioned that during the commercial harvest, young hunters had a chance to learn from their elders.

This was the only reference made to skill acquisition. It concurs with our findings of Phase 1 that “ Due to the relatively short period of employment, this project could not be aimed at improving the employability of its workforce.” (Makivik, 2001:39)



#### 3.4.5 Information on the Project

Various rumours and stories have been circulating regarding commercial harvesting as well as sport hunting and fishing. Some of the Inuit interviewed remembered that people had talked about the commercial hunt on the radio, but others felt they were not well informed on the Project. "We would like to know more about the health of caribou and the impact of the disposal site on the environment. We would also like to be informed if the commercial harvest starts again."

#### 4. MITIGATION MEASURES

##### 4.1 Respondents recommendations

During the interviews, many people proposed ways to improve commercial harvesting, and their recommendations to this end are summarized in this section. As one Inuit puts it: "There are things to be learned from the experiences of the 1998, 1999 and 2000 harvests. With that experience there are better solutions to be found for the benefit of everybody."

Because the presence of so many caribou carcasses raised questions regarding their impacts on the environment and the caribou, a Cree respondent suggested to burn the remaining parts along with wood found around the area.

Crees respondents wondering how the disposal site affects animals feeding there suggested that environmental conditions in the area surrounding the Project be monitored on a regular basis.

Changes in caribou migration patterns, and the difficulty of determining the health status of the herd as well as the effect of sport and commercial hunting on caribou, prompted one Inuit hunter to recommend that caribou be regularly monitored by all native hunters, and that they share their respective observations, learn more about the status of the herd and be in a better position to take decisions concerning its management in the future.

The herding technique may help to reduce inaccurate shots, harvest costs and the stress level of caribou. However, planners should think about how they are going to feed caribou while in fenced enclosures, and also how they are going to proceed if they cannot fence females and males together.

To avoid wasting of valuable caribou parts, there should be stricter harvest and butchering regulations. For example, caribou should be skinned before being butchered. Also, caribou parts that are not used should be given to people in the community who cannot go hunting.

Considering the social impacts of the harvest on the Cree community of Whapmagoostui, greater co-operation between the Cree and the Inuit communities was suggested to diminish or eliminate these impacts and to find better ways of proceeding with the harvest. In that respect, Cree's experience with caribou hunting should be of great help.

The products made from caribou skins, fur and antlers could be marketed. It would offset the transportation cost of those parts to the communities. The antlers could be used to make carvings and jewelry (pins) : Cree women are very good at this and they could teach Inuit women. This commercial operation could justify the use of bigger or more planes and helicopters to take more caribou meat, bones, heads and guts to the community.

The business could be run more locally, with all meat processing done in Kuujjuaraapik. This would bring more jobs to the community and people could learn more about the business world by experiencing it. People would see how the meat is processed and how the whole operation is run. Inuit would have their say about it or they could at least make suggestions. Inuit have the proper knowledge of the land that is needed to avoid wastage.

If the business cannot be run more locally, NAF should at least inform the population about what is done with the food, and how much money is being made. If NAF has problems making profits, meetings should be held with local people who could help them find ideas to enhance the Project.

## 4.2 Other Mitigation Measures

Another mitigation measure that could be added to those already proposed in Phase 1 regards the public information and consultation program. As reported in section 4.1 of Phase 1, SLHC was consulted at length on the matter. As soon as NAF is ready to go ahead with the harvest, its representative will use the local radio station to further explain the Project and gather comments from the population.

To avoid further psychological distress or discontent within the communities, there should also be a Cree and Inuit public meeting prior to the next harvest, the purpose of which would be to give information and explanations about the Project, and discuss issues like processing of caribou meat in the community, disposal of carcasses, skinning, distribution of meat to the community and so on. It would be an excellent opportunity for exchanging views between Cree, Inuit and the representatives of the Project.

## REFERENCES

Hydro-Québec. 1993. Grande-Baleine Complex. Part 2 : Hydroelectric Complex, Book 2:  
Description of Environment, Volume 3 : Human Environment : 203 p.

Makivik Corporation. 2001. Caribou Commercialization Project, Environmental Impact Study:  
Phase 1, 57 p.

**APPENDIX 1**

**QUESTIONNAIRE**

QUESTIONNAIRE- Caribou Commercial Harvest (August 2002)

Identification

1. Name
2. Sex
3. Ethnic group
4. Community of residence today

Knowledge of the project

1. Have you heard about the Caribou Commercialization Project taking place at Lake Mollet?

If yes: a) How did you hear about it?

Are you involved in any way in the project?

b) Could you describe what you know about the project?

Community

1. Do you think the community profits from the project? At the...

a) Economic level:

- Job creation
- Contracts for Inuit and Cree businesses
- Tourism industry

b) Social level:

- Have you noticed any changes in the community's life because of the project?
- Are there any discussions about the project?  
(If yes): Between whom?  
About which aspect of the project?

2. Are some aspects of the projects causing some problems in the community? Which one and why?

Land use:

1. Do you hunt?
  - Where? (At Lake Mollet?)
  - What species?
  
2. (For the Cree) Do you trap?
  - Where? (At Lake Mollet?)
  - What species?
  
3. (For the Cree) Do you fish?
  - Where? (At Lake Mollet?)
  - What species?
  
4. (For the Cree) Where are your travel routes?
  
5. Do you think the project affects your hunting (trapping, fishing, travel routes)? How?

Did you notice a difference during the...

- First 3 years of the project with harvest? (1998-2000)
- Last 2 years without harvest? (2001-2002)

Environment:

Do you think the project can affect the environment (the land)? If yes, explain how.

- Soil (carcasses)
- Plants
- Air (fossil fuel)
- Water (dumpsite and Lake Mollet)
- Fish and other animals



## Caribou

- ✓ The commercial harvest of caribou has targeted what is called the Leaf River herd specifically.
- ✓ All animals are migratory, mostly male and adult.
- ✓ The harvest takes place during the months of February and March.
- ✓ The animals are spotted around Lake Mollet by helicopters
- ✓ The hunt is done by snowmobiles using high-power rifles.
- ✓ The caribou are bled right after the kill by severing the jugular vein.
- ✓ The carcasses are airlifted and carried by helicopter to the processing plant.
- ✓ Another option would be to herd the animals into a snow-fenced area using snowmobiles.

This method is expected to diminish the harvest cost, the number of inaccurate shots, and the stress level for caribou, which would in turn increase the quality of the meat.

### 1. What do you think about the:

- Choice of the herd
- Quotas (5000 for 2002)
- Use of helicopters or snowmobiles
- Period of the year
- The commercial hunting and the way it was done in general

### 2. Do you think the project can affect the caribou population? If yes, explain how.

- Number of individuals
- Migration routes
- Health of individuals
- Health of the different herds

### 3. Is it a good way of managing the herd population?

ADDENDUM

VISIT TO MOLLET LAKE

Submitted by

Geoff Klein, Biologist

Makivik Corporation

December 12, 2002.

Nunavik Arctic Foods Incorporated managed a commercial caribou harvest at Nunami Outfitters camp on Mollet Lake in the winters of 1998, 1999, and 2000. The Environmental Quality Commission waived the need for an environmental assessment during those years, but required that one be undertaken before any future harvests occurred. Lanari and others (2001) produced an environmental impact statement for the project that identified the waters near the carcass dumpsite as the most likely area to be affected by the commercial caribou operation. This document is an installment in the environmental assessment of the commercial caribou operation and presents data collected on site in late July, 2002 to address certain environmental concerns surrounding the disposal of the caribou carcasses.

The dumpsite is centered three kilometers from the caribou operation. There are four small ponds on the dumpsite and a small lake at either end (Figure 1). The dumpsite is primarily sandy and rocky ground covered with lichen, shrubs and graminoids.

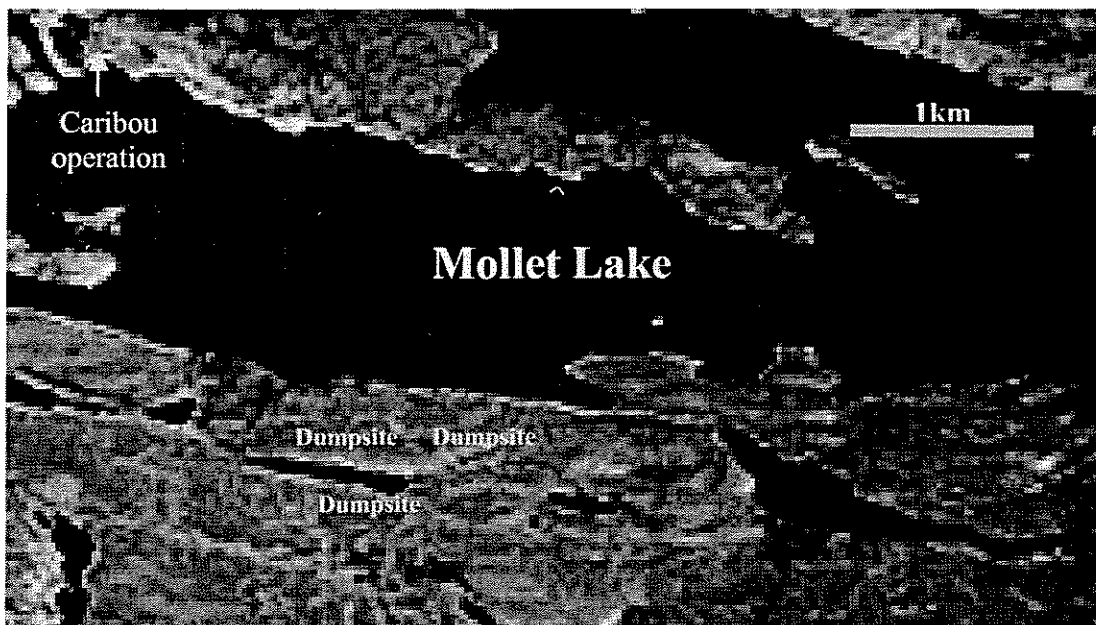


Figure 1: Landsat 5 (1996) false colour image of the study area. Three spectral bands were used to generate the image: red, 630-690nm; near infrared, 760-900nm; and mid-infrared, 1550-1750nm. Water appears black. Light green represents shrubs while dark green represents coniferous forest. Pinkish areas are sandy, but where they fade to light blue and almost white there is increasingly dense lichen growth. Purple is bare rock. Orange represents sedge meadows. Red areas are rock with some vegetation growth.

Receiving waters:

There was a concern that the large input of nutrients from dumping carcasses on the land might eutrophy or otherwise contaminate the waters adjacent to the dumpsites on the south side of Lac Mollet.

The combined surface area of Mollet and Lenormand lakes is 234km<sup>2</sup>. But in a functional sense, the basin on which the commercial operation is located and that the dumpsite drains into is much smaller than that, having an area of less than a hundred square kilometers. In summer and winter when the lake stratifies, the hypolimnion – the area below the thermocline – will be separated into cells that do not interact because of the bottom topography. The entire lake is large enough to absorb any nutrients that enter the water from the caribou dump, but localized anoxia could potentially occur if nutrients are entering the water and settling in a smaller basin. Measurements taken during the site visit showed that anoxia is not an issue. The average depth in the basin of Lac Mollet adjacent to the dumpsites is 13.6 meters. The greatest depth measured was 30.3m close to the outfitting camp. The lake stratifies very weakly at 16.5m, but the epilimnion and hypolimnion remain similar (Table 1). The lake bottom slopes steadily away from the dumpsite so any nutrient loading from the carcasses will be diffuse when it reaches the hypolimnion.

Table 1. Basic water chemistry measurements of late July site visit.

Location	Time	Depth (m)	Temperature (Celsius)	pH	Dissolved Oxygen (mg/L)
Lac Mollet	20:15	0	12.1	7.88	10.95
Lac Mollet	20:20	7.5	11.5	7.82	11.04
Lac Mollet	20:25	22.5	9.5	6.22	11.61
South Pond	14:30	0	14.5	7.72	10.62
South Pond	14:55	Outflow	14.0	7.94	10.27

The locations of the main dumpsites were located on foot, and it was realized that they were concentrated around a long narrow pond to the south of Lac Mollet. The south pond is one kilometer long and about 90 meters wide at the widest point. *Nuphar* is present along the margins and the pond appears well on its way to eutrophication, but brook trout (*Salvelinus fontinalis*) are present nonetheless. Juvenile brook trout were obtained by trapping and adults of almost 30cm in length were observed from shore. The only other aquatic invertebrates observed in the pond were wood frogs (*Rana sylvatica*).

While the dumpsites were on the hilltops, some bones and a plastic, one liter, oil container had been dragged to the shore of the pond near the inflow on the north shore where there is a small grove of trees. This dozen or so bones represents a small nutrient flux to the pond relative to the size of the pond. If the commercial caribou harvest continues, the disposal of the carcasses on the hilltops would not significantly accelerate the rate of eutrophication of the south pond.

Bone scattering by predators was only noticeable for a distance of about half a kilometer from dumpsites. The main vector of nutrient dispersal from the dumpsites appeared to be insects. On some of the more recent dumpsites the caribou remains could not be seen through the heavy layer of shed exoskeletons left behind by metamorphosing insects (Figure 2).



Figure 2. Discarded exoskeletons of macroinvertebrates that developed on the caribou carcasses.

There was a high diversity and density of birds observed during the site visit (Table 2). Insectivory and direct consumption of carrion by birds would have further dispersed nutrients from the dumpsites.

Table 2. List of birds observed during the site visit.

Common loon (*Gavia immer*)  
Arctic tern (*Sterna paradisaea*)  
Horned lark (*Eremophila alpestris*)  
White-crowned sparrow (*Zonotrichia leucophrys*)  
American robin (*Turdus migratorius*)  
Whiskeyjack (*Perisoreus canadensis*)  
Raven (*Corvus corax*)  
Pine siskin (*Carduelis pinus*)  
Savannah sparrow (*Passerculus sandwichensis*)  
White-winged crossbill (*Loxia leucopterus*)  
Blackpoll warbler (*Dendroica striata*)  
Herring gull (*Larus argentatus*)  
Fox sparrow (*Passerella iliaca*)  
Gray-cheeked thrush (*Catharus minimus*)  
Rusty blackbird (*Euphagus carolinus*)  
Surf scoter (*Melanitta fusca*)  
Yellow-rumped warbler (*Dendroica coronata*)  
Spruce grouse (*Canachites canadensis*)  
Northern waterthrush (*Seiurus noveboracensis*)  
Wilson's warbler (*Wilsonia pusilla*)  
Tree sparrow (*Spizella arborea*)  
Canada goose (*Branta canadensis*) – droppings  
Ptarmigan (*Lagopus lagopus*) – droppings

The nutrient flow over the land proved not to be a concern. Vegetation responded quickly to bind up nutrients at the dumpsites. Fire weed (*Epilobium angustifolium*) and an unidentified flower were the first species to colonize the bare ground resulting when the dumped carcasses smothered the existing vegetation. *Potentilla trilobium* and dogwood (*Cornus canadensis*) also showed very strong herbaceous responses at the edges of the dumps. Woody vegetation adjacent to dumps also showed a growth response. Dwarf birch (*Betula glandulosa*) displayed enhanced leader growth that was no longer evident 3 to 7m from dumpsites, but was intense immediately adjacent to the dumps (Figure 3). Beyond three meters leader growth remained an average 3cm annual growth.

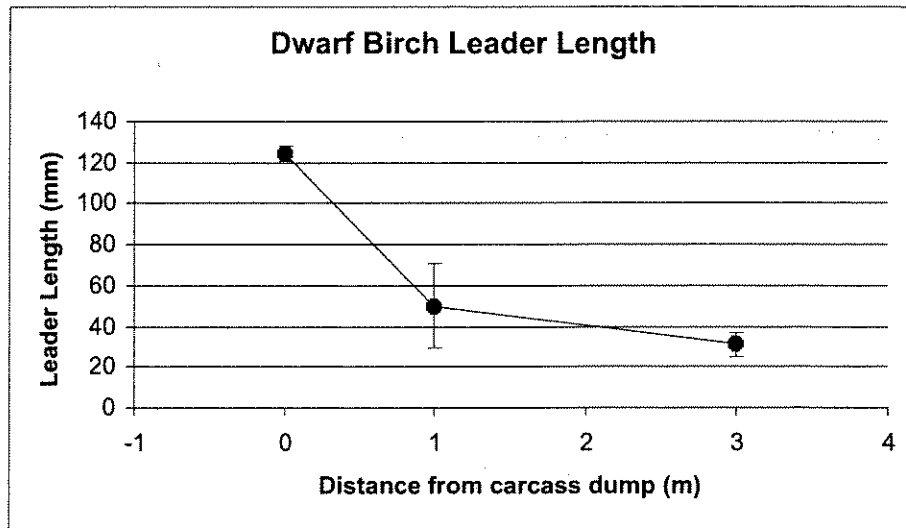


Figure 3. The mean lengths of the longest ten leaders on three dwarf birch (*Betula glandulosa*) plants at three distances from a caribou dumpsite. Error bars represent one standard deviation.

Because of this rapid attenuation of nutrients by vegetation and the dispersal by insects and birds it was determined that there would be no significant impact from dumping caribou carcasses on the waters surrounding the dumpsites.

Threatened and endangered species:

In Phase I of the environmental assessment six species of concern were identified that might be present in the area:

- Endangered: Wolverine (*Gulo gulo*)  
Harlequin duck (*Histrionicus histrionicus*)
- Threatened: Peregrine falcon (*Falco peregrinus anatum*)
- At risk: Golden eagle (*Aquila chrysaeto*)  
Bald eagle (*Haliaeetus leucocephalus*)  
Lynx (*Lynx canadensis*)

Only wolverine and lynx would be present in the winter during the commercial caribou hunt, but investigations were made into all six species nonetheless.

No evidence of the sensitive listed above was found during the four days at the site. Three long-serving guides at the Nunami outfitting camp were interviewed on July 20, 2002 regarding the above species. Dion Skiffington (5 years at Nunami camp), Yvan Simoneau (4 years), and Richard Leblanc (4 years) have seen several harlequin ducks and their young. They note that they are most commonly seen in the rapids of

nearby rivers. They have not seen a nest because the birds are already hatched when they arrive at camp in July. The few harlequin nests that have been found in the north were on riverside cliffs. The study site is ten kilometers from the nearest river. There have been a pair of bald eagles seen near the Nunami camp for the past three years, but this year after three days at camp the eagles have not yet been seen. No nest site is known for these eagles. Golden eagles, peregrine falcons, wolverine and lynx have not been seen in the area while the interviewees worked there. No tracks or other sign of these four species have been seen either.

Some other wildlife were either seen or not seen but evident during the site visit (Table 3).

Table 3. Other wildlife seen on site:

Mammals observed:

Red squirrel (*Tamiascurius hudsonicus*)  
Groundhog (*Marmota monax*)

Mammals not observed, but evident:

Black bear (*Ursus americanus*) – tracks and scats  
Wolf (*Canis lupus*) – tracks and scats  
Caribou (*Rangifer tarandus*) – scats, thrashed spruce  
Porcupine (*Erethizon dorsatum*) – gnawings on trees

References:

Lanari, R., C. Burgy, I. Côté, G.M. Klein, and S. Olpinski. 2001. Caribou Commercialization Project. Environmental Impact Study: Phase 1. Report submitted to the Resource Development Department, Makivik Corporation. 57pp. + appendices.