Economic Valuation and Socio-Cultural Perspectives of the Estimated Harvest of the Beverly and Qamanirjuaq Caribou Herds

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May 1, 2008

EXECUTIVE SUMMARY

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) identified a need to update their previous economic valuation of the harvest of the Beverly and Qamanirjuaq caribou herds that took place in 1990. InterGroup Consultants Ltd. was retained by the BQCMB to update and expand the scope of the economic valuation component of the study, as well as to try and understand the social and cultural importance of the harvest of the Beverly and Qamanirjuaq caribou herds to those who rely on the resource.

To meet these requirements, a two-pronged approach was employed. A conventional economic valuation was conducted to estimate the marketable value of goods produced from the estimated harvest of caribou. To supplement the economic valuation, interviews with resource harvesters were conducted to try and understand the social and cultural importance of the harvest.

The following are key results from the study:

- Total net annual value of the caribou harvest is estimated at $19.9 million.
- Nunavut accounts for 59% ($11.8 million) of the Beverly and Qamanirjuaq caribou harvest, with Manitoba accounting for the next largest share at 20% ($3.8 million). Saskatchewan and the Northwest Territories follow with 17% ($3.4 million) and 4% ($0.8 million) of the total harvest, respectively.
- Of the $19.9 million value from the harvest, $15 million (76%) is estimated to be received from the Qamanirjuaq herd, and $4.8 million (24%) from the Beverly herd.
  - The domestic harvest that is consumed locally accounts for 74% ($14.7 million) of the net value of the harvest. The harvest by outfitters and their clients is the second largest at approximately 21% ($4.1 million), and the commercial and licenced harvests account for the remaining 5% ($1.0 million each).
  - The contribution of the Qamanirjuaq herd is approximately 72% ($10.6 million) of the total domestic harvest value with the remaining 28% ($4.1 million) from the Beverly herd.
  - The Qamanirjuaq herd is the overwhelming contributor to the licenced harvest value accounting for 89% ($0.4 million), while the Beverly herd contributes the remaining 11% ($0.05 million) to this harvest activity.
  - The Qamanirjuaq herd is also the overwhelming contributor to the commercial harvest value, contributing 92% ($0.5 million), while the Beverly herd contributes 8% ($0.04 million) to this harvest activity.
  - The Qamanirjuaq herd contributes the greater share of value to the outfitting harvest at approximately 85% ($3.4 million), while the Beverly herd contributes the remaining 15% ($0.6 million).
- Communities on the caribou range have experienced challenges in preserving their cultural norms and practices over the years with the advent of new technologies and products to their communities.

- Harvesting caribou and activities associated with hunting caribou (e.g., ceremonies/community feasts) are viewed as integral to transferring and retaining knowledge about the traditional culture.
- Many cultural norms and practices are shared while hunting caribou such as the transmission of traditional knowledge, learning outdoor wilderness survival skills, and learning about cultural norms (principles/laws).
- The frequency of ceremonies and participation in making cultural products (i.e., arts and crafts), many of which center around the caribou, has declined in the communities in recent years. Participation in these activities was viewed by interviewees as means of community bonding in years past.
- Programs are starting to be established in the communities in an attempt to preserve/revitalize many of the cultural norms and practices that, traditionally, were part of everyday life.

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1.0 INTRODUCTION

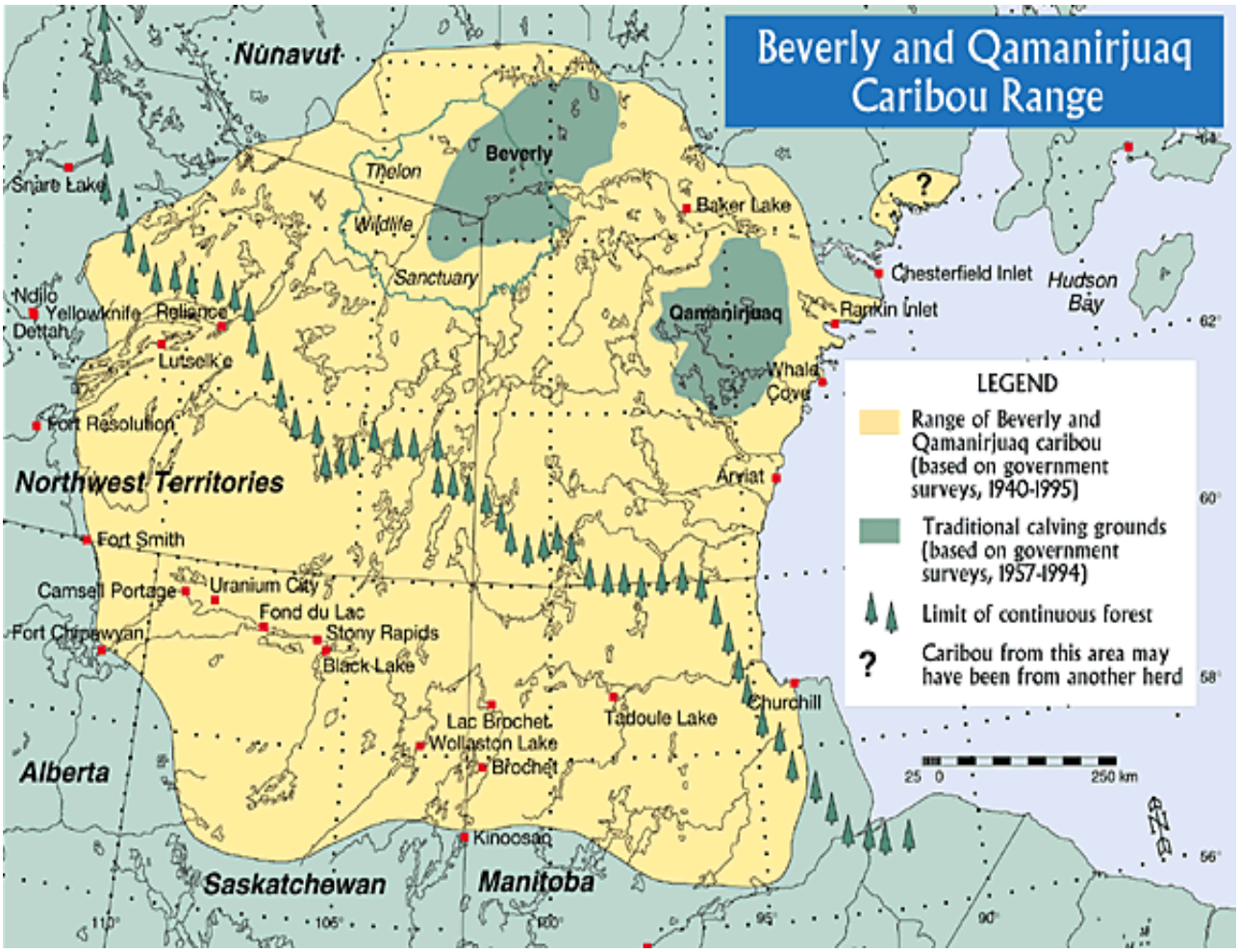
The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) was established in 1982 to address the multi-jurisdictional and multi-cultural nature of the Beverly and Qamanirjuaq caribou herds and the people who depend on them. The two caribou herds' migratory routes straddle two territories, two provinces and four different Aboriginal cultures. The Board's responsibilities include "monitoring caribou habitat, identifying research needs, supporting research, compiling information about the caribou herds and making it accessible, and making recommendations about management and conservation of caribou and their habitats" (BQCMB 2005). Recently, the Board identified a need to conduct an updated economic valuation of the estimated harvest of the Beverly and Qamanirjuaq caribou herds. The last economic valuation of the harvest took place in 1990 and was conducted by the Department of Renewable Resources, Government of Northwest Territories for the BQCMB (Department of Renewable Resources 1990). InterGroup Consultants Ltd. was retained by the BQCMB to update the economic valuation that was conducted in 1990, as well as to describe the social and cultural importance of the caribou harvest to those communities that rely on the resource. Therefore, the objectives of this study are two-fold:

- Provide an updated economic valuation of the estimated harvest of the Beverly and Qamanirjuaq caribou herds and to expand the analysis to included outfitting harvest, commercial harvest and resident licenced hunting harvest; and
- Investigate the social and cultural importance of the harvest of the Beverly and Qamanirjuaq caribou herds to those who rely on the resource.

2.0 BACKGROUND

The Beverly and Qamanirjuaq barren-ground caribou are two of eleven major mainland caribou herds in northern Canada. Each of these herds is named after a lake located on its traditional calving ground. Qamanirjuaq Lake is located approximately 200 km west of Rankin Inlet, and Beverly Lake is located approximately 150 km north of Baker Lake (Kendrick 2003). The Qamanirjuaq herd's traditional calving ground is approximately 28,500 km^2 (Wakelyn 2001a), while the Beverly traditional calving ground is approximately 38,400 km^2 (Wakelyn 2001b). Figure 2.1 illustrates the combined year-round ranges of the two herds.

Figure 2.1
Beverly and Qamanirjuaq Caribou Range



Both herds migrate from their winter range, which is south of the tree line, to their respective traditional calving grounds on the tundra, which are primarily in the Kivalliq region of Nunavut. "After calving in early June, the herds generally travel southward for the rut in October and enter the forested regions where they winter" (BQCMB 2005). It is not uncommon for caribou from these herds to travel approximately 2000 km each year (Kendrick 2003).

Over the decades, herd sizes have fluctuated and there have been large-scale and small-scale shifts in distribution. The 1994 population census estimated 496,000 animals in the Qamanirjuaq herd (+/- 105,400 standard error) and 276,000 caribou in the Beverly herd (+/- 111,000 standard error) (Kendrick 2003).

Dene, Inuit, Métis, Cree, and non-Aboriginal people from about 20 communities across four jurisdictions (Saskatchewan, Manitoba, Nunavut and Northwest Territories) hunt caribou from the Beverly and Qamanirjuaq herds (BQCMB 2005). Approximately 13,000 Aboriginal people rely on the herds for subsistence purposes (BQCMB 2007).

In recent years, "the number of residents on the caribou range has been increasing, and the use of caribou is diversifying from subsistence hunting to a mix of uses, including traditional pursuits, outfitting, commercial meat sales, meat processing and eco-tourism" (BQCMB 2005). Additional hunting pressure on the herds, in combination with resource development and the effects of a changing climate, has many communities worried about the overall health of the herds.

3.0 ECONOMIC VALUES

3.1 DEFINING ECONOMIC VALUES

A useful framework for explaining the economic value of the harvest of the Beverly and Qamanirjuaq caribou herds is that of "total economic value".[1] The underlying principle of total economic value is that goods and services bring value to people in different ways, and often in many ways simultaneously. The sum of all different values that a good or service offers someone is the total economic value.

The different types of values are broadly categorized as follows:

Direct Use Values – Value of products obtained from caribou

- Value of meat harvested; and
- Value of hides and antlers as inputs to arts, crafts and cultural products.

Passive Use Values[2] – Value of experiences and other intangible values

- Value of recreational enjoyment from harvesting caribou;
- Value of kinship and bonding;
- Value of education in traditional ways of life;
- Value of existence for bequest to future generations; and
- Value of existence for option to hunt at a later time.

3.1.1 Direct Use Values

Conceptually, the direct quantifiable economic value of the harvest of the Beverly and Qamanirjuaq caribou herds can be thought of as the sum of the value of all meat, hides and antlers harvested. Products like meat and hides have a direct market value, as they can either be sold in a market by the hunter, or are a substitute for goods that must otherwise be purchased in a market. Caribou meat, for instance, substitutes meat that would be bought from a grocer. This harvested meat offsets income that would otherwise be needed to purchase an equivalent amount of food. The hides and antlers of the caribou can be used to make clothing, gear, crafts and cultural products which also have a market value, or can substitute for items otherwise purchased in a market. In this case; however, the hides and antlers are inputs into finished goods such as clothing and crafts, and are valued accordingly.

[1] The "total economic value" framework is similar to the methodology adopted by Ashley 2000 in his examination of guided caribou hunts in the Northwest Territories. The fundamental concepts of total economic value and willingness to pay are common to both studies, but the broader scope of this economic analysis requires a slightly different approach than that used by Ashley. The results of Ashley's work are in fact incorporated into this study, as one component of the broader economic assessment.

[2] See Boardman et. al. (2001) for further discussion on "passive use values" and the various interpretations in the economic literature.

Direct use values are quantifiable, monetary values that are derived directly or indirectly from the harvest of caribou. The following direct use values are considered for this study: the value of meat from the domestic (licenced) and commercial harvests; the sale of hides from the domestic (licenced) and commercial harvests, and the total contribution to Gross Domestic Product[3] (GDP) of the outfitting harvest.

3.1.2 Passive Use Values

The values that cannot be directly measured in a market are the passive use values. These include the recreational value of enjoyment obtained during the hunt, the value of kinship and bonding that occurs as a result of the caribou harvest, and any number of additional factors that bring value to those who harvest the caribou.

The recreational value of a caribou hunt is not something that can be measured directly through a market exchange, particularly in the case of hunters who do not hunt exclusively for recreation. In the case of recreational hunters who do not rely on the harvest for subsistence purposes, techniques for assessing recreational value such as the travel cost method do exist. However, those hunters who rely on the harvest for subsistence or who hunt as part of their tradition do not value the hunt on a purely recreation basis. They may enjoy recreational benefits, but the value of that recreational enjoyment is blended with the benefits of subsistence, cultural and spiritual aspects of hunting.

The caribou harvest can also be valued for the kinship, bonding and learning that take place with those engaged in the hunt, those community members involved in making cultural products or those who benefit from the harvest. The feeling of pride a hunter may receive when distributing the harvest to elders or community members is also value derived from the hunt. These different types of values may all be simultaneously derived from hunting caribou, but such values are not easily or directly measured in monetary terms.

There are additional values that may be placed on the harvest by people who do not actually take part in the harvest, such as the value elders or others place on knowing that young people are engaging in traditional practices. Known as non-use values, they can also include the value people place on knowing that future generations will have the resource available to them. Non-use values are perhaps the most problematic of the passive use values described here, in that they are difficult to define and measure.

These examples highlight some of the possible values that people place on the harvest of caribou. It illustrates the various ways in which people who, either directly or indirectly engaged in the harvest of caribou can value the harvest in both monetary and non-monetary terms. The core difficulty in conducting economic valuations based on total economic value is establishing a common measurement of the direct and passive use values, so that a sum total can be calculated. The total of the direct use values and passive use values gives us the total value of the harvest as illustrated in Figure 3.1.

[3] Gross Domestic Product is a measure of the value an economy creates, and the contribution to GDP of guided caribou hunts was estimated by Ashley (2000). That result has been incorporated into this study.

Figure 3.1
Total Value of the Harvest

Given the prescribed scope of this study, a two-pronged approach to estimating the total value of the Beverly and Qamanirjuaq caribou harvest was adopted. A classical economic valuation of direct use values was conducted to estimate the marketable value of goods produced from the harvest of caribou. To supplement the economic valuation of direct use values, a qualitative approach relying on interviews of selected hunters was employed to assess the importance of passive use values that the caribou harvest contributes to the lives of those who rely on it. The following section discusses the approach and methodology to the study.

4.0 APPROACH AND METHODOLOGY

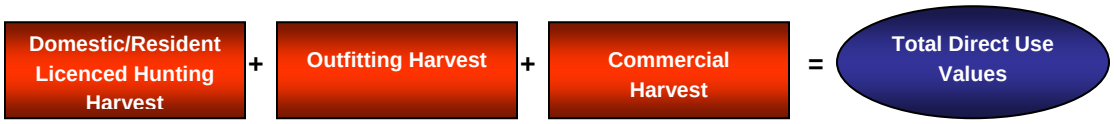
4.1 ECONOMIC VALUATION (DIRECT USE)

An economic valuation was conducted for three types of harvest activities:

- Domestic harvest, which includes both subsistence harvest by Aboriginal people and harvest by resident licenced hunters;
- Commercial harvest, which is conducted for the purpose of acquiring to sell; and
- Outfitting harvest, which outfitters provide licenced hunts for non-resident hunters.

The economic valuation component of the study used different economic analysis methods to determine the economic value of different harvest activities. The domestic harvest, resident licenced harvest and commercial harvest employed a replacement/substitute good approach, while the outfitting harvest used a market value approach. Raw data used for the economic analysis is located in Appendix 1. Figure 4.1 illustrates how the total economic value of the harvest was estimated based on the main harvest activities.

Figure 4.1
Total Direct Use Values



4.1.1 Valuation of Domestic and Commercial Harvest

For the domestic harvest, a replacement value approach was employed since the caribou harvested through these activities are not sold in a market. This was achieved by creating a cash equivalent value for the harvest of caribou. The economic parameters that were taken into consideration for the assessment included: 1) total harvest of both herds for these specific purposes; 2) total edible weight of harvest; 3) nutritional equivalence;[4] 4) replacement value of caribou meat with a "substitute food product" (weighted average of a high and low quality substitute meat from one store in each of the jurisdictions); and 5) production costs – described in section 4.2.

Through consideration of the above parameters, the total annual replacement value of the domestic harvest of caribou meat was calculated. The following is the formula used to determine the total economic value of the harvest for the above harvest activities.

[4] Nutritional equivalence is a nutritional conversion factor for protein content in caribou relative to the substitute meat used to value the caribou. Department of Renewable Resources (1990) used a value of 1.26, which is adopted here. The conversion factor can be interpreted to mean that caribou has 26% more protein per kg than the substitute good.

Step 1:

Caribou harvested (no. animals)
X Edible weight (kg/animal)
Harvested weight (kg)

Step 2:

Harvested weight (kg)
X Nutritional equivalence factor
Equivalent harvested weight (kg)

Step 3:

Equivalent harvested weight (kg)
X High grade meat factor (%)
High grade equivalent weight (kg)

Step 4:

High grade equivalent weight (kg)
X High grade substitute price ($/kg)
Value of high grade harvest

Note: Steps 3 and 4 repeat for low grade meat.

The methodology outlined above was also used to estimate the value of the commercial harvest. The price of commercially harvested caribou could not be obtained, so the price of imported beef was used to estimate the value of the commercial harvest. Caribou meat is not widely available on a commercial basis, and relatively few animals are harvested for this purpose. As a result, the use of a beef price is not expected to have a material impact on the overall harvest value.

The value of hides is also considered in the analysis, based on the estimated value of hides in the 1990 study (Department of Renewable Resources 1990).[5] Based on interview data for this study, it was assumed that 20% of the hides are sold. The $75 price of a hide in the 1990 study was inflated by the Yellowknife Consumer Price Index[6] (CPI), to 2006 prices, which equalled $103. The sum of hides sold is included in the total value of the domestic harvest and commercial harvest.

[5] The inclusion of the value of hides sold represents the primary resource value of the caribou harvest. It is clear that garments and gear are fashioned from caribou hides; however, the value added in transforming the hide into a jacket is a value that is more rightly attributable to the garment industry, than the caribou harvest itself. Therefore, the end retail price of a caribou leather jacket is not properly attributable to the caribou harvest. Such is also the case with arts and crafts derived from the antlers or other parts of the caribou. An assessment of the value of primary inputs from the caribou harvest into making arts and crafts could not be conducted as this type of information was not readily available. Key person interviews with harvesters resulted in limited information, as harvesters are not necessarily the makers of such arts and crafts. Additionally, the prices of these arts and crafts would be expected to vary widely, by type of product and by artisan who produced it, which would impact the input supply price of caribou parts. The social and cultural importance of participating in the above activities is described in section 6.3, however.

[6] The Yellowknife Consumer Price Index is used to adjust for regional inflation over time, and is the only consumer price index specific to the North. As such it is more representative of price changes in Northern Canada, than the general Canadian CPI.

4.1.2 Outfitting Harvest

For the outfitting harvest, the value of the caribou was calculated using values observed in the market place since they are marketable commodities. Ashley (2000) conducted a detailed survey of the economic benefit of guided hunts for barren-ground caribou in the Northwest Territories. This research estimated the contribution to the Gross Domestic Product (GDP) of each harvested caribou, which was applied in this study to the total number of caribou harvested in each jurisdiction for this activity. The per caribou contribution to GDP estimates were adjusted for inflation to determine the value of each caribou harvested for outfitting purposes. The following formula was used for determining the value of the outfitting harvest.

Step 1:

Contribution to GDP per harvested caribou ($/animal)
X Yellowknife CPI index
Inflation adjusted contribution to GDP ($/animal)

Step 2:

Outfitting harvest (no. of animals)
X Inflation adjusted contribution to GDP ($/animal)
Outfitted harvest contribution to GDP ($)

4.2 PRODUCTION COSTS

The sum of economic value derived from the domestic and commercial harvests represents the gross economic value of the harvest.[7] This value represents the benefit of the harvested animals to the hunters and their community. Obtaining that benefit has costs associated with it, such as the cost of transportation to and from the hunt and hunting gear and fuel, for example. These costs are referred to as production costs and must be subtracted from the gross economic value to give the net economic value.

Production costs can vary widely from hunter to hunter and community to community. These costs depend on the price of goods such as fuel, snow-machines or All Terrain Vehicles (ATVs), guns, bullets and other gear used in the hunt. The distance from the community to the hunting area will also increase costs, by the increased amount of fuel needed to get to the desired location. One of the variables that cannot be controlled in the production cost estimate is location of the herds from year to year and between seasons and, therefore, the resulting variation in travel costs that occur for hunts over time. The primary costs associated with varying distances of travel are fuel costs, and to a lesser extent the wear and tear on the vehicles used to reach the herds.

In a 1988 study, "Keeping on the Land" (Ames et al. 1988), the authors calculated the annual cost of harvesting, including depreciated capital costs and annual expenses at $4620 for hunters in Clyde River, Nunavut. The estimate of depreciated capital costs and annual expenses, including consumption of

[7] Note that the outfitting caribou harvest value, as a contribution to GDP, is a comprehensive value that factors in production costs, therefore production costs are not subtracted from the outfitting values.

gasoline, ammunition, and replacement parts on capital equipment, was based on data gathered for that study and is assessed as being detailed, robust, and valid for use in this study. The 1988 production cost estimate did; however, need to be adjusted for inflation and regional cost differences.

To adjust for regional cost differences the Government of Canada Living Cost Differential Index[8] was applied to the production cost estimate in Clyde River. The weighted average[9] living cost differential of each community on the caribou range in each jurisdiction was calculated and applied to the Clyde River estimate in order to adjust for regional price differences. The adjustment of regional price differences accounts for the cost difference of the basket of goods that hunters would generally require to engage in a hunt. This regional adjustment cannot account for any variances in travel costs that may be incurred by hunters from different communities, or within or between years as the herds move within the range.[10] Next, the regional production cost estimate was inflated from 1988 dollars to 2006 dollars based on the Yellowknife Consumer Price Index.[11] This resulted in the estimated annual production cost of hunting.

This production cost estimate does not yet account for other uses of the equipment, gear and supplies. Not all time spent hunting is spent hunting caribou, so the fraction of time spent hunting caribou is then applied to the 2006 regional production cost. In this case the average amount of time spent hunting caribou in one year was determined to be approximately 35% for each hunter, based on information provided from the interviews.

In order for the production cost estimate to conform to the economic benefit estimate, the production cost must be presented on a per-caribou basis. The regional adjusted production cost is divided by the average assumed number of caribou harvested per hunter (derived from the interviews). This produced an average harvesting cost per caribou ranging from $33 to $105 per caribou. By multiplying the regional harvesting cost per caribou by the regional harvest estimate, the result is a total estimated production cost. The production cost estimate is applied to all domestic and commercially harvested caribou, on the assumption that harvesting methods for the two activities are effectively the same.[12]

4.3 HARVEST DATA

Harvest estimates used for the study were derived from the Beverly and Qamanirjuaq Caribou Management Board 2005-2006 Annual Report (Appendix 2). Aboriginal harvests by community (domestic use) are approximations only since governments do not currently tabulate local harvest statistics. Table 4.1 provides an estimate of the Beverly and Qamanirjuaq caribou harvested by jurisdiction and Table 4.2 shows the estimated number of caribou harvested by harvest type.

[8] The Living Cost Differential Index is compiled by Statistics Canada for the purpose of adjusting federal employee pay based on the relative cost of living in a remote community.

[9] The average was weighted by the population of each community.

[10] The regional price adjustment adjusts for the price of fuel, not the quantity used.

[11] The Yellowknife CPI is the only consumer price index specific to the region in question and is more representative of price changes and inflation in Northern Canada, than the general Canadian CPI.

[12] It is recognized that some additional production costs are associated with preparing the meat for commercial sale; however, no specific information on the magnitude of these costs could be obtained. Therefore, these costs are assumed to be a negligible part of overall commercial production cost.

Table 4.1
Estimated Beverly and Qamanirjuaq Caribou Harvested by Jurisdiction

Province or Territory	Beverly Herd	Qamanirjuaq Herd	Total
Manitoba		2,070	2,070
Saskatchewan	2,877		2,877
Nunavut	450	8,238	8,688
Northwest Territories	445		445
Total	3,772	10,308	14,080

Table 4.2
Estimated Beverly and Qamanirjuaq Caribou Harvested by Harvest Type

Province or Territory	Domestic Harvest	Licensed Harvest	Commercial Harvest	Outfitted Harvest	Total
Manitoba	1,420	400		250	2,070
Saskatchewan	2,875	2			2,877
Nunavut	7,373		625	690	8,688
Northwest Territories	200	75	20	150	445
Total	11,868	477	645	1,090	14,080

4.4 SOCIO-CULTURAL IMPORTANCE OF CARIBOU (PASSIVE USE)

An important component of the study was to assess the social and cultural importance of the caribou to those communities that rely on this resource. This is a key component of understanding passive use values of the caribou harvest and contributes to understanding the total value of the herds (Ashley 2000). A two-pronged approach was used to ascertain the social and cultural importance of the caribou to local communities and families.

First, a literature review was undertaken to gain a better understanding of the socio-cultural importance of the caribou in the study area; this information aided in the development of an interview program (Appendix 3) that was based on seven cultural indicators – language, traditional knowledge, cultural practices, health and wellness, kinship, law and order and cultural products. Questions regarding the role/importance of caribou pertaining to each cultural indicator were asked during the interviews. A total of six interviews were conducted in Manitoba, Nunavut, Saskatchewan, with two interviews being carried out in each of the above jurisdictions from communities on or near the Beverly and Qamanirjuaq caribou ranges. Community representatives were responsible for carrying out two interviews from their community with resource harvesters and documenting the results from the interviews. For Saskatchewan; however, a member of the study team carried out the interviews to test the interview questions and make any adjustments if necessary in advance of the rest of the interviews. Results from the interviews are presented in section 6.0.

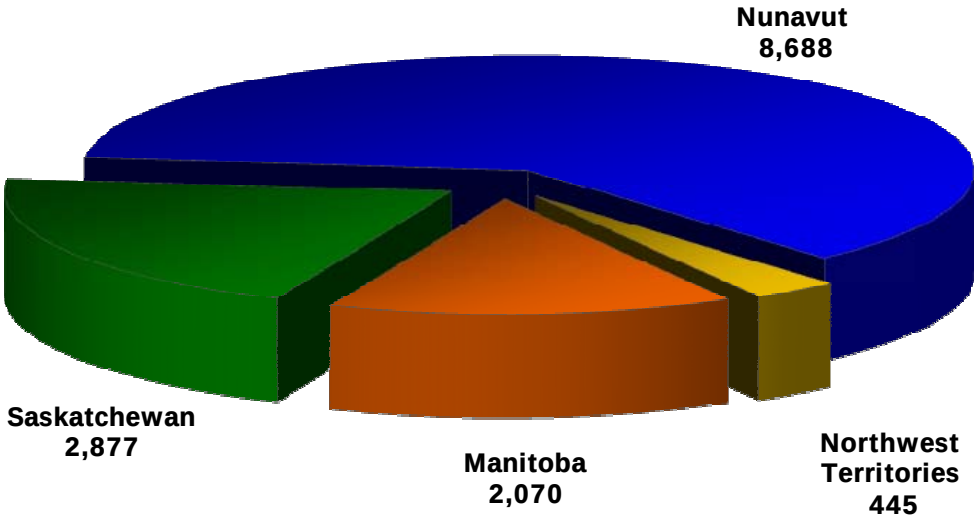
The following section describes the results from the economic valuation of the harvest. First, a brief discussion is provided on the factors that affected the economic value of the harvest (e.g., production costs and regional price of beef as a substitute good). Second, a discussion of the results from the economic valuation is provided.

5.0 RESULTS OF ECONOMIC ANALYSIS

The primary driver of the annual estimated value of the caribou harvest is the quantity of animals harvested. Generally speaking, the more animals that are harvested the more value that is gained.[13] Other variables that drive the net annual value of the harvest in each jurisdiction are regional production costs and regional price of substitute meat products.

In total, it was estimated that 14,080 animals were harvested from the Beverly and Qamanirjuaq herds in 2005-2006. The majority of the animals harvested were from the Qamanirjuaq herd (N=10,308) or 73% of the harvest, while the remaining 27% of the harvest was derived from the Beverly herd (N=3,772). Figure 5.1 presents a breakdown of the caribou harvest estimates by jurisdiction. Nunavut accounts for 62% of the harvest, with Saskatchewan accounting for the next largest share at 20%. Manitoba and the Northwest Territories follow with 15% and 3% of the total harvest, respectively.

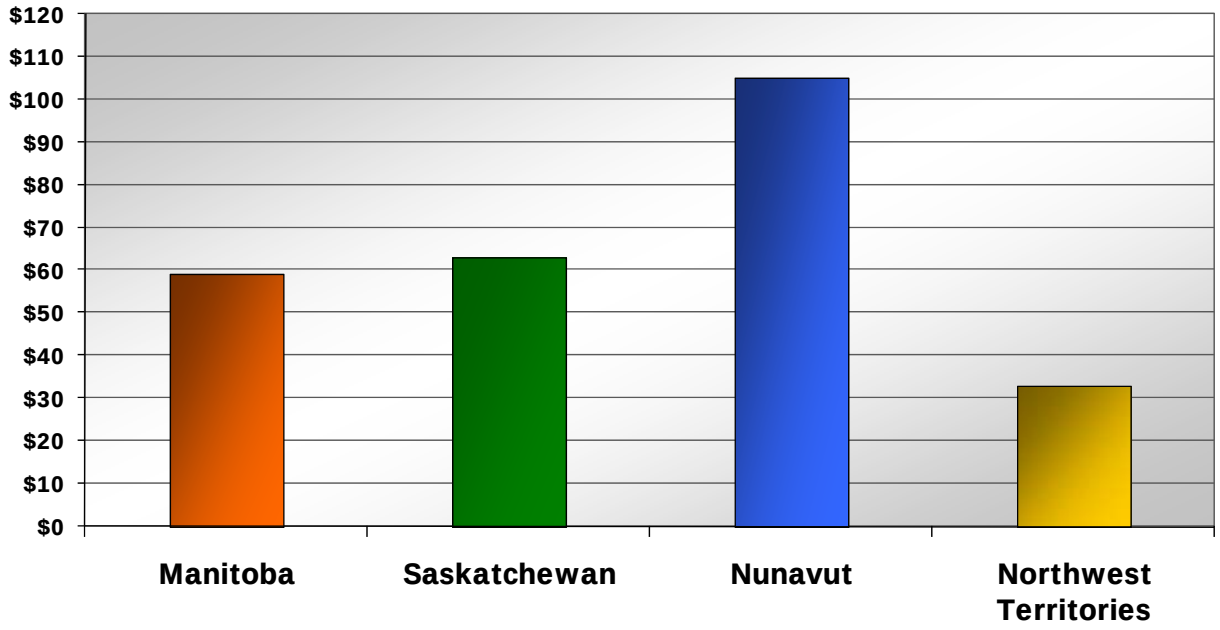
Figure 5.1
Beverly and Qamanirjuaq Caribou Harvest by Jurisdiction, 2005-2006



[13] Subject to decreasing returns to scale. In this case there will be sharply decreasing returns to wealth or utility if animals are over harvested or go to waste.

Figure 5.2 presents a comparison of the estimated regional domestic harvest production costs on a per caribou basis by jurisdiction. Of all the communities on the Beverly and Qamanirjuaq caribou ranges, production costs per caribou are the highest in Nunavut communities along the caribou range, $105 per animal, due to the higher cost of goods and services in those communities relative to other communities along the caribou range. Communities on the caribou ranges in Saskatchewan have the next highest production cost, $63 per animal, at a little over half the cost in Nunavut. Manitoban communities follow closely at $59 dollars per animal, while Northwest Territories communities have the lowest production costs, estimated at $33 per animal.

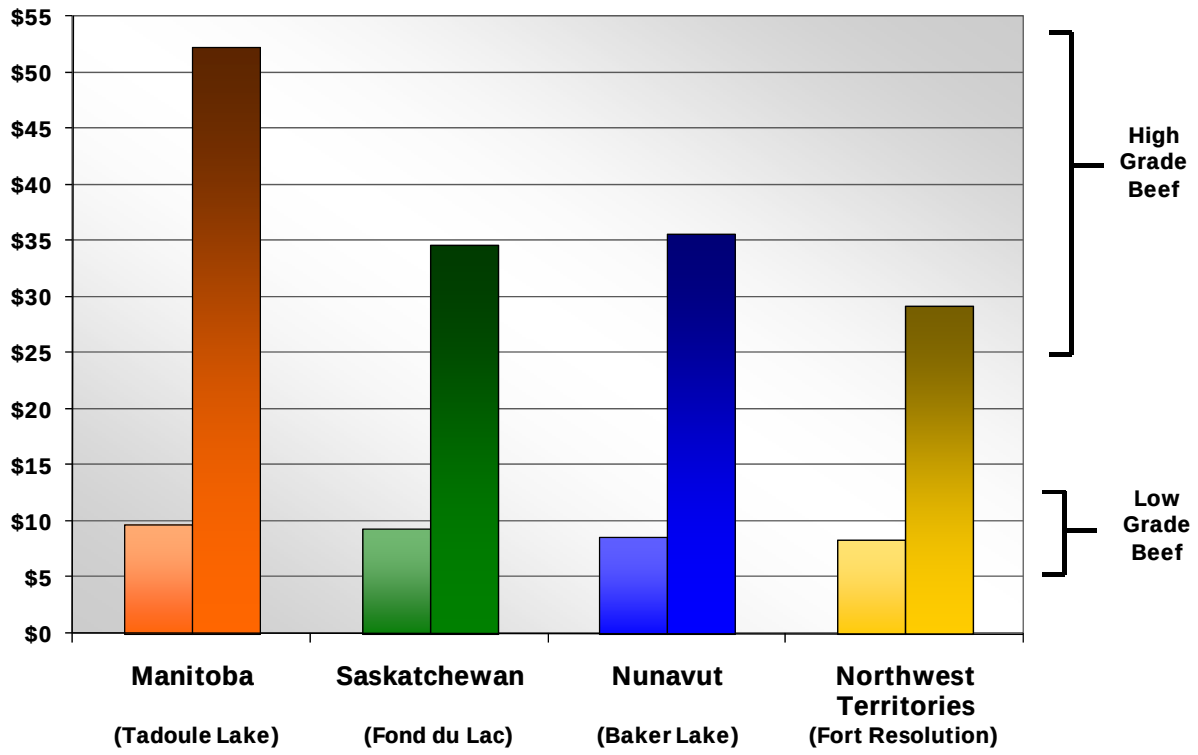
Figure 5.2
Estimated Domestic Harvest Production Cost per Caribou Harvested by Jurisdiction



These production costs are an estimate of the average costs associated with the domestic harvest of caribou. As noted in section 4.2, this cost estimate cannot account for the variation in travel costs incurred as the herds move throughout the range. The key driver of cost differences between the provinces and territories in the range is the relative cost of goods in each of the communities along the caribou range. The Northwest Territories town of Fort Resolution, for example, has all season road access, which lowers the cost of goods, and results in a lower average production cost in the Northwest Territories. Conversely, communities along the caribou range in Nunavut are isolated, which increases the cost of goods and drives up the production costs.

Figure 5.3 presents the regional price variation of substitute beef products. The chart below notes the prices of high grade and low grade beef in selected communities in each jurisdiction. Prices for low grade beef (i.e., ground beef) are fairly uniform across all four jurisdictions, with a variation of only $1.44/kg between the highest and lowest price jurisdictions. Prices are much less uniform for high grade beef. High grade beef varies in terms of type and availability. In each case, prices were collected for the highest priced beef product available at the community grocer. The prices for Nunavut, Northwest Territories and Saskatchewan represent beef tenderloin, while the Manitoba price represents Ribeye (because because beef tenderloin was not available).

Figure 5.3
Regional Price of Beef as Substitute for Caribou (Cost per kg)



This regional price variation drives some of the regional differences in the value of the harvested caribou. In jurisdictions where the value of the replacement good is higher, the estimated value of the harvested caribou is higher, owing to the fact that more money would have to be spent on beef at a grocer to replace the harvested caribou.

Table 5.1 presents the estimated average value of a caribou harvested (domestic) by jurisdiction, which represents the cumulative effect of the variations in production cost and replacement meat costs. In general, the price of substitute beef has the greatest impact on the value of a harvested caribou by region. While the production costs are important, the effects of those production costs are less noticeable. For example, the high price of high grade beef in Manitoba makes caribou a relatively more valuable commodity in terms of replacement value than in other jurisdictions. By contrast, the Northwest

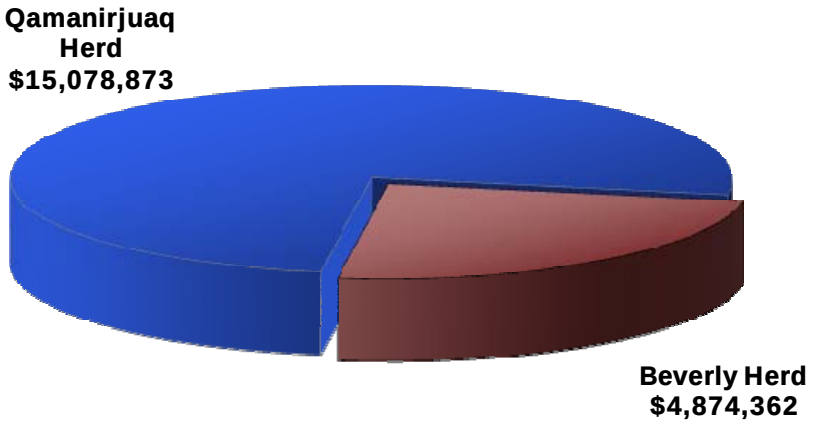
Territories has the lowest estimated production costs; however, this effect is obscured by the relatively lower cost of replacement beef, which results in a harvested caribou having a lower estimated economic value than in the other three jurisdictions.

Table 5.1
Estimated Average Value of a Harvested Caribou by Jurisdiction

Province or Territory	Average Estimated Value of A Domestic Harvest Caribou
Manitoba	$ 1,721
Saskatchewan	$ 1,207
Nunavut	$ 1,174
Northwest Territories	$ 1,052

Figure 5.4 presents the estimated net annual value of the caribou harvest by herd, where the total estimated value[14] is $19,953,234 from which $15,078,873 (76%) is estimated to be received from the Qamanirjuaq herd and the remainder $4,874,362 (24%) from the Beverly herd. The key driver behind the relative values of the harvest from each herd is the number of animals taken from each herd.

Figure 5.4
Estimated Net Annual Value of Caribou Harvest by Herd



[14] The results of this analysis are estimates only. The economic valuation is based on a variety of assumptions and estimates, which were the best available at time the research was conducted.

Figure 5.5 presents the jurisdictional breakdown of the estimated net annual value of the caribou harvest. The Nunavut region is the largest benefactor, at $11,831,565 (or 59% of the total value) resulting from the largest estimated harvest, despite having the highest estimated production costs. Manitoba is the next largest benefactor from the harvest at $3,805,448 (or 20% of the total value), followed by Saskatchewan at $3,471,923 (at 17% of the total value) and the Northwest Territories at $844,298 (or 4% of the total value).

Comparison of Figure 5.1 and Figure 5.5 reveal that the distribution of value of the harvest is similar in proportion to the distribution of animals harvested, highlighting the direct link between value of the harvest and the number of animals harvested. Notice; however, that Manitoba ranks second in value obtained from the harvest (Figure 5.5) even though it is third in terms of most number of animals harvested (Figure 5.1). This variation is the result of a higher price for high grade beef in Manitoba, which results in a higher replacement value of the harvest.

Figure 5.5
Estimated Net Annual Value of Caribou Harvest by Jurisdiction

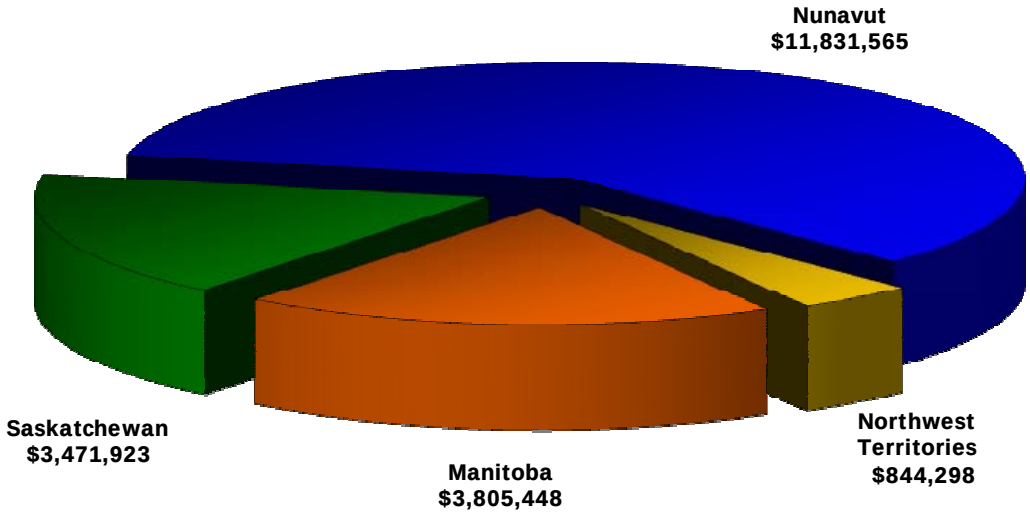
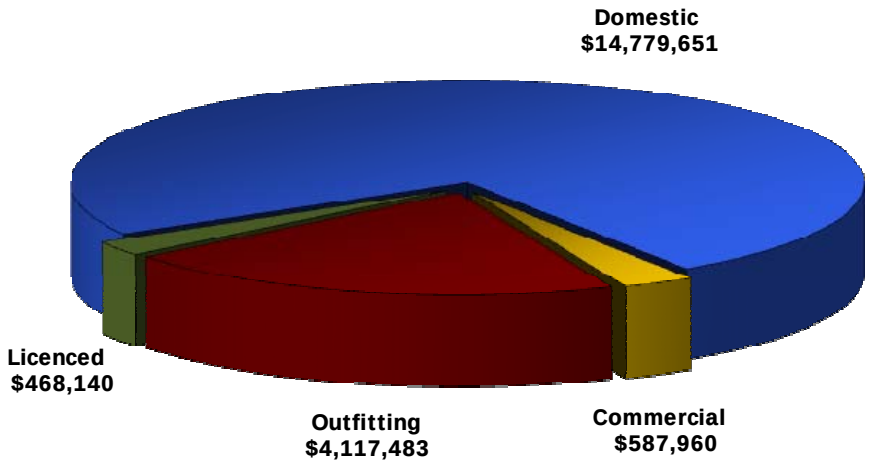


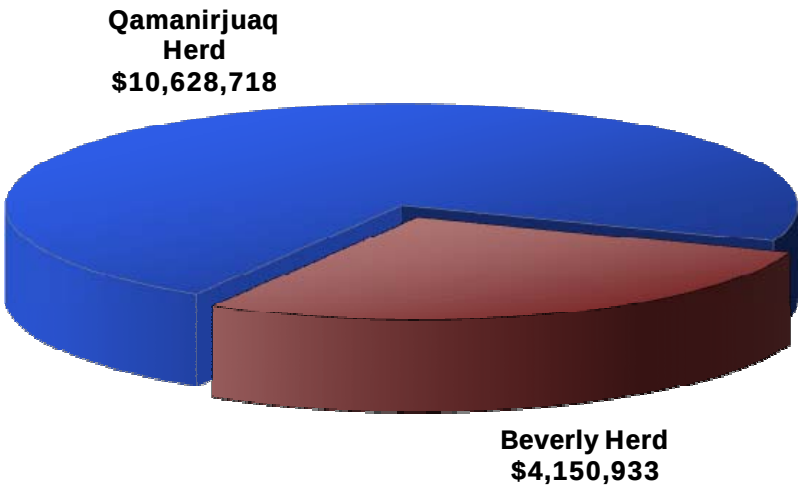
Figure 5.6 presents the estimated net annual value of the caribou harvest by type of harvest: domestic, licenced, commercial and outfitting harvests. The total net value of the harvest is $19,953,234. The domestic harvest accounts for 74% of the net value of the harvest. The outfitting harvest is the second largest at approximately 21%, and the commercial and licenced harvests account for the remaining 5%.

Figure 5.6
Estimated Net Annual Value of Caribou Harvest by Harvest Type



Within each harvest type, we can also identify the contribution of each herd to the value of that harvest type.

Figure 5.7
Estimated Net Annual Value of Domestic Harvest by Herd



The contribution of the Qamanirjuaq herd was approximately 72% of the total domestic harvest value with the remaining 28% from the Beverly herd (Figure 5.7). Note that the distribution of value of the domestic harvest is similar in proportion to the distribution of overall value of animals harvested by herd, as outlined in Figure 5.4.

Figure 5.8 presents the estimated net annual value of the licenced harvest by herd. The Qamanirjuaq herd accounts for 89% of the value of the licenced hunt, while the Beverly herd contributes the remaining 11%.

Figure 5.8
Estimated Net Annual Value of Licenced Harvest By Herd

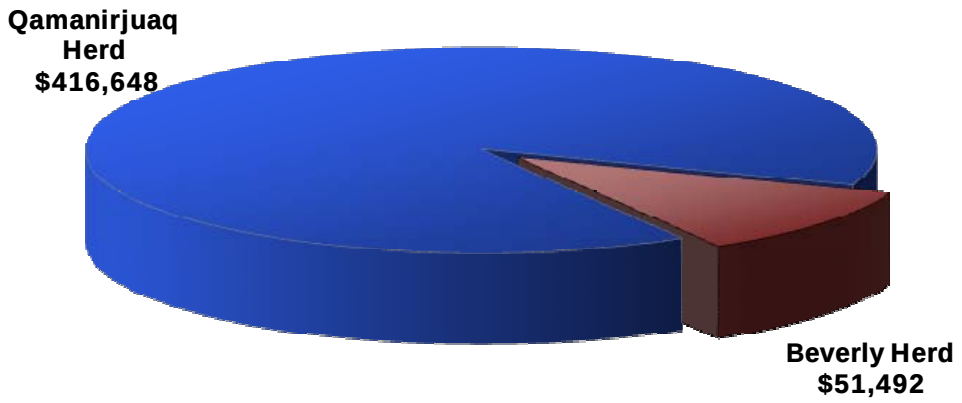


Figure 5.9 presents the net estimated annual value of the commercial harvest by herd. The Qamanirjuaq herd is the overwhelming contributor to the commercial harvest value contributing 92%, while the Beverly herd contributes 8% to this harvest activity.[15]

[15] The commercial harvest estimates represent total quotas and not the total amount of caribou harvested for commercial purposes.

Figure 5.9
Estimated Net Annual Value of Commercial Harvest by Herd

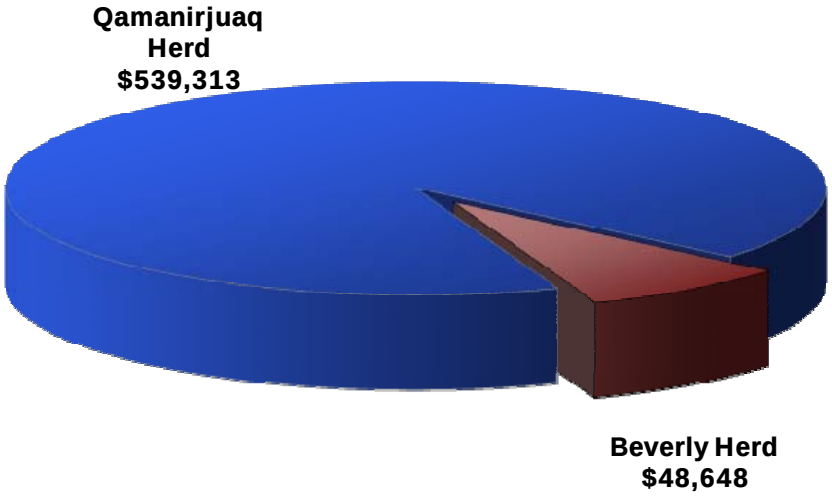
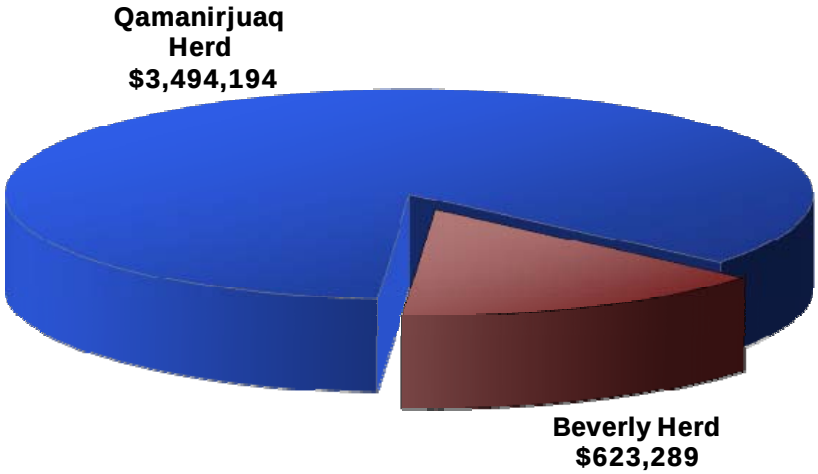


Figure 5.10 presents the net estimated annual value of the outfitting harvest, for which the Qamanirjuaq herd again contributes the greater share of value to the outfitting harvest at 85%, while the Beverly herd contributes the remaining 15%.

Figure 5.10
Estimated Net Annual Value of Outfitting Harvest by Herd



6.0 SOCIO-CULTURAL ANALYSIS

An important component of the study was to assess the socio-cultural importance of the harvest of caribou to those communities that rely on the resource. As alluded to earlier, passive use values cannot be directly measured in a market and include the value of the recreational enjoyment obtained during the hunt, the value of kinship and bonding that occurs as a result of the caribou harvest, and any number of additional factors that bring value to those who harvest the caribou. The integration of passive use values (non-economic values) into an economic valuation can be extremely difficult to quantify and, therefore, are not part of the economic valuation component of this study. However, understanding the passive use values is integral to understand the total value of the herds (Ashley 2000).

Following is an overview of the results from the six interviews that took place in Manitoba (2), Saskatchewan (2) and Nunavut (2). The results coalesced around three themes: 1) cultural practices; 2) cultural products; and 3) traditional knowledge.

6.1 CULTURAL PRACTICES

All respondents noted harvesting caribou as integral to preserving their culture and, where necessary, revitalizing their culture. It was expressed during the interviews that the sense of "community" and "family" has changed over the years. Many communities are becoming disjointed and insular. Furthermore, respondents commented that youth in communities are not aware of the importance their culture plays in knowing about one's identity. Respondents thought that engaging the youth in harvesting caribou could be a vehicle to preserve and revitalize cultural norms and practices that are critical to understanding one's culture. Some communities have started programs in an attempt to facilitate knowledge exchange about their culture to younger generations. Examples are provided below.

Regarding learning cultural norms and practices through hunting caribou, the interviews revealed that the experience of the hunt was as important as harvesting the animals. One example was provided by an interviewee regarding what he has taught the youth in his community about respect for the land and its creatures when he takes fellow community members hunting.

He emphasized that the relationship one has with the caribou must be based on respect and that disrespecting the caribou can be the driver for change in caribou migration patterns and behaviour. The respondent commented that chasing a caribou unnecessarily on a snow machine or hitting the animal after it was killed, for example, would result in the caribou warning the other caribou not to frequent an area.

The findings from the interviews were similar to what is documented in the literature regarding respect for caribou and all living things in general. For example, regarding respect, Kendrick et al. (2005) commented that members of the Lutsel Ke, Northwest Territories show respect for the caribou by:

- Using as much of the animal as possible;
- Sharing meat with community members;
- Not beating or poking the caribou with a stick after it has been killed;

- Not chasing the caribou down with snow machines and running them to exhaustion; and
- Not leaving animal remains (e.g., bones) lying around outside, etc.

Respondents also commented that the transmission of principles and laws regarding one's culture are often shared while hunting with fellow community members. Respondents emphasized that the principles and laws are the foundations of their respective cultures. The following are examples of the principles/laws that were identified during the interviews:

- Be respectful of everything around you;
- Help fellow community/family members;
- All living things are equal;
- Pass on cultural teachings to younger generations;
- Take only what you need from the land;
- Honour and provide for elders and the generations to come; and
- Collectively work together to protect the land and resources.

In addition to the above, practical skills were also taught while one was hunting caribou such as skinning caribou, meat preparation and safety and survival skills. These skills are essential for safe and successful participation in harvesting activities.

Interviewees also commented that in the past, community feasts and traditional dances were vehicles for the transmission of knowledge and culture. A Dene interviewee noted that through traditional dances culturally significant stories were told; often these dances would mimic the animals that were being hunted, such as caribou. Overall, many of the Dene dances symbolize the ancient ways in which the Dene have depended on the animals and the land for subsistence purposes. For example, the drum dance was a dance that honoured the caribou. The people would be dancing like the caribou – the way the caribou walked or ran – the dance would also be a sign of thanks for the caribou giving up its life to feed community members.

Similar to the Dene, the Inuit respondents also commented on the cultural importance of dances and ceremonies that revolved around the caribou. The literature suggests that drum dances were originally carried out to contact special spirits of the hunt for protection or to give praise to a good hunt. Usually Inuit women sat in a large circle and did most of the singing. The men would drum and dance in the centre. Unlike the Dene culture, throat singing was also an important part of the Inuit culture that was often conducted by women as a form of entertainment while their husbands were out hunting.

The interviews provided a glimpse of the importance of sustaining cultural norms and practices such as the above since they are integral to their respective cultures. All respondents noted that the frequency of such community ceremonies and culturally significant events has decreased in recent years and view this as the impetus for eroding cultural norms and practices in their respective communities; however, attempts are currently underway in each community to revitalize many of these practices, many of which revolve around the caribou and other aspects of their life. The elders are of the opinion that the youth in the communities need to gain a better understanding of their cultural identify and this needs to be done through participation in activities that in the past, were part of everyday life.

6.2 CULTURAL PRODUCTS (ARTS, CRAFTS, CLOTHING)

Respondents commented that a wide variety of products/clothing were made from caribou, including: parkas, wind pants, mitts, boots, tarps (i.e., Amiq), vests, caribou tents, rope, caribou hair tufting, caribou hair sculpting, caribou antler and bone carvings and drums.

According to the interviewees, the first priority in the past regarding cultural products was making clothing, especially for the men in the communities who went out hunting caribou. Today; however, most people involved with making traditional arts and crafts in the Canadian North use them for their own household needs.

All respondents commented that the number of members in their respective communities participating in making cultural products has declined over the years. For the most part, respondents commented that it was only the elders in the communities who were still engaged in making arts, crafts, and clothing. It was expressed by all that in the past making cultural products had cultural significance and was a vehicle for bonding and kinship in the communities.

There is also a realization that the monetary value of these items can be quite substantial and could provide economic benefits to the communities. For example, a good quality parka made from caribou could cost between $800-1000 according to a few interviewees. The Bureau of Statistics 1999 Labour Force Survey estimated that the value of the arts and crafts industry in the NWT was approximately $4 million – in 2007 dollars that is an estimated $4,635,000.

Despite few people currently involved in making arts and crafts, respondents did note that efforts are under way in their respective communities to pass on artisan skills to the younger generations. The positive point noted by interviewees was that the younger generations are showing an interest in not only making arts and crafts, but understanding why participation in these types of activities is important to sustaining their cultures. School and community programs are the main vehicles for the transmission of this knowledge and are seen as necessary since the artisan skill base is aging. All respondents saw participation in these activities as a critical component of their culture and noted that these activities facilitate community bonding and kinship and the transmission of knowledge of other aspects of their cultures.

6.3 TRADITIONAL KNOWLEDGE

A few questions were asked to interviewees regarding a body of knowledge commonly referred to as Traditional Knowledge (TK). Aboriginal Knowledge (AK), Traditional Ecological Knowledge (TEK), Indigenous Knowledge (IK), Traditional Knowledge (TK) and Inuit Knowledge (Inuit Qaujimajatuqangit) are examples of terms used in the literature to characterize the knowledge held by Aboriginal people in relation to their environment. According to Usher (2000), there are three elements to TK: 1) knowledge about the environment; 2) knowledge about the use and management of the environment; and 3) values about the environment. A description is provided below on each element.

- **Knowledge about the environment:** This is the factual or "rational knowledge" about the environment. It includes specific observations, knowledge of associations or patterns of biophysical, social and cultural phenomena, or statements about cause and effect and impact prediction. All are based on direct observation, experience and shared information within communities over generations.
- **Knowledge about use and management of the environment:** This is the knowledge that people have about how they use the environment and about how they manage their relationship with the environment (e.g., land use patterns, cultural practices, harvesting practices, social activities).
- **Values about the environment:** This knowledge consists of people's values and preferences, and what they consider "significant" or valued components of the environment. Aboriginal spirituality and culture play a strong role in determining such values.

The following provides a brief overview of what was discussed during the interviews regarding traditional knowledge.

Interviewees commented that over the years many aspects of the caribou have changed. Regarding body condition, some interviewees have found abnormalities in the meat and bones. For example, some interviewees noted that some of the caribou harvested had water on their ankles and the antlers were discoloured. Many reasons were provided by interviewees regarding the changes to the body condition of caribou such as changes in the quality of vegetation, development activities (i.e., mining), hunting pressure, and forest fire frequency. These perspectives parallel the results of a study by Lyver (2005) in which Lutsel Ke elders and hunters reported that caribou body condition varied because of: 1) forest fire frequency or severity; 2) declines in the quality and availability of vegetation; 3) weather-related variables (deep snow and ice); and 4) the distance caribou had to migrate.

Another change noted by some of the interviewees was that caribou appear to have become accustom to noise created by some of the machinery used during hunting such as snowmobiles; elders commented that when caribou were first hunted using snow machines that it was difficult to get close enough to attempt to shoot the animals. Respondents attribute this change to increased human activity in recent years on the ranges.

A question was also asked of respondents regarding what they perceive as some of the major threats to the herds based on their experience of being out on the land. Themes in the data coalesced around road development, mining and climate change. Regarding road development, interviewees were concerned that the linear nature of roads would impact the migratory patterns of the animals. Regarding mining, in particular Northern Saskatchewan and Nunavut, mineral exploration has accelerated in recent years near the wintering ranges, calving grounds and post-calving grounds of the caribou. The concern of respondents was that development/disturbance near calving and post-calving grounds when cows and calves are most sensitive to disturbance could adversely impact the animals. Climate change was also an important topic that was discussed during the interviews. Although many of the hunters did not indicate that there have been substantial changes to the herds caused by climate change to date, the opinion of all was that since most of the effects of climate change would be most pronounced in the North, that the herds could be negatively impacted by changes to climate in the future. Changes to forage availability,

introduction of new parasites and diseases could be a few effects of climate change in the North that could negatively impact the herds in the future.

The preceding paragraphs illustrate the practical application of TK, and TK is now viewed as an important part of project planning, resource management and Environmental Assessment (EA) processes throughout the world (Usher 2000). However, the importance of TK to those communities that rely on this knowledge base goes beyond the mere practical importance of knowing, for example, the migratory routes of the caribou herds. Respondents noted that the social dimension of TK includes understanding the spiritual relationships of community members and an understanding of a worldview that is very different from western society – understanding the social dimension of TK was viewed as pivotal to understanding one's culture.

A quote from Caring for the Earth, as illustrated in Berkes (1993), captures the social context of TK that is central to many Aboriginal cultures:

> Hunting, fishing, trapping, gathering or herding continue to be major sources of food, raw materials and income. Moreover, they provide native communities with a perception of themselves as distinct cultures, confirming continuity with their past and unity with the natural world. Such activities reinforce spiritual values, an ethic of sharing, and a commitment to stewardship of the land, based on a perspective of many generations.

7.0 CONCLUSIONS

The net annual economic value of the caribou harvest from the Beverly and Qamanirjuaq herds is quite substantial. The study concluded that the net annual economic value of the 2005-2006 caribou harvest was approximately $20 million, which is significantly greater than the value of less than $12 million in (2007 dollars) estimated in the 1990 study. The reason for the difference in value between the two studies was due to an approximately 40% increase in the number of animals harvested and an increase in the price of beef as the substitute good.

The jurisdiction that benefited most from the harvest was Nunavut ($11.8 million), due to the fact that most of the animals were harvested in this jurisdiction. The key harvesting type in terms of economic value was the domestic harvest at approximately $14.7 million, which again was a direct result of the number of harvested animals. The outfitting harvest was the next most important activity in terms of value, representing $4.1 million annually despite the fact that relatively few animals were harvested for this activity. This is the direct result of the economic spin-off created by the industry. The economic value of the harvest, both in terms of domestic harvesting and the outfitting harvest is a significant contribution to the welfare of the people living on the caribou ranges.

Regarding the social and cultural importance of the harvest, results focused on three themes: 1) cultural practices; 2) cultural products; and 3) traditional knowledge. All respondents viewed hunting caribou as integral to preserving their culture and, where necessary, revitalizing their culture. Interviewees commented that communities have changed and that participation in the traditional way of life has declined and, therefore, resulted in the erosion of their culture. Respondents were of the opinion that encouraging people to engage in the traditional way of life such as hunting, participating in ceremonies/community events and making traditional arts and crafts, many of which revolve around the caribou, could be the vehicle for revitalizing their culture. Participation in these activities were seen by all respondents as a critical component of their cultural identity and noted that engaging in these activities facilitates community bonding and kinship and the transmission of knowledge of other aspects of their culture, which in the past, was part of everyday life.

8.0 REFERENCES

Ames, R., D. Axford, P. Usher, E. Weick, G. Wenzel (1988) *Keeping on the Land: A Study of the Feasibility of a Comprehensive Wildlife Harvest Support Programme in the Northwest Territories.* Canadian Arctic Resources Committee, Ottawa, ON.

Ashley B. (2000) *Economic Benefits of Outfitted Hunts for Barren-Ground Caribou in the Northwest Territories.* Government of Northwest, Yellowknife, NT.

Berkes F. (1993) *Traditional Ecological Knowledge in Perspective.* In Traditional Ecological Knowledge: Concepts and Case Studies ed. Julian Inglis. IDRC, Ottawa, ON.

Beverly and Qamanirjuaq Caribou Management Board (2005) *Beverly and Qamanirjuaq Caribou Management Plan 2005-2012.* Beverly and Qamanirjuaq Caribou Management Board, Stonewall, MB.

Beverly and Qamanirjuaq Caribou Management Board (2006) *Beverly and Qamanirjuaq Caribou Management Board 24th Annual Report 2005-2006.* Beverly and Qamanirjuaq Caribou Management Board, Stonewall, MB.

Beverly and Qamanirjuaq Caribou Management Board (2007) http://www.arctic-caribou.com/index.html Accessed July 25, 2007.

Boardman, A., D. Greenberg, A. Vining, D. Weimer (2001) *Cost-Benefit Analysis: Concepts and Practice.* Prentice Hall, New Jersey, NJ.

Department of Renewable Resources (1990) *Economic Valuation of the Current Domestic Harvest of the Beverly and Qamanirjuaq Caribou Herds*. Government of the NWT, Yellowknife, NT.

Kendrick, A. (2003) *Caribou Co-Management and Cross-Cultural Knowledge Sharing.* Ph.D dissertation, University of Manitoba, Winnipeg, MB.

Kendrick, A., B. Lyver, Lutsel Ke Dene First Nation (2005) *Denesoline (Chipewyan) Knowledge of Barren-Ground Caribou (Rangifer Tarandus Groenlandicus) Movements.* Arctic Vol. 58:2 p. 175-191.

Lyver, B., Lutsel Ke Dene First Nation (2005) *Monitoring Barren-Ground Caribou Body Condition with Denesoline Traditional Knowledge.* Arctic Vol. 58:1 p. 44-54

Usher, P. (2000) *Traditional Ecological Knowledge in Environmental Assessment and Management.* Arctic. Vol. 53:2 p.173-183.

Wakelyn, L. (2001a) *The Qamanirjuaq Caribou Herd – An Arctic Enigma.* In Project Caribou – An Educator's Guide to Wild Caribou of North America. Government of the Yukon, Whitehorse, Yukon, p. 114-118.

Wakelyn, L. (2001b) *The Beverly Caribou Herd – Continental Wilderness Travelers.* In Project Caribou – An Educator's Guide to Wild Caribou of North America. Government of the Yukon, Whitehorse, Yukon, p. 119-122.

APPENDIX 1

APPENDIX 1

Economic Model Parameters

Parameters

Region	MB	SK	NU	NWT
Region Code	1	2	3	4
Physical Parameters				
Beverly Edible Weight (kg)	45	45	45	45
Qamanirijuaq Edible Weight (kg)	45	45	45	45
Nutritional Equivalence (factor)	1.26	1.26	1.26	1.26
High Grade Meat	50%	50%	50%	50%
Low Grade Meat	50%	50%	50%	50%
Economic Parameters				
High Grade Beef Price ($/kg)	52.29	34.69	35.69	29.21
Low Grade Beef Price ($/kg)	9.79	9.39	8.69	8.35
High Grade Caribou Price ($/kg)	52.29	34.69	35.69	29.21
Low Grade Caribou Price ($/kg)	9.79	9.39	8.69	8.35
Outfitted Contribution to GDP	3,778	3,778	3,778	3,778
Inflation Rate	2.50%	2.50%	2.50%	2.50%
Discount Rate	5%	5%	5%	5%
Discount Horizon 1 (years)	10	10	10	10
Discount Horizon 2 (years)	30	30	30	30
Discount Horizon 3 (years)	50	50	50	50
Value per hide	103	103	103	103
Percent of Hides Used	20%	20%	20%	20%
Production Parameters				
Annual Hunting Expense	4,222	4,496	7,502	2,353
Caribou Harvested per Domestic Hunter	25	25	25	25
Caribou Harvested per Licensed Hunter	2	2	2	2
Time Spent on Caribou Hunt	35%	35%	35%	35%
Annual Cost of Caribou Hunt	1,478	1,574	2,626	823
Average Cost Per Harvested Caribou	59	63	105	33

Harvest Summary

Summary of Animals Harvested

Region	Total Animals Harvested	Domestic Harvest	Licensed Harvest	Commercial Harvest	Outfitted Harvest
Manitoba	**2,070**	**1,420**	**400**	**-**	**250**
Beverly Herd	-	-	-	-	-
Qamanirjuaq Herd	2,070	1,420	400	-	250
Saskatchewan	**2,877**	**2,875**	**2**	**-**	**-**
Beverly Herd	2,877	2,875	2	-	-
Qamanirjuaq Herd	-	-	-	-	-
Nunavut	**8,688**	**7,373**	**-**	**625**	**690**
Beverly Herd	450	400	-	35	15
Qamanirjuaq Herd	8,238	6,973	-	590	675
Northwest Territories	**445**	**200**	**75**	**20**	**150**
Beverly Herd	445	200	75	20	150
Qamanirjuaq Herd	-	-	-	-	-
All Regions	**14,080**	**11,868**	**477**	**645**	**1,090**
Beverly Herd	3,772	3,475	77	55	165
Qamanirjuaq Herd	10,308	8,393	400	590	925

Summary of Edible Weights

Region	Total Edible Weight (kg)	Domestic Edible Weight (kg)	Licensed Edible Weight (kg)	Commercial Edible Weight (kg)	Outfitted Edible Weight (kg)
Manitoba	**93,150**	**63,900**	**18,000**	**-**	**11,250**
Beverly Herd	-	-	-	-	-
Qamanirjuaq Herd	93,150	63,900	18,000	-	11,250
Saskatchewan	**129,465**	**129,375**	**90**	**-**	**-**
Beverly Herd	129,465	129,375	90	-	-
Qamanirjuaq Herd	-	-	-	-	-
Nunavut	**390,960**	**331,785**	**-**	**28,125**	**31,050**
Beverly Herd	20,250	18,000	-	1,575	675
Qamanirjuaq Herd	370,710	313,785	-	26,550	30,375
Northwest Territories	**20,025**	**9,000**	**3,375**	**900**	**6,750**
Beverly Herd	20,025	9,000	3,375	900	6,750
Qamanirjuaq Herd	-	-	-	-	-
All Regions	**633,600**	**534,060**	**21,465**	**29,025**	**49,050**
Beverly Herd	169,740	156,375	3,465	2,475	7,425
Qamanirjuaq Herd	463,860	377,685	18,000	26,550	41,625

Summary of Gross Value of Harvest

Summary of Gross Value of Harvest

Region	Total Gross Value ($)	Domestic Gross Value ($)	Licensed Gross Value ($)	Commercial Gorss Value ($)	Outfitted Gross Value ($)
Manitoba	**4,184,956**	**2,528,364**	**712,215**	**-**	**944,377**
Beverly Herd	-	-	-	-	-
Qamanirjuaq Herd	4,184,956	2,528,364	712,215	-	944,377
Saskatchewan	**3,654,476**	**3,651,935**	**2,540**	**-**	**-**
Beverly Herd	3,654,476	3,651,935	2,540	-	-
Qamanirjuaq Herd	-	-	-	-	-
Nunavut	**12,671,604**	**9,428,174**	**-**	**636,950**	**2,606,480**
Beverly Herd	603,829	511,497	-	35,669	56,663
Qamanirjuaq Herd	12,067,775	8,916,677	-	601,281	2,549,817
Northwest Territories	**882,423**	**217,079**	**81,405**	**17,313**	**566,626**
Beverly Herd	882,423	217,079	81,405	17,313	566,626
Qamanirjuaq Herd	-	-	-	-	-
All Regions	**21,393,460**	**15,825,553**	**796,161**	**654,264**	**4,117,483**
Beverly Herd	5,140,728	4,380,512	83,945	52,983	623,289
Qamanirjuaq Herd	16,252,732	11,445,041	712,215	601,281	3,494,194

Summary of Net Value of Harvest

Summary of Net Value of Harvest

Region	Total Net Value ($)	Domestic Net Value ($)	Licensed Net Value ($)	Commercial Net Value ($)	Outfitted Net Value ($)
Manitoba	**$ 3,805,448**	**$ 2,444,423**	**$ 416,648**	**$ -**	**$ 944,377**
Beverly Herd	$ -	$ -	$ -	$ -	$ -
Qamanirjuaq Herd	$ 3,805,448	$ 2,444,423	$ 416,648	$ -	$ 944,377
Saskatchewan	**$ 3,471,923**	**$ 3,470,956**	**$ 967**	**$ -**	**$ -**
Beverly Herd	$ 3,471,923	$ 3,470,956	$ 967	$ -	$ -
Qamanirjuaq Herd	$ -	$ -	$ -	$ -	$ -
Nunavut	**$ 11,831,565**	**$ 8,653,780**	**$ -**	**$ 571,306**	**$ 2,606,480**
Beverly Herd	$ 558,141	$ 469,485	$ -	$ 31,993	$ 56,663
Qamanirjuaq Herd	$ 11,273,425	$ 8,184,295	$ -	$ 539,313	$ 2,549,817
Northwest Territories	**$ 844,298**	**$ 210,492**	**$ 50,526**	**$ 16,655**	**$ 566,626**
Beverly Herd	$ 844,298	$ 210,492	$ 50,526	$ 16,655	$ 566,626
Qamanirjuaq Herd	$ -	$ -	$ -	$ -	$ -
All Regions	**$ 19,953,234**	**$ 14,779,651**	**$ 468,140**	**$ 587,960**	**$ 4,117,483**
Beverly Herd	$ 4,874,362	$ 4,150,933	$ 51,492	$ 48,648	$ 623,289
Qamanirjuaq Herd	$ 15,078,873	$ 10,628,718	$ 416,648	$ 539,313	$ 3,494,194

Summary of Production Costs

Summary of Production Costs

Region		Total Net Value ($)	Domestic Production Costs ($)	Licensed Production Costs ($)	Commercial Production Costs ($)	Outfitted Production Costs ($)
Manitoba	**$**	**379,509**	**83,941**	**295,567**	**-**	**n/a**
Beverly Herd	$	-	-	-	-	n/a
Qamanirjuaq Herd	$	379,509	83,941	295,567	-	n/a
Saskatchewan	**$**	**182,552**	**180,979**	**1,574**	**-**	**n/a**
Beverly Herd	$	182,552	180,979	1,574	-	n/a
Qamanirjuaq Herd	$	-	-	-	-	n/a
Nunavut	**$**	**840,039**	**774,395**	**-**	**65,644**	**n/a**
Beverly Herd	$	45,689	42,012	-	3,676	n/a
Qamanirjuaq Herd	$	794,350	732,382	-	61,968	n/a
Northwest Territories	**$**	**38,125**	**6,588**	**30,879**	**659**	**n/a**
Beverly Herd	$	38,125	6,588	30,879	659	n/a
Qamanirjuaq Herd	$	-	-	-	-	n/a
All Regions	**$**	**1,440,226**	**1,045,902**	**328,020**	**66,303**	**n/a**
Beverly Herd	$	266,367	229,579	32,453	4,335	n/a
Qamanirjuaq Herd	$	1,173,859	816,323	295,567	61,968	n/a

Summary of Net Present Value Analysis

Summary of Net Present Value

Region		10 Year ($)		30 Year ($)		50 Year ($)
Manitoba	**$**	**29,384,660**	**$**	**58,499,061**	**$**	**69,471,973**
Beverly Herd	$	-	$	-	$	-
Qamanirjuaq Herd	$	29,384,660	$	58,499,061	$	69,471,973
Saskatchewan	**$**	**26,809,270**	**$**	**53,371,968**	**$**	**63,383,169**
Beverly Herd	$	26,809,270	$	53,371,968	$	63,383,169
Qamanirjuaq Herd	$	-	$	-	$	-
Nunavut	**$**	**91,360,212**	**$**	**181,880,160**	**$**	**215,996,177**
Beverly Herd	$	4,309,814	$	8,579,989	$	10,189,373
Qamanirjuaq Herd	$	87,050,398	$	173,300,172	$	205,806,804
Northwest Territories	**$**	**6,519,445**	**$**	**12,978,929**	**$**	**15,413,441**
Beverly Herd	$	6,519,445	$	12,978,929	$	15,413,441
Qamanirjuaq Herd	$	-	$	-	$	-
All Regions	**$**	**154,073,587**	**$**	**306,730,118**	**$**	**364,264,760**
Beverly Herd	$	37,638,529	$	74,930,886	$	88,985,983
Qamanirjuaq Herd	$	116,435,058	$	231,799,233	$	275,278,777

Economic Model – Manitoba

Region	MB			**Total Regional Harvest Value**		**Average Value per Harvested Animal**		**Average Value per domestic harvest animal**	
Region Code	1			$ 3,472,741		$ 1,678		$ 1,721	
Domestic Harvest	Dom	**Licensed Harvest**	Lic	**Commercial Harvest**	Com	**Outfitted Harvest**	Guide	**Total Harvest**	
Animals Harvested		**Animals Harvested**		**Animals Harvested**		**Animals Harvested**		**Animals Harvested**	
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-
Qamanirjuaq Herd	1,420	Qamanirjuaq Herd	400	Qamanirjuaq Herd	-	Qamanirjuaq Herd	250	Qamanirjuaq Herd	2,070
Total	1,420	Total	400	Total	-	Total	250	Total	2,070
Total Edible Weight (kg)		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**	
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-
Qamanirjuaq Herd	63,900	Qamanirjuaq Herd	18,000	Qamanirjuaq Herd	-	Qamanirjuaq Herd	11,250	Qamanirjuaq Herd	93,150
Total	63,900	Total	18,000	Total	-	Total	11,250	Total	93,150
High Grade Meat (kg)		**High Grade Meat (kg)**		**High Grade Meat (kg)**		**High Grade Meat (kg)**		**High Grade Meat (kg)**	
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-
Qamanirjuaq Herd	31,950	Qamanirjuaq Herd	9,000	Qamanirjuaq Herd	-	Qamanirjuaq Herd	5,625	Qamanirjuaq Herd	46,575
Total	31,950	Total	9,000	Total	-	Total	5,625	Total	46,575
Low Grade Meat (kg)		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**	
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-	Beverly Herd	-
Quaminaruiq Herd	31,950	Quaminaruiq Herd	9,000	Qamanirjuaq Herd	-	Qamanirjuaq Herd	5,625	Quaminaruiq Herd	46,575
Total	31,950	Total	9,000	Total	-	Total	5,625	Total	46,575
	Check Total Total OK		Check Total Total OK		Check Total Total OK		Check Total Total OK		Check Total Total OK
Beef Equivilant		**Beef Equivilant**						**Beef Equivilant**	
High Grade Nutritional Equiv. (kg)		**High Grade Nutritional Equiv. (kg)**						**High Grade Nutritional Equiv. (kg)**	
Beverly Herd	-	Beverly Herd	-					Beverly Herd	-
Qamanirjuaq Herd	40,257	Qamanirjuaq Herd	11,340					Qamanirjuaq Herd	58,685
Total	40,257	Total	11,340					Total	58,685
Low Grade Nutritional Equiv. (kg)		**Low Grade Nutritional Equiv. (kg)**						**Low Grade Nutritional Equiv. (kg)**	
Beverly Herd	-	Beverly Herd	-					Beverly Herd	-
Qamanirjuaq Herd	40,257	Qamanirjuaq Herd	11,340					Qamanirjuaq Herd	58,685
Total	40,257	Total	11,340					Total	58,685
High Grade Meat Value ($)		**High Grade Meat Value ($)**		**High Grade Meat Value ($)**				**High Grade Meat Value ($)**	
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-			Beverly Herd	-
Qamanirjuaq Herd	2,105,039	Qamanirjuaq Herd	592,969	Quaminaruiq Herd	-			Qamanirjuaq Herd	3,068,613
Total	2,105,039	Total	592,969	Total	-			Total	3,068,613
Low Grade Meat Value ($)		**Low Grade Meat Value ($)**		**Low Grade Meat Value ($)**				**Low Grade Meat Value ($)**	
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-			Beverly Herd	-
Qamanirjuaq Herd	394,116	Qamanirjuaq Herd	111,019	Qamanirjuaq Herd	-			Qamanirjuaq Herd	3,068,613
Total	394,116	Total	111,019	Total	-			Total	3,068,613
Value of Hides		**Value of Hides**		**Value of Hides**					
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-				
Qamanirjuaq Herd	29,210	Qamanirjuaq Herd	8,228	Qamanirjuaq Herd	-				
Total	29,210	Total	8,228	Total	-				
Gross Domestic Value	**$ 2,528,364**	**Gross Domestic Value**	**$ 712,215**	**Gross Domestic Value**	**$ -**	**Total Outfitted Value**	**944,377**	**Gross Economic Value**	**$ 4,184,956**
Beverly Herd	$ -	Beverly Herd	$ -	Beverly Herd	$ -	Beverly Herd	-	Beverly Herd	$ -
Qamanirjuaq Herd	$ 2,528,364	Qamanirjuaq Herd	$ 712,215	Qamanirjuaq Herd	$ -	Qamanirjuaq Herd	944,377	Qamanirjuaq Herd	$ 4,184,956
Average Gross Unit Value	$ 1,781	Average Gross Unit Value	$ 1,781	Average Gross Unit Value	-	Average Gross Unit Value	$ 3,778		
Production Costs		**Production Costs**		**Production Costs**					
Harvesting Cost per Hunter	4,222	Harvesting Cost per Hunter	4,222	Harvesting Cost per Hunter	4,222				
Estimated Caribou per Hunter	25.0	Estimated Caribou per Hunter	2.0	Estimated Caribou per Hunter	25.0				
Estimated Domestic Hunters	57	Estimated Domestic Hunters	200	Estimated Commercial Hunters	-				
% of Caribou hunting Activities	35%	% of Caribou hunting Activities	35%	% of Caribou hunting Activities	35%				
Estimated Cost of Caribour Hunt	1,478	Estimated Cost of Caribour Hunt	1,478	Estimated Cost of Caribour Hunt	1,478				
Average Unit Cost per Harvested Caribou	$ 59	Average Unit Cost per Harvested Caribou	$ 739	Average Cost per Harvested Caribou	$ 59				
Total Harvesting Cost	**83,941**	**Total Harvesting Cost**	**295,567**	**Total Harvesting Cost**	**-**			**Total Production Cost**	**$ 379,509**
Beverly Herd	-	Beverly Herd	-	Beverly Herd	-			Beverly Herd	$ -
Qamanirjuaq Herd	83,941	Qamanirjuaq Herd	295,567	Qamanirjuaq Herd	-			Qamanirjuaq Herd	$ 379,509
Net Value	**$ 2,444,423**	**Net Value**	**$ 416,648**	**Net Value**	**$ -**	**Net Value**	**$ 944,377**	**Total Net Value**	**$ 3,805,448**
Beverly Herd	**$ -**	Beverly Herd	**$ -**	Beverly Herd	**$ -**	Beverly Herd	-	Beverly Herd	-
Qamanirjuaq Herd	**$ 2,444,423**	Qamanirjuaq Herd	**$ 416,648**	Qamanirjuaq Herd	**$ -**	Qamanirjuaq Herd	944,377	Qamanirjuaq Herd	3,805,448
Average Net Unit Value	$ 1,721	Average Net Unit Value	$ 1,042	Average Net Unit Value	-	Average Net Unit Value	$ 3,778		

Economic Model - Saskatchewan

Region	SK
Region Code	2
Total Regional Harvest Value	$ 3,651,935
Average Value per Harvested Animal	$ 1,269
Average Value per domestic harvest animal	$ 1,207

Domestic Harvest (Dom)

Animals Harvested		
Beverly Herd		2,875
Qamanirjuaq Herd		-
	Total	2,875
Total Edible Weight (kg)		
Beverly Herd		129,375
Qamanirjuaq Herd		-
	Total	129,375
High Grade Meat (kg)		
Beverly Herd		64,688
Qamanirjuaq Herd		-
	Total	64,688
Low Grade Meat (kg)		
Beverly Herd		64,688
Quaminaruiq Herd		-
	Total	64,688
	Check Total	Total OK
Beef Equivilant		
High Grade Nutritional Equiv. (kg)		
Beverly Herd		81,506
Qamanirjuaq Herd		-
	Total	81,506
Low Grade Nutritional Equiv. (kg)		
Beverly Herd		81,506
Qamanirjuaq Herd		-
	Total	81,506
High Grade Meat Value ($)		
Beverly Herd		2,827,452
Qamanirjuaq Herd		-
	Total	2,827,452
Low Grade Meat Value ($)		
Beverly Herd		765,344
Qamanirjuaq Herd		-
	Total	765,344
Value of Hides		
Beverly Herd		59,140
Qamanirjuaq Herd		-
	Total	59,140
Gross Domestic Value	$	**3,651,935**
Beverly Herd	$	3,651,935
Qamanirjuaq Herd	$	-
Average Unit Value	$	1,270
Production Costs		
Harvesting Cost per Hunter		4,496
Estimated Caribou per Hunter		25.0
Estimated Domestic Hunters		115
% of Caribou hunting Activities		35%
Estimated Cost of Caribour Hunt		1,574
Average Cost per Harvested Caribou	$	63
Total Harvesting Cost		**180,979**
Beverly Herd		180,979
Qamanirjuaq Herd		-
Net Value	$	**3,470,956**
Beverly Herd	$	**3,470,956**
Qamanirjuaq Herd	$	**-**
Average Net Unit Value	$	1,207

Licensed Harvest (Lic)

Animals Harvested		
Beverly Herd		2
Qamanirjuaq Herd		-
	Total	2
Total Edible Weight (kg)		
Beverly Herd		90
Qamanirjuaq Herd		-
	Total	90
High Grade Meat (kg)		
Beverly Herd		45
Qamanirjuaq Herd		-
	Total	45
Low Grade Meat (kg)		
Beverly Herd		45
Quaminaruiq Herd		-
	Total	45
	Check Total	Total OK
Beef Equivilant		
High Grade Nutritional Equiv. (kg)		
Beverly Herd		57
Qamanirjuaq Herd		-
	Total	57
Low Grade Nutritional Equiv. (kg)		
Beverly Herd		57
Qamanirjuaq Herd		-
	Total	57
High Grade Meat Value ($)		
Beverly Herd		1,967
Qamanirjuaq Herd		-
	Total	1,967
Low Grade Meat Value ($)		
Beverly Herd		532
Qamanirjuaq Herd		-
	Total	532
Value of Hides		
Beverly Herd		41
Qamanirjuaq Herd		-
	Total	41
Gross Domestic Value	$	**2,540**
Beverly Herd	$	2,540
Qamanirjuaq Herd	$	-
Average Unit Value	$	1,270
Production Costs		
Harvesting Cost per Hunter		4,496
Estimated Caribou per Hunter		2.0
Estimated Domestic Hunters		1
% of Caribou hunting Activities		35%
Estimated Cost of Caribour Hunt		1,574
Average Cost per Harvested Caribou	$	787
Total Harvesting Cost		**1,574**
Beverly Herd		1,574
Qamanirjuaq Herd		-
Net Value	$	**967**
Beverly Herd	$	**967**
Qamanirjuaq Herd	$	**-**
Average Net Unit Value	$	483

Commercial Harvest (Com)

Animals Harvested		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
Total Edible Weight (kg)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
High Grade Meat (kg)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
Low Grade Meat (kg)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
	Check Total	Total OK
High Grade Meat Value ($)		
Beverly Herd		-
Quaminaruiq Herd		-
	Total	-
Low Grade Meat Value ($)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
Value of Hides		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
Gross Domestic Value	$	**-**
Beverly Herd	$	-
Qamanirjuaq Herd	$	-
		-
Production Costs		
Harvesting Cost per Hunter		4,496
Estimated Caribou per Hunter		25.0
Estimated Commercial Hunters		-
% of Caribou hunting Activities		35%
Estimated Cost of Caribour Hunt		1,574
Average Cost per Harvested Caribou	$	63
Total Harvesting Cost		**-**
Beverly Herd		-
Qamanirjuaq Herd		-
Net Value	$	**-**
Beverly Herd	$	**-**
Qamanirjuaq Herd	$	**-**
Average Net Unit Value		-

Outfitted Harvest (Guide)

Animals Harvested		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
Total Edible Weight (kg)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
High Grade Meat (kg)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
Low Grade Meat (kg)		
Beverly Herd		-
Qamanirjuaq Herd		-
	Total	-
	Check Total	Total OK
Total Outfitted Value		**-**
Beverly Herd		-
Qamanirjuaq Herd		-
		-
Net Value	$	**-**
Beverly Herd		-
Qamanirjuaq Herd		-
Average Net Unit Value		-

Total Harvest

Animals Harvested		
Beverly Herd		2,877
Qamanirjuaq Herd		-
	Total	2,877
Total Edible Weight (kg)		
Beverly Herd		129,465
Qamanirjuaq Herd		-
	Total	129,465
High Grade Meat (kg)		
Beverly Herd		64,733
Qamanirjuaq Herd		-
	Total	64,733
Low Grade Meat (kg)		
Beverly Herd		64,733
Quaminaruiq Herd		-
	Total	64,733
	Check Total	Total OK
Beef Equivilant		
High Grade Nutritional Equiv. (kg)		
Beverly Herd		81,563
Qamanirjuaq Herd		-
	Total	81,563
Low Grade Nutritional Equiv. (kg)		
Beverly Herd		81,563
Qamanirjuaq Herd		-
	Total	81,563
High Grade Meat Value ($)		
Beverly Herd		2,829,419
Qamanirjuaq Herd		-
	Total	2,829,419
Low Grade Meat Value ($)		
Beverly Herd		2,829,419
Qamanirjuaq Herd		-
	Total	2,829,419
Gross Economic Value	$	**3,654,476**
Beverly Herd	$	3,654,476
Qamanirjuaq Herd	$	-
Total Production Cost	$	**182,552**
Beverly Herd	$	182,552
Qamanirjuaq Herd	$	-
Total Net Value	$	**3,471,923**
Beverly Herd		3,471,923
Qamanirjuaq Herd		-

Economic Model – Nunavut

Region	NU			**Total Gross Regional Harvest Value**		**Average Value per Harvested Animal**		**Average Value per domestic harvest animal**	
Region Code	3			**$**	**12,671,604**	**$**	**1,459**	$	1,174
Domestic Harvest	Dom	**Licensed Harvest**	Lic	**Commercial Harvest**	Com	**Outfitted Harvest**	Guide	**Total Harvest**	
Animals Harvested		**Animals Harvested**		**Animals Harvested**		**Animals Harvested**		**Animals Harvested**	
Beverly Herd	400	Beverly Herd	-	Beverly Herd	35	Beverly Herd	15	Beverly Herd	450
Qamanirjuaq Herd	6,973	Qamanirjuaq Herd	-	Qamanirjuaq Herd	590	Qamanirjuaq Herd	675	Qamanirjuaq Herd	8,238
Total	7,373	Total	-	Total	625	Total	690	Total	8,688
Total Edible Weight (kg)		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**	
Beverly Herd	18,000	Beverly Herd	-	Beverly Herd	1,575	Beverly Herd	675	Beverly Herd	20,250
Qamanirjuaq Herd	313,785	Qamanirjuaq Herd	-	Qamanirjuaq Herd	26,550	Qamanirjuaq Herd	30,375	Qamanirjuaq Herd	370,710
Total	331,785	Total	-	Total	28,125	Total	31,050	Total	390,960
High Grade Meat (kg)		**High Grade Meat (kg)**		**High Grade Meat (kg)**		**High Grade Meat (kg)**		**High Grade Meat (kg)**	
Beverly Herd	9,000	Beverly Herd	-	Beverly Herd	788	Beverly Herd	338	Beverly Herd	10,125
Qamanirjuaq Herd	156,893	Qamanirjuaq Herd	-	Qamanirjuaq Herd	13,275	Qamanirjuaq Herd	15,188	Qamanirjuaq Herd	185,355
Total	165,893	Total	-	Total	14,063	Total	15,525	Total	195,480
Low Grade Meat (kg)		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**	
Beverly Herd	9,000	Beverly Herd	-	Beverly Herd	788	Beverly Herd	338	Beverly Herd	10,125
Quaminaruiq Herd	156,893	Quaminaruiq Herd	-	Qamanirjuaq Herd	13,275	Qamanirjuaq Herd	15,188	Quaminaruiq Herd	185,355
Total	165,893	Total	-	Total	14,063	Total	15,525	Total	195,480
Check Total	Total OK	Check Total	Total OK	Check Total	Total OK	Check Total	Total OK	Check Total	Total OK
Beef Equivilant		**Beef Equivilant**						**Beef Equivilant**	
High Grade Nutritional Equiv. (kg)		**High Grade Nutritional Equiv. (kg)**						**High Grade Nutritional Equiv. (kg)**	
Beverly Herd	11,340	Beverly Herd	-					Beverly Herd	12,758
Qamanirjuaq Herd	197,685	Qamanirjuaq Herd	-					Qamanirjuaq Herd	233,547
Total	209,025	Total	-					Total	246,305
Low Grade Nutritional Equiv. (kg)		**Low Grade Nutritional Equiv. (kg)**						**Low Grade Nutritional Equiv. (kg)**	
Beverly Herd	11,340	Beverly Herd	-					Beverly Herd	12,758
Qamanirjuaq Herd	197,685	Qamanirjuaq Herd	-					Qamanirjuaq Herd	233,547
Total	209,025	Total	-					Total	246,305
High Grade Meat Value ($)		**High Grade Meat Value ($)**		**High Grade Meat Value ($)**				**High Grade Meat Value ($)**	
Beverly Herd	404,725	Beverly Herd	-	Beverly Herd	28,106			Beverly Herd	455,315
Qamanirjuaq Herd	7,055,362	Qamanirjuaq Herd	-	Quaminaruiq Herd	473,785			Qamanirjuaq Herd	8,335,303
Total	7,460,086	Total	-	Total	501,891			Total	8,790,618
Low Grade Meat Value ($)		**Low Grade Meat Value ($)**		**Low Grade Meat Value ($)**				**Low Grade Meat Value ($)**	
Beverly Herd	98,545	Beverly Herd	-	Beverly Herd	6,843			Beverly Herd	455,315
Qamanirjuaq Herd	1,717,879	Qamanirjuaq Herd	-	Qamanirjuaq Herd	115,360			Qamanirjuaq Herd	8,335,303
Total	1,816,423	Total	-	Total	122,203			Total	8,790,618
Value of Hides		**Value of Hides**		**Value of Hides**					
Beverly Herd	8,228	Beverly Herd	-	Beverly Herd	720				
Qamanirjuaq Herd	143,437	Qamanirjuaq Herd	-	Qamanirjuaq Herd	12,136				
Total	151,665	Total	-	Total	12,856				
Gross Domestic Value	**$ 9,428,174**	**Gross Domestic Value**	**$ -**	**Gross Domestic Value**	**$ 636,950**	**Total Outfitted Value**	**2,606,480**	**Gross Economic Value**	**$ 12,671,604**
Beverly Herd	$ 511,497	Beverly Herd	$ -	Beverly Herd	$ 35,669	Beverly Herd	56,663	Beverly Herd	$ 603,829
Qamanirjuaq Herd	$ 8,916,677	Qamanirjuaq Herd	$ -	Qamanirjuaq Herd	$ 601,281	Qamanirjuaq Herd	2,549,817	Qamanirjuaq Herd	$ 12,067,775
Average Unit Value	$ 1,279	Average Unit Value	-	Average Unit Value	$ 1,019	Average Unit Value	$ 3,778		
Production Costs		**Production Costs**		**Production Costs**					
Harvesting Cost per Hunter	7,502	Harvesting Cost per Hunter	7,502	Harvesting Cost per Hunter	7,502				
Estimated Caribou per Hunter	25.0	Estimated Caribou per Hunter	2.0	Estimated Caribou per Hunter	25.0				
Estimated Domestic Hunters	295	Estimated Domestic Hunters	-	Estimated Commercial Hunters	25				
% of Caribou hunting Activities	35%	% of Caribou hunting Activities	35%	% of Caribou hunting Activities	35%				
Estimated Cost of Caribour Hunt	2,626	Estimated Cost of Caribour Hunt	2,626	Estimated Cost of Caribour Hunt	2,626				
Average Cost per Harvested Caribou	$ 105	Average Cost per Harvested Caribou	$ 1,313	Average Cost per Harvested Caribou	$ 105				
Total Harvesting Cost	**774,395**	**Total Harvesting Cost**	**-**	**Total Harvesting Cost**	**65,644**			**Total Production Cost**	**$ 840,039**
Beverly Herd	42,012	Beverly Herd	-	Beverly Herd	3,676			Beverly Herd	$ 45,689
Qamanirjuaq Herd	732,382	Qamanirjuaq Herd	-	Qamanirjuaq Herd	61,968			Qamanirjuaq Herd	$ 794,350
Net Value	**$ 8,653,780**	**Net Value**	**$ -**	**Net Value**	**$ 571,306**	**Net Value**	**$ 2,606,480**	**Total Net Value**	**$ 11,831,565**
Beverly Herd	**$ 469,485**	Beverly Herd	**$ -**	Beverly Herd	**$ 31,993**	Beverly Herd	56,663	Beverly Herd	558,141
Qamanirjuaq Herd	**$ 8,184,295**	Qamanirjuaq Herd	**$ -**	Qamanirjuaq Herd	**$ 539,313**	Qamanirjuaq Herd	2,549,817	Qamanirjuaq Herd	11,273,425
Average Net Unit Value	$ 1,174	Average Net Unit Value	-	Average Net Unit Value	$ 914	Average Net Unit Value	$ 3,778		

Economic Model – Northwest Territories

Region	NWT			Total Regional Harvest Value		Average Value per Harvested Animal		Average Value per domestic harvest animal	
Region Code	4			$ 801,019		$ 1,800		$ 1,052	
Domestic Harvest	Dom	**Licensed Harvest**	Lic	**Commercial Harvest**	Com	**Outfitted Harvest**	Guide	**Total Harvest**	
Animals Harvested		**Animals Harvested**		**Animals Harvested**		**Animals Harvested**		**Animals Harvested**	
Beverly Herd	200	Beverly Herd	75	Beverly Herd	20	Beverly Herd	150	Beverly Herd	445
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-
Total	200	Total	75	Total	20	Total	150	Total	445
Total Edible Weight (kg)		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**		**Total Edible Weight (kg)**	
Beverly Herd	9,000	Beverly Herd	3,375	Beverly Herd	900	Beverly Herd	6,750	Beverly Herd	20,025
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-
Total	9,000	Total	3,375	Total	900	Total	6,750	Total	20,025
High Grade Meat (kg)		**High Grade Meat (kg)**		**High Grade Meat (kg)**		**High Grade Meat (kg)**		**High Grade Meat (kg)**	
Beverly Herd	4,500	Beverly Herd	1,688	Beverly Herd	450	Beverly Herd	3,375	Beverly Herd	10,013
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-
Total	4,500	Total	1,688	Total	450	Total	3,375	Total	10,013
Low Grade Meat (kg)		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**		**Low Grade Meat (kg)**	
Beverly Herd	4,500	Beverly Herd	1,688	Beverly Herd	450	Beverly Herd	3,375	Beverly Herd	10,013
Quaminaruiq Herd	-	Quaminaruiq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Quaminaruiq Herd	-
Total	4,500	Total	1,688	Total	450	Total	3,375	Total	10,013
Check Total	Total OK	Check Total	Total OK	Check Total	Total OK			Check Total	Total OK
Beef Equivilant		**Beef Equivilant**						**Beef Equivilant**	
High Grade Nutritional Equiv. (kg)		**High Grade Nutritional Equiv. (kg)**						**High Grade Nutritional Equiv. (kg)**	
Beverly Herd	5,670	Beverly Herd	2,126					Beverly Herd	12,616
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-					Qamanirjuaq Herd	-
Total	5,670	Total	2,126					Total	12,616
Low Grade Nutritional Equiv. (kg)		**Low Grade Nutritional Equiv. (kg)**						**Low Grade Nutritional Equiv. (kg)**	
Beverly Herd	5,670	Beverly Herd	2,126					Beverly Herd	12,616
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-					Qamanirjuaq Herd	-
Total	5,670	Total	2,126					Total	12,616
High Grade Meat Value ($)		**High Grade Meat Value ($)**		**High Grade Meat Value ($)**				**High Grade Meat Value ($)**	
Beverly Herd	165,621	Beverly Herd	62,108	Beverly Herd	13,145			Beverly Herd	368,506
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Quaminaruiq Herd	-			Qamanirjuaq Herd	-
Total	165,621	Total	62,108	Total	13,145			Total	368,506
Low Grade Meat Value ($)		**Low Grade Meat Value ($)**		**Low Grade Meat Value ($)**				**Low Grade Meat Value ($)**	
Beverly Herd	47,345	Beverly Herd	17,754	Beverly Herd	3,758			Beverly Herd	368,506
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-			Qamanirjuaq Herd	-
Total	47,345	Total	17,754	Total	3,758			Total	368,506
Value of Hides		**Value of Hides**		**Value of Hides**					
Beverly Herd	4,114	Beverly Herd	1,543	Beverly Herd	411				
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-				
Total	4,114	Total	1,543	Total	411				
Gross Domestic Value	**$ 217,079**	**Gross Domestic Value**	**$ 81,405**	**Gross Domestic Value**	**$ 17,313**	**Total Outfitted Value**	**566,626**	**Gross Economic Value**	**$ 882,423**
Beverly Herd	$ 217,079	Beverly Herd	$ 81,405	Beverly Herd	$ 17,313	Beverly Herd	566,626	Beverly Herd	$ 882,423
Qamanirjuaq Herd	$ -	Qamanirjuaq Herd	$ -	Qamanirjuaq Herd	$ -	Qamanirjuaq Herd	-	Qamanirjuaq Herd	$ -
Average Unit Value	$ 1,085	Average Unit Value	$ 1,085		$ 866		$ 3,778		
Production Costs		**Production Costs**		**Production Costs**					
Harvesting Cost per Hunter	2,353	Harvesting Cost per Hunter	2,353	Harvesting Cost per Hunter	2,353				
Estimated Caribou per Hunter	25.0	Estimated Caribou per Hunter	2.0	Estimated Caribou per Hunter	25.0				
Estimated Domestic Hunters	8	Estimated Domestic Hunters	38	Estimated Commercial Hunters	1				
% of Caribou hunting Activities	35%	% of Caribou hunting Activities	35%	% of Caribou hunting Activities	35%				
Estimated Cost of Caribour Hunt	823	Estimated Cost of Caribour Hunt	823	Estimated Cost of Caribour Hunt	823				
Average Cost per Harvested Caribou	$ 33	Average Cost per Harvested Caribou	$ 412	Average Cost per Harvested Caribou	$ 33				
Total Harvesting Cost	**6,588**	**Total Harvesting Cost**	**30,879**	**Total Harvesting Cost**	**659**			**Total Production Cost**	**$ 38,125**
Beverly Herd	6,588	Beverly Herd	30,879	Beverly Herd	659			Beverly Herd	$ 38,125
Qamanirjuaq Herd	-	Qamanirjuaq Herd	-	Qamanirjuaq Herd	-			Qamanirjuaq Herd	$ -
Net Value	**$ 210,492**	**Net Value**	**$ 50,526**	**Net Value**	**$ 16,655**	**Net Value**	**$ 566,626**	**Total Net Value**	**$ 844,298**
Beverly Herd	**$ 210,492**	Beverly Herd	**$ 50,526**	Beverly Herd	**$ 16,655**	Beverly Herd	566,626	Beverly Herd	$ 844,298
Qamanirjuaq Herd	**$ -**	Qamanirjuaq Herd	**$ -**	Qamanirjuaq Herd	**$ -**	Qamanirjuaq Herd	-	Qamanirjuaq Herd	$ -
Average Net Unit Value	$ 1,052	Average Net Unit Value	$ 674	Average Net Unit Value	$ 833	Average Net Unit Value	$ 3,778		

APPENDIX 2

APPENDIX 2

Qamanirjuaq Herd

Community	Population by Community	Traditional User and Other Aboriginal Domestic Use[6]	Resident Licenced Hunters Domestic Use	Commercial Use
Arviat[1]	1,899	3,273		
Baker Lake[1,7]	603	800		
Brochet[5]	513	300		
Chesterfield Inlet[1]	345	0		
Churchill[4]	100	50		
Lac Brochet[1]	629	600		
Rankin Inlet[1]	2,177	400		
South Indian Lake[1]	808	200		
Split Lake[1]	1581	0		
Nelson House[1]	1,710	1,710		
Tadoule Lake[1]	316	250		
Whale Cove[1]	305	500		
Wollaston[5,8]	1,100	2,000		
Manitoba			400[13]	250[13] (guiding non-residents)
Nunavut			N/A	590[15] (meat, local sales) 675[15] (guiding non-residents
TOTALS	12,086		400	1,515
TOTAL CARIBOU HARVEST				10,308

1) Census 2001
2) Registered Indian population on reserve. INAC 2001
3) Registered Indian population on crown land. INAC 2001
4) Registered Indian population and holders of hunting licences in the community.
5) All residents. Combined total of Census Canada 2001 and INAC 2001.

Beverly Herd

Community	Population by Community	Traditional User and Other Aboriginal Domestic Use[6]	Resident Licenced Hunters Domestic Use	Commercial Use
Baker Lake[6,7]	301	400		
Black Lake[2,8]	1,281	1,600		
Camsell Portage[1]	40	0		
Fond du Lac[2,8]	827	1,000		
Fort Resolution[1]	525	0[9]		
Fort Smith[4]	700	100[9]		20[10,13] (meat, local sales)
Lutselk'e[3]	444	100[9]		150[10,13] (guiding non-residents)
Stony Rapids[5,8]	189	200		
Uranium City[5]	160	0		
Fort Chipewayan[11]	N/A	75[11]		
Saskatchewan			2[12]	
Northwest Territories			75[14]	
Nunavut			N/A	35[15] (meat, local sales) 15[15] (guiding non-residents)
TOTALS	4,467	3,475	77	220
TOTAL CARIBOU HARVEST				3,772

6) Harvest estimated by the Hunters and Trappers Organizations (HTOs) of Rankin Inlet, Baker Lake, Arviat, Chesterfield Inlet and Whale Cove, and government staff of Nunavut's Department of Environment, the NWT's Department of Environment and Natural Resources, Saskatchewan Environment and Manitoba Conservation.

7) The BQCMB apportion the Baker Lake caribou harvest as 40% Qamanirjuaq, 20% Beverly and 40% Wager Bay.

8) Caribou did not migrate close to stony rapids or Black Lake this past year, so many hunters from those communities travelled south of Wollaston to harvest caribou. In both the Black Lake and Fond du Lac areas, hunters also had to travel north to NWT to harvest caribou (Grant Duncan, Saskatchewan Environment, personal communication). Together, the communities of Fond du Lac, Black Lake and Stony Rapids are entitles to harvest 1000 caribou in NWT under their Border a license (Nahum Lee, NWT Environment and Natural Resources, personal communication).

9) While domestic caribou harvests for Lutselk'e and Fort Smith were estimated at 500 animals per community, government staff indicated caribou were likely taken from the Bathurst herd for the most part, not the Beverly herd. The domestic caribou harvest for Fort Resolution was thought o be entirely from the Bathurst herd.

10) Lutselk'e Dene were issued 150 tags for outfitter camps on Elmer and Artillery Lakes. Of 200 tags available for commercial meat sales in Fort Smith, 20 were issued.

11) NWT Border B licence tags were estimated to have been used, so the median figure of 75 appears here.

12) Of eight licences issued in Stony Rapids, two caribou were harvested. No caribou were harvested as a result of the four licences issued in Uranium City (Grant Duncan, Saskatchewan Environment personal communication).
13) Figures provided by Government staff.
14) Government staff estimates that Fort Smith's harvest of Beverly animals for licenced residents was between 50 and 100. The median figure of 75 is used.
15) These are the total quotas. However, reports from communities indicating how much of their quota was used over the past year had not been received by Nunavut's Department of Environment at the time of this publication.

APPENDIX 3

APPENDIX 3

April 16, 2007

Dear Interviewee:

InterGroup Consultants Ltd. has been retained to undertake an economic valuation of the current harvest of the Beverly and Qamanirjuaq caribou herds for the Beverly and Qamanirjuaq Caribou Management Board (BQCMB). The objectives of the study are to: 1) Provide an updated economic valuation of the current harvest of the Beverly and Qamanirjuaq caribou herds; and 2) Investigate the social and cultural importance of the Beverly and Qamanirjuaq caribou herds to those who rely on the resource.

As noted above, an important component of the study is to assess the social and cultural importance of the caribou – this will be done through interviews. A total of 8 interviews will be conducted for this study, with 2 interviews being carried out in each jurisdiction (Manitoba, Saskatchewan, NWT, Nunavut) that relies on the herds. Both the interviewer and interviewee will receive $50.00 each. Cheques will be mailed immediately following the interview once complete mailing addresses have been provided.

The interview will take approximately one-hour to complete and will cover a range of topics relating to the Beverly and Qamanirjuaq caribou herds including arts and crafts, cultural practices, traditional knowledge, as well as some general questions. Through the course of the interview, please feel free to engage in discussion as much as you would like. In the event that you do not want to answer a specific question, simply respond “no comment”. Your responses will be held in strict confidence, and the results from the study will be aggregated with no reference made to specific participants.

Thank you very much for taking time out of your busy schedule to participate in an interview for this study – your comments and perspectives are greatly appreciated. If you have any questions about the interview or the study, please do not hesitate to contact Brett McGurk at (204) 942-0654.

Regards,

Brett McGurk

Information for Interviewers

1. Find a resource harvester in your community who is willing to be interviewed.

2. Indicate to interviewee prior to beginning the interview that they will receive a cheque for $50.00 once a complete mailing address is provided to Brett McGurk at InterGroup Consultants.

3. Please read the cover letter to interviewee before beginning the interview.

4. Make sure you bring all the materials you will need for the interview with you - this includes a copy of the interview guide, letter to be read to participants, note paper and extra pens.
5. Attempt to get responses to each question.

6. Please fill out responses to questions using the same numbering as the interview guide and on separate sheets of paper or using a computer word processing program; do not fill in responses to questions on the interview guide other than the biographical information.

7. Brett McGurk at InterGroup Consultants will have to read and interpret your notes. Please make sure your notes are accurate and legible.

8. Return the interview guide with the completed biographical information and responses to questions to the contact person who asked you to carry out the interview or mail/fax directly to Brett McGurk no later than **May 25, 2007.**

   Mr. Brett McGurk
   InterGroup Consultants
   500-280 Smith Street
   Winnipeg, Manitoba R3C 1K2
   Tel: (204) 942-0654
   Fax: (204) 943-3922

9. Please do not share information provided from interviewees to anyone else – this information must be kept confidential.

BEVERLY AND QAMANIRJUAQ CARIBOU MANAGEMENT BOARD

Interview Guide: Understanding the Social and Cultural Importance of the Beverly and Qamanirjuaq Barren-Ground Caribou

Biographical Information (this information will be kept confidential)

Name: _____ Sex (Male or Female): _____

Age: _____ Community: _____

Ethnicity (Inuit, Dene, Cree, Métis):_____ Date of interview: _____

Interviewer's name: _____

Interviewer's telephone number: _____

Fee for interviewer: **$50.00** Fee for person being interviewed: **$50.00**

GENERAL QUESTIONS

The following are general questions that are being asked to assist with the study. Some of the responses to the questions will be used for the economic valuation component of the study, while other responses will be used to gain a better understanding of the social and cultural importance of caribou.

1. On average, how many caribou do you harvest annually for yourself and the community?

2. Of the total amount of time you spend hunting, how much of that time is dedicated to hunting caribou? All (100%), most (75%), half (50%), some (25%), other _____.

3. How important is caribou to your community's overall health? What parts of the animal do people consume? How is it prepared? Which parts do people like the most?

4. Describe the social, cultural and spiritual importance of caribou to you and your community?

5. Do community members sell the hides from the caribou they harvest? If yes, of the caribou harvested by a community member annually, approximately how many of the hides are sold - all (100%), most (75%), half (50%), some (25%), other _____.

6. How much money can a caribou hide be sold for?

7. Are hides exchanged for other products besides money? If yes, what products are exchanged?

8. Are there opportunities for one to learn about their culture through hunting caribou and other animals? Describe.

9. Are there any documents/reports you suggest we read to develop a better understanding of the social and cultural importance of the caribou?

ARTS, CRAFTS, CLOTHING – CULTURAL PRODUCTS

The following questions will focus on arts, crafts and clothing made from caribou. It is recognized that time spent together making arts, crafts and clothing provides an opportunity to learn about one's culture and other teachings from community members and family.

10. What types of arts, crafts and clothing are made from caribou in your community? What parts of the caribou are used for each product? Identify and describe.

11. Do community members sell the products they make from caribou? If yes, for each product made, how much can you sell the product for?

12. On average, how many products made from caribou can a community member sell in one year? Identify and describe.

13. On average, how many caribou do you think are used for arts, crafts and clothing by your community each year? Please provide as a percentage of the total caribou harvested by your community each year - all (100%), most (75%), half (50%), some (25%), other _____.

14. Approximately, how many community members are engaged in making arts, crafts and clothing? Please provide as a percentage of community population.

15. What changes have occurred over the years regarding making arts, crafts and clothing from caribou? Describe.

16. What opportunities are there to have community members learn about their culture through their participation in making arts and crafts?

CULTURAL PRACTICES

This section asks questions about the role the caribou plays in the community's cultural practices and identifies whether there are any traditional rules regarding caribou.

17. Are there ceremonies or cultural practices regarding the caribou that brings community members together? Identify and describe.

18. Would a decrease in the size of the caribou herds or a change in their migration patterns affect the opportunity for community members to spend time together and learn about their culture? Explain.

19. What legends and beliefs are there regarding the caribou? What are these legends and beliefs regarding caribou telling/teaching the community?

20. What community rules are there regarding the caribou (e.g., community/traditional rules for hunting caribou and other resources in general)? Explain.

21. What role do elders play in passing down traditional rules and culture in the community? Explain

22. Have traditional rules regarding the caribou (e.g., harvesting caribou) changed over the years?

23. What roles do community rules play in keeping your culture?

TRADITIONAL KNOWLEDGE/TRANSMISSION OF KNOWLEDGE

This section asks questions about traditional knowledge regarding the caribou.

24. What changes have you seen to the caribou over the years based on your observations? Describe.

25. What are the three largest threats to the herds? Identify and describe.

26. How is traditional knowledge passed down in the community regarding caribou and other resources? Describe.

27. Is there anything else that you feel I should know for the purposes of this study that we have not talked about today?