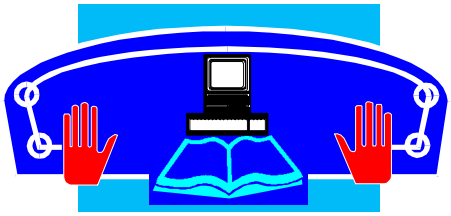

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Mr. Syd Kirwan
Director, Natural Resources Development
Economic Development and Tourism
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9

June 30, 1988

Dear Mr. Kirwan:

Re: Production and Marketing of Country Food from the N.W.T.

We are pleased to submit the final version of this important study

The report contains a discussion on the background of the Country Food industry in the N.W.T., with ensuing analysis into production and marketing of:

- Muskox
- Caribou
- Reindeer
- Bison
- Whitefish
- Arctic Char
- Lake Trout
- Northern Pike
- Inconnu
- Scallops
- Shrimp
- Greenland Halibut

The report is then closed with summary statements, conclusions and recommendations.

We appreciate the opportunity to have undertaken this study and we look foxward to working with you again in the future.

Yours truly,
DELOITTE HASKINS & SELLS

Deloitte Haskins & Sells

/da

Enclosure

PRODUCTION AND MARKETING
OF COUNTRY FOOD
FROM THE NORTHWEST TERRITORIES

Prepared For

ECONOMIC DEVELOPMENT AND TOURISM

GOVERNMENT OF NORTHWEST TERRITORIES

Prepared By

DELOITTE HASKINS & SELLS

EDMONTON, ALBERTA

June, 1988

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Background

The Northwest Territories (l J. W. T.) is highly dependent on imported foodstuffs and durable and nondurable consumer items that are transported in from southern Canadian locations, such as Alberta and British Columbia, and the U.S.A. Government of the Northwest Territories (G.N.W.T.) statistics indicate that the Territory spends an estimated $130 million annually on imported southern foods.[1] Many imported products cannot be produced locally for a variety of reasons, such as uneconomic plant scale, a small population distributed over a large area and climate limitations (e.g., extreme temperatures, sunlight variability, soil).

However, further potential may exist in naturally available food products, called "Country Foods". Such production may be a means to local economic growth by import substitution and export strategies which have been used by Canada and many other countries to achieve economic growth and improve income levels in designated sectors. Although local production of some types of products may not be currently feasible because of economic (e.g., low volumes) *or* technical reasons, local conditions do favour production of meat, fish and seafood from indigenous species such as caribou, muskox, arctic char and whitefish. Such local naturally occurring food sources could become viable "country food" production opportunities. Country Foods being harvested now amount to approximately $70 million.[2]

Production of certain foodstuffs, such as highly perishable fresh meat and vegetables by the local community, is a desirable goal to

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[1] G.N.W.T. "The Arctic Food Industry"

[2] Ibid,

strive for and has been promoted by federal, provincial/territorial and municipal governments in the past. Clearly, governments realize the need for and social benefits of increasing such local production. The G.N.W.T. 'S commitment to this goal is recognized by its Commercial Renewable Resource Use Policy, which allows for the provision of financial assistance for developing renewable resource businesses. The Territorial government is designing a northern food strategy that will provide direction to the industry. The approach to any such industry development should focus on those country food items exhibiting the greatest economic potential while remaining consistent with local needs and constraints. A balance of resource development and resource conservation is the key underlying principal as country food production strategies are formed.

1.2 Study Objectives

As stated in the Terms of Reference and further clarified in discussion with the Department of Economic Development and Tourism, the main objective of the study was to:

> "...determine the cost/benefit of establishing a Northern foods industry in the N.W.T., the constraints and how they can be overcome and particularly the N.W.T. 'S ability to produce and market its food products competitively both in the N.W.T. and the South."

Specific sub-objectives were then developed as an addendum to the initial study proposal:

- Quantify commercial harvest levels of country food products (on a regional basis if possible). The five regions utilized were the N.W.T. Administrative Regions: Inuvik, Fort Smith, Kitikmeot, Keewatin and Baffin (except for the freshwater fish).
- Estimate costs of production for the products and provide a breakdown by major components (i.e., slaughter/capture, processing, transportation, marketing).

Measure demand for the various commercial products and report their respective prices (by region and/or community).

- Undertake market research to identify demand and product specification requirements in Alberta, British Columbia, Quebec and Ontario markets.
- Evaluate competitiveness of N.W.T. Country Food products relative to other products available.
- Identify opportunities and constraints in the N.W.T. Country Food sector.

Provide recommendations to encourage greater production of the key products with identified market potential.

1.3 Scope of the Study

The scope of the study was limited to examining specific species occurring in the N.W.T. that were understood to be commercially harvested. These included:

- Muskox
- Caribou
- Reindeer
- Bison
- Whitefish
- Arctic Char
- Lake Trout
- Northern Pike
- Inconnu
- Scallops
- Shrimp
- Greenland Halibut (Turbot)

Subsequent research discussed throughout the remainder of this report outlines the varying degree to which these species occupy commercial markets.

The market centers visited included Yellowknife, Vancouver, Edmonton, Montreal and Toronto. Interviews were conducted in each of these centres. Recent research conducted for the Department of Economic Development and Tourism was also used for the market assessment.

1.4 Methodology and Study Outline

The study was divided into three key components:

- Production - Harvest/Processing Review (Chapters 3 to 5)
- Market Assessment (Chapter 6)
- Summary, Conclusions and Recommendations (Chapter 7).

Each component was researched in light of the specific game or aquatic species (or group of species) being examined. Commercial harvest and processing practices were reviewed to provide an understanding of the production and resource utilization side of the industry. Markets were examined through industry contacts and a review of past research identifying production strengths, requirements and consumption trends. Based on the combined assessments of production and markets, opportunities and constraints for economic development of each identified species were then outlined. The final research component then combined the results of the proceeding reviews and formulated recommendations to encourage both greater commercial production of country foods with the most economic potential and further research into production and markets.

2.0 BACKGROUND TO COUNTRY FOOD

Country food is defined as 'food obtained from the northern wilderness by people who either eat it or share it with others". This may be further broadened to include commercial production and sales of food harvested. It encompasses various species of game animals, freshwater fish, marine fish and marine mammals. Country food production has typically been a non-commercial activity, although the economic importance to native families in terms of value of equivalent store-bought food has been demonstrated by several studies[3]. There have also been commercial sales of country food both within and outside the N.W.T. in recent years.

Composition of the country food harvest (in terms of species) varies considerably from region to region depending upon availability. A study in the area of the Norman Wells Oilfield Expansion and Pipeline Project indicated that the harvest was composed mainly of big game (56%), fish (27%), with some fur bearing animals (8%) and birds (7%)4. A 1975 study of an isolated camp of Inuit hunters in southern Baffin Island found that common seal accounted for 66 percent of the total harvest, followed by bearded seals and beluga whales. These three species accounted for 83 percent of the annual harvest. The remaining 17 percent was made Up of 15 different species with duck eggs contributing the largest proportion. [5]

Hunting, fishing and trapping in the N.W.T. is primarily undertaken by the native inhabitants and practically all of the harvest is utilized for their domestic consumption. It was estimated that native people consume about 95 percent of the red meat and nearly

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[3] Bone, p. 3

[4] Ibid.

[5] Kemp, p. 24

half the fish caught in the N. W.T.[6] This is not to suggest that additional markets for these products are not available, and the topic of potential markets will be addressed in Chapter 6. The Science Advisory Board of the Northwest Territories estimated that "under intensive management and carefully controlled harvest", about 10 million kg of meat and fish could be harvested annually on a sustainable basis without depleting the available resources. This is about two to four times estimated recent harvests[7]. The G.N.W.T. estimates that the Country Foods industry has the potential to become a $150 million industry.[8] Several alternatives have been considered in the past in an attempt to maintain a consistent harvest volume, including the establishment of reindeer herds in northern Canada. However, one researcher concluded that wild populations of caribou and musk-oxen offered the best potential for converting northern tundra into meat, hides, hooves and other products useful to man[9].

Although potential production appears to be substantial, the possibility for commercial production must be evaluated considering many factors including location of supplies relative to individuals involved in harvest, harvest quotas, processing and distribution systems available and potential markets. These aspects are discussed throughout the remainder of this report.

Current technologies including snowmobiles, aircraft and freezers have been incorporated into the harvest of country foods. Although the adoption of these technologies has increased the ease and efficiency of harvesting country foods, a new problem has arisen in how to obtain funds to acquire the tools and equipment.

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6 Usher, pp. 19-21

7 Usher, p. 19

8 G.N.W.T. "The Arctic Food Industry"

9 Scotter, p. 173

In 1977, Justice Berger in his report Northern Frontier Northern Homeland stated the problem thus:

> "The basic problem is not the resource base but the realization of a cash income from it. ..persons participating in the traditional economy spend a total of almost $3.5 million a year to outfit themselves. . . These expenses amount to nearly $1,600 for each General Hunting Licence holder . . . this estimated $3.5 million is three times the present cash yield from trapping and substantially more than the most optimistic potential yield from this activity
>
> ...further. . .
>
> ...This differential does, however, highlight the need for cash from other sources to support the viability of the traditional sector as it now exists, and it demonstrates yet again why so many persons who identify themselves as trappers also work - indeed, may have to work - for wages. In some small communities, transfer payments, such as family allowances and old age pensions, can be important sources of capital for hunting. . . Even the most optimistic estimates of the harvest potential of renewable resources do not suggest that every man, woman and child in the territories can harvest enough, not only to eat, but also to pay for all the other things they might want. I have made it quite clear that there is a need for cash that goes far beyond what is at present earned from that sector."[10]

The Government of the Northwest Territories has responded to this identified need for outside capital with several programs:

1. Outpost Camp Program: Provides financial assistance to any family or group of persons, less than 60 in number, who hold General Hunting Licenses and who wish to live or move away from settlements to isolated areas in the N.W.T. for at least three months to make a living from the land. In 1986-87, a total of $461,927 was distributed through this program. Items provided include:
   - transportation of persons/supplies and equipment to camp and return.
   - sufficient funds for first year's requirement of food and supplies.

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10 R.M.C., pp. 10-11

fuel oil above the tree line.
materials for basic shelter.
loan of a radio.
medical services.

2. Communitv Harvest Program: This program provides similar benefits as the Outpost Camp Program, but is available to individuals. In 1986-87, $423.700 was made available through this program.

3. Special ARDA: This program is a joint Federal-Territorial program to provide financial help to people of N.W.T. (especially of Indian and Inuit ancestry). The program has supplied capital equipment such as traps, boats, outboard motors, snowmobiles, sled and cabin materials, to assist hunters and trappers to earn a living.

   Hunters and trappers generally pay 35 percent of the cost of an item and can only receive funding once for a particular item. For 1986-87, $1,907,854 was approved for this program.

4. Hunters & Trappers Associations (HTAs): The Wildlife Service contacts the HTA's or Band Councils routinely to gather information. In recognition for the service these organizations provide, the Wildlife Service issues grants to the HTAs or Band Councils. In 1986-87, a total of $837,400 was distributed to a total of 58 HTAs ar,d the Bands in the N.W.T.

5. Organized Caribou Hunts: In 1986-87, $13,403 was paid from this program to provide financial assistance to holders of GHL's to provide transportation for caribou hunts when it was otherwise impossible for the hunters to access caribou.

Additional programs are available specifically to trappers to provide interest-free loans, fur marketing services and gasoline subsidies.[11]

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11 N.W.T. Wildlife Notes, Number 9, May 1983 and updated by Department of Renewable Resources for 1986-87.

3.0 GAHE ANIMALS

3.1 Main Species of Game Animals

3.1.1 Barren- ground Caribou

Barren-ground caribou (Rangifer tarandus groenlandicus) are the most numerous of the four subspecies found in the N.W.T. Caribou are long-legged animals with sharp hooves to aid in traveling over ice and snow. Males typically stand about 43 inches at the shoulder and weigh about 250 lb. The caribou has an exceptionally warm coat due to the insulating effect of the hollow hairs. Both males and females have antlers which are shed and regrown each year. Caribou are migratory animals and travel from their winter feeding grounds to calving grounds - trips which may be as long as 450 miles.

Caribou are economically important to the people of the N.W.T. for several reasons. They are utilized for domestic/subsistence purposes by N.W.T. residents to provide meat, hides and bones. Meat is sold commercially, locally and within the N.W.T. They are also hunted by resident and non-resident sportsmen.

3.1.1.1 Regional Distribution of Caribou: Barren-ground caribou populations in the N.W.T. have been estimated to be between 1,193,000 to 1,646,000 animals.[12] Population estimates by region are shown in Table 3.1.

Due to migration of caribou, the same herd may be found in different regions. Also, the herds migrate outside the N.W.T. The populations indicated are therefore not available solely to the residents in a particular region.

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12 Ference, p. 15

Table 3.1

Population Estimates Of Barren-grad Caribou Found In Each Region Of N.W.T.

Herd	Inuvik	Fort Smith	Kitikmeot	Keewatin	Baffin	Total
Porcupine	150,000					150,000
Bluenose	50,000- 80,000		50,000- 80,000			50,000- 80,000
Bathurst	320,000-450,000	320,000-450,000	320,000-450,000			320,000-450,000
Beverly	-	250,000-420,000		250,000-420,000	-	250,000-420,000
Wager	-	-	110,000-130,000	110,000-130,000		110,000-130,000
Boothia	-		8,900			8,900
Victoria Island			7,000- 9,000			7,000- 9,000
Kaminuriak				180,000-280,000	-	180,000-280,000
South Hampton				1,100		1,100
Coates Island				2,100	-	2,100
South Baffin			-		60,000	60,000
North Baffin					30,000	30,000
Somerset and Prince of Wales Island					4,400- 5,800	4,400- 5.800
Northeast Baffin					10,000	10,000
Belcher Islands					300	300
Banks Island	5,000					5,000
Queen Elizabeth Island					4,200	4,200
Total	525,000-685,000	570,000-870,000	493,900-677,900	543,200-833,200	108,WO-11O,3OO	1,193,000-1,646,400

Source: Ference, p. 15 referenced to World Status of Wild Rangifer Tarandus Populations, T. McWilliams and O.C. Heard, Rangifer, 1986.

3. 1.1,2 Caribou C)uotas and Harvest: Potential harvests are limited by quotas established by the Department of Renewable Resources. The available commercial quota for caribou totals 4,200 animals annually and is divided into three categories:

- outfitting of non-resident hunters or meat harvested for commercial sale in country food retail outlets.
- inter-settlement trade which camot be used for outfitting of non-resident hunters or commercial meat sales outside N.W.T. country food which cannot be used for outfitting non-resident hunters.

Table 3.2 outlines commercial quotas by region and designated use. It should be noted that quotas for some herds (e.g., Bathurst) apply to several *regions* and therefore quotas per region do not add to total quota.

The allocation of quotas by community is outlined in Table 3.3. Commercial quotas were originally established to provide an opportunity for local residents to earn additional income by hunting and selling meat and other products. The quotas were distributed among the communities with this purpose in mind rather than on the basis of where excess caribou might be available. As a result, much of the commercial quota is not utilized by communities which are located too far from the herds to make commercial hunting viable. A redistribution of commercial quotas might be more conducive to the establishment of a viable commercial caribou hunt, but would require a reassessment of the goals and purpose of the commercial quota program.

Table 3.4 provides the only information available at this time on volumes harvested for different uses. Data collection systems are currently being established to provide more complete information.

3.1.1.3 Future Harvest Potentials: The Ference report outlined total harvest volumes by herd (Table 3.5).

Table 3.2

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(October 1987)

Quota	Inuvik	Fort Smith	Kitikmeot	Keewatin	Baffin	Total
Commercial Outfitting and Country Foods						
North Baffin	-	-	-	-	100	100
South Baffin	-	-	-	-	500	500
Banks Island	95	-	-	-	-	95
Bathurst	400	4∞	400	-	-	400
Bluenose	950	-	950	-	-	950
Melville Peninsula	-	-	-	-	350	350
Queen Maud	-	-	180	-	-	180
Victoria Island	-	-	125	-	-	125
Wager Bay	-	-	-	250	-	250
Total Outfitting and Country Foods						2,950
Country Foods Only						
Bathurst	650	650	650		-	650
Total Country Foods Only						650
Inter-settlement Trade Only						
Kaminuriak	-	-	-	350	-	350
Beverly	-	200*	-	50	-	250
Total Inter-settlement Trade						600
TOTAL	2,095	1,250	2,305	650	950	4,200

Source: Ference, p. 19 referenced to Planning Framework for Renewable Resources in the N.W.T.

* Updated by Department of Renewable Resources, GNWT.

Ference indicated that an annual harvest of 5 percent of the herd would be feasible, and stated that based on population and harvest estimates, hunting could increase in only a few herds if herd numbers are to be maintained. Hunting could potentially be expanded in the Porcupine, Bathurst, Beverly, Somerset and Prince of Wales Island herds. Estimated surplus caribou in some of the major herds is shown in Table 3.6. The number of surplus animals depended on whether the upper or lower estimate of caribou population was utilized. [13]

Table 3.3

Commercial Quota Allocation By Community

(October 1987)

Herd	Annual Quota	HTA(s)
North Baffin	100 a	Arctic Bay, Pond Inlet
South Baffin	500 a	Iqaluit, Cape Dorset, Lake Harbour, Pangnirtung
Banks Island	95 a	Sachs Harbour
Bathurst	200 a	All HTAs on range
Bathurst	200 a	Non-HTA outfitters
Bathurst	650	50 to Bay Chime, Others to Rae, Rae Lakes, Lac La Marte, Snare Lake, Detah, Yellowknife and Coppermine
Bluenose	950 a	All HTAs on range
Melville Peninsula	350 a	Repulse Bay, Hall Beach, Igloolik
Queen Maud	180 a	Spence Bay, Pelly Bay, Gjoa Haven
Victoria Island	125 a	Cambridge Bay (75), Holman Island (50)
Wager Bay	250 a	Keewatin Wildlife Federation
Kaminuriak	350 b	Keewatin Wildlife Federation
Beverly	50 b	Keewatin Wildlife Federation
Beverly	200 b	Fort Smith (October 1987)
Total N.W.T.	4,200 head	

a - May be used for Non-resident hunting

b - Not for export south of 60° North

Source: Department of Renewable Resources, G.N.W.T.

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13 Ibid

Table 3.4

Harvest Volumes By Region By Use

	Inuvik	Fort Smith	Kitikmeot	Keewatin	Baffin	Total
Estimated Population	525,000-685,000	570,000-870,000	fi95,900-677,900	543,200-833,200	108,900-110,300	1,193,000-1,646,400"
Harvest Volumes						
GHL1	2,700- 4,450[5]	3,000- 6,000'	7,100	8,000- 12,000	12,000- 17,000	32,800- 46,550
Resident Hunters[2]	96	301	47	31	95	570
Sports tiunters[3]	N/A	N/A	N/A	N/A	N/A	16a
Country Foods[4]*	100		·	20		120

Source: Ference, p. 17 referenced to:

' A PlanningFramework for Reneuable Resource Development in N.U.T.

[2]Resident Hunter Harvest Estimates

[3]Department of Renewable Rescurces

[4]Interviews with cwntry food outlets in N.U.T.

[5] These harvest figures are thought to be low but actual harvest levels are not knoun

• As edited byOH&S

Table 3.5

Hawed Levels In 1985

nerd	Estisnted Harvest Volume	Total Population	% of Total Population Harvested
Porcupine	400	150,000	0.3%
Bluenose	4,000	50,000- 80,000	5.0- 8.0
Bathurst	14,300	320,000- 450,000	3.2- 4.8
Beverly	6,000	250,000- 420,000	1.4 - 2.4
Uager	3,900	110,000- 130,000	3.0- 3.5
Boothia	N/A	8,900	U/A
Victoria Island	1,000- 1,500	7,000- 9,000	14.3 - 16.7
Kaminuriak	10,000	180,000- 280,000	3.8 - 5.6
South Hampton	70	1,100	6.4
Coates Is[and	300	2,100	14.3
South Baffin	8,000	60,000	13.3
North Baffin	7,000	30,000	23.3
Somerset and Prince of Uales Island	150- 250	4,400- 5,800	4.3
Northeast Baffin	1,000	10,000	10.0
Belcher Islands	32	300	10.7
Banks Island	500	5,000	10.1
Queen Elizabeth Islands	N/A	4,200	N/A
Total	56,652-57,252	1,193,000-1,646,400	3.5 - 4.7X

Source: Ference, p. 16 referenced to World Status of Wild Rangifer Tarandus Populations, T. McWilliams and O.C. Heard, Rangifer, 1986.

Table 3.6

Surolus Caribou in N.W.T.

Herd	Surplus (animals)
Bathurst	1,700 - 8,200
Beverly	6,500 - 15,000
Wager	1,600 - 2,600
Kaminuriak	o - 4,000
Porcupine	7.100
Total	16,900 - 36,900

Source: Ference, p. 17

Ference indicated that additional information and population estimates are required before surpluses can be accurately calculated[14]. However, these surplus estimates differ greatly from the commercial quotas discussed earlier which set the current upper limit of harvest potential. Department of Renewable Resources officers indicated that it is unlikely that commercial quotas will change in the foreseeable future.

3.1.1.4 Summarv: There are currently 4,200 commercial caribou tags available. Table 3.4 indicated that 168 of these have been used previously for sports hunting. Assuming sports hunting will continue at approximately this level, there are 3,432 tags available to be sold either within or outside the N.W.T.[15] An additional 600 tags are available which could be used for inter-settlement trade in the N.W.T.

There appears to be sufficient quota available to establish a commercial country food trade in caribou meat. Due to the difficulties associated with exporting the meat from the N.W.T. it is

14 Ibid

15 Calculated as (2,950 + 650) - 168 used for sports hunts = 3,432.

likely that only sales within the Territories will be feasible in the foreseeable future. The total quota available for country food is therefore 4,032 animals or approximately 403,200 lbs. of meat.

3.1.2 Woodland Caribou

Woodland caribou (Rangifer tarandus caribou) are similar in appearance and behaviour to barren-ground caribou, but inhabit the woodland regions rather than the tundra.

The population of woodland caribou is small relative to barren-ground caribou and is estimated to be between 2,000 and 5,000 animals.[16] These animals are found only in the Fort Smith and Inuvik Regions and harvest is limited due to the small herd sizes. Harvest volumes and use are outlined in Table 3.7.

Table 3.7

Woodland Caribou Harvest Volumes

Use	Inuvik	Fort Smith	Total
Domestic Subsistence	50-150	250	300-400
Resident Hunters	11	48	59
Outfitters	100	85	185
Total	161-261	383	544-644

Source: Ference p. 22 referenced to Planning Framework of Renewable Resource Development in the N.W.T. and Resident Hunter Harvest Estimates.

Since herd size and harvest numbers are so small, they are considered to have no potential for commercial country food production at this time.

3.1.3 Muskox

The muskox (Ovibos moschatus), aptly described as 'the bearded one" by the Inuit, is an animal which is entirely covered with a double

16 Ference, p. 22

coat of hair and wool except for its horns, hooves, lips and nose. This protective coat allows the animals to survive the dark cold winters in the Arctic islands. Muskox appear extremely large because of their thick coats. Bulls may stand 50 to 60 inches tall at the shoulder and weigh about 750 lbs.; females weigh about 200 lbs. Muskox do not migrate like caribou, but will travel many miles between their winter and summer ranges.

Muskox are used for their meat, hides and qiviut (muskox wool).

3.1,3.1 Regional Distribution and Harvest of Muskox

Regional distribution of muskox populations and commercial quotas and utilization are outlined in Table 3.8. Ference indicated that population figures are only estimates and should not be relied upon, especially because populations can fluctuate dramatically due to harsh climatic factors.[17] There are currently no estimates of non-quota harvest volumes for subsistence use.

The total muskox population was estimated by Ference to be 57,100 (Urquhart indicates this may be at the high end[18]), with the largest population being on Banks Island. There are also large populations on Victoria Island and Queen Maud Gulf. No explanation was given for the small commercial quota available in Kitikmeot Region although the area has an estimated muskox population close to that of the Inuvik Region.

At the present time it appears that due to animal numbers the Sachs Harbour area exhibits the best potential for development of commercial sales of muskox. The existing quota of 2,000 animals per year shows potential for the establishment of a viable commercial enterprise. Quotas for other communities could be altered if reviews of animal numbers indicated that this was desirable. It is unlikely,

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17 Ference, p. 21

18 Urquhart, p. 4

Table 3.8

Muskox Populations. Quotas And Utilization By Community

(November, 1987)

Region/Community	Population[1]	Quota Total	Quota M/F	Use[2]	surplus
Baffin Region:					
Grise Fiord		18	9/9	t	
Grise Fiord		2	1/1	n	
Grise Fiord		4	4/0	t	
Arctic Bay		4	2/2	t	
Resolute Bay		7	4/3	n	
Resolute Bay		12	9/3	t	
Total	7,600	47		38	9
Inuvik Region:					
Melville Island[3]		12		t	
Sachs Harbour		2,000		500	
Paulatuk		50	30/20	20	
Tuktoyuktuk		10		n	
Total	26,500	2.072		532	1.540
Kitikmeot Region:					
Coppermine		5		t	
Holman Island		110		t	
Cambridge Bay		30		n	
Cambridge Bay		65		t	
Spence Bay		3		n	
Coppermine		50		t	
Bay Chimo		30		5	
Coppermine		20		n	
Cambridge Bay		35		n	
Gjoa Haven		30		20	
Gjoa Haven		10		t	
Total	20,600	388		265	123
Keewatin Region:					
KWF[4]		10		t	
Baker Lake		6	4/2	t	
Baker Lake		3	2/1	t	
Baker Lake		3	2/1	t	
KWF[4]		10		t	
Total	2.400	32		32	0
Total N.W.T.	57,100	2,539		867	1,672

1 Ference referenced t. planning Framework of Renewable Resource Development for the N.W.T., and Wildlife Division Renewable Resources, G.N.W.T.

2 Average Use Over Past Three years:
t - Total Use
n - Never Used

3 This quota is shared by !jachs Harbour and Holman Island

4 This quota is allocated by the Keewatin Wildlife Federation (KWF) to the Keewatin Communities

Source: Department of Renewable Resources, G.N.W.T.

however, that quota sufficient to establish a commercially viable hunt would be available to other communities.

The total commercial quota for 1987 was 2,539 animals. Most of this quota (2,000) applies to Banks Island, with the next largest allocation (110) to Holman Island. The average harvest over the last three years was only about 867 animals or 34 percent of the total commercial quota, which means considerable surplus exists.

Ference indicated that he felt commercial quotas for muskox could increase in the future if sufficient demand existed for hides, meat and qiviut.[19] Current quotas, however, establish the upper commercial harvest limit at this time, and Department of Renewable Resources Officers indicated that quotas were unlikely to change in the foreseeable future.

Urquhart's study entitled Muskox - Life Historv and Current Status of Muskoxen in the N.W.T. outlines muskox populations and use. A summary for each region follows.

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19 Ference, P. 21

3.1.3.1.1 Muskox in the Baffin Region:

Devon Island: It is estimated that about 400 muskox inhabit Devon Island. The animals are hunted on the north coast by residents of Grise Fiord. This area is the most accessible of three available. Quota for Resolute residents for muskox on the same part of the island is not used.

South Ellesmere Island: This island is also hunted by residents of Grise Fiord. Muskox population on the island is estimated to be approximately 1,120. Hunting occurs in two zones on the island, but quota is seldom filled due to the inaccessibility of the hunting areas.

The meat harvested is mainly used for subsistence, but some is sold in Frobisher Bay. Hides, heads and horns are used for handicrafts and souvenirs and sold locally or in Resolute.

Muskox have been observed on other islands in the region, with the largest number of sightings on Axel Heiberg, North Ellesmere and Melville Islands, but little or no hunting activity occurs in these areas.

3.1.3.1.2 Muskox in the Inuvik Region:

Banks Island: This island supports about 35 percent of Canada's known muskox population. A quota of 2,000 animals has been established, but, to date, only about 500 animals per year have been taken.

ULU Foods in Inuvik is run by the Inuvialuit Development Corporation and sells various cuts of muskox meat to the restaurant trade within and outside the N.W.T. Commercial harvest programs are run in a four-party cooperative management agreement between Inuvialuit Development Corporation, the Inuvialuit Game Council, Sachs Harbour Hunters and Trappers Association and the Government of the Northwest Territories. Sport hunts have been held successfully since 1979.

3.1,3.1.3 Muskox in the Kitikmeot Region:

Victoria 1s1and: The estimated muskox population on Victoria Island is 12,160 animals. Residents of Holman hunt the animals on a quota basis to provide meat and sleeping robes. Hides and heads are also sold to local barge crews. Sport hunting accounts for a small part of the quota, as does hunting from outpost camps at Kuuk River and Minto.

Residents of Cambridge Bay hunt on a quota basis to the north of the settlement. Local hunters and the HTA sell the hides and heads, or they may be shipped to taxidermists.

Quota for an additional hunting area near Hadley Bay is not utilized due to the remoteness and inaccessibility of the zone.

Prince of Wales Island: The population of muskox on this island is estimated to be 1,100 animals. The settlements of Resolute and Spence Bay have harvest quotas. Resolute utilizes a portion of its quota, while Spence Bay uses none due to the remoteness of the area. Meat harvested is used for subsistence or sold in Igloolik. Some hides may be sold.

Queen Maud Gulf: The 8,500 muskox in this area are accessed by residents of five communities and one outpost camp.

Residents of Cambridge Bay sell hides and heads locally or export them to taxidermists in the south through the Hunters and Trappers Association or through individual hunters. Horns may be carved and sold locally; meat is used for subsistence.

In Gjoa Haven, muskox are used entirely for subsistence, with hides being utilized for sleeping robes.

Baker Lake residents use animals primarily for subsistence. Hides are seldom sold and heads may be displayed as trophies by the hunters.

Perry Island residents use muskox meat for subsistence and ship hides and heads to the Cambridge Bay Hunters and Trappers Association for sale.

Thelon Game Sanctuary: The sanctuary was established to protect a small number of animals believed to be one of the last remnants of the mainland population. The population of about 600 animals in this area is protected.

Thelon East: Population of muskox in this area is estimated at 300 animals which are hunted by the residents of Baker Lake.

Central Mainland: This area has approximately 1,000 to 1,500 animals which are hunted on a quota basis by residents of Bathurst Inlet and Bay Chime. Meat is used for subsistence; hides and heads may be sent to Cambridge Bay Hunters and Trappers Association for sale. Some hides are used for sleeping robes.

Great Bear North: An estimated population of about 4,500 animals is found in the area and are hunted by quota by residents of Paulatuk and Coppermine.

Fifty percent of the paulatuk quota is reserved for sport hunting. Hides, heads and horns are sold locally and meat is used for subsistence or sold in Inuvik. Sport hunting is likely to increase in this area.

Coppermine quota is usually fully utilized for subsistence hunting.[20]

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[20](Regional Summaries) Urquhart, PP. 11-33

3.1.3.2 Summary: Table 3.9 outlines Regional quota utilization and product movement.

Based on the regional analysis, only 34 percent of available commercial quota is being utilized with significant surplus quota available in the Inuvik Region on Banks Island. This region appears to be the most promising area for the development of a commercial muskox enterprise, depending on costs involved and market available.

Table 3.9

Regional Quota Utilization And Product Movement

Region	Quota	Utilization	surDlus	Product Movement
Baffin	47	38	9	Most meat consumed locally for subsistence. Some intra-regional sales of meat from Grise Fiord to Frobisher Bay, and Resolute to Igloolik.
Inuvik	2,072	532	1,540	Some consumed locally. Meat from organized hunts by Sachs Harbour HTA moves to the south through Inuvik. Some quota is used for sport hunting.
Kitikmeot	388	265	123	Meat is used for subsistence. Some quota is used for sports hunting.
Keewatin	3 2	32	o	Meat is used for subsistence.
Total	2,539	867	1,672	

The harvest activities that are currently carried out and costs involved will be described in 'Section 3.2. Costs of Production".

3.1,4 Bison

Bison are the largest terrestrial mammals in North America. They can measure up to 6 ft. at the shoulder and weigh aver 2,000 lbs. The

animals have a wooly undercoat covered by long guard hairs, Bison roam in herds and may make seasonal migrations depending on the availability of forage.

There are two subspecies of bison in the N.W.T., the wood bison and the plains bison. For clarity, each will be discussed separately.

3.1.4.1 Wood Bison: Wood bison (Bison bison athabasca) are deemed an "endangered" species by the Northwest Territories Act, the Committee on the Status of Endangered Wildlife in Canada and the Red Data Book of the International Union for the Conservation of Nature and Natural Resources. The Mackenzie wood bison herd is the largest herd of wood bison in the world, with population estimated to be 1,206 animals in 1984.[21] It is estimated that the Mackenzie Bison Sanctuary could support a population of 7,100 animals, and a conservative management plan is in place to assure continued slow herd growth towards this population.

Population growth will be moderated through a harvest program and transplant program in an attempt to establish additional herds. It is expected that the target population for the Mackenzie Bison Sanctuary of 7,100 animals may be reached by 1992.

The initial harvest of animals was scheduled for the fall of 1987 when 20 bulls were to be harvested. The target harvest for 1988 was set at 40 animals. These hunts would allow evaluation of the impact of hunting on the herd without disturbing its productivity. Future limited harvests would be set at rates necessary to maintain population at the desired level.

Hunting would be restricted to a specific season, with GHL holders and local residents receiving tags based on recommendation by the

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21 Bison Management Plan, p. 13

local Hunters' and Trappers' Association for the former, and by a draw for the latter.[22]

3.1.4.2 Plains Bison: In 1906, the Canadian Government imported 709 piains bison from the U.S.A. in an attempt to re-establish the species in Canada. When relocated to the Wood Buffalo National Park, these animals interbred with resident wood bison to produce hybrid bison. Herds of hybrid bison now exist in Wood Buffalo National Park and the Slave River Lowlands. Diseases such as brucellosis, tuberculosis and anthrax have plagued the herds. Population of the Wood Buffalo Park herd appears to be stable at 3,000 to 4,000 animals, but the Slave River herds are declining and their future appears bleak.

3.1.4.3 Bison Farming Potential: A 1987 study conducted for the Fort Smith Hunters & Trappers Association[23] undertook a detailed analysis of the financial feasibility of a bison ranch in the Slave River Lowlands. The study looked at site selection, herd productivity assessment, and the design and costing of an optimum scale ranch. Detailed financial and risk analyses were also undertaken to determine the overall commercial feasibility of the ranch.

The conclusion of the report was that although some difficulties and constraints exist, a commercial scale ranch in the Slave River Lowlands is an economically viable enterprise. This project has not proceeded to date, and it is unknown when an economically feasible bison farm may be established in the N.W.T. in the future.

3.1.5 Reindeer

Reindeer (Rangifer tarandus) are a domesticated variety of caribou although they are slightly smaller. Reindeer measure up to 43 inches at the shoulder and weigh up to 225 lb. Reindeer are now considered

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22 Ibid, pp. 8-17

23 Ruitenbeek, H. Jack, et al.

totally domesticated and are easily herded and handled. They are valued for their meat, hides and antlers.

Very little information is available on the N.W.T. reindeer industry. The N.W.T. industry has been directed through the efforts of a private company which is currently selling off the herd to Alberta and B.C. Details provided in this section are based on a single interview. [24]

3.1.5.1 Background: Canadian Reindeer Company Ltd. was established in 1961 to slaughter and market reindeer raised in the N.W.T. Reindeer were introduced to the N.W.T. in 1934 because of the lack of caribou in the Inuvik region. This herd was acquired from Alaska with breeding stock originating in Russia and Scandinavia. The herd was managed by the government until 1973 when it was sold to Canadian Reindeer Ltd.

The company was successful in marketing its product at a profit. The most recent slaughter was conducted in the winter of 1985. A portable slaughter facility was employed under the direction of Agriculture Canada meat inspectors. The animals (approximately 3,000 in recent years) were corralled, slaughtered, gutted and halved on location. The carcasses were allowed to air-freeze and then were trucked hanging to the Federally-inspected Lambco plant in Innisfail, Alberta where they were further processed and wholesaled. With the construction of the Dempster highway, trucking costs were considered very inexpensive, at $.07/lb. in a refrigerated van, to Innisfail. The freight cost is said to compare to that for a herd located within 150 to 200 miles of a processing plant because there is very little alternative back-haul available to truckers returning to Edmonton or Calgary from Inuvik.

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24 Personal Communication with Mr. Doug Billingsley, Manager, Canadian Reindeer Company.

The product wholesaled for $4.70/lb. in hanging form, and typically retailed for $7.00 to $9.00/lb. through Woodwards Stores in Alberta. It also sold in the food service sector in Alberta and central Canada.

3.1.5.2 Current Situation: As mentioned earlier, the last reindeer slaughter occurred in 1985. The ongoing negotiations to settle native land claims have included northern land areas containing the Reindeer Grazing Reserve. As a result, Mr. Billingsley indicated that '.. there is no way to carry on now... the government gave the reserve away twice". When Canadian Reindeer Company set up their portable facility and attempted slaughter in 1985, the ".. .natives threaten to serve notice for using the land, hoping to collapse the company". Because slaughter under such conditions is no longer deemed possible, the company is now selling off the herd to British Columbia and Alberta interests. The company is confident that demand exists for the meat and the purchasers will be successful in their ventures.

If indeed all of the reindeer from the Inuvik region are sold to outside interests, the only remaining reindeer in the N.W.T. will be those located on Belcher Island as a result of a transplant of 63 reindeer in 1978. Mr. Billingsley estimated the population of this herd to now be 700 to 800. However, he is highly skeptical of the economics of commercially harvesting this herd which would require air freighting meat to southern markets. He believes that only the returns from selling antlers (valued at $20 to $50/lb.) can warrant such expense.

3.1.5.3 Opportunities in the Reindeer Industry: Based on a discussion with the manager of the Canadian Reindeer Company, it was indicated that reindeer harvesting in the N.W.T. was a profitable enterprise up to the time the land claim conflicts arose. Their approach to accessing markets through an Alberta-based Federally inspected outlet and utilizing low-cost back-hauls apparently worked

extremely well. Although the reindeer are not considered to be true "country food" of the N.W.T. because they are not indigenous, the southern markets still demand such products. Currently, such product is being supplied primarily from New Zealand. It may indeed be profitable for the Alberta and B.C. buyers to develop this resource.

The market outlook for red game meat is discussed separately in a later section.

3.2 Costs of Production

This section summarizes previous research on production costs for game and estimates current costs of production for caribou and muskox. Reindeer costs cannot be estimated because the information is kept confidential by the Canadian Reindeer Company. Wood bison are not expected to be slaughtered commercially in the foreseeable future and no plains bison are yet produced in the N.W.T., thereby rendering such analysis premature.

3,2.1 Background

Very little information has been collected in the past regarding costs involved in hunting country foods. Most country foods which are sold commercially are gathered in conjunction with subsistence hunting and/or commercial trapping and most hunters involved in country food production do not have definite ideas of the cost to them of obtaining the products. Results of previous studies are outlined below, and current production cost estimates are outlined in the next section.

A study issued by the Baffin Region Inuit Association as reported in the Northern Food Costs - Draft #l report surveyed hunting costs for the month of May 1983 in the communities of Hall Beach and Pangnirtung. The report stated:

> "Hunters in Hall Beach reported spending a total of $5,175.15 in May, $4,371.20 on operating costs and $803.95 on capital expenditures. . . Each person who hunted pur-

> chased a mean of 24.6 . . . gal. (116 1.) of gas, 0.92 . . . 1. of oil and 1.03 . . . boxes of ammunition. This cost a mean of $65.20 for gas, $1.61 for oil and $17.10 for ammunition. Additionally, hunters spent a mean of $38 on snowmobile parts. The average spent on all operating costs was $121.
>
> Pangnirtung hunters reported spending $6,851.04 in May, a mean of $208 per hunter on operating costs. . . Each hunter reported spending a mean of $118 on gas, $15 on oil, $33 on ammunition, $37 on snowmobile parts, and $3.70 on naptha"[25]

It was indicated that these costs cannot be extrapolated to an annual cost since May does not represent the period of heaviest harvest or the time of most difficult harvest. The figures indicated make no allowance for capital purchases such as snowmobiles or wages.[26]

A 1976 study by Nowak is also referenced by Northern Food Costs. This study looked at hunting costs in Alaska for seven species and indicated a total annual cost figure of U.S. !j2,788 or $4.12 per edible kg of meat and fish. Costs varied by species from $1.60 per kg for tomcod to $7.90 per kg for ptarmigan. The Northern Food Costs repcrt indicated that taking exchange rates, inflation and other factors into consideration, the Canadian cost would likely have been approximately $6,000 for the same harvest in 1984. This would mean an average cost of $8.90 Cdn. per edible kg.

Production cost of country foods was indicated by an analysis entitled Man and Caribou: The Economics of Naskapi Hunting in Northeastern Quebec (19821. The Naskapi of Schefferville hunt caribou to supply the community with meat and raw materials for crafts. Some hunting in the area is undertaken by individuals, but a considerable amount of the local hunt takes place under the Naskapi Hunter Support Program. Under this program, a grant is made available which is administered by the Naskapi Hunter Support Program Committee. The committee distributes the money based on hunters'

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25 Northern Food Costs, p. 12

26 Ibid, p. 13

Table 3.10

Hunting Statistics and Acquisition Cost of Traditional Food

Alaska: 1976 ('U.S. $)

Particulars	Total	Seals	Reindeer	Salmon	Tomcod	Geese	Ducks	Ptarmigan
Shells used	247	36	16			50		
	120	25						
Days of Hunting	123	21	10	14	30	16	16	16
Number of Trips	48	3	2	1	30	4	4	4
Animal Nos.	1,270	6	4	250	900	25	60	25
Total Weight (kg.)	908	282	182	170	114	45	81	34
Edible Meat (kg.)	674	130	160	145	97	40	72	30
COST (U.S.A. $):								
1. Capital								
Weapons	150	24	24		-	34	34	34
Boats[1]	746	219	89	219	-	73	73	73
Snowmobiles	631	368	131		105	9	9	9
Nets[1]	4	0	- -	40	-	-	-	
sub-total	1,567	611	244	259	105	116	116	116
2. Recurring								
Repairs	175	50	25	50	5	15	15	15
Permit	80	-	80			-		
Amunition	122	16	7			33	33	33
Line, Baits	30	-	-		30	-	-	
Fuel	804	185	119	266	15	73	73	73
sub-total	1,211	251	231	316	50	121	121	121
3. Total Cost	2,788	862	475	575	155	237	237	237
Cost per Edible kg. (U.S. $)	4.12	6.63	2.97	3.97	1.60	5.93	3.29	7.90

1 Economic life 4 years.

Source: Northern Food Costs, Appendix X, Table 21.

applications to purchase hunting equipment, provisions for hunting parties, garb and transportation to the hunting fields. Hunters are also paid a per diem for time spent hunting.

Hunts are usually either day-long hunts by individuals, teams or family groups, or extended hunts to more distant locations averaging one week in duration. Additional hunts are undertaken by individuals using their own resources and for their own benefit. The hunts typically occur in August and in early September, December, March and April. Most of the wildlife harvest has been derived from team hunts to remote locations. Carcasses (all parts of the animals are utilized) are transported back to Schefferville. Carcasses are then cut up and distributed among households in the community.

Records were available documenting 41 hunts and the major expenses involved. The 41 hunts involved 36 hunters in 907 man-days of hunting and yielded 42,445 lb. of edible meat, of which 93.5 percent was caribou. It was indicated that weighted means for all recorded hunts indicate a delivered price of $1.97 per lb. and an average daily return of 47.45 lb. per man-day.

The yield obtained by each hunter appeared to vary substantially and was not always related to expenditure on hunting. It is possible that low yields were partly due to the different levels of experience of hunters, and some could benefit from a training program.

The author commented that the data do not reflect private hunting activities which might show higher productivity (lower cost per lb.). However, the program hunts could also prove more productive than private hunts since capital restrictions are not a problem. The results showed great variation between months which indicate that consolidating effort in certain months could be beneficial.[27]

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27 Meredith, pp. 40-42

Data from the Game Management Division N. W.T. (1973-75) outlined costs for organized caribou hunts. The results showed costs from $0.15 per lb. for hunts in the Aklavik region, $0.22 to $0.37 per lb. in the Yellowknife region and Up to $0.51 per lb. in the Spence Bay region. It was indicated that these estimates do not include all costs, and should be considered rough estimates only.[28]

As these examples illustrate, there is great variation in costs involved in obtaining country foods. There is also a lack of published information adequately itemizing these costs. The next section outlines average cost estimates for the two species which are considered to have the greatest commercial potential.

3.2.2 Current Cost of Production Estimates

This section outlines cost of production estimates for caribou and muskox. Information used in these estimates was obtained through interviews with HTA representatives and industry and government staff.[29]

3.2.2.1 Caribou Hunting costs: It is estimated that there are approximately 12,000 active hunters in the N.W.T. who could be involved in harvesting commercial tags.[30] As outlined in Table 3.5, harvest volume for 1985 was estimated at 56,652 to 57,252 animals. Most of this harvest was for subsistence use, with only a small portion sold commercially.

Hunting practices vary from community to community and depend upon a variety of factors such as the location of the animals relative to

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28 Arctic, pp. 116-117

29 Processing costs have been estimated to the degree possible. ULU Foods in Inuvik is the only slaughter/processor that has been in business for several years. Kal's Country Foods in Rankin Inlet and Central Arctic Meat at Cambridge Bay are both recent entries into meat processing.

30 Department of Renewable Resources.

the community, facilities available in the community, commercial quotas available and potential commercial markets.[31] Most hunting activity is for subsistence purposes. Hunting of commercial tags is usually done in conjunction with subsistence hunting and/or commercial trapping. The exception to this would be crganized hunts, often organized by the HTA, set up specifically to harvest commercial tags.

Subsistence hunting is usually undertaken on day hunts if the location of the herd permits. Overnight or longer hunts may also occur. Day hunts are feasible if animals are located within approximately 100 miles of the community. Greater distances than this require overnight or extended hunting trips. Day hunts are generally undertaken by individuals or pairs of hunters traveling by snowmobile. Skilled hunters are usually successful in harvesting an average of seven caribou per trip which would be the capacity of the snowmobile toboggan.

Organized hunts are generally several days in length and often involve flying to more isolated hunting areas if insufficient caribou are located within ground travel distance. These hunts are often set up by the local HTA. Some of the organized hunts are community hunts and meat harvested is distributed to members of the community, especially to those who are unable to hunt for themselves. Air costs for these hunts is generally subsidized by the G.N.W.T.

Some commercial hunts are organized by HTA's. The HTA's often pay each hunter per day plus a portion of the take and the HTA sells the meat either in the local community or outside.

The costs involved in hunting caribou for commercial purposes include fixed costs for snowmobiles, rifles, sleds and tents, as well as variable costs such as gasoline, oil and ammunition, repairs and maintenance. Since most commercial hunting is done in conjunction

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31 Renewable Resource officers and HTA representative interviews.

with other activities (subsistence hunting and/or commercial trapping) costs must be allocated appropriately. Table 3.11 outlines typical total fixed and annual fixed costs incurred by hunters in the N.W.T.

Table 3.11

Fixed Costs For Hunting, 1987-88

Fixed Costs	Capital cost	Economic Life (Years)	Annual Cost
snowmobile	$5,000	3	$1,667
sled	700	10	70
rifle	800	7	114
miscellaneous (tent, stove, etc.)	5 0 0	5	1 0 0
cost	$7,000		$1,951

Hunters who harvest commercial animals are generally already involved in hunting for subsistence purposes and/or in commercial trapping and would not need to purchase additional equipment in order to harvest commercial animals. The cost of this equipment must therefore be spread over the entire period of use. Subsistence hunting occurs year round, and the rifle and miscellaneous items would be available for use during the entire year. The cost of these items is calculated on a per diem basis at approximately $().60 per day ([$114.00 + 100] ÷ 365 days). The snowmobile and sled are usable only during the winter (approximately seven months) and the cost of these items is therefore approximately $8.30 per day ([$1,667 + 70] ÷ 210 days). Fixed costs to the hunter therefore total $8.90 per day.

Typical prices of variable items are outlined in the Table 3.12. The total cost of these items will vary depending on the ty-pe of hunt undertaken.

Table 3.12

Variable Costs For Hunting, 1987-88

Variable costs

gasoline	$3.40/gal ($0.75/1)
oil	$5.10/quart ($4.50/1)
repairs and maintenance (3 belts, 2 sets of plugs annually)	$125.00/year
shells	$25.00/box (24)
miscellaneous (supplies, etc.)	$5.00/day/man

The above costs are used as the basis for estimating production costs for typical types of hunts undertaken. The two most common types of hunts undertaken are day hunts by individuals and organized group hunts to fly-in locations.

Costs involved for individuals on day hunts are outlined in Table 3.13 and are subject to the following assumptions.

- each hunting trip (one day) would yield on average seven caribou.
- each one-day trip would require 5-15 gallons (23-68 litres) of gasoline with average use of 10 gallons per trip.

The total cost for the one day hunt was estimated to be $74.84. Assuming an average take of seven animals per day, the cost per animal is therefore $10.69, or approximately $0.11 per lb. of meat produced (caribou dress at about 100 lb. per animal). It should be noted that the above estimate includes cash costs. Any return to the hunter for time involved would be in addition to this cost and appears to be adequate. Each caribou would sell for about $125.00 (100 lb. x $1.25/lb.) and cash costs of $10.69 would indicate a return of about $114.00 per animal to the hunter or $798.00 per day if he were to sell all seven animals. However, this does not mean that a hunter is able to sustain such production and daily income for the whole season.

Table 3.13

Cost For A One Dav Hunting Trip, 1987-88

costs	
Fixed Costs (1 day x $8.30/day)	
snowmobile, sled, riffle, miscellaneous items	$ 8.30
Variable Costs	
gasoline (10 gal. x $3.40/gal.)	34.00
oil (40:1 mixture; 1 quart x $5.10/quart)	5.10
repairs and maintenance ($125.00/year ÷ 210 days)	0.60
shells (7 animals x 3 shells/animal x $1.04/shell)	21.84
miscellaneous	-5 00
Total Cost Per Day Hunt	$74.84

Many of the costs involved in extended fly-in group hunts are equivalent to those involved in day hunts since the hunters are using the same equipment, and time which would not otherwise be involved in hunting activities. The main additional cost would be for air transportation.

Costs estimated for an organized hunt are outlined in Table 3.14 and are based on the following assumptions:

- a PartY of four would include two hunters and two skinners.
- each hunter would harvest an average of 7 animals per day.
- air costs are based on a Twin Otter plane flying 60 miles into the hunting ground; two trips transporting men and equipment and two trips transporting the harvested animals.
- approximately 70 animals could be harvested by the four men in 4-6 days (including transportation, camp set up and knock-down time).
- minimal food supplies would be required since the hunters live mainly from the land.
- each hunter would use approximately 10 gallons of gasoline per day.

Table 3.14

Cost For A Five Day Hunting Trip, 1987-88

Costs (5 Day Hunt]	
Fixed Costs (5 days x 2 hunters x $8.30/day)	$ 83.00
Variable Costs:	
air transportation ($700.00 per trip x 4 trips)	2,800.00
gasoline (10 gal. x $3.40/gal. x 2 machines x 5 days)	340.00
oil (50:1 mixture; 1 quart x $5.10/quart x 2 machines x 5 days)	51.00
repairs and maintenance ($125.00/yr. ÷ 210 days x 2 machines x 5 days)	6.00
shells (70 animals x 3 shells/animal x $1.04/shell)	218.40
miscellaneous ($5.00/day x 5 days x 4 men)	100.00
Total Cost Per 5 Day Hunt	$3,598.40

The total cost of the hunting trip was estimated to be $3,598.40. The cost per animal harvested is therefore $51.41, or approximately $0.51 per lb. of meat produced (70 animals at 100 lb. per animal). Again, this includes cash costs only, and any return to the two hunters and two skinners for time involved would be in addition to this cost. If the entire harvest were sold, returns would be approximately $8,750.00 (70 animals x $125.00/animal). After cash costs, the returns to the four men would be $1,288.00 each ([$8, 750.00 - $3,598.40] ÷ 4) or about $258.00 per day.

Commercial Potential: As outlined in Table 3.2, the current commercial quota for barren-ground caribou is 4,200 animals. The initial intent of establishing commercial tags was to provide a means for hunters throughout the N.W.T. to earn supplemental income by selling some of their harvest. Commercial tags are often made available to those who could benefit most from supplemental income. Quotas were established based upon biological considerations such as herd size and rate of increase so that harvesting could occur without disturbing the natural equilibrium in the herd.

As outlined previously, the maximum quota available for country food sales is limited to 4,200 animals, Table 3.4 indicates that about 168 commercial tags have been used for sports hunting. If we assume this level of sports hunting will continue, the available maximum quantities of caribou would be:

- 3,432[32] animals or approximately 343,200 lbs. of meat which could be sold commercially either inside or outside the N.W.T.
- 600 animals or approximately 60,000 lbs. of meat which could be commercially marketed only within the N.W.T.

Commercial quotas were distributed among the communities and HTA's throughout the Territories. Quotas allocated to each community or HTA vary but are generally a limited number of animals (20-100) are allocated to each community. This distribution of quotas makes the establishment of viable commercial sales of caribou difficult because larger animal numbers are needed than are currently available in any community in order to set up an organized slaughtering, storage, transportation and marketing system.

Many communities do not currently utilize any of their commercial tags because the herds are located too distant from the community to make harvesting feasible. Reallocation of commercial tags to communities located in a position to efficiently harvest larger numbers of caribou would aid in the expansion of commercial sales of caribou. Such a reallocation might, however, not be socially or politically acceptable.

Additional constraints are also placed on the feasibility of selling caribou commercially due to difficulties of inspection requirements. Meat cannot be exported from the N.W.T. without Federal inspection by Agriculture Canada. Retail stores within the N.W.T., and non-native consumers as well, are showing concern regarding purchase of uninspected meat.[33] Therefore, inspection of caribou appears to be a

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32 Calculated as (2,950 + 650) - 168 ~ 3,432.

33 Webber, p. 22

necessity in order to establish significant levels of commercial sales. It is unlikely that Federal inspection of caribou kills could be accomplished satisfactorily due to timing and logistical problems associated with the slaughter.

3.2.2.2 Muskox Hunting costs: Muskox are currently hunted for subsistence use and for commercial sale. Commercial hunting has been undertaken through organized group hunts. These hunts have taken place on a large scale on Banks Island, where muskox are abundant. The Island supports about 35 percent of Canada's muskox population and herd size has been estimated at 19,328 ± 25 percent (1980).[34] The commercial quota for the Island is 2,000 animals and, as previously stated (Table 3.8), an average of 500 animals per year have been harvested over the past three years.

The hunts were organized by the Sachs Harbour HTA in conjunction with ULU Foods of Inuvik. The slaughter of animals is organized to meet Federal inspection requirements and two hunts have been conducted under Federal inspection and the meat was exported from the N.W.T. by ULU Foods.

The location of the hunt varies depending on movement of the muskox. Some hunts have been set up within forty miles of Sachs Harbour, while others may require traveling distances of more than 100 miles. The number of animals in a particular location and the experience from previous hunts are important in deciding where the next hunt will take place.

The HTA has been paid $1.25 per lb. for meat harvested. The hunters supply their own food and transportation by snowmobile to the hunting site. All other costs were covered by the purchaser and included project direction and supenision, field supenision and meat inspection, transportation, equipment, supplies and aerial survey.

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34 Urquhart, p. 19

Hunts have involved harvests of about 200 animals and it was indicated that the goal of the next hunt is to harvest 400 animals. Between 15 and 20 HTA members are typically involved in a hunt. Each individual has specialized responsibilities including herders, skinners, gutters, splitters and camp coordinators. A professional butcher and skinner have also been involved in the past and have trained the HTA members in slaughter techniques to meet Federal inspection standards.

A camp and portable abattoir are set up near the herd. The site is generally on a frozen lake so an adequate supply of water for the abattoir is available.

The muskox travel in herds and, unlike caribou, can be herded so a controlled slaughter can take place. The herders travel by snowmobile and round up the muskox to bring them back to the corrals. The muskox can be herded for up to fifteen miles which can take up to ten hours. The animals are then rested in the corrals for eight hours before the slaughter begins. About 30 - 50 animals can be slaughtered per day.

The carcasses are halved and some are deboned and cut up, but not into retail cuts. The meat is then flown out to Inuvik and on to a Federally approved facility outside the N.W.T.

Approximate costs involved in the 1985 hunt which supplied meat to Expo '86 are outlined below:[35]

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35 ULU Foods estimates.

Table 3.15

Muskox Hunting Costs

Management (Fees and Expenses)	
Project Director	$ 13,510.00
Field Supervisor	4,500.00
Skinning Foreman	2,200.00
Accommodation	962.60
Meat Inspectors	2.536.50
	23.709.10
Transportation to Inuvik	38,261.67
Purchase of Meat from HTA (27,675 lbs. @ $1.25/lb.)	34,593.75
Equipment (Purchase and Rental)	9,580.46
Supplies	18,632.36
Aerial Survey	1,026.00
	102.094,24
Total Expenses	$125,803.34

Total costs of the hunt were therefore $125,803.34 or $4.55 per lb. ($125,803.34 ÷ 27,675 lb.) to Inuvik. It should be noted that $1.25 per pound paid to the hunters is in the same range as the price paid for caribou. The previous analysis showed that this price adequately covers all the cash costs involved in caribou hunting plus an allowance for the hunters' time. It is therefore assumed that, at this price, the muskox hunters are also adequately compensated for their time and costs. If the hunt went as planned, 27,675 lbs. could be harvested in about 5 days plus 2 days for travel and camp setup/takedown. Each HTA member involved would receive $2,326.25 ($34,593.75 ÷ 15 persons) which would amount to $332.00/day for the 7 days the HTA members were involved. The annual income that a member could receive would depend on the number of hunts he is involved in. Most of the additional costs are incurred to provide for Federal inspection of the meat so that it can be sold outside the N.W.T.

Commercial Potential: As previously stated (Table 3.8), the current commercial quota for muskox is 2,539 animals, of which 867 were utilized in 1987. Commercial quotas are fairly small (2-110 animals) on a per community basis. It was also indicated that over half of

the communities utilized their entire quota over the past three years. Seven communities were indicated to have not used their quota over the last three years, but total quota for these communities amounted to only 107 animals. The area considered to have the greatest potential for commercial meat sales is Sachs Harbour where there is a commercial quota of 2,000 animals. Approximately 500 animals have been harvested annually over the last three years and potential for increased harvests exists.

The available supply of muskox for commercial sales is therefore estimated to be 2,000 animals annually, or approximately 300,000 lbs. of meat.

Organized hunts have previously been held successfully and two hunts have met Federal inspection standards. Representatives of the Sachs Harbour HTA indicated that they would be interested in undertaking additional hunts if there was a market for the meat. It is expected that the full quota of 2,000 animals available on the Island could be harvested through organized hunts.

Problems relative to Federal Inspection through portable facilities are surmountable and more work is needed to determine the best equipment and process to utilize in order to make the inspection process run smoothly. Currently, the main factor believed to be limiting expansion of commercial muskox sales is the lack of a Federally inspected permanent slaughter/processing facility. Without such a facility, meat which has met Federal requirements must be shipped outside the Territories for processing. A permar.ent Federally inspected meat packing facility in the N.W.T. would provide an opportunity for increased employment in the area which could be an even greater benefit than the additional income the hunt would provide to the community.

3.3 Meat Inspection and Handling

3.3.1 Inspection Procedures

For meat to be legally exported for sale from the Northwest Territories, it must be "Federally inspected".[36] Federally inspected, as the term applies to game not in captivity, differs somewhat from the typical interpretation of inspection that would apply to domestic animals.[37] However, certain rules must still be adhered to.

An "ante mortem" (pre-slaughter) inspection of the animal is not required although the "post mortem" inspection must be completed immediately after slaughter while the meat is warm. The Agriculture Canada inspectors who have observed reindeer and muskox slaughters in the past have made an effort to visually assess general herd health and ensure that only fit-looking animals were slaughtered for meat. The only such involvement of Agriculture Canada to date in the N.W.T. has been with Canadian Reindeer Company and ULU Foods, both of Inuvik Region.

The slaughter of muskox (and previously reindeer) takes place near a portable processing facility which is equipped with water and heating. The animal is gutted, skinned and halved or quartered at the site. The meat is hung to freeze and is then netted and plastic wrapped for flight or trucking south. The meat must be transferred

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36 personal discussion with Drs. G. H. Spencer and M.N.B. McKie, Agriculture Canada, Food Production and Inspection Branch, Calgary.

37 Recent amendments to the Meat Inspection Act have served to differentiate game from domestically raised animals to ".. ..exempt meat products derived from wild muskox, caribou and reindeer that are entered into interprovincial trade from the requirement that they be prepared in a registered establishment" . (p. 1315, Canada Gazette Part II, Vol. 120, No. 7).

to a federally-approved[38] storage or processing facility if it is to be sold in southern Canada. Some such muskox is being held by Capital Packers in Edmonton as no Federally-approved processing facility is located on Banks Island or at Inuvik currently.

Meat sold within the territories does not require Federal inspection. There appears to be concern by stores and consumers towards purchasing uninspected product as indicated by the Country Food Marketing Survey - Iqaluit.[39] Because no territorial regulations are in place, the only other regulatory departments are Health and Welfare and Consumer & Corporate Affairs whose standards are said to generally focus only on the retail level. This leads to the next section.

3.3.2 The Future of Meat Inspection in the N.W.T.

The subject of meat inspection has been in the forefront of discussion for several years. At the close of the Northern Food Conference held in February 1987, a recommendation was made that:

> "...the Federal and Territorial governments establish a uniform, consistent and reasonable set of quality control standards, in cooperation with industry representatives. The legislation and regulations should address harvesting, processing, inspection and packaging issues.
>
> The inspection services should be administered and be available on a regional basis.
>
> All policies, standards and regulations should be compiled in one reference volume so that current and prospective participants in the food industry can be assured that they have all the relevant background information."[40]

This same recommendation was echoed at the Producers' Workshop on the Northern Foods Industry in February, 1988.

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38 To ship product to the EEC, an EEC-approved facility would have to be used.

39 Webber, p. 22

40 Northern Food Conference - Proceedings, P- 4, Section IV

The Government of the Northwest Territories is taking action on this issue by commissioning a study on meat inspection this spring. The study will address the key issues of Territorial/Federal standards, location/accessibility of inspectors, and other issues pertinent to game slaughter and processing standards.

3.4 Chapter Summary

Four main species of game animals were evaluated for commercial country food potential. Two species, caribou and muskox, show the best potential at the present time. Muskox has been harvested through organized slaughters which meet Federal inspection requirements and shows the best potential for export outside the N.W.T. It is unlikely that slaughter of caribou could meet these requirements, so commercial sales of caribou would be restricted to the N,W.T. at the present time.

Table 3.16 gives a summary of expected volumes and returns which could be expected from the commercial sale of game.

Table 3.16
Summary Statistics For Game Meat

	Muskox	Caribou
Production (lbs.)	300,000	403,200
Price per lb.	$1.25	$1.25
Estimated Returns	$375,000	$504,000

4.0 FRESHWATER FISHERIES

4.1 Background

The Northwest Territories freshwater fishing industry is comprised of three sectors: 1) domestic (or subsistence) fishing; 2) commercial fisheries; and 3) sport fishing. All three sectors have played an important role in development of the Territory.

Domestic fishing has been important as a source of protein for the population of the N.W.T. and represents a traditional lifestyle of native northerners. It refers to the catching of fish for personal consumption and not for sale. Although in recent years there has been a decline in domestic harvests, they still equal or exceed commercial production in some areas. The decline in domestic harvests has been attributed to the change from dog sleds to snow-mobiles and the move many fishermen have taken into other industries such as oil and mining. In terms of resource allocation, domestic subsistence fishing is still given priority over the commercial and sport fisheries. The only limits placed on domestic fishing are conservation requirements.

Fish stocks in excess of domestic requirements are allotted to the commercial and sport fisheries. Sport and commercial fishing have both developed in more recent years, in concert with improved access and transportation into the Territories. The first fishing lodge was built in 1951 at Talthelei Narrows on Great Slave Lake. Today there are approximately 48 fishing lodges situated throughout the N.W.T. The majority are lake trout (Salvelinus namaycush) lodges that are concentrated in the Great Slave Lake and Great Bear Lake areas and in inland lakes north of the Manitoba border. Arctic char (Salvelinus alpinus) sport fishing along the Arctic coastal areas is also increasing in importance. Angler license sales have also increased steadily since their introduction in 1951.

The commercial fisheries are the third sector of the N.W.T. fishing industry. Commercial fishing dates back to 1945 with the opening of the Great Slave Lake fishery (a chronology of important events in the history of commercial freshwater fishing in the N.W.T. is found in Table 4.1). The early years of this fishery saw rapid expansion; by 1949, 4.5 million kg of lake trout and whitefish (Coregonus Clupeaformis) were harvested, making it the largest producer of these fish in North America.

The next major development in the N.W.T. commercial fisheries came in 1961 with efforts directed at the inland lakes and coastal char fisheries. Three factors led to this development: 1) a need to decrease fishing pressure on Great Slave Lake where fish populations were declining; 2) increased market potential for whitefish due to a decline in production from Lake Winnipeg and the Great Lakes; and 3) depressed economic conditions in the Keewatin district due to closure of the Rankin Inlet Nickel Mine. Over the next ten years, over 140 water bodies were fished. Attempts were also made to exploit the Mackenzie Delta's huge potential.

Since the early 1970s, production and areas fished have declined substantially in the N.W.T. commercial fisheries (excepting char fisheries), although the industry still contributes close to $2 million in export sales and employs over 100 people in primary production alone. Table 4.2 shows total N.W.T. harvests for five species from 1976 to 1985.[41] Total commercial harvests of the five species have declined from the levels of the late 1970s, although 1985 indicates some recovery. It should be noted here that pickerel (walleye) is also harvested commercially, but is not dealt with in

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41 1985 is the most recent year of data availability. It should be noted that some inconsistencies were found with the harvest and quota data. Contact was made with Mr. Brian Wong and Mr. Gerald Yaremchuk of DFO to correct these inconsistencies. However, it would appear that some of the data may not be completely reliable. Caution must be exercised when using this data that appears throughout Chapter 4.0.

Table 4.1

Important Events in the History of Commercial Freshwater Fishing in the Northwest Territories

1945	.	Great Slave Lake opened for commercial fishing
1946		Kakisa Lake opened for commercial fishing
1947	.	Department of Fisheries and Oceans opened its Hay River office
	.	Commercial char fishing started at Frobisher Bay
1948	.	Talthelei Narrows on Great Slave Lake closed to commercial fishing
	.	Completion of Mackenzie Highway to Hay River caused expansion of the fishery
1949	.	Peak production of 4.5 million kg of lake trout and whitefish taken from Great Slave Lake; this level has never been equalled
1950	.	McLeod Bay closed to commercial fishing
	.	Great Slave Lake quota raised to 4 million kg of lake trout and whitefish
1955	.	First attempt made to commercially fish in the Mackenzie Delta Region of Fort McPherson
1960		Cambridge Bay Char fishery started
1961	.	Commercial fishing expanded to include numerous inland lakes
	.	Small fisheries started at Aklavik and Peel River
1964	.	Peak production of approximately 45,500 kg taken from the Mackenzie Delta fisheries
1965	.	Cannery started at Rankin Inlet
1969		Freshwater Fish Marketing Corporation (F.F.M.C.) formed to act as the sole marketing agency for commercial production
	.	Pelly Bay fishery started
1970	.	Commercial fishing of inland lakes peaked with over 30 lakes being fished

1972	.	Great Slave Lake advisory committee established
1974	.	Nettilling Lake Char fishery started
	.	Complete east arm of Great Slave Lake closed to commercial fishing
1976	.	Rankin Inlet cannery found to be uneconomical and closed
1981	.	Government of the Northwest Territories provided price support for whitefish on Great Slave Lake
1985		*Arctic* char test fisheries conducted at Steensby Inlet and Holman Island
		Commercial char fishery started at Chesterfield Inlet
		Fish processing plant constructed at Chesterfield Inlet
1986		Arctic char test fisheries conducted at Duke of York Bay
		Test fishery at Steensby Inlet expanded to include weir operation

Source: Adapted from: 'A History of Commercial Fishing in the Northwest Territories", G.N.W.T. Department of Economic Development and Tourism.

this report. Pickerel harvests have also declined in recent years. Several reasons nave been cited for the decline in freshwater fish harvests, including: heavy demands placed on the stocks from domestic, commercial and sport fishing; high costs of production; and availability of employment in other resource sectors (oil and gas and mining).

Tables 4.3 and 4.4 show a ten-year landed values trend for the N.W.T. fisheries, by major water body andby species. Values by major water bodies have not shown much increase, and have declined in some instances (even in nominal dollars). The same holds true when considering the individual species. The commercial fisheries industry has contributed $1.6 million to the N.W.T. economy in 1984 and 1985.

Currently, the coastal char fisheries, Great Slave Lake and two walleye producing lakes (Kakiska and Tathlina) are the only major commercial fisheries in operation. Many smaller commercial fisheries exist, particularly along the Arctic coast for anadromous char. Many of these fisheries are only sporadic, with the lakes and rivers only opened to commercial fishing every few years upon request. It is still believed, however, that the N.W.T. fisheries hold tremendous potential for commercial operations.

Table 4.2

Total Northwest Territories Commercial Harvests

1976-1985

('000 kg. round weight)

Year	White Fish[1]	Lake Trout	Northern Pike	Inconnu	Arctic Char	Total
1976	976	102.3	103	80	102	1,363.3
1977	1,293	118	118	91	165	1,785
1978	1,110.6	119	157	167	104	1,657.6
1979	1,111.3	135	129	158	122	1,655.3
1980	1,270.7	135.5	199.1	72	106	1,783.3
1981	1,110	92.5	149	43.4	152	1,546.9
1982	1,142 1	83	166.3	23.3	136	1,550.7
1983	844[2]	59.3	94.1	24	164	1,185.4
1984	961[3]	57	130	70	147	1,365
1985	1,004.4	113.2	154.2	75	129	1,475.8
1986[42]	N/A	N/A	N/A	N/A	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A

1 Includes lake whitefish, broad whitefish and round whitefish.

2 Includes lake trout for region II.

3 Includes lake trout for region II and IV.

Note: Yearly totals are based on fiscal year timeframes.

Source: Tables 4.3 - 4.7.

42 According to Mr. G. yaremchuk, DFO, Freshwater Institute, Winnipeg, data for 1986 and 1987 harvests and quotas will be available in July, 1988.

Table 4.3

Northwest Territories

Ten Year Landed values Trend BY Xaior Lakes

(Vsluea i[redacted] $000'S)

Lake	76/77	77/78	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87
Great Slave	676	1,029	1,314	1,218	1,319	1,117	997	763	1,216	1,283	1,593
Cambridge Bay	164	276	178	179	236	200	179	278	309	204	299
Rsnkin Inlet	o	50	37	44	112	113	102	29	40	89	112
Others	7 9	103	29	95	1 9 8	122	75	104	89	78	52
Total	919	1,457	1,558	1,536	1,865	1,552	1,353	1,174	1,654	1,654	2,056

Source: DFO Annual Reports.

Table 4.4

NorthuestTerritories

Ten Year Landed Values Trend By Species

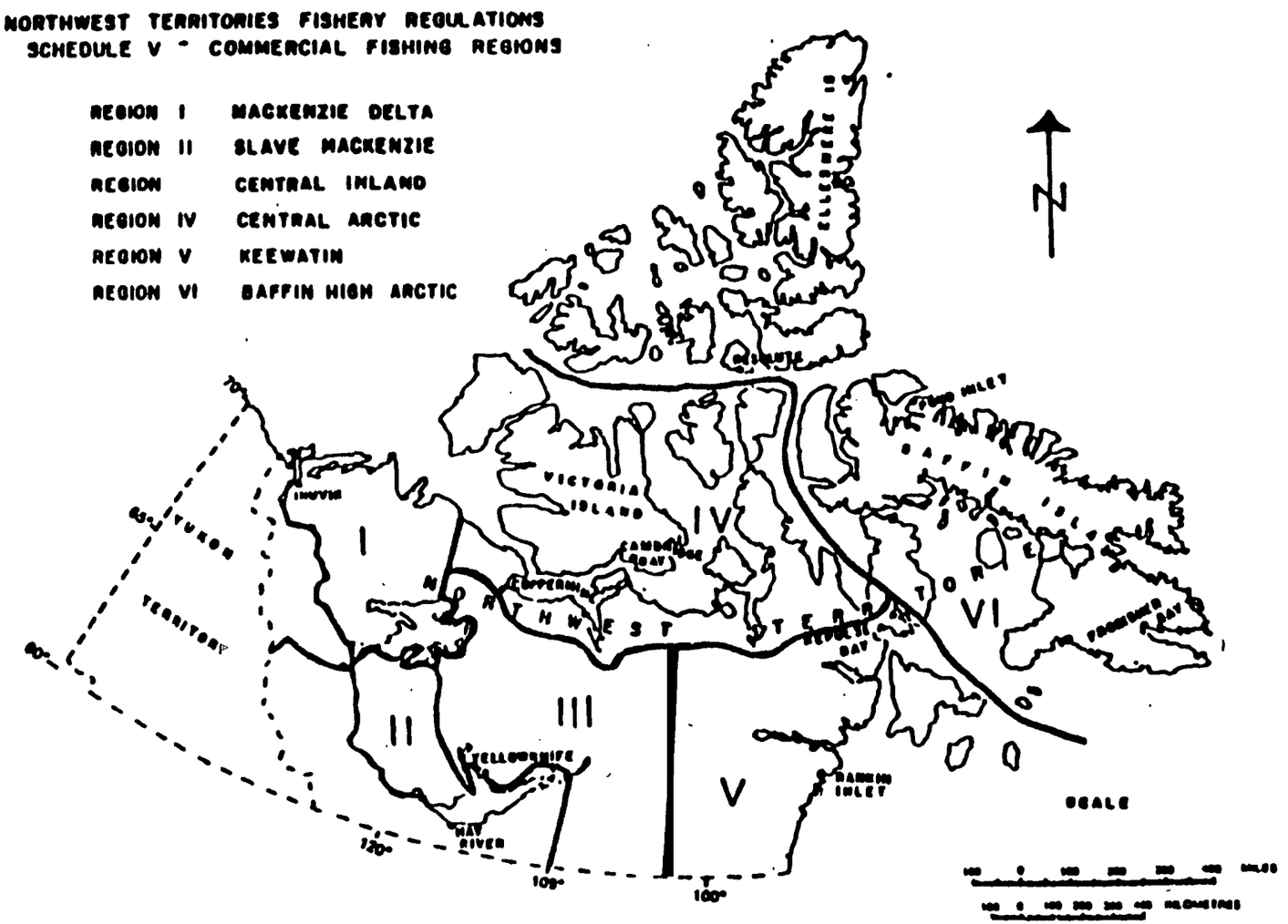
(values in [redacted]1$000'S)

Species	76/77	77/78	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87
Whitefish Lake	592	874	1,070	963	1,068	894	865	571	907	916	1,132
Trout	23	31	72	62	85	76	57	88	76	116	112
Northern Pike	49	85	104	114	99	82	58	56	97	107	156
Arctic Char	186	397	239	265	417	313	281	307	380	320	411
Inconnu	19	27	52	65	55	49	14	41	112	116	141
Others	o	6	0	0	0	0	0	0	0	0	1 0 4
Total	919	1.457	1.558	1.536	1.865	1.552	1.353	1.174	1.654	1.654	2.056

Source: DFO Annual Reports.

Figure 5.

Regions Used in Schedule V of the N.W.T. Fishery Regulations



Source: Department of Fisheries and Oceans

The fishery resources in the N. W.T. are managed by the Central and Arctic Region of the Federal Department of Fisheries and Oceans (DFO). Resource assessment and the setting of seasons and quotas is done by the Fisheries and Marine Mammals Management Division, situated at the Freshwater Institute in Winnipeg. For purposes of fisheries management, DFO divides the N.W.T. into six jurisdictions: Mackenzie Delta, Slave Mackenzie, Central Inland, Central Arctic, Keewatin and Baffin High Arctic. These are illustrated in Figure 4.1. Schedule V of the Northwest Territories Fishery Regulations, which fall under the Federal Fisheries Act, lists quotas and closed commercial seasons for the fisheries. Fishing seasons are opened for operation in response to public requests by the issuing of variation notices by the DFO Regional Director General. The variation notices state, by region, the water body, species, mesh size, dates of opening, and quotas. Quotas are revised by DFO personnel when needed and in response to changes in exploitation and production.

Fish may also be harvested commercially under test fishery permits, where provisional quotas are set for water bodies which are not listed on Schedule V. These water bodies are fished under supervision of the Government of the N.W.T. (G.N.W.T.) Wildlife Officers or DFO Fishery Officers. Biological samples are taken to assess the fisheries potential. Field services staff of DFO also collect information on total commercial hanests through surveys of fishermen and sales slips. The figures on total commercial hanests for the N.W.T. were derived from this database. While this database is the most comprehensive available, the accuracy of the statistics is variable, and decreases with increasing age. Some hanests have likely gone unreported. Therefore, the total commercial harvest figures contained in this report should be used with some caution. They are best used to look at the overall picture of commercial harvests in the N.W.T. and identify trends in production.

4.2 Production Trends By Species

Tables 4.5 to 4.9 show commercial harvests of the five species by DFO regions. It should be noted that these regions are established by DFO and do not correspond precisely to G.N.W.T. regions. There are similarities, however, and the rest of this chapter will refer to DFO regions.

Whitefish (Coregonus Clupeaforinis): Commercial harvests of whitefish are almost totally sourced from Region II (Table 4.5). There are small harvests in Regions I, III, IV and V as well. As Table 4.5 shows, the majority of the harvests in Region II are exported out of the N.W.T.[43] In other regions, most of the whitefish harvest is sold locally.

Overall, except for a resurgence in 1985, whitefish harvests have declined substantially since 1980. It should be noted that there has been an excess of whitefish in recent years. A voluntary Whitefish Reduction Program was introduced in 1987. The Voluntary Reduction program was an attempt to reduce the overall whitefish production by 25 percent (in FFMC'S jurisdiction). This was accomplished by a guaranteed bonus to fishermen over and above the initial 85 percent payment. The outcome of the program was: 1) less production; 2) same (or close) return to fishermen as if they produced at high level but at lower price; and 3) FFMC reduced inventory and therefore carrying costs. Reductions in whitefish harvesting on Great Slave Lake will of course influence harvests of the other species for that water body.

Lake Trout (Salvelinus Namaycush): Lake trout harvests are also concentrated in Region II (Table 4.6). As with the whitefish, most

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43 "Export" harvests refer to all volumes sold to FFMC, which are then exported out of the N.W.T. FFMC then sells the fish to various markets. "Domestic" harvests refer to volumes of fish sold locally.

Table 4.5

Commercial Harvests of Whitefish By Schedule V Regions

('000 kg. roundweight)

	1 Mackenzie Delta			11 Slave Mackenzie			111 Central Inland			Iv Central Arctic			v Keewatin			Totals For All Regions		
	Export	Daneatic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Daneatic	Total	Export	Domestic	Total
1976		-		930	45	975				-				1	1	930	46	976
1977				1,293		1,293										1,293		1293
1978	-	3	3	977	130	1,107					.6	.6				977	133.6	1110.6
1979		12	12	1,099		1,099					.3	.3			-	I,OW	12.3	1111.?
1980		9	9	1,245		1,245	16	-	16		.7	.7				1,261	97	1270.i
1981		7	7	1,030	67	1,097					6	6			-	1,030	80	1110
1982		.1	.1	1,121	18	1,139	3	-	3							1,124	18.1	1142.1
1983				808[1]	29	837	3	2	5		1	1				811	32	843
1984				954	6	960					1	,1				954	7	961
1985		1	1	1,001		1,001		1	1		I	1		.4	.4	1,001	3.4	1004.4
1986		N/A	NIA	1,315	N/A	N/A		N/A	N/A		N/A	N/A		N/A	N/A	1,315	N/A	N/I
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/I

Source: DFO "Commercial Harvests of Eight Fish Species From the Northuest Territories. 1945 to 1982". Figures for 1983 to 1985 derived from OFO Annual Reports. FFMC records stored at DFO, Uimipeg. (Export figures).

[1] Includes sane lake trout.

Note: Region VI (Baffin High Arctic) is not included as this region has not reported commercial fishing for Whitefish.

Table 4.6

Commercial Harvests Of Lake Trout By Schedule V Regions

('000 kg. ound weight)

	I Mackenzie Delta			II Slave Mackenzie			III Central Inland			IV Central Arctic			V Keewatin			Totals For All Regions		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1976	-	-	-	81	2	83	-	-	-	-	.3	.3	-	19	19	81	21.3	102.3
1977	-	-	-	113	-	113	-	-	-	2	3	5	-	-	-	115	3	118
1978	-	-	-	119	-	119	-	-	-	-	-	-	-	-	-	119	-	119
1979	-	.4	.4	134	-	134	-	-	-	-	.5	.5	-	.1	.1	134	1	135
1980	-	.3	.3	105	19	124	11	-	11	-	.2	.2	-	-	-	116	19.5	135.5
1981	-	.5	.5	92	-	92	-	-	-	-	-	-	-	-	-	92	.5	92.5
1982	-	-	-	72	3	75	8	-	8	-	-	-	-	-	-	80	3	83
1983	-	-	-	56	-	56	2	1	3	-	.3	.3	-	-	-	58	1.3	59.3
1984	-	-	-	53	4	57	-	-	-	-	-	-	-	-	-	53	4	57
1985	-	-	-	108	3	111	-	1	1	-	1	1	-	.2	.2	108	5.2	113.2
1986	-	N/A	N/A	113	N/A	N/A	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A	113	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: DFO "Commercial Harvests of Eight Fish Species From the Northwest Terr tories. 1945 to 1982"
Figures for 1983 to 1985 derived from DFO Annual Reports.
FFMC records stored at DFO, Winnipeg. (Export figures).

Note: Region VI (Baffin High Arctic) s not included as this region has not reported commercial fishing for ake Trout.

Table 4.7

Commercial Harvests Of Northern Pike By Schedule V Regions

000 kg. round weight)

	I Mackenzie Delta			II Slave Mackenzie			III Central Inland			Totals For All Regions		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1976	-	-	-	105	-	105	-	-	-	105	-	103
1977	-	-	-	122	·	122	-	-	-	122	·	118
1978	-	-	-	178	·	178	-	-	-	178	-	157
1979	-	-	-	143	-	143	-	-	-	143	-	129
1980	-	-	-	181	18	199	.1	-	.1	181.1	18	199.1
1981	-	-	-	135	14	149	-	-	-	135	14	149
1982	-	-	-	137	29	166	.3	-	.3	137.3	29	166.3
1983	-	-	-	94	-	94	.1	-	.1	94.1	-	94.1
1984	-	-	-	120	10	130	-	-	-	120	10	130
1985	-	.2	.2	146	8	154	-	-	-	146	8.2	154.2
1986	-	N/A	N/A	137	N/A	N/A	-	N/A	N/A	137	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: DFO "Commercial Harvests of Eight Fish Species From the Northwest err tories. 945 to 9°2".
Figures for 1983 to 1985 derived from DFO Annual Reports.
FFMC records stored at DFO, Winnipeg. (Export figures).

Note: Regions IV (Central Arctic), V (Keewatin), and VI (Baffin High Arctic) are not included as these regions have not reported commercial fisheries for Northern Pike.

Table 4.8

Commercial Harvests Of Inconnu By Schedule V Regions

('000 kg. round weight)

	1 Mackenzie Delta			11 Slave Hackenzie			Totals For All Regions		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1976	-			80	-	80	80		80
1977	-			91	-	91	91		91
1978	-			167	-	167	167		167
1979	-	5	5	130	23	153	130	28	158
1980	-	2	2	70	-	70	70	2	72
1981	-	.4	.4	40	3	43	40	3.4	43.4
1982	-	.3	.3	18	5	23	18	5.3	23.3
1983	-			24	-	24	24		24
1984	-			70	-	70	70		70
1985	-	1	1	74	-	74	74	1	75
1986	-	N/A	N/A	75	N/A	N/A	75	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: OFO "Commercial Harvests of Eight Fish Species From the Northuest Territories. 1965 to 198211.
Figures for 1983 to 1985 derived from DFO Annual Reports.
FFMC records storedat DFO, Winnipeg. (Export figures).

Note: Regions III (Central Inland), IV (Central Arctic), V (Keewatin), and VI (Baffin High Arctic) are not included as these regions have not reported commercial fisheries for Inconnu.

Table 4.9

Commercial Harvests Of Arctic Char By Schedule V Regions

('000 kg. round weight)

	I Mackenzie Delta			IV Central Arctic			V Kitikmeot			VI Baffin High Arctic			Totals For All Regions		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
1976	-	-	-	46	4	50	-	39	39	-	13	13	46	56	102
1977	-	6	6	87	16	103	24	-	24	14	18	32	125	40	165
1978	-	1	1	61	13	74	12	4	16	4	9	13	77	27	104
1979	-	5	5	66	8	74	12	12	24	-	19	19	78	44	122
1980	-	11	11	61	3	64	25	-	25	6	-	6	92	14	106
1981	-	15	15	48	17	65	27	19	46	-	26	26	75	77	152
1982	-	10	10	43	13	56	25	6	31	-	39	39	68	68	136
1983	-	41	41	47	30	77	5	21	26	-	20	20	52	112	164
1984	-	17	17	49	21	70	6	6	12	6	42	48	61	86	147
1985	-	-	-	43	9	52	19	18	37	6	34	40	68	61	129
1986	-	N/A	N/A	50	N/A	N/A	17	N/A	N/A	-	N/A	N/A	67	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: DFO "Commercial Harvests of Eight Fish Species From the Northwest Terr tories. 1945 to 1982".
Figures for 1983 to 1985 derived from DFO Annual Reports.
FFMC records stored at DFO, Winnipeg. (Export figures).

Note: Regions II (Slave Mackenzie) and I I (Central Inland) are not included as these regions have not reported commercial fisheries for Char.

of the lake trout is sold to FFMC and exported out of the N. W.T. There are minimal amounts of lake trout harvested and sold locally in the other regions.

Lake trout harvests have declined since 1980. The primary reason for this decline has been over fishing, This species of fish is very susceptible to exploitation. Because it is fished together with whitefish, maintaining populations has been a concern.

Northern Pike (Esox Lucius): Most of the commercial harvests of Northern Pike are taken from Region II, and the bulk of this volume is exported out of the N.W.T. The FFMC has established markets for Northern pike in France. This species is not favoured for consumption by N.W.T. residents because it is very bony and there is an abundance of other species.

Inconnu (Stenodus Leucichthys Nelma): Inconnu is also harvested primarily in Region II. This species has never been a large part of the N.W.T. freshwater fisheries. Harvests of inconnu have been quite variable from 1976 to 1985. This species has gained popularity in U.S.A. markets as a smoked product. Both Northern pike and inconnu are considered to be "incidental" catches to the whitefish and lake trout harvests.

Arctic Char (Salvelinus Alpinus): Arctic char has been harvested in four regions - I, IV, V and VI. The char fisheries occur primarily along the coastal regions. The largest char fishery is found in the Cambridge Bay area in Region IV. It has been predicted that char harvests will develop in other Regions as interest in the fisheries is heightened. This will depend on stable/high prices and economically accessible stocks.

4.3 Production Trends By Region

Tables 4.10 to 4.15 show total commercial harvests versus quotas of the five species by region.[44] A comparison of quotas and harvests indicates the extent to which the resources are being utilized.

Region I: Region I has had quotas for whitefish, lake trout, Arctic char, Northern pike and inconnu at various times since 1976. Whitefish and lake trout represent the most abundant species. Table 4.10 indicates that all of these species have been grossly under-utilized in the years that quota has been assigned to them. From a strictly resource utilization viewpoint (ignoring economic constraints), it would appear that Region I shows great potential for commercial harvests of whitefish and lake trout.

Region II: Region II fisheries, of which Great Slave Lake comprises most of the total, have also been under-utilized. Quota in this Region is assigned to whitefish and lake trout jointly. The other species (Northern pike and inconnu) are harvested incidentally with the whitefish and lake trout harvests. Therefore, when the fishermen fill those quotas, fishing for the other species also ceases. Quotas for whitefish and lake trout have been fairly steady since 1979. The surplus has been increasing somewhat since 1980, however.

Region III: There are very few commercial fisheries in Region III, as indicated by Table 4.12. There would appear to be limited potential for commercial fisheries in this Region.

Region IV: Table 4.13 shows the commercial harvests and quotas for Region IV. Arctic char is the most abundantly harvested species in this area. These fisheries are located mainly along the coastal regions. There is a small amount of whitefish and lake trout

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[44] The quotas used in this report are derived from the variation notices issued, and not directly from Schedule V.

Table 4.10

Commercial Harvests And Quotas[1]

For Region I

(Mackenzie Delta)

('000 kg round weight)

Year	Whitefish and Lake Trout			Arctic Char			Northern Pike[2]			Inconnu			All Species		
	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus
1976	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1977	-	119	119	6	33	27	-	14	14	-	6	6	6	172	166
1978	3	130	127	1	8	7	-	14	14	-	7	7	4	159	155
1979	12.4	108	95.6	5	8	3	-	14	14	5	6	1	22.4	136	113.6
1980	9.3	148	138.7	11	8	-	-	15	15	2	7	5	22.3	178	155.7
1981	7.5	44	36.5	15	8	-	-	9	9	.4	1	.6	22.9	62	39.1
1982	-	124	124	10	8	-	-	14	14	.3	7	6.7	10.3	153	142.7
1983	-	386	386	41	-	-	-	-	-	-	-	-	41	386	345
1984	-	351	351	17	-	-	-	-	-	-	-	-	17	351	334
1985	-	103.5	103.5	-	-	-	.2	-	-	1	-	-	1.2	103.5	102.3
1986	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[1] Quotas include test and commercial fisheries.

[2] Quota includes turbot.

Note: Quotas for 1983 to 1985 listed under whitef sh and lake trout, are totals of all species. Most of this quota wi be for whitefish and lake trout.

Source: DFO Annual Reports (1983 to 1985).
DFO "Commercial Harvests of Eight Fish Species From the N.W.T. 1945 to 1982".

Table 4.11

Commercial Harvests And Quotas[1]

For Region 11

(Slave Mackenzie)

('000 kg. mud weight)

Year	Whitefish and Lake Trout		
	Harvest	Quota	Surplus
1976	1,058	2,175	1,117
1977	1,406	1,941	535
1978	1,226	1,197	
1979	1,233	1,680	447
1980	1,369	1,744	375
1981	1,189	1,719	530
1982	1,214	1,%56	522
1983	893	1,636	743
1984	1,017	1,682	665
1985	1,112	I,6a2	570
1986	N/A	N/A	N/A
1987	N/A	N/A	N/A

[1]Test and commercial fisheries.

Source: DFO Annual Reports (1983 to 1985).
DFO "Commercial Harvests of Eight Fish Species Fran the N.W.T. 1945 to 198211.

Table 4.12

Commercial Harvests And Quotas[1]

For Region III

(Central Inland)

('000 kg. round weight)

Year	Whitefish and Lake Trout			Inconnu			Arctic Char			All Species		
	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus
1976	-	-	-	-	-	-	-	-	-	-	-	-
1977	-	-	-	-	1	1	-	-	-	-	1	-
1978	-	-	-	-	-	-	-	-	-	-	-	-
1979	-	11	11	-	-	-	-	-	-	-	11	-
1980	27	154	127	-	-	-	-	-	-	-	154	-
1981	-	121	-	-	-	-	-	9	9	-	130	-
1982	11	158	147	-	-	-	-	-	-	-	158	-
1983	8	-	-	-	-	-	-	-	-	-	81	-
1984	-	-	-	-	-	-	-	-	-	-	-	-
1985	2	-	-	-	-	-	-	-	-	-	-	-
1986	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[1] Includes test and commercial fisheries.

Source: DFO Annual Reports (1983 to 1985).
DFO "Commercial Harvests of Eight Fish Species in the N.W.T. 1945 to 1982".

Table 4.13

Commercial Harvests And Quotas[1]

For Region IV

(Central Arctic)

('000 kg. round weight)

Year	Whitefish and Lake Trout			Arctic Char			Total for All Species		
	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus
1976	.3	-	-	50	-	-	50.3	-	-
1977	5	72	67	103	234	131	108	306	198
1978	.6	-	-	74	106	32	74.6	106	31.4
1979	.8	22	21.2	74	208	134	74.8	230	155.2
1980	16.2	11	-	64	224	160	80.2	235	154.8
1981	6	18	12	65	143	78	71	161	90
1982	-	16	16	56	102	46	56	118	62
1983	1.3	-	-	77	122[2]	45	78.3	122	43.7
1984	1	27	26	70	104	34	71	131	60
1985	1	7	6	52	106	54	53	113	60
1986	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1 Includes test and commercial fisheries.

2 Includes some whitefish and ake trout.

Source: DFO Annual Reports (1983 to 1985).
DFO "Commercial Harvests of Eight Fish Species in the N.W.T. 1945 to 1982".

Table 4.14

Comme rves And Quo as

For Region V

(Keewatin)

('000 kg. round weight)

Year	Whitefish and Lake Trout			Arctic Char			Total for All Species		
	Harvest	Quota	Surplus	Harvest	Quota	Surplus	Harvest	Quota	Surplus
1976	20	-	-	39	-	-	59	-	-
1977	-	358	358	24	225	201	24	583	559
1978	-	31	31	16	141	125	16	172	156
1979	.1	35	34.9	24	135	111	24.1	170	145.9
1980	-	70	70	25	120	95	25	190	165
1981	-	27	27	46	117	71	46	144	98
1982	-	46	46	31	112	81	31	158	127
1983	-	-	-	26	157[2]	131	26	157	131
1984	-	-	-	12	136[2]	124	12	136	124
1985	.6	23	22.4	37	103	66	37.6	126	88.4
1986	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1987	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[1] Test and commercial fisheries.

[2] Includes some whitefish and lake trout.

Source: DFO Annual Reports (1983 to 1985).
DFO "Commercial Harvests of Eight Fish Species in the N.W.T. 1945 to 1982".