

Resources Wildlife and Economic Development
Government of the Northwest Territories, Canada



WILDLIFE AND FISHERIES 2001/2002

Renewable Resource Values



INTRODUCTION

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Wildlife, forests and fish have always been very important to the people of the Northwest Territories (NWT). Historically, these and other resources from the land were the basis of the economy of Aboriginal people, with their cultural, spiritual and other values inextricably linked to the use of renewable resources. Today, the modern economy has displaced some of this traditional economy in NWT communities, but traditional values associated with renewable resources and their use in Aboriginal culture and society remain important.

Similarly, many non-Aboriginal residents of the NWT also associate important social, spiritual and environmental values with their use of renewable resources. Many renewable resource values have benefits that are well-known, such as the importance of fish and wildlife as food, especially in small Aboriginal communities, and the commercial value of timber to local and regional economies. Such benefits can be assigned a monetary value, though this cannot represent the entire array of benefits that arise from a use of a resource. Other values, such as the cultural importance of wildlife and environment, or the value of biodiversity or wilderness, are more difficult concepts to understand and may be impossible to quantify in any meaningful way. Yet there is growing public recognition that social and environmental values may be at least as important as values to which we can easily assign monetary value. Thus our inability to measure and present some of these non-economic values in an economic framework increases the risk that they will be ignored in conventional economic analyses. This may contribute to the minimization of non-economic values and benefits in policy formulation and public decision making.

This report presents some of the benefits, values and other indicators of importance of renewable resources in the NWT. Direct comparison between these benefits, values and indicators should be made with caution since they are presented only to demonstrate a minimum contribution of these resources to the economy.

1. Wildlife

Wildlife in the Northwest Territories

Wildlife has always been very important to the people of the Northwest Territories (NWT). Historically, these and other resources from the land were the basis of the economy of Aboriginal people, with their cultural, spiritual and other values inextricably linked to the use of renewable resources. Today, the modern economy has displaced some of this traditional economy in NWT communities, but traditional values associated with renewable resources and their use in Aboriginal culture and society remain important. Similarly, many non-Aboriginal residents of the NWT also associate important social, spiritual and environmental values with their use of renewable resources.

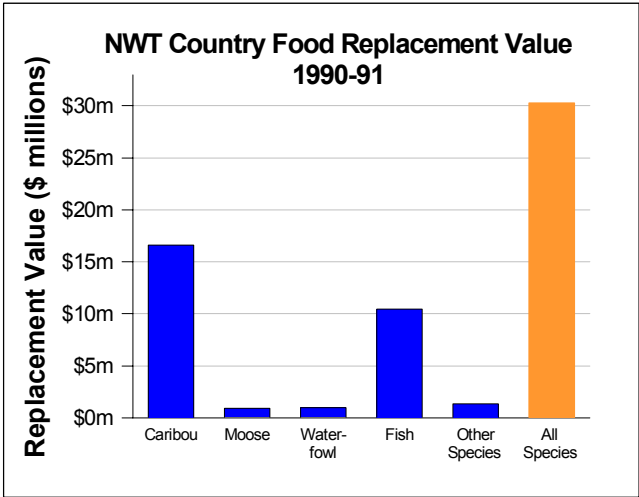


Bison on the NWT grassy plains

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The Value of Country Food

Perhaps the most fundamental and important use of wildlife in the NWT is as food. Yet quantifying the economic value of country food is dependent on wildlife harvest statistics that are not routinely available. The replacement value of country food was estimated for all NWT residents in 1990/91 and is shown in the chart below.



Clearly caribou is the most important food species in the NWT, representing over half (\$17 million) of the \$30 million in total replacement value of meat and fish harvested from the land. Fish of all species account for a further one-third (\$10.5 million) of the value of country food in the NWT. The value of moose is most likely under-represented in the chart, probably as a result of erroneous harvest statistics. An update of country food replacement values in the NWT is planned, pending the availability of new wildlife harvest statistics.

The use of replacement value as an economic measure of the value of country food should recognize that the cost of country food production (the cost of hunting or fishing) should be deducted from total replacement value.

Replacement values are economic measures and cannot be used as indicators of other social values associated with the harvesting and use of wildlife. This is an consideration, particularly in smaller, more-remote communities, where the harvesting and use of wildlife maintains important aspects of Aboriginal identity and culture. Additionally, it is well-known that country foods are nutritionally superior to store-bought alternatives, and that the physical exercise of harvesting and processing wildlife and fish for food contributes to a healthy life-style and physical well-being.



Black Bears are common in the North

Another indicator of the importance of wildlife to NWT residents is the relative amount of country food consumed in households. Thirty percent of NWT households reported that half or more of the meat and fish consumed in the household in 1998 was obtained by hunting and fishing. Another 47% of NWT households reported that some, but less than half, of the meat and fish consumed was obtained through hunting and fishing. These proportions increase when considering smaller, mostly Aboriginal communities.



People of the north rely on such resources as wildlife, shown here is a woman that is drying some meat

Wildlife

In the NWT, a wide variety of wildlife species have been important for people as sources of food; for making clothing, tents, boats, and tools; and as a source of income through the sale of furs, hides, and meat. Many of the territory's most abundant and treasured animal species are mammals: including moose, marten, barren-ground and woodland caribou, Dall's sheep, wolf, lynx, muskox and polar bear. Some of our wildlife species, such as the polar bear, occur only in the far north well above treeline while others like the Dall's sheep, are only found in the rugged Mackenzie and Richardson Mountains, and others such as bison are at the northern limit of their range in North America within the NWT and rarely venture north of the 62nd line of latitude. Some other species, such as the wolf, are highly adaptable to local environmental conditions and are found across most of the territory.



A herd of Caribou running past a nearby river

Because of their continued importance, biologists spend more time studying wildlife in the NWT. Considerable effort has been spent on documenting the range, habitat requirements, seasonal migration patterns, and numbers of mammals such as barren-ground caribou, muskox, moose, polar bears, grizzly bears, wolves, and Dall's sheep. These projects often take many years to complete and sometimes involve detailed study of individual animals within a herd or population through the use of special collars that transmit radio signals that can be received from an aircraft or even by a passing satellite. The health status, including the accumulation of contaminants from the environment, of both marine and terrestrial mammals is of particular importance because so many different mammals are eaten for food.

Commercial Game Meat Harvests

The Banks Island muskoxen hunt is the only large-scale, organized game-meat harvest that has occurred on a repeated basis in the NWT. The chart below shows the historical harvest. The 1997 harvest of 1,250 animals was reported to have generated about \$400,000 in regional economic benefits. Early harvests focused on commercial meat, but producing consistent meat quality has been a challenge. In more recent years, the development of markets for qiviut (muskoxen under-fur) has been a priority and in 1999 these efforts began to pay-off. In addition to the sale of meat from the 1999 harvest of 1,450 animals, the value of the qiviut and leather increased the total NWT value of the harvest to \$1.1 million.

Commercial game-meat harvests for caribou have also occurred in the NWT. These small-scale pilot projects have not been repeated.

Non-Consumptive Use of Wildlife

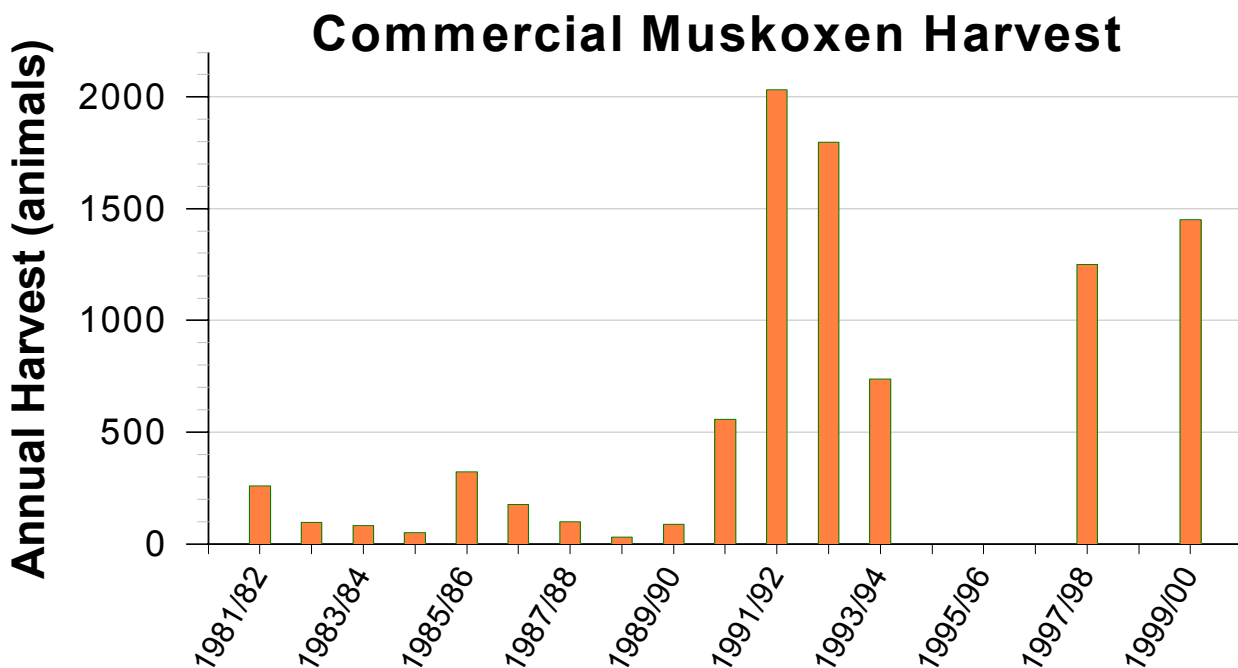
NWT-residents and non-resident tourists also use wildlife in non-consumptive ways such as bird watching or wildlife viewing. The value of this type of activity has not been estimated in the NWT, so the extent to which wildlife contributes to these activities in the NWT is unknown. However, a survey of wildlife-related expenditures and economic values for Canadians found that total expenditures on non-consumptive wildlife-related activities in 1996 (\$1.3 billion) were about 60% higher than total

expenditures by Canadians on hunting activities (\$824 million). (Sport fishing expenditures by all Canadians were reported to be \$1.9 billion.)

This clearly shows non-consumptive wildlife-related activity to be important when considering wildlife values. While total expenditures by all Canadians on non-consumptive wildlife use are substantially higher than corresponding expenditures for hunting activities, the survey also identified that per-participant expenditures on non-consumptive wildlife use by Canadians in 1996 were less than half of per-hunter expenditures on hunting.

Consideration of non-consumptive wildlife use can be broadened to “nature-based non-consumptive activities” to include all renewable resources used in non-consumptive recreation. In addition to activities like wildlife viewing or bird watching, nature-based non-consumptive activities include activities like canoeing, hiking and skiing, activities that generally occur in and require natural areas like forests, lakes, rivers or mountains. Although these activities are probably not done primarily for the opportunity to see wildlife, seeing wildlife is likely an important part of the overall outdoor recreation experience.

Expenditures by Canadians on nature-related non-consumptive recreational activities in 1996 (\$7.2 billion) were reported to be two and a half times greater than total expenditures by all Canadians on hunting and wildlife viewing (\$2.1 billion).



Red Fox

The red fox (*Vulpes vulpes*) is a member of the dog family. It has a pointed face and ears and a long, bushy tail. It is larger than the arctic fox and lives in more southern ranges. However, the red fox is an adaptable animal and some have extended their range into areas where the arctic fox is found. The red fox is a small animal, weighing 3.0 to 7.0 kg. It is about 100 cm long with its tail accounting for almost half this length. The fur industry often refers to red foxes as coloured foxes because the red fox has three separate colour phases. The red phase is most common and occurs in 45 to 75 per cent of the population. These foxes are reddish-brown with a white chest, abdomen and tip of the tail. They have black hairs on their legs and down their backs. The cross fox is grey-brown in colour with black hairs across the shoulders, which form a "cross." This second phase constitutes 20 to 44 per cent of the red fox population in Canada. Silver foxes are black with a white tip of the tail and a variable amount of silver frosting on the guard hairs. The silver phase occurs in only 2 to 17 per cent of red foxes. All colour phases can occur in the same litter.

Red foxes are shy, nervous animals, which are most active at night. They have acute hearing and a keen sense of smell. They run with a quick, airy gait, leaving paw prints in a line in the snow.



A Red Fox, well known for its brilliant fur.

Red foxes are harvested as furbearers. Trapping seasons extend generally from early November to late February below the treeline, and to mid-April in tundra areas. Like the arctic fox, pelt production is affected by the market value of the fur, which dropped in the 1980s and rose again during

the 1990s. There has been a much greater production of arctic fox pelts, but red fox pelts have commanded a higher price. In 1978/79, the average value of a red fox fur in the Northwest Territories was \$95.12. The number of pelts harvested during this season was 2,746 for a total value of \$261,215. In 1989/90, a trapper received an average of only \$14.69 for a pelt. At this low price, pelt production was down to 413 pelts for a total value of \$6,070. By 1996/97 average pelt price had risen to \$33.12. A total of 953 pelts were harvested that year, worth \$31,543. The cross fox produces the highest valued fox pelt in the Northwest Territories

Polar Bear

The Polar bear (*Ursus maritimus*) evolved from coastal populations of grizzly bears during the late Pleistocene period. The first recorded mention in North America was in 1794 by Captain Phipps in *A Voyage towards the North Pole*. Phipps called the bear *Ursus maritimus*, which is the scientific name by which it is known today. Other names such as Nanook, ice bear and white bear all identify the polar bear.

Inuit have always killed polar bears for their hides, for self-protection and as an indisputable sign of honour. Because such a powerful and dangerous prey was difficult to kill and because weapons were primitive, there was no question of over-hunting. However, after explorers, whalers, sealers and fur traders began to penetrate the Arctic in the early 17th century, bears were hunted in ever increasing numbers. Inquisitive bears were easily killed as they approached whaling ships or camps, being little match for men with rifles, and dogs. Bear numbers steadily declined, but it was not until 1935 that concern for their apparent over-exploitation was heard. As a result the federal government limited the season for polar bears in Canada from October 1 to May 31.



Polar bears are an important source of revenue to the Inuit. The average price of a polar bear hide in 1988-89 was \$1350.00. This is over 40 times the price paid for a hide in 1957-58 (\$25.00).

Assuming hunting is controlled, the greatest danger to polar bears now is the advent of oil and gas exploration in the north. It is known from experiments that oil is fatal to bears and a major spill would likely result in the direct death of many. It would also lead to the disruption of arctic food chains and polar bears, as carnivores at the end of the food chain, would suffer. Hungry bears, deprived of their traditional prey, would become nuisance bears in camps and settlements. The result would invariably be more dead bears.



Even where polar bears and man are not directly competing for space in the bear's environment, man's technology is penetrating the bears' domain. DDT, dieldrin, mercury and other chemicals from urban centres are borne by winds, spring runoff and summer rains down rivers into Hudson Bay and the Arctic Sea. Bears from the most remote regions have been found to carry pollutants in their body tissue. It is not yet known what effect such poisons will have on bears. Canada has committed itself through the 1976 International Agreement on the Conservation of Polar Bears to manage

Caribou

Some writers believe the word "caribou" was derived from the Micmac "xalibu" which means "the power". Inuit call the caribou "tuktu" or "tuktuk", Chipewyan Indians say "et-then", Dogribs "ek-wo", and to the Slavey Indians the caribou are "ekwe". European explorers naturally called them reindeer, or simply deer, which is the term used for this species in the Old World.

Caribou have always been important to the people of the NWT. Most Inuit, Dene, and Metis still rely on caribou as their main source of food, and hides are still used for clothing and to sleep on when camping. In the past, when caribou numbers declined, people starved unless they were fortunate enough to be able to meet their needs by using other species. Most barren-ground caribou herds are more abundant now than they have been for decades. As caribou numbers have increased, they have increased their winter range with the result that caribou are accessible to more hunters.

Caribou numbers will continue to fluctuate and not all herds will always be large enough to meet people's needs. Even though people will no longer starve when there is a shortage of caribou, declines will still bring economic and social hardships. The goal of caribou management is to ensure that the herds never decline to the point where people do not have enough caribou nor increase to a point where the caribou might damage their food supply.



Caribou and wildlife management boards have been established to provide more management control to people who have the greatest stake in caribou conservation. All boards are made up of both native users and government representatives. Boards establish management decisions affecting caribou. They also develop conservation education programs, which increase peoples' awareness of caribou ecology and management options in order to reduce friction caused by misunderstandings.

Dall's Sheep

Dall's sheep (*Ovis dalli*) are one of the most spectacular animals found in alpine regions. Posing regally in their white coats against the green and grey summer alpine habitat, they are a delight to photographers. Their large curled horns complete an impressive picture.

Dall's sheep in the Mackenzie Mountains are important as a trophy species. They also attract naturalists and photographers. Trophy hunting of Dall's sheep by outfitted hunters began in the mid-1960s after many years of light subsistence hunting by local residents. Dall's sheep in the Richardson Mountains can only be hunted by local residents for subsistence, and the annual take is very small.

Each year outfitted, non-resident hunters, and resident hunters may take one ram having horns of at least three-quarter curl. At present, there is no quota on the total number of rams that can be taken by outfitted hunters in the Mackenzie Mountains, but the number of sheep killed is limited by the vastness and inaccessibility of the area. The annual harvest of rams is monitored by the Department of Resources, Wildlife and Economic Development, and data are collected on each ram taken. Since 1990, the annual harvest of Dall's sheep rams in the Mackenzie Mountains has been 200 to 250. Although no precise count of the Dall's sheep population in the Mackenzie Mountains has been obtained, limited surveys estimate the adult population at 15,000 to 26,000 sheep. It appears, therefore, that the current harvest rate of Dall's sheep rams in the Mackenzie Mountains is light.



Dall Sheep, attract wildlife enthusiasts from all over the world.

Information on population characteristics is necessary for assessing the effect of new impacts on Dall's sheep as well as any possible effects from hunting. In the Northwest Territories, the first extensive studies on Dall's sheep in the Mackenzie Mountains were conducted by the Canadian Wildlife Service. Their research, undertaken from 1966 to 1974 in several separate study areas, showed that the population in the Mackenzie Mountains was stationary.

Moose

The moose (*Alces alces*) is the largest member of the deer family. Moose stand about 2 m at the shoulder, and bulls may weigh as much as 700 - 750 kg, although the average is about 500 kg. Cows are about the same height, but lighter in weight. The body is bulky with a short, stubby tail and a disproportionately large head. The long, square muzzle ends with an overhanging upper lip. Moose of both sexes have a "bell" that hangs under the throat. This is a flap of skin covered with hair that grows as long as 25 cm on males. The bell is used in communication, both visual and olfactory. The large surface of the bell in bull moose transfers scents to the cows during their "chinning" behaviour. The size and shape of the bell on bulls may be a secondary indicator of sex, relative to age and rank, especially during the antlerless period.

Thick hides and warm coats insulate them against the winter cold. A difference of as much as 20°C may be registered between the air temperature and the hide of the moose. A fine undercoat of grey wool, and coarse, scaly guard hairs helps to retain heat. The coat is about 10 cm long on the body, but may grow to 20 cm on the neck and shoulders. In spring, the old, faded coat is shed and replaced with a new, short, dark brown coat. In late summer, the guard hairs grow longer and produce a rich, reddish, brown-black coat. The underhair thickens in September to provide additional warmth.



A bull moose in tall grass

Moose are well-known for their distinctive palmate antlers. Only bulls grow them and the rack is in its prime when the animal is about six years of age. During the first year a moose may grow short stubs and yearlings may develop one or two forks. As the moose ages, a characteristic shovel shape develops, and the antlers form points on both sides.

Lynx

The lynx (*Lynx canadensis*) is a member of the “felid” or cat family. It lives in boreal forests across North America. Within the NWT, lynx are found below the treeline and are most numerous in the southwest and in the Mackenzie Delta. Although other prey are eaten, lynx depend heavily on snowshoe hares to thrive. As a result, the lynx populations fluctuate with cycles of the snowshoe hare.

To get the highest price for a pelt, it is important to harvest when the fur is of the best quality, or at its prime. In the NWT, lynx generally “prime up” in mid-to-late November, and fur quality is best during December and January.

In the past, cyclic population lows naturally limited the lynx harvest. However, harvest pressure on lynx has increased in the past 20-30 years because of higher prices for pelts, use of snowmobiles, and improved access to remote areas along roads and cut lines cleared through the bush. In some areas, over-harvesting during a lynx population low could damage the population’s ability to increase again to former levels. Since very few if any kittens survive to breeding age during a population low, it is important that enough adults remain to repopulate suitable habitat, including areas completely vacated by lynx. Heavy harvesting in the 1980’s caused concern about over-harvesting in the NWT, and at the request of harvesters, studies were undertaken to monitor the lynx populations.



Conservation Management assures that the Lynx population remains strong

Field work continues to provide crucial information.

Harvesters work with biologists and Renewable Resource Officers to monitor lynx populations and to track the lynx-hare cycles. This is done by lynx carcass collections and analysis, by radio-collaring and following lynx movements, and by annual monitoring of snowshoe hare levels.

Harvesters provide the lynx carcasses and biologists examine them to get information about sex, age, physical condition, and reproduction. Lynx are live-captured by biologists using a leg snare and the unharmed lynx are equipped with a radio-collar prior to release. Each collar sends out a unique signal so that individual lynx movements can be traced. This provides information about home range size, habitat use, movement patterns, and survival rates at different times of the cycle.

Wolves

Wolves are a member of the Canidae (dog) family and look like a large husky dog. Adult males average about 35 - 40 kg, while females are smaller, at about 30 - 35 kg. Length of males, from nose to the tip of the tail, varies from 1.5 to 2.0 m, with females from 1.4 to 1.8 m. The tail is nearly one-quarter of the total length. In Canada, the largest wolves are from the northwest, while the smallest occur on the arctic islands.

Throughout its range, the distribution, habitat and ultimately the numbers of wolves has been greatly affected by human settlement and development. In the NWT, where a small number of people occupy a vast area, most of the land has remained undeveloped. In the mid 1900s a wolf control program was implemented in an attempt to increase prey populations for human consumption. The last wolf control program in the NWT was in 1977 - 78.

In the past 18 years the total NWT wolf harvest has usually been 600 to 800 annually. Local hunters and trappers harvest wolves and may sell the hide or use the fur for homemade winter garments such as parka trim and mitts.



Wolf can adapt to all parts of North America

Wolves are extremely resilient and can usually survive the pressures of hunting and trapping, providing they have sufficient prey. Thus wolf management is directly related to caribou and other prey management. It can be concluded that the future of the wolf in the NWT depends on the future of the caribou and other prey species. Wolves are an important and natural part of ecosystems in the NWT. Many residents and visitors to the NWT enjoy the opportunity to see them.

Marten

Marten (*Martes americana*) are members of the family Mustelidae, which also includes wolverines, weasels and fishers. The South Slavey word for marten is “nohthee”, in North Slavey marten are “zo”, in Dogrib they are “wha” and in Gwich’in they are “tsuk”. They are also called pine marten and American marten. In the fur industry marten are usually called Canadian or American sable, to link them to the valuable Russian sable.

The marten is a fairly small animal, about the size of a small house cat. NWT martens are among the largest in North America and the largest of these live in the most northern parts of their range. Full-grown males weigh approximately 1300-1600 g, and measure about 70-80 cm, including the tail. Females are about 75% the size and weight of the males.



“Marten pelts are among the most valuable in North America...”

The harvest season for marten in the NWT is November 1 to early or mid-March, varying slightly by region. This period roughly covers the time that marten fur is prime, or at its highest quality. This means that the fur has reached its maximum length, density, finest texture, and will bring the highest price at the fur auctions. NWT marten pelts are among the most valuable in North America because of their size and the density of their fur. Their especially thick fur is a response to the often extreme cold weather. The darkest fur is most popular and therefore most valuable. By late February or March the fur is past prime.

The NWT uses a co-management approach in furbearer management. Personnel from the Department of Resources, Wildlife and Economic Development work with harvesters, elders, and other community members with knowledge of the land and its resources. Harvesters’ concern about population levels during the record harvests in the late 1980’s resulted in studies of marten harvests. Government personnel, in co-operation with local harvesters, continue to monitor the marten, and its food animals, to learn more about the status of marten populations.

Harvesters can monitor the health of the marten population in their area to determine if they need to ease harvesting pressure. Low populations should be lightly harvested or not harvested at all, which enables numbers to rebuild. The government encourages self-monitoring by trappers, and also offers workshops and training on harvest assessment techniques.

Studies of the marten continue through the co-operation of all those involved in fur harvest. Through co-management of this valuable resource we can ensure these quick and graceful animals continue to thrive in the Northwest Territories.

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2. Furs

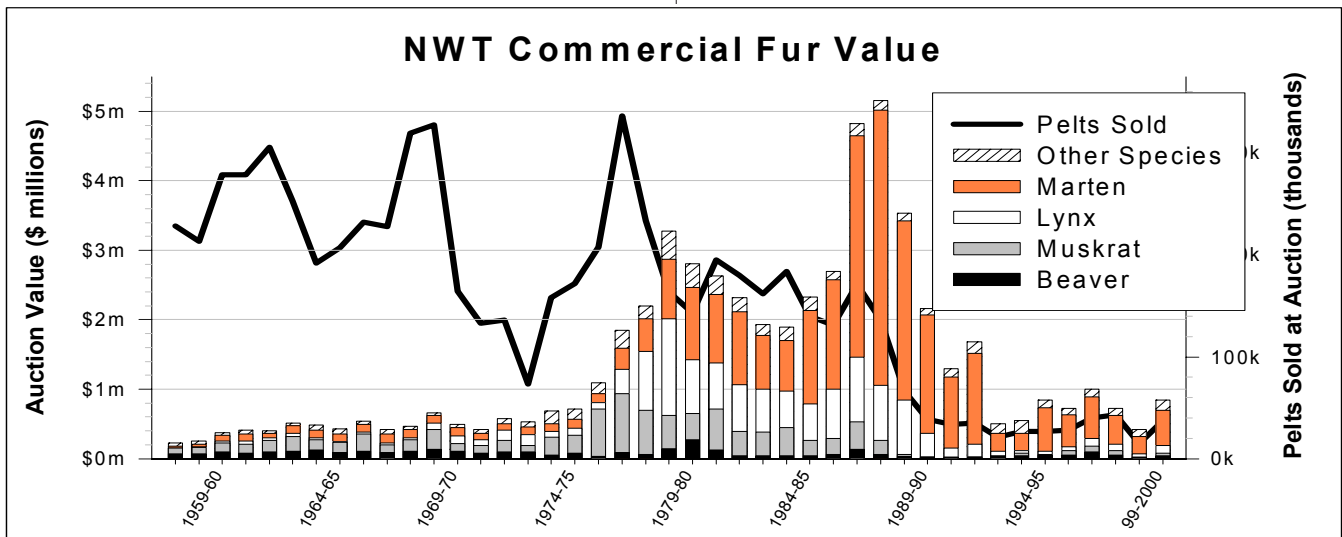
The NWT fur industry is most often valued as the total value of NWT furs sold annually at auction. This approximates the collective income received by NWT trappers for furs they sell to fur auction houses, less auction commissions and transportation costs. The chart below shows the total annual number of NWT pelts sold at auction, and the corresponding revenue or value from these furs for the past 43 years. The value of the four most important species are shown separately.

Immediately evident is the large annual variability in the number of pelts sold at auction and their total annual value. Before the 1970s, total annual value was relatively steady, occasionally rising above \$500,000. Conversely, the number of pelts sold at auction before the 1970s, fluctuated between 190,000 and 325,000. In 1972/73, the number of pelts sold at auction declined to a low of about 75,000 and then rebounded to an all-time high of 335,000 pelts in 1976/77. Total fur value of all species began to rise rapidly in the mid-1970s and by 1979 had exceeded \$3 million. Although the number of pelts sold annually at auction generally declined through the 1980s, total value peaked again at over \$5 million in the late 1980s. During the 1990s both sales and harvest declined significantly with the number of pelts sold at auction remaining below 50,000. The total annual value has remained under \$1 million.

NWT Ermine



There are a number of reasons for these sharp fluctuations in annual number of pelts sold at auction and their total annual value. Prices for various species are heavily influenced by fashion trends. Participation in trapping is also price sensitive, with more residents participation when prices (and their returns) are higher. Similarly, low pelt prices act as disincentives to trappers. For example, in the mid-1970s, muskrat pelt prices rose from about \$1 to \$5, creating strong incentives for trappers, and consequently muskrat pelt production rose significantly. Prices for the pelts of most other species were also increasing in the mid-1970s and fur production generally rose as a result.



Significant fluctuations in harvests and sales can also be caused by the natural variation in abundance of some fur-bearers. Lynx is a classic example, with a population cycle that peaks about every ten years. So despite pelt prices and market incentives to trappers, the relative abundance of fur-bearers will also affect production by trappers, and thus the number of pelts available for sale at auction.



A woman modeling an Arctic Hare coat

Lastly, trappers are influenced by alternatives to trapping like wage employment, especially when pelt prices are low. Good wage employment alternatives to trapping probably contributed to the low number of pelts sold at auction in the 1990s, and consequently, the relatively low, total annual fur values that resulted during this period.

In the 1960s and early 1970s, several species, mainly marten, lynx, muskrat and beaver, contributed about equally to the total annual fur value. This changed in the mid-1970s as high-priced pelts like lynx and marten began contributing a much larger proportion of the total annual fur value. During the past 15 years, marten has accounted for over half, and often three-quarters, of total annual NWT fur value.

Non Commercial Aspects

Not all NWT fur is sold into commercial auction systems. A small amount of fur, mainly from a few select species, is retained in the NWT for personal use or local trade. The cultural significance of polar bears to the Inuvialuit and the unique properties of polar bear hides for winter clothing and



An array of fur, social trends affect the demand for such a commodity

bedding make it an attractive fur to retain for local use in the NWT. Additionally, declining auction prices for polar bear hides from an average of over \$1,800 in 1988/89 to less than \$250 in 1995/96 also contributed to greater domestic use. Although wolverine and wolf pelt prices have not declined as have polar bear hides, both are favoured in the NWT for use in winter clothing. As a result, a substantial but unknown number of wolf and wolverine pelts are either sold in local markets in NWT communities or retained for personal use. Such local sales and domestic use of fur from these three species are difficult to monitor, and therefore is not included in fur values in this report.

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3. Forestry

Small one-to-two person portable sawmills exist in many communities in the NWT and produce lumber and building logs for local use. Commercial timber harvesting in the NWT occurs mainly in the Liard River Valley, the Cameron Hills and the Slave River Lowlands, where commercially-viable stands of white spruce and aspen are found.

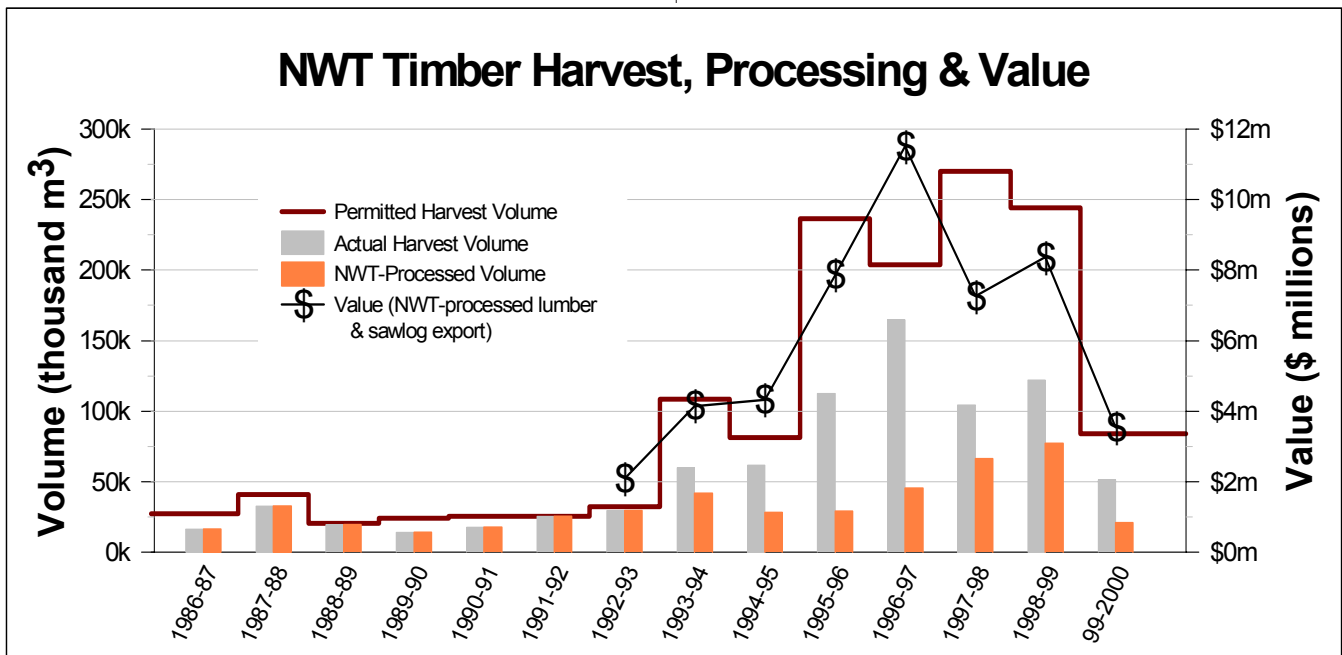
The volume of sawlogs harvested in the NWT during the past 14 years is shown in the chart below, along with the permitted harvest volume and the volume of sawlogs that are processed into lumber in the NWT. Processing of sawlogs into rough-cut lumber for export and northern use increased from about 30,000 cubic metres or less annually prior to the early 1990s, to over 75,000 cubic metres in 1998/99. However, it dropped back to about 22,000 cubic metres in 1999/2000.

The chart also shows the combined market value of sawlogs exported from the NWT and NWT-produced lumber since 1992/93. Although market value rose quickly to peak at \$11.5 million in 1996/97, it has dropped back to only \$3.5 million in 1999/2000.

Lumber prices are very cyclical and move in relation to housing starts in the USA and Canada. When lumber prices were high in 1996, the NWT harvest increased substantially. More recently, a number of factors have caused the decrease in NWT timber harvest and value:

- Labour and capital is getting more difficult to locate.
- Lumber prices have dropped sharply in recent years, especially since 1999.

Nonetheless, the past decade of commercial timber production in the NWT shows the potential of the industry given improved lumber prices.

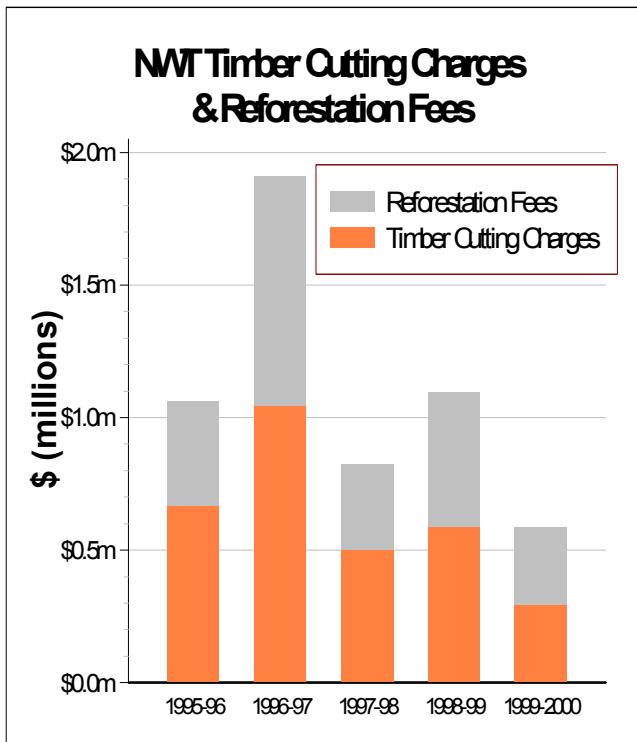


Timber Cutting & Reforestation

Revenue from timber cutting charges or “stumpage” shown in the table below have fluctuated during the period 1995/96 to 1999/2000 in relation to the harvest. Lumber prices were high in 1996, and as a result, the industry harvested timber near the permitted harvest volume. Lower lumber prices after 1996, combined with increasing oil and gas exploration and development reduced timber harvesting activities.

The stumpage regime of the NWT allows for a decrease in timber-cutting charges with increased processing in the NWT. NWT-processed volumes of timber have increased since 1995/96, as shown in the chart on page 8, which would also contribute to decreased stumpage revenues. Although this reduces government revenues, it increases the number of direct and indirect jobs resulting from sawmills, which are typically located in smaller communities.

Reforestation fees are collected on a volume-harvested basis. In general, when timber harvesting increases, revenue from reforestation fees also increases. Revenue from reforestation fees is reinvested in forest renewal programs to ensure the sustainability of the forest resource.



This graph illustrates the relationship between the revenue from timber cutting versus the reforestation fees.

NWT Forests



NWT boreal forest is vast. The photo shows a cut-line, mainly used for oil and gas exploration.

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4. Fishing

Great Slave Lake Commercial Fishery

Great Slave Lake has been commercially producing lake whitefish and other freshwater species on a year-round basis since the late 1940s. With the exception of small markets in Yellowknife and Hay River, most of the product is sold through a federal crown corporation into the mid-west and northeastern United States. Efforts to expand these markets globally have been underway for some time.

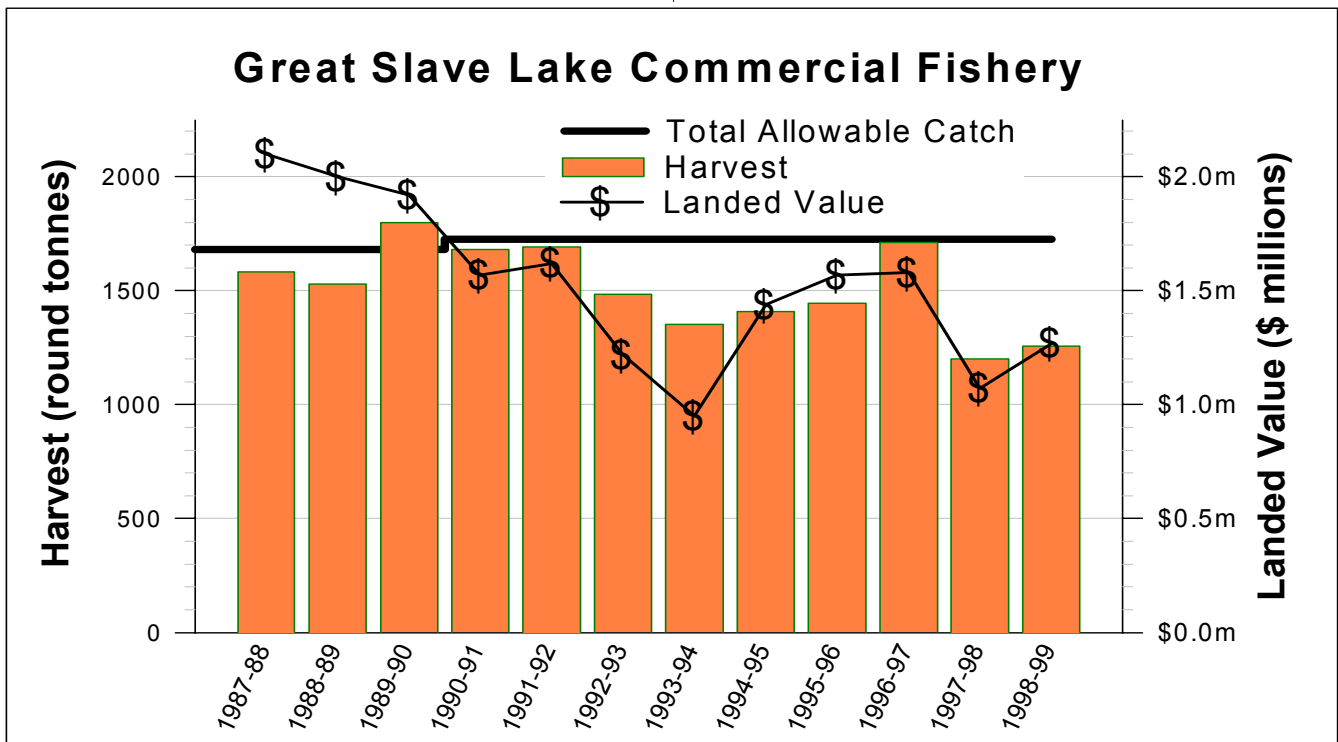
Great Slave Lake commercial fishery production and value have been declining for the past 10 years as shown in the adjacent chart. Present production and value are near 10-year lows of about 1,250 tonnes and \$1.25 million in landed value. Recent landings have not usually approached the total allowable catch and this is likely related to the declining number of commercial fishers on the lake.

Other Commercial Fisheries

There are several small scale commercial fisheries in the NWT. The most significant of these are the Kakisa and Tathlina Lakes pickerel (walleye) fisheries and the Mackenzie Delta whitefish fishery, which employ between 10 and 30 fishers respectively. Most years, the two pickerel fisheries harvest the 20 tonne total allowable catch and the landed value to fishers ranges between \$25,000 and \$70,000.

The Mackenzie Delta whitefish fishery is also variable in both harvest and value. Annual harvest has been as low as 5 tonnes and yet in some years has surpassed 30 tonnes. Annual landed value to fishers has ranged between \$5,000 and \$35,000 during the past decade.

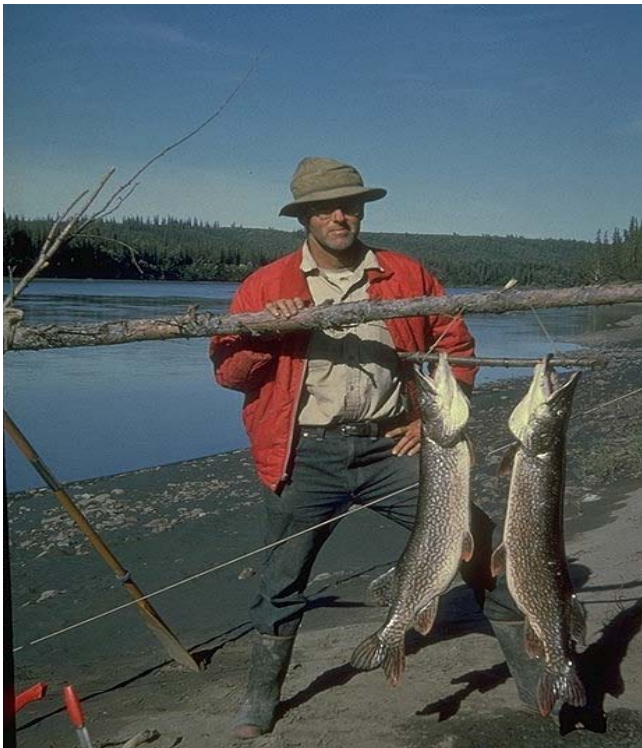
Some of the smaller-scale commercial fisheries in the NWT include a strong element of the traditional economy, where a substantial and often major portion of the harvest is not sold commercially but rather retained by the fisher for domestic purposes.



Recreational Fishing

Recreational fishing or angling is an important economic and leisure activity in the NWT. Its value to non-Aboriginal NWT (including Nunavut) residents has been estimated using non-market valuation techniques. There are three types of benefits: 'major purchases partly attributable to angling' by all anglers, 'direct expenditures and major purchases wholly attributable to angling' by all anglers, and 'willingness to pay additional amounts for angling' by NWT (including Nunavut) residents. It is estimated that anglers made direct expenditures and major purchases in the NWT (including Nunavut) of about \$14 million in 1990 and about \$21 million in 1995. Direct expenditures are supplies like lures, fishing line and groceries while on fishing trips, and services like travel, accommodation and guiding.

An additional \$3.8 million in 1990, and \$5.9 million in 1995, was spent by anglers in the NWT (including Nunavut) on 'major purchases partly attributable to angling'. An example would be boats used for angling as well as other purposes.



These purchases and expenditures are indicators of actual willingness to pay for angling; that is, they are necessary for anglers to fish in the chosen manner. To this value we can add a 'willingness to pay additional amounts for angling' by NWT (including Nunavut) resident anglers. This represents "value received but not paid for", or amounts that anglers would pay in the case that prices for fishing equipment, supplies or services increased. 'Willingness to pay additional amounts for angling' by NWT (including Nunavut) resident anglers was estimated to be \$2.5 million in 1990 and \$3.0 million in 1995.

Aggregating 'willingness to pay additional amounts' with 'direct expenditures and major purchases wholly attributable to angling' provides an indication of the benefit of angling to the NWT (including Nunavut) economy and residents. Angling was "worth" at least \$16 million in 1990 and at least \$24 million in 1995. If 'major purchases partly attributable to angling' were included in the "worth", the benefit of angling would increase to a maximum of \$20 million in 1990 and \$30 million in 1995, however some portion of the value of these purchases is not associated with angling.

Based on the benefits outlined above and the estimated number of fish caught by anglers in 1990 and 1995, the average fish caught by NWT (including Nunavut) anglers was "worth" between \$29 and \$36 in 1990 and between \$34 and \$43 in 1995.

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