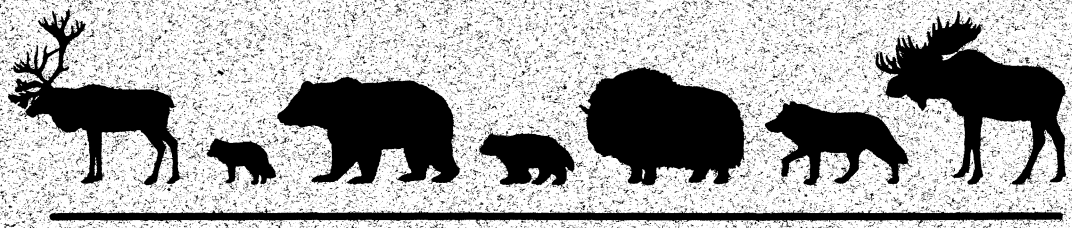
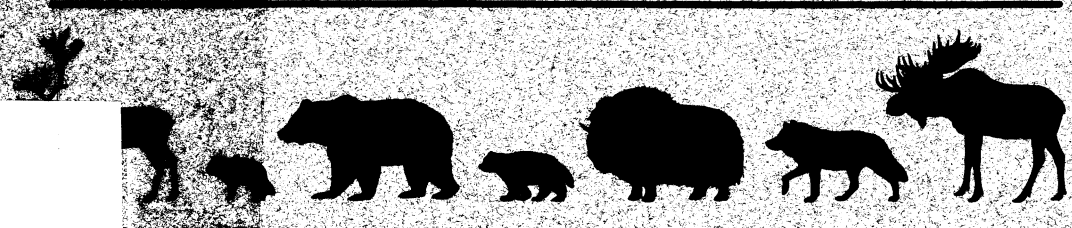


SUMMARY OF YUKON NORTH SLOPE WILDLIFE STUDIES

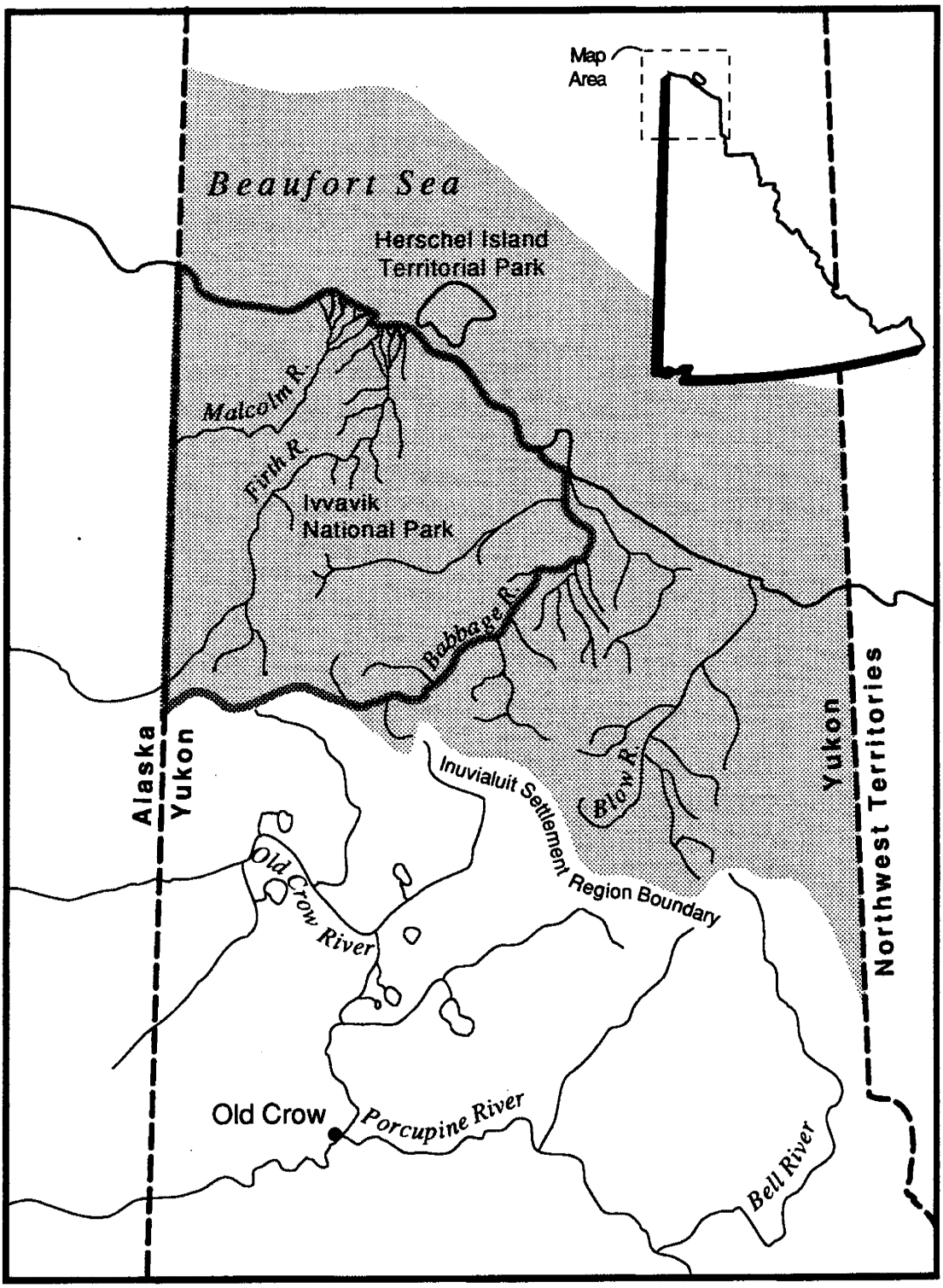
1984 - 1994



Yukon
Renewable Resources

Yukon Department of Renewable Resources
September, 1995
TR-95-3

Yukon North Slope



The "Yukon North Slope" means all those lands between the juridictional boundaries of Alaska and the Yukon Territory and the Northwest Territories, north of the height of land dividing the watersheds of the Porcupine River and the Beaufort Sea, and including adjacent nearshore and offshore waters and islands.

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INTRODUCTION

Implementation funding has been provided to the Yukon each year in order to implement the terms and conditions of Section 12 (Yukon North Slope) of the Inuvialuit Final Agreement (IFA). According to Section 12, the Yukon North Slope falls under a special management regime whose dominant purpose is the conservation of wildlife, habitat and traditional native use. All development proposals must be screened to determine whether they could have a significant negative impact on wildlife, habitat or native harvesting. Furthermore, the Wildlife Management Advisory Council (North Slope) [WMAC(NS)] provides advice on all matters relating to wildlife policy and the management, regulation and administration of wildlife, habitat and harvesting, including the preparation of a conservation and management plan, quotas for the Inuvialuit harvesting of game, and the protection of habitat that is critical to wildlife or harvesting. This report summarizes the wildlife projects undertaken between 1984 and 1994 on the Yukon's North Slope as part of implementation of the Inuvialuit Final Agreement.

In 1985 the Yukon began by consulting the community of Aklavik regarding the current status and management of wildlife population on the North Slope, and about future plans to use this resource. Periodic meetings were held with the Aklavik Hunters and Trappers Committee (Aklavik HTC) in order to determine the priority for, and specific direction for the wildlife studies, to determine how the community of Aklavik wished to be involved in these studies, and to report on the progress and results of the field studies. In addition, the Aklavik HTC also pursued opportunities for the hiring and training of local people which was often incorporated into the project design. As a result, local people were hired and trained to carry out field work. Public information sessions were held each year, posters on each project were displayed and questions were answered. The posters remain in Aklavik for use by the HTC. Workshops and meetings were held with Inuvik regional staff from the Government of NWT Renewable Resources, Parks Canada, WMAC(NWT) and WMAC(NS) in order to allocate funding, and to co-ordinate studies and field work each year.

All of the wildlife studies on the North Slope were reviewed and approved by the WMAC(NS) which oversaw the review process for this research and initially maintained the broader linkages into relevant Inuvialuit structures. During the first few years of implementation, the specific direction of the studies as determined by the Aklavik HTC were to assess the opportunities and to create guidelines for wildlife and developmental related use including:

- supporting the development of family operated wildlife viewing businesses along the coast;

- establishing a big game outfitting concession in the North Richardson Mountains and adjacent areas to the west; and,
- assessing the status of the arctic fox population and their habitat.

The studies on wildlife viewing, which took place from 1987 to 1990, looked specifically at the feasibility, marketability, and the resource management criteria needed to support a wildlife viewing enterprise on the North Slope. The studies on big game outfitting looked at the capacity of the resource to sustain this harvesting activity. Sheep and caribou inventories had previously been completed, so studies were focused on moose numbers and distribution, the importance of wolf predation, and a review of current grizzly bear information. We did not have sufficient resources to inventory grizzly bears and did not feel that an inventory to support the proposed conservative harvest would be an effective expenditure of funds at that time. Studies on arctic fox took place from 1986 to 1990 and were designed to provide baseline population and habitat information.

During the remaining years of the ten year implementation period, studies were designed to enable future resource development assessment and environmental protection on the North Slope generally, and to answer several specific remaining wildlife management questions. These included:

- an inventory of key habitats;
- an assessment of hunting on the local wolverine population;
- an assessment of competition between muskoxen and caribou; and,
- an assessment of hunting on the local wolf population.

The habitat inventory occurred between 1991 and 1994, and focused on producing a vegetation and land-cover map to be used as a base map for outlining the distribution of key wildlife habitats. The wolverine study took place between 1992 and 1994. It compared the numbers of wolverine in hunted and unhunted areas and assessed reported harvest levels to these populations. The muskoxen/ caribou competition literature review was done in 1989. The wolf study took place between 1987 and 1994, and included a comparison of a 1993 population estimate to the earlier estimate in 1987.

These studies have provided important information to the Inuvialuit, WMAC(NS), Parks Canada and the Yukon regarding the status and use of wildlife populations and their habitats on the North Slope. The capability of these populations to sustain local hunting pressures, commercial wilderness viewing activities, and big game outfitting has also been assessed, and the feasibility of a wildlife viewing enterprise has been investigated. This information will be invaluable to all the parties as they assess development proposals and activities, implement the North Slope Conservation and Management Plan, pursue the development of a renewable

resource based economy in Aklavik, and generally ensure that the management and use of wildlife populations and their habitats is based upon sound conservation, and is consistent with the terms and conditions of the IFA.

Table 1 summarizes the wildlife projects undertaken by YTG between 1984 and 1994 (including 1995 information for those projects which were started during the review period and completed in 1995). The table identifies funding sources for each project, the total cost of each project, and the total amounts of funding from each source each year for all projects combined.

Table 2 contains a summary of the publications which resulted from each of the various projects.

The remainder of this report contains summaries of each project including rationale, objective, methods, management actions, and abstracts for each report produced as a result of the research.

All of the IFA Wildlife Research projects were accomplished with the cooperation and support of many people, organizations and government agencies. The Yukon Government would like to thank everyone who contributed to the success of these studies, in particular: the Aklavik HTC, the WMAC(NS), and the many people of Aklavik who contributed their information and their time.

Table 1: Summary of Wildlife Research Projects Undertaken Between 1984 & 1994

PROJECT	$	85/86	86/87	87/88	88/89	89/90	91/92	92/93	93/94	94/95	TOTAL
Wolf, Moose, Muskoxen & Grizzly Bear Observations on the Yukon North Slope	IFA YTG	$50K $10K	- $10K								$70K
Status & Habitat Assessment of Arctic Fox on the Yukon North Slope	IFA YTG PCS		$9K $2.5K -	$16K - -	$4K $1K $10K	$5K $1K $15K					$63.5K
Status & Seasonal Distribution of Moose in the Northern Richardson Mountains	IFA YTG PCS			$48K - -	$52.5K $1K -	$32.5K $2K $11K					$147K
North Slope Wolf Studies	IFA YTG PCS NOGAP			$83K $21.5K - -	$43K $19.5K $10K $68K	$11.8K $18K - -		$58K $10K - -	$83K $10K - -	$23.1K $5K - -	$463.9K
Wildlife Viewing Assessment	IFA YTG			$5K $8K	$5K $10K	$5K $12K					$45K
A Review of the Biology and Management of Grizzly Bears on the Yukon North Slope	IFA YTG				$12K $1K						$13K
Competition Between Muskoxen & Caribou on the Yukon North Slope	IFA YTG					$5K -					$5K
North Richardson Mountains Habitat Mapping	IFA YTG NOGAP						- $25K $50K	$265.5K $13K -	$225K $36K $68K	$51K $9K -	$742.5K
North Slope Wolverine Study	IFA YTG							$47K $5K	$62.7K $5K	$.4K -	$120.1K

TOTALS by Year & Funding Source	Source	85/86	86/87	87/88	88/89	89/90	91/92	92/93	93/94	94/95	TOTALS
	IFA	$50K	$9K	$152K	$116.5	$59.3K	-	$370.5	$370.7	$74.5K	$1,202.5K
	YTG	$10K	$12.5K	$29.5K	$32.5K	$33K	$25K	$28K	$51K	$14K	$235.5K
	PCS	-	-	-	$20K	$26K	-	-	-	-	$46K
	NOGAP	-	-	-	$68K	-	$50K	-	$68K	-	$186K

IFA - Inuvialuit Final Agreement, **YTG** - Government of Yukon, **PCS** - Polar Continental Shelf, **NOGAP** - Northern Oil and Gas Action Program

Table 2: Summary of Publications

PROJECT	RESULTING PUBLICATIONS
Wolf, Moose, Muskoxen and Grizzly Bear Observations on the Yukon North Slope	1. Wolf, Moose, Muskoxen and Grizzly Bear Observations on the Yukon North Slope. Hayes & Barichello, 1986
Status and Habitat Assessment of Arctic Fox on the Yukon North Slope	1. Abundance, Distribution and Occupancy of Arctic Fox (*Alopex lagopus*) Dens in the Northern Yukon Territory. Smits & Slough, 1987 2. Physical Characteristics, Terrain Associations and Soil Properties of Arctic Fox (*Alopex lagopus*) Dens in Northern Yukon Territory, Canada. Smits et al, 1987 3. Summer Food Habits of Sympatric Arctic Fox (*Alopex lagopus*), and Red Foxes (*Vulpes vulpes*), in Northern Yukon Territory. Smit et al, 1989 4. Distribution and Summer Occupancy of Fox Dens in Northern Yukon Territory 1984 - 1990. Smits & Slough, 1992 5. Landform Selection and Soil Modifications Associated with Arctic Fox (Alopex lagopus) Den Sites in Yukon Territory, Canada. Smith et al, 1992
Status & Seasonal Distribution of Moose in the Northern Richardson Mountains	1. Status and Seasonal Distribution of Moose in the Northern Richardson Mountains. Smits, 1991
North Slope Wolf Studies	Report in prep. - expected October, 1995
Wildlife Viewing Assessment	1. Non-consumptive Wildlife Use on the Yukon North Slope. Mossop & Talicaro, 1988 2. Wildlife Viewing Tourism on the North Slope, Considerations Relevant to the Inuvialuit. Talicaro, 1989 3. Herschel Island Avifauna Monitoring Project. Talicaro & Mossop, 1989
A Review of the Biology & Management of Grizzly Bears on the Yukon North Slope	1. Biology and Management of Grizzly Bear on the Yukon North Slope. Nagy, 1990
Competition Between Muskoxen and Caribou on the Yukon North Slope	1. A review of Competition for Limiting Resources Between Muskoxen and the Porcupine Caribou Herd. Smits, 1989
North Richardson Mountains Habitat Mapping	A computerized map of landcover and wildlife habitat was produced. No reports were published
North Slope Wolverine Study	Report in prep. - expected September 1995.

PROJECT SUMMARIES

&

ABSTRACTS

PROJECT: Wolf, Moose, Muskoxen & Grizzly Bear Observations on the Yukon North Slope

Rationale: As part of the implementation of the Inuvialuit Final Agreement, the development of a sound wildlife harvest strategy for the Yukon North Slope was considered a high priority to ensure harvest meet the needs of the Inuvialuit and be sustainable, within wildlife conservation objectives. Four locally important species for which little information had been gathered were moose, muskoxen, wolves and grizzly bears.

Objective: To report on the abundance and distribution of wolves, muskoxen, moose and grizzly bears observed on the Yukon's North Slope in late spring (June).

Time frame: June 1986.

Methods: To record late spring distribution and general abundance of moose, muskoxen and grizzly bear on the Yukon North Slope drainages; to visit previously identified wolf den sites to determine wolf use in 1986; search for new wolf dens; and, to radio-instrument a sample of denning wolves.

Product: Report - Hayes and Barichello, 1986.

Status: Completed 1986.



	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1985/86	50,000	10,000	nil	nil	60,000
1986/87	Nil	10,000	nil	nil	10,000
Totals	50,000	20,000	nil	nil	70,000

Partners: None.

Management Actions: A number of recommendations for further studies on wolves, moose and muskoxen were provided. Further research into wolf numbers, distribution and prey were conducted in 1987-90 and 1993-95. Detailed population trend information for moose was obtained during 1987-91. Further information on muskoxen (distribution and population trend) was obtained in conjunction with Parks Canada as a basis for the management plan which is presently under consideration.

ABSTRACT: Wolf, Moose, Muskoxen and Grizzly Bear Observation on the Yukon North Slope
Hayes & Barichello, 1986

During June 1986, aerial surveys of wildlife were conducted along major drainages of the Yukon North Slope. The purpose of the surveys were to visit known wolf dens and search for new den sites. During flights, we recorded moose, muskoxen and grizzly bear observations.

- Ten wolf dens were visited: two were active, one was productive. At the productive site, two adult wolves were radio-instrumented.
- Forty moose were classified, most were in the upper drainages of the Firth and Babbage Rivers.
- Twenty-three muskoxen were observed on the Firth-Malcolm River delta.
- Seventeen adult-size grizzly bears were seen.

The low occupancy rate of wolf dens probably reflects the low density of wolves thought to range in the Yukon North Slope. Rabies is known to be an important factor limiting pup survival in the adjacent Arctic National Wildlife Refuge in Alaska, but the effects of illegal and legal harvest of wolves are currently unknown.

Muskoxen appeared to be colonizing the Yukon North Slope from an introduced herd in Alaska. Recommendations are made to begin more detailed research on wolves, moose and muskoxen based on the findings of this initial survey.

PROJECT: Status and Habitat Assessment of Arctic Fox on Yukon North Slope

Rationale: Knowledge of location of breeding dens will provide an important basis for enabling conservation of arctic fox habitat through the land use planning process. This information will also facilitate population monitoring of the species by providing locations where reproductive success of the local population can be monitored. It will establish a foundation from which to measure the effects of future industrial development and other potential disturbances and harvest.

Objective: To gather baseline information for the management of arctic fox from both habitat and population management perspectives.

Time frame: 1986/87 to 1990.

Methods: Dens were located by systematic transect census, stratified random block sampling census, and incidental observations during relocation flights or other field activities. Dens were checked to determine their occupancy, and the presence of juveniles. Foxes were ear-tagged to enable identification of harvested foxes and seasonal distribution.

Product: A number of reports produced: Smits and Slough 1987, Smits et al 1987, Smits et al 1989, Smits and Slough 1992, and Smith et al 1992.

Status: Completed 1990 

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1986/87	9,000	2,500	nil	nil	11,500
1987/88	16,000	nil	nil	nil	16,000
1988/89	4,000	1,000	nil	10,000	15,000
1989/90	5,000	1,000	nil	15,000	21,000
Totals	34,000	4,500	nil	25,000	63,500

Partners: Aklavik Hunters and Trappers Committee

Management Actions: Current information suggests that Herschel Island is the primary arctic fox producing area in the Yukon. All arctic fox litters located on the study area in July 1988 and July 1989 had been produced on Herschel Island. The total number of arctic fox breeders appears to be extremely low. The clumped distribution of the population's breeding component increases the vulnerability of the population as a whole to harvest and human disturbance. Harvest will continue to be monitored and den site locational information will continue to be used when considering land management practices, including management of wildlife viewing/tourism enterprises

ABSTRACT: Abundance, Distribution and Occupancy of Arctic Fox (*Alopex lagopus*) Dens in Northern Yukon Territory
Smits & Slough, 1987

Presented are the results of an aerial stratified block sampling census of arctic fox dens on the Yukon Coastal Plain between the Babbage and Crow Rivers to the east, and the Alaska/Yukon Territory boundary to the west. The study area was divided into a high density and a low density area based on the results of earlier surveys. In total, 34.2% of the study area was censused. In the high density area, 23 sampling units, representing 90.4% of the stratum area were censused which amounted to 77.8%. The estimate of the total number of fox dens in the study area, corrected for sightability bias amounts to 92 $\pm$ 19 (95% C.I.). Of 75 dens checked on the ground for use or occupancy by foxes, 19 (25.3%) were classified as active. At three of these (4.0%), arctic foxes were observed while at another one (1.3%) a red fox was observed. No sign of pups was seen at any of the dens. A total of nine dens have produced pups during the period 1984-1987. Further activities planned under the arctic fox project are discussed.

ABSTRACT: Physical Characteristics, Terrain Associations, and Soil Properties of Arctic Fox *(Alopex lagopus)* Dens in Northern Yukon Territory, Canada
Smits et al, 1987

Physical and soil characteristics of arctic fox (*Alopex lagopus*) dens on Herschel Island and the Yukon Coastal Plain, Yukon Territory, Canada are described. Additionally, their distribution (n=42) is related to terrain map units within the study area.

Dens are generally associated with warm and well drained landscape positions. Burrow entrances are significantly oriented toward the south ($P<0.0025$). Soils of dens are coarse textured and well drained. Mean depth to permafrost under the den (172 cm) is greater ($p<0.02$) than at adjacent sites 44 cm. Certain unique soil profile characteristics, particularly the replacement of common cryoturbation features with those of zooturbation and the formation of humus rich surface horizons, appear to be the result of denning activities by foxes. Observed differences in soil temperature and depth to permafrost between den site soils and adjacent soils have likely been caused, at least in part, by denning activities.

Den distribution is evaluated using an 1:25,000 ecological (soil and vegetation) map of Herschel Island and a 1:125,000 map of surficial deposits and landforms of Yukon Coastal Plain. Distribution of dens over the various map units is significantly different from random ($P<0.001$). The map unit foxes prefer for

denning on Herschel Island is characterized by moderately eroded, sloping gullied terrain where foxes select sandy erosional mounds for denning. The map unit preferred for denning on the Yukon Coastal Plain is a fluvial unit where foxes select streamside cutbanks and occasional dunes for den location. The non-random association of fox dens with certain landforms facilitates the use of existing terrain maps in making land use planning decisions.

ABSTRACT: Summer Food Habits of Sympatric Arctic Foxes, *Alopex lagopus*, and Red Foxes, *Vulpes vulpes*, in the Northern Yukon Territory
Smits et al, 1989

Food habits of sympatric Arctic Foxes (*Alopex lagopus*) and red foxed (*Vulpes vulpes*) were determined from 31 Arctic Fox scats (from three active natal dens) and 39 Red Fox scats (from two active natal dens) collected in the Northern Yukon Territory in summer 1985. Prey consumption was quantified in terms of percentages of fragments and percent frequency occurrence of taxa. Microtinae, primarily the Varying Lemming (*Dicrostonyx groenlandicus*) was the major prey for both fox species. The Brown Lemming (*Lemmus sibiricus*) and Tundra Vole (*Microtus oeconomus*) [Red Fox only], and Northern Bog Lemming (*Synaptomys borealis*) [Arctic Fox only] were consumed in lower quantities. Several bird species were consumed, primarily by Red Foxes. *D. groenlandicus* was consumed less frequently and birds more frequently by Red Foxes on the mainland (Yukon Coastal Plain) than by those on Herschel Island. The diets of sympatric Arctic Foxes and Red Foxes were similar, however, the Red Fox used more birds and less *D. groenlandicus* than did the Arctic Fox.

ABSTRACT: Distribution and Summer Occupancy of Fox Dens in Northern Yukon Territory 1984-1990
Smits & Slough, 1992

We investigated the distribution and summer occupancy of fox (*Alopex lagopus* and *Vulpes vulpes*) dens in northern Yukon during 1984-1990. During a preliminary survey in 1984, 14 dens were identified on Herschel Island. Additional dens were found in subsequent years incidental to monitoring flights and a complete survey was conducted in 1986. It is considered unlikely that any natal dens went undetected. There were two natal arctic fox dens annually from 1984-1987, seven in 1988, one in 1989, and six in 1990. There was one natal red fox den in both 1984 and 1985. A comparison of occupancy rates of dens by fox litters between years was complicated by the fact that dens located in earlier years were generally larger and, therefore, more likely to be natal. When occupancy rates are compared between years using dens sampled each year, proportions of natal arctic fox dens were substantially higher in 1988 (18.8%) and 1990 (18.8%) than in 1986 (6.3%),

1987 (6.3%), and in 1989 (3.1%). A comparison of occupancy rates by arctic fox litters of dens known in 1984 between all years during 1984-1990 showed that the difference between those was not significant ($p>0.75$).

On the Yukon Coastal Plain, 32 dens were identified during a preliminary survey in 1984, while an aerial stratified random block sampling census in 1987 yielded a total estimate of 50 dens ($\pm$ 13, 90% C.I.). It is considered unlikely that any natal dens have been missed on the Yukon Coastal Plain within the study area. One natal arctic fox den was observed during each of 1985 and 1988, and one red fox natal den was observed in 1985, 1987, 1988, and 1989. There was no significant difference in occupancy rates between years for arctic foxes or red foxes on the Yukon Coastal Plain. Twenty arctic fox pups are known to have been produced on Herschel Island in 1980; litter size varied from four to seven ($X = 5.0 \pm 1.2$ [S.D.]). Herschel Island had one of the highest densities of arctic fox natal dens reported in the literature, whereas the Yukon Coastal Plain had one of the lowest densities. Information currently available suggests that Herschel Island is the primary arctic fox producing area in Yukon Territory. The clumped distribution of the population's breeding component increases the vulnerability of the population as a whole to harvest and human disturbance. Arctic fox trapping may need to be restricted if wildlife viewing becomes a significant use of this natural resource.

ABSTRACT: Landform Selection and Soil Modifications Associated with Arctic Fox (*Alopex lagopus*) Den Sites in Yukon Territory, Canada

Smith et al, 1992

Arctic Fox (*Alopex lagopus*) dens were examined in the unglaciated portion of the Yukon Coastal Plain and on Herschel Island. Den selection relative to landform type was evaluated for 65 dens. On the Yukon Coastal Plain foxes established dens on sandy fluvial and wind-modified (dunes) fluvial deposits almost exclusively. On Herschel Island, moderately eroded landscapes were selected over noneroded, slightly eroded, and wetland terrain. The use of terrain maps proved to be useful in defining suitable den habitat. Chemical and physical properties of soil were compared on and immediately adjacent to 25 dens. Mean values for soil temperature, depth to permafrost, soil particle size, pH, N, and exchangable K were significantly different ($P < 0.05$) between on-den and off-den samples in both study areas. Total carbon, total phosphorous, and C:N were significantly different on Herschel Island but not on the Yukon Coastal Plain. The role of foxes in modifying soil chemical and physical properties is discussed relative to differences inherited through the parent material properties.

PROJECT: Status and Seasonal Distribution of Moose in the Northern Richardson Mountains

Rationale: Little was known of the biology of moose on the Yukon North Slope. Most observations of moose in the area were made in the early 1970's in conjunction with caribou studies addressing the impact of a proposed pipeline route. The available information suggests that these moose constitute a unique population; striking features appear to be their migratory behaviour and their dependence on often widely dispersed habitat patches. Road development in support of hydrocarbon exploration, increased harvest levels due to these roads, and the potential establishment of an outfitting industry could all have direct affects on the moose population. Because little specific and current information was available on moose in this area, it was not possible to provide recommendations to effectively regulate harvest or minimize negative impacts on moose populations and their habitat due to future possible resource development.

Objective: To determine abundance of moose, to delineate seasonal movement patterns and location, timing, and duration of seasonal use of habitat units, and to estimate sustainable harvest levels.

Time frame: 1987/88 to 1990/91

Methods: A total of 26 moose were fitted with radio collars over 1987 and 1988. To determine seasonal distribution, 18 aerial searches were made between December 1987 to July 1990. Population size was estimated using aerial surveys during March or April of 1987, 1988, and 1989. Mortality rates were calculated from radio collared moose. A survey to determine sex and age composition was conducted in November 1988. Home range areas were calculated. Habitat use was recorded for all moose seen.

Product: Report - Smits 1991.

Status: Complete 1991.

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1987/88	48,000	nil	nil	nil	48,000
1988/89	52,500	1,000	nil	nil	53,500
1989/90	32,500	2,000	nil	11,000	45,500
Totals	133,000	3,000	nil	11,000	147,000

Partners: Aklavik Hunters and Trappers Comittee

Management Actions: For the northern slope portion of the study area, a conservative harvest rate of 3% (5 bull moose) is proposed. For the southern slope, an annual harvest rate of 6% (10 moose either sex) is proposed, with nine of these to be taken in the Yukon and one in the Northwest Territories. Further assessment and adjustment of harvest is dependant on refinement of the harvest data as it relates to location of kill.

ABSTRACT: Status and Seasonal Distribution of Moose in the Northern Richardson Mountains
Smits, 1991

Presented are the results of a study into the abundance, seasonal movement patterns, and habitat use of moose (*Alces alces*) in the Northern Richardson Mountains and adjacent Yukon Coastal Plain. Aerial surveys covering the whole study area were completed in March/April and October 1987, April and November 1988, and March 1989. All surveys prior to 1989 were fixed-wing surveys for the purpose of determining sex/age composition and seasonal distribution.

The March 1989 survey yielded, additionally, a precise estimate of moose abundance in the study area: 237 adults (>1 yr.) $\pm$ 28 (95% CI). The extended population estimate including calves amounted to 283. Twenty-six adult moose were radio collared (20 in October 1987: 14 females, six males and six in July 1988: four females, two males) across the study area and aerially monitored through July 1990 to determine mortality rates, seasonal movements and habitat use.

The range of annual mortality (95% CI) was 8.7%-17.4% and 15.8%-21.1% for the periods June 1988 - July 1989 and July 1989 - July 1990, respectively. Although estimates of calf recruitment in March 1989 overlap with the adult mortality rate estimated for the period June 1988-July 1989 it is thought to be more likely for the population to have increased during the period June 1988 - July 1989. Mean group size of moose was lowest in July (1.3) and highest in December (4.4).

Seasonal movement patterns were strikingly different between moose spending the summer on the North Slope ('North Slope moose') and those summering on the South Slope ('South Slope moose'). North Slope moose exhibited maximum distances between summer and winter locations averaging 97.3 km, significantly different from South Slope moose (30.3 km). Total home range areas of adult males was not different from adult females. Average home range area of combined adult male and adult female moose was 1,142 km^2. Mean home range area of 'North Slope moose' (2,285 km^2) differed from 'South Slope moose' (X = 197.6 km^2). Moose habitat constituted 609.0 km^2 (6.5%) of the study area with a March 1989 density of 0.46 moose km^2 of moose habitat. Of nine radio-collared moose summering on the North Slope, only one remained there year-round.

A quantitative estimate of seasonal distribution was derived from the distribution of radio-collared animals relative to the numbers and distribution of moose observed during the March 1989 survey. It appeared that 160 moose were present on the North Slope during the summer of 1988. Sixty-nine percent of these wintered on the South Slope within the study area. The remaining 173 moose wintering on the South Slope appeared to be year-round residents. During late winter, 88% of

the estimated moose 'sub'-population resides in the Yukon and 12% in the Northwest Territories.

Observations of moose in groups with one or more radio-collared moose, pooled by season among years, were non-randomly associated with vegetation types during all seasons. Moose were most often associated with shrub vegetation in all seasons (range 50.7%-94.3%). Association with other vegetation types ranged from 0%-13.0% for coniferous vegetation, from 0.8%-2.9% for deciduous vegetation, and from 4.8%-33.3% for mixed coniferous/deciduous vegetation. Significant positive linear relationships were found between moose numbers and total moose habitat, by drainage and between moose numbers and shrub vegetation availability, by drainage. Moose were non-randomly associated with elevation classes during all seasons. During spring, most animals were concentrated between 1,000-2,499 ft. The most frequently used elevation was 1,000-1,499 ft. Summer observations were more evenly distributed over the available elevations. Relative to spring, this constituted a shift toward lower (<1,000 ft.) elevations. In fall, moose were concentrated between 1,5000-2,000 ft., with almost half of all observations between 2,000-2,499 ft. During winter, moose were relatively evenly distributed over the 1,000-2,499 ft. elevations.

Moose groups were seasonally aggregated although less aggregated in April 1988 than in either April 1987 or March 1989. Similarly, moose groups were more aggregated in fall than they were in late winter/spring. The clumped distribution of moose combined with the narrowness of habitat patches makes the moose population vulnerable to hunting and disturbance.

Because current estimates of 'North Slope moose' are crude and this 'sub'-population is difficult to survey, conservation harvest rates of 3%, bull only, or 5 bulls annually, are proposed. For the South Slope portion of the study area, an annual harvest rate of 6% or ten moose, either sex, is proposed. Proportional with the distribution of moose observed during the March 1989 nine of these should be harvested in Yukon and one from the Northwest Territories.

PROJECT: North Slope Wolf Studies

Rationale: In accordance with the Inuvialuit Final Agreement, the objective of wildlife management on Inuvialuit land is to ensure that the annual harvest of all wildlife species occurs within sustainable limits. This requires understanding the effects of natural predation on ungulates, especially by the gray wolf (*Canis lupus*). Equally, an understanding of the ecological factors that limit wolf distribution and population dynamics in the area will contribute to a comprehensive management plan for these valuable northern furbearers, and highly desirable species for wildlife viewers.

Objectives: To record distribution and abundance of wolves in the northern Yukon. To record information on wolf-killed ungulates and summer food habits. To determine the seasonal movements and general prey relationships of radio-instrumented wolves. To locate denning sites and determine productivity. To determine annual survival rates of pups.

Time frame: 1987 to 1995

Methods: An aerial census done in spring 1987. At least 2 members of each wolf pack encountered during the spring census were radio-collared and followed to record denning sites, pup survival, and movements. Scat samples were taken to determine food habits. Kill sites were examined to determine species, age class and sex of prey. Denning sites were mapped and pup survival was recorded.

A second aerial survey to count wolves was conducted in 1993. Because the first aerial survey indicated that wolves on the North Slope could not easily be followed by aircraft due to the long distances they travelled, satellite collars were put on eight wolves and weekly locations were recorded until April 1994.

Product: Report - Hayes et al, 1995 in prep. -expected October 1995.
Verbal presentation of results to the Aklavik HTC and the public, with recommendations to the HTC on harvest management.

Status: All field work is complete.

Partners: Government of the Northwest Territories, Aklavik Hunters and Trappers Committee

Management Actions: The field work has been completed. Upon completion of the report, all recommendations on harvest management will be given to WMAC (NS) and the Aklavik Hunters and Trappers Committee. Results will also be forwarded to the Porcupine Caribou Management Board.

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1987/88	83,000	21,500	nil	nil	104,500
1988/89	43,000	19,500	68,000	10,000	140,500
1989/90	11,800	18,000	nil	nil	29,800
1992/93	58,000	10,000	nil	nil	68,000
1993/94	83,000	10,000	nil	nil	93,000
1994/94	23,100	5,000	nil	nil	28,100
Totals	301,900	84,000	68,000	10,000	463,900

ABSTRACT: Population Ecology of Wolves in the Yukon North Slope and Western Northwest Territories
(Hayes et al, in prep.)

Ecological studies of wolves (*Canis lupus*) were conducted from 1987 to 1992 in the northern Yukon and in the adjacent Richardson Mountains of the Northwest Territories. Fifty radio-tagged wolves in 20 packs were annually studied. Based on radio-telemetry and snow-tracking census, average wolf density was 3 wolves/ 1000 km^2 in a 40,000 km^2 area. The wolf population appeared to increase slightly through 1990, based on changes in size of radio-tagged wolf packs. Mean pack size increased from 4.5 wolves in April 1987 to 8.5 wolves by November 1988. Pack size declined though winter to 5.8 wolves in April 1989. Wolves in the mountainous tundra area were mainly migratory and followed the annual movements of the Porcupine Caribou Herd (*Rangifer tarandus groenlanicus*). Mean home range size of tundra wolves was 7,254 km^2. Wolves in the southern taiga area were mainly territorial and hunted moose (*Alces alces*). Mean home range size of taiga wolves was 1.310 km^2.

We found caribou and 21 moose that were killed by wolves. Most caribou were middle aged and were not in stressed physical condition. A total of 489 wolf scats were collected from six wolf dens. Small mammals, waterfowl, caribou and moose were important prey items. Predation rates were monitored among 31 wolves in seven packs in late winter 1989. Wolves killed an average of 0.07 caribou/wolf/ day, or 6.6 kg of caribou/wolf/day. The mean consumption rate was 4.9 kg of caribou/wolf/day. Kill rates were high compared to wolves that mainly killed migratory barren ground caribou in other studies.

Pup survival appeared to be relatively low during the study, and wolf mortality was high in most years. Natural mortality and hunting of wolves by people were important factors limiting wolf population size. Rabies was not found to be an important mortality factor for wolves. Wolves dispersed up to 600 km into Alaska, and long distance immigration of radio-tagged wolves from Alaska was also documented. No wolf movements were observed across the MacKenzie Delta.

A total of 121 wolves were harvested by hunters in Aklavik and Fort MacPherson. Harvest of wolves was closely linked to the distribution of caribou harvested by Aklavik hunters. Annual wolf harvest fluctuated each year, depending on the availability of Porcupine Caribou to arctic communities.

Wolves did not constitute a major limiting factor to the Porcupine Caribou Herd. Wolves apparently cannot regulate caribou densities because they cannot follow year-round caribou movements efficiently, especially during the wolf denning period. Recommendations are made to limit the effect of wolf harvest by people on caribou winter ranges.

PROJECT: Wildlife Viewing Assessment

Rationale: To research the feasibility, marketability, and the necessary resource management criteria to develop a stable wildlife viewing enterprise on the NWT-Yukon North Slope.

Objective: To determine the potential affects of the industry on the resources of the area; the attractiveness of bird populations and other features of the slope to visitors; the various disruptions to life of the people of the North Slope which can be anticipated; and, a monitoring program for the non-game wildlife of Herschel Island.

Time frame: 1987/88 to 1989/90, with subsequent stages planned for 1991/92 and 1992/93. Proposals for continuation were unsuccessful due to lack of interest in Aklavik in developing this sector.

Methods: Personal interviews with Aklavik Community members and a community workshop provided background information concerning attitudes towards wildlife viewing. A trip was designed to field test potential impacts and reources of the island. Training sessions for Park employees were held and field transects were developoed to monitor avian populations.

Product: Three reports were produced: Mossop and Talarico 1988, Talarico 1989, Talarico and Mossop 1989.

Status: Complete.

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1987/88	5,000	8,000	nil	nil	13,000
1988/89	5,000	10,000	nil	nil	15,000
1989/90	5,000	12,000	nil	nil	17,000
Totals	15,000	30,000	nil	nil	45,000

Partners: Aklavik Hunters and Trappers Committee

Management Actions: Dependent on community interest in developing this sector.

ABSTRACT: Non-consumptive Wildlife Use on the Yukon North Slope
Mossop & Talarico, 1988

Part 1: The effects of wildlife viewing: tourism and birds in Herschel Island Territorial Park.

The current tourism trend is seeing an increase in the numbers of specialised tours and visitors. It is expected to result in an increased stress on the wildlife and habitat. This section addresses the effects of increased tourism on bird life in Herschel Island Territorial Park.

Some of the negative impacts of the increased use of the Park are that disturbance at nest sites can result in the failure of that year's nesting attempt and trampling of areas suitable for nesting. Two positive impacts are the educational benefits that come from an increased concern for wildlife and habitat by visitors and the economic benefits of employment.

Three of the effects an increased number of visitors may have are discussed.

1. Habitat destruction resulting from the increased trampling of soil and vegetation can lead to a loss of habitat diversity and an increase in erosion of ravines and mud cliffs.
2. Driftwood collected for firewood reduces the nesting potential of several bird species. Removal or alterations of vegetation around nest sites by photographers make the nests more vulnerable to predators.
3. Viewing harassment from frequent and long visits by photographers and wildlife observers. This type of viewing has a greater potential for disturbance.

The report also suggests four methods to manage the impacts of visitors.

1. Determine zones around special areas. Spatial and temporal zones can contribute to the protection of nesting birds at certain times of the year.
2. Provide printed information. Brochures and pamphlets can provide behavioural guidance for visitors at viewing sites
3. The development of an interpretive strategy. Incorporate the information on the sensitive nature of nesting birds in a broader interpretive context for the Island.
4. Establish viewing facilities such as boardwalks, blinds and viewpoints to guide visitors to the various sites while minimising their impact on the sensitive habitat.

Eight recommendations are put forward to manage both the visitors to the Island as well as the wildlife.

1. Specify nesting zones that are sensitive to human disturbance.
2. Include a section in an interpretation program that promotes protection and awareness of the island's bird communities.
3. Rangers should monitor the progress of sensitive nesting bird species and collect long term trends on nesting data.
4. Draft bird viewing guidelines for visitors, photographers and guides. Include: awareness of sensitive areas; recognition of nest defence behaviour; understand the threats of premature fledging; understand the treats of harassment of boats to moulting waterfowl; understand that close approach can cause broods of shorebirds and waterfowl to scatter and; awareness of the threat to disturbed birds from natural predators.
5. Experiment with bird viewing blinds.
6. Design hiking routes and boardwalks to provide access across sensitive areas.
7. Restrict collection of driftwood for firewood.
8. Disperse hikers to other parts of the island to reduce localised impact.

Part 2: Bird Watching Enterprise on the Yukon North Slope.

This section details an experimental trip designed to test the potential of taking boat trips from Aklavik to the North Slope and Herschel Island. This research seeks a better understanding of six unknowns of the non-consumptive wildlife use on the North Slope. They are as follows:

1. The degree that birds are available for viewing;
2. The susceptibility to disturbance;
3. The best access strategy to pursue;
4. Logistics of available transportation;
5. Marketing strategy;
6. Potential financial returns.

Researchers accompanied a boat tour of visitors to Herschel Island from Aklavik. Records of bird observations, species, nesting activity and behaviour of participants were kept.

The visitors found 69 species of birds and discovered the nests of 29 species. Features that were most important to the visitors were described as follows:

- observing new species of birds;
- observing nests never before seen;
- observing behaviours; and,
- experiencing a different habitat (ecosystem).

There are 2 ways of gaining access to Herschel Island, by boat or by float plane. Float planes restrict the movements of visitors between Herschel Island and Inuvik and are usually more expensive. Boats take more time but provide visitors with more freedom to explore the coast on their way to the island. They are usually an inexpensive way to travel.

The conclusions and recommendations of the report include:

1. The birds of the North Slope are an attraction to visitors.
2. These birds are vulnerable to disturbance from visitors.
3. Aklavik is in a good geographic and logistic position to provide support for the development of local wildlife viewing enterprises.
4. Enterprises can expect only moderate to low returns.
5. This industry will require the development of training and interpretive materials.

ABSTRACT: Wildlife Viewing Tourism on the North Slope, Considerations Relevant to the Inuvialuit
Talarico, 1989

The report provides background information on the wildlife resources as well as the North Slope wildlife viewing tourism potential. It looks at the issues and factors the community of Aklavik should address when considering further development of this enterprise. The focus is on the needs of local residents and planning required to start wildlife viewing enterprises.

Interviews with residents of Aklavik as well as a community meeting examined people's perspectives on wildlife viewing. The information collected is grouped into the following tourism industry components: market potential; market image; product definition; infrastructure requirements; and resource impact management.

Research shows that adventure tourism is growing fast. The North Slope has much to offer and is easily accessible from the Dempster Highway. The north Slope will have to compete with international destinations that are well established. It offers

diverse wildlife viewing opportunities including a wide variety of arctic plants, birds and the largest North American barren-ground caribou herd; the Porcupine Caribou Herd. It is different from other northern destinations because of its easy access through the Dempster Highway. Travellers can experience the transition from boreal forest to sub-arctic tundra.

Adventure tourism to the North Slope is divided into back-country and front-country opportunities. Front-country opportunities include sites off the Dempster Highway and around Inuvik. Back-country sites include most of the North Slope. The back-country trips are subdivided into 'hard' and 'soft' adventures. These types of trips attract different clients. 'Hard' adventure tourism typically requires much equipment, for example, the Firth River rafting trips. 'Soft' adventure opportunities may be more accessible to Inuvialuit outfitters since they usually require less equipment. Several locations along the North Slope lend themselves well to this type of travel.

Direct and indirect gains are possible for the Inuvialuit people. Direct and dependent gains come from working for an established tour company. Direct and independent gains result from owning and operating a business. Indirect benefits will come from employment created in related businesses. Developments must consider the impact of each business type on life style choices of residents. For any business, proper care and attention must be given to the development of accommodation, insurance, transportation and safety of the equipment utilised.

Cultural values must be used to educate visitors, not to entertain them. Insight into local values, traditions and uses of the land may be beneficial to visitors and residents because it draws attention to their importance. Guide training programs and community boards may help resolve tourism related conflicts.

Some conclusions drawn from the research are that there is a high potential for adventure tourism because of the many unique, inexpensive and easy to access opportunities provided by the Dempster Highway. People of Aklavik are knowledgeable of the methods and equipment necessary for field travel.

Some of the possible negative impacts include habitat disturbance and viewing harassment, especially during breeding season. Visitors may affect the integrity of fishing, whaling and trapping camps. Conflicts between visitors and residents may originate from wildlife and land use values. Exposure to local lifestyle and history through cross-cultural contact between visitors and residents can develop into positive educational values. Guide training programs and information materials may help address conflicts.

The following recommendations are put forward.

1. Establish a community tourism committee to address wildlife and Inuvialuit interests.
2. Develop innovative and traditional training programs for guides and other people involved in wildlife viewing activities.
3. Make tourism practices on the North Slope consistent with the objectives and strategies of wildlife management plans for the area.
4. Identify tourism related conflicts and develop appropriate wildlife management programs and strategies to minimize negative impacts.

ABSTRACT: Herschel Island Avifauna Monitoring Project
Talarico & Mossop, 1989

Increased visitation to Herschel Island Territorial Park suggests several threats and benefits to the breeding bird community. This project attempts to examine the benefits and suitability of four management techniques.

1. Design a methodology for annual monitoring of the breeding bird populations to detect changes over time.
2. Conduct training sessions to familiarize Park Rangers with the process designed to monitor bird numbers.
3. Conduct training sessions with Park Rangers to deliver the techniques required for raptor and seabird banding.
4. Design and test working strategies with visitors to the Park to manage ongoing activities near critical nesting habitat.

Researchers conducted two workshops to acquaint the Park Rangers and the Aklavik Wildlife Technician with bird transects across the settlement and to provide survey techniques of rough-legged hawk and black guillemot nests. They used ground census transects, an organized banding program and daily bird counts to monitor breeding bird numbers. Daily bird lists and incidental nest observations provide reliable independent control on the relative abundance of species. Two designs were selected to manage the behaviour of visitors. The first is to request the cooperation of visitors in using selected walking routes to avoid nesting birds, The second is to guide nature tours of the area.

The results of the projects were that one transect was conducted in the area most frequented by visitors. An experimental control area will be required where there is less visitor traffic to compare results. It was impossible to demonstrate banding techniques on rough-legged hawks because of the low breeding rate. Technical difficulties prevented banding of black guillemots. Incidental sightings of unusual

species or events were recorded and should be continued. Experiments demonstrated that designated walking routes lead to habitat damage and do not help visitors recognize alarm behaviours in birds. Guided walks were more successful to control visitor movements and improve the interpretive value of the experience.

The author concludes that the proposed methodology for annual monitoring of breeding bird populations seems reasonable. Basic standardized field techniques should help to keep training needs to a minimum. Guided tours are an appropriate control of visitor movements to protect breeding birds. More field training sessions in banding techniques for rough-legged hawks and black guillemots are advisable.

Yearly bird transects should be conducted near the settlement area and another selected area to monitor breeding bird density. As well, Park Rangers should continue yearly surveys of rough-legged hawk nests and the black guillemot colony and should record daily bird sightings and breeding observations. A trained guide should lead visitors around the settlement area to reduce the impact on nesting birds. Finally, a cooperative agreement developed between the Government of Yukon Parks and Outdoor Recreation Branch and the Fish and Wildlife Branch will help maintain the ongoing monitoring of birds on Herschel Island.

PROJECT: A Review of the Biology and Management of Grizzly Bears on the Yukon North Slope.

Rationale: During the mid 1970's a population study on grizzly bears in the northern Yukon was completed by the Canadian Wildlife Service. Similar studies were done recently in the Northwest Territories and are ongoing in Alaska. The information necessary to manage grizzly bears in the Inuvialuit Settlement area can be enhanced by using relevant information from other studies in the region.

Objective: To provide a summary of information to direct management responses and guide further research for grizzly bears on the North Slope.

Time frame: October 1988 to December 1989

Methods: Literature review.

Product: Report - Nagy 1990.

Status: Completed 1989.

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1988/89	12,000	1,000	nil	nil	13,000
Totals	12,000	1,000	nil	nil	13,000

Partners: Government of the Northwest Territories.

Management Actions: Ten recommendations were given. These recommendations included: a census be conducted; a standardized harvest data collection system be instituted; a habitat inventory be conducted; and, a number of suggestions regarding information on harvests which should be collected. As a result, a joint YTG/ GNWT grizzly study was proposed and conducted in the Richardson Mountains. This produced an integrated interim bear management plan for the North Slope which has been implemented.

ABSTRACT: Biology and Management of Grizzly Bear on the Yukon North Slope
Nagy, 1990

This report reviews the biology and management of grizzly bears on the Yukon North Slope.

By extrapolation of bear densities found in similar areas in Northern Alaska and those in the Barn Range, to the whole IFA settlement area, the following density estimates were derived:

- Coastal plains and low foothills - 6.5/1000 km^2
- Barn and Buckland Mountains - 26/1000 km^2
- British and Richardson Mountains - 15/1000 km^2

The total grizzly population in the IFA settlement area is estimated at 316 bears, including 151 bears in Northern Yukon National Park and 165 on territorial lands by extrapolating these densities.

A conservative maximum harvest mortality rate of 4% is proposed as it may be difficult to monitor non-harvest mortalities. The sex ratio should be 3 males to 1 female in the annual kill. Based on a wounding loss of 25%, a kill comprised of 75% males and 25% females and a maximum annual allowable kill of 4% of the estimated standing population, the maximum quota should be 5 bears (4 males and 1 female) on territorial lands and 4 bears (3 males and 1 female) in the National Park.

The total known man-caused mortality on territorial and park lands of 2 and 6 bears, respectively, during the period 1980-1987 was less than the annual allowable kill of 5 and 4 bears, respectively, for those areas. Assuming that all mortalities have been recorded, these data suggest that the grizzly bear populations in the IFA settlement area, and in general the Northern Yukon, are largely unexploited. Harvest quotas should be established on a rotation basis within existing game management subzones to ensure a long-term uniform distribution in the harvest of bears.

It is proposed to determine current bear density for the Barn Mountains by further fieldwork. However, first priority should be given to determining densities for the Richardson Mountains and British Mountains. Two approaches are suggested: short-term intensive capture-mark-release studies and early spring den site surveys.

A standardized data collection system to monitor harvest and non-harvest related mortalities is also proposed.

PROJECT: Competition Between Muskoxen and Caribou on the Yukon North Slope

Rationale: Although a few studies on interspecific competition amongst ungulates have been conducted elsewhere, no study has specifically addressed competitive interactions between caribou of the Porcupine Herd and muskoxen occurring within this herd's range. There have been recent concerns from the public about the potential for muskoxen limiting or effecting the caribou population.

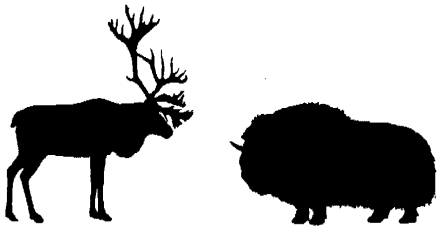
Objective: This report is a review of studies dealing with competition between caribou and muskoxen. From this, conclusions are drawn regarding the likelihood of competition specifically between muskoxen and caribou of the Porcupine Herd.

Time frame: 1989/90.

Methods: Literature review.

Product: Report - Smits, 1989.

Status: Completed 1989.



	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1989/90	5,000	nil	nil	nil	5,000
Totals	5,000	nil	nil	nil	5,000

Partners: None.

Management Actions: The review concluded the likelihood of competition (space and food) between the two species is small due to the following:

- muskoxen habitat is a relatively small proportion of the summer range of the Porcupine Caribou Herd;
- a plant species which both species eat is selected by caribou only part of the year and is abundant;
- caribou vastly outnumber muskoxen; and,
- the Alaskan muskox population appears to have now stabilized which indicates that muskoxen populations on the mainland may stabilize at lower densities than previously believed.

ABSTRACT: A Review of Competition for Limiting Resources Between Muskoxen and the Porcupine Caribou Herd
Smits, 1989

Muskoxen were found throughout arctic Alaska and probably parts of Yukon until their extirpation from the arctic coast between 1858 and 1865. In 1969 and 1970, 64 muskoxen from Nunivak Island, Alaska were reintroduced into northeastern Alaska. Fifteen years later, 476 muskoxen were counted in Alaska. Some of these muskoxen have since wandered into the northern part of the Yukon Territory.

Calf production rate during calving and post calving has been approximately 20%, which is typical of a colonizing muskoxen population. Muskoxen eruption in the calving/post calving range of the Porcupine Caribou Herd is of concern to Inuvialuit of the Mackenzie River Delta. Studies done in the Canadian High Arctic, Banks Island N.W.T. and Melville, N.W.T. concluded that muskoxen and caribou generally prefer different habitats and diets and therefore there is only minimal competition between caribou and muskoxen for food and space.

On Melville Island feeding behaviour was also different, caribou sought out exposed feeding sites where the snow was shallow and muskoxen broke through drifts and cratered in snow up to 50 cm deep. Studies done on the muskoxen in northern Alaska/Yukon and on the Porcupine Caribou Herd show that there may be habitat overlap in northeastern Alaska and northern Yukon from early May until August. However, little information exists on this overlap.

All North American workers studying muskoxen - caribou interactions are of the opinion that little, if any, competition for forage or space takes place between the two species (most of these studies were done in the summer). The dynamics of forage species, feeding ecology and competition for space of caribou and muskoxen is only partly understood. However, in view of what has been studied in other regions, certain inferences can be made for the North Slope. Muskoxen and Porcupine caribou habitat only overlap during a short period of time. This species of forage is readily available and the muskoxen only use a small proportion of it. Thus it seems likely that if any competition occurs for forage the muskoxen will suffer from resource stress more than caribou.

PROJECT: Wildlife Habitat Mapping in the Northern Richardson Mountains

Rationale: Given the increasing interest in northern development (largely hydrocarbon related) and the lack of wildlife habitat information, the Inuvialuit Game Council assigned highest priority to the identification and mapping of key wildlife habitats on the North Slope.

Objective: To produce a vegetation/landcover map of the Richardson Mountains, to be used as a base map for outlining the distribution of important wildlife habitats.

Time frame: Field work - summer 1992, 1993, and 1994. Final map produced by fall 1995.

Methods: Satellite imagery and digital analysis was used to develop classifications of vegetation communities. The classification was ground truthed to see what is on the land in the area, of study, and to determine whether it matched the computer classification. Information on wildlife in the area was gathered and a process to relate wildlife distribution to the landcover classes was developed on a Geographic Information System (GIS).

Product: Computerized map of landcover and wildlife habitat which is available to those requiring this information.

The vegetation/land cover map of the Northern Richardson Mountains shows 16 land cover classes, including 12 vegetation types, as well as ice, water, barren rock, and unclassified. The map was developed using digital analysis of satellite imagery.

The map was developed to provide baseline information for documenting important wildlife habitats. The Geographic Information System (GIS) can be used to overlay wildlife locations onto the vegetation types. The GIS enables calculation of the vegetation types are preferred by the animals and which seem to be avoided. With this information, Inuvialuit and other land managers can plan development activities to ensure that key wildlife habitat are protected.

Discussions are underway to come up with the best way to co-ordinate the databases to ensure all agencies that have accumulated wildlife and habitat data will contribute to this integrated data base in the GIS.

Status: Three field seasons are now complete. A draft map has been produced. Ground truthing of the final map was done in the summer of 1994. Some reclassification work was necessary - this was carried out with a consultant in the winter of 94/95. The reclassified map will be assessed in the fall of 1995 and a GIS analysis to determine important habitat types will be conducted.

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1991/92	nil	25,000	50,000	nil	75,000
1992/93	265,500	13,000	nil	nil	278,500
1993/94	225,000	36,000	68,000	nil	329,000
1994/95	51,000	9,000	nil	nil	60,000
Totals	541,500	83,000	118,000	nil	742,500

Partners: Aklavik Hunters and Trappers Committee.

Management Action: Project is ongoing. The present map will be useful with other studies to determine habitat use and hence for habitat protection purposes. Integration of other related wildlife information on GIS will aid comprehensive resource management decision making.

PROJECT: North Slope Wolverine Study

Rationale: Wolverine are an important furbearer to the people of Aklavik, with Aklavik hunters and trappers taking about one third of all wolverine harvested each year on IFA lands. A population estimate combined with related basic background information on this species in this region is essential to the management of sustained harvest. This information would permit an evaluation of present harvest practices.

Objective: To estimate wolverine population size in hunted and unhunted areas of the North Slope and compare population to reported harvest levels.

Time frame: Study began in April 1993 and will end in March 1994.

Methods: Radio collar wolverines in North Richardson Mountains to estimate population size and density, seasonal movements, how many are born and die each year. Test a new technique developed by Alaska Fish and Game Department to estimate population size.

Product: Report in prep, expected September, 1995. Verbal presentation of results to the Aklavik HTC and public, with recommendations to the WMAC(NS) on harvest management, if necessary.

Status: Thirteen wolverines were collared in April 1993. First survey 1992/93 could not be completed because of poor snow conditions. Ongoing relocations of collared wolverines. Deteriorating weather prevented completion of census in March 1994. However, distribution and home range size information may be enough to indicate density.

Funding: Budget and field work were combined with wolf study for efficiency.

	FUNDING SOURCE				
	IFA	**YTG**	**NOGAP**	**PCS**	**Totals**
1992/93	47,000	5,000	nil	nil	52,000
1993/94	62,700	5,000	nil	nil	67,700
1994/95	400	nil	nil	nil	400
Totals	110,100	10,000	nil	nil	120,100

Partners: Government of the Northwest Territories, Aklavik Hunters and Trappers Committee

Management Action: Recommendations on harvest management and monitoring have been forwarded to the WMAC(NS) and the Aklavik HTC.

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