

SUMMARY REPORT

**Research Funded Through the
Inuvialuit Final Agreement
2005-2008**

**Prepared by the
Wildlife Management Advisory Council (Northwest Territories), the Wildlife
Management Advisory Council (North Slope) and the Fisheries Joint
Management Committee for the**

**Co-management IFA Research Day
Inuvik, NWT- March 27, 2007**

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INTRODUCTION

Every year the Wildlife Management Advisory Council (NWT), the Wildlife Management Advisory Council (North Slope) and the Fisheries Joint Management Committee review proposals for research projects related to wildlife and fisheries management in the Inuvialuit Settlement Region. The funding for these projects comes in full or in part through the Inuvialuit Final Agreement.

Projects supported by these IFA co-management bodies are recommended to Parks Canada, the Yukon Government's Department of Environment, the Government of the Northwest Territories' Department of Environment and Natural Resources, the Department of Fisheries and Oceans and the Canadian Wildlife Service.

Recommendations are based on research priorities identified in meetings with Hunters and Trappers Committees, during public consultations in each community, as well as at joint co-management committee meetings. Recommendations are also based on priorities identified in the ISR Community Conservation Plans, the Yukon North Slope Long Term Research Plan, the Yukon North Slope Wildlife Conservation and Management Plan, the draft Canadian North Slope Muskox Management Plan, the Porcupine Caribou Management Plan, the ISR Grizzly Bear Management Plan, the management plans for Ivvavik, Aulavik and Tukturnogait National Parks, Holman Char Fishing Plan, Rat River Char Fishing Plan, Paulatuk Char Management Plan, Beluga Management Plan, and the Fisheries Joint Management Committee's Strategic Plan.

WMAC(NS), WMAC(NWT) and the FJMC monitor the progress of all recommended projects by requesting status reports and final reports from all agencies that receive IFA funding. This report summarizes research projects that were supported and recommended by the three co-management bodies for 2005-2008.

Project Summary

Name of project: Aklavik Harvest Data Collection, 2005 - 2007

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

To document harvest of moose, caribou, sheep, swans and furbearers in the Yukon and NWT by Inuvialuit hunters in Aklavik, from January to December.

Project description:

A program to collect harvest information in Aklavik was initiated by the Yukon Territorial Government (YTG) in 2002 after the Inuvialuit Harvest Study (IHS) stopped operating. Harvest reporting for some species is done using other means (furbearer seals, tags, mandatory reporting for species under quota etc), but a program is needed to regularly record the harvest of a number of other species. In 2001, YTG developed a database and summarized 12 years of harvest data for the Yukon collected during the IHS. In partnership with the Aklavik HTC, YTG contracts a local person to conduct recall interviews twice during the year – at freeze up and break up. Information recorded includes species, kill date, kill location by Game Management Subzone (GMS), sex and maturity of kill, hunter name, hunter's home community. All identifying information is confidential.

Participating agency (agencies) and personnel: Yukon Government Department of Environment and the Aklavik Hunters and Trappers Committee

Inuvialuit participation: In partnership with the Aklavik HTC, YTG contracts a resident of Aklavik to conduct interviews twice during the year.

Project timeframe: This is the third year of an ongoing project. Interviews are conducted each year during freeze up and break up and cover so that the harvest for the year is recorded.

Funding: IFA: \$3,000. The majority of these funds will be used for local interviewer wages.

Results: Results of the interviews are not currently available to the public.

Project Summary

Name of project: Arctic Borderlands Ecological Knowledge Co-op

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

To support the activities of the Arctic Borderlands Ecological Knowledge Co-op, including the collection of Inuvialuit traditional knowledge through the Community-based Monitoring Program in Aklavik, the tracking of environmental indicators and the 10th Annual Gathering.

Project description:

The Co-op was founded in 1994 when representatives from community groups, agencies and governments initiated an ecological monitoring program for the Yukon, Alaska and Northwest Territories. The focus of this monitoring is on climate change, contaminants and regional development. Membership is open and includes representatives of government agencies, co-management boards and councils, aboriginal government agencies, and academic institutions from northern Canada and Alaska. Co-op activities include a Community-based Monitoring Program and the tracking of ecological indicators in the region and an Annual Gathering each year since 1996. The Co-op's annual community-based monitoring project will continue in 2007-08 in Aklavik, Old Crow, Fort McPherson, Arctic Village, Tuktoyaktuk, Inuvik, Kaktovik and Tsiigehtchic. A local researcher in each community conducts interviews with community experts, collecting and communicating information about the conditions and changes observed during the year. This included observations about caribou movements and condition, fish, berries, weather, and general observations about changes in the health of the environment.

Participating agency (agencies) and personnel: Canadian Wildlife Service, Aklavik HTC and other regional HTC's, RRC's, government agencies and co-management boards and councils.

Inuvialuit participation: Local researchers are hired in Aklavik, Inuvik and Tuktoyaktuk, in conjunction with the HTCs, to conduct the interviews with 20 local experts.

Project timeframe: This is an ongoing project. Community interviews began in Aklavik in 1997. This year's interviews were conducted in January 2007 and we anticipate conducting them again in January 2008.

Funding: IFA: \$10,000 (CWS), \$5,000 (YTG). **Other:** \$ 80,000 - Funding support is provided by a number of government agencies and co-management boards and councils.

Results:

A summary of the Co-op's activities over the years can be found at www.taiga.net/coop. Results discuss trends that are being observed from land users and provide a coarse overview of potential areas of concern and gaps in understanding. Results from all communities are compiled into a summary report and presented at the Co-op Annual Gathering March 2008.

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Project Summary

Name of project: Monitoring Black Guillemot population and nesting success at Herschel Island, Yukon Territory

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

Track long-term changes in Black Guillemot population and nesting success at Herschel Island Territorial Park. Investigate how the population is affected by changes to the marine ecosystem brought about by climate change.

Project description:

The Black Guillemot (*Cepphus grylle*) is a seabird with a circumpolar distribution; it breeds from the eastern Canadian Arctic south to Maine, eastward along the southern Arctic across Eurasia, reaching North America again in scattered colonies in northern Alaska and the Yukon. The Yukon's the only nesting colony is on Herschel Island, a Yukon Territorial Park off the Yukon's North Coast. The Herschel Island colony has been monitored for population and nesting productivity since about 1986. Concerns about the species and ecosystem health have arisen due to population declines at the Herschel Island colony, as well as a colony near Barrow, Alaska. Alaskan researchers have found that sea ice conditions affect nesting productivity, and have made the link between climate change and Black Guillemot population health. Black Guillemot monitoring at Herschel Island provides valuable information for understanding such changes across the Beaufort Sea region.

During 2005-2006, Black Guillemot monitoring at Herschel focused on the continuation of adult counts and nest surveys, along with an investigation to determine the Black Guillemot's primary prey species.

Participating agency (agencies) and personnel: Yukon Government Department of Environment.

Inuvialuit participation: Herschel Island rangers have played a key role in Black Guillemot monitoring and establishing long-term data. Future planning and research will continue with the direct involvement of the rangers.

Project timeframe: Ongoing.

Funding:IFA: \$4,000 (Yukon Government in 2006). **Other:** \$4,000 Yukon Environment, Parks Branch.

Results: During 2005-2006, the population and nest surveys indicate a continued downward population trend for the colony: In 2005, the surveys found 60 adults and 12 nests with 22 chicks; in 2006, surveys recorded 40 adults and 9 nests with 13 chicks.

The dominant prey species taken by nesting Black Guillemots were Arctic Cod (*Arctogadus glacialis*) and Short-horned Sculpin (*Myoxocephalus scorpius*), along with small numbers of Slender Eelblenny (*Lumpenus fabricii*), Arctic Lamprey (*Lethenteron japonicum*), and Capelin (*Mallotus villosus*).

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Project Summary

Name of project: Herschel Island Ecological Monitoring, 2005 - 07

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

Field inventories and mapping of soil and vegetation were conducted in 1985 on the newly established Herschel Island Territorial Park. Fifteen years later, during park staff training in the summers of 1998 and 1999, we observed apparent increases in the abundance of a grass species, willows and lupines in the Arctic Willow-Dryas/Vetch vegetation community type. We have established a number of related projects to track vegetation changes over the long term with the broad objective to monitor several biophysical components of the Herschel Island ecosystem. Herschel Island Rangers are key personnel to this monitoring. The objective for this project was to provide additional training for Rangers to identify vegetation and terrain units as part of the long term ecological monitoring. It is possible that warmer, drier conditions over the last 15 years have led to proportionate species changes in upland tundra vegetation communities on Herschel Island. These changes may have implications for wildlife use of the island.

Project description:

Generally the ecological monitoring program is a collection of projects that researchers have set up but Park Rangers are the data collectors. Most project expenditures are to bring the Dawson Regional Biologist to the island in the summer to do new training or to help the Rangers. Researchers who do not work for YTG generally cover their own expenditures to get to the island.

There are numerous components under 3 broad topics: vegetation, soil and permafrost, and wildlife. Vegetation information consists of permanent plots and annual transects. The 2 permanent plots are re-measured every 3 to 5 years and record which plant species are present. Three plant species are checked every 3 days by the Rangers to record how well the plant is growing that year. There are 2 sensors set up at each of the permanent plots which automatically record the ground temperature to 1 meter deep every 6 hours. Nearby, there are 2 other deeper sensors installed which are checked manually to record the temperature to 15 and 43 meters deep. There is a transect of 10 stations where ground temperature to 1 meter deep is examined relative to snow depth and vegetation. Rangers also measure 2 thaw slumps to see how much they've grown each year. Wildlife sightings have been recorded for almost 20 years, more recently with vegetation and terrain information added. The Rangers also do breeding bird surveys, a survey of birds nesting around the buildings, count guillemots adults and chicks, and count raptors during a ground survey.

Participating agency (agencies) and personnel:

The Park Rangers are critical personnel in this ongoing, long term project.

Inuvialuit participation:

Because these observations happen all summer long, there is little opportunity to involve Inuvialuit observers. With WMAC(NS)'s financial help, we were able to take an FJMC summer student on a researcher trip in 2005. If the Park managers hold the Elder Host program while the researchers are on the island, we offer to participate and talk with the students who attend this program.

Project timeframe:

The Dawson Regional Biologist attends the Park pre-season meeting in April to go over data collection by the Rangers for the coming year and to present last year's information. Rangers record the various observations and surveys for the entire operational season (May to September). The data is sent to Dawson for data entry and summary.

This is a long term project which will continue as long as it is funded and as long as the Park remains committed to the data collection. Some of the data that this program was built on goes back 20 years.

Funding:

IFA – approximately \$6,000 each year

Other – academic or other researchers fund their own programs

Results:

For some of the projects within the overall monitoring project, we have already have a long term record (such as wildlife sightings and Black Guillemot surveys). For others, we have only several years of data and we cannot determine any long term trends yet.

There are 2 cases where data from the monitoring have prompted new research:

- 1) Nesting success of Black Guillemots was very poor for 2003 and 2004. Government of Yukon researchers have started a more detailed study of this.
- 2) Because we have existing information on vegetation and raptors, we are cooperating with an International Polar Year project looking at vegetation, raptors and small mammals.

Project Summary

Name of Project: Muskox Ecology Studies, 2005

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives: In 1969 and 1970, 51 muskoxen were re-introduced to the North Slope in Alaska. The population grew rapidly from 1977 to 1981, doubling every three to four years. The population then stabilized at around 350 animals in the 1980's. During this time, sightings in Yukon were regularly recorded. Calves were first recorded in 1985. The first full muskox survey was done on the Yukon North Slope in 1993. Starting in 1994, muskoxen have been seen each year in excess of 100 kilometers from the Yukon North Slope. The objective of this study was to conduct a population monitoring program consisting of numerous jobs. The study area was from the Alaska border to the Blow River. We wanted to estimate the population size and composition, to document seasonal distribution and movements of collared muskoxen, to develop and implement a system for local travelers to report their sightings and to develop a population model to estimate future population dynamics and the effects of harvest on the population. As the study progressed, other issues came to light and were included: the presence, levels and effects of parasites and disease in muskoxen, caribou and Dall's sheep and the genetic differences between North Slope and NWT mainland muskoxen.

Project description: Ten muskoxen were fitted with satellite radio collars in 1999. In 2002, we recaptured the 4 muskoxen remaining alive to replace their satellite collars and added 4 new muskoxen to the program. We removed the last satellite collar in July 2005.

During the time the satellite collars were deployed, we did 2 aerial surveys each year; one in late winter to estimate the pre-calving population size and one in summer to estimate calf birth rate.

Satellite locations were mapped on a vegetation map which showed seasonal differences in the vegetation communities that muskoxen used.

A population model is also being built using data collected from this study. This computer model should help us understand trends in the population and how a harvest may affect the population.

This 6 year project ended in July 2005. A final report covering all project components is being drafted.

Participating agency (agencies) and personnel and Inuvialuit participation: Various staff members from Parks Canada and observers from the Aklavik HTC have involved in various aspects to this project over the years.

Project timeframe: The main project started in 1999 when we deployed the first set of satellite collars and ended when we removed the last collar in 2005. From this time forward, YTG and Parks Canada will use the co-management plan (now in draft form) to guide any research and monitoring activities.

Funding: IFA – approximately \$20,000 each year **Other** – none

Results:

From the nearly 25,000 locations recorded by the satellite collars over 6 years, we found that as with other studies, muskoxen tend to remain in a relatively small area for most of the time but can make very large movements. These large movements (as far as the Richardson Mountains) tended to be in summer and fall and tended to be by adult bulls. All of the muskoxen that made large movements returned to the main study area.

Since 1993, there were 11 late winter counts and 7 summer counts. The number of muskoxen recorded in the surveys during late winter counts did not differ much, averaging 123 and ranging between 86 and 186 animals. Over these years, there is a slight downward trend. When we add reported sightings to the survey numbers, the number of muskoxen seen from the Alaska border to the Mackenzie River has been between 130 and 225. Of particular note, we started getting reports of a large group of muskox in the Richardson Mountains. In 2004, 54 muskoxen were counted during a sheep survey. We now consider this to be an established breeding group of muskox.

Summer counts also show a downward trend in the number of muskox counted. The ratio of calves during summer counts also went down between 1993 and 2005. The number of yearlings in July ranged between 5 and 13% of the total muskoxen classified for most of the study, jumping to 20 in 2005. In other areas, it appears that about 11% yearlings are needed for the population to grow.

As indicated by the survey information and the satellite collars, the center of the range used by muskox is the Firth and Malcolm River deltas. Other important areas are Clarence Lagoon, Roland Bay and the Babbage River areas. Areas where muskoxen were recorded were the Egaksrak and Kongakut Rivers in Alaska, toward the Richardson Mountains in the Blow, Big Fish and Little Fish Rivers, and toward Old Crow in the Crow and Driftwood River watersheds. Muskoxen tend to use lower elevation areas with 83% of the locations were at 3,000 feet or less.

The satellite locations showed that in spring, muskoxen used wet graminoid and low shrub tundra preferentially but avoided moist cotton grass tussocks. In summer, they were highly selective for moist non-tussock sedge communities. In fall, they preferentially used shrub thicket, wet barrens, dry or partially vegetation wet barrens communities. There was no selection for land cover classes in early winter. In late winter, muskoxen again used moist vegetation classes preferentially.

Project Summary

Name of Project: North Yukon Marmot Study - 2006

Project recommended by: Wildlife Management Advisory Council (North Slope), Aklavik Hunters and Trappers Committee.

Management objectives:

We started ground studies with Inuvialuit to locate colonies of Alaska Marmots in order to a) formally document a new species to Canada in a manner that credits traditional knowledge, b) accumulate information that will be used by COSEWIC to develop a conservation status assessment for *Marmota broweri*, and c) document Inuvialuit activities and perspectives on environmental change in foothill and mountain valleys.

Project description:

Warden Mervin Joe, Elder Nellie Arey and Biologist Barney Smith were dropped off by helicopter in the upper Firth River valley and hiked for a week looking for a marmot colony that Nellie had visited with her grandfather Paul Kayotuk in the 1950s. She later realized that the marmot colony was farther downstream. Barney later traveled with 3 Parks Canada wardens in a raft down the Firth River, stopping and hiking to likely colony sites. At one site in the lower Firth they heard a marmot near a place where a warden had seen two the previous year, but bad weather and many grizzly bears shortened their stay there, and they did not find the colony or collect any marmot bones or droppings.

Participating agency (agencies) and personnel:

Parks Canada Western Field Unit, NatureServe Yukon, Yukon Environment, Aklavik Hunters and Trappers Committee

Inuvialuit participation:

Elder Nellie Arey and Warden Mervin Joe hiked and camped and searched for marmots for the June 6-14 period. Mervin and Barney audio taped Nellie describing her family's activities in the valley, their use of wildlife, marmot trapping and skinning, and gold prospecting- all in the 1950s. From June 15 to 23 Warden Herbert Allen drove the raft and interpreted the landscape to Barney and the 2 other wardens on the trip down the Firth River.

Project timeframe:

The fieldwork was done from June 6-23.

Funding: IFA- \$4000,
Other – about \$16000.

Results:

This will be the only mammal species that is found only in the Inuvialuit Settlement Region in Canada, and the only occurrence of this species in Canada. When found the species will likely be listed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The project and the finding of this species will have additional national significance as it will showcase the application of aboriginal traditional knowledge in documenting the status of species at risk.

There will be no effect on current subsistence activities as these animals are no longer trapped. The documentation of traditional use of this species and areas distant from the coast in the ISR and North Slope will have enduring value to Inuvialuit families and cultural, and how this is portrayed by Parks Canada.

Project Summary

Name of Project: Porcupine Caribou Herd Satellite Location Program

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives: To maintain satellite radio collars on cow caribou in order to document annual migration routes and winter range use of the Porcupine caribou herd.

Project description: Porcupine caribou are located using two different types of collars- conventional radio collars and satellite collars. The satellite collar program started in 1997 when ten collars were purchased. There are currently eleven cow caribou with satellite collars. In order to keep up the number of satellite collars in the herd YTG needs to deploy new collars every year to replace the collars that are no longer working or are on animals that have died. The satellite tracks the animals automatically and is helpful in showing the general distribution of the herd. The satellite collars also provide valuable information about the timing and routes of the migrations. These collars are also used to locate the herd as part of other fieldwork. Interested agencies, organizations and schools in the Yukon, Alaska and the NWT are able to track the location of the collared caribou on the internet and through maps that are distributed once a week. Until February 2007, YTG maintained a website at www.taiga.net/satellite/index.html with current locations. This website will no longer be updated weekly but will provide seasonal information only.

Participating agency (agencies) and personnel: Yukon Government Department of Environment and contributing agencies (see below).

Inuvialuit participation: None.

Project timeframe: The program will continue as long as there are contributions from participating organizations.

Funding varies but in a typical year: IFA: \$2000 (Yukon Govt), \$6000 (Parks Canada) **Other:** \$8,000 The balance of the funding is contributed by YTG (non-IFA funds), Parks Canada (non IFA funds), GNWT, the Canadian Wildlife Service, U.S. Fish & Wildlife, and Alaska Dept. of Fish & Game.

Results: Annual summaries on the internet at www.taiga.net/satellite/index.html Fieldwork summaries are prepared and distributed to relevant agencies. Analyses of conventional and satellite telemetry information shows a loose pattern of shifting winter range use over the years. All location data (conventional and satellite) are used in a variety of projects (for example caribou movements in response to weather (CWS), documenting the timing and location of calving (US Fish and Wildlife), and range use related to the Dempster Highway (YTG)).

Project Summary

Name of Project: Yukon North Slope Grizzly Bear Project

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

To estimate the birth rate, the death rate, population size and the rate at which the population is increasing, and to gather local expert knowledge on grizzly bear population dynamics, movement, and Inuvialuit harvesting practices.

Project description:

In November 2002 members of the Inuvialuit Hunter and Trappers Committees (HTCs), the WMAC boards, Yukon and Northwest Territory governments and Parks Canada met to discuss needs for managing grizzly bear (*Ursus arctos*) populations in the Inuvialuit Settlement Region (ISR). Members of the Aklavik HTC felt that there was a need to update population estimates for the North Slope. The Yukon North Slope Research and Monitoring Plan and the Co-management Plan for Grizzly Bears in the Inuvialuit Settlement Region also indicated a need to update population estimates for grizzly bears.

GPS and VHF collars will be deployed within the study area. We are searching for bears evenly throughout the entire study area. These collars will be used to monitor movement, reproduction and survival of bears. To estimate the population size in the area, we divided the study area into 107 7 km x 7 km cells and placed a hair snare site in each cell. We left each station for approximately three ten-day sessions. Hair samples were collected from each station and will be analyzed to determine individual identity of the bears. This will help us identify how many individual bears are using the area. We will use mark-recapture statistics to analyze the hair survey data. The hair snag survey will be conducted for two consecutive years (2006 and 2007) to capture annual variability. We consolidated the traditional and local knowledge that has already been gathered by others and augmented this information with further interviews.

Participating agency (agencies) and personnel: Yukon Government
Department of Environment, Parks Canada, Wildlife Management Advisory Council-North Slope, Aklavik HCT

Inuvialuit participation: The community is involved directly in some aspects of data collection, and through the traditional knowledge component of the study.

Project timeframe: The project began in 2004. Collars will be taken off in 2009 and data analyzed in 2010 and 2011.

Funding:

IFA- \$75 000 (Yukon Government); \$25 000 (Parks Canada)

Other - \$60 000 (PCSP), \$22 000 (HSP), \$10 000 (SAR), \$25 000 (Parks Canada)

Results:

We have movement data for 16 females and 10 males. The average female home range so far is 190 km² and the average male home range is 1020 km². The largest home range was a male bear that went over 3000 km².

We conducted a hair trapping grid in 2006. Greatest sampling success was found in the Firth River Valley and in the mountainous regions of the North Slope. There was less 'capture' success on the coastal plain region. We had higher capture success than expected. The high 'capture' success rate this summer could be due to high berry productivity in the region, compared to average years, variation in green-up that may have caused bear movements to change relative to other years, and/or calving of the Porcupine Caribou herd in the Yukon this year rather than in ANWR.

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More information on the project can be found at

<http://www.taiga.net/wmac/species/grizzly/research.html>

Project Summary

Name of Project: North Coast Botanical Inventory

Project recommended by: NatureServe Yukon / WMAC (NS)

Management objectives:

Baseline inventory of the vascular plants along the Yukon North Coast – focusing primarily on taxa of conservation concern, introduced plants and significant range extensions.

Project description:

Incidental plant collections have been made on the North Coast since 1893 but mainly as part of other studies. The primary objective of this vascular plant inventory was to compile a baseline species list for each major survey site and estimate the relative abundance of each. The project occurred in 3 stages over two summers. The first stage surveyed the area west of Blow River and east of Kay Point July 24 – July 30, 2005. The second surveyed Kay Point west to the Alaskan border July 31 – August 9, 2005. The third surveyed the eastern portion of the Blow River delta east to the border with the Northwest Territories July 28 – July 31, 2006. In stage 1 some small mammals trapping was also undertaken. In stage 1 and 2 moss, lichen and liverworts were also collected. In stage 3 some dragonflies and butterflies were also collected. All surveys were accessed by water and occurred within 1 km of the coastline.

Participating agency (agencies) and personnel: Environment Yukon, Bruce Bennett, Catherine Kennedy, Jennifer Staniforth; Parks Canada, Mervin Joe; Aurora College, Pippa Seccombe-Hett; University of Alaska, Carolyn Parker; Ontario Natural Heritage Program, Michael Oldham; contractors, Danny C. Gordon, Dr. Terry McIntosh, Dr. David Nagorsen, Jennifer Line

Inuvialuit participation: Danny C. Gordon (Aklavik) assisted as advisor, boat driver, interpreter, community liaison and bear monitor. Mervin Joe (Inuvik) Park monitor, driver, interpreter, bear monitor. Mr. Gordon and Mr. Joe's participation ensured the success of this survey.

Project timeframe: July 24-August 9, 2005; July 28 – July 31, 2006

Funding - estimates only:

IFA- \$4000 (2005), \$3000 (2006)

Other – Parks Canada \$8,000 (2005) Yukon Government \$15,000(2005), \$2000 (2006)

Results: A detailed report is being written. Nearly all collections have now been identified. The main benefit of this survey is that a baseline study now exists for

the area. There is a much better list of species of conservation concern now available for the coast. Some large scale community changes have been noticed and point to possible links to climate change.

Highlights include:

857 collections made

315 species recorded (64 additional species previously recorded were not found on this survey totaling 379); this is significant as this represents ~1/5 of all arctic vascular plant species in the world. This shows the Yukon coast is one of the most biologically diverse arctic areas on the planet.

5 new species added to Yukon. 1 species is globally endangered. Three of the five are widespread and were previously overlooked. The final species is a high arctic dandelion, rare in Alaska and Yukon but not so in NWT and Nunavut.

60 new species added to the Yukon Coast. This is significant in that 1 in every 5 plants found was new to the region. This shows how poor this information is for plant distributions on the Yukon North Coast.

28 new species added to the Inuvialuit Settlement Region in Yukon. Again shows how poorly the region is known.

15 new species added to Ivvavik National Park.

No introduced plants found. Very few plant introductions were also found in Aklavik however Inuvik had several species that are known to be invasive in the north. More work could be done on raising awareness of these invasive species, primarily Sweetclover (*Melilotus albus*) and Smooth Brome (*Bromus inermis*).

Results of species of conservation concern:

74 species were expected in habitats surveyed

- 25% (18) common (found in all expected habitats)
- 20% (15) uncommon (found in most expected habitats)
- 12% (9) occasional (several populations found)
- 16% (12) rare (found only once or in small populations)
- 26% (19) were not found
- 1% (1) deleted based on a misidentification
- 52% of species had status changed

Project Summary

Name of Project: PRISM Shorebird Surveys on the Yukon North Slope, 2005-06

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

The objectives of this project are to estimate the numbers of shorebirds and other tundra birds nesting on the Yukon North Slope, and to track their numbers, distribution, and habitat use over time. This will provide a measure of the importance of the Yukon North Slope to North American shorebird populations, and will enable us to detect changes in the numbers of shorebirds and other tundra-nesting birds.

Project description:

These surveys are part of “Arctic PRISM”, a long-term program for monitoring tundra-nesting shorebirds in the North American Arctic (PRISM=Program for Regional and International Shorebird Monitoring). Each year, several regions of the Arctic are surveyed, and in 2005 and 2006 this included the Yukon North Slope/Mackenzie Delta/Tuktoyaktuk Peninsula region. This project description covers the Yukon North Slope portion of the region. We surveyed shorebirds on foot, using 12ha plots (300m x 400m); two observers spent 1.5 hours systematically walking the plot, and recording all birds using the plot. This resulted in an estimate of the number of pairs in each plot, which will be extrapolated (using correction factors) to make an estimate of the total numbers for the North Slope. In total, 60 plots were surveyed, across the entire Yukon North Slope.

Participating agency (agencies) and personnel: Canadian Wildlife Service (Whitehorse): Pam Sinclair, Mike Gill, Wendy Nixon, Sarah Davidson, Lisa Christiansen; Parks Canada (Inuvik): Ian MacDonald. The Arctic PRISM program is coordinated in Canada by Vicky Johnston of CWS (Yellowknife).

Inuvialuit participation: Inuvialuit students from were hired to work on the Mackenzie Delta side of the study area, where “intensive” surveys were conducted for 5 weeks each summer: Candace Cockney, Kayla Hansen-Craik (Inuvik).

Project timeframe: Field work was completed during 7-11 June 2005 and 8-13 June 2006. This is an ongoing monitoring program, with surveys repeated at least every 10 years.

Funding: IFA- \$5,000 in 2005, \$10,000 in 2006.

Other – Canadian Wildlife Service (Whitehorse) \$20-25,000/year
Parks Canada (Inuvik) \$7-12,600/year

Results:

When data analysis is complete, we will have an estimate of the number of pairs nesting on the Yukon North Slope, for approximately 13 species of shorebirds as well as several other tundra-nesting bird species. This will provide a baseline for comparison with future surveys (at least every 10 years, possibly more frequent). These birds are an important part of the tundra ecosystem, and changes in their numbers or distribution may affect other components of the ecosystem, including predators and other prey species.

Project Summary

Name of Project: Yukon North Slope Raptor Survey, 2005

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

The survey coincides with the Canadian Peregrine Falcon Survey, a national effort to monitor the status of peregrine populations in North America every 5 years. The last North Slope raptor survey was conducted in 2000. Sixteen known peregrine falcon territories were visited and four new territories were found. In total, nine occupied territories were found and seven of these were productive. These results indicate an increase in the number of peregrine falcons on the Yukon NS since 1995. However, a larger area was surveyed in 2000 than was surveyed in the past. Nest sites of other raptor species, including gyrfalcon, golden eagle and rough-legged hawk, were also documented in this survey. The objective of this survey was to resurvey the NS area to continue monitoring.

Project description:

The survey was conducted by 2 field crews transported by helicopter in early to mid July, concentrating initially on areas of known past raptor activity and expanding as possible to new areas. All historical peregrine nest site locations were surveyed as the main priority, and all other raptor nest site locations were also surveyed. Coastal drainages were surveyed up to 30 kilometers inland. Herschel Island was included.

Participating agency (agencies) and personnel:

Parks Canada (Ivvavik National Park) staff made up one crew while the second field crew consisted of Government of Yukon and Yukon College staff. Dave Mossop, now with Yukon College has done almost all of the previous surveys.

Inuvialuit participation:

One observer from Aklavik accompanied the Parks Canada crew.

Project timeframe:

The field work was conducted in mid July to ensure the presence of chicks.

Funding: IFA - \$24,450 total budget for both field crews

Results:

Sites were classified as occupied or unoccupied (by species), the number and age of chicks was recorded and 12 chicks from 4 broods were banded. Interim results for the non-Park survey area showed 8 productive nests, indicating continued population recovery on the Yukon North Slope.

Project Summary

Name of Project: Vegetation Change on Herschel Island and the Coastal Plain of Ivvavik

Project recommended by: Wildlife Management Advisory Council (North Slope)

Management objectives:

To assess changes in vegetation on Herschel Island Territorial Park and the coastal plain of Ivvavik National Park from 1985-2005.

Project description:

Vegetation in some areas of Herschel Island and the coastal plain of Ivvavik have undergone dramatic change in the 20 year period between 1985 and 2005. On many sites, the vegetation has changed from a forb-dominated tundra to a grass-dominated tundra. In particular, one native grass species, polargrass, is invading across stable upland, whereas it was previously only common on disturbed sites, such as coastal thaw slumps.

Initial vegetation inventories were conducted on Herschel Island in 1985/86 and in Ivvavik in 1988/89. A monitoring study was conducted in 2001 and 2005 to measure changes in the vegetation cover in two vegetation types (Cottongrass Tussocks and Dryas/Vetch/Arctic Willow) on Herschel and the Ivvavik coastal plain.

Participating agency (agencies) and personnel:

Catherine E. Kennedy
Fish & Wildlife Branch
Dept. of Environment
Government of Yukon

Ian McDonald
Parks Canada
Western Arctic Field Unit
Inuvik, NT

Richard Gordon
Herschel Island Territorial Park
Parks Branch
Dept. of Environment
Government of Yukon

Dorothy Cooley & Martin Kienzler
Fish & Wildlife Branch
Dept. of Environment
Government of Yukon
Dawson City, Yukon

C.A.Scott Smith
Agriculture & Agri-Food Canada
Pacific Agri-Food Research Centre
Summerland, B.C.

Inuvialuit participation:

Rangers of Herschel Island Territorial Park; wardens of Ivvavik National Park

Project timeframe:

Initial baseline data was collected in 1985-1989. Monitoring of two vegetation types was conducted on Herschel and the Ivvavik coastal plain in 2001 and 2005. Statistical analysis of data was conducted in 2003 and is pending for data collected in 2005.

Funding:

IFA- 2001 – \$15,000 2003 - \$ 1,200 2007 - \$ 2,000

Other – Salaries of employees provided by:

Government of Yukon – Dept. of Environment: Fish & Wildlife Branch; Parks Branch

Government of Canada - Parks Canada; Agriculture and Agri-food Canada

Porcupine Caribou Management Board – summer students

Results:

Analysis of data has indicated similar trends in change of vegetation cover on Herschel and Ivvavik. There is a significant increase in polargrass, lupine and groundshrubs and a significant decrease in cover of bare ground, or frost boils. Lichen is also decreasing.

Comparative long-term vegetation data in the region is unavailable. However, the rapid changes in vegetation cover observed over the past 20 years may have implications for wildlife.

Project Summary

Name of Project: Caribou Harvest Study

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- To document harvests by hunters from Sachs Harbour, Paulatuk and Ulukhaktok hunters in a collaborative study with DFO and CWS (includes more than caribou)
- To document caribou harvests (particularly the Cape Bathurst herd) including location and sex from hunters in Inuvik and Tuktoyaktuk

Project description:

The Inuvialuit Harvest Study recorded numbers of caribou harvested from 1988 to 1999 by Inuvialuit hunters. Due to the conclusion of this study, there was a need to develop alternate ways to estimate the annual number of caribou being harvested by Inuvialuit hunters.

Project A: DFO, ENR, and CWS started a collaborative harvest study to collect harvest information from hunters in Paulatuk, Sachs Harbour, and Ulukhaktok. This project was initiated in 2001 and ENR focused its questions on caribou harvests. This study is spearheaded by DFO with monthly interviews being conducted by interviewers hired in the community by the HTC. ENR provides funding and monthly data entry.

Project B: ENR is working with both the Inuvik HTC and Tuktoyaktuk HTC to collect harvest information from their members. The focus is on Cape Bathurst harvesters and will also collect information on alternative meat sources. ENR is also working with the RRC to collect Gwich'in harvest data in Inuvik.

Participating agencies and personnel:

ENR DFO, CWS, Olokhaktomiut, Paulatuk, Sachs Harbour, Inuvik, and Tuktoyaktuk HTCs, Fieldworkers in Ulukhaktok, Paulatuk, Sachs Harbour, Inuvik, and Tuktoyaktuk. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Field worker and members of Inuvik, Olokhaktomiut, Paulatuk, Sachs Harbour, and Tuktoyaktuk HTCs

Project timeframe: Ongoing

Project A) Monthly data collection interviews

Project B) Periodic data collections

Funding: IFA: approx 25K
Other: 10K ENR

Results to date:

Project A) A written report and poster was provided to the Paulatuk HTC summarizing data from that community from 2001 to 2006. Reports of the data from Ulukhaktok and Sachs Harbour are being drafted.

Project B) Some data has been obtained, however not with complete coverage of harvesters. ENR is continuing to work with HTCs to get as complete data as possible.

Project Summary

Name of Project: Cape Bathurst, Bluenose-West, and Upper Tuktoyaktuk Peninsula Caribou Population Estimate (photocensus), Monitoring, and Satellite Tracking

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- Obtain a current population estimates for the Cape Bathurst, Bluenose-West, and Upper Tuktoyaktuk Peninsula caribou.
- Determine trend in population size for the Cape Bathurst, Bluenose-West, and Upper Tuktoyaktuk Peninsula caribou.
- Collect information to define the seasonal and annual ranges and migration routes used by the Cape Bathurst, Bluenose-West and Upper Tuktoyaktuk peninsula caribou.
- Assess fidelity to calving areas and other seasonal ranges.

Project description:

Baseline data on productivity, recruitment, and population trends in these herds is required to assess cumulative impacts. A photocensus was conducted both in 2005 and 2006. Additional collars were deployed March 2007 to maintain 20 GPS collars on each herd for monitoring of range and migration routes.

1. Collaring – In 2005 and 2006, a reconnaissance survey was flown over the late winter range of each herd during March to locate groups of caribou for capture. This was done to ensure that the collars were deployed in proportion to the occurrence of caribou throughout the winter range of each herd. Caribou were captured by net gun from a helicopter. In 2007, a fixed wing flight was done over the CB range when the capture

2. Photocensus –Telemetry flights were flown after calving to locate collared caribou in each herd, to monitor the distribution and movements of the collared caribou and to assess the degree of aggregation. Once the herds aggregated, each aggregation was photographed using a high resolution digital camera. Caribou on photos of each aggregation were counted and classified.

Participating agency (agencies) and personnel: ENR –(Inuvik; Senior Wildlife Researcher, Mackenzie Valley Development; Manger, Wildlife Management, Geospatial Analyst, and Renewable Resource Officer III; Sahtu; Cumulative Effects Biologist), SRRB, GRRB, Parks Canada, Inuvik, Tuktoyaktuk and Paulatuk HTCs. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Field assistants recommended by HTC

Project timeframe: Ongoing

Collar deployment occurs in February/March of each year. Recruitment information collected in March/April. Productivity and photocensus occurred in June/July of 2005 and 2006. Collection of information from satellite/GPS collars is ongoing.

Funding:

IFA: \$50 - 200K

Other: \$100 – 500K (ENR, PC, GRRB, ConocoPhillips)

Results:

The Cape Bathurst herd was estimated at $2,435 \pm 257$ (95% CI) non-calf caribou in 2005 and declined to $1,821 \pm 149$ (95% CI) non-calf caribou in 2006. The Bluenose-West herd was estimated at $20,801 \pm 2040$ (95% CI) non-calf caribou in 2005 and declined to $18,050 \pm 527$ (95% CI) non-calf caribou in 2006. On the Tuktoyaktuk Peninsula in September 2005, after a strip transect survey with local observers, ENR estimated 3,100 non-calf caribou/reindeer. In July 2006, during the photocensus, 3,078 non-calf caribou/reindeer were counted on the Tuktoyaktuk peninsula.

A low proportion of calves were observed in the Cape Bathurst herd during early July of 2006. The proportion of calves in the Bluenose-West herd was higher. For both herds, the number of calves surviving their first year needs to be maximized for the herds to recover. Results have been presented to WMAC(NWT) and other co-management boards in the ranges of these herds and recommendations have been made to the Minister to impose harvest restrictions on these herds. Already implemented is a zero quota for the Cape Bathurst and Bluenose-West herds for commercial, resident and non-resident harvesters. New regulations, including amended HTC by-laws to implement the changes to the management zones and quotas are being developed.

Seasonal ranges have been mapped from location data obtained from satellite and GPS collars. Work is ongoing to include the data from these herds in an animation for the 14 herds of barren-ground caribou in North America through the CircumArctic Rangifer Monitoring and Assessment Network (CARMA).

Monitoring of these herds is continuing. WMAC (NWT) recommended that another photocensus be conducted in 2009.

GPS collars were deployed in March 2007 to try to maintain 20 collars to monitor movements and locate caribou for the recruitment and productivity surveys. Recruitment, productivity and fall composition surveys are planned for 2007.

Project Summary

Name of Project: Caribou (Peary) Productivity Survey

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives: Estimate calf production, recruitment, and over-winter survival of Peary caribou on Banks Island and determine long-term trend.

Project description: Peary Caribou are classified as Endangered by the Committee on the Status of Endangered Wildlife in Canada. Long-term data on productivity, over-winter survival, and recruitment for Peary caribou populations are lacking. This information is important to determining correct measures for the recovery of Peary caribou populations in the high arctic. Fieldworkers flew in helicopter on transects with a general coverage over the entire Banks Island. Groups of Peary caribou were located and classified. Caribou are classified into calves, cow, young bulls or prime bulls. Locations and calves/non-calves were also recorded for muskox.

Participating agency (agencies) and personnel: ENR (YK - Caribou Biologist and Caribou Technician, Inuvik - Manager, Wildlife Management and Geospatial Analyst); Sachs Harbour HTC. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Field worker recommended by the Sachs Harbour HTC

Project timeframe: Fieldwork conducted July 2006

Funding: IFA: \$10K

Other: \$70K (ENR, NWTSAR, PCSP)

Results:

During the survey, 141 caribou were seen (60 adult females, 33 calves, 27 young bulls and 24 prime bulls) with most observed on NW corner of Banks Island. The calf:cow ratio was approximately 55 calves per 100 cows and calves made up 23% of the caribou seen. Adult sex ratio was 85 bulls to 100 cows. Bulls made up 46% of the non-calf animals observed which is higher than that seen in 2004 and 2005. The difference may be due to sampling intensity or might be explained by adult males, calves and yearlings typically being most vulnerable to the effects of severe winters.

Of all muskox observed (n=3087) 12.6% were calves. Productivity of caribou and muskox are similar to averages from the 1994 to 2004 surveys. Results do not suggest a multi year reduction in productivity of caribou or muskox following the severe winter of the 2003-2004 severe icing.

Project Summary

Name of Project: Peary Caribou / Muskox Population Estimate Banks Island and Northwest Victoria Island

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- Obtain estimates of the number of non-calf and calf Peary caribou and muskox on Banks and NW Victoria Island
- Determine status of the Peary caribou and muskoxen population on banks and NW Victoria Island and population trends for Banks Island
- Determine the density and distribution of muskox in the Egg and Masik river areas

Project description:

Whole Island population surveys were done every 3-4 years on Banks Island since 1982 providing a documentation of the changes in the caribou and muskox population. A strip transect survey was flown on Banks and NW Victoria Islands between early July and early August 2005 to document the numbers and distribution of Peary caribou and muskox. All observations of wolves and den sights were document.

Participating agency (agencies) and personnel: ENR (Inuvik; Senior Wildlife Researcher, Mackenzie Valley Development, Geospatial Analyst, YK; Caribou Biologist); Sachs Harbour and Olokhaktomiut HTC. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310
marsha_branigan@gov.nt.ca

Inuvialuit participation: Field assistants recommended from Sachs Harbour HTC and Olokhaktomiut HTC

Project timeframe: Survey was conducted during July 2005.

Funding: IFA: \$125K
Other: \$235K (Parks, PCSP, NWT SAR)

Results:

Banks Island:

In July 2005, the ENR survey estimated 929 ± 289 (95% CI) non-calf caribou and 251 ± 104 (95% CI) calf caribou on Banks Island. Estimates in 2001 were $1,142 \pm 324$ (95% CI) non-calf and 391 ± 156 (95% CI) calves. These estimates were not significantly different. The lack of growth in the population is due to many factors one of which may be an icing event during the winter of 2003-2004. The survey also indicates that bulls remain a significant component of the population

(29% of non-calf caribou) and calves were approximately 19% of all caribou seen. This indicates that the bull only quota, in effect since 1992, has not had a significant impact on the bull component of the population. The current quota represents approximately 4% of the non-calf population.

The number of muskoxen on Banks Island was estimated to be $47,209 \pm 3,997$ (95% CI) non-calf and $4,924 \pm 537$ (95% CI) calf. The estimates of the numbers of non-calf and calf muskoxen decreased significantly during 2001-2005 (2001 estimates - $68,585 \pm 6,972$ (95% CI) non-calf and $11,780 \pm 1202$ (95% CI) calf). The primary cause of this decline was most likely the icing event that occurred on Banks Island during winter 2003-2004. A large number dead muskox ($n=471$) were observed during the 2004 productivity survey. Results suggest that the population remains high and current levels of harvest are sustainable.

Northwest Victoria Island:

The number of Peary caribou within the range of the Minto Inlet herd was estimated to be 66 ± 61 (95% CI) non-calf and 25 ± 23 calf caribou. Approximately 28 percent of the caribou observed were calves. Because of high confidence intervals, the 2005 estimate is not significantly lower than the 2001 estimate of 204 ± 103 non-calf and 65 ± 59 calf caribou, however, the results suggest a decline likely due to two successive winters with icing events (2002-2003 and 2003-2004). The number of Dolphin & Union herd in the survey area (NW Victoria Island) was estimated to be 769 ± 637 (95% CI) non-calf and 145 ± 129 (95% CI) calf. Approximately 11.5 percent of the caribou observed were calves. The non-calf estimate is significantly lower than the 2001 estimate (1067 ± 371 non-calf, 291 ± 141 calf caribou). Survey results suggested that the moratorium on hunting established by the Olokhatomiut Hunters and Trappers Committee in 1993 should be maintained.

The number of muskoxen within the survey area on NW Victoria Island is estimated to be $12,062 \pm 2156$ (95% CI) non-calf and $2,108 \pm 380$ (95% CI) calf muskoxen. The non-calf portion has declined significantly since 2001 ($19,282 \pm 3,221$ (95% CI) non-calf and $2,474 \pm 431$ calf), again likely due to icing events though no survey was done in 2004. Current harvest of muskox out of Ulukhoktak is less than 500 annually, which represents approximately 3% of the animals in the survey area.

Project Summary

Name of Project: Dall Sheep Population Estimate

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- To estimate population abundance and sex/age structure
- To obtain estimates of recruitment rate

Project description:

The North Richardson Mountains were surveyed in late June by helicopter following contours and drainages in designated survey blocks. Sheep locations were noted and sheep were classified as ewes, lambs, yearlings, ½ curl, ¾ curl and full curl rams. All other wildlife seen was recorded.

Participating agency (agencies) and personnel:

ENR, Inuvik (Wildlife Biologist, and Geospatial Analyst); DOE, YG (Regional Biologist); GRRB - Wildlife Biologist and community assistant, Ehdiitat Renewable Resource Council. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca or Dorothy Cooley (YTG Environment) (867) 993-6461 dorothy.cooley@gov.yk.ca

Inuvialuit participation: None. RRC member participated in survey

Project timeframe: The survey was conducted between June 19th and 25th 2006

Funding:

IFA: \$5K

Other: \$38K (ENR, GRRB, YTG)

Results:

A total of 704 sheep were observed (438 ewes, 22 yearlings, 97 lambs and 101 rams). This total is a slight decrease from the 2003 survey during which a total of 757 sheep were counted. Other wildlife observed during the flights included 98 muskox, 22 grizzly bears, 1 wolf, 4 moose, 82 caribou, 3 bald eagles and 11 golden eagles.

The results of this survey suggest that the decline of Dall sheep in the North Richardson's could be levelling off. The Dall Sheep Management Plan Working Group considered these results and the results from previous surveys while drafting the management plan and selecting the proposed population when harvest limitations would be implemented.

Project Summary

Name of Project: Ecology of Grizzly Bears in the Mackenzie Delta Oil and Gas Development Area

Project recommended by: Wildlife Management Advisory Council (NWT)

Management Objectives:

- To collect baseline data on grizzly bears in the Mackenzie Delta development area;
- To develop habitat use and movement models for grizzlies and identify critical habitats;
- To assess the impact of petroleum development on the habitat use and movements;
- To assess how cumulative impacts may influence grizzly bear population sustainability;
- To determine the contribution of marine protein to diet.

Project Description:

- Capture work conducted mid May to early June annually when most bears have emerged from their dens and there is still sufficient snow for sighting bears.
- Fixed-wing aircraft used to locate bears for capture.
- Bears immobilized by aerial darting, using Telazol drug, from helicopter.
- Bears are equipped with GPS satellite collars to record 6 locations daily. Collars are “break away” so that collars automatically fall off within 2 years if the bear cannot be recaptured. Collars have a VHF transmitter for relocation.
- Each bear is tattooed with a unique number on the lower lip and ear tagged for later ID and information is recorded and samples collected.
- Location data is entered, analyzed, and mapped and site level habitat use characteristics will be quantified for grizzly bears for the active period.
- TK about grizzly bears is collected during meetings/workshops with HTC’s and co-management boards in the region.
- Develop preliminary resource selection and movement models.

Participating agencies and personnel:

University of Alberta (Andrew Derocher, Professor, Mark Edwards, Ph.D. Student); ENR, Local assistants, Students. Contacts: Andy Derocher (University of Alberta) (780) 492-7570 derocher@ualberta.ca or Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: HTC representatives recommended by Inuvik and Tuktoyaktuk

Project timeframe: 4th year of ongoing project. Capture fieldwork conducted from May to June. Site level fieldwork will be conducted from June to September.

Funding:

IFA: \$25,000

Other: varies to \$270,000 (includes PCSP, NWTWBP, Endangered Species Recovery Fund, Northern Scientific Training Program, Alberta Cooperative Conservation Research Unit)

Results:

Location data since 2003 from bears fitted with GPS collars collecting 6 locations a day has been analyzed. Preliminary results indicate mean annual home ranges are 3,825 and 1,525 for males and females respectively. Movement patterns and habitat use analysis is underway. Probability of use maps will be developed to help minimize the impacts of oil and gas development.

Hair and claw samples from captured bears and samples of food sources were collected and will be used for diet analysis. The results will look at seasonal changes to the diet.

Plan is to deploy 6 to 8 collars in the pipeline\gathering system area to monitor movements during pre-construction phase if the pipeline is built. Site-specific investigations will also occur this summer with a new graduate student.

During the capture session in 2007, DNA samples will be taken from all bears seen as part of the population estimate (see next project).

For more details see annual reports.

Project Summary

Name of Project: Grizzly Bear Harvest Monitoring

Project recommended by: Wildlife Management Advisory Council (NWT)

Management Objectives:

- To document all human-caused grizzly bear mortalities and the age, sex and kill location of each bear killed in the ISR.
- To provide annual updates of harvests to each HTC and WMAC (NWT).
- To genotype all bears killed to determine if chronic problem bears or bears marked during the population study have been harvested.
- To Collect samples for diet analysis.

Project Description:

Grizzly bears are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) under the “Special Concern” category and are a very high profile species. Any bear killed in defence of life and property must be reported to a Renewable Resource Officer (*NWT Wildlife Act*). All human-caused mortalities must be accounted for under the current quota system and a tag applied. ENR, Inuvik records information on all grizzly bears harvested including those killed in defence of life and property and maintains a grizzly bear harvest database in the Region (1987 to present).

Participating agencies and personnel: ENR, Inuvik (Renewable Resource Officers, Regional Biologist, Wildlife Technician, Geospatial Analyst) and HTCs. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: HTCs, Harvesters

Project timeframe: Ongoing

Funding: IFA: \$14K

Results to date:

“Tag kits” are distributed with each tag issued (July). Posters and local media are used to remind everyone that they must report bears that they harvest or kill in defence of life or property. Samples and information are collected for each bear killed and added to the Regional database. Posters that summarize the harvest/kill information for each community are prepared and distributed annually to the HTCs after the season closes. A summary report is prepared each year for the WMAC (NWT), WMAC (North Slope), and HTCs. Samples collected and stored for future diet analysis.

Project Summary

Name of Project: Grizzly Bear Population Study Phases 1 & 2

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- To obtain current information on movements, distribution, habitat use, denning sites, survival and productivity for grizzly bears in the study area.
- To obtain current estimates of the number of grizzly bears in the ISR east of the Delta.
- To recommend sustainable harvest quotas for grizzly bears in the Aklavik, Inuvik, and Tuktoyaktuk grizzly bear management areas.

Project description:

Grizzly bears are harvested in the ISR under a quota system. Local knowledge is indicating the population has increased since the implementation of the quota. Current quotas relied on population estimates that were based on older studies and modeling based on historic harvests and estimated population parameters. Current estimates of population size are not available.

Starting in September 2001, bears have been collared and monitored to collect information on movements and productivity. In the development area, data from collared bears will also be used to determine seasonal movements, and habitat use. This is Phase I of the population estimate project. A DNA mark-recapture using DNA biopsy darts will begin in April of 2007 as Phase II of the population estimate project.

Participating agency (agencies) and personnel: ENR, Inuvik (Regional Biologist, Senior Researcher Mackenzie Valley Development, Wildlife Technician, Geospatial Analyst); University of Alberta; Parks Canada. Contacts: Andy Derocher (University of Alberta) (780) 492-7570 derocher@ualberta.ca or Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Field assistants recommended by HTC's

Project timeframe: Multi year project, Phase I 2001-2007; Phase II 2007-2009

Funding: IFA: \$280K

Other: \$74K (PCSP, Parks)

Results:

Results from the study will be used to evaluate the current quotas.

Project Summary

Name of Project: Grizzly Bear Problem Bear Response Program

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- To reduce the number of human\bear conflicts
- To eliminate chronic problem bears
- To prevent bear from becoming food conditioned by minimizing attractants at cabins\camps and municipalities
- To provide assistance to cabin owners

Project description:

Over the past several years, incidents of human\bear conflicts have taken place throughout the Inuvik region. ENR initiated the bear response program to help deal with this issue. Cabin owners undergo an assessment to determine if attractants are present or the land is unsightly. Electric fences will be made available at no cost to cabin owners that meet the “clean cabin” criteria.

A problem bear response team has also been established to respond to problem situations in the immediate area of the Mackenzie Delta. The response may include the use of helicopter to effectively deal with the situation.

Participating agency (agencies) and personnel: ENR, Inuvik (Regional Biologist, Renewable Resource Officers). Contact: Ian Ellsworth, Renewable Resource Officer III, ENR, Inuvik (867) 777-7320 ian_ellsworth@gov.nt.ca

Inuvialuit participation: Cabin owners

Project timeframe: Multi year project

Funding:

IFA: \$5K

Other: \$15K (ENR, ConocoPhillips)

Results:

The Cabin Assessment and Electric Bear Fence Programs continue as Officers make contact with many cabin owners. There has been really good support from the cabin owners, who are taking necessary steps to clean their camps and we expect increased participation in the program. All 8 fences were applied for last year. A short questionnaire will be answered by each fence owner to collect additional information on how the program is working.

Project Summary

Name of Project: Mainland Muskox Survey

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- to determine the status of the muskox population within the mainland portion of the Inuvialuit Settlement Region (ISR) and TNNP,
- to determine if current quotas for muskoxen in the ISR are sustainable

Project description:

Tuktut Nogait National Park and the area west to the Kugaluk River in the ISR was last surveyed during late winter/spring 2002. The non-calf muskox population estimate was 1,215 SE \pm 526 (95% CI). This gave a density estimate of 0.015 non-calf muskoxen per km² in the survey area. A comparison of the mean non-calf population estimates suggests a decline of approximately 11 percent per year between 1997 and 2002.

The results support the view that the distribution of muskoxen in the ISR has shifted to the west during the past 30–35 years. During the late 1960's and 1970 most of the muskoxen sightings made were in TNNP or in adjacent areas to the west. By 2002 most of the muskoxen were observed in the Cape Bathurst Peninsula/Rendezvous Lake area. Another survey may be conducted

Participating agency (agencies) and personnel: ENR Parks Canada, Tuktoyaktuk and Paulatuk HTC's. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Field assistant recommended by HTC's

Project timeframe: March 2008

Funding: IFA: \$50K
Other: \$20K Parks

Results:

The survey has not been conducted yet. The results will be used to reevaluate the quotas. Based on the 2002 estimate and sustainable harvest rates of 5 to 8 percent of the non-calf population estimate, the harvest quotas should be set at 61 and 97 non-calf muskoxen per year. The current quota for this area is 75. With the decline in caribou numbers the pressure on muskox may increase.

Project Summary

Name of Project: Muskox - Mainland West of the Delta

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- to determine the genetic differences between Muskox west and east of the Delta
- to document muskox distribution
- to develop a management plan for Muskox west of the delta

Project description:

Observations of Muskox indicate that both the western and eastern populations are expanding their range. Concerns about the two populations intermixing due to different lungworm parasites and possible genetic differences of the two populations indicate we need to collect more information. During the Yukon North Slope Muskox Management Plan meeting it became apparent that more information on movements needs to be documented. Samples will be sent for DNA analysis and samples collected to continue monitoring of parasites.

Participating agency (agencies) and personnel: ENR, DOE (YTG), Parks Canada, Aklavik HTC. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: hunters

Project timeframe: Ongoing

Funding:

IFA: \$5K

Other:

Results:

No results to date. Genetic results will provide more information on the genetic diversity of the two populations and if intermixing is a concern on a genetic basis. A more systematic method for recording observations and collecting samples should be developed.

Project Summary

Name of Project: Polar Bear Coastal Survey

Project recommended by: Inuvialuit-Inupiat Joint Commissioners

Management objective:

To document the distribution of polar bears along the coast between the US border and Shallow Bay in the fall prior to freeze up

Project description:

This project was recommended by the Inuvialuit-Inupiat Commissioners to compliment the work being done in Alaska. The purpose of conducting aerial coastal surveys is to determine the spatial and temporal distribution and abundance of polar bears using coastal habitats and islands during the open water period. Documenting the number, sex, and age classes of polar bears using coastal habitat will help managers understand the ecological significance of these areas to polar bears, which may be particularly important due to changing sea ice conditions. Surveys are conducted in a fixed wing aircraft on floats or twin engine with two observers, navigator and pilot flying along the coast approximately two hundred feet. A maximum of four surveys will be conducted in a 6 week period until freeze up.

Participating agency (agencies) and personnel: DOE, YG; ENR, GNWT; WMAC (NS); WMAC (NWT); Aklavik HTC. Contacts: Ramona Maraj (867) 393-7423 ramona.maraj@gov.yk.ca or Marsha Branigan (ENR Inuvik) (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Field assistant recommended by HTCs when possible

Project timeframe: September\October 2007

Funding: IFA: \$20K

Other: \$5K ENR

Results:

Products will include trip-by-trip reports, including maps, annual reports, and a final report. The final report will include: 1) maps showing the distribution and abundance of polar bears along the coastline; 2) tables summarizing observations, numbers of polar bears, latitude/longitude of each sighting, survey date, observers, habitat, etc.; and 3) an estimate of polar bear density (number of polar bears/km flown). The data will maintained in a polar bear sightings database maintained by ENR for future planning and monitoring efforts. Data will be combined with data from similar surveys being conducted on the US side of the border.

Project Summary

Name of Project: Population Assessment of Polar Bears in the Beaufort Sea and Amundsen Gulf

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- Obtain current baseline information on distribution, movements, and population dynamics;
- Obtain current population estimates of polar bears in the Beaufort Sea; and
- Establish sustainable harvest levels.

Project description:

Polar bears in the Southern (SB) and Northern Beaufort Sea (NB) areas are managed as separate populations. Annual sustainable harvests there are kept below presumed maximum sustained yield by a combination of user's agreements (Inupiat-Inuvialuit and community agreements) and quotas, based on the available research data. The population data set is now becoming dated while at the same time it appears the environment is changing and there are new large proposals for hydrocarbon extraction. Thus, we needed to establish a firm baseline of research information on distribution, movements, and population dynamics of these polar bears with which to address the management and conservation of these animals. Fieldwork for a mark-recapture effort on the Canadian side concluded in April 2006.

Participating agency (agencies) and personnel:

Ian Stirling and Dennis Andriashek (CWS), Steven C. Amstrup (US, NSB Alaska Fish & Wildlife), Marsha Branigan (ENR), and Andrew Derocher, U of Alberta, Aklavik, Olokhatomiut, Inuvik, Paulatuk, Sachs Harbour, and Tuktoyaktuk HTCs. Contact: Ian Stirling, Canadian Wildlife Service (780) 435-7349
ian.stirling@ec.gc.ca

Inuvialuit participation: Field assistant recommended by HTCs when possible

Project timeframe: Year 2 of 3-4 year project. Fieldwork in late April/May

Funding: Total \$400K annually

IFA: \$100K

Other: ENR Vote 1 \$50K, National Fish & Wildlife Foundation \$150K, Polar Continental Shelf Project \$90K University of Alberta \$10K

Results:

Fieldwork is complete. A USFWS report for the SB population has been submitted. Results indicate a SB population of 1526 (95% CI = 1211, 1841).

Previous population estimate was 1800. Because precision of earlier estimates was low, our current estimate of population size and the earlier ones cannot be statistically differentiated. Declines in cub-of-the-year (COY) survival and decreases in COY and adult male stature was noted in the recent studies. NB results are not available yet.

Project Summary

Name of Project: Wolf Harvest Monitoring

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- To document wolf harvests and location killed, age and sex of killed wolves on Banks Island and Victoria Island
- To document diet of wolves
- To look at genetic diversity of Arctic wolves
- To document harvest and biological parameters from mainland harvests

Project description:

In order to get an idea the impact of wolves on the peary caribou populations, ENR initiated a wolf harvest monitoring program that collected skulls and stomachs from wolves harvested by members of the Sachs Harbour and Olokhaktomiut HTC's. In the 06/07 season this collection was reduced to skulls only. A carcass collection from mainland wolves began in 2006/07.

For all samples collected, "sample kits" are distributed each season to ENR officers in the community or HTC's. The objective is to collect samples and information for each wolf killed and maintain a Regional database.

Participating agency (agencies) and personnel: ENR, Inuvik (Regional Biologist, Wildlife Technician, and Geospatial Analyst, Renewable Resource Officers); HTC's. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: HTC's, Harvesters

Project timeframe: Ongoing

Funding:

IFA: \$8K

Other: \$2K ENR

Results:

Submitted wolf samples on Banks and Victoria Island peaked in 04/05 at 44 and 32 wolves. Maximum age of the wolves to date is 11 years. Stomach contents have been stored for future diet analysis.

Mainland collection of carcasses began this winter. Necropsies will be conducted shortly. Additional funding will be required for sample analysis.

Project Summary

Name of Project: Wolverine Carcass Collection

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

- To document the distribution and level of wolverine harvest in the Inuvik Region
- To assess the age, sex ratios, condition, seasonal diet and reproductive parameters of the wolverines harvested within the Inuvik region and compare to similar work in other regions of the NWT
- To collect genetic material for later analysis to compare wolverine “populations” across the NWT

Project description:

With an increase in resource activity in the Inuvialuit Settlement Region, and the Gwich'in Settlement Area, ENR is faced with data gaps in terms of available baseline information and understanding of how development may impact various furbearers. Historically the GNWT has used annual fur auction sale data to monitor levels of wolverine harvest across the NWT, however in some regions an unknown number of wolverine pelts remain in the community for local use. Harvest data is a fundamental piece of information required by wildlife managers. Information on wolverine feeding habits, age/sex composition, body condition and reproductive data is also collected.

Collection of wolverine carcasses occurred with members of the HTC and RRC within the Inuvik Region. All local harvesters were participating in the study and a financial compensation of \$75 was given to bring in each carcass and provide information on harvest date and location.

Field workers were trained in Paulatuk, Aklavik, and Tuktoyaktuk to perform necropsies. Necropsies involve several body measurements, including measurements for determination of body condition, the removal of teeth for age analysis, collection of small tissue sample for future DNA analysis. Stomach Contents were also looked at for contents and collected for future diet analysis. Colons, tongues and diaphragms were also collected for parasite and disease analysis.

Participating agency (agencies) and personnel:

ENR, Inuvik (Wildlife Biologist, Wildlife Technician, Geospatial Analyst) Local assistants from Paulatuk, Aklavik, and Tuktoyaktuk HTCs; and harvesters. Contact: Marsha Branigan, Manager, Wildlife Management, ENR, Inuvik (867) 777-7310 marsha_branigan@gov.nt.ca

Inuvialuit participation: Hunters participated by submitting wolverine carcasses for the program. Community members selected by the HTC in Aklavik, Tuktoyaktuk, and Paulatuk were trained and performed the necropsies in their community.

Project timeframe: Carcasses collected through out the winter of 04/05, 05/06, and 06/07 season. Necropsies are preformed in April/May.

Funding:

IFA: \$5 to 8 K annually

Other: ENR Cumulative Impacts Monitoring Program in initial year to train community field workers

Results:

Posters distributed to participating communities after the 04/05 season. In the 04/05 season, 23 females and 30 males were collected totaling, 53 wolverines. In the 05/06 season 23 females and 38 males were collected, totaling 61 wolverines. Results from the age distribution from the 04/05 season suggest the harvest is sustainable.

Results from sample analysis are not complete. Preliminary results are back from 04/05 diaphragms and 66% came back positive for tricinella. Genotyping is not complete to determine the strain. Analysis of 52 colon samples for parasites revealed that a few animals were infected with Tapeworms Roundworms and Flatworms. No giardia, cryptosporidiosis or coccidia were detected.

Project Summary

Name of Project: Declining Populations of Snow Geese and Brant at Anderson River Bird Sanctuary

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

To identify causes of population declines in snow geese and brant at Anderson River Bird Sanctuary

Project description:

The numbers and reproductive success of snow geese and brant have declined significantly at Anderson River over the past 10 years or more. Possible causes of the decline include: (a) increased nest destruction by grizzly bears which have been sighted frequently in the goose colonies in the past number of years, and (b) loss or degradation of habitat due to salt water flooding of the outer delta during a storm surge or due to overgrazing by geese. There is evidence suggesting both these factors could be acting on goose populations at Anderson River. Emphasis, during the first two summers of field work in 2003-04, was on habitat work in the outer Anderson River Delta.

Participating agency (agencies) and personnel: Canadian Wildlife Service. Contact: Jim Hines (Environment Canada, CWS) (867) 669-4761 jim.hines@ec.gc.ca

Inuvialuit participation: Inuvialuit participation (two individuals) in spring field work.

Project timeframe: 2003-04 to 2006-07

Funding: IFA: \$34,000 **Other:** CWS \$10,000

Results:

Ground work and remote sensing studies carried out in 2003-04 indicate a widespread die-off of vegetation in the outer part of the Anderson River Delta where most of the snow geese and brant traditionally have nested. It seems improbable that the populations will return to former levels unless the vegetation recovers as well. Investigations in 2005 and 2006 have documented the nesting distribution of snow geese and brant, and the effect of grizzly bears on nest success. Additional detail is presented in the progress report handed out at the meeting.

Project Summary

Name of Project: Eider Spring Migration Count at Point Barrow, Alaska

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

To assess changes in western arctic King and Common Eider populations

Project description:

The King and Common eiders that nest in the western arctic of Canada winter west of the continent in the Bering Sea and North Pacific. The spring migration route for these two populations of eiders follows a lead of early open water in the Chukchi Sea off the coast of Alaska, taking the eiders past Point Barrow as they enter the Beaufort Sea and head eastward towards their nesting grounds in Canada. The narrow migration front at Point Barrow offers a unique and relatively inexpensive means of monitoring population trends of the eiders that nest in the ISR. Systematic counts of eiders at Barrow have been done previously in 1976, 1987, 1994 and 1996. The results of these counts indicate both King and Common eiders declined by over 50% over the two decades. This study proposes to repeat the counts to determine whether eiders have continued to decline since 1996.

Participating agency (agencies) and personnel: Canadian Wildlife Service, North Slope Borough, University of Alaska Fairbanks. Contacts: Lynne Dickson (CWS, Edmonton) (780) 951- 8681 lynne.dickson@ec.gc.ca or Garnet Raven (CWS, Edmonton) (780) 951-8912 garnet.raven@ec.gc.ca

Inuvialuit participation:

Project timeframe: 2003-04 to 2004-05

Funding: IFA: \$8,000 **Other:** CWS \$150,000

Results:

Results from counts in 2003 and 2004 suggest both the King Eider and Common Eider populations have remained stable or increased slightly in number since 1996.

Project Summary

Name of Project: King Eider and Canada Goose Breeding Population Surveys on Victoria Island

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives:

To assess population changes in King Eiders, Canada Geese, and other migratory birds on western Victoria Island

Project description:

The King Eider population that nests in Canada's western arctic declined by more than 50% from 1976 to 1996. This study is a repeat of the aerial breeding pair surveys conducted on western Victoria Island from 1992-94 to determine whether King Eiders have continued to decline in numbers, stabilized, or recovered in more recent years. The King Eider is an important food source for the people of Holman where about 4000 King Eiders are taken annually. Monitoring the population trend will help ensure there will be King Eiders for future harvest. The study will also provide information on the status of Canada Geese (based on wintering ground counts this particular population is thought to have declined dramatically since the mid-1990s), as well as several other species of waterfowl, loons, gulls, jaegers, owls and cranes.

Participating agency (agencies) and personnel: Canadian Wildlife Service, Sea Duck Joint Venture, Arctic Goose Joint Venture, US Fish and Wildlife Service, Polar Continental Shelf Project. Contacts: Lynne Dickson (CWS, Edmonton) (780) 951- 8681 lynne.dickson@ec.gc.ca or Garnet Raven (CWS, Edmonton) (780) 951-8912 garnet.raven@ec.gc.ca

Inuvialuit participation: Opportunity for participation in aerial surveys is limited.

Project timeframe: 2004-05 and 2005-06

Funding: IFA: \$20,000 Other: CWS \$145,000

Results:

Aerial surveys conducted on western Victoria Island in late June, 2004 and 2005 indicate King Eiders have continued to decline in number since 1992-94. By contrast, the estimated number of Canada Geese increased slightly from the previous count. Highest densities of King Eiders were found within the Kagloryuak River valley, near Tahiryuak Lake, and in portions of Prince Albert Peninsula. Highest densities of Canada Geese were found in the Kagloryuak River valley and in southwestern Victoria Island.

Project Summary

Name of Project: Numbers of White-fronted Geese (Yellowlegs) and other Waterfowl on the Mainland of the ISR

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives: to assess population changes in white-fronted geese (yellowlegs) and other waterfowl on the mainland of the ISR

Project description: Extensive aerial surveys of white-fronted geese, tundra swans, and other waterfowl were carried out on the mainland of the ISR in the early 1990s. The purpose is to repeat a subset of transects previously surveyed to see if numbers of birds have decreased. Recent estimates of survival rates of white-fronted geese are very low and there is good evidence that the overall Mid-continent Population of white-fronts (which the ISR birds are part of) has declined substantially over the past number of years. The surveys also provide useful information on many other species of concern including Canada geese, scoters (black ducks), loons, and long-tailed ducks (oldsquaw). Based on wintering ground counts this particular population of Canada geese is thought to have declined since the mid-1990s. The work is especially important for monitoring baseline levels of waterfowl and other species in the area of probable gas and oil development. An additional component of the study is band geese to determine their distribution, harvest, and survival (longevity). This is important to do because of sizable harvest in southern Canada and the US.

Participating agency (agencies) and personnel: Canadian Wildlife Service (including Oil and Gas MC funding). Contact : Jim Hines (Environment Canada, CWS) (867) 669-4761, jim.hines@ec.gc.ca, Polar Continental Shelf Project, United States Fish and Wildlife Service, Arctic Goose Joint Venture.

Inuvialuit participation: Opportunity for participation in aerial surveys is limited.

Project timeframe: 2002-03 to 2008-09

Funding: IFA: \$35000 **Other:** Polar Continental Shelf Project \$14000, CWS \$70000

Results: This is a monitoring study and its purpose is to document long term changes in numbers, distribution, reproductive success, and lifespan of geese and other water birds. Management actions (for example, restricting harvest elsewhere in southern Canada and the US) would be taken if any observed changes were judged to critical. To date, no significant downward trend has been detected for most species. Additional details on results of the study are presented in a progress report handed out at the detail.

Project Summary

Name of Project: Use of Satellite Telemetry to Locate Moulting and Wintering Areas of Long-tailed Ducks (Oldsquaw)

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives: To locate moulting and wintering areas of Long-tailed Ducks (Oldsquaw)

Project description: Waterfowl breeding population surveys suggest that Long-tailed Ducks (formerly called Oldsquaw) have declined in number by about 80% since the surveys began in 1955. The reason for the decline is unknown, in part due a lack of knowledge of even the most basic aspects of Long-tailed Duck biology (including where they go after they leave the nesting grounds). This study involves putting satellite transmitters on Long-tailed Ducks on the nesting grounds, then tracking their movement by satellite to locate their molting, fall staging, and wintering areas. In 2003, satellite transmitters were successfully implanted in 3 Long-tailed Ducks on Victoria Island. The results suggest these ducks moult nearby then migrate westward to the Bering Sea to winter off Russia. In 2004, satellite transmitters were put on 12 King Eiders on Victoria Island. In addition to helping delineate populations, the results are expected to provide valuable information on vulnerability of Long-tailed Ducks and King Eiders to offshore oil and gas development as they migrate through the Beaufort Sea in summer and autumn and then back again the following spring.

Participating agency (agencies) and personnel: Canadian Wildlife Service, Sea Duck Joint Venture, US Fish and Wildlife Service, Polar Continental Shelf Project. Contacts: Lynne Dickson (CWS, Edmonton) (780) 951- 8681 lynne.dickson@ec.gc.ca Garnet Raven (CWS, Edmonton) (780) 951-8912 garnet.raven@ec.gc.ca

Inuvialuit participation: field assistant hired from Holman

Project timeframe: 2003-04 to 2004-05

Funding: IFA: \$15, 000 **Other:** \$105, 000

Results: We were unable to capture any Long-tailed Ducks in 2004 due to their low densities and lack of interest in our decoys. Consequently, we put the satellite transmitters on King Eiders. 8 of the 12 transmitters provided locations through the nesting season in 2005. Two of the three transmitters put on Long-tailed Ducks in 2003 were still functioning the following spring, 2004. Both ducks were males and neither returned to the previous year's nesting area. Instead, one migrated to arctic Russia and the other to northwest Alaska to nest.

Project Summary

Name of Project: Waterfowl Harvest Monitoring

Project recommended by: Wildlife Management Advisory Council (NWT)

Management objectives: Collect waterfowl harvest data

Project description:

Waterfowl harvest data have been collected at 3 ISR communities from 2002-2006 (Paulatuk, Holman, and Sachs Harbour) in collaboration with DFO, ENR, and the local HTC's.

Participating agency (agencies) and personnel: Canadian Wildlife Service, Fisheries and Oceans, NWT Resources Wildlife and Economic Development. Contact: Jessica Beubier, Environment Canada (Canadian Wildlife Service, Inuvik), 867-678-6431), Jessica.Beubier@ec.gc.ca

Inuvialuit participation: local field workers in 3 communities collect harvest data from local hunters.

Project timeframe: Ongoing

Funding:

IFA: \$10,000

Other: about \$40,000 total from DFO & ENR (GNWT)

Results:

The study is intended for monitoring purposes. Recent data have been summarized in a series of posters which compare recent harvests to those collected during the late 1980s and early 1990s (Inuvialuit Harvest Study). Recent summary (see progress report provided at meeting) shows how much harvest differs annually but indicates little or no downward or upward long term trend in harvest for geese in general. Harvest of eiders at Holman may have declined but further analysis and discussions with the HTC need to take place to find out if this trend is real.

Project Summary

Name of Project: Brock Lake Fisheries Assessment in
Tuktut Nogait National Park (2005/2006)

Project recommended by: Fisheries Joint Management Committee

Management objectives: Through community-based initiatives, DFO and FJMC have worked closely to ensure that the community fishing plans are supported through projects, initiatives and meetings. This has proven essential for the successful implementation of community fishing plans. The Brock Lake assessment is one such project, determined and recommended by the Hornaday Charr Management Plan process.

Project description: The project was designed to collect baseline ecological data on the Brock Lake, working closely with the Paulatuk HTC and Parks Canada. The information gained will be used to assess the suitability and management implications of using this area as a subsistence-fishing site, and to provide baseline information on this Lake within the Park.

Objectives

- To gather basic biological, physical and chemical information about Brock Lake, including bathymetry and water quality, during the open water season 2004 and 2005;
- To estimate relative abundance and diversity of fishes in the lake through a non-destructive, small-mesh net gillnetting program;
- To examine movements of Arctic char from Brock Lake to neighbouring systems through a floy tagging program, and,

Open water work in 2004 included small mesh net gill netting; floy tagging charr; bathymetry profiling, water quality assessment and strontium profiling on charr otoliths and fins. The same field work was repeated in 2005.

Participating agency (agencies) and personnel: Lois Harwood (DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca) & John Babaluk DFO; Parks Canada Tuktut Nogait National Park

Inuvialuit participation: Field work led by Joe Illasiak; Nelson Ruben field assistant; Paulatuk HTC, Paulatuk Charr Working Group

Project timeframe: year 3 of 3

Funding: IFA: \$20K **Other:** Parks Canada \$20K; DFO \$6K; PCSP \$10K

Results: All lab work and data entry complete. Report in preparation. Presentation on project to be given to the TNNP Board April 19, 2007 in Deline.

Project Summary

Name of Project: Tributary One Weir Assessment (2005/2006) and Tributary One Weir Materials Clean up (2006/2007)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

The project will help provide a more complete understanding of Kuujjua River charr stock distribution and movements, and use of the upper tributaries of the Kuujjua system. This work assists with the implementation of the Holman Charr Fishing Plan.

Project description:

In 2000, some people from Holman started fishing at Red Belly Lake, which is one of many lakes that drains into Fish Lake via Tributary One. In that year they took over 900 fish, many of them current year (ripe) spawners. This is recognised as contrary to the spirit of the Fishing Plan, the main objective being to conserve Kuujjua River charr. In subsequent years, fishing was lower at Red Belly Lake, but other locations were also used for fishing. There are at least four lakes in this area that are used for fishing from time to time. The 2005 project was to install and operate a conduit weir at the mouth of Tributary One for 56 days. The weir was constructed of materials that were left there in 1992. The objectives of the weir study were:

- To increase our understanding of movements of charr through Tributary One and to upper lakes of the Fish Lake system,
- To contribute information on the life history stage of migrants and movements of these charr, to allow us to better understand the relationship between the charr caught in the Fish Lake subsistence fishery and the population in the Kuujjua River system;
- To contribute information for the Holman Charr Fishing Plan,
- To tag charr moving through this system with the intent that they will be caught in the Red Belly and other lakes in the area, to reaffirm for the community that these are Kuujjua River fish,
- To involve community technicians in the delivery of a major fisheries assessment project.

The study was a success, with juvenile and spawning adult charr being enumerated at the weir (photo left above). However the study was cut short in

late August when torrential rains caused the river to swell by 2.5 m in one day. Within hours the weir washed out.

Over the next 24-48 hr, safety of the crew was paramount and eventually it was decided to evacuate the site. All personnel and gear were safely removed, however it was not possible to gather up all the weir materials due to the raging torrents/water levels which surrounded the camp and site on three sides.

The crew had to be evacuated at short notice, and there was not time or room in the twin otter to retrieve and transport all of the remaining weir materials.

Buddy Alikamik assessed the situation in fall 2005, and has reported back to DFO on the location and condition of remaining materials. It was decided that the best time and approach to remove all remaining materials would be in mid July 2006, when water levels are lowest and all areas accessible.

The crew was flown in to the site and the clean up completed in July and September 2006.

Participating agency (agencies) and personnel: Lois Harwood (project manager) - DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca

Inuvialuit participation: Holman HTC (Buddy Alikamik, Dan Klengenber, John Goose)

Project timeframe: year 1 of 2; year 2 of 2

Funding:

IFA: \$40,000 + \$20,000

Other: PCSP, DFO

Results:

Data entry and aging complete, report in preparation, results presented to the community.

Project Summary

Name of Project: Trapnet Survey of the Fish Community in Nearshore Yukon Coastal Waters

Project recommended by: Fisheries Joint Management Committee

Management objectives:

Establish benchmark data for fish populations in near-shore North Slope waters - for future monitoring efforts by environmental impact assessors, regulatory agencies, and environmental stewards. Examine changes to fish community over past 20 years to put into proper context future studies examining the impacts of climate change, gas & oil development and exploitation. Develop a better overall understanding of the nearshore ecosystem to allow ecosystem based management of its resources. Determine the condition of populations of specific species of special interest to communities and fisheries managers e.g., condition of cisco populations. Support genetic studies examining the stock structure of North Slope Dolly Varden char - an issue for fisheries managers. Support ongoing contaminant studies - an issue for local residents.

Project description:

Nearshore Yukon coastal waters are an important migration corridor, rearing and feeding area for anadromous and marine fish - fish of considerable economic and cultural importance to the people of the area. This project has 2 parts: 1) a trapnet fish survey at Phillips Bay, Yukon (open-water seasons 2007 & 2008), replicating a 1986 study, to establish new benchmark fish conditions for this area and determine changes to the fish community over the past 20 years; 2) an examination of the structure and function of this ecosystem through stable isotope (SI) analysis. This will build upon a previous study that's established baseline data for SI ratios of N, C and S for fish commonly caught throughout the Beaufort Sea area. Linkages to other research in the area include: the offshore marine fish program - CCGS Nahidik; Sensitive Species fish project funded by Gas Pipeline money; PERD funded stable isotope study; genetics research on North Slope char; ongoing contaminants research; and research examining the lowest trophic levels of the food web through SI analysis.

Participating agency (agencies) and personnel: Jim Johnson (project manager), Jim Reist – DFO; Christian Bucher, Marlow Pellatt – Parks Canada; Michael Power – University of Waterloo; Polar Continental Shelf Project. Contact: Jim Johnson (DFO Winnipeg) (204) 983-5157 johnsonj@dfo-mpo.gc.ca

Inuvialuit participation: FJMC mentoring student(s)

Project timeframe: Year 1 of 4 year project.

Funding:

IFA: \$35,000

Other: Polar Continental Shelf Project - \$55,000; Program for Energy Research and Development - \$75,000; DFO A-base - \$10,000; Parks Canada (pending)

Results: N/A – project to begin in summer of 2007.

Project Summary

Name of Project: Delineation of Fish Stocks in the Mackenzie River by Means of Population Genetics

Project recommended by: Fisheries Joint Management Committee

Management objectives: To determine the population structure of crookedback (**pikuktung**, lake whitefish, *Coregonus clupeaformis*) and coney (**siirgarq**, inconnu, *Stenodus leucichthys*) in the Mackenzie River. In particular, we aim to 1) delineate stocks of three species of migratory freshwater fish and 2) identify downstream fisheries as mixed-stock or single-stock fisheries.

Project description: Anticipated oil and gas development in the Mackenzie River valley have highlighted knowledge gaps about freshwater and anadromous fish species. Adequate monitoring programs should be in place before development. Before monitoring can take place, we require an understanding of stock composition of fish species. Here, we determine the population structure of crookedback and coney. We use a population genetics approach to determine structure of these species throughout the Inuvialuit Settlement Region, the Gwich'in Settlement Area, and the Sahtu Settlement Area. To do this, we collected fins from 50 fish (of each species) at multiple sites.

Participating agency (agencies) and personnel: Nathan Millar, Fisheries Biologist (Gwich'in Renewable Resource Board), Paul Bentzen, Professor (Dalhousie University)

Inuvialuit participation: Local fishermen collected fins for the project at their normal fishing sites. HTCs were contracted to collect fins from members.

Project timeframe: The bulk of the samples have been collected and the genetic analysis is ongoing. We have preliminary results for lake whitefish at this time. The analysis for coney is also underway.

Funding: IFA- \$10,000 **Other -** \$10,000 (Gwich'in RRB), \$12,000 (Sahtu RRB), \$29,600 (INAC) from previous year

Results: *Preliminary* results show that there is a low level of structure (few genetic differences) among fish sampled at different sites in the delta and Mackenzie River. Larger sample sizes will clarify these results. In general though, the results indicate a lot of mixing (exchange of individual fish) among populations (even among those that spawn in different rivers). On the other hand, we found that there are some populations (e.g., Travailant Lake in the Gwich'in Settlement Area) that are quite distinct and may indicate populations worthy of special management.

Project Summary

Name of Project: Phylogeography and Genetic Population Structure of Broad Whitefish (*Coregonus nasus*) in North America with Emphasis on the Mackenzie River System

Project recommended by: The Gwich'in Renewable Resource Board (GRRB), Fisheries and Oceans Canada (DFO) and the Department of Zoology at the University of British Columbia (UBC). Subsequently, the project was approved by all Gwich'in communities.

Management objectives:

Originated over concerns of the recent increase in exploration and development in the Western Arctic and the potential impacts on broad whitefish populations. Viewed pertinent to collect baseline information on the genetic population structure of broad whitefish before development occurs.

From a fisheries management perspective, the aim of determining the intra-specific population genetic structure is to determine the units between which limited gene-flow occurs because if such units are over-fished, it is unlikely that population sizes will recover due to migration, and hence a collapse of the fishery may occur. This is of particular importance for this species as this information is still lacking, and broad whitefish are the coregonid species most valued in the local subsistence fisheries in addition to being the target of intermittent commercial fishery efforts in the Mackenzie River Delta.

Will not only provide insight into the creation of sustainable management plans for this species, knowledge will be gained on the processes that shaped post-glacial dispersal patterns, evolution and gene flow of other western Arctic fishes.

Project description:

The objective will assist in determining if broad whitefish from different areas are genetically different from each other and if the genetic differences among these populations are important enough to cause concern in a management or conservation context.

Participating agency (agencies) and personnel:

The GRRB (Les Harris), UBC (Les Harris and Dr. Eric Taylor), and DFO (Dr. Ross Tallman). Additionally, many local Inuvialuit and Gwich'in fishermen made this study possible by collecting samples during the fall subsistence fishery. Those that contributed to sample collection efforts include, in no particular order, Edward Lennie, Danny Andre, Frederick Blake Sr., Sonny Blake, Collin Allen, James Firth, James Maring and Willy Simon. Samples were also provided by many DFO, Yukon Territorial Government, Alaska Department of Fish and Game and Alaska Department of Natural Resource personnel. Namely I would like to

thank Erin Hiebert, Cal Wenghofer, Don Pittman, Lois Harwood, Ross Tallman, Kimberly Howland, Melanie Toyne, Susan Thomson, John Wenburg, William Morris, Randy Brown and Dmitri Sendek.

Inuvialuit participation:

During fall subsistence fisheries, Inuvialuit fishermen were given the opportunity to return samples from captured broad whitefish, namely fin-clips, for a small reward. Five dollars were offered per fin, to a maximum of 50 fins per person. Additionally, Inuvialuit fishermen were hired specifically to collect samples from areas within the Inuvialuit Settlement Region where samples were notably lacking or absent. As part of this, a local Inuvialuit fisherman was hired for several weeks, over two consecutive years, to capture broad whitefish and collect samples from such areas.

Project timeframe:

Commenced in September, 2005, and will be completed by December, 2007. Currently, all samples have been collected and all of the laboratory work has been completed. I am now organizing all of the data so that the analysis can commence in the near future, more specifically, once I am able to ensure that no other samples need to be amplified.

Funding: IFA: FJMC: \$12 000 **Other:** GRRB: \$10 000, Indian and Northern Affairs Canada, Pipeline Readiness Office: \$12 800, DFO: \$1500, UBC: In kind support.

Results:

Broad whitefish tissue samples for microsatellite analysis have been collected from 46 localities (n=1300) from Alaskan drainages to the Mackenzie River system, Northwest Territories, and its major tributaries. Additionally samples have also been obtained from Siberia, which will be compared to North American samples. Although there are samples from 47 locations, each locality likely does not represent a distinct population, especially for samples collected throughout the Mackenzie River Delta where several populations are known to migrate through. DNA was extracted from these samples using Qiagen DNA extraction kits.

Primers for seven different microsatellite loci have been chosen for use in this study. So far all seven of these different primers have been used to amplify microsatellite loci in all of the samples in which DNA when extracted. As mentioned above, all the lab work has been completed and the analyses will begin in the near future. Although no data analysis has been performed as of yet, for a detailed description of the genetic data analysis to be conducted for this study, please refer to pages 17-20 of the thesis proposal that corresponds to this research. For implications to management and conservation, based on future results, please see the section above (Management Objectives).

Project Summary

Name of Project: Fish Lake Charr Monitoring (2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

The continuation of the monitoring program in 2005 and 2006 will serve to monitor the status of the stock and collect the data to determine if there is compliance with the Holman Charr Fishing Plan.

Project description:

Two monitors from Holman travelled to Fish Lake when the community fishing began, and remained there until it concluded. They kept records of CPUE for all fishermen, and sampled charr. Information on sex and maturity was collected for all charr in the dead sample (n=200), along with the standard CPUE, length, and weight measurements, and aging structures are collected.

Objectives

- To obtain a long-term record of the catches of charr at Fish Lake, and estimate the total harvest and CPUE for charr from Fish Lake;
- To examine trends in the age, size, sex, maturity and condition of a random sample of charr (n=200) taken in Fish Lake, as a means of monitoring the status of the stock and providing further information on the life history of Fish Lake charr;
- To enhance and utilise existing expertise in the communities in the collection of biological data, and to assist with the delivery of the biological program, and,
- To contribute some of the necessary biological information for the development, implementation and fine-tuning of the Holman Charr Fishing Plan.

Participating agency (agencies) and personnel: Lois Harwood (project manager - DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca); G. Carder (aging)

Inuvialuit participation: Holman HTC

Project timeframe: Ongoing, annual

Funding: IFA: \$16,000

Results: All results analyzed and up to date. Provided to DFO, FJMC, HTC and Fishing Plan Working Group.

Project Summary

Name of Project: Hornaday River Charr Monitoring (2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives: The community's revised "Paulatuk Charr Management Plan 2003-2005" provides a means for the HTC to monitor compliance with the updated version of the management plan, and to continue to augment this important long-term database.

Project description: This harvest-based program involved enumerating and measuring Arctic charr taken in the annual harvest at the Hornaday River during the August upstream migration, collection of CPUE information from the elders fishery at Coalmine (formerly closed area), and the collection of charr from Diipi that are thought might be a different stock from Hornaday charr.

Objectives

- To obtain a long-term record of the catches of charr at the Hornaday River subsistence fishery;
- To provide indices of relative stock size based on the catch per unit effort (CPUE) at both the summer and winter/elders fishery;
- To estimate the total harvest of Hornaday River charr in the late summer fishery in 2005 and 2006;
- To examine trends in the age, size, sex, maturity and condition of a random sample of charr (n=300) taken in the summer subsistence fishery as a means of monitoring the status of the stock;
- To facilitate the return of fish tags captured in the fishery;
- To enhance and utilize existing expertise in the communities in the collection of biological data, and to assist with the delivery of the biological program, and,
- To contribute some of the necessary biological information for the implementation of the Paulatuk Charr Management Plan.

Participating agency (agencies) and personnel: Lois Harwood (project manager DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca); G. Carder (aging)

Inuvialuit participation: Paulatuk HTC

Project timeframe: Ongoing, annual

Funding: IFA: \$16,000

Results: Under analysis

Project Summary

Name of Project: Sachs Harbour Char Study

Project recommended by: Fisheries Joint Management Committee, Sachs Harbour HTC

Management objectives:

Gather information on char population numbers and habitat use for incorporation into FJMC and HTC management of the char stocks and harvest in the Sachs Harbour area.

Project description:

No formal project description was developed. Through consultation with the Sachs Harbour HTC and community members during public meetings, plans were formulated for the development of a Sachs Harbour Fishing Plan and Working Group.

Participating agency (agencies) and personnel:

Erin Hiebert & Lois Harwood (DFO); FJMC members and staff

Inuvialuit participation: Sachs Harbour HTC

Project timeframe: 2005-06

Funding:

IFA- \$12, 000

Other – DFO in-kind

Results: Contributed to the development of the Sachs Harbour Fishing Plan and Working Group.

Project Summary

Name of Project: Ulukhaktok (Holman) Char Fishing Plan: Implementation, Consultation and Printing (2005-06, 2006-07)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

To hold a Ulukhaktok (Holman) Char Working Group meeting to discuss concerns and new information and to make recommendations on a revised fishing plan for Holman area Arctic char; to hear local views/concerns about char stocks and the current status of the plan; and help identify priority projects that will provide the greatest benefits to Holman char harvesters.

Project description:

A Holman Char Working Group has met annually since 1996 to discuss local and scientific information, status and management options for Holman char stocks and to update the Holman Char Fishing Plan. The working group has typically met for two days to review information and discuss options prior to a public meeting at which time, the recommendations and new information is presented and (typically) accepted. The Ulukhaktok (Holman) Char Fishing Plan and the annual meetings have proven an effective means to manage Holman area char stocks and gain public input and support.

Beginning 2001 the Working Group decided that a plan could be signed off on for a period of three years and DFO could attend the HTC AGM to give simple updates on the fishery and monitoring studies.

DFO presented information from harvest studies and monitoring programs while members of the Working Group provide Traditional Knowledge as well as community views on the success of the plan and the current status of the fishery.

Participating agency (agencies) and personnel: Erin Hiebert (project manager) – DFO; FJMC members & staff

Inuvialuit participation: Olokhaktomiut HTC, Ulukhaktok (Holman) Char Working Group

Project timeframe: Ongoing

Funding: IFA: \$10,000

Results: Contributes to the ongoing management of the Arctic char stocks in the Ulukhaktok area and implementation of the fishing plan.

Project Summary

Name of Project: Influences of Environmental Variation on Anadromous Arctic Charr from the Hornaday River, NWT

Project recommended by: Fisheries Joint Management Committee

Management objectives:

To collate Hornaday River monitoring data for charr from 1990 to 2003. The completed analysis explores possible connections between observed variation in Arctic charr population characteristics (e.g., length and weight) and climate variation. Better understanding of linkages between the biology of Arctic charr populations and environmental variation will help improve adaptive management of fishery resources and will allow managers to anticipate and mitigate possible adverse effects of climate variation.

Project description:

Data from the Hornaday River (69°21'N, 124°4'W) fishery (1979, 1981 and 1990-2003) were used to determine mean annual lengths and weights by age and sex. Climate data produced from general climate models (GCMs) specific to the year of capture were also collected. Data included: temperature, precipitation, and sea-surface temperature. Correlations between biological and environmental data were estimated using standard linear regression techniques. Multiple regression models were used to explain observed variation in mean at-age length and weight characteristics for fish in age-classes 5 through 8. Analysis of other age-classes was precluded by small sample sizes. Environmental influences on length were found to be age-specific, with temperature being the most significant influence on younger-aged fish and precipitation being the most significant influence on older fish. Weight was positively influenced by precipitation. Models of growth-temperature relationships suggested optimal growth occurred in years after average summer temperatures were in the 6.7 °C to 7.1 °C range. Results further suggested large-scale environmental changes induced by climate change will hold significant implications for Arctic charr from this and other northern rivers. The study also highlighted the value of long-term data series of fishery data and encourages the continuation of such programs and their extension to acquire such data for additional charr populations.

Participating agency (agencies) and personnel: J. Reist (DFO – project funding lead); L. Chavarie (graduate student, U of Waterloo – analysis and writeup); M. Power (supervisor – U of Waterloo); L. Harwood (DFO – char monitoring program lead); and E. Hiebert (DFO – area liaison).

Inuvialuit participation: Paulatuk HTC, Paulatuk Char Working Group.

Project timeframe: September 2005 – September 2006

Funding:

IFA: \$10,000;

Other: DFO A-base - \$6K; plus a large amount of funding in previous years for the community-based collection of char fishery data (long-term funding by FJMC and DFO).

Results:

Information obtained by the study highlights the sensitivity of Hornaday River Arctic charr stocks to environmental variation and suggests careful management of the stocks will be required in the face of changing climate. The linkage between fishery data (e.g., length/weight of fish) and environmental variables provides understanding useful for making informed management decisions. This linkage further suggests the need for continuing long-term study of this and other populations and the establishment of consistent monitoring programs to determine when and how stocks are responding to environmental factors and/or changing over time as these factors change. A manuscript suitable for publication in the primary literature has been prepared, submitted and reviewed by the journal *Arctic*, and is in the final stages of revision presently – this will likely be published later in 2007.

Project Summary

Name of Project: Hornaday River Charr Fishing Plan: Implementation, Consultation and Printing (2005-06, 2006-07)

Project recommended by:

DFO, Fisheries Joint Management Committee, Paulatuk HTC

Management objectives:

To update and implement the Hornaday Charr Management Plan; exchange information among managers and users on the status of the Hornaday River charr stock, and reaffirm consensus on the best approach to management of the charr to ensure they are conserved and the harvests sustainable; and to provide support for implementation of the Fishing Plan.

Project description:

The first component of this project was to administer the Fishing in Alternate Areas program.

The second component of this project was to print the Hornaday Charr Fishing Plan for circulation within the community.

The third component of the project was to hold one meeting of the Charr Working Group each year to examine the results of the monitoring to date, review compliance with the plan, and assess stock recovery indicators.

Participating agency (agencies) and personnel: Erin Hiebert (project manager) - DFO

Inuvialuit participation: Paulatuk HTC, Paulatuk Char Working Group

Project timeframe: Ongoing

Funding:

IFA- \$16,000

Results:

Contributes to the ongoing management of the Hornaday River Arctic char stock and implementation of the fishing plan.

Project Summary

Name of Project: Sachs Harbour Fishing Plan: Implementation, Consultation and Printing (2006-07)

Project recommended by: Sachs Harbour HTC, DFO, FJMC

Management objectives:

This project serves to start a community fishing plan based on the successes of the Ulukhaktok and Paulatuk community based fishing plans. The Sachs Harbour HTC and residents have approached the FJMC, DFO Fish Management and Science sectors to request creation a Fishing Plan Working Group in order to promote the to co-management of various fish stocks for Banks Island.

Project description:

The project brings together representatives from the community, HTC, FJMC, DFO and Parks Canada to form a Sachs Harbour Fisheries Working Group. The Group will create a plan that suites their needs and concerns, with DFO aiding in the physical creation of a plan. Some elements initially suggested were:

- Concerns with the dumping of Musk ox carcasses relating to juvenile char migrations
- Traditional knowledge study relating to char harvesting, habitat and distribution
- Development of a harvest plans for char and tom cod
- Habitat study and stock assessment of the char
- Exploratory fisheries
- More student involvement of local youth

With a new plan being created for the first time in Sachs Harbour, there is the ability to focus on the main harvester needs and concerns, adapting a plan that will include all of the above issues and additional fisheries concerns as they arise. Community meetings occurred during the same week as Working Group Meetings in order to gain more input and acceptance for a plan. As well, this project allows for professional copies of the new fishing plan to be printed for the community, FJMC and DFO distribution.

Participating agency (agencies) and personnel: Erin Hiebert (project manager) – DFO; FJMC members and staff

Inuvialuit participation: Sachs Harbour HTC

Project timeframe: Ongoing

Funding: IFA- \$10,000

Results: Initial steps to development of the plan were completed, and will continue on into 2007-08.

Project Summary

Name of Project: Age Structure and Growth of Beluga Whales in the Eastern Beaufort Sea/ Eastern Beaufort Sea Beluga and Climate Change

Project recommended by: Department of Fisheries and Oceans

Management objectives:

To evaluate the impact, if any, past changes in the environment have had on the demography and growth of Eastern Beaufort Sea beluga. Understanding how these events have affected this beluga stock will provide powerful tools to predict the effect of future environmental perturbations on this beluga stock, especially in the current context of climate change.

Project description:

Based on long term information dataset, integrating information on morphometrics and age from eastern Beaufort Sea beluga, including the Mackenzie delta region. It includes data on over 40 jawbone samples per year, which have been collected and aged from the FJMC region over almost 30 years, as well as similar comparative data from other Canadian stocks. These data are used to estimate the growth of beluga and reconstruct the age structure of the population at periods before and after well documented ecosystem perturbations, for comparison purposes. We are also studying beluga movements and diving behaviour to determine where they feed.

Participating agency (agencies) and personnel:

Freshwater Institute of the Department of Fisheries and Oceans. Researchers responsible for it are Dr. Steve Ferguson and Sebastian P. Luque.

Inuvialuit participation:

The data was obtained in direct collaboration in the field from members of local communities in Tuktoyaktuk and the Mackenzie delta area. Their participation has allowed the design and construction of a complete database on beluga demography and morphometric information.

Project timeframe:

Started in September 2005 and has continued through March 2007. Two separate goals have been achieved during this time: a) a comparison of the growth and age structure of the Beaufort Sea beluga stock with other Canadian stocks, and b) an assessment of the impact of a major, large scale ecosystem change on the demography and morphometric characteristics of this population. Studies to determine where Eastern Beaufort Sea Beluga feed are ongoing.

Funding:

Provided by the Fisheries Joint Management Committee.

Results:

Beluga from the FJMC regions have been found to be larger than those from most of the rest of Canadian populations. Their mortality, however, was found to be similar to those of other Canadian populations. A major ecosystem perturbation in the 1970s in the Bering Sea has not had an important effect on the Eastern Beaufort Sea beluga stock. These results mean that this beluga stock is in relatively good condition and is resilient to major changes in the Bering Sea.

Project Summary

Name of Project: Linking Contaminant Exposure to Neurochemistry of Beluga Whales in the Beaufort Sea

Project recommended by: Dr. Laurie H.M. Chan, Dr. Gary Stern Fisheries and Oceans Canada (DFO), and the Fisheries Joint Management Committee

Management objectives: This study compliments current monitoring studies of belugas and is relevant to the mandate of the FJMC to manage and conserve marine mammal stocks for future generations. An improvement in our understanding of the effect of contaminants on beluga health is integral to the management of this marine resource in the ISR.

Project description: Investigating the effect of environmental chemicals on the nervous system of beluga whales harvested in the western arctic. The objectives are to study whether changes occur to beluga brains and blood that can be linked to exposure to environmental chemicals such as mercury and PCBs. We are studying receptors and enzymes in the brains and blood of belugas because past research has shown that these can be affected by mercury exposure.

Mercury and other environmental chemicals are known to travel to the arctic in the ocean currents, air and rivers. Once these are present in the ocean, they enter the food chain and become concentrated in marine mammals (e.g. polar bears and belugas). Although we know that mercury and PCBs are present in belugas, it is difficult to observe changes in the whales' health that results from this exposure. We are interested in studying the brains and blood of belugas because mercury can be neurotoxic, which means that it can harm the brain.

Dr. Gary Stern (DFO) organizes the collection of meat, blubber, kidney, liver and blood from harvested whales at Hendrickson Island. These tissues are analyzed at the Freshwater Institute in Winnipeg, Manitoba, to learn about the exposure of these whales to environmental chemicals.

We use the information that Dr. Stern collects in order to compare the exposure of whales to chemicals with the amount of receptors and enzymes in their brains. If we observe a difference between the brains, we are interested in understanding whether this is due to exposure to mercury and other chemicals. We would also like to study blood samples to determine if changes to red blood cells occur at the same time as changes to brain chemistry. All of the brain analyses are carried out at the University of Northern British Columbia.

Participating agency (agencies) and personnel:

- Dr. Laurie H.M. Chan, BC Leadership Chair in Aboriginal Environmental Health, Professor of Community Health, University of Northern BC, Phone: (250) 960-5237 Email: lchan@unbc.ca Website: <http://web.unbc.ca/chan/>

- Sonja Ostertag, University of Northern British Columbia Graduate Student
Phone: (250) 552-4564 Email: Sonja.ostertag@elf.mcgill.ca
- Dr. Gary Stern (Department of Fisheries and Oceans)
- Fisheries Joint Management Committee, Inuvik
- Department of Fisheries and Oceans (Inuvik, Winnipeg)

Inuvialuit participation:

Inuvialuit participation is integral to the success of this project. The involvement of local hunters from Tuktoyaktuk and Inuvik permits samples to be collected from beluga whales, which would otherwise not be possible. The participation of the whale monitor and Nellie and Frank Pokiak made the sampling season safe, efficient and enjoyable in 2006. A host from Tuktoyaktuk is required during the sampling season to ensure that sampling is carried out in a safe, effective and culturally appropriate manner.

In November 2006, hunters from Tuktoyaktuk were involved in a harvest and sampling program in the Husky Lakes. The Tuktoyaktuk HTC and Inuvik DFO helped coordinate the sampling of brains from the whales.

In 2007 we hope to include mentoring students in the sampling component.

Project time frame: Sample collection began in the summer of 2006 and should be complete in 2007 following the summer harvest. Laboratory analyses will begin in the summer of 2007 and should continue until 2008 or 2009. All results should be available by 2010 and will be reported back to the appropriate agencies at that time. Preliminary results will be reported upon availability.

Funding: IFA- 11,000.00 (2006)
Other: ArcticNet - \$7000 sampling, NCP \$12,000 sample analysis

Results:

In 2006 we collected 52 samples from whales at East Whitefish Station and Hendrickson Island and 30 brains from the Husky Lakes.

Mercury levels will be measured in the brain samples this summer and preliminary results should be available before the sampling season. Neurochemical analyses will begin after the completion of the 2007 sampling season.

The results will provide information about whether environmental chemicals are causing detectable changes to the brains of belugas. Given the importance of brain function for animal behavior, changes that occur to the brain could negatively affect the health of whales. Understanding the effect of neurotoxic chemicals on belugas is important in evaluating the risk that these chemicals pose to their health.

Project Summary

Name of Project: Study of Beluga Seasonal Range and Ecology with Satellite-linked Transmitters in Relation to Hydro-carbon Development and Contaminant Uptake

Project recommended by: Department of Fisheries and Oceans

Management objectives:

To determine the annual migration extent of the eastern Beaufort Sea Beluga Whales to understand habitat use in particular feeding regions

Project description:

In 2004 and 2005 a total of 13 satellite tags were deployed on beluga whales from Hendrickson Island. No tagging work was conducted in 2006. Habitat use analysis of sea ice was completed on tracking data from 1993-1996, and is currently being completed for 2004 and 2005. In conjunction with sea ice habitat use we are analyzing the movement and dive data to determine important feeding habitats. Our present findings suggest that Wrangel Island and the western Bering Sea are probably important winter feeding sites, and that the Amundsen Gulf and Viscount Melville Sound may also provide important prey items. Prey items from several of these regions have been collect in partnership with the "Mercury in Western Arctic Marine Mammals" to begin identifying diet sources of mercury to beluga in the regions they travel and feed in.

Participating agency (agencies) and personnel: Fisheries & Oceans Canada, University of Manitoba, Devon Canada Corporation, ArcticNet,

Inuvialuit participation:

Community members from Inuvik, Tuktoyaktuk and Aklavik were selected by the local HTC's to participate in the capture and satellite tagging on Hendrickson Island in 2004 and 2005 (without participation of Tuktoyaktuk). In addition students from the FJMC mentoring program were present both years. Lisa Loseto participated in further student mentoring in Winnipeg at Fisheries & Oceans Canada.

Project timeframe: 2003-2007

Funding:

IFA - \$10,000 in 2005-06

Other - \$143,000 in 2004-05

Results:

We now know that health of the western Bering Sea ecosystem is important to the eastern Beaufort Sea Beluga. Only one tag transmitted the entire annual

season revealing that it left the Bering Sea in April and arrived in the eastern Beaufort Sea in early May, but did travel north into heavy pack ice just over 80N latitude. The habitat use analysis in the summering region revealed that within the beluga whale population there is segregation by habitat use of sea ice concentrations, ocean depth and distance to the mainland coastline. The analysis showed that habitat selection differed with length, sex, and reproductive status of whales where: (1) females with calves and smaller males selected open water habitats near the mainland; (2) large males selected closed sea ice cover, in and near the Arctic Archipelago; and (3) smaller males and two females (with calves not newborn) selected habitat near the ice edge. Sex, age, and reproductive segregation of habitat use relate to the different resources required with life stages and may represent characteristics of beluga social structure. This information needs to be considered when making conservation management guidelines.

Project Summary

Name of Project: Retrospective Study of Mercury in Beaufort Sea Beluga
During the 19th and 20th Centuries

Project recommended by: Natural Resources Canada

Management objectives:

Directly relevant to FJMC internal priority to identify “mechanisms responsible for mercury contamination in marine mammals of the ISR”.

Project description:

This project proposed to help evaluate competing hypotheses for increases in mercury in beluga (natural process, exacerbated by climate-warming, or industrial mercury contamination) by providing more detailed temporal data on changes in mercury concentrations and in stable carbon, nitrogen and oxygen isotopes in beluga teeth over the last 2 centuries, and especially in the early to mid-20th Century. Mercury concentrations in beluga teeth are strongly correlated to mercury in soft tissues including muscle and muktuk.

Tooth samples were analysed for mercury, age, and stable carbon, nitrogen and oxygen isotopes in order to correct for any changes in diet and age over time, as well as identify any variations of riverine inputs of carbon and oxygen.

Participating agency (agencies) and personnel:

P. Outridge, NRCan, J. Savelle (McGill U), P. Fraser (assistant archaeologist), A. Kinghorn (grad student, McGill U.), Involved in analytical work: G. Stern (DFO), K. Hobson (CWS).

Inuvialuit participation:

Field guides (C. Pokiak & G. Raddi Jr.), plus one cook and one high school student

Project timeframe: 2005-2006 (2 years)

Funding:

IFA- \$12,000

Other - \$21,000 – GSC; \$16,000 – ArcticNet; \$12,000 – Northern Contaminants Program

Results:

By determining when mercury started to increase during the last century or two, we hope to better understand the roles that climate change, industrial pollution or ecological factors have played.

Project Summary

Name of Project: Beaufort Sea Beluga: Disease and Parasites
(2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

Collection of samples from Beaufort Sea beluga harvested at Kendall Island to assess disease and parasites

Project description:

Our collaborating veterinarian and local sampler worked at Kendall Island beluga whale harvesting area for approximately 10 days in each of July 2005 and July 2006 to examine and sample landed whales. This project is in addition to the regular FJMC harvest monitoring study. They also collected samples for contaminants testing and additional female reproductive tracts. FJMC mentoring students worked alongside the veterinarian in each sampling effort.

Participating agency (agencies) and personnel: Lois Harwood (project manager, DFO), Dr. Steve Raverty (BC Animal Health Center); Ole Nielsen (DFO disease specialist). Contact: Lois Harwood (DFO Yellowknife) (867) 669-4916 HarwoodL@dfo-mpo.gc.ca

Inuvialuit participation: Jerry Rogers (sampler), Angus Alunik (expeditor), Roy & Sandra Ipana (camp host), Noel Cockney (FJMC Student)

Project time frame: Year 1 of 2 (2005); Year 2 of 2 (2006)

Funding:

IFA: \$18-22,000 per year

Other: DFO A-base

Results: Veterinarian reports complete and available.

Project Summary

Name of Project: Marine Mammal Disease Investigation

Project recommended by: Fisheries Joint Management Committee

Management objectives:

The project seeks to identify what infectious disease agents are present in the marine mammals in the Inuvialuit Settlement Region. These agents may affect the number of animals that are available for Northerners to hunt and may pose a threat to the hunters who may come in contact with these diseased animals.

Project description:

The work is a continuation of the project from past years. The project supports monitoring of both seals and beluga in five communities in the ISR in conjunction with Lois Harwood, DFO. Tissues from these monitoring programs are tested for the presence of a number of infectious diseases (influenza A, *Brucella* etc) of importance to the health of both the host animals and the people who utilize them for food. In addition, hunters are asked to submit samples from animals they come across that appear diseased/abnormal. Full work ups are done in conjunction with co-investigators in order to diagnose the underlying problems. Results are communicated back to the submitting hunter via letter and/or by community visits.

Participating agency (agencies) and personnel:

Ole Nielsen (project manager), Lois Harwood - DFO; Dr. Stephen Raverty, BC Provincial Veterinary Pathologist, Abbotsford, BC; Dr. Raymond, Nims BioReliance Corporation, Rockville, Maryland, USA ; Dr. Klaus Nielsen, CFIA, Nepean, Ontario, Dr. Eric Delwart, Department of Medicine, University of California, San Francisco, California, USA

Inuvialuit participation:

HTC's (Local monitors/samplers), FJMC Mentoring Students

Project timeframe:

Ongoing for a few years now but 2007 -2008 is the final year for this project. The upcoming year will focus on providing educational materials as well as community information meetings regarding results and information on identifying and protecting oneself from zoonotic diseases in marine mammals.

Funding:

IFA- \$17,500 2006-07

Other – DFO A-Base - \$2.0K

Results:

A number of infectious diseases have been identified in both seals and beluga from the ISR. They include *Brucella spp.* in seals and belugas, distemper and influenza A in seals and *Bartonella spp.* in beluga. As well, a new previously unidentified *Picornavirus* species has been isolated from apparently healthy ringed seals from Ulukhaktok. Further investigation is needed to ascertain whether this virus has the ability to cause disease in seals.

The results indicate that a number of infectious diseases are circulating in the marine mammals in the ISR (*as well as the entire Canadian arctic*). Some of these diseases (*Brucella, Bartonella* and influenza A have the ability to cause disease in hunters and their families who may come in contact with meat from infected animals. Additionally, diseases may reduce the number of animals available for hunters.

Project Summary

Name of Project: Mercury in Western Arctic Marine Mammals

Project recommended by: Department of Fisheries & Oceans

Management objectives: Monitor mercury levels in the Beaufort Sea Beluga.

Project description: A monitoring program to measure levels of contaminants, in particular mercury in several tissues in beluga whales. This population had some of the highest mercury levels in the 1990's. Levels have since decreased and are comparable to mercury levels in eastern Arctic beluga. In addition to the monitoring of contaminants, various prey have been collected and analyzed for mercury levels to determine the sources of mercury. All beluga tissue and prey samples are being analyzed to assist with the determination of beluga diet. This project works in partnership the "Study of Beluga Seasonal Range and Ecology with Satellite-linked Transmitters in Relation to Hydro-carbon Development and Contaminant Uptake" project that assisted in the determination of feeding regions over the beluga annual range. Results from that project show differences in movement behavior and habitat use which are being taken into consideration in our program, that is we are investigating the influence of beluga age, size and sex on feeding preferences that may further affect their mercury levels.

Participating agency (agencies) and personnel: Fisheries & Oceans Canada, ArcticNet, CASES (Canadian Arctic Shelf Exchange Study)

Inuvialuit participation: Frank Pokiak along with the partnership of the communities has collected beluga samples and morphometric data. In 2005 Bill Wolki from Paulatuk also collected samples from their hunt. Lisa Loseto mentored several FJMC students in the field and in the lab at Fisheries & Oceans Canada in Winnipeg and partnered with a student (Kayla Hansen-Craik) to study mercury levels in zooplankton off of the Sir Wilfred Laurier Ice Breaker, and presented these findings at conferences and in peer reviewed publications.

Project timeframe: Ongoing

Funding: IFA - \$41,400 (2005-06), \$51,400 (2006-07) **Other** – DFO A-Base

Results: Levels of mercury in beluga have decreased and been stable since 2001. Preliminary results show that there is a difference in feeding behaviour that is affecting mercury levels and needs to be considered. Beluga harvested in Paulatuk were typically smaller and younger than those harvested in Hendrickson Island which may be related to few larger whales traveling to that region (see "Study of Beluga Seasonal Range and Ecology with Satellite-linked Transmitters in Relation to Hydro-carbon Development and Contaminant Uptake") as a result mercury levels in beluga harvested in Paulatuk are lower.

Project Summary

Name of Project: Potential Effects of Industry Activity in the Nearshore Beaufort Sea on Local Seal Populations, 2003-2006

Project recommended by: Fisheries Joint Management Committee

Management objectives:

The study is designed to determine the distribution, densities, baseline behavioural patterns, body and reproductive condition of ringed and bearded seals in the near shore land-fast ice of the Beaufort Sea, before and during exploratory drilling. This will increase the knowledge base on the impact of the winter exploration activities on local seal populations, and:

- Provide advice on appropriate mitigating measures, which could be employed to avoid or reduce the impact of hydrocarbon exploration and development activities conducted during the ice covered period on local seal populations;
- Provide advice on suitable monitoring programs, which could be implemented to assess the longer term implications of hydrocarbon exploration and development activities on the local seal populations;
- Evaluate the methods and techniques used during the course of the study; and
- Incorporate the traditional knowledge of the Inuvialuit in the planning and implementation of the research.

Project description:

We studied ringed seals, *Phoca hispida*, during the periods February to June in the fast ice approximately 30 km to the NW of Garry Island in the south-eastern Beaufort Sea during the years 2003-2006. The main study area, at the 12 m isobath, was a 6 x8 km plot, with Devon Canada's Paktoa drilling site (N 69° 37.008 W 136°27.618) at its approximate center. The study involved finding seal structures, live capture and tagging of seals, collection of seal specimens, and an aerial survey of basking seals.

Participating agency (agencies) and personnel: Lois Harwood (project manager DFO Yellowknife) (867) 669-4916 HarwoodL@dfo-mpo.gc.ca ; Tom Smith (EMC); Humfrey Melling (DFO)

Inuvialuit participation: Ray Ettiagiak, Roger Memogana, Joseph Felix Jr., Clarence Mangelana, Douglas Panaktalok, Charlie Ruben, the late Eric Ettiagiak, Joe Nasogaluak, Peter Anikina, David Nasogaluak, Dakota Nasogaluak, Sam Pingo, Eric Cockney, Jerry Rogers, Forrest Day, Angus Alunik.

Project timeframe: 2003 – 2006

Funding:

IFA: \$20,000 annually

Other: \$350 K annually (PERD, PCSP, ESRF, BSTRPA, DIAND, DFO)

Results:

Using detection dogs, we found subnivean seal structures along 500m wide transects at densities of from 1.02 to 2.17 structures per km². Actual densities could be as high as 4.57 per km². Densities did not vary significantly from year to year. Neither did they vary significantly with industry presence nor was there an increase in structure abandonment. We instrumented twenty ringed seals with satellite tags. Their movements and size of breeding territories did not vary statistically between 2005 and the year 2006, when industry was present and when the ice conditions were vastly different. Although a very short exposure period, we found that in 2006 when industry was active there was no clear difference in the behaviour of seals during 19 days when industry was active vs 19 days when industry was inactive immediately following.

During the month of June, we found basking ringed seals widely distributed in the lease areas, at densities in the range from 13.0 - 42.4/100 km². With the exception of the 2003 which was done later in the season, the density of basking seals was not significantly different among the different study years, and comparable to densities found in this same area during surveys flown 1974-1979. There was a significant increase in the densities of basking seals near the floe edge, but no relationship in their distribution to the Paktoa site.

A collection of 68 ringed seals in an adjacent area was done in May of 2004, 2005 and 2006, and specimens showed the ringed seals to be in good body condition and in normal reproductive status. No direct adverse effects on the local seal population were found in this study as the result of one season's drilling activity at one site in the southeastern Beaufort Sea.

This study established a baseline of the behaviour, distribution, condition and reproductive status of seals at or near the Paktoa site, engaged/trained local Inuvialuit in the capture and tagging of seals, and brought traditional knowledge to bear on all aspects of the study. Ringed seals were found to successfully use this highly variable offshore fast ice of the south-eastern Beaufort Sea, both as feeding and breeding areas, even during winters such as 2005 when storms caused a major perturbation in the stability and quality of their fast ice habitat, and even in 2006 when industry was active at one site.

Project Summary

Name of Project: Monitoring Reproductive Status and Condition of Ringed Seals at Ulukhaktok (Holman) (2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

Ringed seals have shown to be a reasonable 'indicator' species for ecosystem productivity. The program is a relatively low-cost, community-based means of monitoring the productivity of the ecosystem over the long term, at the same time providing valuable samples to parasite and pathological studies which could affect human health.

Project description:

The monitor documents the sex of the harvested seals, and takes samples and measurements allowing the determination of maturity, age, reproductive status, health and condition of harvested seals. In addition to the basic harvest information (time and location of kill) and measurements (length, two girths, weight, two blubber thickness), samples in 2005 and 2006 included:

- jaws (aging),
- female reproductive tracts (reproductive status and history),
- blood, lungs and lymph nodes for influenza and brucella testing, and,
- a variety of tissues for contaminants testing.

An on-site expeditor for the project in Holman, sectioned and examined all of the reproductive and aging material for the samples. Second and final readings on the teeth for aging purposes are all complete and up to date.

Other samples/collaborations that were collected in 2005 and 2006 were:

- liver, kidney, meat, blubber, for contaminants (Gary Stern, DFO)
- stomach contents for isotope and diet studies (DFO)
- liver, kidney, meat, blubber for contaminants (Derek Muir, EC, in 2006 only)

Participating agency (agencies) and personnel: Lois Harwood (project manager DFO Yellowknife) (867) 669-4916 HarwoodL@dfo-mpo.gc.ca); Harold Wright; Tom Smith (aging)

Inuvialuit participation: Holman HTC (local monitor John Alikamik)

Project timeframe: Ongoing

Funding: IFA- \$23,000 **Other:** DFO in-kind support

Results: All data analysis, lab work and reporting up to date.

Project Summary

Name of Project: Monitoring Reproductive Status and Condition of Ringed Seals at Sachs Harbour (2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives: Ringed seals have shown to be a reasonable 'indicator' species for ecosystem productivity. The program is a relatively low-cost, community-based means of monitoring the productivity of the seal population and ecosystem over the long term, and providing valuable samples to parasite and pathological studies which could affect human health.

Project description: We examine the body condition of ringed seals harvested by Inuvialuit hunters near Sachs Harbour, and two parameters of seal reproduction (ovulation rate and percent pups in the harvest). In relation to the ongoing study at Holman, that harvest consists primarily of mature adults, whereas the Sachs Harbour harvest consists primarily of juveniles and sub-adults. Thus, including Sachs Harbour harvests allows us to examine reproduction, condition, disease and contaminants in the portion of the seal population that is not well represented in the Holman samples.

The project involves a local technician Jeffrey Kuptana from Sachs Harbour for approximately 10 weeks. In 2006, 55 seals were harvested and sampled, in 2005, approximately 70. He documents the sex of the harvested seals, and takes samples and measurements allowing the determination of maturity, age, reproductive status, health and condition of harvested seals. In addition to the basic harvest information (time and location of kill) and measurements (length, two girths, weight, two blubber thickness), samples include:

- jaws (aging),
- female reproductive tracts (reproductive status and history),
- blood, lungs and lymph nodes for influenza and brucella testing, and,
- a variety of tissues for contaminants testing.

Participating agency (agencies) and personnel: Lois Harwood (project manager DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca) – DFO; Harold Wright; Tom Smith (aging)

Inuvialuit participation: Sachs Harbour HTC, Jeff Kuptana

Project timeframe: 2004 - 2009

Funding: IFA \$18,000 / year **Other:** \$23 K (US Minerals Management Service)

Results: data entry, analysis and reporting up to date. Community meeting in Sachs planned for April or May 2007.

Project Summary

Name of Project: Water Quantity and Quality at the Hornaday River
(2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

Hydrometric data are necessary for the management of renewable and non-renewable resources. This information is particularly important in this case, given pending mineral exploration, establishment of the Tuktut Nogait National Park, the importance of the charr fishery to the people of Paulatuk, and the importance of the river to the well-being of the charr stock.

Project description:

The hydrometric station was installed on July 23, 1998, and has been collecting water pressure information since that time. Three trips to the gauge site occurred in 2004, three in 2005 and four trips in 2006.

Objectives

- To document the annual flow regime of the Hornaday River, for a minimum of ten years, and,
- To determine and document water quality at the Hornaday River at the gauge site and at the lower river site, in a manner complementary to the larger water quality monitoring program underway in Tuktut Nogait National Park.

Participating agency (agencies) and personnel: Lois Harwood (project manager DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca); Water Survey of Canada, Environment Canada, Parks Canada.

Inuvialuit participation: Community rep to gauge site as space permits on helicopter

Project timeframe: Year 8 of 10; Year 9 of 10.

Funding:

IFA: \$10,000

Other: Parks Canada - \$15,000; Polar Continental Shelf Project \$29,000

Results: Real time water levels available on website. Water level and water quality data have been analysed and are up to date.

Project Summary

Name of Project: Water Level Monitoring at Husky Lakes (2005/06 & 2006/07)

Project recommended by: Fisheries Joint Management Committee

Management objectives:

Hydrometric data are necessary for the management of Baseline water quantity data are important for interpretation of biological data, such as fish abundance. This is particularly important against the backdrop of climate change and pending gas development in the Mackenzie Delta area.

Project description:

This study involves monitoring water levels in the Husky Lakes area. A hydrometric station was installed at this location in July 2003, and was monitored during 2004-2006. The Husky Lakes Assessment Project, of which this was a part, was completed in 2004. However the water gauge requires a minimum of five years of data so will be remaining active and be monitored until at least 2008.

The present proposal is thus for the annual maintenance and monitoring of the Husky Lakes water gauge, and for the preparation of maps for the Husky Lakes technical report.

Participating agency (agencies) and personnel: Lois Harwood (project manager DFO Yellowknife (867) 669-4916 HarwoodL@dfo-mpo.gc.ca); Water Survey of Canada (WSC)

Inuvialuit participation: Tuktoyaktuk HTC involved in original selection of site.

Project timeframe: Year 3 of 5; Year 4 of 5.

Funding:

IFA: \$9,000

Other: PERD \$10 K per year

Results: Annual data tables provided by WSC.

Project Summary

Name of Project: Ecosystem Modeling Project: Carbon Studies in the Beaufort Sea: An Examination of the Sources and Sinks of Carbon Dioxide and Food Web Structure of Lower Trophic Levels in the Near-shore Regions of the Beaufort Sea

Project recommended by: Fisheries Joint Management Committee

Management objectives:

The purpose of this project to gather the data to develop a model of the food web of the lower trophic levels of the near-shore area of the Beaufort Sea.

Project description:

The Beaufort Sea Shelf provides habitat for resident and migratory marine fish and mammal populations and is strongly influenced by the Mackenzie River discharge. The need to understand the basic ecology and food web structure of the Beaufort Sea Shelf is imperative as changes in the environment occur from various factors including: climate change, increased oil and gas exploration and increased marine traffic. These types of changes will have direct effects on the Beaufort Sea, as will changes that occur in the watershed of the Mackenzie River. For example, changes in the degree of permafrost, increased run-off and greater use of the river may lead to an increased sediment load from the river to the Beaufort. This will have immediate effects on primary production as the light and nutrient regimes change, and affect benthic organisms as their habitat is altered. These changes will ultimately lead to changes in the higher levels of the food web.

The purpose of this project is to gather the data to develop a model of the food web of the lower trophic levels of the near-shore area of the Beaufort Sea. To be able to do that we use methods that allow the measurement of surface water carbon dioxide (CO₂), and oxygen (O₂) concentrations that provide an estimate of the mixed layer primary production. In addition, water, sediment and biotic samples are collected for chemical analyses, biomass estimates, some species identification and stable isotope measurements. This information will then be used to establish the components of the lower trophic levels that support the food web in the Beaufort Sea. This work will complement other work being done on the higher trophic levels including fish studies (Jim Reist) and contaminant and food chain studies being done by Lisa Loseto.

It is necessary to understand the function and structure of the food web and productivity. To be able to assess changes in the highest levels of the food web it is fundamental to understand the base of that food web. At the same time those components of the food web that are likely to show the first effects of alteration or degradation in ecosystem function are those organisms with quick turnover times. In particular, climate change impacts may first be observed in

primary producers as changes in the levels of nutrients, temperature and carbon dioxide availability may change both species composition and biomass.

Participating agency (agencies) and personnel:

Collaboration on the field program run from the CCGS Nahidik and includes researchers from DFO (Patricia Ramlal), NRCAN (Kevin MacKillop) and the Canadian Museum of Nature (Kathy Conlan). Algal taxonomic work by Hedy Kling and meiofauna taxonomic work by Patrick Buat, both of Algal Taxonomy and Ecology, Inc. FJMC has provided financial assistance in 2006/07.

Inuvialuit participation:

Wildlife observers from the community and Aurora College students participate in the Nahidik program on the Beaufort Sea, although they have not been directly involved in the current project.

Project timeframe:

This project was initiated in 2005 and is expected to be completed in 2009.

Funding:

IFA- FJMC \$10,000

Other - Department of Fisheries and Oceans, Northern Oil and Gas program - \$50,000 (05/06) \$60,000 (06/07)

Results:

The samples that were collected in 2006 are currently being analyzed and the data will be used to develop a model of the lower food web. Preliminary results indicate that there is an increase in biomass and species diversity of phytoplankton and meiofauna from inshore to offshore regions. Some of these organisms may prove to be useful indicators of changes in the ecosystem, and act as an early warning signal.

Project Summary

Name of Project: Rat River Harvest Study

Project recommended by: Rat River Char Working Group, GRRB, FJMC, DFO

Management objectives:

The 2005 population estimate (from Lois Harwood's tagging mark recapture study) for the Rat River Dolly Varden population was down to only 3535 char from the estimate of 12 000 fish in the year 2002. Keeping accurate and correct records of the harvest will be vital to monitoring this declining stock.

Project description:

A local community harvest coordinator was hired in Aklavik (and Fort McPherson through the GRRB/RRC) in order to conduct monthly interviews regarding char harvests for the summer and fall months when fishing is occurring. DFO Fish Mgt staff accompanied the coordinator during the "door to door interviews". Data sheets were supplied by DFO for the harvest coordinator to fill out and send in to DFO for data entry. The local HTC (and RRC) kept and maintained a list of harvesters, each assigned a number (ensuring anonymity and promoting participation), that were contacted every month to report their char harvests for the Rat River. The harvest interviews allowed for any traditional knowledge or concerns with the fishery to be recorded and given to DFO. Any harvester missed during one month's interviews was followed up the next month by the coordinators. In 2005, DFO Fish management and GRRB staff conducted a small post-season harvest study and it was well received by the two communities. A more thorough in season harvest study was discussed at the Working Group meeting in 2006 and members agreed it is a very important project.

Participating agency (agencies) and personnel: Erin Hiebert & Lois Harwood (DFO); GRRB, Aklavik & Fort McPherson RRC's

Inuvialuit participation: Aklavik HTC

Project timeframe:

2006-07

Funding: IFA- \$5, 000

Other – \$1,500 – DFO; \$3,000 - GRRB

Results:

A harvest study report for the Rat River will be produced after several years of data being compiled and will be used yearly at the Rat River Fishing Plan meetings for the creation of new plans and protection of the stock.

Project Summary

Name of Project: Shingle Point Harvest Study (2005-06, 2006-07)

Project recommended by: West Side Working Group, Rat River Working Group, FJMC, DFO

Management objectives:

Provide harvest information and Dolly Varden samples for use by the WSWG and RRWG during annual meetings to assist in determining stock management options and to help develop a genetic baseline for Dolly Varden in the Western Arctic.

Project description:

In both 2005-06 and 2006-07, this project provided funding for a single person to coordinate the collection of recording the harvest of Dolly Varden along the traditional fishing areas near Shingle Point and other coastal areas, possibly including Herschel Island. Casual observations about the fishery were also made during this time. The coordinator was in charge of distributing (at the start of the season) and collecting (at the end of the season) data catch booklets in which individual fishermen will record their coastal Dolly Varden fishing information and harvests. It was based on the guidance of the community members from the Westside Working Group that individuals are given books to record their North Slope harvests of Dolly Varden. Besides the coordinator handing out and collecting booklets, the HTC and DFO contract stipulated checking in along the Shingle Point area to the different camps throughout the fishing season. This helped to ensure that catches were recorded diligently throughout the season and not simply estimated at the end. In 2006-07, samples were also collected (adipose fin clips) from Dolly Varden harvested at Shingle Point, and others along the coastline, during the summer and fall months.

Participating agency (agencies) and personnel: Erin Hiebert (DFO)

Inuvialuit participation: Harvest Monitors – Danny Gordon Jr. & Michelle Gruben

Project timeframe: Ongoing

Funding: IFA- \$6,500 (2005-06), \$17,000 (2006-07)

Other – \$10,000 - DFO in-kind

Results: Harvest numbers were provided to working groups in order for use when reviewing Fisheries Management Plans. The fin clips will allow a mixed-stock genetic analysis in order to determine stock contributions of the North Slope rivers and Rat River to the Shingle Point harvest.

Project Summary

Name of Project: Sachs Harbour, Ulukhaktok & Paulatuk Harvest Studies
(2005-06, 2006-07)

Project recommended by: DFO, FJMC, ENR, CWS

Management objectives:

The objective of this project is to continue gathering harvest data on specific fish or marine mammal species and stocks in areas of the Inuvialuit Settlement Region (ISR) that are required by DFO/FJMC for long-term management/monitoring programs.

Project description:

This project is a continuation of the current harvest studies taking place in Sachs Harbour, Paulatuk and Ulukhaktok. This project has been successful for the past two years due to buy-in by ENR and Canadian Wildlife Service (CWS) which has increased the amount of funding and therefore enabled the project to become a year round study resulting in complete fisheries and seal harvest data for DFO/FJMC, information on large mammal harvest to ENR and information on water fowl harvest to CWS.

As determined by the HTCs in the final year of the Inuvialuit Harvest Study, harvest workers go door to door once a month to interview people about their harvests. This project collects harvest study data from the Holman, Paulatuk and Sachs Harbour areas. Although the main interest from a DFO/FJMC perspective is the fishery and seal data, as in previous years, interest has been expressed by the local RWED office and Canadian Wildlife Service in “tagging” onto this study to collect information on the harvest of a few large mammals and some migratory birds therefore extending the length of the study to an entire year.

Participating agency (agencies) and personnel: Erin Hiebert (project manager) – DFO; ENR (Inuvik); CWS

Inuvialuit participation: Olokhaktomiut HTC, Paulatuk HTC, Sachs Harbour HTC,

Project timeframe: Ongoing

Funding: IFA: \$22,000
ENR: \$10,000; CWS 5,000

Results:

The program contributes to ongoing harvest monitoring in the three communities. Results are under analysis.