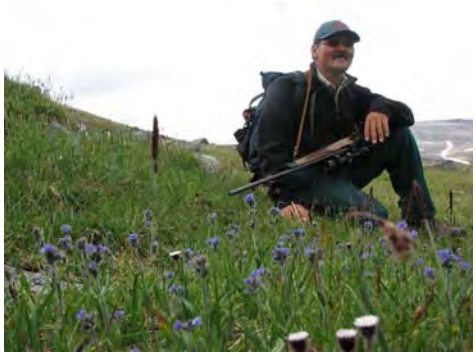
2007 Annual Report Of Research and Monitoring in Torngat Mountains National Park Reserve



Parks Canada Parcs Canada

Canada

Many people contributed to this report.
We wish to acknowledge them for their commitment to the project,
and their timely submission of reports

ACKNOWLEDGEMENTS

Information about Parks Canada research and monitoring activities in Torngat Mountains National Park was provided by Parks Canada staff: Dr. Tom Knight, Shawn Gerrow, Dr. Dave Cote, Dr. Jenneth Curtis, Craig Burden, Scott Taylor, Dr. Donald McLennan and Angus Simpson.

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International Polar Year Research reports were provided by: Dr. Luise Hermanutz, Dr. John Jacobs, Dr. Paul Marino, Dr. Peter Whitridge of Memorial University of Newfoundland and Labrador; Dr. Sergie Ponomarenko of NatureServe Canada; Dr. James Woollett University of Laval; Brian Dempson and Milton Shears Department of Fisheries and Oceans, Atlantic Region; Dr. Allan Curry University of New Brunswick; and Dr. Joseph Culp, Eric Luiker and Donald Baird from Environment Canada.

TABLE OF CONTENTS

MONITORING

INTRODUCTION

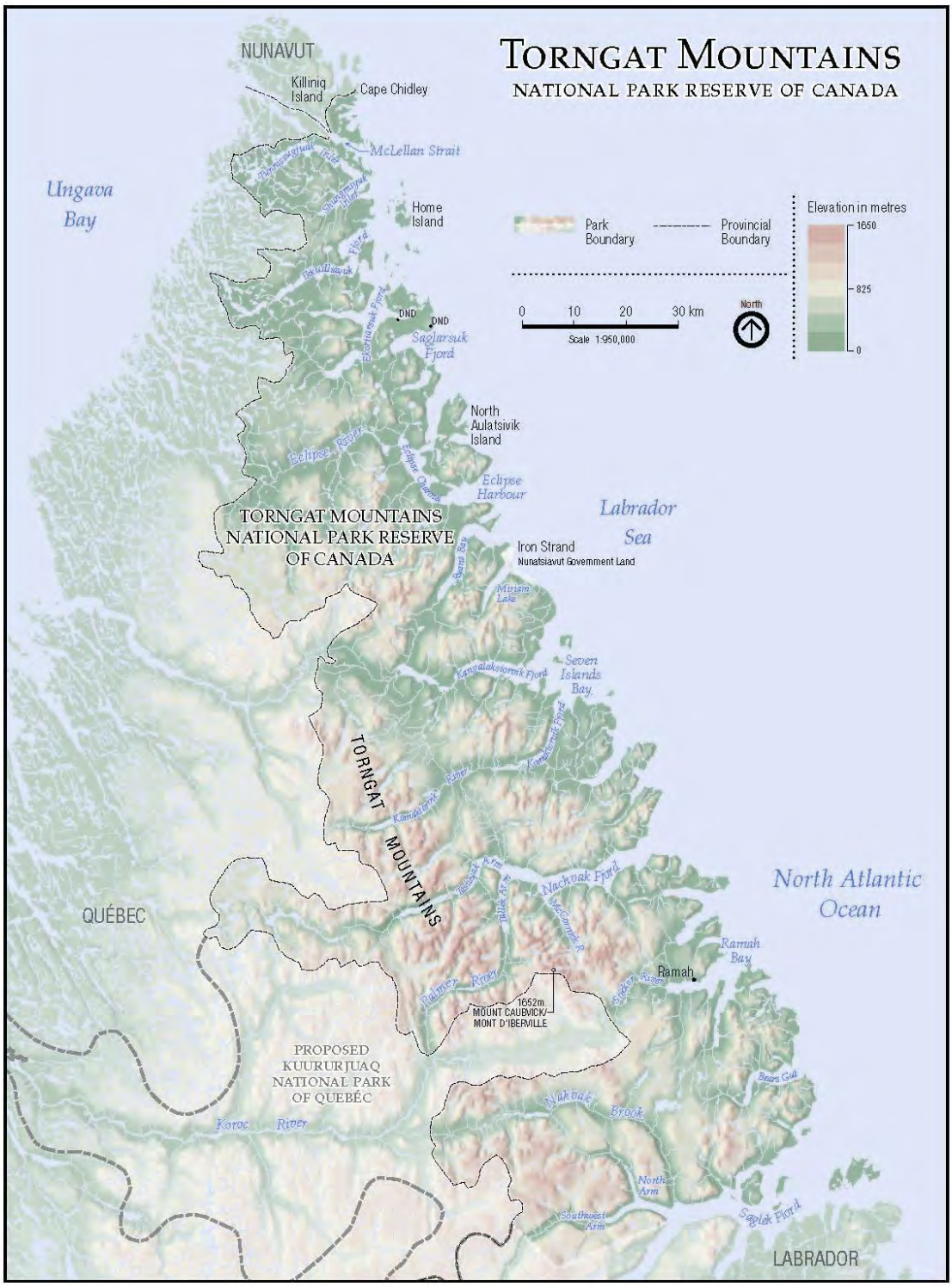
Research and monitoring are essential for managing protected heritage areas such as Canadian National Parks and Reserves. Research and monitoring leads to a better understanding of the cultural and ecological resources of the park and enables us to track how these resources are affected by natural and human induced changes. Research activities are conducted to improve out knowledge of cultural and ecological resources. Monitoring is conducted to determine how systems change over time, especially in response to human caused disturbances and to climate change.

A major challenge to implementing an effective research and monitoring program is making the data, knowledge, and information collected by the program widely available to people outside the science program. The goal of this document is to present the information collected from the park's 2007 research projects and monitoring programs, to the Torngat Mountains National Park Cooperative Management Board, other cooperative management organizations in Nunatsiavut and Nunavik, to government agencies, the general public and Parks Canada staff. All research and monitoring projects conducted in 2007 are included in this document.

The document is divided into two main sections: **Research** and **Monitoring**. Within the research section there are four categories of projects based upon the principal affiliation of the researchers and primary funding source. These four groups are:

- Parks Canada Research
- ArcticNet Research
- International Polar Year Research
- Nunavut, Newfoundland and Labrador, Makivik, Nunatsiavut and Parks Canada Research

We hope that this report serves as an informative synopsis of the current research and monitoring program in Torngat Mountains National Park. We welcome any feedback.



Torngat Mountains National Park Reserve in Northern Nunatsiavut, Labrador

REPORTING ON RESEARCH AND MONITORING

Torngat Mountains National Park is a new park that is still in the early phases of program development. It was established in 2005 through the signing of the Labrador Inuit Land Claims Agreement and is managed in partnership with Inuit through Park Impacts and Benefits Agreements (PIBA) signed with both Labrador and Nunavik Inuit. These agreements provide a blueprint for how the park will be managed, including the development of a research and monitoring program.

Direction for establishing and supporting a research and monitoring program in Torngat Mountains National Park comes from a number of sources.

Consultation and collaboration are central to developing an effective research and monitoring program for the park. Both the Labrador Inuit PIBA and Nunvik Inuit PIBA require consultation with a variety of research and land management institutions for the development of a research strategy. These institutions include:

- Torngat Mountains National Park Cooperative Management Board;
- Nunasiavut Government;
- Makivik Corporation and any Makivik Designated Organization;
- Torngat Wildlife and Plant Co-Management Board;
- Torngat Fisheries Co-Management Board;
- Torngasok Cultural Institute;
- Government of Newfoundland and Labrador;
- Other institutions the Field Unit Superintendent deems appropriate

This research strategy will incorporate the methods that will be used to gather social, cultural and ecological information about the park and will include five components: a traditional knowledge component; an ecosystem component; an ecological monitoring component; a threat specific component; and a communications component. This research strategy will identify research priorities for the park, guide future research and monitoring, inform the State of the Park Reporting and Management Planning, and ensure consistency with regional research priorities in Nunatsiavut and Nunavik.

At the national level, the Canada National Parks Act identifies the “maintenance or restoration of ecological integrity through the protection of natural resources and natural processes, as the first priority when considering all aspects of the management of parks.” Accordingly, research is required to provide a detailed understanding of the natural resources and processes of the park. National parks provide a unique opportunity for researchers to study in relatively natural landscapes protected from intense land use. As such, parks are valuable “laboratories” for learning and research and are ideal for supporting effective outreach programs.

In order to maintain these natural settings, park staff must continuously monitor the state of the parks ecosystems. Parks Canada Agency has developed a comprehensive strategy to develop monitoring programs in each of its national parks and heritage areas that will

evaluate the condition of the parks ecosystems and the effectiveness of management programs. These monitoring programs will be the foundation for evaluating the state of the park's ecological and cultural integrity. The research that is presently being conducted in Torngat Mountains is integral to designing an effective, informative, scientifically credible long-term park monitoring program.

Future initiatives will include collaboration on research and monitoring programs with the newly created *parc national de la Kuururjuaq* in Quebec. This park encompasses the entire Koroc River watershed and shares a common boundary with Torngat Mountains National Park.

STRUCTURE OF THE REPORT

This report covers all research projects that were conducted in 2007 and includes some projects that were initiated in previous years. Each project is summarized using a consistent format that allows for a brief overview of the project, and contact information if the reader requires more detail.

Summaries for each project include:

Rationale
A short paragraph describing why the project is being conducted and why it is important.

Objectives
A description of the main objectives of the project

Methods and Information Collected
A brief description of where the work was conducted, how the project was conducted and what information was collected.

Years of Data
How many years of data currently exist.

Partners
Other organizations that were involved in the project.

Funding
A list of organizations that provided funding for the project

Results
A summary of the results, if they are available.

Contacts
Contact information of the principal researcher


Heiko Wittenborn

RESEARCH


Karen Dicker


Photo: Angus Simpson

RATIONALE

Harlequin ducks (*Histrionicus histrionicus*) and Barrow's Goldeneye ducks (*Bucephala islandica*) have similar distributions over much of their range. Both species of sea ducks are common in Western North America but eastern populations are rare and considered species of special concern by COSEWIC. Mortality caused by duck hunters, hydroelectric development, pollution, and forestry operations are cited as reasons for the decline in both Harlequin Duck and Barrow's Goldeneye numbers. Both species were probably never abundant in eastern North America. They both occur in the Torngat Mountains National Park Reserve, however information on their distribution was scarce and formal surveys had not been conducted in twenty years. This investigation was initiated to fill current data gaps in the distribution of these two species of special concern, in the park.

Parks Canada Research

DISTRIBUTION OF HARLEQUIN AND BARROW'S GOLDENEYE DUCKS IN TORNGAT MOUNTAINS NATIONAL PARK RESERVE.

OBJECTIVES

- Determine the distribution and number of Harlequin ducks on rivers in the park south of Komaktorvik Fiord and identify those rivers where successful breeding had occurred.
- Determine the distribution and of Barrow's Goldeneye in the park and identify important molting sites.
- Record observations of other SAR species found in the park.
- Provide learning and training opportunities for Inuit staff.

Male and female Harlequin duck.

METHODS AND INFORMATION COLLECTED

The study area consisted of that part of the park south of Komaktorvik Fiord. All suitable rivers and streams were surveyed for Harlequin ducks using a Bell 206LR (Long Ranger) helicopter. Surveys were conducted during late July and early August 2007. Duck locations were recorded on topographic maps and were also captured using a GPS. The size and age of observed harlequin duck broods was recorded. While conducting the harlequin duck survey, lakes and ponds of each watershed (along the river) were surveyed for Barrow's Goldeneye females and broods. Fiords and bays within the study were surveyed for molting Goldeneye, with a focus on those areas where past observations have been made.

Male Barrows Goldeneye

YEARS OF DATA

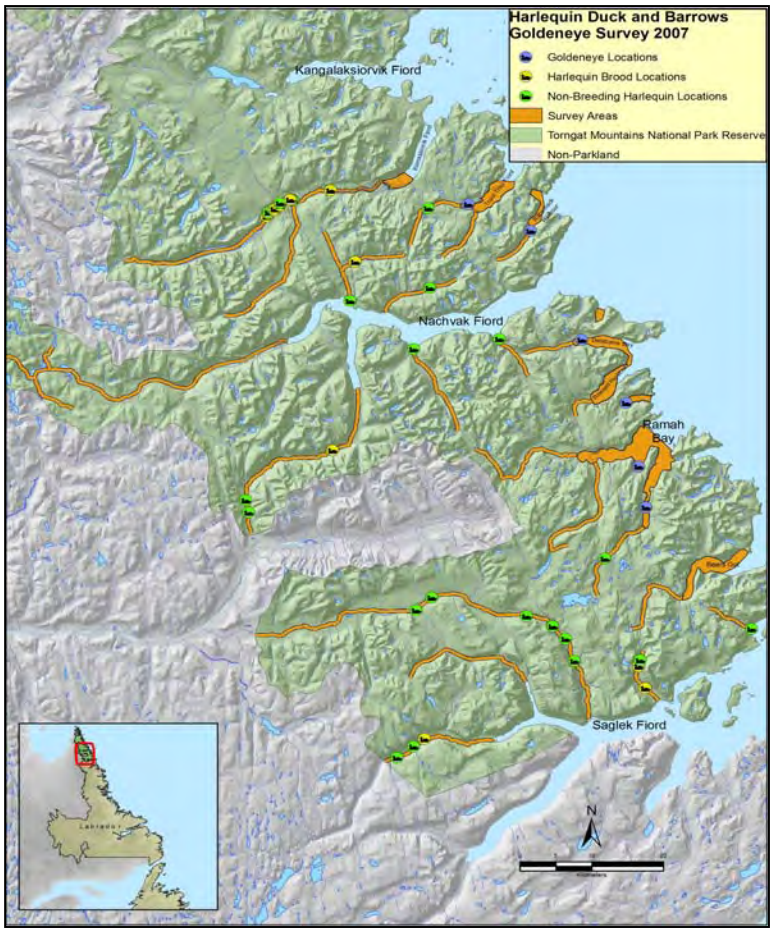
- Newfoundland Wildlife Division and Canadian Wildlife Survey conducted surveys between 1987-1992
- 2007 Parks Canada

FUNDING

- Parks Canada Species at Risk Inventory Fund

RESULTS

- 56 adult Harlequin ducks and 16 broods were observed during the survey.
- Non-breeding female Harlequin ducks were observed on 9 of 23 surveyed watercourses and at the mouths of 3 rivers.
- Broods were observed on 5 rivers.
- 11 of the broods were observed on the Komakatovik River, the farthest north Harlequins have been recorded in the park.
- No female Barrow's Goldeneye were observed on any ponds or lakes in the park.
- Barrow's Goldeneye were observed at Ramah Bay, Little Ramah Bay, Reddick Bight and Delabarre Bay.
- Goldeneye were observed at Razorback Harbour and Trout Trap Fiord however presence of Barrow's was not confirmed.
- Over 100 Barrow's Goldeneye were observed in Little Ramah Bay highlighting the importance of that area as a molting site.



Harlequin Duck and Barrow's Goldeneye observations.

Photo bv: Shawn Gerrow.

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RATIONALE

Benthic invertebrates are used worldwide for assessing water quality and are a promising tool for monitoring ecological change in northern parks. However, their usefulness as a bio-monitoring tool in northern areas is unknown. This study was initiated to acquire baseline information on freshwater benthic communities, in and around the park, for developing a long-term ecological integrity monitoring program for the freshwater environment.

Parks Canada Research

EVALUATING BENTHIC INVERTEBRATES AS A FRESHWATER BIO-MONITORING TOOL IN NORTHERN NATIONAL PARKS.

OBJECTIVES

- Acquire baseline information of the macro-invertebrate community in the Torngat Mountains National Park and the Koroc River Watershed.
- Assess the feasibility of collecting benthic invertebrates for Parks Canada monitoring purposes.
- Assess whether previous PCB contaminant efforts at Saglek Radar Base were affecting stream animals downstream of the contaminant area.

Jacko Merkuratsuk and Dave Cote with kick net in Naksaluk Brook, Nachvak Fiord

METHODS AND INFORMATION COLLECTED

Canadian Aquatic Biomonitoring Network (CABIN) relies on a standard set of field protocols that have previously been used in several temperate field sites in Canada to characterize benthic macroinverebrate community structure.

- Sampling was conducted in the Koroc River watershed and in Saglek and Nachvak Fiords.
- Inuit crews were trained in CABIN sampling procedures
- 44 sites in riffle-run habitats were visited in total
- Benthic invertebrate communities were sampled with a three-minute kick netting procedure.
- Stream characteristics (lat/long, width, water velocity, riparian vegetation, macrophyte vegetation, canopy cover, distance above tide, and primary productivity) were collected for each site.
- One potential impact site was sampled below the PCB contaminant facility at Saglek Radar Base.

Laboratory activities and analysis are as follows:

- 2006 samples were analysed by East Coast Analytical
- All samples were sorted, sub sampled, and processed according to the CABIN protocol
- Invertebrate identification was conducted to the family level
- Invertebrate community structure was analyzed using multivariate statistics
- Water chemistry was analyzed by Environment Canada

YEARS OF DATA

- 2006 - 20 sites sampled in Nachvak and Saglek streams
- 2007 – Re-sampled 2006 sites and added 24 additional sites in TMNPR and the Koroc River valley

PARTNERS

- Environment Canada
- Nunatsiavut Government

FUNDING

- Parks Canada Ecological Integrity Innovation Fund
- International Polar Year

Dave and Jacko processing samples

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RESULTS

- Mean taxonomic richness of benthic invertebrates is 10.2 families per site. This richness is lower than what would be found in insular Newfoundland.
- Species accumulation curves suggest that the Torngat region have 35-60 families of benthic invertebrates in the habitats sampled.
- Estimated individuals ranged from 138-2925 per site
- Invertebrate communities in Saglek and Nachvak were not significantly different despite Nachvak's more northerly location.
- The samples taken below the PCB contaminant site (Saglek Radar Station) was not significantly different than other un-impacted sites.

Joey Merkuratsuk assisting with stream monitoring

RATIONALE

The Labrador Inuit Park Impacts and Benefits Agreement for the Torngat Mountains National Park Reserve of Canada and The Nunavik Inuit Park Impacts and Benefits Agreement for the Torngat Mountains National Park of Canada each contain a commitment that the Parties to the agreement acknowledge the importance of Inuit Knowledge and are committed to its use in the planning and management of the Torngat Mountains National Park Reserve. In keeping with this commitment, this summer's research program began to document Inuit knowledge, to explore the methods needed to conduct an oral history project, and to incorporate the results into the planning process. This process starts with the preparation of a State of the Park Report. Inuit knowledge shared this summer will be incorporated into the report.

Parks Canada Research

INUIT KNOWLEDGE OF TORNGAT MOUNTAINS NATIONAL PARK RESERVE

OBJECTIVES

- To bring Inuit originally from the area back into the park to reconnect with their history, stories and memories
- To begin to collect information from Inuit about their knowledge and experiences of the land that is now the Torngat Mountains National Park Reserve

Inuit from Nunavik and Nunatsiavut identifying place names and travel routes

METHODS AND INFORMATION COLLECTED

Four Inuit from Nunatsiavut and seven from Nunavik spent a week at the base camp. They travelled to traditional places and shared their knowledge, in discussions over maps, with the project investigators.

John Jararuse and Julius Merkuratsuk on Sallikuluk (Rose Island) with Judy Rowell

YEARS OF DATA

- 2007

PARTNERS

- Nunavik Government
- Nunatsiavut Government

FUNDING

- Parks Canada

RESULTS

Inuit shared knowledge of the following topics:

- Hunting places
- Resource distribution
- Changes in environment and resources
- Travel routes
- Place names
- Stories about traditional places
- Issues for the park to consider
- Personal histories of the participants

Wilson Jararuse, Willie Etok and Tommy Unatweenuk discussing the park with staff

Elders, park staff and visitors at the grave site on Sallikuluk

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RATIONALE

This project aims to improve our ability to monitor and manage Arctic char by developing a genetic measure of changes to population size. Genetic diversity should increase as a population expands and decrease, as the population gets smaller. This project evaluates whether we can track trends in fish populations by simply taking a fin clip from a small sample of char that can be live-released. Compared with traditional population-size estimation techniques such as mark-recapture, this genetic method provides data that is more comparable for long-term population monitoring at a fraction of the time and expense. Parallel tests are also being conducted on Arctic char, Atlantic salmon and brook trout in Gros Morne and Terra Nova National Parks.

Parks Canada Research

USE OF GENETIC TECHNIQUES TO ESTIMATE TRENDS IN ARCTIC CHAR POPULATION SIZE.

OBJECTIVES

- To test whether genetic techniques can provide data on trends in population size for Arctic char in the Torngat Mountains National Park.
- To provide important baseline information on genetic diversity of Arctic char populations for future assessments.

Arctic char swimming upstream. Photo: Sid Pain

METHODS AND INFORMATION COLLECTED

- Char were collected from rivers in Nachvak and Saglek Fiords during August 2007.
    - The following rivers were sampled: McCornick River (Nachvak), Palmer River (Nachvak), North Arm Brook (Saglek), Southwest Brook (Saglek), Tor Bay (Saglek)
- Electro-fishing was used to collect juveniles and angling was used to collect adults.
- Inuit crew were involved in sampling.
- All fish were weighed and measured. Scales were taken for aging. A fin clip was taken for genetic analysis.
- All fish were live released, except for individuals lethally sampled (young of the year fish which were too small to obtain scales).

Arctic char swimming upstream. Photo: Sid Pain

YEARS OF DATA

- 2006
- 2007

PARTNERS

- Terra Nova National Park
- Dalhousie University

FUNDING

- Parks Canada Ecological Integrity Innovation and Leadership fund

RESULTS

Nachvak Fiord

- McCornick River (Ivitak Cove) 100 char sampled 2007, and 100 in 2006.
- Palmer River (Tallek Arm) 87 char sampled in 2007, and 97 in 2006.

Saglek Fiord

- North Arm Brook (North Arm) 63 char sampled.
- Southwest Brook (Southwest Arm) 81 char sampled.
- Tor Bay Brook (Tor Bay) 89 char sampled.

Samples have not yet been analysed. They are held at the Biology Department, Dalhousie University.

David Cote and Jacko Merkuratsuk electrofish for juvenile Arctic char. Photo: Tom Knight

Sampling at McCornick River, Nachvak Fiord. Photo: Tom Knight

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RATIONALE

With the exception of Saglek Anchorage, little is known about the bathymetry and benthic habitats of Saglek and Nachvak Fiords. A substantial area of the seabed in both fiords had been surveyed with multibeam sonar in 2006 and earlier. The availability of multibeam data allowed a seabed habitat mapping strategy, which had been developed at Memorial University, to be applied to the fiords. The results of this work will provide detailed maps of seabed morphology and substrate type, as well as an inventory of the types of benthic biota present in the fiords and the distribution of their habitats.

ArcticNet Research

BENTHIC HABITAT MAPPING AND COMMUNITY INVENTORY OF NACHVAK AND SAGLEK FIORDS

OBJECTIVES

- To collect benthic grab samples and video at target stations within Saglek and Nachvak fiords.
- To ground truth an existing multibeam acoustic dataset, to characterise the benthos of both fiords, and to develop substrate and habitat classes to be mapped.

Clams and worms sieved from sediment samples

METHODS AND INFORMATION COLLECTED

Saglek Fiord sampling stations were selected in the shallow arms at the head of the fiord, as well as in the deep main basin of Saglek Fiord, west of Jens Haven Island. Nachvak Fiord stations were primarily located west of Ivitak Cove. At each station the Ponar benthic grab sampler was deployed from the Viola Dee. A substrate sample (sand, mud, pebbles etc.) was taken from the grab, along with any invertebrates and algae that had been captured. A video camera system was also lowered at each station – for two minutes in Nachvak Fiord and four minutes in Saglek Fiord. The camera was not towed but drifted with the boat. In Saglek Anchorage, shore-normal towed video transects were filmed by deploying the camera over the bow of a zodiac and travelling backwards at slow speed towards a defined end point using a GPS.


Jacko Merkuratsuk with the underwater camera

YEARS OF DATA

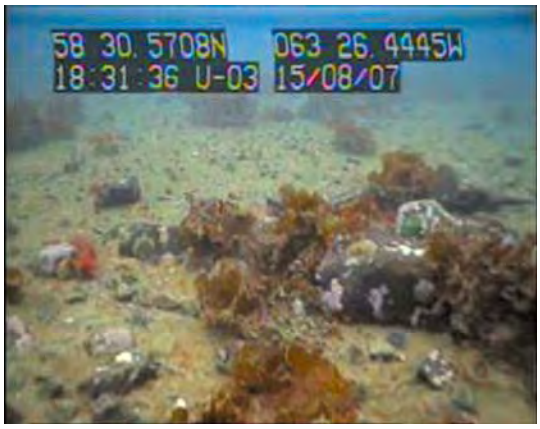
- 2006
- 2007

PARTNERS

- Parks Canada
- Environmental Sciences Group, Royal Military College of Canada
- Canadian Hydrographic Service
- ArcticNet Nunatsiavut Nuluak

FUNDING

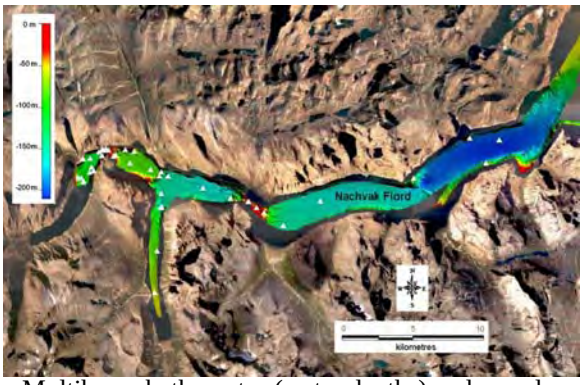
- ArcticNet Nunatsiavut Nuluak
- Parks Canada
- Memorial University of Newfoundland



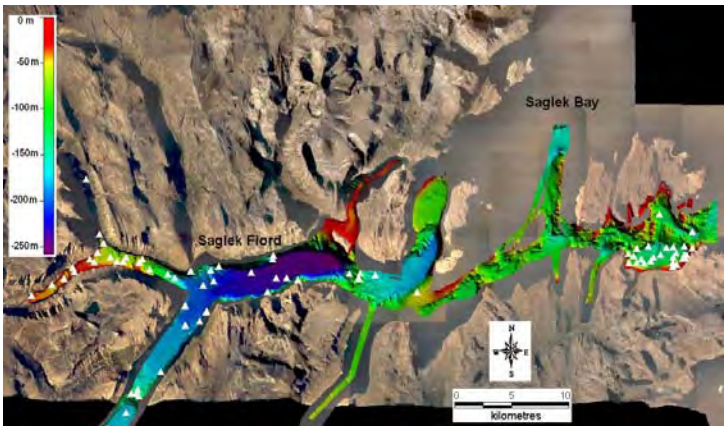
Benthic habitat in Saglek

RESULTS

- A total of 130 stations were sampled with the benthic grab and drop video camera in 2007: 59 from Saglek Fiord, 28 from Saglek Anchorage and 43 from Nachvak Fiord.
- Eleven towed video transects were collected in Saglek Anchorage.
- These sampled stations represent 11 hours of video, 130 sediment samples and 133 jars of invertebrates and algae, which are currently being processed.
- Multibeam sonar bathymetric data have been mapped and described for both Saglek and Nachvak Fiords.



Multibeam bathymetry (water depths) and sample locations in Nachvak Fiord



Multibeam bathymetry (water depths) and sample locations in Saglek Fiord

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RATIONALE

Labrador Inuit are concerned about the impact of stressors, such as climate change, industrialization, and contaminants, to the marine environment in northern Labrador. This project in Nachvak Fiord and Saglek Bay, adjacent to the newly established Torngat Mountains National Park Reserve, examines the utility of several key indicators to assess and monitor ecosystem change through time. Fieldwork from both shore and ship-based platforms was conducted during the summers of 2006 and 2007. Results of this study will provide Parks Canada with significant baseline data required to establish the park's long-term marine monitoring program and provide Labrador Inuit with a comparative snapshot of ecosystem health in relatively pristine reference sites.

ArcticNet Research

ESTABLISHING MONITORING MEASURES FOR MARINE ECOLOGICAL INTEGRITY IN SAGLEK AND NACHVAK FIORDS, TORNGAT MOUNTAIN NATIONAL PARK RESERVE, LABRADOR.

OBJECTIVES

- To determine the logistical and scientific feasibility of using bivalves and shorthorn sculpin to assess and monitor ecosystem change through time in Nachvak and Saglek fiords, adjacent to Torngat Mountains National Park Reserve (TMNPR).
- To develop logistically and scientifically feasible monitoring protocols for marine monitoring measures in Nachvak and Saglek fiords.
- To provide training for Inuit field staff in scientific sampling and collection techniques.
- To contribute knowledge towards the assessment of baseline Ecological Integrity conditions in Nachvak Fiord, to be used in comparative analysis with data from Saglek Fiord and Anaktalak bay.

Joe Webb and Jacko Merkuratsuk retrieve the sediment grab sampler

METHODS AND INFORMATION COLLECTED

Parks Canada staff, contractors and partners spent a week aboard the Viola Dee in both Saglek and Nachvak fiords collecting information for this and other projects. Clams were collected from locations throughout the fiords using a grab sampler. Sculpins were collected using a fishing rod. Water column information was collected using a sonde deployed from the side of the boat. Intertidal areas were evaluated on foot to see if they were suitable for clam surveys.

PARTNERS

- Memorial University of Newfoundland
- Environmental Sciences Group, Royal Military College
- ArcticNet- Nunatsiavut Nuluak
- Parks Canada

Tim Pottle processing shorthorn sculpin in Saglek Fiord

FUNDING

- Parks Canada EI Innovation and Leadership Fund
- ArcticNet Nunatsiavut Nuluak
- Environmental Sciences Group – Royal Military College

YEARS OF DATA

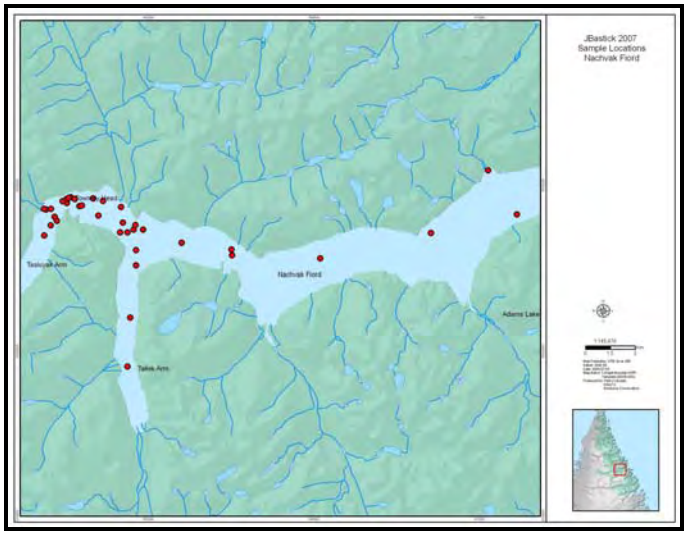
- 2007

RESULTS

Preliminary results include:

- Clam and sculpin samples collected throughout the fiords,
- Water column profiles: collected information on temperature, conductivity, pH, turbidity, depth and chlorophyll,
- Evaluation of beaches in Nachvak and Saglek fiords to ascertain suitability for intertidal clam surveys.

This information will be used to establish clam community-composition profiles, fish health indices, contaminant loading information, and for aging and isotopic analysis.



Sample sites in Nachvak Fiord, TMNPR

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RATIONALE

PCBs were spilled near the former military radar site at Saglek, Labrador. Some of these PCBs moved into the nearby marine environment. In 1998-2000, we studied the exposure of locally breeding black guillemots (*Cepphus grylle*) to these PCBs and the impacts of the PCBs on the health and development of guillemot chicks. Since 2000, a major PCB clean-up was completed at Saglek and PCB levels in the marine environment have declined. In 2007, we returned to Saglek to determine the current levels of PCBs in black guillemot chicks and the current impacts of the PCBs on the health and development of the guillemot chicks. Some sampling was conducted on islands within the park in Saglek Bay.

ArcticNet Research

DETERMINING PCB LEVELS AND EFFECTS IN BLACK GUILLEMOT CHICKS IN SAGLEK BAY, LABRADOR

OBJECTIVES

- To assess the impacts of a wide range of PCB exposure on black guillemots in Saglek Bay, Labrador, and develop exposure thresholds for different adverse effects.
- To feed results into ecosystem monitoring efforts by Parks Canada, the Department of National Defense, ArcticNet and the Nunatsiavut Government.

Black Guillemot chick

METHODS AND INFORMATION COLLECTED

In 2007, we monitored 100 black guillemot nests in Saglek Bay, to determine hatching and chick survival rates. When chicks in 50 of the study nests reached 15-20 days-of-age, we captured, weighed, measured and banded them. When chicks in 40 of these nests reached 21-30 days-of-age, we captured, weighed and measured them again, and injected their wing-webs with a plant protein (phytohemagglutinin), to assess their immune response. One day later, we measured skin swelling at the injection site in chicks from 35 nests. A blood sample was collected from one chick from each nest. That chick was then collected for detailed tissue analysis of PCB contamination and a suite of PCB-sensitive biochemical markers. We also collected 15 addled (rotten) black guillemot eggs from nine nests for PCB analysis.

YEARS OF DATA

- 1998-2000
- 2007

PARTNERS

- Canadian Wildlife Service
- Environmental Sciences Group, Royal Military College of Canada
- Parks Canada
- Nunatsiavut Government
- Memorial University of Newfoundland
- ArcticNet Nunatsiavut Nuluak

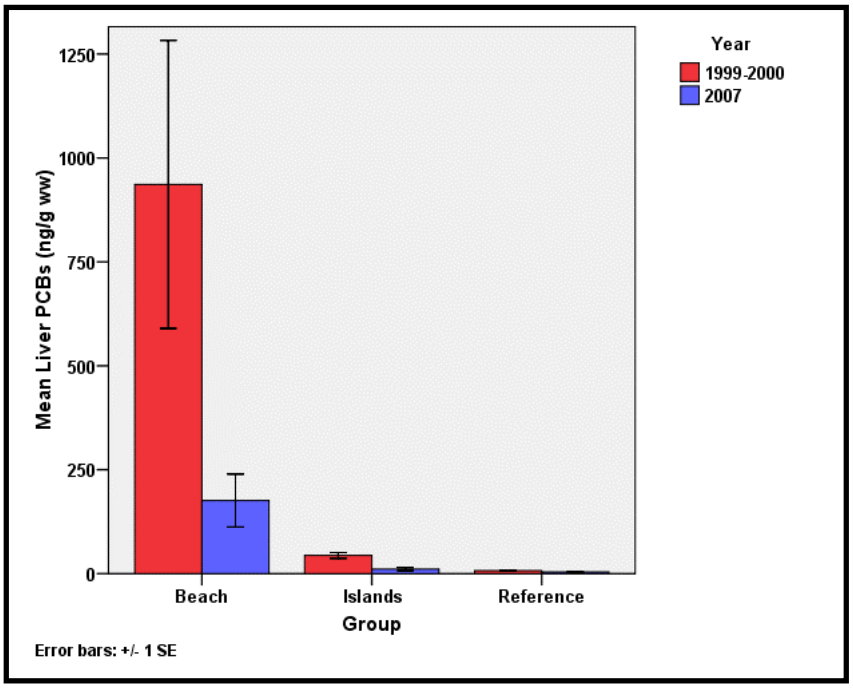
FUNDING

- Department of National Defence
- ArcticNet Nunatsiavut Nuluak
- Canadian Wildlife Service

Neil Burgess weighing a guillemot chick

RESULTS

- PCB levels in black guillemot chicks decreased from 1999-2000 levels, indicating that the marine ecosystem within Saglek Bay is recovering now that the major PCB clean-up has been completed. The graph below shows PCB levels in guillemot chicks from the area where PCBs were cleaned up (Beach), islands 5 kilometres away (Islands), and a clean area 17 kilometres away (Reference).



Change in PCB concentration in black guillemot livers between 1999-2007

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RATIONALE

Over the past thirty years, researchers have confirmed the presence of many contaminants in northern environments. Many have never been used or released in the region while others are believed to have originated from local sources such as military installations. Their persistent nature and the ability of certain contaminants to bioaccumulate is a concern for sensitive Arctic wildlife and may pose a particular threat to the traditional way of life of many Aboriginal communities. The distribution and accumulation of contaminants in the North is well documented, however, studies of the biological effects of many contaminants on northern ecosystems are limited. This project will determine the biological effects of polychlorinated biphenyls (PCBs) on fish and wildlife in Saglek fiord in northern Labrador, using a suite of biological markers, or biomarkers. It is anticipated that this project will ultimately establish biomarkers that can be used to determine the health of other northern ecosystems and may be applied in assessing adverse risks to these ecosystems.

ArcticNet Research

ECOLOGICAL RISK ASSESSMENT OF A NORTHERN FIORD ECOSYSTEM USING BIOMARKERS

OBJECTIVES

- To investigate the biological effects of PCBs on representative fish and wildlife in a northern ecosystem by examining a suite of biomarkers;
- To select biomarkers and other indicators of change that may be applied in monitoring biological effects of contaminants in northern ecosystems; and,
- To investigate the application of biomarkers in the ecological risk assessment process.

Processing a short horn sculpin

METHODS AND INFORMATION COLLECTED

Two field seasons have been carried out during 2006 and 2007. Short horn sculpin were collected from the three fiord systems (Nachvak, Saglek, Anaktalak) during 2006 and 2007. Black guillemots were also collected from Saglek fiord as part of this project in 2007. Deer mice were collected from the terrestrial area bordering Saglek fiord in 2006 and 2007.

PARTNERS

- Memorial University of Newfoundland
- Jacques Whitford Limited
- Department of Fisheries and Oceans
- Environmental Sciences Group – Royal Military College
- Artic Net – Network of Centres of Excellence of Canada. Universite Laval
- Parks Canada

FUNDING

- Memorial University of Newfoundland and Labrador
- ArcticNet Nunatsiavut Nuluak
- Department of Fisheries and Oceans

YEARS OF DATA

2006 and 2007

Harry Hay and Debbie Jeffrey processing guillemots

RESULTS

Preliminary results include:

- Abundance and diversity of gastrointestinal parasites of short-horn sculpin in Saglek, Anaktalak and Nachvak fiords.
- Bone density measurements of black guillemot from Saglek fiord and deer mice from the terrestrial area bordering Saglek fiord, in relation to PCB exposure.
- Samples of various organs from short horn sculpin, Black guillemot and deer mice preserved in anticipation of biochemical analysis in spring 2008.

The results of the biomarker assays will be used to determine the relative health of fish and wildlife in relation to PCB exposure.

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RATIONALE

The Northern Labrador coast is an area where the effects of climate change and modernization are likely to be felt in future decades and centuries. Climate change models suggest increased freshwater discharge of melting glaciers, and warming due to increased air temperatures. Evidence of modernization currently exists adjacent to Anaktalak Bay where a nickel-copper-cobalt mine and mill resides. How such changes in hydrology and pollution might affect the marine ecosystem is unknown. Results of this study will provide Parks Canada with baseline data required to assess the effects of climate change and modernization on the marine ecosystem along the Northern Labrador coast in Saglek and Nachvak Fiords.

Zooplankton are a critical component of the Arctic marine food-web, channelling energy from primary production to fish and marine mammals. Their pivotal role in the food-web make zooplankton a potential indicator of the state of a marine ecosystem. Because of their relationship with hydrological changes, studies also suggest that plankton may be used as an indicator of climate change.

ArcticNet Research

ZOOPLANKTON COMPOSITION AND ABUNDANCE; A COMPARISON OF THREE FIORDS ALONG THE LABRADOR COAST

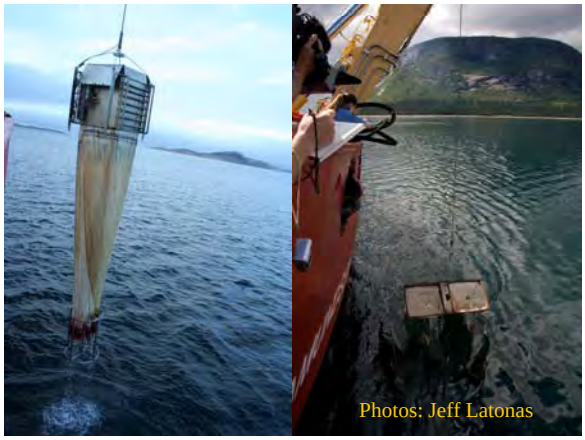
OBJECTIVES

- To provide a baseline description of the distribution, composition, and abundance of zooplankton in three Labrador fiords
- To look at seasonal zooplankton differences in the three fiords
- To assess the impacts of climate change and human activities on the fiord zooplankton populations

Common arctic copepod species L toR: Metridia longa, Calanus glacialis, Calanus hyperboreus.

METHODS AND INFORMATION COLLECTED

Parks Canada staff and partners spent a week aboard the CCGS Amundsen in fall 2006 and summer 2007 collecting information for this project. Zooplankton were collected from the water column using nets (Vertical Hydrobios and Oblique Tucker Trawls). Water column information (e.g. salinity, temperature, nutrients) was collected using a CTD, deployed from a rosette. Samples were collected at the mouth and head of each fiord.



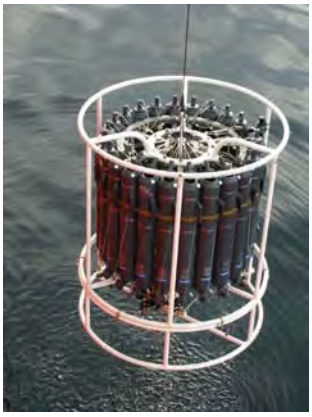
Oblique tucker trawl and vertical hydrobios tow

YEARS OF DATA

- 2006
- 2007

PARTNERS

- Environmental Sciences Group, Royal Military College
- Parks Canada
- ArcticNet – Network of Centres of Excellence of Canada, Université Laval



CTD rosette deployed from CCGS Amundsen

FUNDING

- ArcticNet Nunatsiavut Nuluak

RESULTS

Preliminary results include:

- Greater species diversity in Anaktalak and Saglek than in Nachvak
- Summer was more diverse than winter
- Zooplankton species composition of Anaktalak differed greatly from that of Nachvak and Saglek
- Zooplankton species composition differed among seasons
- Copepods were the most important group in terms of species diversity and numerical abundance
- Water column profiles indicated that Anaktalak had the freshest surface water in the summer when compared to Saglek and Nachvak.

CCGS Amundsen in Nachvak Fiord

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RATIONALE

Climate change is a broad and dynamic field of research, important on many ecological, social, and political levels. To date, research into how climate change will affect the terrestrial ecosystems of northern Labrador is limited; systematic, baseline data on the terrestrial ecosystems of the Park are lacking. Thus, the purpose of the research in the Torngat Mountains study area was not only to catalogue and collect samples from the many vegetation communities and establish baseline climate monitoring for future modelling efforts, but to begin experimentation that will document how these communities are likely to change under the scenarios of climate change. The ultimate goal is to develop protocols for long-term sustainable monitoring of the tundra environment and to understand the changes in the landscape to assist in adaptation.

International Polar Year Research

CLIMATE CHANGE AND ITS IMPACT ON TERRESTRIAL ECOSYSTEMS IN TORNGAT MOUNTAINS NATIONAL PARK RESERVE

OBJECTIVES

- To gather baseline data on plant distribution across altitudinal gradients
- To determine the impact of increasing temperatures on tundra vegetation
- To investigate the variation in plant distribution across a riverine ecosystem
- To set up an Automated Climate Station in the study area

OTC's and climate station in TMNPR

METHODS AND INFORMATION COLLECTED

Over-top chambers (OTC) were used to simulate increasing temperatures and were installed across an altitudinal gradient that captured the diversity of vegetation types. Ten OTCs were installed with a further 10 to be installed in 2008. Two, 1 metre squared plots were randomly chosen within each habitat type, marked using painted PVC tubing, GPS coordinates taken, and plant species present determined using the 100 pin drop method (1 m^2 is divided into 100 squares and the pin is dropped in the corner of each of the 100 – cm^2 and species the pin intercepts is (are) recorded). This enables us to get a "snapshot" of the species present but also vegetation structure (shrubs, grasses, forbs, mosses, lichens) at OTC establishment. The plots are randomly assigned as control plots and treatment plots. The OTC is then installed to enclose the treatment plot. The OTCs/controls are usually resurveyed every 5 years.

Detailed species composition (plants, lichens and mosses) and species diversity was recorded at each site and along an elevation gradient in a major river valley (Nachvak Brook). In addition, soil samples were collected at five locations for nutrient analysis in support of vegetation studies.

An Automatic Climate Station was set up at a site that is central to the study area, away from the effects of water bodies and at an elevation of approximately 430m (1400ft). The climate station along with a rain gauge and snowsticks will record temperature, relative humidity, wind speed and direction, solar radiation and ground temperature, rainfall, snow cover. These data will be used to establish baseline for future evaluations of climate change and for climate modeling purposes. Field work for this research will continue in 2008.

YEARS OF DATA

- 2007

PARTNERS

- Memorial University (Depts of Biology and Geography)
- Parks Canada, Torngat Mountains National Park Reserve
- IPY- CiCAT programme

FUNDING

- International Polar Year
- Memorial University of NL

RESULTS

- Ten OTC/control sites (20 quadrats) were established in different habitat types within the study area.
- Lichen and bryophyte samples were collected from a variety of habitat types, at the 10 OTC sites and at 20 sites along an altitudinal gradient in Nachvak Brook.
- Lichen samples were preliminarily identified and will be sent to Dr. Michelle Piercy-Normore at the University of Manitoba for verification.
- More than 20 distinct species of moss were identified in the field and now await further classification.
- Vascular plant species were collected and classified at all 20 quadrats as well as the 20 sites along the altitudinal gradient transect in Nachvak Brook.
- Those plant species not classified in the field were pressed for later classification. Plant vouchers will be verified by vascular plant experts at The Rooms in St. Johns.
- The Automatic Climate Station was set up and operational on July 17th 2007.
- Hourly and daily recordings are stored in a CR-1000 datalogger and will be downloaded in 2008.

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MUN Field Camp.
Photo Labrador Highlands Group

RATIONALE

The structure and function of Arctic rivers is expected to be significantly modified with climate variability and change (CVC). This climate change is predicted to reduce permafrost and, therefore, deepen the active soil layer. This will likely increase rock weathering and lead to a more rapid release of nutrients, sediments and contaminants to rivers. While predicting the impacts of these multiple effects is highly complex, expert consensus suggests that their cumulative effects will cause dramatic changes to arctic river ecology. The rationale for this study is to obtain a better understanding of the current river systems in the Arctic, in order to improve our ability to estimate the future effects of CVC on the ecology of these rivers.

International Polar Year Research

ESTABLISHING LEGACY CONDITIONS OF ARCTIC RIVER ECOSYSTEM BIODIVERSITY AND FUNCTION.

OBJECTIVES

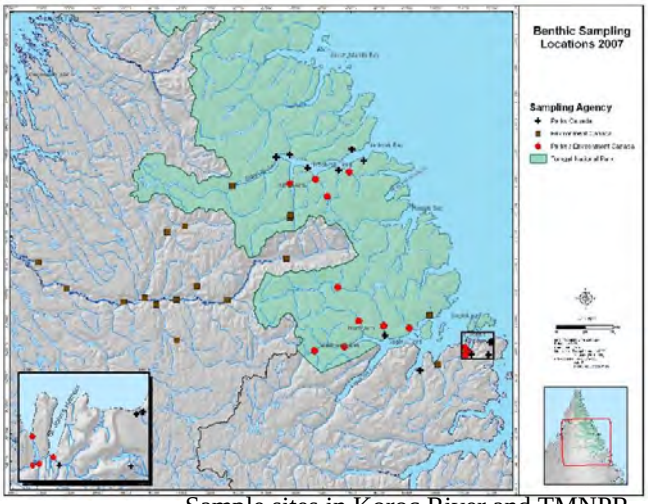
- Collect information on freshwater biodiversity and related environmental conditions from Arctic freshwater ecosystems;
- Obtain an improved Canadian perspective on the current status and future trends of freshwater biodiversity in Arctic regions, particularly in relation to projected CVC.
- Conduct ecological research at strategic sites in the eastern portion of the Canadian Arctic to improve our ability to estimate the effects of CVC impacts; and,
- Establish an International Arctic-BIONET research and monitoring consortium/network involving long-term sites in the circumpolar Arctic.

Joseph Culp kick netting in Palmer River

METHODS AND INFORMATION COLLECTED

- The Arctic Bionet – “Legacy” field program was conducted between August 20 – 28, 2007,with the last four days within Torngat Mountains National Park
- Field sites during the research program were located on rivers within three major watersheds: the Koroc River watershed which flows into Ungava Bay, and rivers draining into Saglek and Nachvak Fjords which both drain into the Labrador Sea
- Conducted river and stream surveys on approximately 30 sites – half in the Koroc watershed, the other half within the Torngat Mountains National Park.

This included:
• Collection of benthic invertebrates (biodiversity, stable isotope analysis).
• Algal sampling (biodiversity, chlorophyl a biomass, stable isotope analysis)
• Water sampling (chemical analysis – nutrients, trace metals, stable isotope analysis of fine particulate organic matter (FPOM)
• Water parameters (dissolved oxygen, conductivity, temperature, pH)
• Riparian vegetation (stable isotope analysis)
• Stream discharge in rivers small enough to cross safely



Sample sites in Koroc River and TMNPR

• Deployment of temperature and pressure transducers, left till summer 2008
• Stream substrate surveys

YEARS OF DATA
- 2007

PARTNERS
- Parks Canada
- Environment Canada

FUNDING
- International Polar Year

RESULTS

- ***Reconnaissance survey*** – Initial surveys of the region indicated that many of the rivers and streams were of a large scale, and that changes to our traditional river/stream sampling techniques would be required. The decision was made to focus on the Koroc River watershed, and the Nachvak and Saglek Fjords.
- ***River surveys*** – Thirty river sampling sites were selected on the Koroc R, and Saglek and Nachvak Fjord in riffle sections approximately 20 to 50 cm deep. Sites at lower elevation on the main channel and tributaries of the Koroc River were forested. The remaining sites were above the tree line, most had riparian zones dominated by low growing shrubs and grasses. The survey was conducted during the Arctic charr migration into freshwater, with adult charr sightings in many of the streams.
- Water quality parameter information indicates that the waters are highly oligotrophic, with extremely low conductivity, and dissolved oxygen concentrations near saturation.
- Samples collected during the project are being processed, with initial results anticipated for April 2008.
- Visual inspection in the field of benthic invertebrate and periphyton samples suggest that stream systems have low productivity and biodiversity, typical of Arctic streams.

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RATIONALE

Arctic char (*Salvelinus* alpinus) is a circumpolar fish species that is distributed across a wide latitudinal and climatic range, which in Canada ranges from the High Arctic to temperate locations such as Newfoundland and southern Quebec. The char species lends itself well to investigations associated with climate and environmental variation. There is also scientific evidence indicating significant warming in much of the Arctic with possible consequences to various species including Arctic char. As part of a larger International Polar Year (IPY) initiative, led by Dr. Jim Reist, DFO Winnipeg, investigations on the ecology of Arctic char have been undertaken to try and better understand how populations may respond to events such as climate variability and change as this species is of particular importance to the Inuit peoples of northern Canada.

International Polar Year Research

CLIMATE VARIABILITY AND CHANGE EFFECTS ON CHAR IN THE ARCTIC

OBJECTIVES

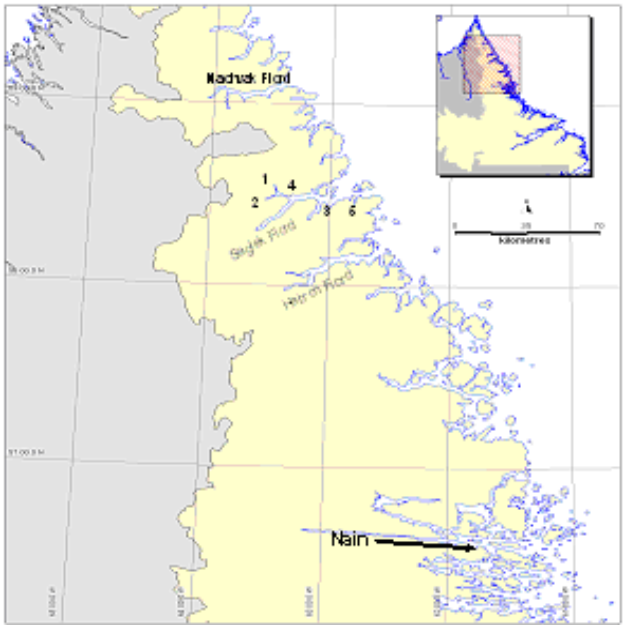
- Determining the responses of char to variability in thermal (temperature) regimes.
- Identifying food web relationships of Arctic char by analyses of carbon and nitrogen stable isotopes
- Examining contaminant levels of anadromous and resident freshwater samples of north Labrador Arctic char
- Assessing the genetic and morphological variation, genetic population structure and variation in the dynamics of char populations within the Park in comparison with samples obtained from other locations and regions of northern Canada
- Contributing to the development of base data for the long-term monitoring of Arctic char populations in the Park.

PARTNERS

- Department of Fisheries and Oceans
- Parks Canada

YEARS OF DATA

- 2007



Sample sites: 1 = North Arm Brook, Saglek; 2 = Southwest Arm Brook, Saglek; 3 = Torr Bay Brook, Saglek; 4 = Upper Nakvak Lake, Saglek; 5 = St. John's Harbour, Saglek.

METHODS AND INFORMATION COLLECTED

Sampling was not restricted to areas within Torngat National Park Reserve, but was also carried out in areas adjacent to the Park using the base camp in St. John's Harbour as the primary platform from which sampling activities originated. The following locations were sampled in 2007, where numbers refer to sample locations on the map above:

1. North Arm Brook (YOY char), and North Arm, Saglek (marine sampling adult char)
2. Southwest Arm Brook, Saglek (YOY char)
3. Torr Bay Brook, Saglek (YOY char)
4. Upper Nakvak Lake (freshwater resident Arctic char)
5. St. John's Harbour, Saglek (for amphipods, sticklebacks, sculpins, mysids, gastropods)

FUNDING

- Department of Fisheries and Oceans
- International Polar Year

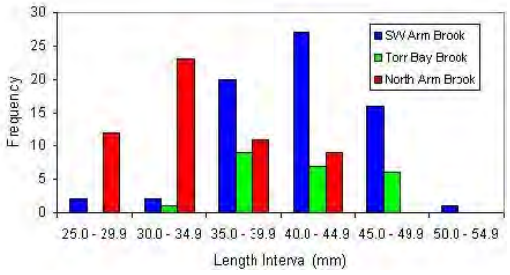
Arctic char in spawning colours

RESULTS

Young-of-the-year samples of Arctic char were obtained from:

North Arm Brook, Saglek,	N = 55
Southwest Arm Brook, Saglek,	N = 73
Torr Bay Brook, Saglek,	N = 22

Biological characteristics data (length, weight, sex, otoliths for ageing) were also obtained from 30 adult Arctic char at North Arm, Saglek. In addition, 50 samples of freshwater resident Arctic char were caught in Upper Nakvak Lake, Saglek. Upper Nakvak Lake is an isolated pond that drains into Nakvak Brook, on the north shore of the Saglek Fiord and thus represents a "landlocked" char population. In addition to the above, approximately 200 Arctic char were sampled from areas around the community of Nain. Samples will be analysed over the next year in various locations in Canada including the University of Waterloo, and Fisheries and Oceans laboratories in St. John's and Winnipeg.



Length-frequency distribution of young-of-the-year samples of arctic char from various locations in Saglek Fiord, Labrador, 2007.

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RATIONALE

In 2007 a four year archaeological research program was initiated in the Komaktorvik Fiord region, aimed at characterizing the organization of household production among pioneering and early historic Inuit groups through the integration of social, economic, historical and paleoenvironmental evidence. The investigation is shaped by an understanding of household organization as the outcome of interactions amongst internal societal dynamics, environmental change, and inter-societal interactions including interactions between Inuit and various European groups.

International Polar Year Research

KOMAKTORVIK ARCHAEOLOGY PROJECT

OBJECTIVES

- To generate spatial, artifactual and zooarchaeological data through mapping, testing and preliminary excavation at the Inuit winter settlement at the mouth of Komaktorvik Fiord.
- To revisit and test sites reported by the Torngat Archaeology Project in 1977-78 and conduct additional archaeological survey around the mouths of Komaktorvik and Kangalaksiorvik Fiords.
- To provide thesis research opportunities for graduate and undergraduate students from Memorial University and Université Laval on topics such as geochemical mapping and community archaeology.
- To provide training for northern field assistants in the scientific and logistical conduct of Labrador archaeology.

PARTNERS

- Parks Canada
- Nunatsiavut Government
- Memorial University of Newfoundland
- Laval University

YEARS OF DATA

- 2007

Photo: Peter Whitridge

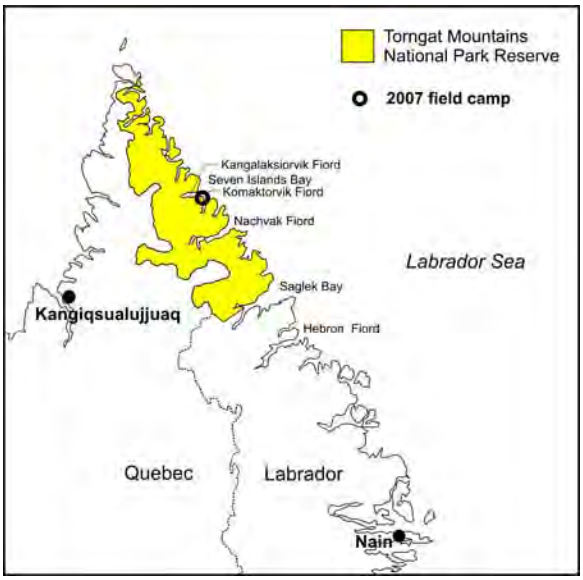
INUIT INVOLVEMENT

The research project employed three students as field assistants, as well as two adults from Nain. The students received training in archaeological research methods and the adults served as bear monitors for the project.

METHODS, INFORMATION COLLECTED AND DISCUSSION

In August the crew travelled by longliner to northern Labrador and set up camp on the terrace overlooking the winter site of Komaktorvik 1 (IhCw-01). Test excavations were conducted next to precontact and historic Inuit winter houses at the western and eastern ends of the site, generating large artifact and animal bone assemblages that span the Middle Dorset through later historic periods. The terrace was intensively utilized by pre-Inuit groups; their Ramah chert artifacts and waste material were frequently encountered during excavation of Inuit features. Indeed, the latter's house foundations appear to have been deliberately reused by Inuit colonists in the late fifteenth century. Komaktorvik 1 was occupied over a much longer period than analogous sod house sites in nearby Nachvak Fiord, but this occupation appears to have been intermittent. Alternating episodes of settlement expansion and retraction in Seven Islands Bay may reflect periodic population pulses from more productive and consistently occupied locales, such as Nachvak Fiord. Komaktorvik 1 exhibits a distinctive progression of house styles that culminates in an unusual late historic variety of house group composed of tiny, discrete dwellings with radiating entrance tunnels. This architectural pattern is duplicated at the nearby winter site of Big Head 1 (IiCw-03), at the mouth of Kangalaksiorvik Fiord. Testing and sampling were conducted at the latter site, and numerous small pre-Inuit and Inuit sites recorded or revisited in the surrounding area

2007 Field Camp



Location of 2007 Field Camp

RESULTS

Analysis of artefacts and animal bone collections from both areas is currently underway

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RATIONALE

Parks Canada requires that every national park develop a comprehensive ecological integrity monitoring program for each major ecosystem in the park. The tundra ecosystem in Torngat Mountains National Park is extensive and variable due to dramatic range in elevation, a variety of bedrock and soil types, climate variability due to influences from the Labrador Sea, Ungava Bay and Davis Strait, and a pronounced north-south temperature gradient with topographically induced microclimates. Little is known about the vegetation communities in the park, so baseline inventory information is required before a monitoring program can be developed. This inventory and vegetation classification (Terrestrial Ecosystem Mapping) will help to inform Remote Sensing tools that will support long-term condition monitoring of the tundra environment.

International Polar Year Research

RECONNAISSANCE VEGETATION CLASSIFICATION AND ECOSYSTEM MAPPING IN TORNGAT MOUNTAINS NATIONAL PARK RESERVE

OBJECTIVES

- To provide baseline information in support of terrestrial ecosystem mapping of the park.
- Describe the terrestrial and wetland ecosystems of a select study area in the southern part of the park.
- To identify vegetation communities, soils and landforms.
- To identify and record rare plants in the area

Example of the study area

METHODS AND INFORMATION COLLECTED

Four preliminary ecosystem maps were created from airphotos prior to fieldwork
Field work commenced on July 25th and was completed on August 3rd 2007
Ground truthing of the ecosystem maps was conducted. One map was extensively covered by field traverses based out of a field camp. The other maps were spot-checked using a helicopter, or from ground observation points.
At each site ecosystem descriptions were recorded and included:

- dominant and subdominant plant growth forms
- the dominant height of vegetation
- a list of vascular species and their abundance (% cover)
- a list of major lichens and mosses
- soil description (texture, humus form, depth to permafrost)
- map polygon boundaries and transitions, and
- identification and description of terrestrial ecosystem complexes

Eli Merkuratsuk - Guide

RESULTS

- 179 sample sites were visited and classified
- Unknown plant species were collected, dried in the field and sent to the Canadian Museum of Nature for identification.
- A preliminary ecosystem classification is being produced for the areas mapped.
- This map will provide baseline information for subsequent field work and remote sensing
- From our field reconnaissance in Torngats National Park Reserve we discovered a new range extension for the sedge, *Carex filifolia*. This plant has not previously been reported east of Manitoba in Canada.

PARTNERS

- Canadian Centre for Remote Sensing
- Memorial University of Newfoundland and Labrador
- International Polar Year

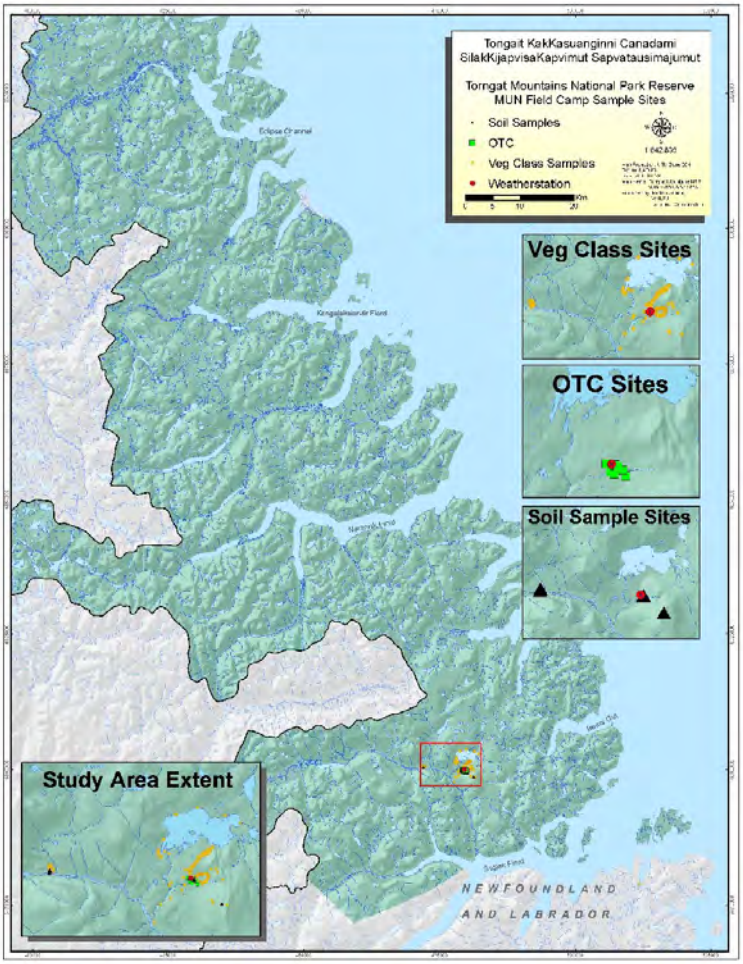
YEARS OF DATA

2007

FUNDING

- International Polar Year
- Parks Canada

Thermokarst holes in alluvial sediments.
Meadow tundra community- Nachvak Brook



Vegetation classification sites are in yellow

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RATIONALE

Status reports in the 1990's on the Davis Strait polar bear population suggested that it was declining, but reports from local hunters did not support this scenario. Based upon this traditional knowledge, the population estimate was increased from 750 to 1400 animals in the mid 1990's, and then further increased to 1650 animals in 2004. Yet, this increase was not universally accepted. So, in 2005 a three-year mark-recapture population survey was initiated to provide an accurate population estimate and survival estimate for the Davis Strait population. From this survey, an updated recommendation for a revised Total Allowable Harvest (TAH) for the population may be made once the data analysis is complete. In 2007 the final year of the survey was completed. The Torngat Mountains National Park was surveyed in the second week of August.

Nunavut, Newfoundland & Labrador, Makivik Nunatsiavut and Parks Canada Research

DAVIS STRAIT POLAR BEAR POPULATION INVENTORY

OBJECTIVES

- Complete the third field year of the 3-year mark-recapture survey.
- Provide a preliminary population estimate for the Davis Strait polar bear population.
- Provide a preliminary survival estimate.

Survey area for the Davis Strait polar bear population.

METHODS AND INFORMATION COLLECTED

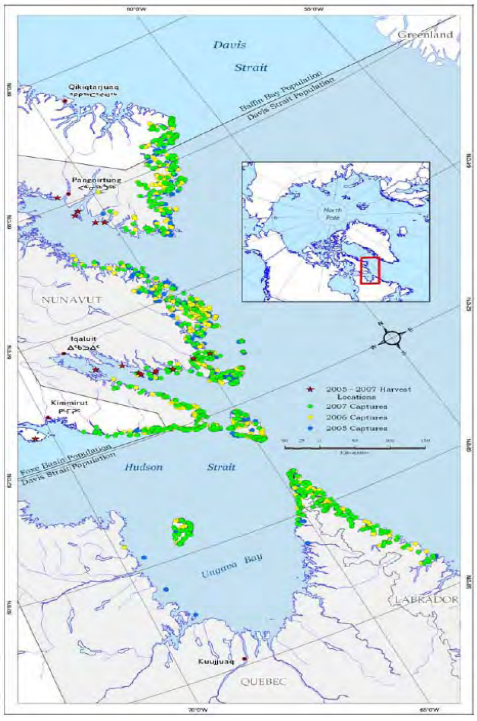

Fig. 1:Capture locations for 2005,2006, 2007

The 2007 survey used a helicopter to survey the entire coastline of the study area, including offshore islands. Inland transects were also flown. Every bear observed was captured, providing that the capture was safe for bears and crew. Bears were immobilized and given a unique capture number (ear tags and lip tattoo). Capture numbers were recorded for the recaptured bears. The data collected from each bear included straight line body length, greatest breadth of zygomatic arch, chest girth, an index of body condition, approximate age, tooth wear, sex and location and date of capture. Research samples collected from each bear include hair, tissue, claw tips and a premolar tooth.

PARTNERS AND FUNDING

- Nunavut Department of Environment
- Nunavut Wildlife Management Board
- The Qikiqtaaluk Wildlife Board
- Hunter and Trapper Organizations (HTOs) of Pangnirtung, Iqaluit and Kimmirut, Nunavut
- Newfoundland & Labrador Department of Environment and Conservation
- Makivik Corporation
- Parks Canada

Polar bear in Saglek Fiord

RESULTS

In 2007, 886 polar bears were caught and released in Davis Strait. There were three capture mortalities. The table below shows the number of polar bears caught and released in each year of the mark-recapture effort, and Figure 1 shows the distribution of captured bears in all three years. Estimated population size is approximately 2,200, up from the old estimate of 1,650. On completion of the data analysis, the results will be conveyed to the communities during a series of workshops culminating in revised polar bear MOU's. Communication format will include computer graphics, posters, handouts, local radio, and oral presentations. Interim reports will provide timely detailed summaries until the results have been published in peer-reviewed journals.

At this stage, recommending a revised TAH would be premature and can not be made until the status of the population has been determined, i.e. is it increasing, stable or decreasing. This analysis is ongoing.

	Labrador			Nunavut			Quebec			Davis Strait (Total)		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
Adults	34	83	90	381	437	466	8	16	18	423	536	574
Sub-adults	2	11	21	97	136	124	5	8	5	104	155	150
Yearlings	3	15	24	36	56	73	2	2	4	41	73	101
COY	1	23	12	49	52	47	5	2	2	55	77	61
All Bears	**40**	**132**	**147**	**563**	**681**	**710**	**20**	**28**	**29**	**623**	**841**	**886**

Polar bears caught and released in the different jurisdictions of the Davis Strait Population from 2005 – 2007.

Family group on Shuldham Island TMNPR

YEARS OF DATA

- 2005
- 2006
- 2007

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MONITORING

RATIONALE

Recording incidental wildlife observations is an inexpensive method of collecting information about wildlife populations. Observations of wildlife in Torngat Mountains National Park, and surrounding areas, are recorded on wildlife cards and the information is stored in a computer database. Special attention is paid to observations of Species at Risk such as peregrine falcon, wolverine, polar bear, harlequin duck, barrows goldeneye duck, ivory gull, and shorteared owl. Observations of black bear, wolves and marine mammals are also recorded, as they are good indicators of environmental health.

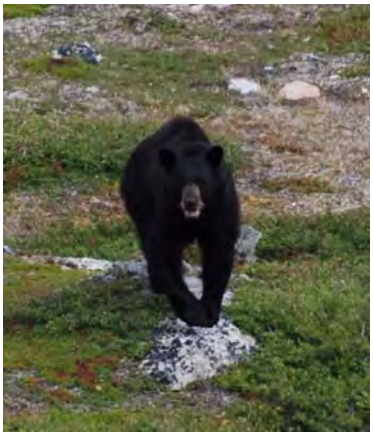
WILDLIFE CARDS

OBJECTIVES

- To collect basic information (presence, distribution, relative abundance) about wildlife populations in TMNPR and surrounding areas.

METHODS AND INFORMATION COLLECTED

- Parks Canada staff, contractors and visitors record incidental observations of wildlife on wildlife cards.
- Information collected includes: date and time of observation, name of observer, species observed, number of individuals seen, location of observation, elevation, aspect, age, sex of animal, evidence of reproduction, habitat, weather and remarks.
- Information from the wildlife cards is entered into a database.
- Summaries of incidental observations and maps of these observations can be produced.



Black bear near St. Johns Harbour, Saglek Bay

Minke whale in Nachvak Fiord

YEARS OF DATA

- 2005
- 2006
- 2007

FUNDING

- Parks Canada

RESULTS

- There are currently in excess of 200 observations in the wildlife cards database
- In subsequent years all visitors will receive wildlife cards as part of their pre-trip information package.
- All Researchers will be asked to participate in the wildlife observation program

Polar bear in Nachvak Fiord

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RATIONALE

Raptors are often used as indicators of ecosystem health. Changes in prey abundance and the presence of pesticides can affect raptor populations. Surveying raptors when they are in northern Labrador to breed provides an indicator of the health of their populations and the condition of the ecosystem throughout their range. The Peregrine Falcon (*Falco peregrinus*) is listed as a Threatened species under the Province of Newfoundland and Labrador's *Endangered Species Act*. The sub-species anatum is also listed as Threatened under the federal *Species at Risk Act* and the sub-species tundra is listed as Special Concern under that same Act. Since 1985 the Province of Newfoundland and Labrador has actively participated in the 5 year North American surveys (1985, 1990, 1995, 2000) for Peregrine Falcons This survey contributes information to the Canadian Peregrine Falcon Survey (CAPFS), a national effort to monitor the status of peregrine falcon populations in North America every five years.

PEREGRINE FALCON SURVEY

OBJECTIVES

- To determine if selected known peregrine falcon territories are occupied.
- To estimate the reproductive success of these selected peregrine falcon territories during the nesting period.
- To document previous unknown nest sites
- To collect incidental observations of all species of raptors.
- To collect incidental observations of any Species at Risk.

Peregrine falcon chick getting a leg band

METHODS AND INFORMATION COLLECTED

- The raptor survey is conducted every five years. The next survey will be in 2010.
- Two methods were employed to inventory peregrine falcon nest sites. **1**. A concentrated effort surveying known and potential new nest sites by helicopter in 2005 and **2.** opportunistic ground surveys during hiking patrols, research and monitoring activities and other park activities
- Aerial surveys were conducted in late July 2005 when chicks were 1-3 weeks of age and parents are likely to flush at the approach of an intruder making observations easier. Other raptors have usually fledged by this time.
- The helicopter approaches potential and known nest sites where orange lichen or fresh whitewash is visible. Two of three passes are made along the rock face looking for adult birds and nests.
- When nest were located, the number of eggs and/or chicks are counted, their age estimated, and sub-species of adult determined.
- Ground observations were conducted opportunistically whenever park staff, researchers and visitors are in the park.

YEARS OF DATA

- 1986, 1987, 1988, 1989, 1990, 1995, 2000
- 2005
- 2006 and 2007

PARTNERS

- Newfoundland and Labrador Wildlife Division
- Canadian Wildlife Service

FUNDING

- Parks Canada EI Species at Risk Fund
- Newfoundland Government
- Canadian Wildlife Service

RESULTS

Aerial Survey: July 27-31,2005

- One potential new PEFA nest site was found in the Eclipse valley
- One of the 6 known nest sites was confirmed to be active. It had 2 adults and 2 chicks
- Three of the other nest sites had adult birds observed in the area but the nest could not be located to confirm nesting.
- A total of 6 adults and 2 yoy were observed near nest sights and three other birds observed in areas where no nest has ever been found.

Ground Survey

- Ground surveys occurred in Sept 2005, July and August 2006 and July and August 2007.
- Ten peregrine falcons were observed in various places between Nachvak Fiord and Saglek Bay
- None of these sightings were near known nest sites.
- One observation was of 2 adults and 2 yoy in late august that showed a strong affinity to a raptor nest that had been occupied that season. This is a possible new nest site.
- The high concentration of sightings in the Nachvak Fiord area in July and August suggests that there may be an active nest yet to be discovered.

Peregrine falcon known nest sites

Peregrine falcon sightings 2005/06

Adult peregrine falcon

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