2001

Compendium of Research in the Northwest Territories

Including:

- Scientific Licences
- Archaeological Permits
- Wildlife Permits and
- Fisheries Permits

Aurora Research Institute
Aurora College

ABOUT THE AURORA RESEARCH INSTITUTE

The Aurora Research Institute (ARI) was established in 1995 as a division of Aurora College when the Science Institute of the Northwest Territories (NWT) divided into eastern (Nunavut) and western (NWT) divisions.

The Aurora Research Institute's mandate is to improve the quality of life for NWT residents by applying scientific, technological and indigenous knowledge to solve northern problems and advance social and economic goals.

ARI is responsible for:

- licensing and coordinating research in accordance with the NWT *Scientists Act:* This covers all disciplines including the physical, social, biological sciences and traditional knowledge;
- promoting communication between researchers and the people of the communities in which they work;
- promoting public awareness of the importance of science, technology and indigenous knowledge;
- fostering a scientific community within the NWT which recognizes and uses the traditional knowledge of northern aboriginal people;
- making scientific and indigenous knowledge available to the people of the NWT;
- supporting or conducting research and technological developments which contribute to the social, cultural and economic prosperity of the people of the NWT

To learn more about ARI, you can contact us at:

Aurora Research Institute
Box 1450
Inuvik, NT X0E 0T0

Tel: 867-777-3298
Fax: 867-777-4264

Website: www.nwtresearch.com

FOREWORD

The Aurora Research Institute is responsible for compiling this document in an effort to keep northerners informed of research activities in the Northwest Territories. The licensing requirement for researchers in the Northwest Territories is a provision of the Scientists Act of the NWT, ensuring that an annual summary of their work is accessible to all those who need to be informed and others who may be interested in these activities. The sharing of this information allows for greater involvement of northerners in the development of research programs that are pertinent to the needs of the north. This information also enables researchers to work collaboratively on related issues.

Industrial development in the NWT in recent years has highlighted the need for scientific and technological knowledge. The critical role that research plays in guiding public policy is increasingly recognized by the people, the governing agencies and the private sector of the Northwest Territories. Training in these areas is critical to allow for adaptation to the rapidly changing social and economic structure of the North. ARI actively promotes partnership with community groups, government agencies, and private sector organizations in order to identify research needs and strategies to meet those needs. Researchers are also partners in these endeavours.

Through the research licensing and permitting requirements, aboriginal organizations and community groups have input into the research that is conducted and are kept informed of current and proposed research in their region. ARI, in cooperation with researchers assists in training community members to participate in research projects within and outside their communities.

Researchers make a valuable contribution to the north as they provide information and education through schools and community presentations, and they also provide employment and training opportunities. There are an increasing number of partnerships and cooperative programs being developed with researchers and the people of the north. By sharing this information the people of the north are able to help in sharing the future direction of research in this region.

The Aurora Research Institute works to connect scientists with the communities of the Northwest Territories by promoting and supporting studies which improve the understanding of the natural resources and indigenous knowledge and cultures of the NWT. The Compendium of Research is one means by which scientific and traditional knowledge is made available to people of the NWT.

Andrew Applejohn
Director
Aurora Research Institute

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ABOUT THIS BOOK

The Compendium of Research in the Northwest Territories is a summary of research licences/permits that were issued in the Northwest Territories during 2001. The information contained in this book is a collaboration between the Aurora Research Institute (ARI), the Prince of Wales Northern Heritage Centre (PWNHC), the Department of Resources, Wildlife, and Economic Development (RWED) and the Department of Fisheries and Oceans (DFO). The Compendium series began in 1986.

Licensing in the NWT

Under territorial legislation, all research in the NWT requires a licence/permit from one of three agencies, depending on the type of research being conducted:

- Prince of Wales Northern Heritage Centre – Archaeology
- Department of Resources, Wildlife, and Economic Development, Government of the Northwest Territories – Wildlife
- Aurora Research Institute – All other research in the NWT

Included in this Compendium are Fisheries Research projects conducted by the Department of Fisheries and Oceans staff. Other researchers conducting fisheries research are required to have a Science Licence and are included in this section of the Compendium. In addition to one of these licences/permits there may be other permits required depending on the nature of the research work.

Through the licensing process, researchers are informed of appropriate organizations, communities and other licensing/permitting agencies that should be contacted prior to conducting studies. Licensing ensures research activities are communicated to interested parties and provides opportunities for the exchange of information.

Although the Compendium is a summary of all licences/permits issued in the NWT by all three licensing/permitting bodies, it is not a list of actual research conducted. The reader is encouraged to contact the researcher for further verification and additional information.

HOW TO USE THIS BOOK

This book has four main sections. Each of these sections reflects a specific licensing agency and type of licence/permit issued. Within each section research descriptions have been grouped by subject, and listed alphanumerically by the principal researcher's last name. Refer to the Table of Contents for the specific page on which each section and/or subject begins.

1. Reference Number

The reference numbers shown in each of the Aurora Research Institute's subject areas refer to the file number issued to a particular researcher. It allows cross referencing with research material that may be available on file or in the ARI library. The reference numbers of the other two agencies refers directly to the permit numbers given to each researcher. When requesting information from any of these agencies on specific research outlined in this compendium, please refer to the reference number in your correspondence.

2. Regional Abbreviations

Throughout the book reference is given to the specific land claim region(s) in which the research took place. The regions are shown in Figure 1. Some of the land claim regions are still under negotiation and boundaries shown are only approximations. The abbreviations shown for each region are as follows:

DC	Deh Cho	*SS*	South Slave
NS	North Slave	*SA*	Sahtu
IN	Inuvik (includes Gwich'in and Inuvialuit Settlement Regions)		

3. Glossary

A glossary of terms has been added to the Compendium. The intent of the glossary is to allow the reader to better appreciate the research descriptions.

4. Index

At the back of this book, you will find two indices. These have been developed to help the reader cross reference material more easily. The numbers used in the Researcher Index refer to the number listed with each research description. The numbers listed in the Subject Index refer to the page numbers.

AVAILABLE IN PRINT OR CD

The Compendium is available as a printed publication or digitally on CD. The Compendium can be downloaded from the Aurora Research Institute's website (www.nwtresearch.com) or a copy can be requested by contacting the Aurora Research Institute. We encourage photocopying of the printed publication to promote its distribution.

FOR MORE INFORMATION ABOUT THE RESEARCH LISTED IN THIS BOOK

Please contact:

Aurora Research Institute
Scientific Services
Box 1450
Inuvik, NT X0E 0T0
Tel: 867-777-3298
Fax: 867-777-4264

Prince of Wales Northern Heritage Centre
Department of Education, Culture & Employment
Box 1320
Yellowknife, NT X1A 2L9
Tel: 867-920-8084
Fax: 867-873-0205

Department of Resources, Wildlife & Economic Development
Wildlife & Fisheries Division
Government of the NWT
600, 5102 - 50th Avenue
Yellowknife, NT X1A 3S8
Tel: 867-920-8064
Fax: 867-873-0293

Department of Fisheries & Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9
Tel: 867-874-5570
Fax: 867-874-5508

SEND US YOUR COMMENTS

Whether you are a researcher or an interested member of the public, the Aurora Research Institute welcomes your comments and suggestions about the Compendium. Contact us by mail, fax, email or telephone (see address above).

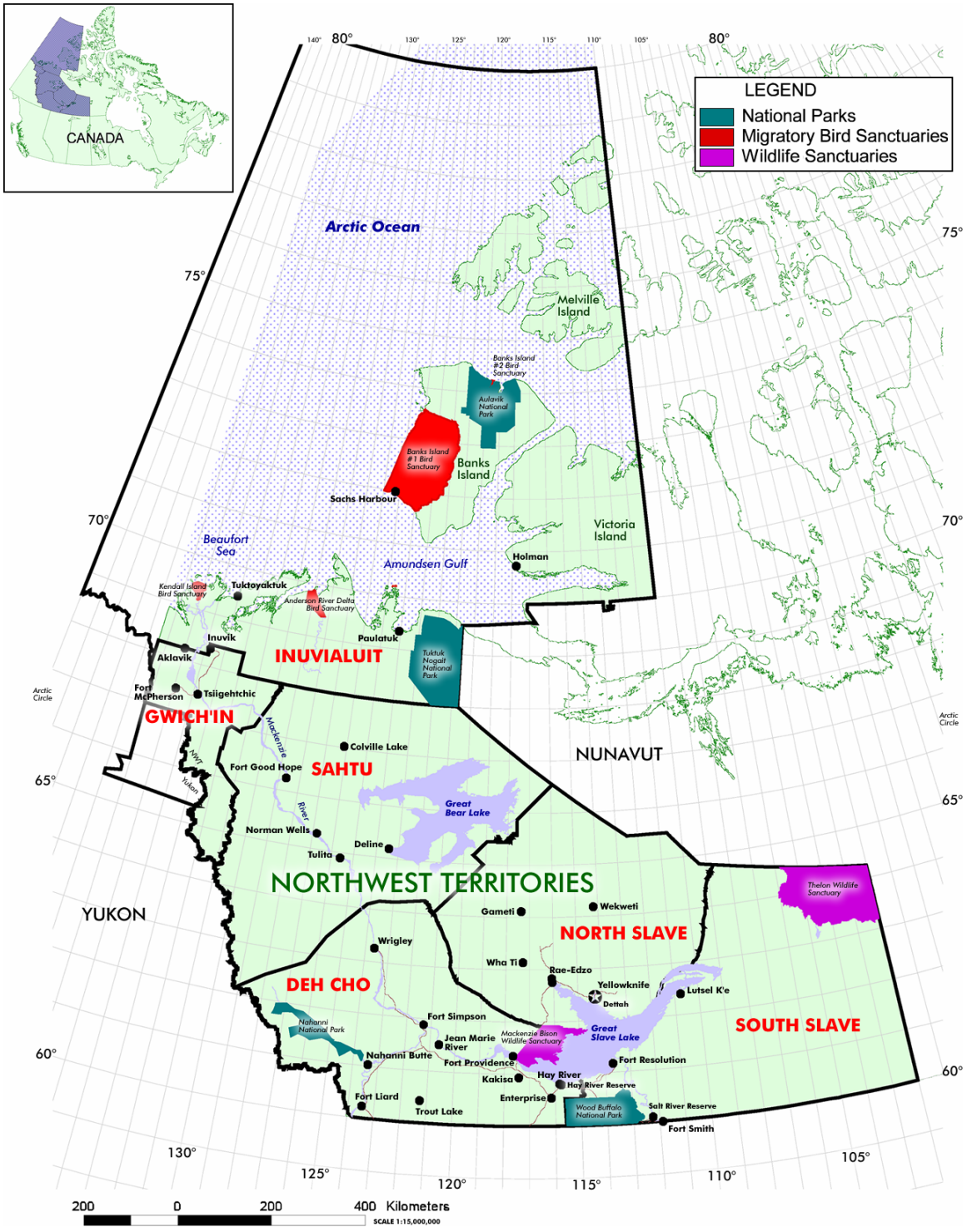

Figure 1: Land Claim Regions in the Northwest Territories

Aurora Research Institute
Science Licences

BIOLOGY

001 **Biology**

Aiken, Susan
Canadian Museum of Nature
P.O. Box 3443
Station D
Ottawa, ON K1P 6P4
Email: saiken@mus-nature.ca

Reference Number: 12 402 616
Region: IN **Location:** Tuktoyaktuk

Flora of the Canadian Arctic Archipelago

The goal of the project was to obtain a representative collection of the biodiversity present around Tuktoyaktuk. The specimens were collected and then compared to collections in Alaska. They are significant for the developing Panarctic Flora checklist, as it is thought that many of the plants that returned to North America after the last ice age came across the Beringian land bridge. At each site visited during the survey, the plants were photographed and the local habitat was recorded. Duplicates were taken and sent to herbariums in Oslo and the Canadian Museum of Nature.

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002 **Biology**

Antoine, Don
General Delivery
Fort Liard, NT X0E 0A0
Email: don_antoine@nahendeh.com

Reference Number: 12 402 669
Region: DC **Location:** on Anadarko Canada Corporation seismic blocks in the vicinity of Fort Liard

Environmental Assessment for the Fort Liard Area Seismic, Drilling and Development Project, Fort Liard, NT

The objective of the study was to determine the presence or absence of fish and wildlife habitat in the vicinity of the proposed project. All wildlife observations (mammals and birds) were recorded and their GPS location noted. The emphasis of the survey was on nests, moose and any other ungulates, black and grizzly bears, wolves and other carnivores and their dens. Aquatic studies involved a survey of the physical, chemical and biological features of relevant water bodies, and a fish habitat assessment. Water quality studies were also completed. Surface water samples were collected from creeks or streams and from mid-depth in lakes and analyzed for metal content, nutrients, alkalinity, hardness and major ions. Standard limnological parameters (pH, conductivity, temperature, oxygen) were also collected from each water body. Finally, soils were assessed on proposed lease sites and new access areas. The soil was assessed to a one metre depth with hand augers/shovels to determine soil handling and protection measures.

003 **Biology**

Armstrong, Allison
BHP Diamonds Inc.
1102-4920 52nd Street
Yellowknife, NT X1A 3T1
Email: armstrong.allison.ar@bhp.com

Reference Number: 12 402 662
Region: NS **Location:** Lac de Gras

Desperation Pond and Carrie Pond Fish Transfer Program

The object of the Fish Transfer Program was to provide an understanding of the structure and distribution of habitat in lakes, the relationship of fish to habitat, and to develop models for predicting the productivity of compensation initiatives. The Fish Transfer Program was broken into three general components based on level of ecosystem organization. These components were: (1) Fish Community; (2) Aquatic Biology/Physical Limnology; and (3) Habitat Inventory. The Fish Community component had two phases: Transfer Phase and Total Removal Phase. The Transfer Phase consisted of short duration fishing with small-mesh nets. These results were used to derive population estimates from catch per unit effort. The Total Removal Phase was initiated after the termination criteria for the Transfer Phase was met. This final phase consisted of overnight net-sets as well as efforts to capture all remaining fish in each water body. This phase provided data on total fish production which was used to examine habitat-production relationships. Information about the various links within a lakes ecosystem were collected. These data provided the linkages between available habitat and observed fish stocks. The following ecosystem components were characterized: (1) physical limnology; (2) water quality/nutrients; (3) chlorophyll a; (4) zooplankton; and (5) benthos.

004 **Biology**

Armstrong, Allison
BHP Diamonds Inc.
1102-4920 52nd Street
Yellowknife, NT X1A 3T1
Email: armstrong.allison.ar@bhp.com

Reference Number: 12 402 662
Region: NS **Location:** Ekati Mine site

Sable and Two-Rock Lake Fish-Out

The objective of the study was the collection of scientific information (as required by the Department of Fisheries and Oceans) in advance of the destruction of these two lakes. The objective of the fish-out program was to provide scientifically defensible data to: (1) quantify fish production, fish habitat and productivity of the intermediate trophic levels (primary and secondary producers); (2) establish linkages between fish habitat and fish productivity; (3) establish a reference database through which comparisons among lakes can be conducted; and (4) verify preliminary sampling program data on fish abundance and community structure with a complete fish census. Fish suitable for human consumption were provided to aboriginal communities, while fish unsuitable for human consumption were provided to dog teams in Yellowknife.

005 **Biology**

Baker, Mike
Diavik Diamond Mines Inc.
5077-50th Avenue, Suite 205
PO Box 2498
Yellowknife, NT X1A 2P1
Email: mike.baker@diavik.com

Reference Number: 12 402 666
Region: NS **Location:** Lac de Gras

Diavik Diamond Mines Inc. Aquatic Effects Monitoring Program

The purpose of the 2001 Aquatic Effects Monitoring Program was: (1) to initiate a program in order to produce a data set that will be used to track the overall effects of the Diavik Diamond Mines Inc. project on the aquatic ecosystem of Lac de Gras; and (2) to confirm predictions made during the environmental assessment. The research team visited 11 fixed monitoring stations by boat. At each station, water samples were collected at mid-depth for full chemical analyses (major ions, trace metals and nutrients) using the lowest commercially available analytical detection limits. At each station, samples were also collected for zooplankton and phytoplankton biomass. Samples for taxonomy were archived. At three separate stations, samples were collected for benthic analysis and sediment chemistry.

006 **Biology**

Boxall, Peter
Department of Rural Economy
University of Alberta
Edmonton, AB T6G 2H1
Email: peter.boxall@ualberta.ca

Reference Number: 12 402 633
Region: IN **Location:** Gwich'in Settlement Area

Developing Sustainable Non-Timber Forest Product Business Opportunities in the Gwich'in Settlement Area

Economic opportunities in traditional forestry (i.e., timber production) in the Gwich'in Settlement Area are limited due to the slow tree growth rates and distances to markets. This project provided an initial assessment of local business opportunities in non-timber forest products and identified some potential products, their distribution and abundance (sustainability), and undertook market research. The distribution and abundance of some potential non-timber forest products (berries) were assessed based on the results of community interviews and field studies. The number of berries in various forest stands were counted by hand. Sites for berry counting were accessed by boat or road. Community interviews were carried out to determine general attitudes on berries, to quantify the harvest levels, and to determine the end use of those berries. Participation in the study was voluntary, and all participants signed a consent form.

007 **Biology**

Bush, Dana
Kavik - AXYS Environmental Consulting Ltd.
Suite 600, 555-4th Avenue SW
Calgary, AB T2P 3E7
Email: dbush@axys.net

Reference Number: 12 402 659
Region: IN **Location:** Inuvialuit Settlement Region

Summer Vegetation, Forestry and Soil Surveys in the Inuvialuit Settlement Region: Biophysical Baseline Studies in Support of the Mackenzie Delta Gas Feasibility Study

Detailed vegetation studies in the Inuvialuit Settlement Region were conducted in the summer of 2001. A total of 13 detailed ground inspections, 50 quick ground inspections and 72 visual checks were performed. Indentification of vegetative species and estimate cover was recorded. Pits were also dug to determine the depth of the permafrost and organic layer along with soil conditions.

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008 **Biology**

Bush, Dana
Kavik-AXYS Environmental Consulting Ltd.
600, 555-4th Ave. S.W.
Calgary, AB T2M 3P2
Email: dbush@axys.net

Reference Number: 12 402 659
Region: IN **Location:** Gwich'in Settlement Area

Vegetation, Forestry and Soils Surveys: Gwich'in Settlement Area

Detailed vegetation studies in the Gwich'in Settlement Area were conducted in the summer of 2001. A total of 23 detailed ground inspections, 35 quick ground inspections and 105 visual checks were performed. Indentification of vegetative species and estimate cover was recorded. Pits were also dug to determine the depth of the permafrost and organic layer along with soil conditions.

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009 **Biology**

Bush, Dana
Kavik-AXYS Environmental Consulting Ltd.
600, 555-4th Ave. S.W.
Calgary, AB T2M 3P2
Email: dbush@axys.net

Reference Number: 12 402 659
Region: SA **Location:** Crown Lands in the Sahtu Settlement Area

Vegetation, Forestry and Soils Surveys: Sahtu Settlement Area

Detailed vegetation studies in the Sahtu Settlement Area were conducted in the early fall of 2001. These investigations were limited to Crown Lands only. A total of 43 detailed ground inspections, 70 quick ground inspections and 373 visual checks were performed. Identification of vegetative species and estimate cover was recorded. Pits were also dug to determine the depth of the permafrost and organic layer along with soil conditions.

010 **Biology**

Collard, Tod
ExxonMobil Resources Ltd.
330 5th Avenue SW, Suite 1968
Calgary, AB T2P 0L4
Email: tod.collard@bp.com

Reference Number: 12 402 664
Region: IN **Location:** Gwich'in Settlement Area

Alaskan Gas Producers Pipeline Team Environmental Studies for the Portion of the Proposed Mackenzie Valley Pipeline Route Within the Gwich'in Settlement Area

This research involved a series of environmental studies in connection with a proposed Mackenzie Valley pipeline route, a portion of which lies within the Gwich'in Settlement Area (GSA). The 2001 study program had the following objectives: (1) to start to develop a baseline data inventory of resources that could potentially be affected by the construction of a terrestrial pipeline traversing Gwich'in lands; (2) to develop an adequate level of information to determine the potential impacts on the natural and cultural resources, as well as the significance of those impacts; and (3) to start to use field results to assist in the development of mitigative strategies. The field research program within the GSA included the following general areas of study: freshwater aquatics; terrestrial wildlife; vegetation and soils; archaeology; and noise. Methods employed involved standard environmental survey techniques and did not involve any new technology. Global Positioning Systems (GPS) and appropriate scale maps and aerial photos were used for recording point location information and navigation. Studies were conducted within a 5 km wide corridor centered on the proposed pipeline. Fish were captured live and released. Interactions with wildlife were minimized and wildlife monitors were utilized during the completion of the study program.

011 **Biology**

Collard, Tod
ExxonMobil Resources Ltd.
330 5th Avenue SW, Suite 1968
Calgary, AB T2P 0L4
Email: tod.collard@bp.com

Reference Number: 12 402 664
Region: SA **Location:** Crown Lands within the Sahtu Settlement Area

Alaskan Gas Producers Pipeline Team Environmental Studies for the Portion of the Proposed Mackenzie Valley Pipeline Route Located Within the Sahtu Settlement Area

This research involved a series of environmental studies in connection with the proposed Mackenzie Valley pipeline route, a portion of which lies within the Sahtu Settlement Area. The 2001 study program had the following objectives: (1) to start to develop a baseline data inventory of resources that could potentially be affected by the construction of a terrestrial pipeline traversing Sahtu lands; (2) to develop an adequate level of information to determine the potential impacts on natural and cultural resources, as well as the significance of those impacts; and (3) to start to use field results to assist in the development of mitigative strategies. The field research program within the Sahtu included the following general areas of study: freshwater aquatics; terrestrial wildlife; vegetation and soils; archaeology; and noise. Methods employed involved standard environmental survey techniques and did not involve any new technology. Global Positioning Systems (GPS), appropriate scale maps and aerial photos were used for recording point location information and navigation. Studies were conducted within a 5 km wide corridor centered on the proposed pipeline. Fish were captured live and released. Interactions with wildlife were minimized and wildlife monitors were utilized during the completion of the study program.

012 **Biology**

Couture, Richard
EBA Engineering Consultants Ltd
Suite 550
Sun Life Plaza
Vancouver, BC V6E 4A6
Email: rcouture@eba.ca

Reference Number: 12 402 630
Region: NS **Location:** the corridor containing the Tibbett to Contwoyto Winter Road

Tibbitt to Contwoyto Winter Road Summer Field Program - Aquatic Resources

The current Licence of Occupation for the Tibbitt to Contwoyto winter road expires in April 2003 and requires renewal. EBA Engineering Consultants Ltd. was requested to address the key information deficiencies needed to support effective planning, assessment and implementation of proposed changes to the winter road. The aquatic resource study was conducted during July 2001 and constituted a reconnaissance level survey. The program consisted of the following elements: (1) the evaluation of fish species present and relative abundance (methods: electrofishing, beach seining and/or minnow trapping); (2) the measurement of fish biological parameters (length, weight, sex, life phase); (3) the evaluation of fish habitat parameters within 50 metres on either side of the crossing; and (4) the collection of water samples for analysis of ambient water quality (physical parameters, anions, ions, nutrients, hydrocarbons and metals).

013 **Biology**

Couture, Richard
EBA Engineering Consultants Ltd
Suite 550
Sun Life Plaza
Vancouver, BC V6E 4A6

Reference Number: 12 402 630
Region: NS **Location:** Kennady Lake Exploration Camp

Gahcho Kué (Kennady Lake) Baseline Environmental Studies - Fisheries Program

This program consisted of a fish population assessment of key species and a habitat characterization study within Gahcho Kué. If future feasibility studies determine that a mine should be developed for access to the diamondiferous kimberlite underlying Gahcho Kué, the lake will be dyked and partially drained as has been the case at other diamond properties in the NWT. As such, the Fisheries Act requires compensation for lost fish productivity and lost habitat. To determine the amount of compensation DeBeers Canada Exploration would be responsible for, an assessment of the losses had to be undertaken. The Summer 2001 Fisheries Program focused on two objectives: (1) to recapture previously tagged fish and tag new fish (target species were lake trout, arctic grayling, lake whitefish and northern pike) to obtain a population estimate for these species; and (2) to conduct a fish habitat and utilization survey of Gahcho Kué employing regulatory approved and standardized methodology.

014 **Biology**

Green, Jeff
Kavik-AXYS Environmental Consulting Ltd.
205, 925-7th Ave. S.W.
Calgary, AB T2P 1A5
Email: jgreen@axys.net

Reference Number: 12 402 660
Region: IN **Location:** Gwich'in Settlement Area

Reconnaissance Surveys to Select Sample Sites for Detailed Biophysical Surveys in the Gwich'in Settlement Area

During the summer and fall of 2001, two reconnaissance surveys were conducted in the Gwich'in Settlement Area. The first survey conducted was for vegetation studies. General vegetation characteristics were observed and locations where detailed vegetation studies would be required were identified. The second survey was to select sample sites for fisheries and hydrology studies. Each watercourse encountered was documented using photographs and a brief description. The survey identified 18 watercourses where further aquatic studies were required.

015 **Biology**

Green, Jeff
Kavik-AXYS Environmental Consulting Ltd.
205, 925-7th Ave. S.W.
Calgary, AB T2P 1A5
Email: jgreen@axys.net

Reference Number: 12 402 660
Region: SA **Location:** Crown Lands in the Sahtu Settlement Area

Reconnaissance Surveys to Select Sample Sites for Detailed Biophysical Surveys in the Sahtu Settlement Area

During the fall of 2001, two reconnaissance surveys were conducted in the Sahtu Settlement Area. The first survey conducted was for vegetation studies. General vegetation characteristics were observed and locations where detailed vegetation studies would be required were identified. The second survey was to select sample sites for fisheries and hydrology studies. Each watercourse encountered was documented using photographs and a brief description. The survey identified 62 watercourses where further aquatic studies were required.

016 **Biology**

Green, Jeff
Kavik - AXYS Environmental Consulting Ltd.
Suite 600, 555-4th Avenue SW
Calgary, AB T2P 3E7
Email: jgreen@axys.net

Reference Number: 12 402 660
Region: IN **Location:** Inuvialuit Settlement Region

Reconnaissance Surveys to Select Sample Sites for Detailed Biophysical Surveys in the Inuvialuit Settlement Region: Biophysical Baseline Studies in Support of the Mackenzie Delta Gas Feasibility Study

During the fall of 2001, two reconnaissance surveys were conducted in the Inuvialuit Settlement Region. The first survey conducted was for vegetation studies. General vegetation characteristics were observed and locations where detailed vegetation studies would be required were identified. The second survey was to select sample sites for fisheries and hydrology studies. Each watercourse encountered was documented using photographs and a brief description. The survey identified 17 watercourses where further aquatic studies were required.

017 **Biology**

Hoyt, Andrea
Natural Resources Institute
University of Manitoba
Winnipeg, MB R3T 2N2
Email: andrea_hoyt@yahoo.com

Reference Number: 12 402 624
Region: IN **Location:** Tuktoyaktuk - Husky Lakes

Integrated Management Planning in the Husky Lakes Area of the Inuvialuit Settlement Region

This study examined land use, development and management issues for the Husky Lakes area. Results are presented through maps showing subsistence land use and quotes from participants regarding land use, development and management. Economic development is causing conflict with subsistence harvesters, as industrial use displaces traditional and subsistence land use. The report concludes that integrated management is a suitable approach for land and resource management around Husky Lakes. An integrated management plan could address concerns raised in the course of this research and create an inclusive and comprehensive planning process, encouraging participation and building capacity in the community.

018 **Biology**

Jalkotzy, Peter
Inuvialuit Environmental & Geotechnical Inc.
1338R-36th Avenue N.E.
Calgary, AB T2E 6T6
Email: peter.jalkotzy@ieg.ca

Reference Number: 12 402 647
Region: IN **Location:** Inuvialuit Settlement Region

Fall 2001 Mackenzie Delta Aquatics Survey

This survey was a short-term assessment of aquatic habitats in selected lakes that may be affected by seismic activities during winter 2001-2002. The objective of the study was to obtain environmental information on a sub-sample of fish-bearing lakes to aid in decision-making by operators and regulatory agencies within the Inuvialuit Settlement Region. A total of 6 lakes were identified for inclusion. Parameters related to the potential for fish and fish habitat were assessed. This study also provided background information as to the potential effect of seismic activity on waterbodies. The parameters assessed were: (1) dissolved oxygen; (2) carbon dioxide; (3) pH; (4) conductivity; (5) total suspended solids; and (6) nitrogen. Measurements were taken on an established daily schedule to minimize variation due to time-of-day effects. In addition, stream flow measurements, bathymetric surveys, and digital imaging were completed for the selected lakes. Water velocity and total discharge were calculated at inlets and outlets of the lakes using topset flow meters. Bathymetric profiling was conducted with the use of an echosounder that transmits and receives signals from the substrata of the waterbody.

019 **Biology**

Jones, Nicholas
Department of Biology
University of Alberta
Edmonton, AB T6G 2E9
Emial: njones@ualberta.ca

Reference Number: 12 402 615
Region: NS **Location:** BHP Ekati Mine Base Camp

The Effectiveness of a Diversion Channel in Providing Fish Habitat in NWT Barrenlands

Work was continued towards assessing the Panda Diversion Channel, a 3.4 kilometre artificial stream at the Ekati Diamond Mine site. Reference streams were used to develop standards against which gains and losses of functions (e.g., production of arctic grayling) could be quantified in the artificial stream. The artificial stream restored watershed connectivity, allowing grayling migration, and provided spawning and nursery habitat. However, the end-of-summer mass of young-of-the-year (YOY) grayling was significantly lower (ca. 50%) in the artificial stream than in natural streams. Bioenergetic modelling indicated that the slightly cooler summer water temperatures in the artificial stream had limited influence on growth. Rather, growth was more affected by factors controlling food production (including indirect effects of temperature) than the direct effects of temperature. Low habitat complexity in the artificial stream likely contributed to poor growth. Most importantly, low amounts of autochthonous primary production and low inputs of allochthonous organic matter in the artificial stream limited the productivity of benthic invertebrates, ultimately leading to poor growth of the YOY arctic grayling.

020 **Biology**

Kingsley, David
Beckman Center B300
279 Campus Drive
Stanford University
Stanford, CA 94305-5329
Email: kingsley@cmgm.stanford.edu

Reference Number: 12 402 642
Region: SS **Location:** Fox Hole Lake

Molecular Analysis of Evolutionary Change in Stickleback Populations

This study focused on understanding how evolution occurs at the level of genes and DNA. To identify the genetic changes that make one species of animal look different from another, three species of stickleback fish (threespine stickleback, ninespine stickleback, and brook stickleback) were studied. For protection against predatory fish and birds, all three species have bony spines on their backs and bellies, and bony plates on their sides. Interestingly, in Fox Hole Lake, the ninespine and brook stickleback do not have spines on their bellies. These unique populations represent excellent examples of evolution of the skeleton. The study will allow an identification of the genes that cause the loss of spines in two different species of sticklebacks, and also tell whether the same or different genes are responsible for this evolutionary change in both kinds of fish.

021 **Biology**

Komers, Petr
Inuvialuit Environmental & Geotechnical Inc.
1338R-36th Avenue N.E.
Calgary, AB T2E 6T6
Email: petr.komers@ieg.ca

Reference Number: 12 402 656
Region: IN **Location:** Inuvialuit Settlement Region

Biophysical Study-Inuvialuit Settlement Region

The aim of this biophysical study in the Mackenzie Delta was to better assess the environmental impacts and cumulative effects of oil and gas developments, and to aid in the development of future environmental management plans. The survey incorporated remote sensing data, field surveys and traditional ecological knowledge in an effort to illustrate a refined picture of the region's floral and faunal diversity. Flora and fauna were surveyed at more than 500 sites, including the Richardson Mountains, Peel Plain, Husky Lakes and Tuktoyaktuk Peninsula. Using information obtained during air calls (site descriptions, plant community types, percent cover, and other physical parameters) and ground plot surveys (vegetation composition, vegetation structure, hiding cover, and wildlife signs), two satellite Landsat images were classified and merged to create a uniform map of the area. The map integrated the ground surveys, satellite imagery and traditional ecological knowledge.

022 **Biology**

Lawson, Nick
Jacques Whitford Environment Ltd.
5201-50th Avenue
PO Box 1680
Yellowknife, NT X1A 2P3
Email: nlawson@jacqueswhitford.com

Reference Number: 12 402 651
Region: NS **Location:** Kennady Lake Exploration Camp

Baseline Limnology Program, Kennady Lake Environmental Program

Over the course of three field trips to Gahcho Kué (Kennady Lake), water quality data was collected from the three main basins of the lake. Physical measurements included temperature, dissolved oxygen and conductivity. The lake water was well mixed throughout the season and there were no areas of anoxia (areas with no dissolved oxygen). Zooplankton samples were collected; organisms were identified and counted. While overall densities differed from previous years, the organisms found were present in both years. An extensive survey of benthos (organisms living on the bottom of the lake) was undertaken. Benthic communities were similar in all three basins of the lake, with abundance and distribution generally dependent on the type of sediment, that is, some organisms were found in greater numbers on cobbles and boulders while others were found in higher densities in silty or sandy areas. Water samples were analysed for nutrients, major ions and trace metals. Kennady Lake remains an oligotrophic (low in nutrients) lake, with extremely clear, clean water. Sediment traps were placed in the two deepest basins of the lake. Sediment accumulation rates were low as compared to the average for Canadian lakes in general, but were similar to other northern shield and high arctic lakes.

023 **Biology**

Liber, Karsten
Toxicology Centre
University of Saskatchewan
44 Campus Drive
Saskatoon, SK S7N 5B3
Email: croquet@sask.usask.ca

Reference Number: 12 402 667
Region: NS **Location:** Long Lake (on Ekati Mine site)

Effects of Processed Kimberlite Effluent from the Ekati Diamond Mine, NT on Freshwater Zooplankton

As part of its Type "A" Water Licence, BHP Diamonds was granted permission to sacrifice Long Lake at the Ekati Diamond Mine for fine tailings containment purposes. Long Lake therefore offers a unique opportunity to study the sequence of ecosystem changes that result from the addition of processed kimberlite to an aquatic environment. Information developed will allow the diamond mining industry to minimize adverse effects on the environment, which is an important component of the long-term sustainability of this industry in the NWT. The field component of this study involved collecting zooplankton, phytoplankton and water samples from Long Lake using a motorized boat. Water and phytoplankton samples were collected using a 10 L Go-Flo water sampler. Zooplankton samples were collected using a zooplankton net and included rotifers, cladocerans and copepods. There were five designated sites on Long Lake which were sampled at two depths: 1 metre from the surface and 1 metre from the bottom of the lake.

024 **Biology**

Madsen, Eric
Diavik Diamond Mines Inc.
5077-50th Ave, Suite 205
Box 2498
Yellowknife, NT X1A 2P1
Email: erik.madsen@diavik.com

Reference Number: 12 402 636
Region: NS **Location:** Lac de Gras

2001 Baseline Slimy Sculpin/Lake Trout Habitat Utilization Studies

During the summer of 2001 Diavik Diamond Mines Inc. conducted a Lake Trout Utilization Study as part of its Fisheries Authorization commitments. During the survey, a total of 26 lake trout were captured and tagged in Lac de Gras within a 5 km radius around the project. The surveys were recorded at four seasonal time periods with the conclusion that lake trout tend to disperse throughout Lac de Gras and its associated habitats. Furthermore, the Lac du Sauvage/Lac de Gras narrows consistently had 1 out of 26 tagged fish residing in the area during the sampling periods. This frequency demonstrates the narrows ability to attract fish at different seasons, due to year-round open water and above average spawning, rearing and foraging habitat.

025 **Biology**

Metikosh, Serge
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: smetikosh@golder.com

Reference Number: 12 402 658
Region: SA **Location:** Crown Lands in the Sahtu Settlement Area

Fish and Fish Habitat and Water Quality Surveys: Sahtu Settlement Area

This reconnaissance survey was conducted in October of 2001. Based on this survey, 62 watercourses were identified in the Sahtu Settlement Area where more detailed fish and fish habitat studies are required. Detailed studies will be conducted in 2002.

026 **Biology**

Metikosh, Serge
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: smetikosh@golder.com

Reference Number: 12 402 658
Region: IN **Location:** Inuvialuit Settlement Region

Summer Fish and Fish Habitat Surveys: Biophysical Baseline Studies in Support of the Mackenzie Delta Gas Feasibility Study

Based on the results of the reconnaissance survey, 17 watercourses were identified where more detailed fish and fish habitat studies are required. Three sites were surveyed in the Inuvialuit Settlement Region (three delta channels near Big Lake) before weather conditions precluded further studies. Basic geomorphological descriptions of the watercourses, channel features, hydrological features and habitat features were documented. Fish sampling was also carried out at each of the six watercourses.

027 **Biology**

Metikosh, Serge
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: smetikosh@golder.com

Reference Number: 12 402 658
Region: IN **Location:** Gwich'in Settlement Area

Fish and Fish Habitat and Water Quality Surveys: Gwich'in Settlement Area

Based on the results of the reconnaissance survey, 18 watercourses were identified where more detailed fish and fish habitat studies are required. Six sites were surveyed in the Gwich'in Settlement Area (including the Travaillant and Thunder Rivers) before weather conditions precluded further sampling. Basic geomorphological descriptions of the watercourses, channel features, hydrological features and habitat features were documented. Fish sampling was also carried out at each of the six sites.

028 **Biology**

Mochnacz, Neil
Department of Fisheries and Oceans (Freshwater Institute)
501 University Crescent
Winnipeg, MB R3T 2N6
Email: mochnaczn@dfo-mpo.gc.ca

Reference Number: 12 402 644
Region: DC/SA **Location:** Keele River, Fort Liard area, and Nahanni River

Bull Trout Distribution and Habitat Requirements in the Northwest Territories

This project studied habitat requirements and availability for bull trout, focusing on appropriate habitat protection for oil and gas development in the region. Potential and existing environmental impacts on critical bull trout habitat (i.e., spawning, rearing, and feeding sites) were assessed and compared. The information obtained will give habitat biologists the ability to identify and protect bull trout habitat effectively during oil and gas development. Habitat in the NWT was compared to habitat in Alberta to provide insight into future management strategies for both areas. The information obtained will give fisheries managers a unique opportunity to compare undisturbed populations in their habitat in the north to disturbed populations and habitat in the south. The information will also allow fisheries managers to formulate effective management strategies to conserve and protect bull trout in the future. Most sampling included measuring habitat parameters such as water velocity, substrate size, available cover, water temperature, groundwater flow and gradient. The public living throughout the potential bull trout range was asked to report all species caught to the Department of Fisheries and Oceans conservation officers in the NWT.

029 **Biology**

Monita, Darwin
Inuvialuit Environmental & Geotechnical Inc.
1338R-36th Avenue N.E.
Calgary, AB T2E 6T6
Email: darwiin.monita@ieg.ca

Reference Number: 12 402 665
Region: IN **Location:** Inuvialuit Settlement Region

Aquatic Assessment

This research involved the completion of baseline studies on a subsample of waterbodies within proposed seismic operation areas to determine the potential effects of these proposed programs on fish and fish habitat characteristics. The aquatic assessment focused on three lakes in the Chevron Canada Resources 2001/2002 seismic program areas in the Ellice 3-D, Mallik 3-D and Ogruknang 3-D blocks. All lakes examined exceeded 400 m in width. A variety of chemical and physical parameters were examined in the completion of the study. Chemical parameters included the following: dissolved oxygen, carbon dioxide, pH, conductivity, total suspended solids and nitrogen levels. The physical characteristics of the lakes, including stream flow and lake bathymetry (determined through the use of a multibeam ecosounder) were determined and digital image recordings made at each lake. Finally, while the capability of the lakes to support fish was evaluated, no fishing program was carried out because the low conductivity of the lake waters precluded the use of electrofishing techniques (which increases the potential for fish mortalities during the collection program).

030 **Biology**

Moore, Peter
Dillon Consulting
4920 - 47th Street, Suite 303
PO Box 1409
Yellowknife, NT X1A 2P1
Email: jpmoore@dillon.ca

Reference Number: 12 402 631
Region: NS **Location:** Ekati Diamond Mine diversion channel

Panda Diversion Channel Monitoring Program

The objectives of the study were to complete biological and hydraulic assessments of the constructed diversion channel at the Ekati Diamond Mine site. The project looked at the effectiveness of created fish habitat within the on-site Panda Diversion Channel. Assessments included fish use, invertebrate use, stability and function on a seasonal and yearly basis. Fish were collected and released live using two-way box traps, seining and electro-fishing. Invertebrates and periphyton samples were taken using artificial substrate samplers. Data collection also included flow monitoring. All assessments were completed within the Diversion Channel and Grizzly and Buster Creeks within the mine site.

031 **Biology**

Moore, Peter
Dillon Consulting
4920 - 47th Street, Suite 303
PO Box 1409
Yellowknife, NT X1A 2P1
Email: jpmoore@dillon.ca

Reference Number: 12 402 631
Region: NS **Location:** Stagg River

Fish Habitat Compensation Monitoring Program-Stagg River

Results from the 2001 monitoring season clearly suggest that the constructed and/or enhanced habitat at the Stagg River is functioning as designed, as well as meeting all requirements outlined by DFO. Target fish species, namely northern pike, are utilizing the monitoring area for spawning, nursery, rearing and foraging purposes. Furthermore, results conclude that fish species, such as pike and Spottail Shiners, are gaining access to all constructed habitat areas, including Middle, Upper and Borrow Pit Ponds. Lastly, previously unstable and/or unseeded areas have had adequate time in 2001 to stabilize and are offering added value to the compensation site.

032 **Biology**

Moore, Peter
Dillon Consulting
4920 - 47th Street, Suite 303
PO Box 1409
Yellowknife, NT X1A 2P1
Email: jpmoore@dillon.ca

Reference Number: 12 402 631
Region: NS **Location:** Ekati Diamond Mine

Fish Habitat Assessments for Future Mine Road Developments

The objective of the study was to collect baseline information for fish and fish habitat at proposed mine road development sites at BHP Diamonds' Ekati Mine. Aquatic habitat assessments were completed for streams and stream crossings during the high/low flow periods in 2001. The main project components included fish habitat assessments, fish community assessments, stream hydraulics (high/low flow measurements) and assessment reporting. Fish were collected and released live using seining and electro-fishing techniques. Data collection also included flow monitoring. All assessments were completed on watercourses within the Misery Road, Sable Lake Road and Fox Lake Road developments within the mine site.

033 **Biology**

Moore, Steve
EBA Engineering Consultants Ltd.
#201, 4916-49th Street
Yellowknife, NT X1A 2P7
Email: smoore@eba.ca

Reference Number: 12 402 638
Region: SA **Location:** Sahyoue (Grizzly Bear Mountain) and Edacho (Scented Grass Hills)

Preliminary Reconnaissance of Wildlife and Vegetation of the Proposed Sahyoue/Edacho National Historic Park, Edacho Portion, Great Bear Lake, NT

Biological investigations were conducted on Edacho and Sahyoue Peninsulas to describe the vegetative community types and the flora and fauna presented in the area. Twenty community types were distinguishable in the field with a total of 236 plant species documented from 46 plant families. A total of 577 wildlife observations were recorded, which consisted of direct observations of sightings, tracks, scat and browse. Based on the results from the ecological evaluation, at least 9 areas are potentially significant on or adjacent to Sahyoue and Edacho for their landscape uniqueness and/or importance to wildlife.

034 **Biology**

Osawa, Akira
Faculty of Intercultural Communication
Ryukoku University
Seta-Ohe, Ohtsu, Japan 520-2194
Email: oosawa@world.ryukoku.ac.jp

Reference Number: 12 402 412
Region: SS **Location:** Wood Buffalo National Park

Carbon Dynamics in Chronosequence of Boreal Forest Ecosystems: a Production Ecological Approach

Northern forests are closely related to the problem of global warming because they absorb carbon dioxide. The amounts that these forests are absorbing is, however, not clear. Measurements were taken of the amount of carbon fixation by the boreal forests in Wood Buffalo National Park. A new technique has been developed for this purpose that works for various tree sizes and ages. So far, the technique has successfully tested feasibility of the hanging litter traps and economical infra-red carbon dioxide gas analyzing system for field use. The litter traps provided monthly amounts of falling leaves and branches from the tree canopy. The infra-red gas analyzing system enabled the researchers to characterize seasonal changes and spatial variations of the amounts of soil respiration in various jack pine forests in the park. The project is scheduled to continue measurements in Wood Buffalo National Park during the 2002 field season.

035 **Biology**

Palmer, Rick
Gartner Lee Ltd.
140 Renfrew Drive, Suite 102
Markham, ON L3R 6B3
Email: rpalmer@gartnerlee.com

Reference Number: 12 402 652
Region: NS **Location:** Prelude Lake

Ingraham Trail Area Lakes Fish Habitat Restoration/Enhancement

This study included a fish assessment of the forage species in Prelude Lake. Fish species were captured using baited minnow traps and a 30 m - ¼ inch beach seine. The traps were deployed at various depths along the shoreline, tied to a permanent structure and left to fish for 24 hours. The beach seine was deployed from the boat in shallow weedy bays and rocky shoals. The seine was tied to a tree with a rope and set off the front of the boat, while travelling in reverse. The seine was pulled into shore, ensuring that the lead line was kept along the substrate. All captured fish were held in a bucket of fresh water, identified to species, enumerated, length measurements taken and released alive back into the lake. A maximum of two specimens from each species were sacrificed, stored in 70% ethanol and sent to the Royal Ontario Museum for positive identification and future genetic analysis (Accession number 6920). A total of five different forage species are present in Prelude Lake including spot-tailed shiners, lake chub, ninespine stickleback, slimy sculpin and troutperch. A total of 585 fish were captured, with 510 captured in the beach seine and 75 by the minnow traps. Even though the beach seine captured more fish, the minnow traps were considered more effective at capturing different species. However, the two methods allowed various different habitat types to be sampled. Habitat areas typically used for rearing by lake trout, lake whitefish and cisco were sampled for young-of-the year (YOY) and juveniles, but only one cisco YOY was captured. This result was not totally unexpected as the sampling gear used was chosen to collect a wide range of fish and not focused only on collecting YOY.

036 **Biology**

Parlee, Brenda
GeoNorth Northern Environmental Consulting
Box 673
Yellowknife, NT X1A 1A5
Email: geonorth@theedge.ca

Reference Number: 12 410 522
Region: IN **Location:** Ferry Crossings at Tsiigehtchic and Fort McPherson

An Aquatic Effects Study for the Ferry Crossings near Tsiigehtchic and Fort McPherson, NT

People in Tsiigehtchic and Fort McPherson have been concerned about the construction and operation of the GNWT Department of Transportation's ferry landings in the Gwich'in Settlement Area because of the river's importance to their lifestyles. The study found that the water quality is normal, as are fish populations. New eddies are forming as a result of how the river flows around the ferry landings. Work must be continued for another year to confirm these results.

037 **Biology**

Salomons, Michael
Aurora Research Institute
Box 1450
Inuvik, NT X0E 0T0
Email: research_ari@gov.nt.ca

Reference Number: 12 402 654
Region: IN **Location:** Municipality of Inuvik

Birds of the Mackenzie Delta

In order to complete a field guide to the birds of the Mackenzie Delta, a checklist of bird species found in the Mackenzie Delta was developed and research was done into local knowledge and history about different species. The checklist was verified by talking to local residents, by reviewing oral history transcripts and by literature reviews. The Field Guide was released in August 2002.

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038 **Biology**

Sawetsky, Les
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: lsawetsky@golder.com

Reference Number: 12 402 657
Region: SA **Location:** Crown Lands in the Sahtu Settlement Area

Summer Hydrology Surveys Within the Sahtu Settlement Region: Biophysical Baseline Studies in Support of the Mackenzie Delta Gas Feasibility Study

Based on the results of this reconnaissance survey, 62 watercourses were identified in the Sahtu Settlement Area where more detailed hydrology studies are required. Detailed studies will be conducted in 2002.

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039 **Biology**

Sawetsky, Les
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: lsawetsky@golder.com

Reference Number: 12 402 657
Region: IN **Location:** Gwich'in Settlement Area

Summer Hydrology Surveys within the Gwich'in Settlement Region: Biophysical Baseline Studies in Support of the Mackenzie Delta Gas Feasibility Study

Based on the results of this reconnaissance survey, 18 watercourses were identified where more detailed hydrology studies are required. Six sites were surveyed in the Gwich'in Settlement Area (including the Travaillant and Thunder rivers) before weather conditions prevented further sampling. Each detailed survey included: a general assessment of stream type, stage, channel morphology, bed material and watershed characteristics. Where conditions allowed, detailed survey measurements were taken of the channel cross-section and longitudinal profile. At some locations this was not possible due to the depth of flow or due to snow and/or ice conditions. Photographs were taken at each site to help document characteristics of each crossing location.

040 **Biology**

Sawetsky, Les
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: lsawetsky@golder.com

Reference Number: 12 402 657
Region: IN **Location:** Inuvialuit Settlement Region

Summer Hydrology Surveys within the Inuvialuit Settlement Region: Biophysical Baseline Studies in Support of the Mackenzie Delta Gas Feasibility Study

Based on the results of this reconnaissance survey, 17 watercourses were identified where more detailed hydrology studies are required. Three sites were surveyed in the Inuvialuit Settlement Region (three delta channels near Big Lake) before weather conditions precluded further studies. Each detailed survey included a general assessment of stream type, stage, channel morphology, bed material and watershed characteristics. Where conditions allowed, detailed survey measurements were taken of the channel cross-section and longitudinal profile. At some locations this was not possible due to the depth of flow or due to snow and/or ice conditions. Photographs were taken at each site to help document characteristics of each crossing location.

041 **Biology**

Schryer, Rick
Golder Associates
5007 Bryson Dr.
Box 255, Postal Service 9700
Yellowknife, NT X1A 2R3
Email: rschryer@golder.com

Reference Number: 12 402 608
Region: NS **Location:** Snap Lake area

Snap Lake Project, Environmental Baseline Survey

Water quality and hydrology were monitored throughout the local watershed. Quality of camp effluent was also monitored. Dust levels were monitored and collected from lichens and snow to assess toxicology concerns. Finally, fish habitat was constructed to compensate for lost habitat.

042 **Biology**

Shopik, Tim
ExxonMobil Resources Ltd.
330 5th Avenue SW, Suite 1968
Calgary, AB T2P 0L4
Email: shopiktd@bp.com

Reference Number: 12 402 655
Region: IN **Location:** proposed Alaska Gas Producers pipeline corridor west of the Mackenzie Delta

Alaskan Gas Producers Pipeline Team- Terrestrial Environmental Studies for the Portion of the Proposed Mackenzie Valley Pipeline Route Within the Inuvialuit Settlement Region

This research involved a series of terrestrial environmental studies in connection with a proposed Mackenzie Valley pipeline route, a portion of which lies within the Inuvialuit Settlement Region (ISR). The program had the following objectives: (1) to develop a baseline data inventory of resources that could potentially be affected by the construction of a terrestrial pipeline in the ISR; (2) to develop an adequate level of information to determine the potential impacts on the natural and cultural resources, as well as the significance of those impacts; and (3) to start to use field results to assist in the development of mitigative strategies. The field research program included the following general areas of study: freshwater aquatics, terrestrial wildlife, vegetation and soils, archaeology and noise. Methods employed involved standard environmental survey techniques and did not involve any new technology. Global Positioning Systems (GPS), appropriate scale maps and aerial photos were used for recording point location information and navigation. Studies were conducted within a 5 km wide corridor centred on the proposed route. Fish were captured live and released. Interactions with wildlife were minimized and wildlife monitors were utilized during the completion of the study program.

043 **Biology**

Shopik, Tim
ExxonMobil Resources Ltd.
330 5th Avenue SW, Suite 1968
Calgary, AB T2P 0L4
Email: shopiktd@bp.com

Reference Number: 12 402 655
Region: IN **Location:** Inuvialuit Settlement Region

Alaskan Gas Producers Pipeline Team-Marine Environmental Studies for the Portion of the Proposed Mackenzie Valley Pipeline Route Within the Inuvialuit Settlement Region

This research involved a series of marine environmental studies in connection with a proposed Mackenzie Valley pipeline route, a portion of which lies within the Inuvialuit Settlement Region (ISR). The program had the following objectives: (1) to start to develop a baseline inventory of resources that could potentially be affected by the construction of an offshore pipeline within the Beaufort Sea and a terrestrial pipeline within the ISR; (2) to evaluate the environmental constraints determining the location of the pipeline landfall and the location of construction sites, equipment staging sites and compressor station locations; and (3) to start to use field results to assist in the development of mitigative strategies. The research will help determine the technical and environmental feasibility and economic viability of a subsea natural gas pipeline from Prudhoe Bay, Alaska to the Mackenzie Delta area of Canada. Water depth and bottom surface characteristics were examined to assess the feasibility and design of the proposed pipeline offshore route. The potential effects of coastal erosion were examined. The effects of climate change on coastal processes (focusing on permafrost, oceanographic processes, shoreline stability, and coastal geomorphology) were assessed. The distribution of moulting waterfowl through a series of aerial surveys was documented. The timing and extent of use of the nearshore waters by concentrations of bowhead and beluga whales was documented to aid in the selection of the most appropriate route and the timing of construction activities in the area. Camp locations, traditional land use patterns and resource use were also mapped.

044 **Biology**

Spence, Chris
Environment Canada
#301, 5204 50th Ave.
Yellowknife, NT X1A 1E2

Reference Number: 12 404 535
Region: NS **Location:** Lower Carp Lake

Hydrologic Investigation of a Canadian Shield Basin

The objective of the project was to expand the knowledge of processes relevant to northern Canadian Shield hydrology such as spring snowmelt, seasonal permafrost thawing, wetland hydrology and lake storage. To meet this objective, a study site near Yellowknife, Pocket Lake on the Miramar Giant Mine property, was selected for detailed measurements of the water cycle. In 2001, activities concentrated on the spring snowmelt. Daily trips during the melt were made to take measurements of snow depth and water content, snowmelt, groundwater storage and runoff. An automatic climate tower measured precipitation and weather conditions. Temperature, solar radiation and humidity data from the tower were used to calculate evaporation. Results suggest that predicting the behaviour of runoff during the operation of mine tailings ponds or waste rock piles will be very difficult if not impossible without detailed site specific studies and constant monitoring.

045 **Biology**

Swystun, Heather
PO Box 1864
Inuvik, NT X0E 0T0
Email: hswystun@canada.com

Reference Number: 12 402 650
Region: IN **Location:** Mackenzie Delta

Reproductive Ecology of Tundra Swans in the Mackenzie Delta Region

Nine local knowledge interviews were completed in the communities of Aklavik and Fort McPherson in 2001. In Fort McPherson, a local expert conducted the interviews and follow-up meetings were held. In Aklavik, a local elder was hired to complete the interviews while the researcher did the recording. One month was spent with a Gwich'in elder on the land during spring break-up to learn about the arrival of swans and other waterfowl in the Mackenzie Delta. A formal interview was also completed and the project was discussed with several Gwich'in hunters who passed through the camp. Data from all of the local knowledge interviews will be summarized once interviews in the remaining communities are carried out in 2002. A parallel science project collecting field data on reproductive ecology of tundra swans will continue during the summer of 2002.

046 **Biology**

Walker-Larsen, Jennifer
Gwich'in Renewable Resource Board
Box 2240
Inuvik, NT X0E 0T0
Email: jen.larsen@grrb.nt.ca

Reference Number: 12 402 629
Region: IN **Location:** Gwich'in Settlement Area

Peel River Fish Study

This year was the fourth year of the Peel River Fish Study. The project ran from mid-July to mid-November 2001. Nets were set for 24 hours three times a week throughout the study period. Monitors caught 47 herring (arctic and least cisco), 288 broad whitefish, 125 coney (inconnu), 82 crookedback (lake whitefish) and 77 jackfish (northern pike). Samples from these fish will be analyzed to determine age. The study will run for one more year. Data collected during the five-year period will provide baseline data for future monitoring of the Peel River fish stocks.

047 **Biology**

Walker-Larsen, Jennifer
Gwich'in Renewable Resource Board
Box 2240
Inuvik, NT X0E 0T0
Email: jen.larsen@grrb.nt.ca

Reference Number: 12 402 629
Region: IN **Location:** Gwich'in Settlement Area

Forestry Research in the Gwich'in Settlement Area

Select seismic line sites along the Dempster Highway between Tsiigehtchic and Fort McPherson (14 sites) and between Sunny Lakes and Tree River (25 sites) were visited and assessed. All lines visited were cut between 1966 and 1974. The ground along the seismic lines had greater active layer depths (amount of thaw) than the surrounding area. Although this usually means that the conditions are better for tree growth, few trees were found growing on the lines except for a few

sites where there was quite a bit of birch growth. There was insufficient funding to complete this project in 2001.

048 **Biology**

Wein, Ross
422 Earth Science Building
University of Alberta
Edmonton, AB T6G 2E3
Email: ross.wein@ualberta.ca

Reference Number: 12 402 653
Region: IN **Location:** Mackenzie Delta, Aklavik, Tsiigehtchic, Fort McPherson, Inuvik

Alternate Forest Products: A Dynamic Time and Space Model of Driftwood Along the Lower Mackenzie River

This study assessed driftwood flow past Gwich'in Settlement Area communities. There are increasing needs for wood products by communities (e.g., for fuel and construction) and potentially by industry (e.g., for construction and chips to insulate permafrost). The researchers examined how much driftwood was used and how much was stored along the riversides, and began studies on how fast driftwood sinks. The researchers found that there were surprisingly few good quality logs over 30 centimetres in diameter and that community members collect a few hundred (mainly white spruce) just after spring breakup. Compared to what is collected there are vast numbers of driftwood logs along the riverside and sunken in Delta lakes. Along the rivers most logs were white spruce, with a few balsam poplar and pine. In Delta lakes there were also black spruce and birch that grew locally. Much of this wood was rotted to the point of only being good for wood chips. In preliminary studies on the rate that logs sink, it was found that black spruce and especially paper birch and tamarack were so dense that they sank within a few months.

049 **Biology**

Wong, Stephen
National Research Council
McGill University
6100 Royalmount Avenue
Montreal, QC H4P 2R2
Email: stephen.wong@nrc.ca

Reference Number: 12 402 668
Region: NS **Location:** Con Mine site (Yellowknife)

The Reproductive and Developmental Toxicity of Arsenic in Mine Waste Soils on the Earthworm (Eisenia fetida andrei)

Soil was sampled from approximately 25 km northwest of Yellowknife (referred to as field soil) and from near the Miramar Con Mine, N 62º25.781' W 114º24.652' (referred to as mine soil). The measured total arsenic concentration in field soil was 9.5 mg/kg dry soil and 2038.7 mg/kg dry soil in mine soil. A standardised laboratory earthworm reproduction test was used to study the toxicity and availability of arsenic in the soils. Toxicity to earthworms is indicated by the decrease in survival and reproduction. Field soil proved to be relatively non-toxic. However, mine soil demonstrated toxic effects on earthworm survival (72.5% survival compared to 100% for the controls) and reproduction (10.8% juvenile production compared to 100% for the controls). Despite the high arsenic concentration in mine soil, its toxicity is less than what would be expected in freshly contaminated soils, indicating decreased availability.

ENGINEERING

050 **Engineering**

Hoos, Richard
EBA Engineering Consultants Ltd.
Suite 550, Sun Life Tower
1100 Melville Street
Vancouver, BC V6E 4A6
Email: rhoos@eba.ca

Reference Number: 12 406 030
Region: NS **Location:** the corridor containing the Tibbett to Contwoyto Winter Road

Tibbitt to Contwoyto Winter Road Summer Field Program - Terrestrial Resources

EBA Engineering Consultants Ltd. was requested to conduct a comprehensive, integrated field program to obtain site-specific environmental, engineering and cultural information on the 64 portages, active or former gravel borrow pits and 3 existing and 1 former winter road maintenance camps in the Tibbitt to Contwoyto winter road corridor. The primary components of the integrated summer program included: 1) Spring Engineering/Environmental Reconnaissance Survey; 2) Airborne Digital Imagery, GPS and Laser Altimeter Data Collection Survey; 3) Ecological Land Classification and Wildlife Habitat Assessment; 4) Aquatic Resources Baseline Survey; 5) Engineering Reconnaissance Survey; and 6) Archaeological Investigations. Results from the various studies have been combined into a GIS-based Winter Road Information Management System (WRIMS) for the winter road corridor.

GEOLOGY

051 **Geology**

Burn, Chris
Department of Geography
Carleton University
1125 Colonel By Drive
Ottawa, ON K1S 5B6
Email: christopher_burn@carelton.ca

Reference Number: 12 404 325
Region: IN **Location:** Illisarvik, Richards Island, Inuvik Region, Paulatuk

Permafrost Investigations in Western Arctic Canada

Field research was concentrated on sites at 1) Illisarvik, the experimental drained lake on Richards Island, Mackenzie Delta area, 2) Garry Island, 3) near Inuvik and 4) near Paulatuk. At Garry Island and near Inuvik, ground temperatures and ground movement associated with the annual warming and cooling of the ground and development of ice wedges were monitored. At Paulatuk, rocks which have been blasted by snow carried by strong winds are being studied. The rocks are on the hills behind the community, and have been examined by Dr. Ross Mackay since 1951. Data is being collected so that the rocks can be described and it can be determined how their orientation and the growth of vegetation near them is controlled by the wind. At Illisarvik, the team examined ground temperatures and the thawing of the ground in the summer. Over the past five or six years, as willows and grasses have grown up in the lake bottom, there is much more snow there now and the permafrost has warmed up. However, as permafrost has grown in the lake bottom, the ground has been lifted up and drainage in the lake bottom has been disrupted, so that now there is a large pond in the middle of the drained lake. The pond is increasing the depth of summer thaw in the lake bottom.

052 **Geology**

Gajewski, Konrad
Department of Geography
University of Ottawa
Ottawa, ON K1N 6N5

Reference Number: 12 404 569
Region: IN **Location:** Victoria Island-Kuujjua River area

Environmental History of the Central Canadian Arctic

Field work was completed in the Kujjua River of Victoria Island in the summer of 2001. Water and sediment samples were collected from 8 lakes and were analyzed for diatoms and pollen. The pollen and diatoms were extracted and used to determine climate change impacts on vegetation and lakes of the region. The pH of the lakes was relatively neutral and the conductivity was low, suggesting that the lakes do not contain many dissolved ions needed for productivity. Diatoms from the sediment samples will be compared to the water chemistry to determine environmental constraints on abundance of these aquatic organisms.

053 **Geology**

Hardy, Francois
105W. Fleury, Apt. #1
Montreal, PQ H3L 1T3
Email: fhardy@nrcan.gc.ca

Reference Number: 12 404 560
Region: SS **Location:** Thelon River, NT

Luminescence Dating of Build-Up of the Laurentide Ice Sheet

The study consisted of a canoe field trip on the Thelon River between the Thelon and Hanbury Rivers junction and Muskox Hill. The objective of this expedition was to document the stratigraphic succession of Quaternary sedimentary units older and younger than the last glacial extent. Multiple river sections have shown the presence of a non-glacial unit older than the last glacial episode (Wisconsin Episode). This geological unit is made up of a succession of short-lived ancient soils (paleosoils), and in at least one exposure, non-glacial sediments represented by fluvial sands and gravels. This unit, stratigraphically positioned between two glacial sedimentary units (called till), can be related to the Sangamon Interglacial Episode (an ancient episode recording non-glacial climate, similar to the climatic conditions of nowadays). Such a geological unit has never been observed before in this part of the country. A luminescence dating program is underway in order to establish the time framework of this sequence. Raised beaches formed during the retreat of the ice-sheet from the Thelon River basin were also sampled in order to document the ice retreat of the Wisconsin Episode in this part of the Northwest Territories.

054 **Geology**

Hoffman, Paul
Department of Earth and Planetary sciences
Harvard University
20 Oxford Street
Cambridge, MA 02138
Email: hoffman@eps.harvard.edu

Reference Number: 12 404 573
Region: SA **Location:** the Mackenzie Mountains, SW of Norman Wells

Banded Iron Formations and "Snow-Ball Earth" Events

The study team spent one month measuring stratigraphic sections and collecting rock samples for laboratory analysis at ten different sites above tree-line in the northern Mackenzie Mountains. The results will be compared with data from correlative strata elsewhere in the world (e.g., Svalbard, Namibia, Australia, China) with a view to testing the "Snowball Earth" hypothesis. In this theory, a series of ice ages so severe that sea ice enveloped even the tropics, occurred 600-700 million years ago, and multicellular animal life arose as a consequence. In the Mackenzie Mountains, several new lines of evidence consistent with the hypothesis were discovered. The theory remains the focus of international attention and controversy. More field work in the southern Mackenzie Mountains is planned for 2003.

055 **Geology**

Hubbard, Laura
Department of Earth Sciences
Simon Fraser University
8888 University Drive
Burnaby, BC V5A 1S6
Email: lhubbard74@hotmail.com

Reference Number: 12 404 572
Region: NS **Location:** Yellowknife, NT (Giant Mine site)

Alteration Study of the Giant Mine, Yellowknife

Gold mineralization of the Miramar Giant Mine is the product of multiple geological events. The project studied mineral alteration assemblages, fluid chemistry, and ore morphologies of the Supercrest zone. Current work has documented three gold bearing assemblages and five sericite-mica alteration assemblages in eighteen active stopes over a segregated six-month period. Three sericitic alteration shells and two green mica assemblages are spatially associated with gold mineralization.

056 **Geology**

Kiss, Frank
239A-615 Booth Street
Ottawa, ON K1A 0E9
Email: fkiss@gsc.nrcan.gc.ca

Reference Number: 12 404 546
Region: SA **Location:** Colville Lake, NT

Colville Lake Area, NWT Aeromagnetic Survey, Phase IV of Mackenzie Corridor Survey.

The Geological Survey of Canada (GSC) continued with its fourth year of the magnetic survey over the Mackenzie Corridor in the Colville Lake area. The survey's purpose is to increase public awareness and understanding of the geology in the area. The survey recorded the variations in the Earth's magnetic field caused by magnetic minerals contained in the Earth's surface. The patterns that were obtained will be indicative of the subsurface geological structures and will be an important element of geological mapping and resource exploration. Data is being processed and maps will be available from the GSC.

057 **Geology**

Kokelj, Steve
20 Trails End
Yellowknife, NT X1A 1A4
Email: skokelj@yahoo.com

Reference Number: 12 404 545
Region: IN **Location:** Mackenzie Delta

Near-surface ground ice in sediments of the Mackenzie Delta region, N.W.T.

This project investigated the physical and chemical characteristics of near-surface ground ice in the sediments of the Mackenzie Delta region. A relationship has been established between ground ice and vegetation type indicating that vegetation communities may be used to predict the amounts of near surface ground ice in the sediments of the Mackenzie Delta. Field data also suggests that ground ice development influences spruce forest succession in the delta, through the tilting and eventual toppling of trees. Preliminary results indicate that the ice-rich zone is nutrient-rich relative to the base of the active layer and that nutrient accumulation is linked to water movement in freezing soils. This could be important in understanding fire ecology in permafrost terrain,

since after intense burns, active layer thickness increases, resulting in the thaw of near-surface permafrost.

058 **Geology**

Lane, Larry
Geological Survey of Canada
3303 - 33st NW
Calgary, AB T2L 2A7
Email: llane@nrcan.gc.ca

Reference Number: 12 404 312
Region: DC **Location:** Ft. Liard area

Central Foreland NATMAP Project

In the summer of 2001, new bedrock mapping produced four new maps. The new mapping revised the age and distribution of rock units in Pool Creek and Mount Martin, with less drastic revisions of Fisherman Lake. The structures of the mountain ranges are principally large folds. Large faults are less important than previously thought. The Mount Martin anticline is not connected to the Kotaneelee anticline which has implications for gas exploration in the area. Dating has placed the Pool Creek intrusion to over 500 million years old, more than five times older than was once thought. Much of the area is susceptible to landslides. An important task for surficial mappers is to find areas of high landslide potential; this is particularly apparent on the new Mount Martin map. This is an issue of concern for economic and public safety reasons, in particular with respect to the safe placing of well pads roads and pipelines.

059 **Geology**

Lane, Larry
Geological Survey of Canada
3303 - 33rd Street NW
Calgary, AB T2L 2A7
Email: llane@nrcan.gc.ca

Reference Number: 12 404 312
Region: IN **Location:** Richardson Mountains

Geological Mapping, Stratigraphic and Structural Analysis in the Aklavik Range and Adjacent Parts of the Northern Richardson Mountains.

Significant new data was acquired in this study from the Northern Richardson Mountains in the Gwich'in Settlement Region. The team measured detailed stratigraphic sections in Jurassic rocks in fifteen localities distributed across the Richardson Mountains, and results are being written. Similar detailed stratigraphic studies were conducted by petroleum industry partners focused on Jurassic and Cretaceous rocks in the Aklavik Range and Willow River areas. Geological mapping by the GSC (Geological Survey of Canada) in the Aklavik Range map area (NTS 107B/4) has improved the resolution of early Tertiary deformation features and provided a regional geological context for many of the detailed stratigraphic sections. Part of the mapping focused on the displacement history of the Donna River Fault Zone, a regionally significant strike-slip structure in the Aklavik Range. A report and map are in preparation, with publications expected in the fall of 2003. Preliminary reports on the results of industry and GSC fieldwork were presented to the Landowner (Gwich'in Tribal Council) at a meeting in Inuvik, in April of 2002.

060 **Geology**

MacLachlan, Kate
Geological Survey of Canada
601 Booth St.
Ottawa, ON K1A 0E8
Email: kmaclach@nrcan.gc.ca

Reference Number: 12 404 579
Region: NS **Location:** south end of Kirk Lake and southwestern end of Walmsley Lake

Geology of the Walmsley Lake Area

The team carried out 1:100,000 scale geological mapping in the central and northern parts of Walmsley Lake (map sheet NTS 75/N). This work helped to determine that the early part of the geological history in the area is likely correlative with the geological history that is well-documented father west around Yellowknife. Studies of granite compositions have allowed the Geological Survey of Canada to map the southern extent of a major boundary between the western and eastern parts of the Slave Province, which has been postulated to have some control on the location of diamondiferous kimberlites. Knowing the full extent of this boundary is critical to evaluating it's role, if any, in the localization of diamondiferous kimberlites. Geochemical and field studies of the Aylmer Lake volcanic belt in the northeastern-most part of the map area have highlighted the potential of this belt for base metal (copper, zinc and lead) and gold mineralization. Study of the surface geology, including ice-flow indicators, have provided a regional framework for exploration companies to understand results of surficial sampling exploration techniques.

061 **Geology**

Nixon, Mark
191-601 Booth Street
Ottawa, ON K1A 0E8
Email: mnixon@nrcan.gc.ca

Reference Number: 12 404 398
Region: IN, SA **Location:** Fort Simpson, Inuvik, Norman Wells

Active Layer Monitoring Network in the Mackenzie Valley

This was the 11th year of the annual survey of the active layer monitoring system in the Mackenzie Valley from Fort Simpson to the Arctic coast. There are now 56 sites, with about half in the Mackenzie Delta. Along this 1400 km transect, active layer thickness varies more as a result of local factors, related to situation, than to regional climate, associated with latitude. Thaw penetration is increasing at many sites over much of the system with 1998 and 1996 having the greatest recordings. In the long term, measurements from this transect will be used to help model climate change impact on near surface permafrost in this fragile environment.

062 **Geology**

Pope, Michael
Department of Geology
Washington State University
1155 Webster Hall
Pullman, WA 99164-2812
Email: mcpope@wsu.edu

Reference Number: 12 404 574
Region: SA **Location:** June Lake, Dahl Sheep Lake, Caribou Pass, Ingta River and Keel River

Role of Climate and Sea Change on Early Cambrian Evolution

In the summer of 2001 researchers measured and sampled three locations of the Early Cambrian Sekwi Formation south of the Canol Heritage Trail. The measured sections were plotted and correlated to determine sea level fluctuations in this area during the Early Cambrian. Thin sections of rock samples were also studied for their composition. The results thus far indicate climate fluctuations between arid and humid and fluctuations in sea depth. This project will continue in the 2002/2003 season.

063 **Geology**

Siddorn, James
University of Toronto
Department of Geology
22 Russell Street
Toronto, ON M5S 3B1
Email: jsiddorn@geology.utoronto.ca

Reference Number: 12 404 571
Region: NS **Location:** Yellowknife (Giant and Con Mine sites)

Structural Geology and Timing of Gold Mineralization in the Giant and Con Gold Deposits, Yellowknife, Canada

This research will aid in the interpretation of the formation and distribution of gold ores on a stope, mine and regional scale. The Giant and Con gold deposits provide a unique opportunity to resolve the first order characteristics and subsequent deformation history of a world-class gold camp. An understanding of the similarities and differences in mineralization and deformation in both deposits, in conjunction with a detailed understanding of the displacement history along the West Bay fault, which offsets the two deposits, is essential to understanding the genesis of, and relationship between, the two gold deposits. Data on the origination of structural features (faults, foliations, folds, etc.) was measured with a compass clinometer. Samples (< 10cm in diameter) were taken of certain rock types that display interesting small-scale structures.

064 **Geology**

Taylor, James
Canadian Forest Oil Ltd.
Suite 600, 800, 6th Avenue
Calgary, AB T2P 3G3
Email: jrtaylor@cfol.ab.ca

Reference Number: 12 404 578
Region: DC **Location:** Last Mountain, Dendale Lake, Jackfish Creek and LaBiche River

Geological Survey in the Last Mountain, Dendale Lake, Jackfish Creek and LaBiche River Areas

This research is a petroleum prospecting project involving structural mapping using aerial photography, rock measurements and rock specimen sampling. The project team was based in Fort Liard. Rock samples (fist sized) were collected and returned to the laboratory for detailed chemical analysis. Structural mapping was traced on aerial photos and transferred to topographic base maps. Existing government geological maps was used to spot check previously mapped ambiguous, anomalous or critical areas for examination.

065 **Geology**

Turner, William
Department of Indian Affairs and Northern Development
Box 1500
Yellowknife, NT X1A 2R3
Email: allan_turner@gov.nt.ca

Reference Number: 12 404 575
Region: DC **Location:** Pine Point, NT (near Ft. Resolution)

Carbonate-Hosted Lead-Zinc (Mississippi Valley Type) Occurrences in Northern Alberta and Southern Northwest Territories.

The field program involved the collection of core samples from the Pine Point and Westmin Core facilities, north and west of the former Pine Point townsite. The cominco core samples were analyzed by a new technique to develop a model for determining proximity to lead-zinc ore bodies. The results of this study are being compiled in a paper and are to be sent for publication review in July of 2002. The Westmin core samples were sent to the Geological Survey of Canada, and were examined for chemical analysis. Chemistry studies are still ongoing and will be released in publications sometime in 2003.

066 **Geology**

Veillette, Jean
Geological Survey of Canada
601 Booth Street
Ottawa, ON K1A 0E8
Email: jveillet@nrcan.gc.ca

Reference Number: 12 404 577
Region: IN **Location:** Tuktut Nogait

Surficial Mapping of Tuktut Nogait National Park

The need for a detailed map of the surface geology of Tuktut Nogait National Park and for a thorough study of its glacial history was first recognized in 1992. The park is located near the limit of the vast ice sheet that once covered the whole continent, and parts of it may have been free of ice during the last ice age, thus preserving old sediments from the destructive action of glaciers. However, no detailed study has ever been undertaken to establish the exact nature of the probable ice-free zone. Field work consisted of helicopter traverses run from two base camps, with stops at points of interest previously identified from air photos, and detailed traverses conducted from fly camps lasting from 4-6 days. Most field observations were directed at identifying and counting boulders carried away from their source areas by glaciers. Soil sampling was limited to about 60 sites to establish the main characteristics of sediments. Samples consisted of 1-2 kg of soil. Fossil wood previously at Little Hornady Lake was revisited to attempt to locate the precise source of the wood, which is presently unknown. Glacial and non-glacial landforms were described and photographed. Additionally, ice buried in the soil (which many scientists believe is fossil ice that has survived since the last glaciation) was sampled using simple hand tools or a small hand-held drill.

HEALTH

067 **Health**

Doherty, Maryanne
1-107 Education Center North
University of Alberta
Edmonton, AB T6G 2G5
Email: m.doherty@ualberta.ca

Reference Number: 12 408 121
Region: IN, SA, DC, NS, SS **Location:** Communities throughout the N.W.T.

Canadian Youth, Sexual Health and HIV/AIDS Study

The objectives for this study were to: (1) Describe the relationships among determinants of health, adolescent sexuality, and the sexual health status of youth, including elements of income/social status, social support, social environment, culture, health services, health practices/coping skills, gender and sexual orientation; (2) Compare descriptive analyses of selected aspects of adolescent sexual health, especially in relation to HIV prevention, with the 1988 Canada Youth and AIDS Study; (3) Provide national and provincial/territorial data that inform policy and program development, and facilitate professional practice; and (4) Facilitate dissemination of the findings of the study. The research team interviewed students in Grades 7, 9 and 11 (generally ages 12, 14 and 16) from across Canada to examine the changes that occur in sexual health behaviours and attitudes at critical development stages in adolescence. Upon receiving the written permission of their parent or guardian, students in the NWT were asked to fill out a questionnaire identical to the one used in the rest of Canada. The Grade 7 version asked whether students have had sexual relations. Grade 9 and 11 students were given a more complete version of the questionnaire that explored sexual behaviours more fully. Children will not be identifiable in any documents that result from the research.

068 **Health**

Hoey, Shawn
School of Social Work
University of British Columbia
2473 East 29th Street
Vancouver, BC V5R 1T8
Email: shoey@interchange.ubc.ca

Reference Number: 12 408 120
Region: IN **Location:** the Gwich'in and Inuvialuit Settlement Region communities serviced by the Inuvik Regional Health and Social Services Board

Child Welfare Service Delivery As Experienced By Front Line Workers In Isolated Northern Communities.

The aim of this study was to explore feminist standpoint theory and institutional ethnography's effectiveness for informing northern practice. The objective was to investigate the contradictions social workers from isolated western Arctic communities experience everyday and the child welfare services they are asked to deliver. Interviews were conducted and the results suggest that the standards of the mandated services and the realities of the communities shape the workers practice. Their practice appears to be informed and biased by southern perspective. This perspective creates many of the contradictions experienced by the participants. Feminist standpoint theory, on the other hand, provided a perspective that has potential to better inform northern practice.

069 **Health**

Kuhnlein, H.V.
Centre for Indigenous Peoples' Nutrition & Environment
Macdonald Campus, McGill University
21, 111 Lakeshore
Ste. Anne de Bellevue, PQ H9X 3V9
Email: kuhnlein@macdonald.mcgill.ca

Reference Number: 12 408 067
Region: IN, SA, SS **Location:** Fort Resolution, Tulita and Fort McPherson

Food Choice Decisions by Western Arctic Aboriginal Women and Children

The objectives of this study were to; 1) derive quantitative estimates of traditional and market food among aboriginal people; 2) complete databases of nutrient and contaminant contents of traditional food; 3) define benefits of traditional food in terms of nutritional, socioeconomic and cultural significance; and 4) define the levels of exposure to contaminants (heavy metals and organochlorines). In each community, a random sample of 30 households was drawn. One man, one woman, and one adolescent when available were invited to participate in a one-hour confidential interview. Interviews were conducted by local researchers in the language of the respondent's choice. The local researcher was also responsible for collecting traditional food samples available in the community. Approximately ten traditional food samples were collected in each community to complete the nutrient/contaminant databases. The local researcher worked in collaboration with a research nutritionist available for the duration of data collection.

070 **Health**

Willows, Noreen
Dept. of Agricultural, Food and Nutritional Science
410 Agricultural and Forestry Center
University of Alberta
Edmonton, AB T6G 2P5
Email: noreen.willows@ualberta.ca

Reference Number: 12 408 120
Region: IN, SA, DC, NS, SS **Location:** throughout the Northwest Territories

Birth Weights of Native Canadians-Rates and Consequences

The study looked at how many babies have very high or low birth weights in First Nations and Inuit communities across Canada because of the health problems associated with high and low birth weights. Rates of infant morbidity (illness) and mortality (death) in aboriginal communities are higher than the national average despite evidence that low infant birth weight rates are lower than average. As part of the study, we analyzed vital statistics data for Dene, Métis and Inuit babies who were born in the Northwest Territories between the years of 1990 and 2000. A healthy weight for a baby is 2.5 - 4.0 kg (5.5 lbs - 8.8 lbs). Only 3.5% of babies were born weighing less than 2.5 kg, whereas 17.8% of babies weighed more than 4.0 kg. This information can be used to develop appropriate prenatal care programs.

PHYSICAL SCIENCES

071 **Physical Sciences**

Batten, Kelly
Department of Geological Sciences
Queen's University
Kingston, ON K7L 3N6
Email: batten@students.geol.queensu.ca

Reference Number: 12 404 561
Region: SA **Location:** Ravens Throat River, Tsezotene Range and Redstone Plateau

Stratigraphy and sedimentology of the Little Dal Formation, NWT, Canada.

Vertical sections through rock units were measured, photographs were taken and small rock samples were collected near Raven's Throat River and in the Tsezoetne Range. The rocks appear to be from a shallow incline ramp in a warm tropical ocean. Evidence of reefs was also recorded and the project looked at how changing sea levels affected these reefs and sediments on the ramp. The samples were collected and studied by a microscope. The chemical make-up is also being looked at to learn more about the chemistry of the oceans and what the climate was like when these sediments were deposited 800 million years ago.

072 **Physical Sciences**

Blasco, Steve
Geological Survey of Canada (Atlantic)
Bedford Institute of Oceanography
1 Challenger Drive, P.O. Box 1006
Bedford, Nova Scotia B2Y 4A2
Email: blasco@agc.bio.ns.ca

Reference Number: 12 404 576
Region: IN **Location:** the Beaufort Shelf, in a survey area bounded by: 131 to 141 degrees west longitude and 69 degrees 30 minutes to 71 degrees north latitude

Evaluation of New Technologies for Environmental Impact Assessment in the Offshore, Canadian Beaufort Sea

In August 2001 the Geological Survey of Canada, in collaboration with the Canadian Hydrographic Service and Canadian Coast Guard, conducted the first Beaufort Sea seabed mapping field program since 1991. The field program focused on testing the application of new digital multibeam sonar technologies to seabed issues related to renewed offshore hydrocarbon development. The sonar system was mounted in a hydrographic launch which was deployed daily from the Coast Guard vessel CCGS Nahidik during the survey. The multibeam sonar technology test was very successful. Digital georeferenced maps of the seabed were acquired at 10 sites. Four abandoned artificial exploration-drilling islands from the 1980's were surveyed. All four islands have been eroded below sea surface. These submerged islands are both hazards to navigation as well as potential sources of sand and gravel. Seabed topographic/bottom classification maps were collected as baseline information for seafloor habitat assessments. Sectors of the seabed previously mapped in 1990 were resurveyed to identify new ice scours that occurred on the seabed over the 11-year period. In addition to the four planned objectives, the multibeam technology proved successful at mapping bottom sediment transport processes and craters on the seabed created by gases escaping from below the seafloor.

073 **Physical Sciences**

Day, Edith
Queens University
Kingston, ON
Email: day@students.geol.queensu.ca

Reference Number: 12 404 562
Region: SA, DC **Location:** Moose Horn River, Black Wolf Creek and Stoneknife River

Neoproterozoic Keele Formation, Mackenzie Mountains, NWT and its Relation to Major Late Proterozoic Glaciations.

Eight days were spent at camp near Moose Horn River where measurements and photographs were taken of rocks and samples collected in the area. It was found that river sediment is much more abundant in rocks of the Keele Formation than was expected. A small reef constructed by algae - like organisms was also discovered. Similar studies were conducted at Glacier Lake for nine days. It was concluded that the Keele rocks at the studied locations were deposited in an ancient, narrow, warm ocean; therefore, the ocean warmed significantly between two major glaciations. River deposits, discovered at the Moose Horn River site were deposited in a deep valley at the edge of the ancient ocean.

074 **Physical Sciences**

Dyke, Arthur
Geological Survey of Canada
601 Booth Street
Ottawa, ON K1A 0E8
Email: adyke@nrcan.gc.ca

Reference Number: 12 404 389
Region: IN **Location:** Holman

Younger Dryas and Postglacial Threshold Events in the Western Canadian Arctic

Field work for this project was conducted out of two field camps: one near Cape Ptarmigan on the south side of the mouth of the Minto Inlet, and one at Berkeley Point on the north side. As in previous seasons, work focused on obtaining radiocarbon samples (marine mollusks) to establish the ages of end moraines in the region, and on examining the raised beaches for evidence of former occupation of the region by bowhead whales. The radiocarbon ages obtained indicate that the moraines here were formed early in the Younger Dryas interval, which is an interval (10,000 to 11,000 years ago) when temperatures dropped to low levels and halted or slowed the process of continental deglaciation. Remains of a dozen or so bowhead whales from raised beaches were also recovered. The radiocarbon ages indicate that these whales occupied the region 8,000 to 10,000 years ago, a result that agrees with earlier findings from previous field seasons. The results of concurrent archaeological surveys were reported to the Prince of Wales Northern Heritage Museum, Yellowknife.

075 **Physical Sciences**

Edinger, Evan
Department of Earth Sciences
Laurentian University
Ramsey Lake Road
Sudbury, ON P3E 4X6
Email: eedinger@nickel.laurentian.ca

Reference Number: 12 404 552
Region: IN **Location:** Mercy Bay, Banks Island

Paleoecology of Mercy Bay Reefs, Frasnian, Banks Island

The Devonian aged fossil reefs of Mercy Bay, Banks Island are important examples of fossil reefs that grew in a sand and mud dominant environment on a broad continental shelf. During the study, photographs and samples were taken. It was found after analysis that there are three distinct levels of reef limestones in the Mercy Bay reef tract. Each reef typically grew on top of sands or muds and was first dominated by branching and platy corals. Later the area was dominated by domal and tabular sponges.

076 **Physical Sciences**

English, Michael
Wilfrid Laurier University
75 University Ave. W.
Waterloo, ON N2L 3C5
Email: menglish@wlu.ca

Reference Number: 12 404 555
Region: NS **Location:** Daring Lake

Active Layer Growth and Groundwater Chemistry, Daring Lake, NWT

The objective of the research was to quantify differences in undisturbed arctic tundra groundwater and surface water chemistry related to active depth and physical/biological characteristics including soil moisture, temperature, organic content and vegetation. The study focused on these changes at different spatial scales in the Daring Lake catchment. The 2001 field work focused on the installation of instruments in the active layer while it was at its most pronounced just prior to initiation of freeze-back. All Daring Lake subbasins were sampled for water chemistry. To develop more specific information on this highly important watershed area, an intensive study site, which included drive point piezometers, time domain reflectometer probes and thermister cables was set up in one of the Daring Lake subbasins. Samples of water were extracted from the piezometers to later analyze for chemistry.

077 **Physical Sciences**

English, Michael
Wilfrid Laurier University
75 University Ave. W.
Waterloo, ON N2L 3C5
Email: menglish@wlu.ca

Reference Number: 12 404 555
Region: SS **Location:** Slave River Delta, NWT

Monitoring Water Levels in the Slave River Delta, NWT

The objectives of the research in the Slave River Delta for the 2001 field season were to install water level recorders at various sites, so that changing water levels could be recorded and compared to changes in wind speed and velocity (recorded in the outer portion of the Delta). The information collected in the study will be used to determine how the creation of seiches in Great Slave Lake impacts the flow of water in the channels of the Delta. Water level recorders were established at six sites in the Delta, basically duplicating the instrumentation plan from the past year. The water level recorders were taken out of the Delta in October of 2001.

078 **Physical Sciences**

Forbes, Donald
Marine Environmental Geosciences
Bedford Institute of Oceanography
1 Challenger Drive (P.O. Box 1006)
Bedford, Nova Scotia B2Y 4A2
Email: dforbes@nrcan.gc.ca

Reference Number: 12 404 399
Region: IN **Location:** the Inuvialuit Settlement Region

Coastal Hazards, Relative Sea-level Change, and Climate Impacts on Northern Coasts and Seaways

The research project involved the following: (1) mapping the western Canadian Arctic coastline in terms of its sensitivity to coastal erosion under climate change and sea-level rise; (2) monitoring coastline changes and the processes responsible; (3) defining rates of relative sea-level change and contributions from vertical motion of the crust; (4) determining coastal sensitivity to other climate changes (increased air, ground, and water temperatures, diminished sea ice and higher wave energy); and (5) collecting information on coastal geology and geomorphology for ground-truthing of remote sensing data (to calibrate predictive models of coastal change).

079 **Physical Sciences**

Jackson, Valerie
Department of Indian and Northern Affairs
PO Box 1500
Yellowknife, NT X1A 2R3
Email: valerie_jackson@gov.nt.ca

Reference Number: 12 404 554
Region: NS **Location:** Emile River, Wheeler Lake and Basler Lake

The Snare Lake Mapping Project: Parts of NTS 85O and 85N

The objective of the mapping project was to define the structural, metamorphic, lithographical and geochemical bedrock characteristics of the area. Geological work entailed walking across the land, mapping the rocks and collecting samples of the outcrops. Sampling was mainly done with small hand-held rock hammers. A report summarising the geological findings was presented at the 2001 Geoscience Forum held in Yellowknife.

080 **Physical Sciences**

Jowett, David
Dept. of Earth Sciences, Carleton University
1125 Colonel By Drive
2240 Herzberg Laboratories
Ottawa, ON K1S 5B6
Email: djowett@chat.carleton.ca

Reference Number: 12 404 566
Region: DC **Location:** Liard River, Kotaneelee River, Petitot River and La Biche River

Basin Analysis of the Liard Basin

A number of field locations were studied: three rock sections along Murky Creek (west flank of the Liard Range), two sections along Sully Creek, four sections along the Kotaneelee River (beginning on the west flank of the Kotaneelee Range and continuing to its junction with the Liard River), a small creek on the west flank of Mount Martin (Yukon Territory), and six small rock outcrops along the Petitot River beginning at its junction with the Liard Highway and continuing to its junction with the Liard River. Other sections studied in 2001 in northeastern British Columbia will allow comparison to those in the Yukon and Northwest Territories. A total of 35 rock samples from the NWT were collected in 2001 for micropaleontological and geochemical study. All samples were no more than 300g in mass, and were taken from rocks of Cretaceous age. All samples are currently being studied and, along with data from other fieldwork seasons, will be published in international scientific journals.

081 **Physical Sciences**

Kerr, Daniel
Geological Survey of Canada (Terrain Sciences Division)
601 Booth St.
Ottawa, ON K1A 0E8
Email: dkerr@nrcan.gc.ca

Reference Number: 12 404 550
Region: NS **Location:** Yellowknife

Surficial Geology and Till Geochemistry of the Yellowknife Greenstone Belt Area

Geological fieldwork along the Yellowknife Greenstone Belt was undertaken to provide additional information of soil geochemistry and ice flow resulting from the effects of the last ice age which ended about 8500 years ago. Soil samples were collected and will be analyzed to see if they contain gold grains. The work is important because the analysis checks the soil samples for any economically important elements such as gold, as well as harmful ones such as arsenic. The background data will help other research to seek out kimberlite and new gold deposits.

082 **Physical Sciences**

Kershaw, G. Peter
Department of Earth and Atmospheric Sciences
University of Alberta
Edmonton, AB T6G 2E3
Email: peter.kershaw@ualberta.ca

Reference Number: 12 404 116
Region: IN **Location:** Canol Heritage Trail, 10 km North of Tulita

Ecological and Geomorphological Investigations in the Alpine Tundra of the Mackenzie Mountains, N.W.T.

The main objectives of this study were: (1) to determine the status of permafrost land forms in the study area; and (2) to determine the long-term recovery after abandonment of the CANOL No.1 project. Both of these objectives are part of long-term studies in the area that were initiated in 1974. Intensive investigations were carried out in 1974, 1977-82 and since 1990. With climate change potentially resulting in warming in the north it is important to know the current condition of permafrost land forms. Since 1945 disturbances have been affected by natural processes of revegetation and studies have been underway since 1977 to determine the nature of these processes. Access during the summer was via the Yukon along the Canol Road through Macmillan Pass. Limited soil sampling and permafrost coring were conducted and a small amount (< 25 kg) was returned to University of Alberta for analysis. Studies encompass the area between Macmillan Pass and Caribou Pass.

083 **Physical Sciences**

Ketchum, John
Earth Sciences Department
Royal Ontario Museum
100 Queens Park
Toronto, ON M5S 2C6
Email: jketchum@rom.on.ca

Reference Number: 12 404 581
Region: SA **Location:** Grant Lake/Acasta River area, near Rae Lakes

Examination and Dating of 4.0-2.9 Billion Year Old Rocks in the Slave and Wopmay Geological Provinces of the Canadian Shield

Fieldwork focused on 1) the Grant Lake area (64 55'N, 116 15'W) and 2) the Acasta River area (65 10'N, 115 34'W). The second area is the site of Earth's oldest known rocks, the Acasta gneisses, dated at 4 billion years old. The main focus of the work was to examine the Grant Lake area for rocks similar to the Acasta gneisses. Their presence in this area would greatly increase the size of the region known to contain these ancient rocks. Samples collected for dating are currently being processed at the Royal Ontario Museum (ROM), Toronto, and preliminary results have thus far not revealed any 4 billion year old ages. Another task of the fieldwork was to collect a large piece of Acasta gneiss to display in the Earth Sciences Gallery at the ROM. Plans are being made to display a large piece with a cut-and-polished surface near the gallery entrance. The aim is to highlight the remarkably old age of the Earth and to draw attention to the fact that Canada (specifically the NWT) contains the oldest fragment of continental crust on the planet.

084 **Physical Sciences**

Lamoureux, Scott
Dept. of Geography
Queens University
Kingston, ON K7L 3N6
Email: lamoureux@lake.geog.queensu.ca

Reference Number: 12 404 567
Region: IN **Location:** Dempster Highway, near Ft. MacPherson and Melville Hills area, near Paulatuk

Late Quaternary History of the Richardson Mountains and the Melville Hills

The lake sediment coring expedition undertaken in June of 2001 to the Melville Hills was completed as scheduled with cores taken from four lakes. The longest core recovered (SL-2) has been analysed for organic carbon, grain size, microfossils and magnetic susceptibility, with results of pollen and radiocarbon dating anticipated in early 2002. Preliminary results suggest that the sedimentary record in South Lake is at least 10,000 years old, and that most of the Late Glacial period is contained in the SL-2 core. The inferred chronology suggests that sedimentary changes in the bottom 40 cm of the record may correlate to the Allerød-Bølling and Younger Dryas events seen in the Greenland Ice cores. The Holocene portion of the record also contains significant variability in microfossils and organic carbon, suggesting that the climate during this period in the Melville Hills may have been quite variable. The coring trip to the Richardson Mountains took place in April of 2001. The goals were to obtain cores from lakes in the eastern foothills of the mountains, near Fort McPherson. A combination of mechanical failures and inclement weather prevented the team from accomplishing a significant portion of the proposed research and only one core was obtained. This core was short, and unlikely to be of use in the research. Field operations were aborted because of hazardous weather conditions and road closures.

085 **Physical Sciences**

Lesack, Lance
Department of Geography
Simon Fraser University
8888 University Dr.
Burnaby, BC V5A 1S6
Email: lance_lesack@sfu.ca

Reference Number: 12 404 485
Region: IN **Location:** Mackenzie Delta near Inuvik

Biogeochemistry of Lakes in the Mackenzie Delta

This project is ongoing and the long-term goal is to develop a biogeochemical model for the lakes in the Mackenzie Delta and ultimately, a more general ecosystem model for lakes in the floodplains and deltas of major world rivers. During the field season samples were collected for various microorganisms. Seasonal trends in bacterial and zooplankton communities were documented for the first time across a gradient of lake flooding frequencies. It was also confirmed that the consumption of microflagellates by zooplankton depends strongly on the species of zooplankton present.

086 **Physical Sciences**

Maric, Robert
University of Waterloo
200 University Avenue West
Waterloo, ON N2L 3G1
Email: rmaric@scimail.uwaterloo.ca

Reference Number: 12 404 565
Region: NS **Location:** Ekati Mine

Water Balance Studies in the Coppermine River Basin: The Chain of Lakes Effect in Space and Time.

The study provided a benchmark for potential future projects in the Northwest Territories that will lend insight into the hydrological characteristics in the under-monitored regions. The current study completed a baseline characterization of the spatial and temporal variations in the surface water balance of lakes in the Coppermine Drainage Basin. The study areas are situated within an undisturbed hydrologic system in close proximity to a region of diamond exploration and mining activity. The findings show a significant response in the isotopic behaviour of these lakes in reaction to lake evaporation. There was significant temporal change in the lakes as well, where low isotopic values corresponded with the spring snow melt period and higher isotopic values connected with the late summer. Field studies in the Northwest Territories have been completed for the years 2000 and 2001. Currently, the thesis write-up is near completion and will be defended in August of 2002.

087 **Physical Sciences**

Marsh, Philip
National Water Research Institute
11 Innovation Blvd.
Saskatoon, SK S7N 3H5
Email: Philip.marsh@ec.gc.ca

Reference Number: 12 404 378
Region: IN **Location:** Trail Valley Creek and Havikpak Creek

Snow Accumulation/Runoff in High Latitude Permafrost Basins

This study is ongoing and considers the factors controlling the movement of energy and water between land surface and the atmosphere during the spring snowmelt. These factors control both the supply of energy and water to the atmosphere, as well as snowmelt and therefore spring runoff in the streams and rivers. The long term objective of these studies is to improve the ability to predict weather, climate and water resources. Over the last year information has been analysed on the rapid drainage of two lakes due to the rapid melting of the permafrost. Such lake drainage is natural, but the number of lakes which drain in this fashion may increase due to global warming. Ongoing studies are considering the implications of climate warming and lake drainage.

088 **Physical Sciences**

Martel, Edith
Dept. of Earth Sciences
University of Waterloo
249-24 Cedarbrae
Waterloo, ON N2L 4S8
Email: edithmartel@hotmail.com

Reference Number: 12 404 582
Region: NS **Location:** Clan Lake (Yellowknife area)

Structural Geology of the Jackson Lake Formation

The objective of the research was to better understand the formation of the Yellowstone Greenstone Belt, so as to better evaluate the economic potential of the formation. Structural data on the formation were gathered through the collection and analysis of rock samples using laboratory and geochronological methods. Samples (fist-sized chunks of rock) were collected with a hammer and returned to the laboratory for detailed physical and chemical analysis.

089 **Physical Sciences**

Masse, Tom
University of Alaska, Fairbanks Frontier Group
University of Alaska, Fairbanks
Fairbanks, AK 99775
Email: jm@iarc.uaf.ala

Reference Number: 12 404 568
Region: IN **Location:** Town of Inuvik

Analysis of Oxygen-18 Isotope Rates From Northern Alaska and Canada

The objective of the research team was to collect ice cores and liquid water from the Mackenzie River adjacent to the Town of Inuvik. The research team examined the concentration of the naturally occurring, stable isotope of oxygen (oxygen -18) in water, and attempted to determine how these concentrations differ in Northern Alaska and Canada. All samples were taken to the University of Alaska, Fairbanks, for analysis. This work is part of an on-going study on global climate change, and will contribute to an overall understanding of atmospheric and land surface water budgets in the region.

090 **Physical Sciences**

Murton, Julian
School of Chemistry, Physics and Environmental Science
University of Sussex
Brighton, UK BN1 9QJ
Email: j.b.murton@sussex.ac.uk

Reference Number: 12 404 538
Region: IN **Location:** Mason Bay, Richards Island, Liverpool Bay and Hadwen Island

Arctic Sand Sheet Development

Sheets of windblown sand are common in the Tuktoyaktuk Peninsula and Summer Island area. The sheets vary in thickness from a few centimetres to at least 15 metres, and extend horizontally over distances of 10's of metres to several kilometres or more. The sand sheets resemble those reported from sub-arctic sand sheets in Alaska and Greenland, and from the Ice Age mid-latitude sand sheets in the USA and Europe. The distinguishing feature of the Mackenzie Delta area is the occurrence of the large sand-filled cracks that grew upwards with depositions of the sand. Cracking resulted from intense cooling of the sand sheets, and individual structures can exceed 9 metres in height. The time of the sand deposition is being determined. Knowing the age of the sand sheets will help geologists to understand the climatic and environmental conditions under which sand erosion and deposition take place in sensitive arctic environments.

091 **Physical Sciences**

Narbonne, Guy
Department of Geological Sciences
Queen's University
Kingston, ON K7L3N6
Email: narbonne@geol.queensu.ca

Reference Number: 12 412 040
Region: SA **Location:** NW of Shale Lake

Proterozoic Ice Ages in Northwestern Canada

One of the best records of two ice ages that occurred 600-750 million years ago is in the Mackenzie Mountains, where the research team has been working continuously since 1982. A lengthy paper was submitted on the 600 million year old ice age, and the team's objective was to continue a study of the earlier (750 million year old) ice age during the summer of 2001. The research team was flown from Norman Wells to the base camp near Shale Lake by helicopter. The research team walked to several rock sections within 3 km of the base camp. Data collection consisted of measuring rocks with a ruler, taking photographs, and collecting up to 50 small (fist-sized) pieces with a hammer. The research team was in the field for a week in July, 2001.

092 **Physical Sciences**

Ootes, Luke
Dept. of Geology
C.S. Lord Northern Geoscience Centre
University of New Brunswick
Fredericton, NB E3B 5A3
Email: ootes@unb.ca

Reference Number: 12 404 564
Region: NS **Location:** Ryan Lake, Milner Lake and Daigle Lake

Structural and Geochemical Study of the Crestaurum Gold Deposit, Yellowknife Volcanic Belt, NWT

From July to August 2002, geological mapping for the Crestaurum project was focused around the Crestaurum gold mine in the vicinity of Ryan Lake, Milner Lake and Daigle Lake (NTS 85j/9). Mapping is aimed at understanding the host-rock characteristics of small gold deposits and the geological characteristics of the gold deposit itself. To compliment mapping about 100 fist-sized rock samples were collected, some of which have been examined under the microscope and others have been analyzed by chemical techniques to better determine their composition, including their gold values. Microscope analysis and chemical analysis have been completed and interpretation of the data is being conducted. Other samples were collected to obtain information about their age and events that affected them after formation. An age of rock formation has been determined at 2.671 billion years old. The age predates the gold deposit formation however, which likely occurred 2.600 billion years ago.

093 **Physical Sciences**

Quinton, William
Simon Fraser University
8888 University Drive
Burnaby, BC V5A 1S6
Email: bquinton@sfu.ca

Reference Number: 12 404 570
Region: DC **Location:** Scotty Creek (61 degrees, 18' N; 121 degrees, 18' W)

Modelling the Flow and Storage Components in the Lower Liard River Valley

The hydrological response of the low-relief, wetland-dominated zone of discontinuous permafrost occupying the central region of the Mackenzie basin is poorly understood. The present study examined the runoff response of five representative study basins (Scotty Creek, and the Jean-Marie, Birch, Blackstone and Martin Rivers) in the lower Liard River valley as a function of their major biophysical characteristics. High resolution (4 m x 4 m) Ikonos satellite imagery was used in combination with aerial and ground verification surveys to classify the land cover, and to delineate the wetland area connected to the drainage system in these drainage basins. Analysis of the annual hydrographs of each basin for the four year period 1997 to 2000 demonstrated that runoff was positively correlated with drainage density, basin slope, and the percentage of the basin covered by channel fens; and negatively correlated with the percentage of the basin covered by bogs. The detailed analysis of the water level response to summer rainstorms at several nodes along the main drainage network in the Scotty Creek basin showed that the storm water was slowly routed through channel fens with an average flood-wave velocity of 0.23 km/h. The flood-wave velocity appears to be controlled by channel slope and hydraulic roughness in a manner consistent with the Manning formula, suggesting that a roughness-based routing algorithm might be useful in large-scale hydrological models.

094 **Physical Sciences**

Riseborough, Dan
Department of Geography and Environmental Studies
Carleton University
1125 Colonel By Drive
Ottawa, ON K1S 5B6
Email: drisebor@ccs.carleton.ca

Reference Number: 12 404 556
Region: IN **Location:** Lake Illisarvik, Richards Island

The Influence of Snowcover on the Ground Surface Temperature in Permafrost

This field study investigated how cold the ground surface gets below snow covers of different depths. Of particular interest was the difference between behaviour while the active layer (the unfrozen soil above the permafrost) is re-freezing in autumn, and what happens through the winter after it is frozen. Snow depth, air temperature, near surface ground temperature and shallow permafrost temperature were measured at ten sites along a 600 metre transect on a hillslope east of Lake Illisarvik. Seasonal maximum snow depth along this transect varied from 12 cm to over 4 m at these sites in the previous winter. The temperature data collected clearly showed a sharp drop in temperature related to the conclusion of active layer freezing.

095 **Physical Sciences**

Rouse, Wayne
Burke Science Building, #311
McMaster University
Hamilton, ON L8S 4K1
Email: rouse@mcmaster.ca

Reference Number: 12 404 563
Region: NS **Location:** Sleepy Dragon Lake, Gar Lake, Inner Whale Back Islands

Modeling the Energy and Water Balance and Characteristics of Lakes in the Mackenzie River Basin

The goals of the research were to: 1) fully understand and model the role of lakes in the energy and water-balance in the Mackenzie River Basin (MRB); 2) forecast the role that lakes will play in the water-balance, energy-balance and hydrology of the MRB during climatic change; 3) document the aerial coverage of lakes in select regions of the MRB; 4) develop models relating lake size to lake depth; and 5) scale energy and water balance modeling from individual lakes to local, regional and macro-scales. Measurements of energy and water exchanges on small, medium, and very large lakes were continued during the ice-free season. Assessment of lake sizes, lake depths and volumes was continued in the region between Great Slave and Great Bear Lakes. A start was made in modeling the energy and water budgets of various-sized lakes and in integrating this lakes research into the Canadian Regional Climate Model.

096 **Physical Sciences**

Unrau, Greg
Golder Associates Ltd.
1000, 940-6th Avenue SW
Calgary, AB T2P 3T1
Email: gunrau@golder.com

Reference Number: 12 404 580
Region: IN **Location:** the Gwich'in Settlement Area

Ambient Air Quality Study in the Vicinity of Inuvik: Gwich'in Settlement Area

During the summer of 2001, the Inuvik monitoring equipment was installed east of the town, at an existing Environment Canada monitoring station. The equipment measures monthly values of sulphur dioxide, oxides of nitrogen and ozone. The site is located such that it should be accessible during all seasons of the year. The sample media is being shipped south where it can be analyzed for the above compounds. Since monitoring has only been conducted for a short time, limited data has been collected and no conclusions on baseline air quality can be made at this time.

SOCIAL SCIENCES

097 **Social Sciences**

Blomqvist, Jennifer
Frost Centre
Trent University
Peterborough, ON K9J 7B8

Reference Number: 12 410 573
Region: SA **Location:** Fort Good Hope

Alternative Sentencing in Fort Good Hope

The researcher's efforts focused on alternative sentencing for Aboriginal offenders, specifically the Hume River Bush Camp near Fort Good Hope. Information on the wilderness camps program and observations/interviews from this case study constitute the primary research for a forthcoming Master's thesis. This thesis will contribute to a larger body of research and literature on Aboriginal justice reforms. Data was collected during interviews with participants in the Hume River Bush Camp, an alternative sentencing option for Aboriginal offenders. Interviews were taped, to facilitate data collection. Participation in the study was voluntary, and all participants signed a consent form. The researcher also obtained background information on the program from the Justice Department in Yellowknife.

098 **Social Sciences**

Irlbacher-Fox, Stephanie
PO Box 962
Yellowknife, NT X1A 2N7
Email: stephaniefox@ssimicro.com

Reference Number: 12 410 495
Region: DC **Location:** Fort Simpson and other Deh Cho Communities

Deh Cho First Nations Political Customs and Traditions

The project began in July 2001 focusing on the Deh Cho First Nations. The project involved spending time in Deh Cho communities to gain information about the Deh Cho Process and issues of importance for Deh Cho political development. As part of the study public meetings relating to the Deh Cho Process, community governance, and specific issues were attended. People knowledgeable of Deh Cho political development and issues were interviewed. At the request of negotiations staff, research and information gathering was performed in support of the development of the Deh Cho Governance Working Group terms of reference and bibliography. A report will be produced to meet academic standards and a plain language report will be produced that may be used by the Deh Cho and Métis Councils for their own purposes including research, education, and promotion. The research will continue until August 2002.

099 **Social Sciences**

Little, Lois
Box 1866
Lutra Associates Ltd.
Yellowknife, NT X1A 2P4
Email: loislutra@ssimicro.com

Reference Number: 12 410 579
Region: ALL **Location:** Yellowknife, Inuvik, Fort Smith, Hay River, Deline, Ft. McPherson, Norman Wells, Tuktoyaktuk, Fort Providence, Lutsel K'e, Rae-Edzo, Wekweti

Public Attitudes and Awareness of Climate Change in the NWT

This study included a structured survey of a representative sample of youth enrolled in grades 5-12 and focus groups with adults in Yellowknife and Rae-Edzo. The youth survey looked at youth participation in school and community projects that help protect the environment, and at their awareness of climate change and its effects in the NWT. Adults participating in focus groups suggest that growing urbanization, consumerism and disconnection from the natural environment are posing new risks and putting new pressures on the environment. Participants suggested that youth are in the best position to diminish pressures on the environment. They say that action on environmental issues is related to information and understanding, and to the immediacy of the problem/impact.

100 **Social Sciences**

Martin, Jim
8 Simi Ndi Tili
Rae-Edzo, NT X0E 0Y0
Email: jmartin@dogrib.net

Reference Number: 12 410 576
Region: NS **Location:** Dettah, Gameti, Rae-Edzo, Wekweti, Wha Ti

An Examination of an Organizational Experiment to Integrate Child and Family Services, Education and Health Programs in Rural, Aboriginal Communities in the NWT

The Dogrib Community Services Board represents a new governance model for delivering programs and services at both the community and the regional level by uniting tribal and public authorities. The Board seeks to develop a continuum of care for residents of their communities and deliver these programs and services in the context of "strong like two people," a quote from an elder which speaks to the importance of building community capacity using the strengths of two cultures. The regional treaty organization, the Dogrib Treaty 11 Council, has described the Dogrib Community Services Board as an interim step towards self government for their people.

101 **Social Sciences**

McCartney, Leslie
4 Regent Street
Lindsay, ON
Email: leslie.mccartney@sympatico.ca

Reference Number: 12 410 568
Region: IN **Location:** Tsiigehtchic, NT

Gwich'in Elders' Biographies Research Project

Interviews were recorded with 17 Gwich'in elders in Tsiigehtchic, Inuvik, Aklavik and Fort McPherson to create a series of biographies. A translator was hired and worked both during the interviews and in translating the Gwich'in interview audio tapes into English. The audio tape translations have been retained by the Gwich'in Social and Cultural Institute (GSCI). All the short stories have been written and forwarded, along with photos of the elders to be printed in a 2003 calendar. A longer version of the biographies is being written in draft form and amendments are in progress. Each story has been read back to the elders except when certain amendments were made. All verification of Gwich'in place names and spellings has been completed. On completion these stories will be published in a book by the GSCI.

102 **Social Sciences**

Meredith, John
2232 Keyes Avenue
Madison, WI 53711
Email: johnnykayak65@hotmail.com

Reference Number: 12 410 578
Region: SS **Location:** Ft. Smith, NT

A Sense of Place for the People of Ft. Smith, NT

The purpose and goal of the project was to learn what composes a sense of place for the people of Fort Smith. How are the rhythms and constraints of the natural environment reflected in people's sense of place? The research team attempted to articulate spatial relationships that people in Ft. Smith have with their surroundings. The researcher walked throughout the Town of Ft. Smith on foot. Citizens of the town were requested to participate in an interview to determine their perceptions of their surroundings. Interviews were video-taped (with the participants permission), or manually recorded. The target goal was to interview 50 persons, although a smaller sample will be sufficient as long as it represents a cross section of the Town's population.

103 **Social Sciences**

Snortland, Jody
PO Box 134
Tulita, NT X0E 0K0
Email: harvestc@srrb.nt.ca

Reference Number: 12 410 548
Region: SA **Location:** Sahtu Settlement Region Communities (Tulita, Norman Wells, Colville Lake, Fort Good Hope, Deline)

Sahtu Settlement Harvest Study

The Sahtu Settlement Harvest Study is an important project required under the Sahtu Land Claim Agreement (1993). The Sahtu Renewable Resource Board (a co-management board set up under the Claim) is responsible for conducting this project. The Study will count the numbers of fish and wildlife harvested by Sahtu Dene and Metis until April 2003 (5 year study). The Board will use this information to meet two specific objectives : (1) to establish the minimum needs of Sahtu Dene and Metis; and (2) to be used as a tool in natural resource management in the Sahtu. Each month, in each community, a local interviewer recommended by the local Renewable Resource Council collects harvest information in their community using a brief face-to-face interview. All adult Sahtu Dene-Metis (16 years +) and a select group of adult non-beneficiaries who provide for their Dene-Metis families are interviewed every month. Numbers and general locations of all fish and wildlife species harvested are collected. Confidentiality is maintained through use of harvester ID numbers.

104 **Social Sciences**

Tolley, Muriel
18 Gitzel Street
Yellowknife, NT X1A 2C1
Email: muriel_tolley@gov.nt.va

Reference Number: 12 410 580
Region: IN, SA, DC, NS, SS **Location:** throughout the NWT

Teacher Induction in the Northwest Territories

Each educational division in the Northwest Territories was contacted and a list of all first year teachers was obtained. These teachers were contacted and asked to participate in the study. Through a selection process, five first year teachers who had no previous teaching experience were chosen and completed the project. Each participant was interviewed either by phone or in person, at three stages during the year: fall; winter; and end of year. These teachers shared their experiences openly, providing a great deal of information to synthesize. They expressed appreciation for the opportunity to share their experiences, both positive and challenging, with a neutral person. Field notes were returned for their approval, and they noted that this was an unexpected opportunity to reflect on their practice which they wouldn't have had otherwise. Thesis completion is expected by the spring of 2003.

TRADITIONAL KNOWLEDGE

105 **Traditional Knowledge**

Fafard, Melanie
13-15 Tory Building
Dept. of Anthropology
University of Alberta
Edmonton, AB T6G 2H4
Email: fafard@ualberta.ca

Reference Number: 12 410 574
Region: IN **Location:** Ft. McPherson, Tsiigehtchic, Inuvik and Yellowknife

Gwich'in Settlement Region Heritage Resources Project

The Gwich'in Settlement Region Heritage Resources Project is an ongoing research project being carried out in partnership with the Gwich'in Social and Cultural Institute to document the values of the Gwich'in with respect to heritage resources. Last year, as a case study, the Fort McPherson National Historic Site designation was revisited from the perspective of the Teetl'it Gwich'in. Meetings and individual interviews were carried out with a community steering committee and elders in order to document the history of the Fort and to determine the significance of this place for the Teetl'it Gwich'in. The elders had many stories of what happened in Fort McPherson in the old days. In the past, the Fort was an important trading/gathering place and a religious centre. For the Teetl'it Gwich'in, the location and stories related to the Fort remain very important. The elders expressed their wish that another plaque presenting the people's perspective about the site should be made and put beside the old one which refers only to Euro-Canadian activities.

106 **Traditional Knowledge**

Kendrick, Anne
PO Box 53
Lutsel K'e, NT X0E 1A0
Email: umkkendrick@cc.umanitoba.ca

Reference Number: 12 410 118
Region: SS **Location:** Lutsel K'e and Yellowknife, NT

Beyond Control: Caribou Co-management and Cross-Cultural Information

This study is designed to improve the understanding of cross-cultural differences in the co-management of the Bathurst caribou herd. This study follows up on major differences revealed in a Man and Biosphere High Latitude Ecosystems Directorate comparative study of the management of the Western Arctic and Beverly-Qamanirjuaq caribou herds. The researcher assisted with the coordination of the community-based monitoring program in Lutsel K'e, as well as completed a needs assessment as it relates to the dissemination and sharing of local knowledge. Community members were consulted about their aspirations and their concerns about the process of documenting oral traditions and traditional ecological knowledge into electronic databases. Methods used included semi-directed interviews, workshops, displays and related activities to communicate information collected through the research project.

107 **Traditional Knowledge**

Ruttan, Lia
12016-41st Avenue
Edmonton, AB T6V 0V5
Email: lmruttan@telusplanet.net

Reference Number: 12 410 575
Region: SS **Location:** Fort Smith, NT

For The Future: Parents' Priorities for their Children's Education in a Northern Community

The study examined differences in parents' viewpoints related to their priorities for their children's learning experience and educational goals. Data produced in this study will be used to assist in program and policy development, as a base for theory building, and to assist in understanding cross-cultural interactions in the context of sharing collective community resources. The researcher surveyed parents in Fort Smith to determine what factors are important to them regarding their children's public education. Key issues were identified from the survey data and interviews were conducted to determine how these issues are influenced by the parent's personal experiences and cultural beliefs.

Prince of Wales Northern Heritage Centre

ARCHAEOLOGY PERMITS

108 **Archaeology**

Bussey, Jean
Points West Heritage Consulting Ltd.
2595 204 Street
Langley, BC V2Z 2B6

Reference Number: NWT Archaeologists Permit 2001-906
Region: NS **Location:** Tibbitt to Contwoyto Winter Road

Archaeological Investigations Conducted Along the Tibbitt to Contwoyto Winter Road

This investigation was basically a post-construction assessment necessitated by increased road activity and the fact that the existing Licence of Occupation will expire in 2003. There was no requirement for an archaeological study prior to the first use of this approximately twenty-year-old winter road. The Joint Venture partners wished to conduct sufficient background studies in advance of their application for renewal of the licence. Archaeological work represented one component of this multi-disciplinary program. Gabriella Prager, Carol Rushworth and Robert Lackowicz, representing Points West, and Mike Francois (Yellowknife's Dene First Nation) and Len Turner (North Slave Metis Alliance) assisted with field investigations. The fieldwork consisted of an archaeological inventory of the existing winter road and adjacent areas, as well as associated gravel pits and camps.

During the archaeological inventory, 55 new archaeological sites were discovered and 14 previously recorded sites were revisited. Stone tools or the fragments (flakes) removed during the manufacture of stone tools are characteristic of most sites, but a number contained a single tent ring. The majority of the artifacts are white or gray quartz, but specimens of chert, siltstone, basalt and sandstone were also recovered. Six of the new sites were found in Nunavut Territory and the remaining 49 were in the Northwest Territories. All 14 previously recorded sites were in the NWT. Several sites in both territories contained tools suggestive of the Arctic Small Tool tradition. Most archaeological sites were located on or adjacent to eskers, but a number were on well-drained deposits associated with large lakes and several were situated near a height of land that provided a strategic viewpoint. A number of sites have been disturbed by construction and use of the Tibbitt to Contwoyto winter road and associated facilities; a few have been destroyed, primarily as a result of gravel pits or camps. Several sites are threatened by continued and increased use of the winter road. Two such sites at one of the gravel pits were tested and visible surface artifacts were collected. No further work is required at these two locations, but other sites will require testing, more detailed excavation and/or surface collection in the near future. Potentially diagnostic tools or specimens of a unique material type were collected from a number of sites and will be analyzed during the winter of 2001-2002.

109 **Archaeology**

Bussey, Jean
Points West Heritage Consulting Ltd.
2595 204 Street
Langley, BC V2Z 2B6

Reference Number: Northwest Territories Archaeologists permit 2001-907
Region: NS **Location:** near Snap Lake

Archaeological Investigations Conducted near Snap Lake in the Northwest Territories

Jean Bussey of Points West Heritage Consulting Ltd. conducted archaeological investigations for De Beers Canada Mining Inc. at Snap Lake, approximately 200 km northeast of Yellowknife. Bonnie Campbell, of Points West and Frank Basil, from the community of Lutsel K'e, assisted with the field investigations. The majority of the fieldwork was completed in early July, but additional archaeological investigations were undertaken in mid-August. Previous studies were conducted at Snap Lake in 1998 and 1999; eleven archaeological sites were discovered during these investigations, most are associated with a large esker south of the Snap Lake property.

The work in 2001 was in response to new developments and the expansion of the mine footprint. In addition, a number of previously recorded sites located in the vicinity of the winter road that connects with the Lupin Road were revisited and assessed and the winter road to a gravel pit south of the Snap Lake property was examined. One new archaeological site was found on the south shore of the west arm of Snap Lake, within the area of the expanded mine footprint. It is a small lithic scatter located on a point of land that extends north into the lake; a small island is located to the northeast. No sites were found along the access road to the gravel pit and borrowing activities conducted in previous winters did not impact the sites near this reserve.

A number of sites were recorded in the vicinity of the Snap Lake winter road connector in 2000, but very few are near the actual road route. All nearby sites were revisited in 2001, as were a number that were further removed. Only one site is sufficiently near that impact is likely to occur. Since KkNv-6 was threatened by impact during future winter seasons, subsurface testing was conducted. The northeast corner of the site yielded a small quantity of buried cultural material in the form of quartz fragments. The surface of the site was intensively examined and all surface artifacts were collected. No further archaeological investigation is required at this site.

110 **Archaeology**

Bussey, Jean
Points West Heritage Consulting Ltd.
2595 204 Street
Langley, BC V2Z 2B6

Reference Number: Northwest Territories Archaeologists permit 2001-908
Region: NS **Location:** North of Lac de Gras

Archaeological Investigations conducted North of Lac de Gras in the Northwest Territories

Points West Heritage Consulting Ltd. conducted archaeological investigations for BHP Diamonds Inc. in its claim block north of Lac de Gras. Bonnie Campbell of Points West and Robert Beaulieu, a member of the Yellowknives Dene First Nation, assisted. The fieldwork consisted of an archaeological inventory as well as a tour for Edward Camille and his interpreter, Jonas Lafferty, representatives of the Dogrib First Nation. Previously recorded and newly discovered archaeological sites were visited during the tour.

During the archaeological inventory, eight new archaeological sites were discovered, bringing the total number of known sites in the BHP claim block to 170. Stone tools or the fragments (flakes) removed during the manufacture of stone tools characterize the eight new sites. The majority of the artifacts are white or gray quartz, but some chert and siltstone specimens were also discovered. In addition a tent ring and several battered quartz veins were encountered. No development activity has been identified in the vicinity of these sites; thus, there is no potential for conflict.

Two of the new sites were found adjacent to a river flowing into the east side of Achilles Lake in the northeast portion of the BHP claim block. One was associated with an esker and the other with an esker remnant. The other six sites were found at the narrows between Lac de Gras and Lac du Sauvage, in the southeast corner of the claim block. All six are likely associated with caribou hunting since the narrows represents an important caribou crossing. Two sites, one to either side of the narrows, each yielded a small biface suggestive of the Arctic Small Tool tradition. The presence of these artifacts suggests that the narrows represents a significant location utilized through time. There is high potential for additional archaeological sites in this vicinity.

111 **Archaeology**

Hanna, Don
Bison Historical Services
1A, 215-36th Ave NE
Calgary, AB T2E 2L4

Reference Number: NWT Archaeologists Permit 2001-910
Region: IN **Location:** Mackenzie River Delta

The 2001 Mackenzie River Delta Heritage Resource Survey

This project was a heritage survey in the Mackenzie River Delta region. AEC West Ltd, Anadarko Resources Ltd, BP Canada Energy Company, Burlington Resources Canada Energy Ltd, Chevron Canada Resources, Conoco Canada Resources Limited, Devon ARL Corporation (formerly Anderson Resources Ltd.), Petro-Canada and Shell Canada Ltd funded the research.

People in the Delta have been worried about possible damage to heritage sites caused by recent seismic exploration and development. This project was carried out to learn if sites were damaged by recent seismic work and to help avoid any future damage. The study was done in July and September of 2001 and included both Crown and Inuvialuit Private lands within the Mackenzie River Delta. Work involved helicopter and foot surveys and community consultations and traditional knowledge interviews in the communities of Aklavik, Inuvik, and Tuktoyaktuk. Nothing was collected from any site and no excavations were carried out.

One goal of the project was to obtain accurate locations of recorded heritage sites using GPS. Accurate locations mean seismic crews will be able to avoid these sites. Visiting and mapping the locations of 84-recorded sites successfully completed this goal.

Another goal was to look for unknown sites in areas where future developments might occur. 175 new sites were recorded. These sites include ancient villages, camps and graves, as well as more recent traditional land-use areas. These sites were also mapped using GPS. Another goal was to evaluate damage to sites from recent seismic and drilling programs. Very limited damage to two known sites and one new site was recorded. Accurate locations for sites should ensure that no more damage to known sites occurs. The final goal was to develop a map-model to help predict the distribution of heritage sites in the Mackenzie River Delta. This model will be used by industry to plan future projects that avoid damage to heritage sites.

This project was very successful in terms of adding new knowledge and in giving industry the tools it needs. The number of recorded heritage sites has tripled and these sites are recorded in a way that will make future avoidance possible. The success of this study is due in part to the assistance, cooperation and encouragement of staff of the Inuvialuit Land Administration, the Prince of Wales Northern Heritage Centre and the people of Aklavik, Inuvik, and Tuktoyaktuk.

112 **Archaeology**

Hart, Elisa
Inuvialuit Social Development Program
P.O. Box 2000
Inuvik, NT X0E 0T0

Reference Number: NWT Archaeologists Permit 2001-911
Region: IN **Location:** Kitigaaryuit National Historic Site

Fieldwork at Kitigaaryuit National Historic Site by the Inuvialuit Social Development Program

The Inuvialuit Social Development Program conducted a small-scale field project at Kitigaaryuit National Historic Site in August of 2001. The work consisted of oral history interviews with 5 elders, identifying a number of new cultural remains, and conducting geological assessments of the site. The work was done over a 5-day period. The crew consisted of Steven Solomon of the Geological Survey of Canada, Elisa Hart and James Sydney of the Inuvialuit Social Development Program. James is also a student at the University of Northern British Columbia. Emmanuel Adam of Tuktoyaktuk managed the camp, and John Pokiak and Oliver Pingo operated the boat operation and provided assistance. The Polar Continental Shelf Project provided helicopter support.

Elders, Annie Emaghok and Laura Raymond told the researchers about the time they lived at Kitigaaryuit in the 1930s. Otto Binder and Adam Emaghok talked about their use of the reindeer corral in the 1950s. Noah Felix related information that had been passed to him by his father Felix Nuyaviak, on the construction of ice pits used for storing whale parts.

Six previously undocumented traditional driftwood graves were located. This brings the number of traditional graves that can be seen on the surface to approximately 250.

The majority of the work at Kitigaaryuit was devoted to the geological assessments of the site that are needed to monitor the erosion and slumping that is taking place there. The edges of the eroding bluffs were surveyed and videotaped. The thickness of the active layer of permafrost was measured in a number of places. Vegetation mapping was done, as changes in vegetation can have a profound effect on the temperature of the ground by changing the snow depth. Thicker snow pack increases the average annual temperature of the ground, resulting in a reduction of the permafrost that binds the soil together. Nearshore profiles of the underwater slope adjacent to threatened locations will be created from the echo sounding that was done.

All of the information will be used to produce detailed maps showing the distribution of landscape features and vegetation at the site that are sensitive to change. Once the maps of coastal and landscape sensitivity are constructed, a monitoring plan can be developed which targets high risk locations. This information is essential for cultural resource managers who must assess the impacts to cultural remains at Kitigaaryuit from erosion and slumping that are both natural and human induced.

113 **Archaeology**

Head, Thomas
Bison Historical Services
1A, 215-36th Ave. NE
Calgary, AB T2E 2L4

Reference Number: NWT Archaeologists Permit 2001-915
Region: DC **Location:** Liard-E 25 Well-site

Liard-E 25 Well-site and Access Road Impact Assessment

In 2001, Bison Historical Services Ltd. undertook an Historical Resources Impact Assessment (HRIA) along with a traditional land use study for Purcell Energy Ltd. of a well site and access road (Purcell et al Liard E 25 in Unit E, Section 25 - Sub-surface in Unit D, Section 25). This project will see the construction of a short access road, an associated well site, a borrow source and a remote sump for a total impact of between 6.1 ha. The Acho-Dene Koe First Nation (Fort Liard) and Alpine Environmental Consulting Ltd. (Calgary) facilitated this work. Mr. Louie Betthale (member of the Acho-Dene Koe First Nation) provided field assistance and information concerning traditional land use by the Acho-Dene Koe First Nation.

The project involved a day of field research and discussion concerning traditional land use. The proposed well site and access road were walked and 15 negative shovel tests dug during the fieldwork. Evidence of recent historic period activities were noted (cutlines and rusted cans) but are not felt to be significant to the researchers' understanding of the proposed well site or the area in general. Cultural resource sites relating to First Nations use of the area were not identified during this portion of the study.

The Traditional Use Study consisted of an interview with Mr. Louie Betthale concerning his knowledge of the area in general and the project specifically. The intent was to identify areas of potential concern to the Acho-Dene Koe First Nation relative to the proposed project. While the HRIA was directed specifically at the proposed construction, the traditional land use focused on surrounding areas and more general information but based primarily on observations from the field component of the HRIA.

In discussing the proposed well site, access road and associated facilities, Mr. Betthale indicated that this project has a low potential for impacting traditional sites. Given the data outlined above, it is recommended that clearance be provided to Purcell Energy Ltd. for the proposed well site and access road (PURCELL et al LIARD E-25).

114 **Archaeology**

Savelle, James
Department of Anthropology
McGill University
Montreal, PQ

Reference Number: NWT Archaeologists Permit 2001-912
Region: IN **Location:** Northwestern Victoria Island

Archaeological Surveys on Northwestern Victoria Island, NWT

Archaeological surveys were carried out in July 2001 on two areas in the Amundsen Gulf region of northwestern Victoria Island, Cape Ptarmigan and Berkeley Point. The surveys were conducted to determine the types of prehistoric sites present in these areas, and their age. No artifacts were collected, but several samples of charcoal and other material suitable for radiocarbon dating were collected from several features. Approximately 20 archeological sites, including Paleoeskimo (4500 – 1000 years before the present), Thule (approximately 1000 – 200 years before the present) and historic Inuit sites were recorded. This number of sites is much smaller than in comparable areas further south on Victoria Island that the researchers have surveyed, and may reflect either a) smaller prehistoric Inuit population levels in these northern areas, or b) possibly the erosion of many prehistoric sites due to rising sea levels at some point in the past.

115 **Archaeology**

Thomson, Callum
Jacques Whitford Envornment Ltd.
Suite 500, 708-11th Ave. SW
Calgary, AB T2P 0E4

Reference Number: Northwest Territories Archaeologists permit 2001-909
Region: NS **Location:** Kennady Lake

Gahcho Kué and Winter Access Route Continuing Archaeological Investigations

De Beers Canada Exploration Inc. (DBCE) requested that Jacques Whitford Environment Limited conduct archaeological investigations of proposed mineral exploration activities in the vicinity of Gahcho Kué, and on parts of the winter access route between MacKay Lake and Gahcho Kué. A total of 33 new sites were found.

Most of the work was concentrated in four activity areas. MZ Lake is an exploration area about 20 km west of Gahcho Kué; trenching is contemplated in addition to test drilling in this area, which is located at the centre of the southern half of the claim block. Four precontact sites were found around the lake; these consisted of scatters of stone tools, and a recent trapping site. None of the sites were judged to be at risk from the proposed activities. Kelvin and Faraday lakes are approximately 10 km northeast of Gahcho Kué; continuation of mineral exploration activities around the lakes indicated a need for an archaeological survey. Two small sites were found, including a concentration of quartz veins in a bedrock outcrop that had been exploited as a source of material for making stone tools. A number of eskers within about 20 km around Gahcho Kué were checked, which were thought to be at risk from future exploitation for sand and gravel for construction of berms and roads, and found 11 new precontact sites and two traditional use sites. Among these 11 sites are several that are quite extensive, indicating a need for land-users to conduct such archaeological assessments of these prominent features before they are exploited for quarrying activities. The last target areas were three places where the construction firm working on the winter access route from MacKay Lake to Gahcho Kué had deviated from the past access route because of operational necessity; parts of these deviations had not previously been surveyed. A total of 13 new sites were found on new portages between Reid and Munn Lakes, Munn and Margaret Lakes, and Margaret and Back Lakes, all from the precontact period and mostly on knolls and gravel terraces. Most of these sites appear to have been situated for taking caribou on migration routes crossing lake narrows, river pools and rapids, and on narrow land constrictions between lakes. For the most part, the new routings were good choices, coming no closer than about 50-300 m from these sites, but two small sites recorded in previous years had been disturbed by vehicle traffic.

The most interesting and significant site found during these surveys was a major quartz quarry which covers the top of a prominent hill between Margaret and Back Lakes, an area of about 55 x 45 m, criss-crossed with deep, wide quartz veins, quartz boulders, and quartz chunks, with lots of evidence of quartz extraction and use. Two boulder and slab structures were found on the summit of the hill, which could be graves, and a low blind or shelter on the south side of the hill. This is a remarkable site that may have supplied many generations of passing aboriginal hunters with raw material.

The conclusions reached were that drilling and trenching should be able to proceed safely in the MZ and Kelvin/Faraday lakes areas, except in the vicinity of known sites. As a general recommendation for all exploration and development projects in this region, exploitation of eskers and other sources of aggregate should always be preceded by an archaeological assessment. Similarly, construction and use of winter access routes should always be preceded by an archaeological assessment, involvement of the archaeologist in the route planning process, and

follow-up surveys to verify predictions made on archaeological potential and to initiate mitigation measures where necessary.

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116 **Archaeology**

Thomson, Callum
Jacques Whitford Envornment Ltd.
Suite 500, 708-11th Ave. SW
Calgary, AB T2P 0E4

Reference Number: Northwest Territories Archaeologists permit 2001-914
Region: IN **Location:** Mackenzie Valley Pipeline

Archaeological Survey of Mackenzie Valley Pipeline Route

A team of archaeologists from Jacques Whitford Environment Limited, Calgary, assisted by Rita Carpenter, Tsiigehtchic and Dwayne Semple, Inuvik, conducted preliminary archaeological assessments of the sections of a proposed natural gas pipeline route that pass through the Inuvialuit Settlement Region and the Gwich'in Settlement Area. The work was undertaken on behalf of the AGA Consulting Group and the Alaska Gas Producers Pipeline Team. The field team flew the proposed pipeline route by helicopter, noting areas of archaeological potential from visual attributes to complement the zones previously identified during a mapping exercise. All of these areas of potential within the 5 km wide study corridor were visited and pedestrian surveys and subsurface testing were conducted. A total of 43 new archaeological, historic and contemporary sites were found in the ISR and GSA study areas, some of which had more than one component from different periods. The site components included seven from the precontact period, 30 from the historic and contemporary period, three most likely from the precontact period, one with components from both the precontact and historic periods, three whose age could not be determined, and several occurrences of palaeontological material. The precontact material included stone tools and materials used for manufacturing tools, some of the undated sites consisted of boulder markers that could have been built in the precontact period, and the historic sites included camps related to fishing, hunting, trapping and travel. Fossil marine shells were noted at several sites; a large section of fossilized tree trunk was found at another site. With the aid of Ms. Carpenter and Mr. Semple, we were able to interpret the function of most of the sites, all of which were recorded and located using GPS. We were also able to identify the owners of some of the contemporary historic sites.

We concluded that there is potential for the presence of additional sites within the corridor, particularly on bedrock and gravel exposures, ridges, rivers and lakes, especially at confluences, and other areas that offer access to resources, travel routes or a broad view of resource exploitation areas. Some of the sites found are sufficiently close to the proposed route alignment that some form of mitigation would be necessary should that alignment be selected. Mitigation could include avoidance or complete site documentation and excavation, for example. During our surveys we made note of wildlife sightings, and passed these on to other field crews. Included were several grizzly and black bears in groups or alone, eagles, owls, moose and cranes. Once the Mackenzie Valley route has been confirmed, this preliminary survey will be followed in subsequent seasons by more detailed surveys of the ISR and GSA sections and the sections that run through the Sahtu and Deh Cho areas, so that the entire 1500 km route alignment has been assessed.

117 **Archaeology**

Sauvage, Stephen
Parks Canada
7th Floor, 25 Eddy Street
Hull, Quebec K1A 0M5

Reference Number: Parks Canada Archaeology Permit # 01-00004
Region: IN **Location:** Tuktut Nogait National Park

Tuktut Nogait National Park Cultural Resource Inventory 2001

The final season of a three-year cultural resource inventory was conducted in Tuktut Nogait National Park of Canada in July, 2001. Tuktut Nogait is one of Canada's newest parks, located near the community of Paulatuuq (Paulatuk). The project was launched to find and record archaeological resources in the park, to assess their condition, make recommendations for management, and to offer some interpretations about the previous inhabitants and visitors to the area. The fieldwork in 2001 concentrated on the south half of the park, effectively completing the goal of surveying all key areas within park boundaries. Only surface sites were studied, and no artifacts were collected.

One of the main goals this year was to complete the survey of the Hornaday River within the Park boundary. The Hornaday is expected to be one of the most intensively used canoe routes for visitors in future years. As a result, it was deemed important to complete the survey of this river to ensure that all sites recorded along its course can be adequately managed and protected.

The Hornaday River survey was completed within two weeks, with two people walking on either side of the river, supported by two paddlers in two canoes on the river itself. In total the survey party walked and paddled nearly 120 km along the river, amounting to over 200 km when all the necessary detours and brief inland explorations of promising locations are factored in. Fifteen hours of helicopter flying time–over a four-day period– was also used to explore all areas in the park not examined in the previous years of surveys. A small crew of two persons conducted ground-based surveys from the helicopter base camp while the aerial survey was being undertaken.

Over 100 previously unrecorded sites were found and documented in 2001, which brings the total of known sites within the park to over 350. Almost all of the sites recorded this year are in generally good and stable condition.

The information collected so far suggests the land was occupied periodically, if not constantly, from Classic Thule times, and perhaps earlier. The land continues to be used today by local Inuvialuit residents and by visitors. The types of sites encountered this year are similar to those recorded in previous years, with the exception that no graves, qayaq rests, or isolated lithic scatters were observed. The types of sites recorded, in order of those most frequently found to less frequently found are: campsites, isolated markers, rock alignments, cache sites, isolated artifact finds, and undetermined. Other features within these sites, such as hearths, hunting blinds, and meat-drying areas were also recorded. Komatik parts were found at several previously unrecorded sites this year, but apart from these remnants, few artifacts were observed. Most sites appear to be temporary camps, representing a stay of perhaps a few nights, and some were larger camps that may have been occupied seasonally over many generations.

Cathy Cockney (Parks Canada) managed the project, and Norman Kudlak Jr. (from Paulatuuq) and Myrna Pokiak (Parks Canada) assisted in all aspects of the fieldwork. Archaeological direction was provided by Stephen Savauge, with assistance by Barry Greco (Parks Canada). Park wardens Angus Simpson and Michelle Theberge provided vital logistic support and advice, and safely paddled all the crew's gear for over two weeks on the Hornaday River.

Department of Resources, Wildlife and Economic Development

WILDLIFE RESEARCH PERMITS

118 **Wildlife**

Antoine, Don
Nahendeh Lands & Environmental Svcs LLP
General Delivery
Fort Liard, NT X0G 0A0

Reference Number: 2887
Region: DC **Location:** Fort Liard region of the Deh Cho

Objective: To conduct wildlife and habitat surveys for Anadarko Canada Corporation's exploration, drilling and production project in the Fort Liard area.
Species studied: All mammal and bird species and their signs

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119 **Wildlife**

Antoine, Don
Nahendeh Lands & Environmental Svcs LLP
General Delivery
Fort Liard, NT X0G 0A0

Reference Number: 2887
Region: DC **Location:** Shiha Transmission pipeline south of Fort Liard

Objective: To conduct the winter track counts along the Shiha Transmission Pipeline south of the Fort Liard area.
Species studied: Various

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120 **Wildlife**

Branigan, Marsha
RWED
BAG SERVICE # 1
Inuvik, NT X0E 0T0

Reference Number: 2191
Region: IN **Location:** NE Mackenzie Delta

Assessment of Grizzly Bear and Black Bear population size in the North-eastern Mackenzie Delta.
Objective: To obtain current estimates of the number of grizzly and black bears in the NE portion of the Mackenzie Delta; To assess the potential for use of DNA capture techniques to estimate numbers of grizzly and black bears in the NE portion of the Delta.
Species studied: Grizzly Bear, Black Bear

121 **Wildlife**

Carmichael, Lindsay
University of Alberta
Dept of Biological Sciences
Edmonton, AB T6G 2E9

Reference Number: 2892
Region: NS, SS, SA **Location:** North Slave Region, South Slave Region and the Sahtu Region

Objective: To conduct a survey of the population genetic structure, dispersal patterns and subspecies classification of Arctic Foxes.
Species studied: Arctic Foxes

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122 **Wildlife**

Carrière, Suzanne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2173
Region: NS **Location:** Taiga Shield Watershed Gordon and Tibbitt Lakes

Objective: To continue the "Multi-disciplinary study of post-fire effects on a Taiga Shield Watershed."
Species studied: All vegetation species, use by small mammals and birds; fur bearers, fish and insects

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123 **Wildlife**

Carrière, Suzanne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2186
Region: ALL **Location:** various locations of the NWT

Objective: To continue research on small mammals and snowshoe hare throughout various locations of the NWT.
Species studied: Snowshoe hare, Mice, voles, lemmings, shrews

124 **Wildlife**

Cluff, Dean
RWED
Forestry Building
P O Box 2668
Yellowknife, NT X1A 2P9

Reference Number: 2155
Region: NS and SS **Location:** various locations in the North and South Slave Regions of the NWT

Objective: To continue research on the genetics, movements and management of wolves in various locations of the NWT. To study wolves in the Bathurst & Beverly Caribou range, the Mackenzie Bison Range and the Fort Smith area.
Species studied: Wolf (Canis lupus)

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125 **Wildlife**

Cluff, Dean
RWED
Forestry Building
P O Box 2668
Yellowknife, NT X1A 2P9

Reference Number: 2176
Region: NS **Location:** southern tundra of the SGP

Objective: To continue monitoring wolf den sites in the NWT.
Species studied: Wolf (Canis lupus)

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126 **Wildlife**

Colpitts, Brad
Canada Public Health NWT\Nunavut
P O Box 1709
Yellowknife, NT X1A 2P3

Reference Number: 2175
Region: NS **Location:** North Slave Region

Objective: To conduct a Human Health and Environmental Risk Assessment of Arsenic Contaminated Soils in the Yellowknife area.
Species studied: hare, grouse, ptarmigan

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127 **Wildlife**

Cooley, Dorothy
Govt of the Yukon
P O Box 600
Dawson City, YT Y0B 1G0

Reference Number: 2796
Region: IN **Location:** Fort McPherson NWT

Objective: To conduct a Porcupine Caribou Body Condition Monitoring Program.
Species studied: Caribou

128 **Wildlife**

Davis, Rolph and Stephen Johnson
LGL Limited
9768 Second Street
Sidney, BC V8L 3Y8

Reference Number: 2174
Region: DC, SA, IN **Location:** Zama, Alberta to the ISR southern boundary (along proposed gas pipeline route).

Objective: To conduct ground and aerial surveys of migratory birds along the proposed gas pipeline route, Zama, Alberta to the ISR southern boundary.
Species studied: All waterfowl

129 **Wildlife**

Davis, Rolph
Tera Environmental Consultants
Suite 205, 925 7th Avenue SW
Calgary, AB T2P 1A5

Reference Number: 2880
Region: IN **Location:** Inuvialuit Settlement Region of proposed pipeline

Objective: To commence with the proposed late summer to fall waterfowl staging and waterbird surveys on proposed Mackenzie Valley pipeline route in the ISR.
Species studied: All waterfowl

130 **Wildlife**

Elkin, Brett
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2800
Region: ALL **Location:** Various Locations of the NWT

Objective: To conduct wildlife health and genetic monitoring by testing samples from sick\dead animals.
Species studied: All indigenous wildlife will be surveyed

131 **Wildlife**

Ferguson, Carl F
US Fish & Wildlife
Patuxent Wildlife Research Center
11500 American Holly Dr.
Laurel, MD USA 20708

Reference Number: 2196
Region: **Location:** Stagg River Banding Station

Objective: To continue waterfowl banding activities at the Stagg River Station.
Species studied: Mallards, Northern Pintail, Green-winged Teal

132 **Wildlife**

Gunn, Anne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2184
Region: NS, SS **Location:** Rae-Edzo, Kugluktuk, Umingmaktok, Cam Bay, Wekweti, Wha Ti, Rae Lakes and Lutsel K'e

Objective: To continue research on the movement of the Bathurst Caribou Herd, by continuing to acquire data on the weekly movements of the Bathurst caribou from satellite collars and to relate movements to ecological conditions (plant growth, insect activity and snow depth).
Species studied: Caribou

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133 **Wildlife**

Gunn, Anne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2795
Region: DC, SA **Location:** Selwyn-Logan Mackenzie Mountains

Objective: To conduct a survey on the distribution and movement of the South Nahanni Mountain caribou herd.
Species studied: Woodland Caribou

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134 **Wildlife**

Gunn, Anne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2798
Region: SA **Location:** Deline and Tulita regions

Objective: To monitor the movements of South Great Bear Lake caribou cows that have satellite collars and to determine seasonal movements from this telemetry and from hunter knowledge. This year, collars will be removed from two (2) cows in February, 2001.
Species studied: Caribou

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135 **Wildlife**

Hazzard, Shannon
U of Saskatchewan, Department of Biology
112 - Science Place
Saskatoon, SK S7N 5E2

Reference Number: 2791
Region: IN **Location:** Mackenzie Delta Region of the NWT

Objective: To conduct research on the habitat requirements of White-Winged and Surf Scoters in the Gwich'in Settlement Areas.
Species studied: White-Winged and Surf Scoters

136 **Wildlife**

Hines, Jim
Canadian Wildlife Service
Suite 301, 5204 - 50th Street
Yellowknife, NT X1A 1E2

Reference Number: 2168
Region: NS **Location:** YK highway (400 m each side, starting 16km west of YK & going westward along the highway 48km)

Objective: To continue research on the abundance and productivity of waterfowl and other aquatic birds breeding in the boreal forest.
Species studied: All dabbling ducks, diving ducks, loons, and grebes in area

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137 **Wildlife**

Hines, Jim
Canadian Wildlife Service
Suite 301, 5204 - 50th Street
Yellowknife, NT X1A 1E2

Reference Number: 2172
Region: IN **Location:** Banks Island #1 Bird Sanctuary, Anderson River Bird Sanctuary and Kendall Island Bird Sanctuary

Objective: To carry out studies of populations and habitat of Lesser Snow Geese in the Inuvialuit Settlement Region.
Species studied: Lesser Snow Geese

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138 **Wildlife**

Hudon, Dr. Joyce
Provincial Museum of Alberta
12845 - 102nd Avenue
Edmonton, AB T5N 0M6

Reference Number: 2158
Region: **Location:** South Central Mackenzie area of the NWT

Objective: To continue with year two (2) of the project characterization of a phenotypically various species, the Western Tanager, at the northern limit of its distribution in northern Alberta and south-central Mackenzie (NWT).
Species studied: Western Tanager

139 **Wildlife**

Johannesen, Daryl
Golder Associates Limited
10th Floor, 940 -6TH AVE SW
Calgary, AB T2P 3T1

Reference Number: 2794
Region: **Location:** Shiha Energy Transmission Pipeline

Objective: To continue the monitoring program for breeding birds and large mammals on the pipeline right of way.
Species studied: Ungulates, furbearers and any other wildlife or sign

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140 **Wildlife**

Johnstone, Robin
Golder Associates Limited
5007 Bryson Drive
Box 255 Postal Service 9600
Yellowknife, NT X1A 2R3

Reference Number: 2157
Region: NS **Location:** Snap Lake Diamond Project NWT

Objective: To conduct wildlife research for the Snap Lake Diamond Project for DeBeers and to continue its baseline environmental data collection for the Snap Lake Diamond Project and the surrounding area. Caribou studies were carried out during peak migration periods through the study area and across the winter road to monitor abundance and distribution. Wolverine tracks were counted and breeding bird densities were estimated and recorded along with known raptor nests. For the first time at Snap Lake, habitat use by grizzly bears was monitored and indexed.
Species studied: All indigenous wildlife

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141 **Wildlife**

King, Rodney J.
U.S. Fish and Wildlife Service
P O Box 2012
Mare Island, CA 94592

Reference Number: 2160
Region: IN **Location:** Mackenzie River Delta

Objective: To capture and band migratory birds under the Western Canada Cooperative Waterfowl Banding Program.
Species studied: Migratory waterfowl

142 **Wildlife**

Komers, Petr
Inuvialuit Environmental & Geotechnical Inc.
202 - 107 Mackenzie Rd
Bag Service #7
Inuvik, NT X0E 0T0

Reference Number: 2193
Region: IN **Location:** NE corner of Mackenzie Delta

Biophysical survey of baseline data for plant communities and animals

Objective: To map vegetation communities and wildlife habitats in the region, including bird communities, using GIS remote sensing and spatial modelling. Ground truthing and mapping analyses based on satellite imagery.
Species studied: All vegetation species, use by small mammals and birds

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143 **Wildlife**

Lawson, Nick
Jacques Whitford Environment Limited
P O Box 1680
810 5201 – 50th Avenue
Yellowknife, NT X1A 2P3

Reference Number: 2164
Region: **Location:** 200 km2 study area centred on the Gacho Kué/Kennady Lake property

Waterfowl, Shorebird, Songbird and Caribou surveys

Objective: To conduct an environmental survey on waterfowl, shorebirds, songbirds and caribou migration routes in the Kennady Lake area.
Species studied: Waterfowl, shorebirds, songbirds, caribou

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144 **Wildlife**

Lyvers, Philip
Natural Resources Institute, U of Manitoba
University of Manitoba
Winnipeg, MB
R3T 2N2

Reference Number: 2787
Region: SS **Location:** Lutsel K'e area

Objective: To study and monitor caribou body condition with the help of the Elders.
Species studied: Caribou

145 **Wildlife**

MacDonald, Bruce
Ducks Unlimited Canada
5017 – 50th Avenue
Yellowknife, NT X1A 1E8

Reference Number: 2166
Region: SA **Location:** Norman Wells LandSat Image within the Sahtu Settlement area

Objective: To conduct a survey on the waterbird ecology and water chemistry of Wetland Habitats. To determine distribution and abundance of waterbirds breeding within the Norman Wells study area; to determine the general characteristics of various wetlands and apply it across the entire Norman Wells study area and to provide this information to our partners.
Species studied: All mammal and bird species and their signs.

146 **Wildlife**

MacDonald, Bruce
Ducks Unlimited Canada
5017 – 50th Avenue
Yellowknife, NT X1A 1E8

Reference Number: 2170
Region: IN **Location:** Lower Mackenzie River Area within Inuvialuit and Gwich'in Settlement Areas

Objective: To conduct a survey on the waterbird ecology, vegetation landcover classification and ground based waterfowl research.

147 **Wildlife**

Madsen, Eric
Diavik Diamond Mines Inc
P O Box 2498
Suite 205, 5007 50th Ave
Yellowknife, NT X1A 2P8

Reference Number: 2162
Region: NS **Location:** Lac de Gras areas NWT

2001 Wildlife Monitoring Program for Diavik Diamonds Project
Species studied: Various bird, terrestrial mammal, and aquatic species

148 **Wildlife**

McLeod, Ian and Dale Semple
RWED
General Delivery
Aklavik, NT X0E 0A0

Reference Number: 2171
Region: IN **Location:** Richardson Mountains in the Gwich'in Settlement Area

Objective: To conduct a mini-harvest of muskoxen to provide meat for the community and to do parasite and disease research.
Species studied: Muskoxen

149 **Wildlife**

Moore, Steve
Rescan Environmental Services
Suite 908, 5201 - 50th Avenue
Yellowknife, NT X1A 3S9

Reference Number: 2152
Region: SS **Location:** Taltson River and Nonacho Lake areas

Objective: To conduct an aerial muskrat survey.
Species studied: Muuskrat

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150 **Wildlife**

Moore, Steve
EBA Engineering Consultants Ltd.
P O Box 2244
201 4916 - 49 Street
Yellowknife, NT X1A 2P7

Reference Number: 2178
Region: SA **Location:** Sahyoue (Grizzly Bear Mtn) s\w corner of GBL and Edacho (Scented Grass Hills) n\w corner of GBL

Objective: To gather baseline information on wildlife and vegetation to help fulfill step 5 of the protected areas strategy process (Sahyoue/Edacho NHPark).
Species studied: All mammal and bird species or their signs, main vegetation types.

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151 **Wildlife**

Moore, Steve
EBA Engineering Consultants Ltd.
P O Box 2244
201 4916 - 49 Street
Yellowknife, NT X1A 2P7

Reference Number: 2185
Region: NS **Location:** Tibbitt Lake to Contwoyto

Tibbitt to Contwoyto Winter Road Summer 2001 Field Program

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152 **Wildlife**

Mulders, Robert
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT
X1A 3S8

Reference Number: 2151
Region: DC **Location:** Fort Providence NWT

Lynx Ecology, Health and Harvest Monitoring at Fort Providence
Objective: To continue a lynx survey in the Ft. Providence Area
Species studied: Lynx

153 **Wildlife**

Mulders, Robert
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2169
Region: NS **Location:** Lac de Gras area

Objective: To monitor barren-ground grizzly bear habitat use in the Lac de Gras area.
Species studied: Grizzly bear

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154 **Wildlife**

Mulders, Robert
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2889
Region: SS **Location:** Fort Resolution, NT

Objective: To commence the Martin Harvest Study in the vicinity of Fort Resolution.

---

155 **Wildlife**

Nagy, John and Nic Larter
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2154
Region: IN **Location:** NW Victoria Island

Objective: To capture 5 caribou and outfit them with satellite radio collars in order to determine seasonal ranges & migration routes used by Minto Inlet caribou; determine movement patterns; locate caribou in late June\early July to determine productivity (# of calves born per 100 cows) and calf survival rates; determine genetic relatedness.
Species studied: Caribou

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156 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2156
Region: IN **Location:** Sachs Harbour on Banks Island

Objective: To herd and harvest a maximum of 20 muskox in the Sachs Harbour area to be used for 1) Muskox Mini-Harvest for Meat Quality & Parasite Research; 2) Survey & Pathology of abomasal parasites in free-ranging muskoxen on Banks Island; 3) The use of pre and post slaughter technologies to improve meat quality in Muskox.
Species studied: Muskoxen

157 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2165
Region: IN **Location:** Sachs Harbour on Banks Island

Objective: To conduct a mini-harvest of muskoxen at Sachs for meat quality and parasite research.
Species studied: Muskoxen

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158 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2187
Region: IN **Location:** Banks Island

Objective: To continue the survey of the Banks Island Caribou and Wolf populations.
Species studied: Peary Caribou, Muskoxen, Wolf

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159 **Wildlife**

Nagy, John and Liz Gordon
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2188
Region: IN **Location:** Northwest Victoria Island

Objective: To continue the survey of Peary Caribou, Muskox and Wolf populations on NW Victoria Island.
Species studied: Peary Caribou, Muskoxen, Wolf

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160 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2189
Region: IN **Location:** Richardson Mountains

Objective: To carry out the Richardson Mountains Dall's Sheep Population and Lungworm Infection Survey
Species studied: Dall's sheep (Ovis dalli dalli)

161 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2195
Region: IN **Location:** Banks Island

Objective: To estimate calf production, recruitment and over winter survival of Peary Caribou on Banks Island.
Species studied: Peary Caribou

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162 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2799
Region: IN **Location:** Sachs Harbour on Banks Island

Objective: To conduct a mini-harvest of muskoxen for meat quality and parasite research.
Species studied: Muskoxen

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163 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2884
Region: IN **Location:** Inuvialuit Settlement Region

Objective: To conduct an assessment of Grizzly Bear population and size in the northern portion of the Mackenzie Delta in the Inuvialuit Settlement Region.
Species studied: Grizzly bear

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164 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0P0

Reference Number: 2190
Region: DC **Location:** Fort Providence Area

Mackenzie Wood Bison population monitoring project
Objective: To measure calf, yearling, and bull to cow ratios during the post calving period; Monitor the Mackenzie herd for the presence of brucellosis and tuberculosis.
Species studied: Bison

165 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0P0

Reference Number: 2192
Region: SS **Location:** Slave River Lowlands

Slave River Lowland's Bison population studies
Objective: To collect tissue samples to determine genetic diversity; collect fecal samples to determine prevalence of Johne's disease and other parasites and measure calf, yearling, and bull to cow ratios during post calving period for the Hook Lake herd.
Species studied: Bison

---

166 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0P0

Reference Number: 2194
Region: SS **Location:** Fort Resolution

Salvage and propagation of Hook Lake Wood Bison
Species studied: Bison

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167 **Wildlife**

Popko, Richard
RWED
P O Box 130
Norman Wells, NT X0E 0V0

Reference Number: 2199
Region: SA **Location:** Tulita, Fort Good Hope and Norman Wells areas.

Objective: To conduct a study to determine the number of active beaver lodges in the Sahtu Settlement Area.
Species studied: Beavers

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168 **Wildlife**

Prendergast, Dr. Brian J.
Dept of Psychology, University of Ohio
Townshend Hall
1855 Neil Avenue
Columbus, OH 43210

Reference Number: 2161
Region: DC **Location:** Fort Providence and Kakisa areas

Objective: To collect 20 deer mice of each sex for use in laboratory investigation on the coordination of season reproduction.
Species studied: Deer mice

169 **Wildlife**

Slattery, Stuart
Ducks Unlimited Canada
P O Box 1160
Stonewall, MB R0C 2Z0

Reference Number: 2167
Region: SA **Location:** Mackenzie Valley (Sahtu Settlement area)

Objective: To conduct a survey on the demographic rates and factors limiting breeding duck populations.
Species studied: Breeding population of ducks and other waterfowl

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170 **Wildlife**

Snowshoe, Norman
Gwich'in Tribal Council
P O Box 1509
Inuvik, NT X0E 0T0

Reference Number: 2179
Region: IN **Location:** Mackenzie River Delta

Objective: To conduct research of contaminants in beaver and muskrat of the Mackenzie River Delta.
Species studied: Beaver and Muskrat

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171 **Wildlife**

Snowshoe, Norman
Gwich'in Tribal Council
P O Box 1509
Inuvik, NT X0E 0T0

Reference Number: 2180
Region: IN **Location:** Mackenzie River Delta

Objective: To conduct research of contaminants in beaver and muskrat of the Mackenzie River Delta.
Species studied: Beaver and Muskrat

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172 **Wildlife**

Snowshoe, Norman
Gwich'in Tribal Council
P O Box 1509
Inuvik, NT X0E 0T0

Reference Number: 2181
Region: IN **Location:** Mackenzie River Delta

Objective: To conduct research of contaminants in beaver and muskrat of the Mackenzie River Delta.
Species studied: Beaver and Muskrat

173 **Wildlife**

Solberg, John W
US Fish & Wildlife
3425 Miriam Avenue
Bismarck, ND 58501

Reference Number: 2183
Region: DC **Location:** Mills lake Marsh on the Mackenzie River app 18 miles west of Ft. Providence

Objective: To continue banding activities at the Mills Lake Station under the Western Canada Cooperative Waterfowl Banding Program.
Species studied: Mallards, Northern Pintail, Green-winged Teal

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174 **Wildlife**

Stefan, Carol
AGA Consulting Group
1000 940 6th Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2877
Region: IN **Location:** Inuvialuit Settlement Region

Objective: To conduct reconnaissance wildlife surveys on the proposed Mackenzie Valley pipeline in the Inuvialuit Settlement Region.
Species studied: All mammal and bird species and their signs.

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175 **Wildlife**

Stefan, Carol
AGA Consulting Group
1000 940 6th Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2878
Region: IN **Location:** Inuvialuit Settlement Area

Objective: To do reconnaissance wildlife surveys on the proposed Mackenzie Valley Pipeline route in the Inuvialuit Settlement Area.
Species studied: All mammal and bird species and their signs.

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176 **Wildlife**

Stefan, Carol
AGA Consulting Group
1000 940 6th Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2879
Region: IN **Location:** Inuvialuit Settlement Area

Objective: To conduct reconnaissance wildlife surveys on the proposed Mackenzie Valley pipeline route in the Inuvialuit Settlement Region.
Species studied: All mammal and bird species and their signs.

177 **Wildlife**

Stefan, Carol
AGA Consulting Group
1000 940 6th Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2882
Region: IN **Location:** Gwich'in Settlement Area

Objective: To commence reconnaissance wildlife surveys on the proposed Mackenzie Valley pipeline route in the Gwich'in Settlement Area.
Species studied: All mammal and bird species and their signs.

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178 **Wildlife**

Stefan, Carol
AGA Consulting Group
1000 940 6th Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2886
Region: IN **Location:** Sahtu Settlement Region

Objective: To conduct reconnaissance wildlife surveys for the proposed Mackenzie Valley pipeline route in the Sahtu Settlement Region.
Species studied: All mammal and bird species and their signs.

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179 **Wildlife**

Swystun, Heather
University of Northern British Columbia
P O Box 1864
Inuvik, NT X0E 0T0

Reference Number: 2153
Region: IN **Location:** Mackenzie Delta region of the NWT

Objective: To conduct research on the reproductive ecology of Tundra Swans.
Species studied: Tundra Swans

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180 **Wildlife**

Veitch, Alasdair
RWED
P O Box 130
Norman Wells, NT
X0E 0V0

Reference Number: 2792
Region: SA **Location:** Norman Wells, NWT

Objective: To conduct a survey on the population size and composition of moose in the Norman Wells area.
Species studied: Moose

181 **Wildlife**

Veitch, Alasdair
RWED
P O Box 130
Norman Wells, NT
X0E 0V0

Reference Number: 2197
Region: SA **Location:** Norman Wells area

Objective: To continue testing the relative efficiency of Museum Special and Sherman traps for small mammal capture.
Species studied: Red-backed vole, Tundra vole

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182 **Wildlife**

Veitch, Alasdair
RWED
P O Box 130
Norman Wells, NT X0E 0V0

Reference Number: 2198
Region: SA **Location:** Willow Lake

Objective: To continue the duck banding program at Willow Lake in conjunction with the Western Canada Cooperative Duck Banding Program.

---

183 **Wildlife**

Veitch, Alasdair
RWED
P O Box 130
Norman Wells, NT X0E 0V0

Reference Number: 2793
Region: SA **Location:** Norman Wells region of the NWT

Objective: To conduct a ptarmigan and grouse banding program in the Norman Wells region of the NWT.
Species studied: ptarmigan and grouse

---

184 **Wildlife**

Veitch, Alasdair
RWED
P O Box 130
Norman Wells, NT X0E 0V0

Reference Number: 2888
Region: SA **Location:** Mackenzie Mountais in the Norman Wells area (Canyon Range)

Objective: To conduct an investigation of the Microbiological Fauna of Dall's Sheep in the Mackenzie Mountains in the Norman Wells area.
Species studied: Dall's sheep (Ovis dalli dalli)

185 **Wildlife**

Voelzer, James F.
U.S. Fish and Wildlife Service
Room 125, 911 N E 11th Avenue
Portland, OR 97232-4181

Reference Number: 2159
Region: ALL **Location:** Mackenzie River drainage area of the NWT.

Objective: To conduct aerial surveys of waterfowl (size and species). This survey is in conjunction with the US\Canada waterfowl population surveys.
Species studied: breeding population of ducks and other waterfowl

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186 **Wildlife**

Waltari, Eric and Joseph Cook
Curators of Mammals
University of Alaska
907 Yukon Drive
Fairbanks, Alaska 99775

Reference Number: 2797
Region: NS **Location:** Tundra 250 km north of Yellowknife

Objective: To conduct research on genetic relationships of the Arctic Hare and its parasites.
Species studied: Arctic hare

---

187 **Wildlife**

Warner, Keith D.
Canadian Wildlife Service
115 Perimeter Road
Saskatoon, SK S7N 2E5

Reference Number: 2177
Region: IN **Location:** Banks Island # 1 Bird Sanctuary, Anderson River Bird Sanctuary, Kendall Island Bird Sanctuary

Objective: To continue studies estimating the population growth of Lesser Snow Geese on Banks Island # 1 Bird Sanctuary and Anderson River and Kendall Island Bird Sanctuary.
Species Studied: Lesser Snow Geese

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188 **Wildlife**

Williams, Scott
BHP Diamonds Inc.
1102 - 4920 - 52nd Street
Yellowknife, NT X1A 3T1

Reference Number: 2163
Region: NS **Location:** Ekati Diamond Mine

Objective: To commence the 2001 Wildlife Effects Monitoring Program at the Ekati Diamond Mine area to test impact predictions and efficacy of mitigation measures.
Species studied: All species of waterbirds encountered, grizzlies, wolves, wolverine, foxes, etc.

Department of Fisheries and Oceans

FISHERIES SCIENTIFIC LICENCES

189 **Fisheries**

Cobb, Donald
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

Reference No: SLE-01/02-241
Location: Pokiak Channel in the Mackenzie River

Fish Monitoring in the Mackenzie River

Objective: To initiate a long term monitoring program to provide communities with information on the health of fish stocks at the mouth of the Pokiak Channel in the Mackenzie River.

---

190 **Fisheries**

Cobb, Donald
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

Reference No: SLE-01/02-242
Location: Tuktoyaktuk Harbour and Shingle Point

Fish Stock Monitoring at Tuktoyaktuk Harbour and Shingle Point

Objective: To initiate a long term monitoring program to provide communities with information on the health of fish stocks within Tuktoyaktuk Harbour and Shingle Point.

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191 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT XOE 0T0

Reference No: SLE-01/02-219
Location: Eskimo Lakes

Baseline Survey: Eskimo Lakes

Objective: To collect baseline information - size, sex, age structure and fish abundance - and to determine the present exploitation rates of fish in the system.

192 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT XOE 0T0

Reference No: SLE-01/02-239
Location: Rat River

Dolly Varden Migrant Run at Rat River

Objective: To obtain an ongoing index of the strength of sea run migrants of dolly varden at Rat River as part of the community harvest program.

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193 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0

Reference No: SLE-01/02-243
Location: Cape Perry

Range of Seal Activities at Cape Parry

Objective: To collect information on the distribution and movements, depth and duration of dives and important feeding locations of ringed seals.

---

194 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0

Reference No: SLE-01/02-244
Location: Rat River

Char Data in the Rat River

Objective: To obtain information on size, sex and maturity and collect data on the numbers of spawning char at Fish Hole on the Rat River.

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195 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

Reference No: SLE-01/02-201
Location: between Kodiak Lake and Lac de Gras

Waterflow in the Koala Watershed

Objectives: To determine if there is sufficient waterflow to allow the potential passage of fish in lakes and streams in the Koala watershed between Kodiak Lake and Lac de Gras. To observe and document fish movement between Kodiak Lake and Lac de Gras utilizing 40 radio telemetry tags and up to 400 floy tags.

196 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

Reference No: SLE-01/02-202
Location: Kakisa River

Grayling Monitoring
Objective: To monitor the recovery of the grayling runs by measuring length, weight, sex and maturity and collecting ageing structures. To collect specimens for use in training for the surgical implantation of radio tags.

---

197 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

Reference No: SLE-01/02-203
Location: Providence Creek

Training for Surgical Implantation
Objective: To obtain specimens for use in the training for surgical implantation of radio tags.

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198 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

Reference No: SLE-01/02-206
Location: Trout Lake

Trout Lake Monitoring
Objective: To monitor the sport fishery, conduct a creel census, and collect aboriginal fish use data.

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199 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

Reference No: SLE-01/02-246
Location: Red Knife River

Heavy Metal Analysis
Objective: To collect baseline data and tissue samples for heavy metal analysis from fish at the Redknife River.

200 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

Reference No: SLE-01/02-251
Location: Tathlina Lake

Stock Structure of Walleye

Objective: To assess the stock structure of the walleye population and determine a total allowable catch and commercial quota for walleye in Tathlina Lake.

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201 **Fisheries**

Mochnacz, Neil
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

Reference No: SLE-01/02-216
Location: Mackenzie and Liard Rivers

Bull Trout Distribution and Habitat

Objective: To identify bull trout distribution and habitat in the Mackenzie and Liard Rivers and tributaries in the Deh Cho and Sahtu regions.

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202 **Fisheries**

Reist, James
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

Reference No: SLE-01/02-233
Location: Great Slave Lake

Sampling in Great Slave Lake

Objectives: To collect a sample of cisco to explore the distribution and abundance of shortjaw cisco across Canada under the Species at Risk project. To collect a sample of lake trout for the following purposes: 1) ongoing genetic study addressing local lake trout diversity and distribution; 2) a study reconstructing growth histories with comparisons between present and archival materials; and 3) a study examining occurrence and distribution of multiple lake trout morphotypes. To collect a sample of sculpins for distribution, genetic and diversity study.

203 **Fisheries**

Stephenson, Sam
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0

Reference No: SLE-01/02-247
Location: all waterbodies in the NWT

Fish Abundance and Species in the NWT

Objective: To document changes in various fishes and positively identify vagrant species in all waterbodies of the NWT.

---

204 **Fisheries**

Stephenson, Sam
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0

Reference No: SLE-01/02-249
Location: Mackenzie River/Beaufort Sea

Fish Sampling Video

Objective: To collect fish samples in the Mackenzie River/Beaufort Sea for use in a fish sampling instructional video.

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205 **Fisheries**

Tallman, Ross
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

Reference No: SLE-01/02-223
Location: Keith Arm of Great Bear Lake

Trout Baseline Survey: Keith Arm of Great Bear Lake

Objective: To collect baseline data on trout size and age structure, growth, mortality and fecundity.

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206 **Fisheries**

Tyson, J. David
Department of Fisheries and Oceans
Suite 101 Diamond Plaza
5204-50th Avenue
Yellowknife, NT X1A 1E2

Reference No: SLE-01/02-208
Location: All water bodies in the NWT

Habitat Impacts on Fish

Objective: To provide timely support for investigations of habitat impacts, prevent or mitigate impact on fish by relocating and to take other action to prevent, mitigate and/or investigate impacts on fish and fish habitat.

GLOSSARY OF SCIENTIFIC TERMS

Active layer	the area where the soil freezes and thaws above the permafrost
Aeration	pumping air into a medium
Aeromagnetic survey	surveys from aircraft that make use of the magnetic field caused by magnetized rocks in the Earth's crust to make estimates about underlying geology of a given area such as distribution of potential resources
Algae	simple living things that are composed of one or more cells. Most algae are similar to plants that do not have roots or flowers
Alkali	a soluble salt obtained from the ashes of plants and consisting largely of potassium or sodium carbonate
Analytical	a detailed examination of the structure or some other parameter of a substance or thing
Anatomy	the science that deals with body structures of animals or plants
Anoxic	a situation where oxygen is present in very low amounts or not at all
Anthropogenic	of, relating to, or resulting from the influence of human beings on nature (ie: source of pollution)
Anthropometric	measurements of the body
Anticline	a folded upward rock that has a center that contains stratigraphically older rocks
Aquatic Biota	all living organisms in the aquatic environment
Archival	pertaining to a collection of documents
Arsenic	a chemical element that is gray in colour and that is highly poisonous with no taste
Artifacts	an old tool, weapon or other human-made thing from the past
Asexual	an organism that reproduces without the aid of a partner and who passes on all of its genetic information
Asphodel	a herb like plant
Assessed	from observations, estimated result(s) of the outcome are made
Attributed	giving a cause to affect or outcome
Aufies	ever-thickening sheets of ice formed by springs that freeze in layers 2 - 5 meters thick over existing river ice, often breaking away to become navigational hazards
Autoecology	the branch of ecology that deals with the biological relationship between an individual organism or an individual species and its environment
Awl	a tool that is pointed for poking holes in leather or wood

Bacteria	tiny living single cells that can only be seen through a microscope
Baseline	the standard
Benthic	organisms that live at the bottom of a body of water
Benthos	the bottom of the ocean or body of water
Bentonite	a rock composed of clay-like material formed by volcanic ash or tuff. Bentonite beds are common in shade or limestone from the Paleozoic time
Biochemistry	study of chemical processes in living organisms
Biodiversity	pertaining to the variety of species in an area
Biogenic	produced by living organisms or biological processes
Biogenic emission rates	the speed that volatile organic compounds are released into the surrounding environment
Biogeography	the science that deals with distribution of all living organisms
Biomass	the total amount of all living material within a specific volume of the environment
Biomes	distinct areas of the Earth that are common in climate conditions, life forms and physical features like the tundra or woodland
Biostratigraphy	identification and differentiation of rocks based on the types of fossils they contain
Bituminous	a term used to describe many forms of solid/semi-solid hydrocarbons that are either synthetic or found in nature
Brachiopods	marine invertebrates characterized by their filamentous feeding organs and two bilaterally symmetrical valves that make up its shell
Brittle stars	a marine organism belonging to the same family as sea stars and sea urchins that is commonly fond in Arctic regions in shallow waters
Calcrete	a mix of gravel and sand cemented by calcium carbonate
Carnivore	a flesh eating animal
Characterized	to describe something
Chlorophyll	a pigment in plants that give them their green colour and which absorb energy from the sun. Plants use Chlorophyll to change carbon dioxide and water into food and oxygen
Classification	organize into groups or categories
Cockles	a sea clam used for food with a shell that looks like a heart
Compliance	an agreement with something
Comprehend	being able to understand
Comprehensive	conveying or including everything or almost everything
Coniferous woodland	a wooded area that is dominated by evergreen trees

Conifers	a group of woody plant commonly known as evergreen trees such as pine, spruce or fir that bears cones
Connectivity	how well something is able to connect or relate with another thing
Convection	a transfer of heat through a gas or liquid by currents
Coral	a hard substance like stone found in tropical seas. Coral is made from the skeletons of tiny marine organisms
Core	a part removed from the interior of a mass especially to determine the interior composition
Correlated	a mutual relation between two comparable things
Cosmopolitan	consisting of a group of individuals from around the world
Crinoids	a sea urchin that has feathery arms
Cumulative	things that add together
Dark septate endophytes	tiny fungi that grows underground into tree roots
Deducing	draw a conclusion
Deformation	a measurable change in structure
Degradation	to reduce something or to place something at a lower level
Density	a quantity of mass per unit volume
Devonian	a period between 410 and 370 million years ago when terrestrial plants began to spread across the land as well as much development in aquatic animals such as fish and other shell fish
Diamiction	glacial soils with clay, sand, gravel and boulders mixed together
Diatom	microscopic one-celled marine or fresh water alga having cell walls that contain silica (a white colorless glass-like solid that doesn't dissolve)
Disjunct	refers to separate societies
Diversion	a changing of the direction in which something is going
Dorsal fin	the fin on an aquatic animal that is located on its backside
Ecology	the science that deals with how living organisms live in relation to each other and their environment
Ecological integrity	ensuring the relationship in plant and animal communities remains healthy
Ecophysiological	pertaining to an individual organism's response to the factors in the environment such as temperature
Ecosystem	living organisms and non-living structures that work together to form a system
Effluent	something that flows out from a main source, such as sewage or waste matter
Electro-fishing	using electricity to stun and kill fish, usually used during scientific scenarios
Electromagnetic	magnetism that is caused by electricity

Emissions	something that is radiated outward or discharged from a source
Endophytes	a plant that grows underground or under a tree
Eocene	a time when small mammals began to develop on Earth between 54 and 38 million years ago
Epoch	a period of time during which something important developed or happened
Erosion	group of natural processes (weathering, disintegration, abrasion, corrosion, transportation) where the Earth's surface is worn away and removed
Eskers	a long, narrow ridge of coarse gravel deposited by a stream flowing under a decaying glacial sheet of ice
Estuary	a place where coastal seawater comes into contact with the current of a freshwater stream
Evolution	a process where different species come into existence by differentiation and genetic mutations from common ancestors over a long period of time.
Excavated	extracting or revealing something by removal of the surrounding earth
Extant	organisms that are still present on the Earth today
Fauna	animal life of a particular region, environment, or geological period
Fibril	a smaller unit of an individual fibre
Flora	the plants of a particular region, environment or geological region
Fluvial	pertaining to something's existence or growth around a stream or river
Fossil	trace of an organism of a past age, embedded and preserved in the Earth's crust
Fungi	a kingdom of heterotrophic organisms that produce spores
Gastropod	an organism that characteristically has a single, usually coiled shell or no shell at all, a ventral muscular foot for locomotion, and eyes and feelers located on a distinct head
Gender	one's characteristics or traits determined socially as a result of one's sex
Genetic	pertaining to an organism's traits or characters being linked to genes
Genera	a group of organisms that share common characteristics
Geochemistry	a science that deals with the chemical composition of and chemical changes in the solid matter of the Earth
Geochronological	the chronology of the earth's history as determined by geologic events and not by human history
Geomorphologic	pertaining to the physical features of the Earth's surface
Glacial refugia	an area isolated by glaciers where little environmental change took place
Glyptostrobus pensilis	a species of conifer that has the common name of water pine
Gneisses	a banded or foliated metamorphic rock, usually of the same composition as granite

Grams	a unit of measurement for mass
Granitic rock	light colored coarse-grained rock that was formed at great depths such as quartz
Habitat	a place where organisms can live
Heterogeneous	a situation where something is in a mixed composition
Holocene	the most recent 11,000 years of the Earth's history starting at the end of the last major ice age, which has been relatively warm
Host specificity	how selective a parasite is when looking for a host to live on as a source of food
Hydraulic	pertaining to movement caused by water
Hydrology	science dealing with the properties, distribution and circulation of water
Implemented	to put into effect
Inoculated	to introduce to an organism
Iron	a metallic element used for making tools and essential for all living organisms' survival
Kitigaaryumiut	the traditional gathering place where the Kitigaaryumiut people would hunt beluga and hold celebrations
Larix	a genus of boreal trees commonly known as Larch, the range of which includes the circumpolar region and some mid-high altitudes in the south
Larvae	a premature stage for an insect where it feeds a lot before it becomes a pupa
Latitude	a measurement of the angular distance from the equator to a given point on the Earth's surface
Lenticular	resembling the shape of a cross section of a lens
Liliaceae	a family of mostly perennial herb-like plants with about 280 genera and 4,000 species
Limestone	a sedimentary rock that contains mostly calcium carbonate and can be formed by either inorganic or organic processes
Limnology	the scientific study of the life and phenomena of fresh water, especially lakes and ponds
Manganese	a metallic element that is used to make alloys
Metamorphosed rock	any rock derived from pre-existing rocks by changes in response to environmental factors such as temperature, pressure and shear stresses
Metasquoia	a Dawn Redwood that belongs to the conifers
Methane	the simplest hydrocarbon that is the main ingredient in natural gas
Microbes	bacteria that can cause disease
Microclimate	the climate close to Earth's surface or the climate of a small area
Microfossils	a very small fossil that needs the aid to a microscope to view it

Microorganisms	organisms that must be viewed under a microscope, such as bacteria or a virus
Migration	the long range movement of a group of animals based on the seasons
Molecular analysis	a detailed look at the chemical structure and properties of a molecule
Moraine	a mound of rock debris carried and deposited by a glacier
Morphometric	measurements taken at designated places to compare individuals of a species
N-butanol	an isomer of the alcohol butanol - C4H9OH
Nested plots	in an experiment, designated areas are placed out along a transect line to gather data
Oligotrophic	a pond or lake lacking in plant nutrients and having a large amount of dissolved oxygen throughout
Organic	material pertaining to plants or animals
Outcrop	a portion of bedrock or other stratum protruding through the soil level
Overlie	sedimentary or volcanic rock that lays on top of older rock
Paleo-Eskimo	the people who migrated across the north around 2000 years ago. It is not known if they are the ancestors of the modern Inuit.
Paleoecological	a relationship or study of ancient organisms and how they related to their ancient environment
Paleoenvironmental	an environment that existed in the past
Paleohydrological	a study regarding the ancient water features preserved in rocks
Paleolimnological	a study regarding the ancient lake conditions by looking at its sediment
Parameter	one set of measurable factors, such as the temperature and pressure, that define a system and determine its behavior and are varied in an experiment
Parameterized	expressing something in terms of a parameter
Pertinent	something is relevant to the topic
Physiological	pertaining to the physical structures and functions of living organisms
Phytoplankton	a group of plant-like plankton that all sea animals depend on either directly or indirectly
Pixel	a single unit of a television or computer screen that is responsible for the picture
Pleistocene	an age of notable ice ages and development of humans between 2,000,000 and 10,000 years ago
Polycycle thaw slump	a depression with underground drainage that reflects many base-leveling for more than one sea-level
Postglacial	relating to or occurring during the time following a glacial period
Putative	to assume something

Qualitative	complete detailed descriptions usually taken from a small sample that allows for distinctions to be drawn from the data
Quantitative	use of large amounts of data where statistics can be applied to interpret the data
Radiocarbon dating	the determination of the approximate age of an ancient object, such as an archaeological specimen, by measuring the amount of carbon 14 it contains
Raptor	a bird of prey such as an eagle, falcon or osprey
Reef	a structure formed by coral and its remains that lie above the bottom sediment
Reticular	a system that adopts a network design
Revitalization	to give new life or vitality to something
Sandstone	sedimentary rock that contains fine-grained fragments that are firmly cemented together
Satellite imagery	computer images generated by a satellite which allow researchers to look at a specific area and monitor surface features such as vegetation
Sediment	solid fragment material that occurs from the weathering of rocks. In water it is material that has settled from a state of suspension
Sedimentary rock	rock derived from loose particles that have accumulated over time
Sedimentation	the process where small particles are moved and deposited to accumulate into layers
Seiche events	an environmental event such as pressure or especially high winds that generate a change in a lakes water level or wave level
Seismic	pertaining to vibrations in the Earth, both natural and induced
Shovel testing	a crude test where a sample of ground is taken by use of a shovel
Siltstone	silt having the texture of shale
Skeptical	to have doubt
Solutes	a substance that has dissolved
Species	a group of organisms that share common characteristics that group them together and also distinguish them from others
Sponges	aquatic organisms that characteristically have a porous skeleton composed of fibrous material and often form colonies attached to an underwater surface
Stone flakes	debris left over from a rock while making tools
Stratified	a system that is set up in layers or strata
Stratigraphic	formation of rock where different layers can be picked out based on type and age of the rock
Subsidence	to flatten out so as to form a depression; to sink or fall to the bottom
Succession	a progressive change in the biological community as a result of a response from species to the changing environment

Surficial	pertaining to something that is on the surface
Suspension	a situation where the medium is able to support the weight of the particles trapped inside it
Systematic	done according to a plan
Thermatic	pertaining to a cause of heat
Thermokarst	sinking holes, caves and underground drainage that are produced in regions with permafrost from melting of ground ice and settling of the remaining ground
Thermokarst lakes	lakes where water is trapped in a cut off karst region
Thule Eskimo	a culture which arose in Northwest Alaskan about 1100 years ago. They are considered to be the ancestors to many of the modern day Inuit.
Topography	a description of the surface of a given area
Trace metals	a metal that is not essential in the sample but is found in small quantities
Tracheid	a pitted long cylindrical tube in the xylem of a plant used for water conduction
Transect	an imaginary line across a surface where observations are made
Tributary	a place where a stream feeds into a larger stream or lake
Trilobite	an ancient group of marine organisms that represents some of the oldest arthropods known and whose fossils are often found in rock
Turbid	stirred up material suspended in a medium leaving it unclear and opaque
Unconformity	a large break in the chronological sequence layers of rock
Vascular plants	a group of plants that have developed a good conductive system and that have structural differentiation
Velocity	rate of occurrence or action; quickness of motion
Volatile	an easily vaporized compound
Watershed	the region draining into a river, river system, or other body of water
Younger Dryas	the most significant rapid climate change event that occurred during the last deglaciation of the North Atlantic region

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