# Fish and Wildlife Branch
# **Project Summaries**
# 2016-17

Yukon
Environment
*Environnement*

cover photo: Peter Mather

Copies available from:
Yukon Department of Environment
Fish and Wildlife Branch, V-5
Box 2703, Whitehorse, Yukon Y1A 2C6
Phone (867) 667-5715 Fax (867) 393-6405
Email: environmentyukon@gov.yk.ca

Also available online under publications at: www.env.gov.yk.ca

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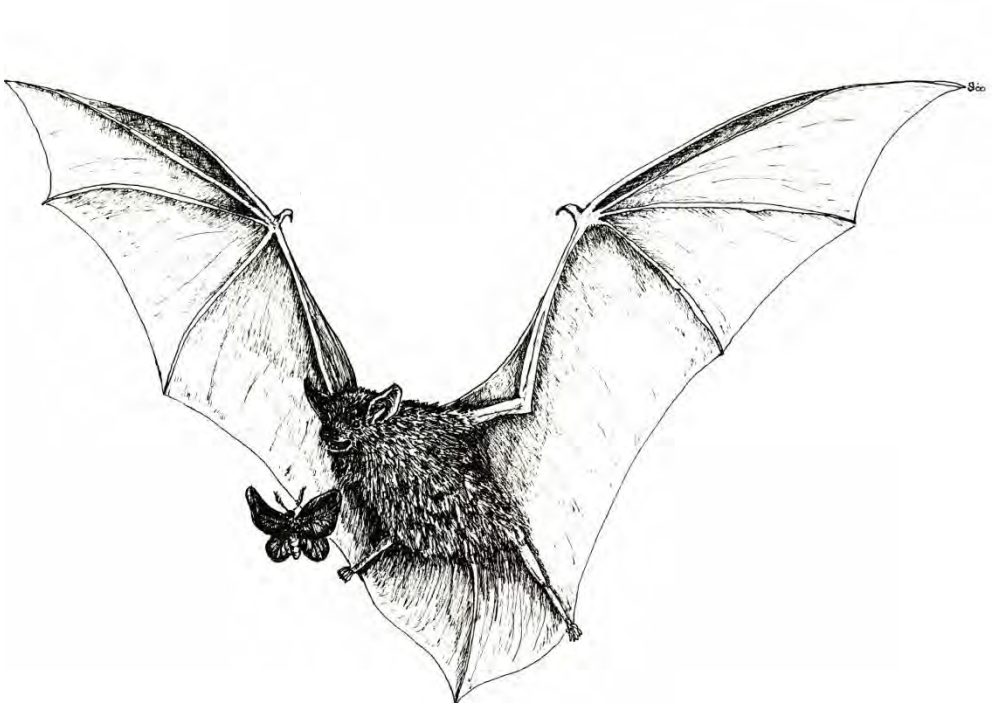


Yukon
Environment

# Biodiversity Science and Management

**Thomas Jung,** Senior Wildlife Biologist

## Project Description: What we are going to do

Assessing and monitoring pressures on biodiversity partly fulfill Yukon's commitment to the Canadian Biodiversity Strategy. To inform the state of biodiversity in Yukon, we will conduct monitoring programs for a key prey species (snowshoe hare), and a top predator (gyrfalcon). Their responses to changing conditions help us understand and predict the response of other northern species.

*Impact of Climate Change on Snowshoe Hare Survival:* This project will help us understand how snowshoe hare adapt to rapid changes in the timing and duration of snow cover.

*Gyrfalcon Monitoring:* This project will help us track the population status and trend of gyrfalcons in the Coast Mountains.

## Management Implications: Why we are doing it

Through these projects we will monitor species important to Yukon biodiversity, and provide information on the impacts of climate change and human activities on these species—a key departmental priority for 2016.

Snowshoe hare are an important food source for boreal forest predators. The Kluane snowshoe hare survival study will help us determine how climate change and different snow conditions are affecting the survival of snowshoe hare.

Southern Lakes gyrfalcon monitoring will allow us to monitor the gyrfalcon population in the region and help inform British Columbia's harvest management and permit allocations for this species.

In addition, these projects contribute to the monitoring of harvested small game species and birds; species which are not otherwise monitored.

## Project Activities: How we will get it done

*Impact of Climate Change on Snowshoe Hare Survival:* This is the fifth of a proposed 5 year cooperative study with the University of British Columbia and the University of Toronto. The work is being carried out by our university partners.

For year 5, we will capture and radio-collar up to 30 snowshoe hare in early spring (April 2016) near Kluane Lake. We will monitor their survival by radio-telemetry and explore how survival relates to coat colour and snow conditions.

*Gyrfalcon Inventory:* In June 2016, we will conduct a 1-day aerial survey of known gyrfalcon nesting territories in the Coast Mountains, including portions of Kusawa Territorial Park. We will monitor which territories are occupied by nesting pairs, and the number of chicks in nests (their reproductive success). Results will be shared with the British Columbia Ministry of Environment by the end of June 2016, and will be used to assess harvest options that ensure a conservative harvest.

# Species at Risk Inventory and Monitoring

**Thomas Jung,** Senior Wildlife Biologist

## Project Description: What we are going to do

This project has three components, each aimed at providing information on the status of species at risk in Yukon. We will use this information to inform territorial and national/international status assessments; and to aid the development and implementation of national management plans.

*Bat Monitoring and Conservation:* This project will allow us to monitor changes in the diversity and abundance of Yukon bats, and inform the re-assessment their status by COSEWIC and NatureServe. We will also be able to highlight how bats provide natural pest (mosquito) control in Yukon government campgrounds, alleviate problems with bats in picnic shelters, and provide wildlife viewing opportunities.

*Collared Pika Monitoring:* We will track changes in the presence of pika in alpine ecosystems. This occupancy information will provide us with a broader indication of change in alpine ecosystems. Collared Pika are a species at risk, and monitoring for change helps with re-assessment of their status by COSEWIC and NatureServe.

*Wolverine Harvest Sustainability:* We will be sampling wolverine carcasses collected by Yukon trappers, to assess sustainability of the harvest, as well as increase our knowledge of the basic biology of this elusive species. Wolverines are currently listed as a species of Special Concern federally and are listed under the Convention of International Trade in Endangered Species (CITES).

## Management Implications: Why we are doing it

These projects are carried out as part of our commitment to monitor species that may be affected by climate change and harvest. They also demonstrate innovative approaches to tackle technically difficult questions. We have designed these projects to link with similar projects being conducted elsewhere, making our data comparable on a continental scale. In addition, these projects engage stakeholders outside of government through dialogue and exchange of information, and improve the potential for stewardship of these species.

*Bat Monitoring and Conservation:* Little brown bats are assessed as Endangered in Canada, and require management and monitoring action.

*Collared Pika Monitoring:* Data from this project will be useful in the development of the national management plan for collared pika, which is required under the federal Species at Risk Act.

*Wolverine Harvest Sustainability:* Data from this project will be useful in the development of the national management plan for wolverine, which is required under the federal Species at Risk Act.

### Project Activities: How we will get it done

*Bat Monitoring and Conservation:* We will band and monitor bat populations at bat houses erected in southern and central Yukon, primarily in or adjacent to Yukon government campgrounds. The information we collect in 2016 will help us calculate: a) a population census of the colonies, b) the proportion of pups born each year (productivity); and c) number of previously marked bats returning the following spring (adult survival). This information will provide a pre-whitenose syndrome baseline and reasonable assessment of change in these populations in relation to climate. In June and July, we will count and capture bats during 12 nights of field work. Captured bats will be measured, banded, assessed for reproductive state and released.

*Collared Pika:* We will monitor approximately 60 sites for collared pika patch occupancy in August 2016 by surveying the sites twice and noting where pika are present. The goal is to collect 5 years of occupancy data—we currently have 3 years data from 2009, 2013 and 2014—so that we can look for annual variation, build models of change in occupancy, and correlate these changes to factors such as spring weather.

*Wolverine Carcass Collection:* Trappers are asked to voluntarily submit skinned wolverine carcasses from their trapping concessions. Carcasses are kept frozen until spring, when we can process them and collect biological samples. It will take about 12 years to collect an adequate amount of data before we can correctly determine if the harvest is sustainable; we currently have 9 years of the necessary data.

# Yukon Conservation Data Centre

**Bruce Bennett,** Coordinator, Yukon Conservation Data Centre

## Project Description: What we are going to do

Yukon Conservation Data Centre (Yukon CDC) has a mandate to gather, maintain, and distribute information on wildlife and ecological communities of conservation concern in Yukon. The Yukon CDC also coordinates assessments to determine conservation status for all Yukon species.

The Yukon CDC's database currently lists and tracks information on the locations and conditions of nearly 300 species that are of conservation concern in Yukon. This information is available to anyone through the Yukon Lands Viewer, but is primarily used in environmental assessment, land-use planning, conservation actions, recovery planning, and conservation status assessments. The YCDC also produces materials and hosts workshops designed to help people learn about species of conservation concern and to solicit data for contribution.

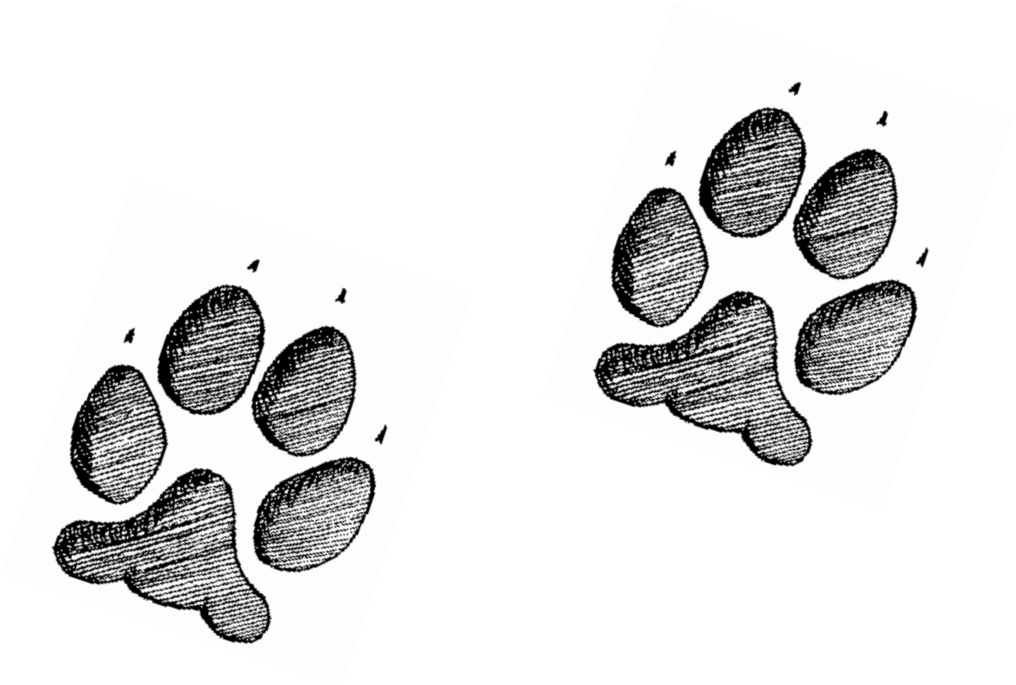
## Management Implications: Why we are doing it

The Yukon CDC is part of an international network of conservation organizations and is the primary body responsible for supporting status rankings for all species in Yukon. The information we collect is critical for land-use planning, environmental assessments, and for meeting our obligations under agreements including the Umbrella Final Agreement, Canadian Biodiversity Strategy and the National Accord for the Protection of Species at Risk.

## Project Activities: How we will get it done

We will collect data from multiple sources and serve as a point of contact for the public and government for all information related to rare or at-risk species in Yukon. We will continue to assign and update rankings for all Yukon species and play a proactive role in identification of rare elements (plants, animals, and ecosystems) and their conservation. The information we collect will feed directly into general status reporting for species of conservation concern.

# Carnivores



# Alsek Wolf Monitoring

**Ramona Maraj,** Carnivore Biologist

## Project Description: What we are going to do

We have initiated a community-based trapping program on the west side of Game Management Zone 7 as part of the Alsek Integrated Community Based Moose Management Program in partnership with Champagne Aishihik First Nation and the Alsek Renewable Resources Council. We will examine the effects of this trapping program on wolf population size, and in combination with information on moose recruitment, will assess how the community-based trapping programs affect moose population growth.

More information on companion moose monitoring activities related to this project are outlined in the Alsek Moose Recruitment and Paint Mountain / Jarvis / Cultus Moose Recruitment project summaries; and the trapper training initiative is outlined in the Community-based Wolf Trapper Training project summary.

## Management Implications: Why we are doing it

This project supports aspects of Recommended Implementation Measure 17 of Goal 4 of the Wolf Conservation and Management Plan. This measure states that where harvest is used as a local management tool to reduce predation rates of moose, parties should collaboratively develop and implement a study design which considers local, traditional and scientific knowledge. Additionally, a program evaluation should take place and determine the impact of the study on wolves and moose.

## Project Activities: How we will get it done

This is a proposed multi-year project, spanning a minimum of 3 years and dependant on the duration of the joint initiative. Work will occur in late fall 2016 or early winter 2017. We will monitor changes in relative wolf population size through ground-based or aerial survey methods in the Alsek moose area (experimental area) and the Kluane moose area (control area). Methods for surveying the wolf population will be confirmed after the 2015/16 pilot project is assessed to examine plausible ground-based and aerial survey methods is assessed.

We will also monitor wolf harvest rates.

# Community-based Wolf Trapper Training

**Peter Knamiller,** Wolf Program Coordinator

## Project Description: What we are going to do

We will work directly with Renewable Resources Councils (RRCs), First Nations and trappers to provide hands on training and support; review community trapping interests; and promote an industry approach to trapping that is done in a respectful and humane manner.

## Management Implications: Why we are doing it

This project supports the goals, objectives and recommended implementation measures identified in the 2012 Yukon Wolf Conservation and Management Plan, and supports the wolf management component of the Alsek Integrated Community-based Moose Management Program. The project also provides outreach for humane trapping training.

Individual trappers and communities with strong interest in management of local wolf populations see an increased wolf harvest as a means to achieve short term benefits for local prey populations. We collaborate with RRC's, First Nations and local trappers to identify priority areas of concern, and within these areas, improve capture efficiency and promote humane trapping methods. This work helps promote sound and respectful resource stewardship and management.

## Project Activities: How we will get it done

We will engage with RRCs and other parties (e.g., Yukon Trappers Association) to identify trappers interested in participating in the training program. We are currently collaborating with the Champagne and Aishihik First Nation, and the Alsek RRC on working with local trappers and implementing the directed wolf harvest effort outlined in the Alsek Integrated Community-based Moose Management Program.

We will collaborate with local instructors to provide wolf trapping training workshops and on-the-ground training. Instruction will include demonstrations of snare preparation and setting techniques, in an effort to increase familiarity with humane trapping tools and methods.

# Grizzly Bear Harvest Scenario Modeling and Guidelines

**Ramona Maraj,** Carnivore Biologist

### Project Description: What we are going to do

Currently, grizzly bear harvest rates for Yukon are based on a single study from the mid-1980s, along with comparative studies conducted elsewhere. We will use harvest scenario modeling to examine the potential effects of harvest on grizzly bear populations and determine the needed population parameters to sustain various harvest rates.

### Management Implications: Why we are doing it

Recent work on grizzly bear populations—in the Southern Lakes and Yukon North Slope regions—suggest a single harvest rate may not be sustainable for all grizzly bear populations in Yukon. Simulated scenario information may provide more information on sustainability of harvest, which can be applied to populations based on their estimated size and trend.

We will use results of this scenario modeling, when combined with other information (e.g., defence of life and property kills), to estimate sustainable harvest rates for grizzly bear populations in Yukon, assign outfitter quotas, identify resident harvest impacts, and improve current regulatory regimes. This work will support the development and implementation of the Grizzly Bear Conservation and Management Plan and grizzly bear science-based species guidelines.

### Project Activities: How we will get it done

We will use a simulation modeling approach to assess sustainable harvest rates for populations that are increasing, decreasing, stable, or where population information is limited. To draw on the expertise of population modellers, we will complete the work in collaboration with university or other research agencies.

# Southern Lakes Grizzly Bear Population Study

**Ramona Maraj,** Carnivore Biologist

### Project Description: What we are going to do

Our primary objective with this project is to estimate the size and trend of the Southern Lakes grizzly bear population. Information from this project will also help us improve our understanding of grizzly bear ecology in the Southern Lakes area.

### Management Implications: Why we are doing it

The results of this project will allow us to estimate the status and trend of the Southern Lakes grizzly bear population. This information is important for calculating harvest quotas, identifying ways to reduce management kills (by reducing human-bear conflicts), and identifying important habitat and habitat components that are needed for land-use planning and environmental assessment activities.

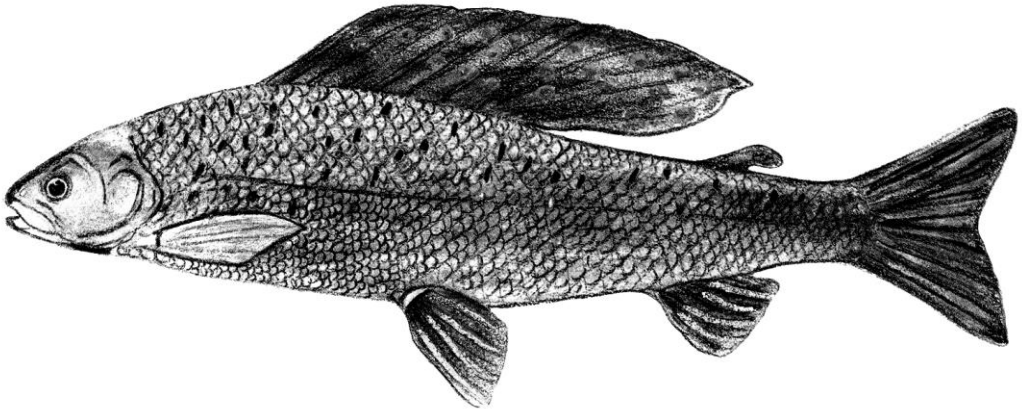
This project will support the development and implementation of the Grizzly Bear Conservation and Management Plan. It will also help us meet Yukon's obligations under the Convention on International Trade in Endangered Species to manage grizzly bears using the best available scientific techniques and information. In addition, information from this project will allow us to assess the non-detriment finding for grizzly bears in Yukon.

### Project Activities: How we will get it done

This is the last year of a multi-year project. The primary objective of this project is to estimate the size and trend of the Southern Lakes grizzly bear population. To do this, we will estimate population size based on previously collected DNA mark-recapture information. We will also monitor trends by collecting information on den use, survival rates, reproductive output, and body condition metrics.

The secondary objective of this project is to improve our understanding of grizzly bear ecology in the Southern Lakes and how it is impacted by caribou and moose distribution. To do this, we will collect information on bear diet, general habitat use and movement, and compare it to caribou and moose information collected under other Fish and Wildlife programs.

# FISHERIES



# Angler Harvest Monitoring

**Aaron Foos,** Fisheries Technician

## Project Description: What we are going to do

Angler harvest surveys provide key information for fisheries management decisions and actions in Yukon. Each year, we conduct angler harvest surveys on several high-use recreational fisheries in Yukon. The primary goals of these surveys are to determine angler effort, catch rates, and harvest, and to gather biological data from fish harvested by recreational fisheries.

## Management Implications: Why we are doing it

Angler harvest surveys, in combination with other fish and fishery related assessments, are used to determine if the angler effort and harvest are sustainable under the existing regulatory regime. Regular monitoring of key harvested stocks can also avoid costly interventions if harvest is too high. This information will guide our allocation and regulation decision making processes.

Priority areas for 2016 are several high-use recreational fisheries: Watson/Simpson Lakes, Lake Laberge, Aishihik Lake, Lubbock River, and the Southern Lakes System (year 3 of a 4 year survey that covers Marsh, Tagish, Bennett, Tagish River, and Nares River).

## Project Activities: How we will get it done

We will work with contractors to conduct face-to-face interviews with anglers on selected sample days and lakes throughout the summer. The contractors will ask a standard set of questions about the social and biological aspects of the fishery, such as the time spent angling and the species and number of fish caught. We will analyze and compare data from these surveys with past results to determine trends in the fishery and the sustainability of the current level of angler harvest.

A data gap identified in many previous surveys is the poor understanding of winter—particularly late-winter—ice fishing effort, which is increasing. We addressed this gap with a winter modification of the standard creel approach on Fish Lake in late winter 2016 —Fish Lake is very accessible, has a popular and increasing ice fishery, is under General Regulations, and is already exceeding sustainable harvest during the open water season. Results from this trial will be analyzed this year and be used to help determine next steps for this type of work.

# Aquatic Health Monitoring for Placer Mining

**Aaron Foos,** Fisheries Technician

## Project Description: What we are going to do

This is an ongoing project through which we monitor how placer mining activities are affecting streams, stream organisms, and aquatic health. Through this project, we will ensure established mine effluent discharge standards are appropriate for maintaining or improving aquatic health.

## Management Implications: Why we are doing it

The 2003 Record of Agreement commits the Government of Yukon, Council of Yukon First Nations, and the federal Department of Fisheries & Oceans (DFO) to develop and implement a new regime for placer mining, and minimize its impacts on fish habitat. The Government of Yukon (YG) and DFO are jointly responsible for carrying out annual aquatic health monitoring. Conducting this work is important for ensuring sufficient protection to freshwater fish—and salmon—and their habitats.

Annual Aquatic Health monitoring for placer mining, when combined with Energy, Mines & Resources' (EMR) Water Quality Objectives monitoring and Economic Health monitoring, informs the Yukon Placer Secretariat's adaptive management process. Through this process, decisions can be made to change or modify effluent discharge standards for placer mining to maintain and protect the health of Yukon aquatic environments.

## Project Activities: How we will get it done

Forty sampling sites are selected annually at a coordination meeting each spring, half are completed by DFO and half by YG Environment. In a typical year, we will sample 15 sites by helicopter and 5 sites by boat/road access.

Field work is completed between July 15th and August 7th each year so that sampling of aquatic benthic macroinvertebrates is consistent. When the field data collection is complete, the aquatic insect samples are analyzed by an expert in the field. When the data are available, we will assess the health of each aquatic environment site visited.

Results of the monitoring will be communicated through the Yukon Placer Secretariat in the Annual Monitoring Report—a component of the annual adaptive management process.

# Fish Health and Laboratory

**TBD,** Senior Fisheries Biologist

### Project Description: What we are going to do

This is an ongoing program through which we conduct laboratory analyses of fish and other fish-related biological specimens (e.g., parasites, stomach contents, aquatic organisms, etc.) to assess fish health and condition. We also sample fish for contaminants; coordinate aquatic animal health activities, including disease screening for introduced and transferred fish; and identify fish diseases and parasites.

### Management Implications: Why we are doing it

This program supports our ability to provide quick feedback to the public if concerns about fish disease or parasites arise. Ongoing monitoring contributes to the safety of fish stocks through the maintenance of appropriate screening processes, and ensures public confidence in fish as a healthy food option.

### Project Activities: How we will get it done

We will monitor the health of fish populations throughout Yukon by examining diseased fish turned in by the public or caught in netting studies. Some work will focus on areas and stocks that have been identified as having potential or actual disease or parasite problems.

We will collect and examine stomach contents of 250 to 500 fish obtained during other surveys (e.g., SPIN surveys, Angler harvest surveys, angler submitted samples, etc.). Stomach content data will be incorporated into reports on fish populations where appropriate. We will monitor the health of hatchery-raised fish at the Whitehorse Rapids Fish Hatchery through disease screening to ensure that no diseased fish are released into the wild.

We will coordinate samples collected from fisheries surveys and public submissions, and submit them for contaminants testing. Results will be communicated to the public—in part through annual updates to the Fisheries Synopsis. We will incorporate disease information, as necessary, into the Fish Health Handbook publication; we will reprint the publication this year. Information will also be provided directly to the public when concerns are raised or fish with health problems are submitted for inspection.

# Fisheries Stock Assessment and Monitoring

**TBD,** Senior Fisheries Biologist

## Project Description: What we are going to do

Stock assessments are the major source of long-term fisheries data and are collected in a systematic and consistent fashion year after year. This year we will conduct stock assessments, including aging, of lake trout in Teslin, Laberge, and Ten Mile lakes. We will also follow up on local concerns expressed regarding habitat and carrying capacity for lake trout in Pine Lake. We will continue our burbot stock assessment in Canyon Lake and build on our burbot population assessment approach by conducting a second year of mark-recapture work on Squanga Lake. We will continue to develop the best approaches to monitor pike and lake productivity in Yukon.

## Management Implications: Why we are doing it

The information collected during this work allows us to manage fish resources; maintain healthy fish stocks and sustainable harvest opportunities; assess the status of fish stocks; and monitor changes over time that may be occurring due to human activities (e.g., harvest) and environmental factors (e.g., climate change). Ongoing and regular evaluation of important stocks is necessary for detecting and responding to changes in a timely manner.

Where appropriate, stock assessment data are used in conjunction with other data (e.g., angler harvest survey data) to develop management strategies for water bodies and fish populations of interest.

## Project Activities: How we will get it done

*Lake trout:* We use the summer profundal index netting (SPIN) method for assessing key populations of lake trout and whitefish. We will carry out SPIN surveys on Teslin, Laberge, and Ten Mile lakes. Lake trout assessments of these lakes are supported by regional work plan objectives, Renewable Resource Council (RRC) and First Nations engagement, conservation concerns outlined in Status of Yukon Fisheries, and method development priorities.

We will also follow up on the Alsek RRC's concerns about lake trout habitat in Pine Lake. We will regularly monitor temperature and dissolved oxygen through the summer and autumn, and complete directed spawning site investigations in September and October 2016. We will share our results with the RRC in early winter 2016, and incorporate them into upcoming population and harvest assessment reports for Pine Lake.

*Burbot:* We will continue to develop a burbot mark-recapture method as we balance short term management information needs and long-term model development for broad scale management of burbot. We will focus on management needs—Canyon Lake, where preliminary information suggests the burbot population is depleted—and further refinement of burbot assessment methods (Squanga Lake).

*Pike:* We will begin to develop a method for monitoring northern pike. This will involve: i) developing monitoring method options, ii) selecting options for Yukon lakes, and iii) determining how to apply the best method to Yukon fisheries management. This project builds on a jurisdictional review of pike population assessment methods completed in 2015/16.

# Movement and Population Structure of Lake Trout in the Southern Lakes

**Oliver Barker,** Fisheries Biologist

## Project Description: What we are going to do

As part of this multi-year project, we are tracking movement of lake trout within the interconnected Southern Lakes (Marsh, Tagish, Nares, Bennett, and Atlin lakes) using transmitter-tagged lake trout telemetry and genetic analysis of collected fish. The genetic information is required for assessing multi-year, inter-lake migration behaviour to specific sub-populations and will tell us if harvest of distinct populations is sustainable.

## Management Implications: Why we are doing it

Bennett, Nares, Windy Arm, Tagish, Marsh and Atlin lakes are all closely connected by large rivers that allow fish to readily migrate between water bodies. Movement of lake trout among these lakes is apparent, through both local and traditional knowledge, and past tagging studies. Both the interconnected Southern Lakes and the rivers that connect them are popular and productive destinations for anglers seeking lake trout.

Effective management of lake trout within the interconnected Southern Lakes requires an understanding of the contribution of each lake to the system-wide lake trout population. Without this understanding, assigning harvest pressure at specific locations to different sub-populations within the lakes is not possible, and the harvest rate of these sub-populations cannot be assessed reliably. Results from this study will help us make informed decisions about the sustainability of Southern Lakes lake trout harvest.

## Project Activities: How we will get it done

In spring, we will download and analyze the data recorded by autonomous receivers (20 in total). We will deploy transmitters in lake trout captured by volunteer anglers in Marsh Lake (15 transmitters). In summer, we will continue to collect genetic samples from Southern Lakes fisheries (recreational, subsistence and commercial). In fall, we will use fish with affixed transmitters to identify new spawning locations and we may deploy an additional 10 to 20 transmitters. This work will be carried out mostly in Bennett and Marsh lakes, where we currently lack data on spawning locations. We will also develop and begin a collaborative approach for the analysis of genetic data collected through this project.

# Stocked Lakes Program

**Oliver Barker,** Fisheries Biologist

## Project Description: What we are going to do

Suitable pothole lakes are stocked on a rotating basis, providing easily-accessible fisheries that are particularly attractive to families and first-time anglers. This program also includes an educational component; we offer interactive programs on lake stocking and responsible angling practices.

## Management Implications: Why we are doing it

The maintenance of the stocking program (currently 20 lakes across Yukon) provides an important set of opportunities for Yukon anglers: over 20% of resident anglers fish stocked lakes and Yukoners spend over 6,700 days angling in stocked lakes each year. Wild stocks of fish in Yukon are slow-growing and susceptible to overharvest if subject to excessive fishing pressure. Providing alternative angling opportunities close to population centres alleviates some of the fishing pressure from wild stocks without requiring more restrictive angling regulations.

Yukon Fish and Wildlife Enhancement Trust (YFWET) has recently expressed interest in partnering with Environment Yukon in delivering enhanced angling opportunities to Yukoners via the Stocked Lakes Program.

## Project Activities: How we will get it done

This is an ongoing program, with a stocking rotation that ensures continued viable fisheries at stocked lakes across the territory. This year, Chadden, Coffee, Fisheye, Hidden 1 and 3, Judas, Long, Marcella, Salmo, Wrong and Whiskers lakes are due for stocking. We will stock these lakes in late May to early June with rainbow trout and kokanee salmon from Whitehorse Rapids Fish Hatchery. The Yukon Fish and Game Association regularly contributes to fry transportation and release with publicity surrounding fry release events.

As part of this program, we will also deliver an interactive Hidden Lakes Fry Release public event in Whitehorse in late May—an event that has become very popular, particularly among families with young children.

Activities in this program also include spawn takes at Whitehorse Rapids Fish Hatchery (June and September) and purchase of eggs and fry (October and December).

# Habitat

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# Fish, Wildlife and Habitat Planning

**Michelle Sicotte,** Fish and Wildlife Planner

## Project Description: What we are going to do

Fish and wildlife management plans are developed by the planning program within the Habitat Programs section. We develop plans for special management areas, species of conservation concern, and community fish and wildlife work plans. We work cooperatively on these plans with First Nation governments, and boards and councils to address management challenges.

Our 2016–17 fish and wildlife planning priorities are:

- Complete the Management Plan for Elk in Yukon, Community-based Fish and Wildlife Work Plan for the Champagne and Aishihik First Nations (CAFN) Traditional Territory, Pickhandle Lakes Habitat Protection Area Management Plan, and Whitefish Wetlands Habitat Protection Area Management Plan.
- Continue work on the Grizzly Bear Conservation and Management Plan and the Tagish River Habitat Protection Area Management Plan.
- Begin work on the Community-based Fish and Wildlife Work Plan for the Carcross/Tagish First Nation (CTFN) Traditional Territory and the Southern Lakes Caribou Management Plan.
- Continue tracking plan implementation.

## Management Implications: Why we are doing it

Through these plans we help set branch priorities, and provide clarity about important regional and community-based fish and wildlife management issues. These plans facilitate decision making, and provide a forum for discussion and consideration of management issues. We work closely with First Nation governments, boards and councils, other Yukon government departments, non-government organizations, and the public. The dialogue and relationships developed during these processes are critical for ensuring we effectively deliver programs and set priorities.

## Project Activities: How we will get it done

*Management Plan for Elk in Yukon:* We are in the final stages of developing a revised elk plan. The final plan is expected to be released to the public in the summer of 2016.

*Community-based Fish and Wildlife Work Plan for Champagne and Aishihik Traditional Territory*: We have been working in partnership with CAFN and Alsek RRC to develop this work plan and will present the work plan to the community in the summer of 2016. The work plan is focused on priority issues in the region including recovering moose and fish populations.

*Grizzly Bear Conservation and Management Plan:* We are working in partnership with the Yukon Fish and Wildlife Management Board to develop this plan. The working group will look at all relevant factors related to grizzly bear management, including national and international considerations. The process will provide for input from First Nations and the Inuvialuit, mandated boards and councils, stakeholders, and the public.

*Habitat Protection Areas*: Work on the Pickhandle Lakes and Whitefish Wetlands Habitat Protection Area Management Plans are expected to be completed this year and work on the Tagish River Habitat Protection Area Management Plan is ongoing. Plans are being developed with First Nation partners and are guided by Final Agreements and land use plans. Funding for habitat protection area planning comes from land claims implementation.

*Community-Based Fish and Wildlife Work Plan for the Carcross/Tagish Traditional Territory:* Building on past work in the region, we will work with Carcross/Tagish First Nation, and the Carcross Renewable Resource Council to engage the community and identify the priority fish, wildlife and habitat issues in the traditional territory, as well as how these issues will be tackled.

Through operational funding, we support White River First Nation member participation in the Pickhandle Lakes process by providing funds for travel, accommodation, and time for their delegate to attended steering committee meetings.

*Tracking plan implementation:* We will work with Information Management & Technology (IMT) to assess and update our implementation tracking database.

# Yukon Wetlands Policy Finalization

**Bruce McLean,** Senior Habitat Biologist

## Project Description: What we are going to do

We will complete and finalize a wetlands policy for Yukon. The policy will apply to Yukon government, but the process will be open to participation by First Nations, other land managers, and non-government organizations.

Development and implementation of a Yukon wetlands policy will provide clarity to land use planning processes, environmental assessments, and regulators.

## Management Implications: Why we are doing it

Wetlands are an important component of the natural environment. They support a diversity of animals and plants; and are crucial to hydrology, and water quantity and quality.

There is currently a lack of policy direction and little coordination within Yukon government concerning the management of resource activities in or near wetlands.

A wetland policy is needed to help define wetland values, support improved mapping and classification of wetlands, and assist with tracking natural and human-caused changes to the ecology and function of these areas.

## Project Activities: How we will get it done

We will work with an interdepartmental working group and senior management to develop a Yukon wetlands policy. We will engage other departments, agencies, First Nations, and non-government organizations in the process to ensure the policy is broadly-based, and supported by stakeholders and the public.

# Wildlife Key Area Surveys

**Val Loewen,** Habitat Inventory Coordinator

### Project Description: What we are going to do

Wildlife key areas (WKAs) are used by wildlife for critical, seasonal life functions and are defined for each species or species group. We conduct WKA surveys at critical times of the year to document animal locations. Identified key areas are summarized in publicly available maps and GIS products.

This year, we will conduct WKA surveys to fill data gaps or update existing information, and provide information for land use planning and environmental assessment processes. The priority WKA surveys for 2016/2017 are:

- Sheep spring lambing – Upper Stewart River Watershed
- Sheep winter range – Upper Nordenskiold River area
- Sheep spring lambing and late winter range – Dawson Range
- Raptor summer nesting – southern Yukon

### Management Implications: Why we are doing it

Knowledge of wildlife key areas will provide the basis for recommendations on avoiding impacts or mitigating mining and other resource development activities. In addition, established fish and wildlife work plans have identified a need to gather data on these important wildlife habitats. Data collected during these surveys in combination with other distribution data can contribute to habitat suitability modeling and can assist with developing population and habitat goals.

### Project Activities: How we will get it done

Specific activities for each WKA survey are described below:

*Sheep spring lambing (upper Stewart River watershed):* In June 2016, we will map sheep locations in the upper Stewart River watershed using a helicopter-based survey. We will collate baseline data on sheep lambing in the areas overlapping with active mining claims for use in environmental assessments and for the WKA database.

*Sheep winter range (upper Nordenskiold River area):* In March 2017, we will conduct a helicopter-based survey to confirm mapped sheep winter range and locate potential new sheep winter range.

*Sheep spring lambing and late winter range (Dawson Range):* In early June 2016, we will conduct the lambing survey in the Dawson Range. In addition, we will fly the late winter survey in the region in February or early March 2017.

*Raptor summer nesting:* In June and July 2016, we will conduct ground-based surveys of current known raptor nesting sites, to update and assess the quality of our existing nesting location data.

# Lichen Abundance Classification for the Kluane Caribou Herd Range and Validation of Classification Methods

**Heather Clarke,** Habitat Biologist

### Project Description: What we are going to do

Lichen abundance mapping has been identified as a key priority for caribou habitat management in Yukon. We will use this project to collect data necessary for understanding landscape conditions, and determining caribou habitat suitability and selection in three caribou herd ranges.

We will combine vegetation data collected from the air with remotely-sensed imagery to quantify caribou lichen forage across the Kluane caribou herd range. Additionally, we will be able to compare the accuracy of this classification with a previous classification—developed using an alternative methodology—and determine best approaches for future classifications.

### Management Implications: Why we are doing it

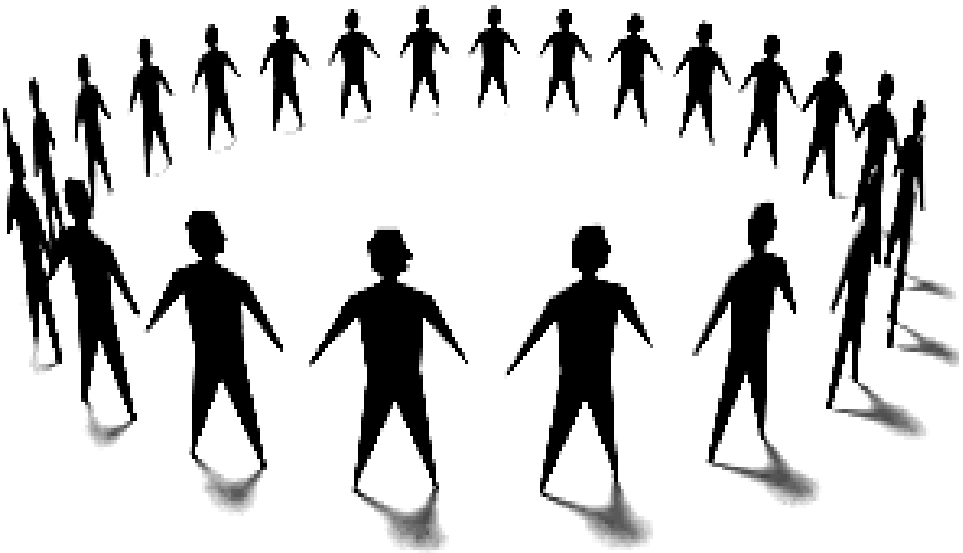
Results of this project will inform both species and habitat management, and can be used in a variety of ways including local area planning, regional land use planning, and environmental assessment. The identification of habitat suitability and selection will complement existing information from collared animals (where present) indicating actual habitat use and areas of occupancy.

### Project Activities: How we will get it done

We will collect vegetation data from the air; surveying approximately 100 plots during 2 field days in August 2016. As a cost effective measure, we will take a significant amount of georeferenced photography in the field to increase the sample size for both training and validating the classification.

Following completion of the field work, a qualified contractor will complete the spectral analysis using satellite imagery along with provided field data. The contractor will produce a detailed map of lichen abundance and distribution across the caribou herd range and an accompanying technical report. In addition, the contractor will use the same classification validation methods to validate a previously-developed (2015) lichen classification for the Hart River and Clear Creek caribou herd ranges, which used a different methodology. This additional validation will allow for a comparison between the two methods, and will help us determine the most accurate methodology for future lichen classification work.

# Outreach and Communication



# Aquatic Invasive Species

**Heather Milligan,** Project Biologist

## Project Description: What we are going to do

The introduction and colonization of aquatic invasive species (AIS) pose potentially serious threats to Yukon waterways. This project will help us mitigate these threats by raising public awareness about prevention of introductions of AIS. Field assessments will lead to early detection, rapid response, and a better understanding of the impacts of AIS on Yukon waters.

This year, we will focus on three aspects: education and outreach, early detection, and impact studies.

## Management Implications: Why we are doing it

The introduction of AIS could pose significant risk to Yukon's economy and aquatic environments. This project will help mitigate this risk by raising awareness and understanding of those activities most likely to result in accidental introduction of AIS, and what steps can be taken to avoid AIS introduction and spread. A risk assessment of zebra mussel introduction will support early detection and rapid response. Impact studies help quantify the concern and demonstrate impacts in a Yukon context.

## Project Activities: How we will get it done

*Education and Outreach:* We will deliver communication materials that help inform anglers and boat operators about aquatic invasive species. Our communication materials (including installed signage at boat ramps and information provided to anglers during ongoing angler harvest surveys) promote behaviours that prevent the introduction and spread of aquatic invaders.

*Early Detection:* We will develop a risk assessment for zebra mussels to better understand which water bodies are at most risk of an introduction of zebra mussels.

*Impact studies:* We will continue to compare benthic invertebrate communities—using the CABIN monitoring protocol—in didymo affected and un-affected areas on streams with known didymo blooms. Our work will build on initial sampling completed last year to increase the number of representative sites.

# Fish and Wildlife Communications

**Tyler Kuhn,** Biologist – Information Specialist

## Project Description: What we are going to do

This is an ongoing project through which we co-ordinate and facilitate Fish and Wildlife Branch (FWB) communication initiatives. We work to develop and produce tangible and novel products, using a wide variety of mediums that enhance the accessibility of FWB programs, and scientific and technical information.

We work with and support staff in developing clear communication products for a variety of audiences. We ensure that high quality, accessible information is available to support FWB programs and initiatives.

## Management Implications: Why we are doing it

Communication is central to all of the primary responsibilities of the Fish and Wildlife Branch. By producing and providing accessible, trustworthy, and useful information, we are supporting the meaningful participation of all Yukon people in planning and decision-making processes. Through this program, we assists with numerous requests for information about FWB programs from the public, boards and councils, and other interested organizations.

## Project Activities: How we will get it done

Through this project, we work on a variety of communications projects—producing timely and accessible information about FWB programs. Priority programs are listed below, however much of our work is identified through specific needs that develop throughout the year, and from specific information requests.

For this year, our priority projects will include:

- Producing the annual Fish and Wildlife Branch Highlights report;
- Assisting with development of communications for the Grizzly Bear Conservation and Management Plan;
- Assisting with the development of Wildlife Harvest report products;
- Using video and photography to promote and demonstrate FWB activities.

# Fisheries Education and Communications

**TBD,** Senior Fisheries Biologist

### Project Description: What we are going to do

Education is a core component of fisheries management programs—it promotes participation, stewardship and compliance with regulations. Education is consistently identified as the first step in addressing management challenges.

The fisheries communication and education program is multifaceted. We will develop and deliver programs that educate anglers about overharvested and stressed populations, and current regulations; and promote angling, particularly for young people.

### Management Implications: Why we are doing it

The Status of Yukon Fisheries identifies the importance of public education and communication for effective fisheries management. An informed, engaged and responsible angling public will benefit fisheries resources and anglers alike, and promote sustainable management and compliance with fisheries regulations. Education programs will also help engage young anglers, ensuring that angling remains a relevant activity for Yukoners into the future.

### Project Activities: How we will get it done

Where we need to communicate with anglers about depleted stocks and populations of lakes or streams, we will design and install signage.

We will continue to provide tools to facilitate and encourage ethical and legal angling. These include give away promotional materials like sticker rulers for angler's boats and hats for anglers who provide information on their catch.

We will develop and deliver public activities (e.g., Family Fishing Weekend, 1 to 4 July 2016) to help promote angling and engage young people.

We will ensure that fisheries publications are available and up to date. Work here includes revising publications in advance of reprinting.

Yukon Fish and Wildlife Enhancement Trust (YFWET) has recently expressed interest in partnering with Environment Yukon in enhancing angling opportunities for Yukoners by developing and delivering educational programs aimed at increasing angler interest in lake whitefish. We will continue to engage with YFWET to expand and develop on this interest.

# Hunter Effort Survey – Caribou

**Carol Foster,** Wildlife Harvest Specialist

### Project Description: What we are going to do

Working with the Yukon Bureau of Statistics, we will survey hunters who purchased a caribou seal or seals in the 2016 hunting season to gain an understanding of success rates, the methods they utilized, the amount of effort they exerted, and their general satisfaction with their experience.

### Management Implications: Why we are doing it

Survey results will be used to inform harvest discussions and future management decisions. We can respond more quickly and effectively to management issues, either through regulation, education, or information if we have current information about hunting practices. Surveys of the same species over time can reveal trends in hunter effort.

### Project Activities: How we will get it done

We will mail out surveys in early January—after licenced hunting season closes and subject to presence/absence of Porcupine caribou along the Dempster—to all licenced Yukon resident hunters who acquired a caribou seal or seals in the 2016/17 season. Hunters that have not returned a survey by early February will be called and invited to complete the survey over the telephone.

# National Recreational Fishing Survey

**TBD,** Senior Fisheries Biologist

### Project Description: What we are going to do

In 2016/17, we will continue our partnership with the federal government and the other provinces and territories to deliver on the 5-year National Recreational Fishing Survey. In 2015/16, anglers across the country were asked about their angling practices, type and number of fish harvested, perceptions and observations about the quality of fishing, and preference for different approaches to fisheries management; as well as the economic value of fishing. In 2016/17, these responses will be analyzed and reported on.

### Management Implications: Why we are doing it

The National Recreational Fishing survey provides us—and related stakeholders—with a broad set of data on which to base fishery management decisions.

All provinces and territories engage with the federal Department of Fisheries and Oceans (DFO) in implementing, analyzing and reporting on the National Recreational Fishing Surveys every five years.

### Project Activities: How we will get it done

We will collaborate with DFO to analyze the results of the survey of angling activity from the 2015 calendar year (distributed to households in Jan/Feb 2016). This is year two of a proposed two year project.

# Technical Reporting Program

**Tyler Kuhn,** Biologist – Information Specialist

## Project Description: What we are going to do

This is an ongoing project designed to provide Yukoners with accessible, trustworthy, and useful technical information that supports their meaningful participation in fish and wildlife planning and decision-making processes.

We ensure the timely publication of quality technical reports by providing editorial support to Fish and Wildlife Branch (FWB) staff—assisting them with use of consistent and accessible language, and formatting. We establish and maintain the FWB publication review protocols and authorizations.

## Management Implications: Why we are doing it

Communication is central to all of the primary responsibilities of the Fish and Wildlife Branch. By producing and providing accessible, trustworthy, and useful information, we are supporting the meaningful participation of all Yukon people in planning and decision-making processes.

Through this program, we assist FWB staff with the production of high quality, accessible technical reports. Producing these reports in a timely fashion is essential for fulfilling our departmental commitment to strengthening and improving communications.

## Project Activities: How we will get it done

Our project priorities are developed throughout the year, and in support of FWB staff reporting needs. To facilitate this work, we will focus on the following activities for 2016/17:

- Collect, produce and distribute the FWB project summaries report.
- Provide editorial support to staff, as needed, for completion of reports.
- Review, update and improve the technical reporting process within the branch.
- Develop a pilot database for storage of, and internal access to, all FWB reports, as well as ensuring our reports are available on existing public facing reporting portals (e.g., EMR library, ASTIS).

# Wildlife Viewing Program

**Carrie McClelland,** Wildlife Viewing Biologist

## Project Description: What we are going to do

Through the Wildlife Viewing Program, we provide opportunities for the public to learn about Yukon's environment, which fosters a better understanding of the natural world. This supports our departmental strategic goals of promoting environmental stewardship and sharing information with Yukoners to inspire appreciation of Yukon's environment. Opportunities to view and appreciate wildlife are an important component in fostering stewardship and respect for our environment.

There are 3 key components to the outreach work we do: i) A Celebration of Swans is dedicated to the spring bird migration period; ii) the Wild Discoveries interpretive event series; and iii) the static interpretive sites and products produced in partnership with communities and other groups.

## Management Implications: Why we are doing it

Increasing public awareness of wildlife management issues supports conservation efforts and encourages Yukoners to become proud stewards of Yukon's biodiversity. This project enhances the visitor experience in Yukon, fosters greater understanding and appreciation in residents and visitors for the natural attributes of Yukon, and increases opportunities for residents and visitors to engage in conservation and stewardship. The WVP directly supports the goals of the Environment Yukon Strategic Plan to promote environmental stewardship and share environmental information with citizens. Specific programs are often designed to support goals and objectives outlined in fish and wildlife plans. Furthermore, Chapter 16 of the Umbrella Final Agreement requires Yukoners to consider the non-consumptive uses of our wildlife.

## Project Activities: How we will get it done

Throughout the territory, and throughout the year, we deliver a wide variety of special events and programs, and create opportunities for residents and visitors of all ages and interests to engage in watching and learning about wildlife. Our major projects are:

*A Celebration of Swans and Swan Haven:* We host A Celebration of Swans activities in April during peak swan migration. We deliver dozens of events throughout the month—attracting a variety of audiences to water-bird staging areas so that they may appreciate respectful viewing practices. Events are

hosted in Whitehorse, Tagish, Johnson's Crossing, and Burwash; and include birding tours, family activities, photography and art workshops, exhibits, storytelling, guest speakers, and contests. The Swan Haven Interpretive Centre will be open daily in April and early May, with the grounds open year-round.

*Wild Discoveries:* We will work with other Environment Yukon biologists, local experts, and community members to develop engaging walks and talks that highlight a wide variety of Yukon species and/or issues facing Yukon wildlife. On average, we host more than two dozen events between May and October.

*Community programs and products:* We develop and maintain publications and interpretive panels that encourage stewardship, raise awareness of biodiversity issues, and augment local viewing opportunities. We will also work with community partners to develop site specific events and programs that highlight a local feature. This year, we will partner with the Historic Sites Unit to update panels at Lewes River Bridge, and with the City of Whitehorse to update 2 interpretive panels as part of the Significant Wildlife Areas.

# Wood Bison Co-operative Management

**Thomas Jung,** Senior Wildlife Biologist

### Project Description: What we are going to do

Through this project we support the activities of the Yukon Wood Bison Technical Team (YWBTT) in fulfilling their mandate to develop recommendations for the management of Yukon wood bison for consideration by the Yukon Bison Management Committee.

This year we will also be reviewing all the activities related to the 1998 to 2016 bison harvest. We will use 18 years of bison harvested-related information to report on spatial and temporal patterns in the harvest, changes in the population size, changes in the harvest regime, and results of the 2015 bison hunter effort survey.

### Management Implications: Why we are doing it

The YWBTT facilitates an inclusive process among relevant management partners to make recommendations toward the adaptive management of wood bison—a species that is both a species at risk, and the focus of a popular resident hunt.

The bison harvest and population growth report will be a capstone piece on bison management in Yukon, and will be a key information source for the technical team, as well as for the planned 2017/2018 review and revision of the bison management plan.

### Project Activities: How we will get it done

We will co-chair the YWBTT and host the meetings. There are two meetings annually—one in March or April and another in October or November.

We will review and analyze available spatial and temporal data related to the harvest and population growth for trends and patterns. This will likely include data from harvest reporting and biological submissions to ascertain trends and patterns in the sex- and age-structure of the harvest, as well as its spatial and temporal components. Where feasible, we will assess how changes in bison harvest regulations or permit conditions may have impacted bison harvest statistics and population growth. A more complete analysis of the 2015 bison hunter effort survey will be a key component in the report.

# UNGULATES

## (hoofed mammals)

Yukon Environment

# Alsek Moose Recruitment

**Sophie Czetwertynski,** Ungulate Biologist (Moose, Elk, Deer)

## Project Description: What we are going to do

We will conduct a moose recruitment survey in the Alsek area where we are working with the Champagne and Aishihik First Nation (CAFN) to conduct intensive wolf trapping to help recover the moose population.

This survey will provide us with information on calf survival to early-winter—data that is essential for i) estimating recruitment and adjusting the current estimated sustainable harvest rate, as needed, to meet management objectives for population recovery; and ii) evaluating the potential impact of wolf trapping on the dynamics of this moose population.

## Management Implications: Why we are doing it

The moose population in the Alsek area declined by 44% between 1998 and 2008, and is currently the focus of a 3-year project with CAFN to implement a joint wildlife management initiative—the Alsek Integrated Community-based Moose Management Program.

We completed a census in November 2015, with the next census scheduled for 2020. Annual recruitment surveys between census surveys are a minimum to be able to speak to the impact of management actions on population change. Information from this recruitment survey is important for us to meet our obligations of conservation-based management as described in the funding agreement.

More information on companion wolf monitoring activities related to this project are outlined in the Alsek Wolf Survey project summary; the trapper training initiative is outlined in the Community-based Wolf Trapper Training project summary.

## Project Activities: How we will get it done

The survey will be conducted in November 2016. We will count and classify moose in selected 4km x 4km survey cells using crews of three observers in a helicopter. This survey will take approximately 5 days for 1 crew (including weather days).

# Southern Lakes Caribou Management Planning

**Lars Jessup,** A/Southern Lakes Regional Biologist

### Project Description: What we are going to do

Through this project, we will work with the Southern Lakes Wildlife Coordinating Committee (SLWCC) co-management partners towards completing a management plan for the Southern Lakes caribou herds. We will also obtain updated population estimates for these herds. This work will satisfy several key recommendations put forward by the SLWCC in 2012.

### Management Implications: Why we are doing it

The Southern Lakes Caribou Recovery Program began in 1994 and was a cooperative effort to recover the Carcross, Ibex, and Atlin caribou herds from historic declines. The Recovery Program established broad objectives relating to herd size with the overarching goal of having healthy, self-sustaining populations which would allow for a carefully managed harvest once objectives were met. Current indicators suggest that the population recovery objectives may have been met, but there is, as yet, no plan to establish a management regime for the herds in the future.

### Project Activities: How we will get it done

The Carcross/Tagish Renewable Resources Council (CR=TRRC) initiated discussions in summer 2015 regarding management planning and updated population estimates for Southern Lakes caribou. The two main components of this project are: 1) we will work directly with the SLWCC to develop the management plan, 2) we conduct mark-resight surveys of the herds for updated population estimates.

This is the first year of a planned 5-year project.

# Caribou Rut Counts

**Various,** Regional Biologists

### Project Description: What we are going to do

We will conduct fall rut composition counts of key caribou herds to assess their status, track recovery, and measure the effectiveness of management actions. Rut counts for the following herds will be conducted in 2016/17:

- Carcross, Ibex and Laberge caribou herds
- Chisana caribou herd
- Ethel Lake caribou herd
- Hart River caribou herd
- Tatchun caribou herd

### Management Implications: Why we are doing it

Northern Mountain caribou are listed as "Special Concern" under the federal Species at Risk Act and the health of these herds is a high priority for management partners in Yukon. Annual monitoring of herds helps inform management decisions, track harvest levels, and provides a long-term dataset that helps track demographic changes in mountain caribou across the territory. Annual monitoring is also essential for recording caribou population responses to changing climate.

Herds chosen in 2016/17 are based on past trends and community priorities:

- The Carcross and Ibex caribou herds have been the focus of a long term recovery program. Monitoring was identified as a priority by local First Nations, boards and councils, and the Southern Lakes Wildlife Coordinating Committee.
- The Chisana Caribou herd has been the focus of a long term recovery program conducted in partnership with Alaska Department of Fish and Game. Monitoring was identified as a priority in the international Management Plan for the Chisana Caribou Herd.
- There has been a voluntary hunting closure on the Ethel Lake herd since 2002. Monitoring this herd has been identified as a high priority by the communities of Mayo and Pelly Crossing; and is recommended within the Community-based Fish and Wildlife Management Plan for Na-cho Nyäk Dun Traditional Territory and the Ddhaw Ghro Habitat Protection Area Management Plan.

- High harvest rates and the ease of access into the Hart River caribou herd's range, especially in years when the Porcupine caribou do not winter near the Dempster, has led to a management concern on the sustainability of the current harvest management regime.
- Harvest of the Tatchun Caribou herd is at or above sustainable limits and the population estimate is outdated. Monitoring of this herd has been identified as a high priority by the communities of Carmacks and Pelly Crossing, and is recommended in the Community-based Fish and Wildlife Work Plan for the Little Salmon/Carmacks First Nation Traditional Territory.

### Project Activities: How we will get it done

We conduct rut count surveys using helicopters flying along high alpine plateaus where caribou breeding occurs. When groups of animals are encountered they are classified into one of four categories: calves, cows, immature males or mature males. The tallies in each category are used to calculate the adult sex ratio (bull: cow ratio) and the recruitment rate (calf: cow ratio). These ratios are standard indicators of caribou population health—they allow us to highlight potential concerns and make predictions about population status. We will conduct this year's rut count composition surveys during late September and early October.

# Deer Inventory and Monitoring

**Sophie Czetwertynski,** Ungulate Biologist (Moose, Elk, Deer)

## Project Description: What we are going to do

Estimates of animal abundance are essential to species management. We currently have no science-based estimate of deer abundance anywhere in Yukon. This is the first year of a proposed 5-year deer monitoring and inventory project. This year we will complete camera deployment and study design. We are conducting this project primarily to acquire the first accurate estimate of deer in the Whitehorse region.

## Management Implications: Why we are doing it

Deer are a relatively recent newcomer to Yukon and while population size and distribution in Yukon is poorly understood, it appears to vary over time. The primary impetus for this project is to design a method to estimate deer numbers and distribution, which will inform the management of deer harvest. Deer are often associated with roads and agricultural developments—understanding the dynamics of deer on the landscape (i.e., population size, structure and dynamics, and use of key habitats) will be important for helping communities adapt to changing numbers and distribution of deer, and aid in the management of key habitats. Interest in deer demographics was recently articulated in the recommendations of the Southern Lakes Wildlife Coordinating Committee.

In addition, disease surveillance will provide important information about the presence, distribution, and effects of diseases on deer, and the potential for deer to contribute to the distribution of certain pathogens in Yukon. Currently, little is known about the health of deer in Yukon. Early detection of a disease such as chronic wasting disease will be important to guide management of deer and other affected species.

## Project Activities: How we will get it done

This project will use data from camera traps to help design a future monitoring program to meet long-term project objectives. Specifically, we will use preliminary data from camera traps deployed in grid cells spanning an area east-west from Jake's Corner to Mendenhall and north-south from Braeburn to Carcross to help guide the study design.

# Elk Population Monitoring

**Sophie Czetwertynski,** Ungulate Biologist (Moose, Elk, Deer)

## Project Description: What we are going to do

The Management Plan for Elk in the Yukon was recently updated. The first goal of the plan is to maintain healthy and viable populations of free-ranging elk in Yukon. The current harvest management regime functions under the assumption that current allocation and harvest balances with recruitment to maintain the herds at current population levels. We will monitor the Yukon elk population distribution, abundance and population composition to ensure harvest management objectives are being achieved.

This project has 3 components:

1) A Takhini herd composition and recruitment survey in late-winter,
2) A Braeburn herd composition and recruitment survey in late-winter,
3) Ongoing ground-based monitoring of radio-collared animals.

## Management Implications: Why we are doing it

Implementation of the updated Yukon Elk Management plan requires the review of action items and implementation of appropriate activities to meet the plan objectives. This project integrates the delivery of this plan with First Nation resource managers, local Renewable Resource Councils and stakeholder groups. The outcome of this work is that the delivery of elk management activities is coordinated, rationales are clear, and the direction for the program is supported. In addition, monitoring movement and habitat use by elk assists and supports our land use planning process.

The Elk Harvest Plan developed by the Elk Technical Team called for a reduction of the Takhini herd size to about 200 animals. The Takhini Valley Elk survey conducted in March 2014 estimated approximately 200 animals. This information is important for understanding if harvest is sustainable, now that we have increased the number of animals available for harvest by introducing depredation permits under the updated Plan.

## Project Activities: How we will get it done

The Takhini and Braeburn herd composition and recruitment estimates will be obtained via fall ground-based observations and aerial surveys. The distribution and movement patterns of radio-collared animals will be monitored via regular ground-based telemetry.

# Finlayson Caribou Co-management Workshop and Ross River Community Engagement

**Alain Fontaine,** Liard Regional Biologist

### Project Description: What we are going to do

We will engage with the community of Ross River to build trust and relations in support of future wildlife population management discussions for the Finlayson caribou herd.

The community and its leadership have long expressed concerns over the harvest of Finlayson caribou by non-First Nation hunters and by hunters from other First Nations within their traditional territory. This project will seek the information required to assess harvest levels within the region, and work towards improving communication between RRDC and Environment Yukon.

### Management Implications: Why we are doing it

Conservation and effective management of the Finlayson caribou herd is a key concern given their value as a subsistence harvest resource for the Ross River Dena, as well as harvest interest from resident and non-resident hunters. The management implications of this project are threefold: collection of harvest information, education and outreach, and building relationships and opening dialog with the local community.

An increased presence in the area will allow us to work towards building relationships with the local community and gain local credibility. Being physically present in the community on a more frequent basis may allow us to open dialogue with the leadership and community of Ross River.

### Project Activities: How we will get it done

We will conduct a one-day Finlayson caribou co-management workshop in the coming year with a representative of BMC Minerals, RRDC Chief and Council, and up to 20 local experts. We will use this workshop to discuss a wide variety of topics relevant to the co-management of the Finlayson caribou herd.

Leading up to and following the workshop, we will travel to Ross River on an ad hoc basis to meet with the RRDC leadership and operational staff and engage the RRDC leadership in discussions related to the workshop, co-management of the Finlayson caribou herd, and other wildlife management issues and concerns

# Fortymile Caribou Herd Monitoring

**Mike Suitor,** North Yukon Regional Biologist

### Project Description: What we are going to do

Through this project we will continue to monitor the movements and seasonal distribution of the Fortymile Caribou Herd (FMCH) and develop models that will predict future habitat use and relative quality at a range scale. This information is needed to support harvest management, land use recommendations, predictive habitat modelling and upcoming population and harvest management discussions in Yukon and Alaska.

### Management Implications: Why we are doing it

Alaska Department of Fish and Game (ADFG) has identified a concern that the Fortymile herd is reaching carrying capacity on its summer range. Real-time information from the satellite collars is needed to inform range assessment and harvest management decisions. Predictive habitat modelling of areas used by the herd will assist in land use management decisions.

### Project Activities: How we will get it done

We will use telemetry flights in association with GPS collar locations to locate the herd from fall through late winter and determine where Yukon range expansion is occurring. This collar information will also support ADF&G range sustainability interests, and will inform harvest management during openings and closures in both jurisdictions. ADF&G will continue to use GPS collars as a basis for monitoring the nutritional status of satellite collared caribou and their young.

# Game Management Zones 5 and 7 Sheep Inventory Completion

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

### Project Description: What we are going to do

In 2015, a large-scale inventory of thinhorn sheep was conducted across most of Game Management Zones 5 and 7. Due to time constraints and other logistical issues, not all game management subzones in these areas were surveyed. This year, we will survey those missed subzones and ensure the inventory for sheep in GMZs 5 and 7 is complete. Additionally, our preliminary analysis of the 2015 survey results indicated some subzones had sheep total counts and/or composition ratios suggesting incomplete counts. We will resurvey these subzones to ensure the overall inventory results are as accurate as possible.

### Management Implications: Why we are doing it

Information from this work will be added to survey information collected in 2015 and will allow for a more complete inventory of thinhorn sheep populations across Game Management Zones 5 and 7. The absence of this information will create “holes” in our broader inventory, and may limit our ability to monitor the sustainability of the harvest in these subzones. This information could be used for potential regulation changes such as PHAs in portions of GMZ 7 (west) and GMZ 5, and subsequent outfitter quota negotiations. This was a key rationale for completing this large survey in 2015. Complete inventories for thinhorn sheep in GMZs 5 and 7 would also represent the start of broader Yukon-wide sheep monitoring and management.

### Project Activities: How we will get it done

This is follow-up work to the survey conducted in 2015. In June 2016, we will survey thinhorn sheep populations in game management subzones that were not surveyed in 2015 or have been deemed as needing a resurvey. During these helicopter-based surveys, all observed sheep will be counted and classified to estimate lamb:nursery sheep ratios (an index of recruitment), ram:nursery sheep ratios (an index of adult sex ratio), and ram age composition based on horn curl size classes.

# Ibex Caribou Late Winter Distribution Survey

**Lars Jessup,** A/Southern Lakes Regional Biologist

## Project Description: What we are going to do

A key data-gap in Southern Lakes is the current range of the Ibex caribou herd. Various reports collected over the last several years have placed Ibex caribou outside of their previously identified herd range. This expanding herd range is indicative of population growth. A better understanding of the herd distribution is needed to best inform management decisions. We will assess the distribution of Ibex caribou during late winter—when they are concentrated on winter range—to address this key data-gap.

## Management Implications: Why we are doing it

Southern Lakes caribou have been the focus of a long-term recovery program designed to reverse the observed decline in the Carcross, Atlin and Ibex herds. Current indicators, such as range expansion, suggest that recovery objectives may have been met. Preliminary discussions regarding management planning and inventory of Southern Lakes caribou—including the Ibex herd—have begun in earnest.

Accurate herd range mapping is fundamental to all management activities associated with caribou management, from habitat mapping to environmental assessments to population estimation and harvest management. Management planning management discussions and future inventory work on the Ibex herd all depend on a current understanding of the Ibex herd range.

## Project Activities: How we will get it done

Late winter is the best time for this survey as the caribou will be concentrated on winter range and snow conditions will allow for tracking of animals. Additionally, future collaring efforts will be conducted during late winter, and will be directly informed by this late winter distribution work.

We will survey the herd in late February or March—prior to caribou spring migration. We will use a fixed wing aircraft to fly systematically over the survey area and document all sightings of caribou and caribou tracks. Fresh tracks will be used to locate groups of caribou where possible.

# Kluane Caribou Distribution and Population Status

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

## Project Description: What we are going to do

The Kluane northern mountain caribou herd is one of the smallest herds (300-350) in Yukon. Due to its small size, the herd is at a higher risk to disturbance or decline due to development in its range; small herds should be afforded a higher degree of monitoring based on the National Northern Mountain Caribou Management Plan. We will determine the seasonal distribution and population status of the Kluane caribou herd. Information from this project will also be used to identify critical areas and movement corridors. This information will allow us to update our assessment of population size and status based on survival of collared adult caribou and annual calf survival.

## Management Implications: Why we are doing it

Northern Mountain caribou are listed as "Special Concern" under the federal Species at Risk Act and maintaining the health of these herds is a high priority for management partners in Yukon. The Kluane caribou herd is one of the smallest herds in Yukon and requires a higher degree of monitoring, based on the National Northern Mountain Caribou Management Plan. Given the small size of this herd, the level of acceptable risk associated with any development may be reduced.

Data from the radio-collars will directly inform the environmental assessment process by providing more accurate and up to date information on the spatial distribution of the herd, including critical areas and/or movement corridors.

Updated information on the size of the herd will also affect the level of acceptable risk related to industrial development and whether any harvest on the herd is recommended, as licenced harvest of this herd is currently closed.

## Project Activities: How we will get it done

This is a proposed multi-year project (year 4 of 6) operating from March 2014 thru to August 2018. The first two years consisted of animal capture and collaring. We completed a population estimate in 2015. Over the next 3 years, we will continue tracking location data from the collars; collars are programmed to drop-off during the summer of 2018. This year we will conduct a composition survey in October 2016 to assess calf recruitment and adult sex ratio.

# Laberge Caribou Herd Distribution and Habitat Use

**Lars Jessup,** A/Southern Lakes Regional Biologist

### Project Description: What we are going to do

Southern Lakes caribou have been the focus of a long-term recovery program designed to reverse the observed decline in the Carcross, Ibex and Atlin herds. Management of the Laberge Caribou Herd (LCH) currently operates on an estimated herd range. The LCH range has significant overlap with the Carcross Herd (CCH) range; delineation of herd ranges between the Laberge and Carcross caribou is still uncertain.

This project will allow us to improve our understanding of LCH distribution and habitat use, and will inform future management planning discussions for Southern Lakes caribou.

### Management Implications: Why we are doing it

Environment Yukon's woodland caribou management guidelines recommend no harvest of small herds. Currently, the Game Management Subzones overlapping much of the estimated LCH range are open to bull harvest for licenced hunters. Range delineation is critical in assessing LCH harvest, and reviewing the regulations, as appropriate.

Imminent management planning for Southern Lakes caribou will require defined herd ranges as well as population assessments of each herd. This project is especially critical as the area of overlap between LCH and CCH contains the highest density of caribou within the entire CCH range.

### Project Activities: How we will get it done

To date, 14 Laberge caribou have been collared. This year, we will continue monitoring and collected collar location information, working towards our longer term project objectives.

# Liard Basin Early Winter Moose Census

**Alain Fontaine,** Liard Regional Biologist

## Project Description: What we are going to do

We will conduct an early-winter moose census survey in the Liard Basin Moose Management Unit (MMU) to estimate population density, composition, and distribution. We will also host a moose harvest workshop with local experts prior to the survey to estimate subsistence moose harvest within the MMU and draft an expert-based stratification map for the survey. This information will be used to estimate current harvest levels and population comparisons from previous surveys in the area. Once results are finalized following the survey, we will hold another workshop with Liard First Nation community leaders to discuss survey results, harvest levels and their implications for the Liard Basin moose population.

## Management Implications: Why we are doing it

We have identified this census as a priority for Yukon moose management. Data from this survey will provide us with information on moose densities, population composition, and distribution for the entire Liard Basin MMU.

Moose hunting pressure within the Liard Basin MMU is believed to be high. Much of the harvest occurs on the Liard River and its tributaries, along the Alaska and Robert Campbell highways, and off other access roads. Based on available harvest information and expert opinion, we estimate a total harvest rate between 5.3% and 8.1%, exceeding the maximum sustainable harvest level of 2 to 3%.

This survey will also inform future moose population predictions in un-surveyed MMUs near the Liard Basin. We currently have model-based population estimates in most areas of southern Yukon; however, we have an information gap in the south-eastern portion of the territory. .

## Project Activities: How we will get it done

We will conduct a one-day moose harvest workshop in 2016 with local experts. We will use this workshop to collect expert knowledge on subsistence harvest of moose within the Liard Basin MMU and to draft a stratification map for the census.

The survey will be conducted in November 2016. We will use a new model-based approach that will incorporate expert local knowledge, habitat

information, and information from previous surveys to predict the number of moose on the landscape. We will use helicopters to count moose in blocks covering approximately 25% of the survey area. The census portion of the survey will take approximately 8 to 11 days with 3 crews (includes weather days).

We will conduct a one-day post moose survey workshop in March 2017. We will use this workshop to discuss the results of the survey and summer moose harvest workshop, and their implications in terms of sustainability for the Liard Basin moose population.

# Paint Mountain, Jarvis and Cultus Moose Recruitment

**Sophie Czetwertynski,** Ungulate Biologist (Moose, Elk, Deer)

## Project Description: What we are going to do

In 2013, we piloted a model-based approach to surveying moose recruitment in the Paint Mountain, Jarvis, and Cultus Moose Management Units (MMUs). We continue to collect and test whether the data from recruitment surveys can be used to detect changes in the moose population a number of years after a census survey. If successful, this approach could result in cost savings compared to a census survey and may allow us to monitor a greater number of high-pressure MMUs.

## Management Implications: Why we are doing it

There is presently no established methodology for conducting unbiased moose recruitment surveys in low-density moose populations. This information is critical for managing highly accessible areas where harvest approaches maximum sustainable levels.

Should this methodology prove successful, it would also allow us to detect changes in the size of accessible moose populations more frequently. This will enable us to respond more rapidly to changing local conditions (e.g., population trend, access, and changes in harvest patterns), particularly in areas with high harvest pressure and unknown FN harvest.

Lastly, this area has been identified as a potential control area for the Integrated Community Based Integrated Alsek moose management program, where Yukon government and Champagne and Aishihik First Nation (CAFN) will be conducting intensive wolf trapping. Recruitment information from this area will help evaluate whether there is evidence to suggest that recruitment trends observed in the Alsek area are related to focussed wolf trapping activities.

## Project Activities: How we will get it done

We will conduct a survey in November 2016; we will count and classify moose in selected 4km x 4km survey cells using crews of three observers in helicopters. This survey will take approximately 4 days.

# Population and Habitat Ecology of the Klaza Caribou Herd

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

### Project Description: What we are going to do

Through this multi-year project, we are collecting the necessary baseline information on the population status, distribution, and habitat ecology of the Klaza caribou herd prior to more advanced development within its range (e.g., Casino, Kaminak Gold, and Klaza Gold). During this fiscal year, we will use a number of monitoring activities to assess population status, adult female mortality, and movements and distribution of the herd.

### Management Implications: Why we are doing it

The Klaza herd has some of the most significant conservation concerns among all Northern Mountain caribou herds in Yukon. Concerns are based on the high level of mineral exploration and proposed development in the herd's range, coupled with the frequent natural fire regime. There was also very little current baseline data on the population status of the herd prior to 2012. An additional objective of the project is to refine our understanding of the distribution of the Klaza herd and its range delineation, particularly with respect to the Aishihik herd to the south.

Information from this project will inform environmental assessment reviews for industrial activity in the Klaza herd's range. A winter range assessment has been completed for the herd; future analyses will focus on seasonal habitat models and herd distribution during the non-winter seasons. The herd was also the focus of a relatively intensive cumulative effects study providing information used in the range assessment.

### Project Activities: How we will get it done

This is year 5 of a proposed multi-year project, with 2 years of data collection remaining. This year we will complete a fall composition survey—retrieving radio-collars emitting a mortality signal, were possible—and continue collection of movement and distribution information gathered through data download from GPS radio-collared female caribou in the herd. All fieldwork will be conducted via helicopter. Ten radio-collars were deployed in November 2014. These collars will remain active for three years. There are currently 11 collars actively transmitting data.

# Porcupine Caribou Harvest Program

**Mike Suitor,** North Yukon Regional Biologist

## Project Description: What we are going to do

Monitoring of the Porcupine Caribou hunt in Yukon is needed to assess the status and effectiveness of harvest management actions implemented under the Porcupine Caribou Harvest Management Plan. We will operate a check station on the southern portion of the Dempster Highway to document harvest and as a means of providing educational materials to hunters. This year we will also enhance communications with harvesters along the Dempster by constructing two new signs with respect to the Hart River caribou overlap—a recommendation from the Porcupine Caribou Management Board.

## Management Implications: Why we are doing it

In the Harvest Management Plan for the Porcupine Caribou Herd in Canada (HMP), all parties committed to collecting rigorous and verifiable harvest data from their respective hunters on an annual basis. Data collected by this program, when combined with knowledge of caribou abundance and age/sex ratio data collected by the PCH Population Monitoring Project, will be evaluated at the Annual Harvest Meeting to determine if harvest is negatively affecting the herd. Pending results, specific actions may be taken as outlined in the Harvest Management Plan and the associated Implementation Plan.

Signage will improve communications and help ensure the conservation of the Hart River herd and permit enforcement.

## Project Activities: How we will get it done

If the herd's migration enables harvesters to access it from the Dempster Highway, we will operate a check station at the Dempster/Klondike Highway for 2.5 months (October to December) to record harvest and provide an easy point of contact with active hunters. The number of caribou harvested, along with harvest data from co-management partners will be collected and summarized. If the check station does not open, we will redirect funding from this project towards the Porcupine Caribou Herd Monitoring project.

We will install new harvest information signs to enhance communications with NWT harvesters hunting along the Dempster Highway. Sign messaging will be crafted with input from the Gwich'in Tribal Council, and the Inuvialuit Game Council, and will be constructed and installed in cooperation with the Department of Highways and Public Works.

# Porcupine Caribou Herd Monitoring

**Mike Suitor,** North Yukon Regional Biologist

## Project Description: What we are going to do

To determine the abundance and health of the Porcupine caribou herd, we will complete a composition count in late winter (when feasible), annual collaring of caribou; body condition monitoring and disease assessment, and monitoring and mapping of the herd distribution. These measures relate directly to harvest management of the Porcupine caribou herd.

## Management Implications: Why we are doing it

Ensuring that harvest of the Porcupine caribou herd is sustainable requires an understanding of the population status of the herd. Monitoring of this international herd is done collaboratively by Canadian and Alaskan partners. The Porcupine Caribou Management Board uses the results from monitoring activities undertaken during this project at their Annual Harvest Meeting to make harvest management decisions, as per the Porcupine Caribou Harvest Management Plan and its associated Implementation Plan.

Monitoring of health indices and metal loads allows wildlife managers to provide recommendations on human consumption of the herd. For example, previous health monitoring has resulted in the current advisory on consumption of kidneys and livers.

## Project Activities: How we will get it done

During the late winter, we will deploy approximately 10 to 20 satellite and 15 to 25 VHF collars. Blood samples from captured caribou are tested as part of ongoing monitoring of disease prevalence.

Body condition monitoring tracks various aspects of the health of harvested caribou. Hunters are asked to submit samples from harvested caribou using provided kits and keep statistics on harvested animals such as back fat depth and their opinion of animal condition based on long term experience. We will assist with collection of samples in September, and again in late winter if harvest activities are occurring.

In 2016, we will continue to work with secondary students at Chief Zzeh Gittlitt School in Old Crow to expose students to the integration of community monitoring and scientific method.

# Porcupine–Hart Caribou Herd Overlap Monitoring

**Mike Suitor,** North Yukon Regional Biologist

## Project Description: What we are going to do

This work will allow us to determine whether Porcupine caribou are within the vicinity of the Hart River herd. Based on the distribution of the 2 herds, harvest opportunities can be adjusted by implementing emergency closures if Porcupine caribou are not found in the area along the Dempster Highway. Emergency closures are in place to ensure sustainable harvest of the smaller Hart River herd. Telemetry from this survey will also inform a planned rut composition survey for 2016.

## Management Implications: Why we are doing it

Effective harvest regulation is critical for ensuring the much smaller Hart River herd is not over-harvested, while at the same time not impacting the ability of licenced harvesters to hunt when the Porcupine caribou are present in the 5 subzones where the herds' ranges overlap. Data collected by the program also provides insight into the herd's rut and winter ranges, and is part of our territory-wide caribou monitoring strategy.

## Project Activities: How we will get it done

We will locate radio-collared Hart River and Porcupine caribou from fixed-wing aircraft twice during 2016/17. One survey will identify the Hart River caribou herd distribution in mid-September, prior to the rut survey. A second flight, in late October, will focus on the overlap area with Porcupine caribou and inform management decisions on season closures. Porcupine caribou herd movements will be monitored by satellite collar locations and aerial telemetry conducted by US Fish and Wildlife Service immediately prior to this survey.

Summary reports will be completed and distributed to the parties immediately after telemetry flights are completed (typically late September and October). If an emergency closure is warranted, the supporting documentation will be available by mid-October.

# Southeast Yukon Caribou Distribution

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

## Project Description: What we are going to do

Knowledge of caribou distribution and herd identification/delineation is critical for effective caribou management, as the herd is the basic unit for management. In the southeast Yukon two herds, Little Rancheria and Horseranch, have previously been identified as separate herds. However, whether they are truly distinct herds is uncertain. To resolve the uncertainty around herd designation, we will deploy radio-collars on caribou in the SE Yukon and NE British Columbia to track seasonal movements and distribution patterns.

## Management Implications: Why we are doing it

To effectively and meaningfully assess, monitor, and manage caribou in the SE Yukon, information is required to identify and delineate the management units (i.e., herds) upon which decisions are made. For example, the combined effects of harvest and road kill mortality could be at or above sustainable levels (> 6%) if Little Rancheria and Horseranch are considered a single management unit. This level of human-caused mortality greatly exceeds sustainable levels identified in the updated caribou management guidelines. As a result, Little Rancheria and Horseranch caribou are ranked as having the highest level of conservation concern among herds in Yukon.

## Project Activities: How we will get it done

This is year 1 of a proposed multi-year project, which is based on the lifespan of the collars. This year, we will deploy 20 GPS radio-collars (Lotek Lifecycle) on caribou in the late-winter (February or March 2017). Our deployment will be coupled with an additional 20 collars deployed by management partners in British Columbia.

In the following 4 years, we will continue to record relocation data from the collars.

# Tay River Caribou Distribution and Population Status

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

## Project Description: What we are going to do

This project involves the deployment of radio-collars to update information on the seasonal distribution of the Tay River herd and to develop process-based habitat models identifying important seasonal habitats. We will use these radio-collars to locate animals and animal groups to collect demographic information (sex ratio, recruitment ratios) and as marks during a proposed mark-resight population estimate of the herd. Information from these collars will also allow us to confirm or refute the existence of the Moose Lake herd, a small herd located and overlapping with the Tay River herd at its northern boundary.

## Management Implications: Why we are doing it

Tay River caribou are one of the 26 herds of Northern Mountain caribou found in Yukon. Northern Mountain caribou are listed as "Special Concern" under the federal Species at Risk Act. The health of these herds is a high priority for management partners in Yukon. Forest fires in the past few decades have altered the winter distribution of the Tay River herd. The population estimate of 3,750 is outdated—obtained in 1993—and may be unreliable. Harvest pressure on the herd may be at sustainable rates and mineral exploration in the herd's range is advancing.

Extensive mineral exploration in the herd's range may put added pressure on the herd. New information on the status and distribution of the herd is required to inform environmental assessment processes and to ensure that harvest is occurring within recommended guidelines.

## Project Activities: How we will get it done

This is year 2 of a proposed 5-year project; year 1 consisted of collar deployment. This year, we will monitor and record spatial data from the 40 deployed GPS radio-collars. In the fall, we will complete a composition survey of the herd by tracking radio-collared animals to locate groups for classification.

This year, we will complete an annual progress report to discuss aspects of the project and survey results with the Ross River Dena Council.

# Thinhorn Sheep Lamb Recruitment Monitoring

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

### Project Description: What we are going to do

The goal of this project is to enhance our capacity to monitor thinhorn sheep populations by tracking lamb recruitment in a number of populations across the Territory. Tracking lamb recruitment in multiple populations will allow us to assess the impacts of annual environmental variability, such as weather and climate change.

### Management Implications: Why we are doing it

Data collected during this work will provide a broader level of knowledge of thinhorn sheep recruitment patterns. For example, this information will allow us to predict potential changes in sheep populations across the territory based on annual weather patterns. Such information could be used to manage hunter expectations in the future regarding sheep availability. This information may also be used in conjunction with environmental assessments; particularly if there have been several continuous years of poor recruitment. Poor recruitment may suggest a sheep population is at a higher risk from industrial development or disturbance. Once sufficient years of data are available, relationships between lamb recruitment and annual environmental variability can be examined. This information will be valuable for predicting effects of climatic change.

### Project Activities: How we will get it done

During fall caribou composition surveys (late-September to early-October), we will assess lamb recruitment for selected sheep populations that overlap with monitored caribou herds. During fall 2016, we plan on surveying game management subzones (GMS): 9-03 (Gray Ridge), 5-36 (Ruby Range – ground-based), 4-03 (Ddhaw Ghro), and Anvil Range (4-46). We will ensure hunters are informed about the planned surveys so as to minimize any disruption to their hunts. As rams will not be classified, we are able to keep survey duration and disturbance to a minimum. The Tombstone population (GMS 2-23, 2-28, 2-41) will also be surveyed, but in July as snow conditions in the fall make sheep detection challenging.

# Trial of Unmanned Aerial Vehicles for Surveying Sheep

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

## Project Description: What we are going to do

Unmanned aerial vehicles (UAVs) are increasingly being used in wildlife survey work. Our aim with this project is to assess the feasibility of using UAVs for surveying sheep populations in Yukon. We will conduct our trial survey on the Caribou Mountain population, outside of Carcross. This population is well suited for assessing the efficacy of UAVs for surveying sheep as it is located on a small isolated mountain block and the sheep population has been surveyed three times since 2009. Further, it is readily accessible so costs will be minimal for positioning the UAV and its receiver/operator.

## Management Implications: Why we are doing it

Wildlife surveys are expensive, have an inherent risk, and can disturb animals. New technology is becoming available to reduce many of these survey "costs". Potential benefits of using UAVs—when compared to helicopter-based surveys—include personnel safety, reduced animal disturbance and reduced fuel usage, in addition to reduced costs. However, we do not know if UAVs will be an effective tool for surveying sheep given rugged and variable terrain, nor have we tested whether the imagery recorded by a UAVs on-board camera will be useful for gathering the type of information we require for management.

## Project Activities: How we will get it done

This is a single-year project, with the survey taking place in late-June on the Caribou Mountain sheep population, outside of Carcross. As part of this trial, a private contractor has agreed to cover the costs associated with the UAV and its operator. We will use a helicopter to position our staff, the UAV operator and equipment on the top of Caribou Mountain to provide an optimal line-of-sight for the operation of the UAV. Sheep will then be surveyed during a single day. We will examine the imagery taken during the flight to determine if these products could be useful for future survey efforts.

# Wood Bison Health Monitoring Program

**Thomas Jung,** Senior Wildlife Biologist

### Project Description: What we are going to do

Monitoring for diseases of concern is an important task for ensuring the long-term viability of wood bison in Yukon. For this project, we will selectively removing a small number of adult wood bison from the Aishihik herd for the purpose of collecting samples to test for diseases of concern. From past experience, we have determined that relying on hunters to obtain necessary samples for disease testing is not sufficient, and that a dedicated sampling effort is needed to provide for rigorous testing.

### Management Implications: Why we are doing it

Nationally, wood bison are a species at risk; however, in Yukon, populations are growing. This project will provide an assessment of the disease status of bison in Yukon and will fulfill a key task in the Yukon Wood Bison Management Plan and the draft National Wood Bison Recovery Strategy.

### Project Activities: How we will get it done

We will need to collect and necropsy 6 to 8 wood bison carcasses to obtain sufficient biological samples. We will target adult female bison. Our field work will occur in early April 2016, soon after the end of the hunting season, and will be dependent on the population size being able to support the additional loss of these animals.

This will be year 3 of the project. Ongoing sampling, if warranted, will need to consider sustainability and any changing harvest patterns. Over the course of the past two years, 14 bison have been sampled by this program.

# Wood Bison Monitoring

**Thomas Jung,** Senior Wildlife Biologist

## Project Description: What we are going to do

Through this project, we collect data needed to aid bison management efforts in Yukon. Bison population monitoring activities are identified in the Yukon Wood Bison Management Plan and the draft National Recovery Strategy for Wood Bison in Canada. This year, our monitoring will focus on:

- A census and composition count of the Aishihik Herd.
- Calculating an Annual Allowable Harvest for the Aishihik herd that meets the goals of the territorial management plan for wood bison;
- Monitoring the spatial distribution of the Aishihik herd and monitoring range expansion and shifts in range use;
- Providing in-season maps to hunters on where they have the best chance of finding bison to harvest.

## Management Implications: Why we are doing it

Nationally, wood bison are a species at risk; however, in Yukon, populations are growing. The current management plan for the Aishihik herd tasks bison managers to reduce the size of the population to at or near 1,000 animals post hunt. Because of the high harvest rate, inherent small population size, and conservation status of the herd, managers need good information about bison to balance recovery and harvest. The opportunity to hunt bison is a valued and beneficial resource, and requires careful management using the best available information.

## Project Activities: How we will get it done

Throughout the year, we will relocate collared bison using bi-monthly radio-telemetry fixed-wing flights. Maps of collared bison will be distributed on a set schedule, for use by hunters. In June 2016, we will conduct a composition count of Aishihik bison, with a focus on counting calves and determining the sex-ratio of the population. We will also use this opportunity to retrieve collars that are in mortality mode—there are currently 4 collars in mortality mode. We will conduct a mark-resight style census in July, 2016, using bison marked with paint, and those with collars, as well as 3 resight surveys to determine the current population size of this herd. We will deploy 6 low-feature GPS collars on cow bison in the Aishihik herd via helicopter-based captures February 2017.

# Yukon Mountain Goat Science-based Management Guidelines

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep, Goat)

## Project Description: What we are going to do

Yukon currently has no formal goat management guidelines in place to inform management decision-making or ensure the Umbrella Final Agreement goal of conservation and long term optimum productivity is met. With this project, we will develop science-based management guidelines for mountain goats in the Yukon. These guidelines will inform any management changes to goat harvest and environmental assessment across Yukon, and will guide how mountain goat population monitoring may be conducted in the future.

## Management Implications: Why we are doing it

Mountain goats occur at the edge of their range in Yukon, occupying more marginal habitats and occurring in much lower densities than goat populations in more coastal regions. As a result, they may be more sensitive to harvest and disturbance than goats elsewhere. In addition, there has been a recent increase in the number of inquiries from the Yukon public regarding the rationale for having goat hunting closures. There are currently no management guidelines related to the conservation and management of mountain goats in the Yukon.

The creation of these guidelines would provide a single source to direct people to which would describe how our management recommendations are made. Additionally, during the discussions regarding the regulation change to close harvest of goats in the Itsi Mountains, some members of the Yukon Fish and Wildlife Management Board indicated that mountain goat guidelines would be a useful product.

## Project Activities: How we will get it done

We will engage a contractor to complete the majority of the work. They will be responsible for reviewing, updating, and adapting British Columbia's 2010 mountain goat management guidelines for application in Yukon.

We will provide Yukon-specific information and context for the guidelines to the contractor, and ensure the proposed guidelines are relevant to Yukon.