Fish and Wildlife Branch
Project Summaries
2017-18

Yukon
Environment
Environnement

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Table of Contents

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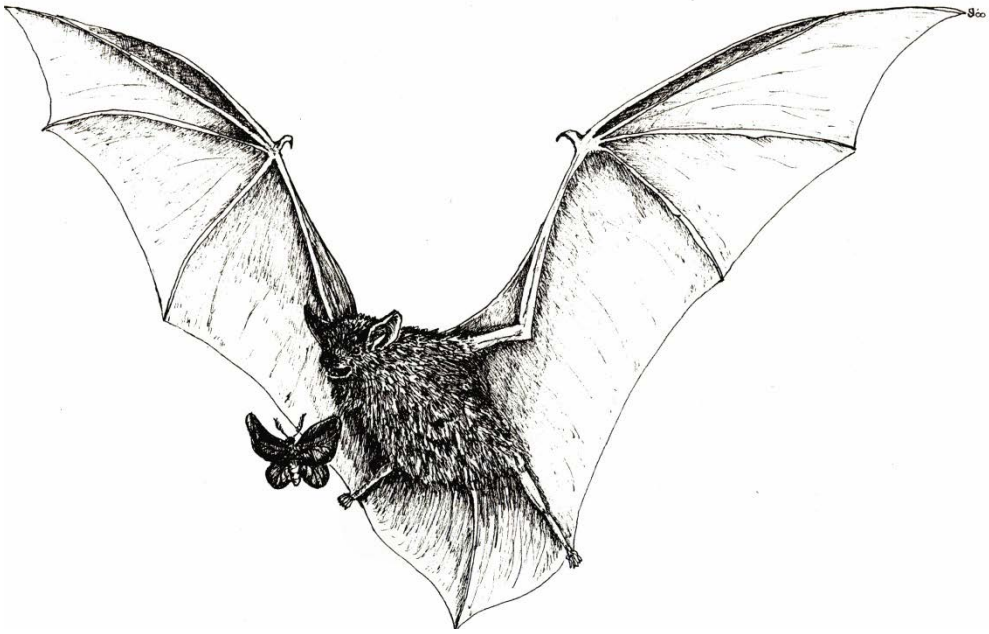

Yukon
Environment

Biodiversity science and management

Thomas Jung, Senior Wildlife Biologist

Project Description: What we are going to do

Assessing and monitoring programs for 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 an ecosystem (beaver). Their responses to changing conditions help us understand and predict the response of other northern species.

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 2017.

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 with possible impacts on key furbearers such as lynx, martin, wolverine and other predators.

We will also track the abundance of beaver, a species predicted to respond strongly to shrubification of riverine ecosystems due to climate warming. Increases in their abundance may impact species that also inhabit riverine ecosystems, such as riparian birds, moose, and salmon.

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

Project Activities: How we will get it done

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

This year we will capture and radio-collar up to 50 Snowshoe Hare in early spring (April 2017) near Kluane Lake. We will monitor their survival by radio-telemetry and explore how survival relates to coat colour and snow conditions. An annual project report will be prepared by the end of February 2018.

Assessing Change in Beaver Abundance: In early October 2017, we will conduct aerial surveys of select protected areas to document changes in beaver abundance. These areas may include territorial parks (Tombstone and Agay Mene), habitat protection areas (Lewes Marsh, Tagish River, Nordienskold, Devil's Elbow, and Horseshoe Slough) and a national wildlife area (Nisutlin River Delta). Each of these areas had been previously surveyed from 2008 to 2011 and a resurvey will provide the data needed to assess the extent of increases in beaver abundance (if any), which may be a predicted result of climate change. A project report will be prepared by December 2017.

Ecological and landscape classification

Nadele Flynn, Ecological and Landscape Classification Coordinator

Project Description: What we are going to do

We will conduct biophysical surveys within the subarctic and boreal bioclimate regions of Yukon to confirm and collect soil, site, and plant community information (biophysical inventory) in plots that represent the diversity of ecological systems within the regions. Having this information is an important step to develop Ecological and Landscape Classification (ELC) guide books and map products.

Management Implications: Why we are doing it

Data from this biophysical survey will provide us with information about plant communities and their environmental context that will fill gaps in Government of Yukon's biophysical inventory. This information is needed to produce ecosite field guides and descriptions of plant communities (vegetation associations) that can be used to develop ecological mapping and further support the management of natural resources.

Project Activities: How we will get it done

We will meet with working group members and local experts (environmental consultants, First Nation lands and resource technicians and managers) to collect knowledge on plant communities, and draft a sampling plan for the biophysical survey by May 31, 2017. This survey will be conducted between June and September 2017, and will take approximately 28 days with two crews.

We will analyze our biophysical inventory and incorporate expert knowledge to develop draft ecosite field guides for the Boreal and Subarctic regions between April 2017 and February 2018. A survey summary report will be completed prior to fiscal year end and a draft version of ecological field guides will be completed for March 31, 2018. We will conduct an ELC technical workshop in February 2018, with local experts and the Working Group to discuss the results of the biophysical survey and analysis. Subjects to be covered in the workshop will vary depending on the results of the biophysical survey but are likely to include discussions on how this information will be used to produce field guides, support ecological mapping and management of natural resources.

Keystone boreal species trend assessments

Todd Powell, Manager, Biodiversity Section

Project Description: What we are going to do

This project is an annual keystone species population trend assessment program based on the established long term sampling sites in the Kluane region, Mayo, Watson Lake, Faro and Whitehorse. The data collected will be analyzed for trends in annual productivity, population, and changes in furbearer species density. The central database is continually updated and includes local knowledge on environmental conditions.

Management Implications: Why we are doing it

Tracking population trends in small mammals and snowshoe hares provides an early warning of change to the natural environment. This information helps us to understand the resilience and vulnerabilities of Yukon's boreal food web to landscape and climatic changes. Tracking the natural variations year to year provides a foundation of understanding from which to discuss and describe trends and whether there are emerging issues in these populations that indicate possible change in harvested species requiring management action.

Project Activities: How we will get it done

Collecting information about population variation is most informative if conducted annually. In the summer of 2017, the key boreal food web components— mice, vole and Snowshoe Hare populations as well as ground berries and spruce cone annual productivity will be measured on the existing standardized monitoring sites using consistent methods among regions.

We will also continue monitoring the abundance of small and medium-sized carnivores using track counts in two communities during the following winter (Mayo, Kluane) while investigating how tracks and trail cameras relate regarding providing trend information. Community members and Fish and Wildlife branch staff conduct these surveys.

Project summaries will be completed in October and March of the fiscal year. We will continue to support the publication of articles about these trends and findings in community newspapers and other local media on a regular basis and report on results in the annual State of the Environment report.

Species at risk inventory and monitoring

Thomas Jung, Senior Wildlife Biologist

Project Description: What we are going to do

This on-going 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: We will monitor changes in the diversity and abundance of Yukon bats, an endangered species, and inform the re-assessment of their status by COSEWIC and NatureServe. We will also highlight how bats provide natural pest (mosquito) control in Government of Yukon's campgrounds, we will provide alternate housing (bat houses) where needed, and provide wildlife viewing opportunities.

Collared Pika Monitoring: We will track changes in the presence of pika in alpine ecosystems. This 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 sample 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 on-going 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 Government of Yukon campgrounds. The information we collect from 2017 and previous years will be used to develop a long-term database on population size, productivity, and 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 to be measured, banded, assessed for reproductive state and released. A small sample will be radio-tagged to determine home ranges and these data will help us to determine summer habitat needs of Little Brown Bats in the boreal forest.

Collared Pika: We will continue to monitor approximately 60 sites for Collared Pika patch occupancy in August 2017. We are in year five of five years of data collection 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. Biological samples are collected to determine sex, age, and diet, and they are tested for disease. 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 10 years of the necessary data.

A project summary will be updated in October and March of the fiscal year. An annual progress report will be prepared in January 2018.

Species at risk management

Todd Powell, Manager, Biodiversity Section

Project Description: What we are going to do

This project manages species at risk through the delivery of programs as required by the *National Accord for the Protection of Species at Risk*, and through the participation in national committees such as COSEWIC (Committee on the Status of Endangered Wildlife in Canada), RENEW (Recovery of Nationally Endangered Wildlife), and CITES (Convention on the International Trade in Endangered Species). Emphasis is placed upon species particularly important to Yukoners, such as Grizzly Bears, Polar Bears, caribou, and bison.

Management Implications: Why we are doing it

The activities undertaken in this project supports Yukon's participation on species at risk matters (assessment and recovery planning) at the territorial, national and international levels. We will represent our concerns, coordinate management and investigations with regional and species programs staff, and address topics of public and political concern as they arise.

Project Activities: How we will get it done

We provide lead technical representation on management planning for Yukon species at risk via national species at risk teams for key species (e.g. bison, caribou, and Polar Bears). Activities will include reviewing territorial general status and NatureServe ranks for vertebrate species (mammals, freshwater fish, resident birds, and raptors) and contributing to the national ranking processes done by the General Status of Wildlife Species Working Group, and participation in national species status assessment meetings and jurisdictionally-based species at risk meetings for species like Polar Bears, caribou, and bison. We will host the COSEWIC Species Assessment Meeting in April 2017, in Whitehorse, the NatureServe Annual General Meeting in June 2017, in Whitehorse and will chair the National Bison Technical Committee in 2017.

Western Toad range description

Bruce Bennett, Coordinator, Yukon Conservation Data Centre

Project Description: What we are going to do

This project is designed to improve our knowledge of the distribution of local amphibians and to identify their key habitats in both southwest and southeast Yukon. Sampling can also improve our knowledge of the distribution of Ranavirus and Chytridiomycosis fungus which has been identified as the largest threat to Yukon amphibians. The northern distribution of Western Toad has been hard to determine using traditional sighting survey methods, therefore, we will use environmental DNA (eDNA) as it has proven to be extremely sensitive in detecting aquatic organisms.

Management Implications: Why we are doing it

The Western Toad is listed as a species of Special Concern and details on their specific range and habitat are incomplete. The purpose of this study is to increase our understanding of distribution, which is a recommendation in the Management Plan for Yukon Amphibians (2013). By providing information on endangered species and ecosystems, the Yukon Conservation Data Centre is able to support agencies involved with land-use planning, species at risk recovery planning and environmental impact assessments. The development of this new technique in Yukon may make surveys more cost effective and sensitive to accurately detect presence or absence of toads in sampled water bodies.

Project Activities: How we will get it done

We will map the range and habitat suitability of the Western Toad using available GIS layers of relevant land cover features (e.g. wetland type, size, surrounding vegetation type, elevation, etc.). We will sample selected road-based water bodies in cooperation with regional staff or with assistance of Environment Canada and Parks Canada. Samples will be collected and analyzed in house to provide training on sampling techniques and processing. Fieldwork will occur over 8 days in June with an anticipated sample size of 40 sites. Results of the sampling (both positive and negative) will be kept within the Yukon Conservation Data Centre.

Yukon Conservation Data Centre

Bruce Bennett, Coordinator

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 over 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 Yukon CDC 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.

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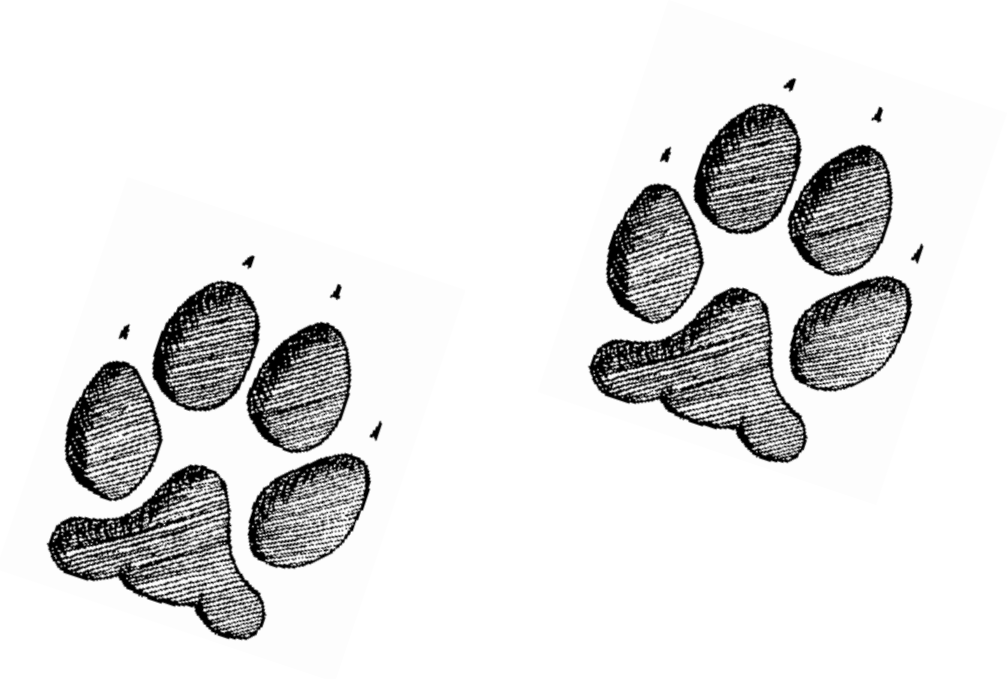


Yukon
Environment

Alsek wolf monitoring

Peter Knamiller, Wolf Program Coordinator

Project Description: What we are going to do

We 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 the Champagne and Aishihik First Nations (CAFN) and the Alsek Renewable Resources Council (ARRC). We are examining 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, and Cultus Moose Recruitment project summaries. 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 the Wolf Conservation and Management Plan including Recommended Implementation Measure 17 of Goal 4. 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 year three of a proposed multi-year project. Work will occur between February and March of 2018. We will assess changes in relative wolf population size through aerial surveys in the Alsek moose area. The minimum count method will be used to estimate wolf population size, pack size and distribution. We will also monitor wolf harvest rates.

Results will be presented to CAFN and the ARRC with a survey summary report to be completed by May 2018. A final report will be completed at the end of the three to five year project.

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 Yukon Wolf Conservation and Management Plan (2012), 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 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 (for example, the Yukon Trappers Association) to identify trappers interested in participating in the training program. We are currently collaborating with the Champagne and Aishihik First Nations, and the Alsek RRC on work with local trappers and implementation of 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

Species Section, Fish and Wildlife Branch

Project Description: What we are going to do

We will use modern harvest modeling techniques to verify our current approach to grizzly bear harvest modeling. This work is similar to what has recently been completed to update harvest rate guidelines for moose, Northern Mountain caribou and thinhorn sheep.

Management Implications: Why we are doing it

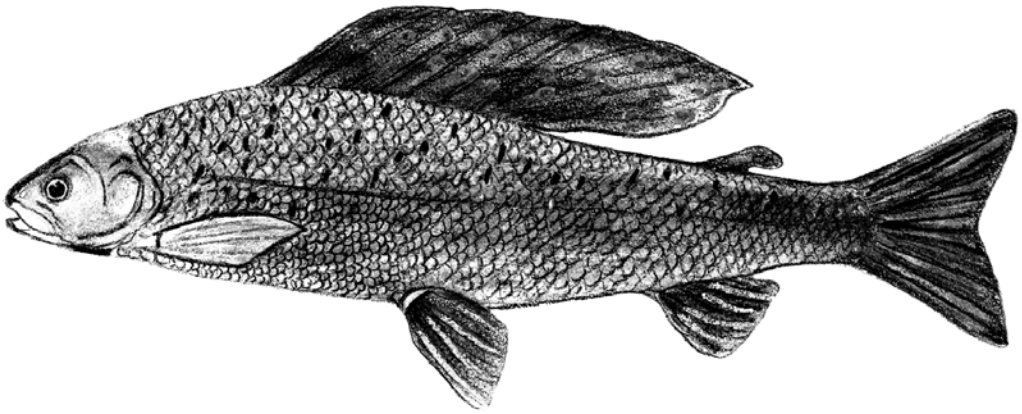
Grizzly Bear harvest rates for Yukon are currently based on limited work completed in the Yukon in the mid-'80s. Since then, we've added to our understanding of some Grizzly Bear populations in Yukon and have a much more extensive understanding of harvest patterns. Modeling approaches used to guide management decisions are also more sophisticated than in the '80s. Updated modeling – using current information – will help us understand if our current approach to Grizzly Bear harvest management continues to be sound.

This work will inform discussion around outfitter quotas and resident harvesters, as well as our overall strategy to manage Grizzly Bear mortality (which includes defense of life and property kills, road kills, etc.). This work will also support the development and implementation of the Grizzly Bear Conservation and Management Plan and Grizzly Bear science-based species management 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.

FISHERIES



Yukon Environment

Angler harvest monitoring

Caitlin January, 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.

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.

Priority areas for 2017 are several high-use recreational fisheries: Snafu/Tarfu Lakes, and the Southern Lakes System (the final year of a four year survey that covers Marsh, Tagish, and Bennett lakes, Tagish River, and Nares River).

A data gap identified in many previous surveys is the poor understanding of winter—particularly late-winter—ice fishing effort, which is increasing. We will address this gap with a winter modification of the standard creel approach. This work will take place on Little Atlin Lake as it is very accessible, has a popular and increasing ice fishery, and a depleted lake trout population.

Aquatic health monitoring for placer mining

Caitlin January, Fisheries Technician

Project Description: What we are going to do

This is an ongoing project where 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 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 Department of Environment. In a typical year, we will sample 15 sites by helicopter and 5 sites by road access.

Field work is completed between July 15 and August 7 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

Robert Perry, Senior Fisheries Biologist

Project Description: What we are going to do

This is an ongoing program where we conduct laboratory analysis 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 (for example: 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 and pathogen 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. 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

Robert Perry, 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 Aishihik, Frances, Michie and Ladue lakes. We will also conduct a Burbot stock assessment survey on Little Teslin Lake and an Arctic grayling spawning survey on Lubbock River.

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 (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 Aishihik, Frances, Michie and Ladue 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.

Burbot: We will continue to monitor Burbot populations, based on concerns about low population levels identified in Burbot surveys to date. In 2017-18, we will conduct a Burbot population assessment of Little Teslin Lake, a very small lake with heavy winter harvest pressure, influenced by recent sale and development of cottage lots.

Arctic Grayling: In spring 2017, we will return to Lubbock River to conduct snorkel survey estimates of Arctic Grayling over the course of their spawning run. We have developed a snorkel survey technique that allows a rapid assessment with low time investment. This estimate update will support the 2016 Lubbock River spring creel, and allow us to assess population health and regulation effectiveness. This survey contributes to our monitoring of run strength and timing of this popular and heavily-fished population.

Productivity: Estimates of sustainable harvest for each lake are based on lake productivity parameters. Updating the methods to reflect the most recent data and best available science will improve our ability to effectively manage Yukon's freshwater fisheries. Estimates of lake productivity provide a baseline against which we can measure the health of a fish population. As part of an ongoing commitment to improving our understanding of lake productivity in Yukon, in 2017-18 we will continue collecting productivity data (including water chemistry samples) at water bodies where we conduct fisheries assessment work. We will also continue comprehensive fish tissue collection (collected during fisheries assessment surveys) to support analyses of lake trout trophic level, and food web energy transfer. Answers to these questions will allow us to determine whether our current productivity/sustainable harvest models apply well to both large and small-body life histories of lake trout.

Fish aging: This project also provides funding for fish ageing for all available samples. Most of these are aged by a contractor. Fish age data provides us with information on population growth rates, age structure, age at maturity and other demographic data, and allows us to make informed inferences about impacts of harvest under various management scenarios.

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 the data recorded by autonomous receivers (20 in total). In fall, we will use fish with affixed transmitters to identify new spawning locations and we may deploy an additional 20 transmitters. Fall captures will also provide for targeted genetic sampling of indistinct genetic groups determined by microsatellite analyses from 2016-17. We will also continue the collaborative approach with University of British Columbia to analyze the 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 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) is partnering with Environment Yukon to deliver 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 Yukon. This year, Coffee, Fisheye, Haldane, Hidden 1, Hour, Long, Lucky, Veronica, and Whiskers lakes will be stocked in late May to early June with rainbow trout and kokanee salmon from Whitehorse Rapids Fish Hatchery. The Yukon Fish and Game Association regularly contribute 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 egg collection at Whitehorse Rapids Fish Hatchery (June and September) and purchase of eggs and fry (October and December).

HABITAT

Fish, wildlife and habitat planning

Tess McLeod, Fish and Wildlife Planner

Project Description: What we are going to do

Fish and Wildlife Branch management plans are developed by the planning program within the Habitat Programs section. We develop plans for special management areas, habitat protection areas, species of conservation concern, and community fish and wildlife work plans. Our 2017–18 fish and wildlife planning priorities are:

- continue work on the Grizzly Bear Conservation and Management Plan, the Pickhandle Lakes Habitat Protection Area Management Plan, the Tagish River Habitat Protection Area Management Plan, and the Ch'ihilii Chik Habitat Protection Area Management Plan;
- complete the review of the Horseshoe Slough Habitat Protection Area Management Plan;
- begin work on the review of Community-based Fish and Wildlife Work Plan for the Little Salmon/Carmacks First Nation Traditional Territory and complete work on the Community-based Fish and Wildlife Plan for the Champagne and Aishihik Traditional Territory;
- review the Wolf Conservation and Management Plan, and the Aishihik Wood Bison Plan and;
- continue tracking plan implementation.

Management Implications: Why we are doing it

These plans help us set branch priorities, and provide clarity about important regional and community-based fish and wildlife management issues. They help 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 Government of Yukon 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

Grizzly Bear Conservation and Management Plan: We are working in partnership with the Yukon Fish and Wildlife Management Board (YFWMB) 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.

Community-based Fish and Wildlife Work Plans for the Little Salmon/Carmacks Traditional Territory and the Champagne and Aishihik Traditional Territory: These work plans are part of the ongoing cooperative approach to fish and wildlife management. We will engage the communities to identify concerns and priorities, work with the relevant First Nations and Renewable Resources Councils (RRC's) to develop the work plans, and produce the final plans to be shared with the community, Government of Yukon staff, and other interested parties. The completed work plans will help us set priorities in the region over the next five years.

Wolf Conservation and Management Plan Review: We will review the implementation of the plan with the appropriate agencies to determine if the overall goals and principles are being met. We will provide a summary of the completed implementation measures and share this with First Nations and RRCs in their communities. In partnership with the YFWMB, Branch staff will provide additional support and meet with communities as requested.

Aishihik Wood Bison Plan Review: We will review the implementation of the management plan with the Wood Bison Technical Team. While much of the work described in the plan has been completed, there is a need to determine if the current management direction, in particular with respect to population objectives, is still appropriate. The technical team will review and update the plan, producing the revised plan for public review, and participate in the public review led by the YFWMB.

Tracking plan implementation: We will work with branch staff and others to evaluate the implementation of existing management plans and identify areas for improvement. This work may also include updating the existing plan implementation database.

Habitat protection area monitoring

Bruce McLean, Senior Habitat Biologist

Project Description: What we are going to do

This project is about the development of a monitoring framework for Habitat Protection Areas (HPAs) in Yukon. The vast majority of HPAs contain wetlands and wetland complexes which are vital ecosystem elements and highly sensitive indicators of environmental and ecological health. We will develop a multi-stakeholder, collaborative monitoring framework around wetland condition and health.

Management Implications: Why we are doing it

Wetlands are considered essential indicators of ecosystem health and are consistently identified as an important ecosystem component during HPA planning and environment assessment. They support a diverse number of animals and plants and are crucial to hydrology and water quantity and quality. Ecosystem change can be measured using wetlands and can help predict future conditions on the landscape. This information is crucial for long-term ecosystem management and mitigation.

Project Activities: How we will get it done

This year we will focus on engaging and collaborating with relevant groups to identify wetland monitoring needs, goals, approaches and capacity to develop a long-term, comprehensive monitoring framework. These groups will include but are not limited to: relevant Department of Environment branches, First Nations, RRCs, academic researchers, communities, other stakeholders, etc. We will identify shared interests and goals and assess capacity for long-term participation.

We will review and assess wetland monitoring methodologies and identify utility for a Yukon framework. A contractor will be hired to help develop a long-term wetland monitoring framework to meet collective goals.

Habitat suitability mapping in upper Stewart River

Heather Clarke, Habitat Biologist

Project Description: What we are going to do

This project will provide information on sheep and caribou habitat suitability in the upper Stewart River watershed. This is an important area to develop habitat suitability maps due to the high levels of mining exploration and development in this region. We will model spring and summer seasons as this is a critical time for sheep lambing while also representing the time of year when mining activity is highest and thus has the most impact on both sheep and caribou habitat use.

Management Implications: Why we are doing it

A key objective of the Nacho Nyak Dunn First Nation (NNDFN) Community-Based Fish and Wildlife Workplan is to develop habitat suitability maps as tools to help inform environmental assessments and land use planning. The management of wildlife and their habitat is dependent upon understanding species-habitat interactions and identifying the abundance, distribution, and availability of important habitats. Data can also be combined with information on other species' habitat use and suitability to assess the combined habitat value for multiple species across the region. In addition, this study will provide an opportunity to work collaboratively with the community of Mayo, NNDFN, and the Mayo Renewable Resource Council.

Project Activities: How we will get it done

A community workshop and/or one-on-one interviews will be held in late 2017 to develop knowledge-based maps. We will select participants based on their level of experience with the species of interest. This information will be modeled and mapped, presented back to the participants for comments, and revised accordingly. Maps, along with a technical report, will be completed by March 2018.

Lichen abundance classification for the Kluane caribou herd range

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 the Kluane caribou herd range.

We will use a contractor to combine vegetation data collected from the air with remotely-sensed imagery to quantify caribou lichen forage across the herd's range.

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 150 plots during four field days in July 2017. 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.

Mapping and assessing climate-related land cover change in important wildlife areas of Yukon

Heather Clarke, Habitat Biologist

Project Description: What we are going to do

We will detect climate-related changes on the Yukon landscape by collecting remote sensing time series images. This information will help us to assess and predict current and future vulnerability of wildlife, identify knowledge gaps of where and how climate change effects are occurring, and will generate a resource which Yukoners can use to plan for and manage areas of concern.

Management Implications: Why we are doing it

A changing climate can result in accelerated or unexpected changes across a landscape, impacting ecosystems, habitats and wildlife. By understanding these impacts, work can be clearly and strategically directed at addressing current and future effects, risks and vulnerabilities. This project will provide an essential tool for wildlife, habitat and land managers in Yukon, allowing them to link current and predicted climate-related land cover change to specific ecological values, populations or habitats, and to identify risks, mitigations and adaptations.

Project Activities: How we will get it done

Specific areas of wildlife management or conservation interest (e.g. protected areas, areas of suspected change, areas of high development pressure, etc.) will be selected across Yukon. Remote sensing time series of select indices indicative of change (e.g. greenness, wetness, brightness) will be derived or compiled through existing sources and analyzed for changes through time. This change detection analysis will provide data on the extent, pattern, and location of land cover change, and will be used to identify where change is occurring most intensely. Observed change will be correlated with natural variables (e.g. vegetation, topography, hydrography, geology, precipitation, temperature) to assess vulnerability and predict future change.

Traditional and/or local knowledge will be gathered by Fish and Wildlife Branch staff using workshops, interviews and/or questionnaires to complement and augment any scientific findings. This will inform our understanding of climate change risk on the landscape and will inform predictions on future change.

Sharp-tailed Grouse habitat use

Mike Suitor, North Yukon Regional Biologist

Project Description: What we are going to do

We will generate an understanding of the Sharp-tailed Grouse in the Dawson region in relation to the impact of disturbance on this species and the level of risk associated with developing specific habitats. We will map habitats in the study area, identify priority areas for conservation, as well as identify areas with high potential to host unknown breeding populations of grouse.

Management Implications: Why we are doing it

Sharp-tailed grouse (STGR) are commonly identified as valued ecosystem components during YESAB project reviews of proposed placer mining activities in the Dawson region. At times this has led to significant conflict between assessors and proponents due to a lack of information on the species.

STGR are currently ranked as vulnerable in the Yukon, primarily owing to their limited distribution here, lack of understanding of population status, and potential impacts to populations and habitats through development activities (e.g. placer mining, access routes, and gravel removal). If deemed appropriate, information could translate directly to mitigation of impacts from proposed development projects in the form of timing windows and areas to be avoided. Mitigations will be implemented through working directly with proponents as they plan and design their projects, assessors during YESAB reviews, and regulators during the decision phases of assessments, project licencing, and follow up on any monitoring/management plans associated with licencing requirements.

Project Activities: How we will get it done

STGR will be captured at their lek sites with efforts focused on hens. Each captured grouse will be fitted with a transmitter that will allow for movement data to be collected over the life of that transmitter (approximately 1-2 year(s)). During nesting and brooding, we will locate hens using the VHF signal to determine their status (active nest, predation, broods present).

Grouse will be relocated frequently during periods where the species is thought to be most sensitive (i.e., nesting and brooding), and less frequently during fall and winter.

When needed, we will conduct aerial flights to locate missing birds, identify new breeding populations (i.e., leks), and relocate hens in the mid-winter. Data will be analyzed on anticipated timelines to develop habitat use models.

Wetland reference condition

Heather Clarke, Habitat Biologist

Project Description: What we are going to do

The main goal of this project is to develop a predictive model to determine natural wetland conditions and to quantify wetland change in the face of development or natural phenomena. The specific goals for 2017-18 are to:

- complete the field sampling of reference wetlands, adding to data collected in 2012;
- develop the interim predictive model describing relationships among reference wetland conditions and landscape variables and;
- conduct an analysis to determine the utility and feasibility of moving forward with the Reference Condition Approach (RCA) to describe and assess wetland conditions in Yukon.

A secondary goal of this project is to provide data toward multiple other Government of Yukon initiatives including: a Yukon-wide wetland classification, the Ecological Land Classification program, the future development of a YG wetland policy, invasive species management initiatives, and a proposed long-term Habitat Protected Areas (HPAs) monitoring program. Many of these initiatives have been identified as departmental or branch priorities to meet the interests of YESAB, NGO's, First Nations, Government of Yukon, and other land and resource managers.

Management Implications: Why we are doing it

Yukon does not currently have a protocol for determining the base-line conditions and health of natural wetlands, nor does it have an effective method for measuring change in wetland condition over time. This information is a necessary consideration when assessing, quantifying and mitigating the effects on wetlands from existing and proposed developments or from natural phenomena such as a changing climate or melting permafrost. Understanding wetland condition and health also informs wetland value and can be used in land use planning, where effects can be mitigated prior to any formal application or licensing process.

Project Activities: How we will get it done

In 2017-18 representative samples will be collected and analyzed from selected wetlands. Wetlands situated in HPAs will be prioritized. Variables analyzed will include vegetation, invertebrates, and water and sediment chemistry. The interim model and additional analyses will be completed by both Department of Environment staff and a qualified contractor.

Wildlife Key Area survey

Marcus Waterreus, Habitat/Remote Sensing Technician

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.

WKA surveys are used to fill data gaps or update existing information, and provide information for land use planning and environmental assessment processes. The priority WKA survey for 2017-2018 is sheep spring lambing in the Upper Stewart River watershed.

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, the Community-based Fish & Wildlife Work Plan for the Na-Cho Nyäk Dun Traditional Territory (2014-2019) includes a recommendation to gather data on important wildlife habitats in areas with concentrated industrial activity, including the upper Stewart River watershed.

Data collected during the survey, 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

In June 2017, 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.

Yukon wetlands policy development

Bruce McLean, Senior Habitat Biologist

Project Description: What we are going to do

We will initiate the development of a wetlands policy for Yukon. The policy will apply to Yukon public lands managed by the Government of Yukon, 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.

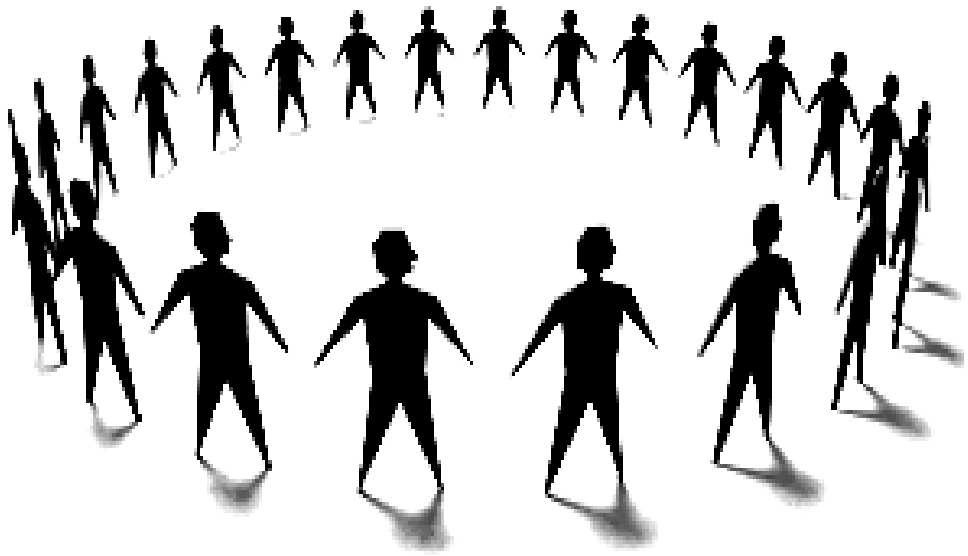
There is currently a lack of policy direction and little coordination within Government of Yukon concerning the management of resource activities in or near wetlands.

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. This will be accomplished through a series of round-table workshops beginning in fall 2017. We anticipate completing the policy by spring 2019.

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 preventing introductions of AIS and building Government of Yukon's capacity to respond to AIS. Risk assessments will lead to early detection and a better understanding of the impacts of AIS to Yukon waters.

This year, we will focus on three aspects: outreach, early detection, and response.

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 invasive mussels will support early detection and rapid response.

Project Activities: How we will get it done

Outreach: We will build on and deliver communication materials that help inform anglers and boat operators about AIS. 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.

Response: We will partner with the B.C. aquatic invasive species coordinator to host watercraft inspection and decontamination training for Conservation Officers and technical staff. This work flows from collaborative approaches to aquatic invasive species management outlined in the Inter-Provincial-Territorial Agreement for Coordinated Defense Against Invasive Species, of which Yukon is a signatory.

Fish and Wildlife communications

Tanis Davey, Biology Information Specialist

Project Description: What we are going to do

This is an ongoing project to co-ordinate and facilitate Fish and Wildlife Branch (FWB) communication initiatives. We develop and produce communications products to a variety of audiences to enhance the accessibility of FWB programs, and scientific and technical information.

We also 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 assist 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. 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 a FWB Project Summaries report to showcase our activities;
- producing interactive web pages to promote the Yukon Conservation Data Centre and Yukon biodiversity;
- developing a communications product that summarizes the grizzly bear survey;
- developing videos on composition survey results for the Southern Lakes caribou herds and;
- assisting with the development and publication of the harvest trends report.

Fisheries education and communications

Robert Perry, 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; our program will also 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

We will design and install signage at popular fishing locations and boat launches to remind anglers about fishing regulations.

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 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) is 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 this interest.

Hunter effort survey – sheep and goat

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 sheep or goat seals in the 2017 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

Surveys will be mailed after the licenced hunting season closes. They will be sent to all licenced Yukon resident hunters who acquired sheep or goat seals in the 2017-18 season. Hunters that have not returned a survey by early February will be called and invited to complete the survey over the telephone.

Wildlife Viewing Program

Carrie McClelland, Wildlife Viewing Biologist

Project Description: What we are going to do

Through the Wildlife Viewing Program (WVP), 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 Yukon, 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 films. The Swan Haven Interpretive Centre will be open daily in April, 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 expand our reach by offering more interpretive programs including the increasingly popular Knee High Nature children's series. We will offer transportation to popular events where lack of transportation has been identified as a barrier to participation.

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 continue to review and assess the bison harvest data. We will use 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 nationally 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 second early-winter moose recruitment survey in the Alsek area where we are working with the Champagne and Aishihik First Nations (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.

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 2017. We will count and classify moose in selected 4km x 4km survey cells using crews of three observers in a helicopter.

Clear Creek caribou distribution and status

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

Project Description: What we are going to do

The Clear Creek caribou herd, northwest of Mayo, has extensive industrial development throughout its range which also provides a high degree of hunter access to the herd. This project will provide information on the spatial distribution and habitat use of the herd, and an updated population estimate. The project will also allow for an understanding of the degree of separation between the Clear Creek herd and the Hart River herd to the north.

Management Implications: Why we are doing it

The Clear Creek herd has the highest level of conservation concern among northern mountain caribou herds across Yukon. Increased monitoring of this herd is also identified in the Community Based Workplan for the Na-Cho Nyäk Dun Traditional Territory. The information will also be used to assess the cumulative effects of the multiple industrial projects currently underway in the herd's range and the sustainability of the current harvest. These are critical pieces of information for YESAB environmental assessment processes and Environment Yukon's Environmental Assessment Branch and for understanding if current harvest management is sound. A range assessment will guide future project assessments and management decisions.

Project Activities: How we will get it done

In year two of this proposed six-year project, we will complete a fall composition survey with the Northern Tutchone Regional Biologist and collect data from the radio-collars deployed the previous year. In future years, a population estimate of the herd will be obtained and fall composition surveys completed, in addition to ongoing collection of spatial location data from the radio-collars. The culmination of the project will be a range assessment for the herd in 2022. A lichen assessment is currently being completed for the herd's range by partners in Alaska as part of a broader assessment of Fortymile caribou habitat conditions. Imagery for much of the herd's range has already been purchased for an assessment of surface disturbance.

Elk Agriculture Working Group

Karen Clyde, Lead Branch Operations

Project Description: What we are going to do

This project focuses on the implementation of the Management Plan for Elk in Yukon (2016). We will address the on-going elk-agriculture conflicts through the following actions: ongoing engagement of the Elk Agriculture Working Group, on-farm and regional-scale risk assessments, evaluation of the effectiveness of the Elk-Agriculture Conflict Hunt, and the assessment of habitat enhancement as a management tool. We are working with First Nations resource managers, local renewable resources councils and stakeholder groups to implement these tools.

Management Implications: Why we are doing it

The Management Plan for Elk in the Yukon (2016) focuses on addressing ongoing elk-agriculture conflicts in the Takhini Valley. Goal 4 of the plan describes that a range of management options is needed to mitigate conflicts between elk and humans. Two actions were implemented in 2015 and 2016: establishment of the Elk-Agriculture Conflict Hunt and the Elk Agriculture Working Group. Additional actions are identified in the plan and form a multi-pronged approach. Evaluation of the effectiveness of these implementation actions is required.

Project Activities: How we will get it done

The Elk-Agriculture Working Group will provide the forum for discussion and guide the following work identified in the management plan.

On-farm risk assessments: Conduct interviews with landowners to gather information about farm practices, attractants, and mitigation efforts and options.

Regional-scale risk assessments: Assemble information obtained through on-farm risk assessments to consider a broader, regional picture of “chronic” areas of elk-agriculture conflicts and recommend mitigations. This will involve understanding elk movements and may include participatory mapping and modelling.

Evaluate Elk-Agriculture Conflict Hunt: Continuing work from 2016-17, implementation of this management tool will be tracked. Using an evaluation framework and working with an independent contractor, a recommendations report will be completed.

Assessment of Habitat Enhancement: Develop and deliver a jurisdictional scan for the working group of pros/cons of habitat enhancement as a management tool. Lead a discussion on how habitat enhancement may be used to attract elk to the core zone, including costs and risks. Independent evaluations of these options will be required through expert opinion on contract.

Elk population monitoring

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

Project Description: What we are going to do

The first goal of the Management Plan for Elk in the Yukon is to maintain healthy and viable populations of free-ranging elk in the 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.

Management Implications: Why we are doing it

Implementation of the 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.

For example, the Takhini Valley Elk survey conducted in March 2017 estimated a minimum of 229 animals. This type of information is important for understanding if current harvest is sustainable, as 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, recruitment estimates, and minimum population count will be obtained via winter aerial surveys. The distribution and movement patterns of radio-collared animals will be monitored via regular ground-based telemetry.

A summary report will be produced by August 2018 with preliminary results presented to the Agriculture/Elk working group.

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 and develop models that will predict future habitat use and relative habitat 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 (ADF&G) 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 to 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 and seasonal limitations of satellite collared caribou and their young.

Game Management Zone 9 sheep and goat inventory

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

Project Description: What we are going to do

This project will help us determine the distribution and status of sheep and goat populations in GMZ 9. We will build upon the overall goal of inventorying sheep populations across Yukon, as well as identify small goat populations potentially sensitive to disturbance and identify any populations that may be harvestable.

Management Implications: Why we are doing it

This work implements recommendations outlined by the Southern Lakes Wildlife Coordinating Committee in their Regional Assessment: the adequate collection of sheep and goat information to inform management decisions, and ensuring sustainable harvest on these species. There has been increased demand from Yukon hunters for additional goat hunting opportunities, and this work will inform those decisions.

The identification of small or isolated sheep and goat populations will inform environmental assessment processes as these populations may be more sensitive to human disturbances. As many of the sheep and goat populations in GMZ 9 are shared with BC, we will provide information regarding any shared management decisions like harvest management with the province. This inventory will also identify sheep and goat management units, beyond the game management subzone, on which management decisions should be based. Finally, this project also works towards meeting the Sheep & Goat Program's long-term goal of inventorying sheep and goat populations across Yukon.

Project Activities: How we will get it done

This is a single year project in which alpine habitats potentially supporting Thinhorn sheep and mountain goats will be surveyed via helicopter in late June or early July. In addition to total counts, sheep will be classified as nursery, rams or lambs to provide productivity (lamb:nursery sheep) and sex (ram:nursery sheep) ratios. A status report will be prepared in early 2018 following discussions with knowledgeable individuals or groups.

Glenlyon Range sheep survey

Mark O'Donoghue, Northern Tutchone Regional Biologist

Project Description: What we are going to do

We will survey sheep by helicopter in the Glenlyon Range during their rutting season. At this time we expect that most sheep will be gathered in the alpine in breeding groups, making them easier to spot with a background of complete snow cover. We will cover all suitable habitat and areas identified from previous surveys and local knowledge. When groups of sheep are encountered we will count and classify all animals by age and sex, and record their locations.

Management Implications: Why we are doing it

The results of the survey (abundance and composition by age and sex of sheep populations in this area) will be used to support a discussion about the need for harvest regulations. Data collected during this survey will also be used to map rutting range for this sheep population.

Project Activities: How we will get it done

This survey will take two days and will be completed in late November or early December when sheep are on their rutting range. We will finalize a report for the survey by March 2018. We will also present the survey results verbally at meetings of the Carmacks and Selkirk Renewable Resource Councils and at the Northern Tutchone May Gathering.

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. 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 and status 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 5 of 6) operating from March 2014 through to August 2018. The first two years consisted of animal capture and collaring. We completed a population estimate in 2015 with composition surveys completed in all years to assess calf recruitment and adult sex ratio. Over the next two years, we will continue tracking location data from the collars; collars are programmed to drop-off during the summer of 2018.

Laberge caribou herd distribution and habitat use

Lars Jessup, Southern Lakes Regional Biologist

Project Description: What we are going to do

This project will improve our understanding of the Laberge caribou herd (LCH) distribution and habitat use, and will also inform future management planning discussions for Southern Lakes caribou. We will continue to monitor previously collared animals and if mortality of collared caribou occurs, collar retrieval will take place.

Management Implications: Why we are doing it

The Laberge caribou herd is considered to be part of the Northern Mountain caribou population, a population listed as Special Concern by COSEWIC. Department of Environment's Science-based Guidelines for Management of Northern Mountain Caribou in Yukon (2016) recommends 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.

The LCH range significantly overlaps with the Carcross caribou herd (CCH), a Southern Lakes herd that has been the focus of a long-term recovery program. Delineation of herd ranges between the Laberge and Carcross herds is still uncertain and management of the LCH currently operates on an estimated herd range. 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, 10 Laberge caribou have been collared. This year, we will continue monitoring and collecting collar location information, working towards our longer term project objective of refining our knowledge of this herd's distribution.

Mayo-Upper Klondike Highway moose census

Mark O'Donoghue, Northern Tutchone Regional Biologist

Project Description: What we are going to do

We will conduct an aerial survey in the Mayo and Upper Klondike Highway moose management units (MMUs) to estimate the number of moose and the composition of the populations (age and sex). We will review estimated density and population composition in the area relative to thresholds recommended by the Moose Management Guidelines (2016). The survey will also enable us to map the early winter distribution of moose.

Management Implications: Why we are doing it

Local residents and First Nations have observed high moose harvest in the area and have expressed concern about moose sustainability. To achieve sustainable harvest, this work may inform potential regulation changes for resident licensed hunters and/or suggest needed collaboration with First Nations to limit subsistence harvest. More refined knowledge of regional wildlife abundance and the distribution of high quality habitats is needed to model habitat suitability and provide the foundation for habitat and population goals.

Project Activities: How we will get it done

The aerial survey will be flown by helicopter in late October or November (weather permitted), and will take approximately 10 days for four crews to complete. We will use the Moose Program's new model-based approach that incorporates expert local knowledge and habitat information (vegetation, landscape, and access GIS layers) to predict the number of moose on the landscape. To ensure that harvest is sustainable, we will calculate the percentage of bulls that are harvested annually and compare that to the bull harvest rate (10%) that is recommended by the Moose Management Guidelines. We will write a survey report with maps at a level accessible to non-technical readers as soon as data analyses are completed. We will present the results verbally at meetings of the Mayo District Renewable Resource Council (RRC) and the Selkirk RRC and at the Northern Tutchone May Gathering. A project description will be completed by March 15, 2018.

Moose model-based survey methodology improvements

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

Project Description: What we are going to do

The purpose of this project is to improve our model-based moose census methodology by integrating model averaging, data cloning and shrinking statistics into current modeling approaches.

While we currently use the best model to predict moose population numbers, by adding *model averaging* we could strengthen predictions and increase the likelihood that local information is used to predict moose numbers.

Implementing *data cloning* would allow us to more efficiently use the information provided by experts (FN, locals, trappers, outfitters, etc.) because it would be treated differently than environmental information (shrub cover, elevation, etc.). Currently, when we analyze moose survey data, environmental data and expert data are treated the same way.

Implementing *shrinking statistics* could more accurately estimate subsets of a survey area. When we are predicting how many moose are in a survey block, information from surveyed units that are closer will be given more value than information from units that are further away. This would be of value when you have a survey area where harvest pressure is very different in one half of the area compared to the other. This approach will have to be developed to be used spatially within our survey methodology. While shrinking statistics has never before been used for wildlife work, it will be helpful for estimating moose abundance in areas without survey information.

Management Implications: Why we are doing it

This project will improve the predictive ability of our models, increase our ability to integrate expert opinion, and provide us with the tools needed to begin estimating moose numbers in unsurveyed areas.

In addition**,** these improvements will allow us to maintain all expert opinion within the models thus reinforcing that these surveys are collaborative projects that recognize the value of local knowledge.

Project Activities: How we will get it done

This work will be conducted by a statistical contractor. Deliverables will include a summary of statistical work and integration into the moose survey software.

Northern Mountain caribou composition surveys

Various, Regional Biologists

Project Description: What we are going to do

We will conduct fall caribou composition surveys to assess the status, track recovery, and measure the effectiveness of management actions for the following Northern Mountain caribou herds: Aishihik caribou herd, Carcross, and Ibex caribou herds, Chisana caribou herd, Clear Creek caribou herd, Ethel Lake caribou herd, Hart River caribou herd, Kluane caribou herd and the 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 Yukon. Annual monitoring is also essential for recording caribou population responses to a changing climate.

Herds chosen in 2017-18 are based on past trends and community priorities.

- Recent data showed low recruitment rates for the Aishihik herd. We will continue to monitor this herd to determine if additional management action is required. This was stated as a priority in the Community-based Fish & Wildlife Management Plan for the Champagne and Aishihik Traditional Territory.
- 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.

- The Clear Creek herd has had increased mining activity in their rutting range over the years. This monitoring is recommended in the Community-based Fish & Wildlife Management Plan for the Na-Cho Nyäk Dun Traditional Territory and will support inputs to YESAB review processes.
- 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.
- The Kluane caribou herd is one of the smallest herds (300-350) in Yukon. Due to its small size, the herd is at a higher risk of disturbance or decline due to development in its range (e.g., Kluane range mining/road developments). For this reason, small herds are afforded a higher degree of monitoring in the National Northern Mountain Caribou Management Plan. This management interest and focus is reflected in the local concerns expressed from the Dan Keyi Renewable Resource Council.
- 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 composition 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 composition surveys during late September and early October.

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 Alsek Integrated Community-based Moose Management Program, where Government of Yukon and Champagne and Aishihik First Nations (CAFN) have been conducting intensive wolf trapping in support of moose recovery. 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 focused wolf trapping activities.

Project Activities: How we will get it done

We will conduct a survey in November 2017; we will count and classify moose in selected 4km x 4km survey cells using crews of three observers in helicopters.

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 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 Mining Corp., Goldcorp, and Rockhaven Resources Ltd.). 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. Northern Mountain caribou are listed as special concern under the federal Species at Risk Act. 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 6 of a proposed multi-year project, with two years of data collection remaining. This year we will complete a fall composition survey—retrieving radio-collars emitting a mortality signal, where 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 will be eight collars actively transmitting data in this fiscal year.

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 provide educational materials to hunters. To further improve communications, we will install a sign at Eagle Plains that describes overlap between the Porcupine and Hart River caribou herds, as recommended by the Porcupine Caribou Management Board.

Management Implications: Why we are doing it

In the Harvest Management Plan for the Porcupine Caribou Herd (PCH) in Canada, all parties committed to collecting rigorous and verifiable harvest data from their respective hunters on an annual basis. This program's harvest data will be combined with abundance, and population health indicators (age/sex ratios) from the PCH Population Monitoring Project. This information will then 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 two and a half 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.

Construction and installation of the sign will be done in cooperation with the Department of Highways.

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 20 to 30 collars on adults and 15 to 20 on short yearling cows. Blood samples from captured caribou are tested as part of ongoing monitoring of pregnancy rates and 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 2017, 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 caribou herd (HRCH). This year, the 5 HRCH Game Management Subzones (GMS) that are periodically occupied by the Porcupine caribou Herd (PCH) will have the normal seasonal closure for woodland caribou (Oct 31). However, if it is determined that there are sufficient numbers of Porcupine caribou in these 5 GMS, which will minimize risk of harvest to Hart River caribou, then the season may be opened for PCH between November 1 and January 31 in the applicable GMS. This change is the outcome of regulations proposed by the Porcupine Caribou Management Board, Yukon Fish and Wildlife Management Board (YFWMB) and Government of Yukon; and recommended by the YFWMB following public consultation.

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 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 Yukon-wide caribou monitoring strategy. Telemetry from this survey will also inform a planned rut composition survey for 2017.

Project Activities: How we will get it done

We will locate radio-collared and unmarked groups of Hart River and Porcupine caribou from fixed-wing aircraft. 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 opening of herd overlap areas. 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 after telemetry flights are completed (typically late September and October).

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 whether the Moose Lake herd, a small herd located and overlapping with the Tay River herd at its northern boundary, is distinct from or a part of the larger Tay River herd.

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. The population estimate of 3,750 was obtained in 1993 and may be unreliable. There has also been much change in the herd's range: for example, forest fires in the past few decades have altered the winter distribution of the Tay River herd and extensive mineral exploration 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 sustainable.

Project Activities: How we will get it done

This is year three of a proposed seven-year project; year one consisted of collar deployment, and year two included a fall composition survey, additional collar deployment and collar location data. This year, we will monitor and record spatial data from the 40 deployed GPS radio-collars. In the fall, three helicopter-based resight surveys will be conducted to estimate the size of the population.

We will also 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 Yukon. 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 Yukon 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

This is the fourth year of a proposed multi-year project that began in 2014. During fall caribou composition surveys (late-September to early-October), we also assess lamb recruitment for selected sheep populations that overlap with monitored caribou herds. During fall 2017, we plan on surveying game management subzones (GMS): 9-03 (Gray Ridge), 9-04 (Caribou Mtn.), 5-36 (Ruby Range – ground-based), 4-03 (Ddhaw Ghro), Tombstone Park (2-23, 2-28, 2-41) and Anvil Range (4-43 to 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 will be surveyed in July as snow conditions in the fall make sheep detection challenging.

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 remove 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 collect and necropsy 6 to 9 wood bison carcasses to obtain sufficient biological samples. We will target adult female bison. Our field work will occur in early April 2017, 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 four, and the final year of the project. Over the course of the past three years, 22 bison have been sampled by this program.

Reporting will be completed on this four year project in February 2018.

Wood Bison population 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. We will conduct a trial photo-census in June 2017 with the cooperation of the Alaska Department of Fish and Game. We will deploy low-feature GPS collars on cow bison in the Aishihik herd via helicopter-based captures in summer of 2017. A report on bison monitoring activities will be submitted in March of 2018.