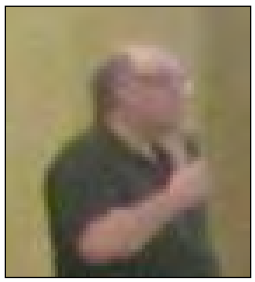




8TH BIENNIAL DEHCHO REGIONAL WILDLIFE WORKSHOP OCTOBER 18-19, 2016

"We need to work together"
Robert Lamalice

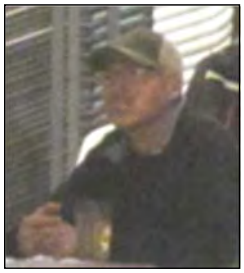


"Harvesters are our eyes out on the land" Nic Larter.

"I think there should be more meetings like this" Harry Deneron.

"It is good sharing information between all of us" Charlie Tale.

"What we say now will be in tomorrow's paper. We need it to reflect what we want to say" Wayne Sabourin.



DEHCHO REGIONAL WILDLIFE WORKSHOP
18-19 OCTOBER, 2016
FORT SIMPSON RECREATION CENTRE

2016 Wildlife Workshop Delegates

Charlie Tale – Pehdzeh Ki First Nation
Dean Holman – Liidlii Kue First Nation
Edward Cholo – Liidlii Kue First Nation
Troy Ruttle – Fort Simpson Métis Local
Derek Erasmus – Fort Simpson Métis Local
Dennis Deneron – Sambaa K'e Dene Band
Ron Kotchea – Sambaa K'e Dene Band
Joshua Bertrand – Nahanni Butte Dene Band
David Konisenta – Nahanni Butte Dene Band
Stan Sanguez – Jean Marie River First Nation
Richard Sanguez – Jean Marie River First Nation
Harry Deneron – Acho Dene Koe Band
Steve Kotchea – Acho Dene Koe Band
Ernie McLeod – Fort Liard Métis Local
Fred Simba – Ka'a'gee Tu First Nation
Samuel Gargan – Deh Gah Gotie Dene Band
Wayne Sabourin – Deh Gah Gotie Dene Band
Priscilla Canadien - Deh Gah Gotie Dene Band
John McLeod – Fort Providence Métis Local
Pearl Leishman – Fort Providence Metis Local
Robert Lamalice – Katlodeeche First Nation

Environment & Natural Resources (ENR) Representatives

Nic Larter – Manager, Wildlife Research and Monitoring (Dehcho)
Danny Allaire – Wildlife Technician II (Dehcho)
Carl Lafferty – Superintendent (Dehcho)
James Hodson – Wildlife Biologist, Environmental Assessment/Habitat (Yellowknife)

Nahanni National Park Reserve Representative

Doug Tate – Ecologist Team Leader (Fort Simpson)

Environment and Climate Change Representative

Marie Fast – Habitat Biologist, Yellowknife

Alberta Biodiversity Monitoring Institute Representative

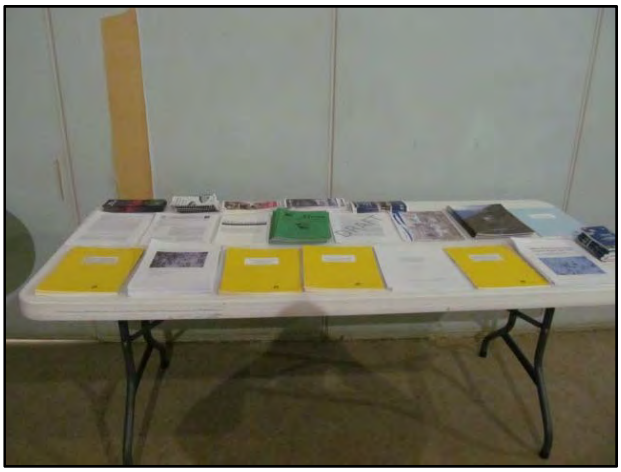
Robert Serrouya – Biologist, Revelstoke

Participants

Bob Norwegian – Rabbitskin River
Fawna Erasmus – Liidlii Kue First Nation
Phoebe Allaire – Liidlii Kue First Nation
Michael Cazon – Liidlii Kue First Nation
Cathy Mouse – Liidlii Kue First Nation
Tanya Hardisty – Liidlii Kue First Nation
Roy Mouse – Liidlii Kue First Nation
Paul Deneron – Sambaa K'e Dene Band
Steve Gooderham – ENR Fort Simpson
April Hudson – Dehcho Drum, Fort Simpson
Ashley OKrainec – Parks Canada, Fort Simpson
Brianna Robinson – Parks Canada, Fort Simpson
Mellissa Carroll – Parks Canada, Fort Simpson
Audrey Steedman – Parks Canada, Fort Simpson
Bill Quinton – Wilfrid Laurier University
Unknown participant – Wilfrid Laurier University
Unknown participant – Wilfrid Laurier University
Unknown participant – Waterloo University

Sound provided by MJC Audio (Ronnie Antoine)
Translation provided by Betty Hardisty & Mary-Jane Cazon
Catering provided by Thomas Simpson School
Title page wildlife art www.wpclipart.com

The workshop had many posters covering the walls. There were copies of many pamphlets and reports made available. Delegates and participants took most of the provided literature.



The Department of Environment and Natural Resources (ENR), Dehcho Region held a Regional Wildlife Workshop at the recreation centre in Fort Simpson on 18-19 October, 2016. This was the eighth regional wildlife workshop; the first was held September 2002 with the others occurring in Octobers 2004, 2006, 2008, 2010, 2012 and 2014. During the first workshop a decision was made to hold future workshops in October because a later date would not conflict with the fall harvest and would permit increased opportunities for harvesters to participate in the workshop. The key results of the 2014 workshop were direction for the various wildlife research programs, the communicating of results, and a list of 12 action items. The goals of the 2016 workshop were to:

1) provide an update on the status and results of ongoing wildlife research programs that ENR had been conducting since the 2014 workshop,
2) provide an assessment of how well ENR had addressed the 12 action items that had been identified from the 2014 workshop,
3) provide a forum for other agencies, organizations, and ENR research programs to present their findings,
4) provide an open forum for the discussion of any and all regional wildlife issues, and
5) ensure a continued open dialogue about wildlife research, monitoring programs, and wildlife issues between all Dehcho First Nations (DFN) and ENR.

Unlike the 2014 workshop where winter storms wreaked havoc with travel for presenters and delegates traveling to the workshop the lack of inclement

weather was a positive factor in the 2016 workshop delegate attendance. Delegates from all but one Dehcho First Nation were able to attend the workshop. This was one of the best attended workshops, and for once the draft agenda became the working agenda. Mother nature saved her impact for those delegates and presenters that were to return home on the Thursday. The Wednesday schedule had permitted those delegates who had driven to return home that day. Freezing fog rolled into Fort Simpson Thursday morning cancelling some flights and delaying the local charters until later in the afternoon when the sun had burnt through the fog. For one unfortunate presenter, a Thursday road trip to Yellowknife was necessary for him to connect on a flight home early the following morning.

During day 1 ENR made a presentation detailing and critiquing how they had addressed each of 12 action items arising from the 2014 workshop. This was followed by presentations on the Dehcho trail camera program and the Dehcho boreal caribou program (by ENR, Fort Simpson), boreal caribou range management planning in the Southern NT (by ENR, Yellowknife), movement and status of northern mountain caribou (by Parks Canada, Fort Simpson), bird monitoring in the Edéhzhíe (by Environment & Climate Change, Yellowknife), the Dehcho moose program (by ENR Fort Simpson), human footprint, habitat, wolves and boreal caribou population growth rates (by the Alberta Biodiversity Monitoring Institute), and the Dehcho wood bison program (by ENR Fort Simpson). The presentations stimulated discussion which extended the day past the planned 1630 conclusion. As for previous workshops, a number of posters of additional studies being conducted in the Dehcho were posted on the walls of the recreation centre. A wide assortment

of study updates, preliminary results, reports, scientific papers, and plain language results from wildlife work done in the Dehcho were also made available. Day 2 featured two round table discussions in the morning. The first dealt mainly with discussions on wildlife issues and concerns and the moose program especially the upcoming large-scale survey. The second dealt mainly with the bison program and upcoming survey and the impact of social media. After lunch there were discussions on working with trappers and sharing trapper information, wildlife diseases and action items. Delegates and audience participants had a lot to say about current wildlife programs and provided feedback on a wide variety of wildlife related topics. ENR would like to take this opportunity to thank all First Nations who sent delegates to participate in this workshop. The outstanding attendance and volume of feedback is gratefully appreciated, our programs can only benefit from comments and suggestions raised. ENR would also like to thank the guest presenters who came from near and far to participate in this workshop.

What follows is the final workshop agenda, the key discussion items and comments from each of the presentations and round table discussions during the 2-day workshop and the list of action items generated from the workshop for ENR to pursue. At the request of delegates we have also included a listing of the action items that were tabled at all previous workshops.

Day 1 – 18 October, 2016

0915 Opening Prayer – Sam Gargan

0915 Introductions

0920 Welcoming Comments - Carl Lafferty, Regional Superintendent, ENR

0935 Review of 2014 workshop action items - Nic Larter, ENR

1020 Coffee Break

1040 Dehcho Trail Camera Trials - Danny Allaire ENR

1100 Dehcho Caribou Program - Nic Larter, ENR

1155 Lunch catered by Thomas Simpson Secondary School

1315 Range Management Planning for Boreal Caribou in the Southern NWT – James Hodson, ENR

1400 Movement and status of Northern Mountain Caribou in the Prairie Creek area, NWT - Doug Tate, PC

1415 Bird Monitoring in the Edéhzhíe – Marie Fast, CWS

1455 Coffee Break

1510 Dehcho Moose Program – Nic Larter, ENR

1555 Human footprint, habitat, wolves and boreal caribou population growth rates – Robert Serrouya, AB Biodiversity Monitoring Institute

1635 Dehcho Bison Program – Nic Larter, ENR

1705 Closing comments

1710 Closing Prayer – Stanley Sanguez

Day 2 – 19 October, 2016

0920 Opening Prayer – Dennis Deneron

0905 Round table discussions on moose research findings and upcoming large-scale survey timing and methodology, wildlife issues and concerns about pressure on regional harvest of wildlife, hunter training and the wildlife act.

1035 Coffee Break

1050 Round table discussions on bison issues, management plans, collaring, survey area and timing, species at risk, harvest study and management, impact of social media.

1215 Lunch catered by Thomas Simpson Secondary School

1325 Round table discussions about trail camera, boreal caribou program, collaring males, sharing trapper information, wildlife disease.

1400 Round table discussion to determine action items/current and future workshop formats.

1505 Coffee Break – departure of delegates driving home.

1530 Final workshop discussions and closing comments.

1540 Workshop adjourned.

Day 1

Presentation on 2014 Action Items

There was limited discussion on this presentation of 12 action items. Most items had been addressed by the Department of Environment and Natural Resources (ENR) over the past two years. There was some clarification made about the caribou classification surveys conducted by both ENR and by biologists in northeastern British Columbia and why it is important for each jurisdiction to locate animals they had collared. Interjurisdictional cooperation and communication is important. There was some discussion around the delay in the bison survey. Delegates appreciated the difficulty ENR had experienced in deploying collars. They were pleased that the delay had provided the opportunity for continued discussion on the survey area boundaries and with the commitment for the survey to be conducted in March 2017. Delegates were pleased that samples had been collected from 40 moose for the contaminant study. They suggested that in future, if there was a difficulty in getting samples from harvested moose, that ENR should target women, as well as harvesters, because women often process and distribute meat from harvested animals. There was an extended discussion on research permitting, the evolution of boreal caribou monitoring, and the continued collection of ultrasound measurements of fatness. Since the initial discussions about handling animals in 2002 there have been adaptive changes in methodologies over time in direct response to suggestions by local first nations at community meetings and/or regional workshops. The use of a non-invasive ultrasound represents one case in point. Delegates realized the difficulty in directly studying reproduction of boreal caribou and that

ultrasound measures did provide an index of fatness. Fatter caribou have a better chance of bearing a calf. Delegates were appreciative of the number of projects ENR Fort Simpson was conducting and were impressed with the number of collaborative projects that ENR Fort Simpson was involved with since the last workshop.

Presentation on Trail Camera Program

This presentation described the trials and tribulations of developing of a trail camera program over the past two years. An initial two cameras were deployed in 2014 with an additional five cameras being deployed in 2015. Cameras were deployed in traditional harvesting areas of Pehdzeh Ki First Nation, Liidlii Kue First Nation, Jean Marie River First Nation, Acho Dene Koe Band, Nahanni Butte Dene Band, Sambaa K'e Dene Band. Some cameras were provided to individual harvesters to set up on their traditional harvesting areas while others were set up by ENR staff. Cameras were originally set up in a variety of different locales including pipelines, winter roads, and side roads, seismic lines, game/harvester trails, and a waterway. The cameras are motion sensitive, can take night photos, and hold over 20,000 photos with the temperature, date, and time recorded on each image; battery lifespan is about 6 months. There were multiple objectives for the first two years including documenting: the frequency of use by all wildlife on a seasonal basis, the presence of predators, and rare wildlife, and establishing a library of photos of undisturbed wildlife in their natural habitat. There has been a fairly steep learning curve over the past two years on just how to have the cameras only capture photos of identifiable wildlife in a natural habitat.

In some instances the cameras were not set up correctly, consequently no photos were taken. In other instances the cameras went missing after being set up. The placement of the camera is critical. The anticipated wildlife needs to pass by in front of the camera in order to trigger a photo. Wildlife needs to pass by at a certain distance. Too close and there are focus issues as well as identification issues if really close to wildlife. There needs to be a clear path to the wildlife being photographed. Any grass or vegetation that grows up near the camera could move in the wind and trigger thousands of photos. Human activity, especially during certain seasons triggered lots of non-wildlife pictures. One camera near a waterway was triggered during freeze up as chunks of ice flowed by with the current.

The most success (number of useful photos) was with cameras that were placed on animal/harvester trails that were generally no more than 3m wide. There still needed to be regular checks to make sure that leaves and grass weren't potentially triggering the camera. There is a plan to focus efforts on placing trail cameras on either animal/harvester trails or on seismic lines in future.

We were successful at getting photos of most large ungulates and predators. We have photos of wildlife taken during all months of the year except for January. The most usable wildlife photos were taken in July. The most photos were taken of snowshoe hares, black bears, lynx, squirrels and wolverines.

Delegate comments

Delegates questioned whether there were cameras available that did not make a noticeable clicking noise when taking a picture. There was an extended discussion about using trail cameras for other things besides getting photos of wildlife. Programing the timing of a picture has many uses. By setting the camera to take a picture every 15 minutes over a two-week period, a time lapse was made that tracked where the sun went up and down near Fort Providence. Taking one picture a day has been used to monitor freeze up of water courses, to record snow depth over the course of the winter, and to monitor daily temperature. Cameras have been used to monitor bear traps to determine what was tripping the trap; whether it was a bear or something else. Other users had experienced similar issues that triggered cameras to take hundreds of photos that were of little use.

Presentation on Dehcho Boreal Caribou Program

The presentation provided an update on the past two years of the boreal caribou population monitoring program, the longest running program in the NT. Eleven and nine collars had been deployed in 2015 and 2016 respectively, throughout the Dehcho in areas requested by First Nation partners. Over the past two years, eight collars had released as programmed and collared caribou had expanded the range of the study area to NE of Edéhzhíe and SW into British Columbia. Eight female collars are available for deployment in February 2017 and as in previous years each First Nation partner will be provided with one collar and the opportunity to designate whether or not the would like to deploy it in their traditional areas, and where.

Female caribou continue to show high pregnancies and birthing, 93% of collared caribou are pregnant. Recruitment rates rebounded from 2012/13 and 2013/14. The average rate of population increase (λ) for the 11 year study is now 0.97. This indicates a slight decline; a λ of 1.0 indicates stability. The new non-invasive method that measures rump fatness has shown that caribou measured in the NT during mid-winter are fatter than their counterparts in NE British Columbia. We recorded a female caribou that died at age 22 years, based on analysing tooth cementum (like counting tree rings). The lab that ages teeth has aged over 45,000 caribou teeth and this was only the second one aged at 22 years. This old lady had calves at 20 and 21 years of age. Caribou populations with long lived females that produce many calves in their lifetime are more resilient to change and disturbance.

Local knowledge suggested that caribou group size increased when the depth of snow increased. Using 11 years of annual sex/age classification surveys and 10 years of snow measurements collected during the deployment of collars we were able to show a positive relationship between snow depth and boreal caribou group size.

There was discussion about collaring male caribou. The DBCWG had raised a concern that if pregnancy rates dropped then the population might be in trouble. All females get pregnant over a short period of time but what is going on with the males at that time? Do males and females group up, if so where and for how long? Are there distinct mating areas? ENR has proposed to collar five males over a three rut period to address these questions. Most First

Nations partners have already approved the deployment of collars on eight females and five males in February 2017.

There was a brief discussion about collaboration with the South Slave on various parts of our project because we are both doing similar things. We share survey aircraft and collar deployment operations to cut down costs and be more efficient with our work. Both regions collaborated with a research group that was collecting vegetation that caribou eat during the summer. We want to see if the quality and amount of summer food available to caribou in NT is different from that in NE British Columbia and possibly a reason why NT caribou are fatter in mid-winter than their counterparts in BC. Both regions collaborated with another research group that was completing aerial surveys for wolves in different parts of boreal caribou range in Alberta, British Columbia, and NT. One of the surveys was conducted over a 4350km^2 area east of Fort Liard in January 2016. That survey identified four packs varying in size from 3-9 animals and estimated a density of 5.3 wolves/1000km^2.

Delegate comments

There was a discussion about the possible impacts of the recent bad wildfire years and for what length of time it might displace large numbers of boreal caribou. There was concern that the combination of fire disturbance and harvest might bring down numbers. Delegates wanted to know if additional monitoring was going to look at this. It was noted that the Dehcho program was going to deploy additional collars and that the South Slave was going to increase the area and number of boreal caribou collared as well as trying to collar wolves. Delegates noted that it was important for ENR to work together

with local harvesters to address concerns. Some delegates aired their frustration with the number of hunters from "elsewhere" in the NT coming into more local traditional hunting areas to harvest. It was noted that, given the current barren-ground situation, there was concern that hunting effort would move to other relatively accessible wildlife elsewhere in the NT - like the Dehcho.

Presentation on Range Management Planning for Boreal Caribou in the Southern Northwest Territories

This presentation provided additional background and an update to the Range Management Planning presentation made at the 2014 regional wildlife workshop. Delegates were reminded that there are four different ecotypes of caribou found in the NT and all have different and distinct lifestyles. The range management planning we are discussing is for boreal caribou, the secretive inhabitants of the boreal forest that spread out when having calves, do not make long distance migrations, and remain in small groups year round.

Boreal caribou are listed as Threatened under federal and territorial legislation. In general declining numbers of boreal caribou occur in landscapes with more habitat disturbance. This disturbance is often associated with increased predation. Based upon the National Recovery Strategy, which came out in 2012 and has legal implications, we need to maintain at least 65% of undisturbed critical habitat for boreal caribou in the NT and to develop range plans to meet these goals by 2017. In the meantime the NT assessed boreal caribou as Threatened which requires the development of a territorial

recovery strategy. The final territorial recovery strategy is expected to be approved in 2017.

The key difference between range plans and the territorial recovery strategy is that range plans focus on caribou habitat and the need to maintain 65% undisturbed critical habitat; there is flexibility in how they are developed and implemented. The NT recovery strategy addresses multiple threats (habitat, harvest, information gaps) and acknowledges the 65% undisturbed requirement. Undisturbed habitat is areas that have not burned in the last 40 years and areas that are >500m from human disturbance visible on satellite imagery. As of fall 2015 there was 66% undisturbed habitat in NT range. On average, 0.7% of the range burns annually in wildfires. 2014 was one of the worst years on record for wildfires.

The main purpose of a range plan is to outline how range-specific land and/or resource activities will be managed over space and time to ensure that critical habitat for boreal caribou is protected from destruction. The range plan should outline the measures and steps that will be taken to manage the interaction between human disturbance, natural disturbance, and the need to maintain or establish an ongoing, dynamic state of a minimum of 65% of the range as undisturbed habitat at any point in time to achieve or maintain a self-sustaining local population. Originally ENR was looking at dividing the NT range plan into regional plans (based upon administrative boundaries), setting regional targets, and coordinating across regional boundaries. Range plans would start with most disturbed regions first. The Dehcho, South Slave and North Slave regions currently have the most disturbance: as of fall 2015 at

44.7, 55.2, and 47.6%, respectively. Land claim boundaries and government administrative boundaries differ in the southern NT. Therefore it was proposed to combine both the Dehcho and South Slave.

One of the key elements of a range plan is determining important areas for caribou. Community-based information combined with location data from collared caribou, land cover types selected by boreal caribou and undisturbed patch size will be used to identify important areas. During 2015-16 ENR held workshops with community harvesters. With the assistance of harvesters important caribou areas were identified in traditional harvesting areas. These areas were classified into high, medium, and low levels of importance. ENR held workshops in Samba K'e, Fort Simpson, Fort Liard, Fort Providence, Kakisa, Hay River, Jean Marie River, Nahanni Butte and Wrigley.

After these meetings, ENR provided summary maps, a table describing the information received about each area, meeting notes, and a copy of the meeting presentation to each First Nation for confirmation of their accuracy and for comment on confidentiality. The response of First Nations has been mixed. ENR reiterated the need to hear back from First Nations about whether or not the descriptions and mapping of areas done at community meetings was interpreted correctly, and whether or not the information should be kept confidential.

Once important areas have been finalized the next steps include engaging with other GNWT departments, Aboriginal governments and wildlife co-management partners on the proposed approach to range planning, finalize

that approach and develop a draft regional range plan for the combined Dehcho and South Slave portion of the boreal caribou range.

Delegate comments

It was noted that the boreal caribou range covered a substantial portion of the NT. Delegates wanted to know if boreal caribou survival trends were different in the Dehcho north of the Mackenzie versus south of the Mackenzie. The north is doing better than the south likely because there is more disturbed habitat to the south relative to the north. Delegates wanted to know if climate change had been included in the model. Climate change will affect fires but has not been included in the model. It was noted that fire mapping has only been for 40 years and that the life cycle for lichens is longer than the 40 years. Delegates felt that there needed to be wise use of resources on species that were at risk. The focus should be on those species that we use and eat, like boreal caribou. Some delegates felt that boreal caribou had been going down locally and that the challenge we face is to protect what we have left while limiting or stopping development – we haven't found that balance yet and so the trend is continuing.

Presentation on Movement and Status of Northern Mountain Caribou in the Prairie Creek area

This was a presentation which had recently been made at the 16th North American Caribou Workshop. The ranges of three or four northern mountain caribou herds include parts of the Nahanni National Park Reserve (NNPR). Seasonal movements are similar between these and other herds in the Yukon with movement from lower elevation forested valleys in winter to higher

elevation tundra plateaus in spring, summer and fall. There is some overlap on breeding (rut) ranges and some movement of individuals between herds. There is little information on caribou found on eastern edge of the Mackenzie Mountains in the vicinity of the Prairie Creek mine and access road towards defined boreal caribou range.

Questions of interest included the number of caribou in the area and whether or not these caribou were associated with other known herds (Redstone, South Nahanni, Coal River, Labiche, or Finlayson). Do these caribou carry disease(s) and are they genetically healthy? Do they use the area near the Prairie Creek mine and access road and will mine activity affect caribou? Can impacts be avoided or reduced?

Following consultation meetings with different stakeholders there was community support for capturing (using a net-gun) and deploying newer lighter GPS collars on caribou. This was seen as the only way to address as least some of the questions and especially those questions related to seasonal movement patterns and estimating numbers. Collars would have programmed release mechanisms.

Six caribou captured February 2015 and 12 more in December 2015, most north of Prairie Creek mine and three well north (20km) of NNPR boundary. Preliminary results show that the majority of collared animals (14 of 18) have seasonal movement patterns similar to those of the Redstone caribou herd, traveling further northwest of the mine in summer, some to at least 250km from the mine site. Four caribou, including two collared on Sundog Creek had

smaller ranges showing less seasonal movement and remaining relatively close to the mine. This is akin to some more sedentary caribou of the Redstone herd that remain in the Carcajou Lake area year round. Each of the two animals collared in the Sundog area (*ca.* 30km NE of the mine site) did make a single one way crossing of the mine access road. However, one must be cautious in interpreting these data as there is <1 year of location data for the majority of collared animals, and two more years of data to come before the collars release. Future work may include aerial surveys during the rut and collaboration with ongoing genetics work.

Delegate comments

Delegates had no questions or comments after this presentation.

Presentation on Bird Monitoring in the Edéhzhíe, Fort Liard, and recent wildfires

As part of their mandate the Canadian Wildlife Service (CWS) is responsible for conserving migratory bird populations, identifying important habitat, and managing National Wildlife Areas. CWS has been involved in a long-term study monitoring forest birds in the Fort Liard area for almost 20 years. Forest birds are good indicators of environmental change and can be used to assess the health of boreal ecosystems. Another long-term project CWS is involved with is the North American Breeding Bird Survey (BBS). CWS also compiles observations from local bird watchers through the Northwest Territories and Nunavut Checklist program, now eBird Canada.

The NT is home to many resident and migrant species and long-term monitoring allows us to determine trends in species populations (i.e. changes in number of birds through time). Information about trends in bird populations are being used to identify environmental changes and threats. Long-term monitoring requires counting the number of birds seen or heard at different locations and revisiting the same locations over multiple years. Songbird species can be identified relatively easily based on differences in their songs. This means that these small birds do not need to be observed. New technology such as automated recording units (ARUs) or song recorders can be pre-programed to record bird songs at specific times and dates. This new technology allows CWS to collect a lot more information about songbirds than traditional human-based surveys. Fortunately, automated recognition programs can be used to identify more and more bird species. This allows the computer to search through many hours of recordings to detect songs of a specific species. However, some human interpreters are still required to identify as many species as possible that are using specific areas.

In 2016, CWS established the Edéhzhíe long-term monitoring program utilizing ARUs. CWS wants to provide a list of birds breeding in Edéhzhíe and estimate population sizes. This information about birds from a relatively pristine area can shed light on questions such as: what are the effects of wintering ground disturbance? How climate change affects bird populations? How natural disturbances affect bird populations? The program uses the boundaries of the proposed Edéhzhíe national wildlife area which represents 2% of the NT and 7% of the Dehcho boreal forest. A total of 33 stations were established systematically throughout the area with an ARU set up at each

station. Twenty of the 33 stations were established by a field crew including local residents from Fort Simpson and the other stations were established by a field crew including local residents from Fort Providence. The ARU's recorded bird songs from May to July. During these months, sites can only be reached by helicopter. Preliminary results from this monitoring program will be available in 2017.

Climate change models predict an increase in the frequency and severity of wildfires in many northern boreal regions, but the implications of these changes on wildlife remains unknown. CWS took advantage of the large wildfires of 2014 in NT to establish a post-fire long-term monitoring program to see how fire severity influences bird communities and monitor changes over time as the forest regenerates. A total of 16 sample sites (2km x 2km in size) were established in areas adjacent to Highway 3 between Fort Providence and Behchokǫ̀. Four of these sites were in mature forest that had not burnt and the remaining 12 sites were located in areas of different fire severity found in two recent burns (2014). Each site was comprised of a grid of 25 sampling locations (5 x 5) spaced 600m apart. ARUs (n=50) were used for 4 days to record bird species at each sampling location. Preliminary results showed that the abundance of common bird species differs between burned and unburned sites and that fire severity affects the breeding songbird populations.

Delegate comments

It was reiterated that the study area was the proposed Edéhzhíe National Wildlife Area (NWA). Delegates were concerned that data from the study

might result in new species at risk in the area which could impact traditional use. Traditional use would not be affected. Hunting and trapping rights are protected under the Migratory Bird Act. NWA's are different from National Parks, they are dedicated to protecting wildlife. Studying all the birds in the area is good but most people are interested in those birds they eat, particularly chickens. Delegates were curious as to what had been learned from the first two months of recordings. It was indicated that the data were still being downloaded. Delegates discussed some of the birds that seemed to be much rarer now, like fewer robins on the Mackenzie River. It was noted that robins were some of the first birds returning to fresh burns and robins were more common now in those areas that had burnt over the past couple of years. It was commented that magpies had recently returned to Fort Simpson. They had been plentiful in the 1940's but had disappeared and had now returned.

Presentation on Dehcho Moose Program

Much of the presentation centered on the contaminant study. ENR indicated that it had been a struggle to get the required number of samples. Although many harvesters had been well intentioned it wasn't until January 2016 that ENR had received samples from 40 locally harvested moose, most came from the fall 2015 hunt. Samples were provided from moose harvested throughout the region, but we received fewer from the Fort Liard area than the previous study. ENR wants to thank all harvesters that provided samples for this study.

A total of 74 kidney, liver, and muscle samples have now been analyzed for their concentrations of 34 different elements including cadmium, lead, and

mercury. We want to compare the results from this collected with those samples collected from moose during 2004-2007. The comparative analyses have just begun. Additionally, 23 muscle samples are being analyzed for their radionuclide content and 15 kidneys were examined under microscope to determine if their cell structure had been affected by cadmium. Local hunters provided a ranking of the body condition of their harvested moose and ENR measured fat on the kidneys and in the bone marrow. All teeth were aged by the layers of cementum (like counting tree rings). Poop samples were analyzed for diseases and parasites.

Some of the preliminary results provided were that there was no cellular evidence of the effects of cadmium on the kidneys of harvested moose. There were low infestations of common parasites similar to those found in the 2004-07 study. Body condition according to hunters, kidney fat and marrow fat measures were all slightly higher in the recent study than those from the previous study. Quite possibly this is because a majority of the samples for this study were harvested during the fall hunt when moose are expected to be in the best condition. For the previous study more sampled animals were harvested in winter. There were fewer harvested females sampled in the recent study. Moose continues to be a healthy food choice.

ENR indicated that they had managed to find funding to complete the contaminant study and to conduct a small scale monitoring survey 24-28 November, 2015. Local observers had been hired to participate in the survey which covered 43 blocks from five survey areas along the Mackenzie River and 35 blocks from four survey areas along the Liard River. All blocks flown

were blocks that have been delineated for the large-scale moose surveys which take place once every six years. A total of 84 moose were observed during the survey, within the range of 60-113 observed on previous small-scale surveys.

ENR informed delegates that they were committed to conducting a large-scale moose survey during winter 2017/18. This survey will need lots of planning and community input. There have been a number of wildfires over the past six years since the last survey and in areas that haven't burned there has been regrowth. It will be important to confirm whether the almost 2000 sample blocks (~16km^2) defined as high or low for the last survey should have the same designation for this survey. During the last large-scale survey in November 2011 a late-freeze and reduced snow cover affected the distribution of moose in the Liard survey area greatly impacting the survey results. In 2003 for the first large-scale survey the Liard area was surveyed in February while the Mackenzie portion was flown in November. There will need to be some agreement on when is the better time to conduct the survey in the Liard area. There are pros and cons to surveying in November and February. One key thing to remember is that if it is critical to get an accurate male:female sex ratio then the survey would have to be in November. These are all points that will need to be discussed at community meetings before the survey is conducted. ENR will be hiring local observers from all First Nations partners for the moose survey.

ENR indicated that they had been fortunate enough to recently participate in 8th International Moose symposium in Brandon, Manitoba. This provided an

important opportunity to promote our work to a larger audience. Our poster on the levels of persistent organic pollutants in moose from the southern NT attracted attention. One fact that attracted our attention at the meeting was that Sweden harvests 90,000 moose annually and still has highest density of moose in world.

Delegate comments

Delegates really wanted to know why Sweden had so many moose. A lot of it has to do with the silvicultural practices as part of their forestry program. There are huge landscapes of harvested and replanted forest. Moose have a field day on the smaller growing trees and shrubs. Moose browsing is a major impact and cost to their forest management practices. Also there are relatively few predators. Lots of food for moose means that twins are common. Delegates wanted to know if the contaminants in moose could affect humans who had been consuming moose over a long period of time (50-100 years). It was indicated that it was unlikely. Kidneys have the highest concentration of cadmium, but given the reported levels in kidneys from locally harvested moose you would have to eat kidneys daily for a long time before there may be a concern. Smoking cigarettes daily would expose you to more cadmium. Delegates wanted clarification on the flame retardant materials that were being picked up in the tissues of harvested moose. The materials in question are a particular group of what are named persistent organic pollutants (POPs). They include PCBs (polychlorinatedbiphenyls) and DDTs (pesticide) that most people are familiar with. PBDEs or brominated diphenyl ether compounds are found in the solutions that we treat furniture and pillows with to make them more fire resistant. These pollutants become airborne and we have detected

very low levels of them in the livers of moose harvested in the region - thousands of kilometres away from where they are being used. The forest fire retardant used to fight wildfires is something quite different.

Presentation on Human Footprint, Habitat, Wolves and Boreal Caribou Growth Rates

The current consensus around declining boreal caribou populations throughout their range is that with increasing disturbance of the boreal forest landscape, either by wildfires or the human linear footprint (eg. roads and seismic lines), there is an increase in the number of alternate prey (generally moose and deer) which results in an increasing number of predators (generally wolves and cougars) in the range and they increase the predation pressure on the, more native, boreal caribou prey population. NT boreal caribou range is a relatively pristine versus ranges in British Columbia and Alberta. However is there more going on than simply wolves? Are there really more wolves out there now than historically? What about the range habitats? Six study areas were chosen (NE British Columbia n=3; Alberta n=1; NT n=2). Most study areas were 3500-7000km^2 in area with a minimum of edge:area ratios; a small (750km^2) area in NE British Columbia was flown but not considered in the final analyses. These study areas had a range in the level of human disturbance from highly disturbed to relatively pristine, a range in moose densities of 0.02-0.25 moose/km^2, a range in the level of decline of boreal caribou numbers, and a range in the proportions of upland and wetland habitat. The goal was to get estimates of wolf densities for the different study areas to see if there was support for the current consensus. The challenge was to determine how best to count wolves in the forest during winter?

The survey design needed to maximize encountering wolf tracks, maximize detecting wolf tracks, and minimize track confusion. By conducting the survey two days after the last snowfall track confusion was minimized and the encounter rate was high. To maximize detecting tracks the line transects were spaced 3km apart. Validation of the transect spacing was determined by data from GPS collared wolves in our study region. Ideal conditions for surveys are when there is 100% snow cover with a snowpack of >40cm. Surveys were conducted in the six study areas during 2015 and 2016 to determine wolf densities in the different study areas. There is a plan to survey additional areas in winter 2016/17. In Saskatchewan, a survey would try and address any confounding by latitude. Another survey in NT would increase the number of survey areas.

Preliminary results showed a range in wolf densities from 1.6/1000km^2 in NT to 15.6/1000km^2 in NE British Columbia. The human footprint positively affected wolf density and negatively affected caribou population growth rates (λ). There was a negative relationship between caribou population growth rate and wolf density, but the best predictor of caribou population growth rate included both the human footprint and the proportion of wetland habitat. Next step include adding all available moose survey data to all of the analyses.

Delegate comments

Delegates noted some consider an overpopulation of wolves in certain areas. They questioned if alpha males were being shot and noted that this could lead to more wolves in future. It was felt that the current wolf problem in the community of Fort Simpson was because the alpha male was shot across the

river from the community. This is certainly a possibility. More wolves makes it worse for boreal caribou. In boreal caribou range further south the milder weather has led to a real increase in deer numbers and range expansion. The increased prey for wolves is likely a more long term problem for boreal caribou populations. Delegates noted that wolves are good at killing deer in deep snow and that wolf kills do increase short term numbers of prey. It was noted that wolves will control their numbers to some extent. When there is lots of prey there are lots of wolves. Male wolves eat wolf pups when less prey to eat. Delegates wondered about the impact of beavers as an alternate prey and asked if it had been included in the model. In addition to creating more wetland habitat in their range, the reduced beaver harvest has meant that there is now a substantial alternate prey resource. Beavers can keep up wolf numbers by providing food in spring/summer. There was debate as to whether increasing the beaver harvest would lower wolf numbers. It was noted that historically when there was lots of beaver being harvested wolves were still plentiful. The current model has not included beavers.

Presentation on Dehcho Bison Program

This presentation provided an update on the past two years of the program and highlighted the frustration in having to reschedule a population survey that had been scheduled for March 2016. ENR had planned to deploy up to 10 collars on bison (males n=2, females n=8) prior to conducting the next bison population survey. A combination of unfortunate factors prevented ENR from having those 10 collars deployed. Bad luck included high temperatures during classification surveys and other field operations, wildfires preventing staff and/or drugging equipment from being available, bison being inaccessible

(only in forested areas not open habitats) or only in areas where drowning was a concern, and rapid changes in weather and/or wind conditions. A lack in funding for the program last fiscal year also meant that even if the 10 collars had been deployed, the population survey had to be rescheduled to March 2017. ENR will continue to try and deploy collars prior to March 2017.

Previous population surveys were conducted in March 2004, estimating 403 bison, and in March 2011 estimating, 431 animals. A third survey is required to determine the population trend. Since the range of the Nahanni bison population has increased since the last survey we will have to increase the survey area to include the Poplar river to the northeast and up the Kotaneelee valley to the west. Like the two previous surveys, the March 2017 survey will be an aerial, strip line transect survey of the winter range. The plane will fly at about 400 feet above ground, the wing struts will be marked so that observers can count all bison observed in a 500m swath on each side of the plane. All animals will be counted and recorded with a waypoint. The flight path will be recorded with a GPS. Larger groups of animals will be photographed. The survey crew consists of a pilot, recorder and two observers. ENR will be hiring local observers to participate in the survey. Collared bison are used to get a sightability correction factor to best interpret survey results.

Sex and age classification surveys continue to be conducted annually from the river in mid-July when bison frequent exposed sandbars. Since 2009 biologists from BC have participated in our survey and in 2013 we participated in the BC survey of the Norquist population. In 2016 the new biologists from BC participated in the survey. These joint ventures ensure consistency in

classifying bison between jurisdictions. Maps of survey results are provided to First Nations after the survey is completed. On average, 151 bison are observed during classification surveys. The 2016 survey reported the lowest yearling:adult female ratio of any year at 4 yearlings per 100 adult females which resulted in an estimated overwinter (2015/16) calf survival of 13%, some 40% below average. So what happened to cause such low overwinter calf survival? We suspect that this was related to a late winter freezing event. There were four exceptionally warm days at the end of March 2016. The snowpack began melting and started to sink. This was followed by 10 days of freezing temperatures which in effect created an almost impenetrable frozen surface over the vegetation. Food availability dropped dramatically. Bison calves would have the lowest levels of stored fat and the most vulnerable to starving. Additionally, with a solid snowpack wolves would have a much easier time traveling and ultimately hunting. Such conditions might also have an impact on young male survival. There were fewer immature bulls recorded during the 2016 classification survey.

There was a brief update on bison and roads and the need to increase the number of bison signs on the Liard Highway. It was noted that some signs had gone missing over the past couple of years after being erected in 2005. ENR had been working with the Department of Transportation to rectify the sign situation.

ENR held a number of bison working group meetings in both Fort Liard and Nahanni Butte from 2012-2015. Many issues had been discussed during those meetings and currently a draft management plan for the Nahanni wood bison

population was being drafted based upon these discussions. One of the topics had been the number and allocation of tags to harvest wood bison. Presently seven bison tags are available annually. Tags are issued to individual GHL or NT resident hunters based upon written approval from either Acho Dene Koe Band (Fort Liard) or Nahanni Butte Dene Band (Nahanni Butte). Tags are not transferable, must be carried by harvesters, and have been used to harvest problem bison in communities. Resident hunters must pay the applicable license/tag fee.

Delegate comments

Delegates had much to talk about after this presentation but because it was getting late in the afternoon they agreed that some topics should be deferred to the following day when there would be round table discussion time. Acho Dene Koe Band (Fort Liard) wanted it noted that they had a problem with the process of issuing wood bison tags. They have five tags available but are getting 40-50 requests from harvesters who want tags, most from outside the community. Delegates wanted to know the estimate of the Nahanni wood bison population. There were surveys in 2004 and 2011 both indicating approximately 400 animals. There was a concern raised that seven bison shot a year from the Nahanni population would damage the genetic diversity. For the Mackenzie herd, which has much higher numbers there were relatively fewer GHL/resident and trophy tags made available. Even if all seven animals were harvested every year this is <2% harvest. We have never had all seven tags used in a year, usually it is 2-3 tags and in many years since the 2004 survey no bison have been harvested.

Day 2

Round table discussions on moose research findings, upcoming large-scale survey timing and methodology, regional wildlife issues and concerns (especially pressure on regional harvest of wildlife)

Delegates were concerned that moose numbers were decreasing and that the number of moose hunters was increasing. There was concern that roadside hunting of moose had increased. Some delegates reported seeing lots of trucks on the road carrying moose antlers. Some had big bull moose antlers. There is a concern that too many prime breeders are being harvested. It was noted that some sport hunters drive up into NT before flying into the Mackenzie Mountains to hunt for moose. ENR has detailed information on the harvest of animals in the Mackenzie Mountains. Over the past 16 years an average of 65 moose are legally harvested and reported by sport hunters from the entire Mackenzie Mountains (8 zones and 140,000km^2). Non-resident hunters represent a small portion of all hunters driving into the Dehcho to hunt moose. There is certainly the perception that more GHL and resident hunters come to the Dehcho to hunt moose, especially now that access to barren-ground caribou is limited. It was noted that during aerial moose surveys in the Dehcho that moose were more abundant 30-40 km away from the main highway and river hunting corridors and were quite abundant in more remote areas of the region.

Delegates questioned whether GHL and/or resident hunters from other areas of the NT were allowed to hunt in the Dehcho. It was indicated that resident

hunters with tags can hunt on public lands anywhere in the NT, similarly for GHL hunters.

Delegates wanted to know what the impact of the large wildfires had been on moose. Those from Fort Providence wanted to know what moose densities had been before the wildfires had burned their traditional moose harvesting areas. They wondered if there would be moose surveys after the burn in these areas. It was noted that there had been historic moose surveys conducted in the Fort Providence area, and that for regular surveys of the bison control area observations of all wildlife species are reported. ENR South Slave was planning on conducting moose surveys in future.

One delegate questioned why there were so many moose in Newfoundland? It was noted that there is an abundance of good habitat in Newfoundland and that forestry practices have enhanced the amount of good habitat. Good habitat leads to many females having twins. Additionally, there are no wolves on the island so predation is virtually absent.

One delegate noted that in Teslin, Yukon there was a self-imposed ban on moose hunting by First Nations for 5 years in response to low moose numbers. This action resulted in the moose coming back.

Delegates questioned whether there could be a 500m buffer off the highway where hunting is banned to reduce moose harvest; there was one in the past? It was noted that any ban on hunting along the highway would be a ban for all hunters, GHL and resident. Such a ban would be extremely difficult to enforce.

It was mentioned that in British Columbia there is a no hunting zone of a mile around the main highway. Delegates wondered if you would be considered a criminal, by BC hunting rules, if you shot chickens, rabbits or a moose along the Liard Highway to Fort Nelson. Recently an RCMP officer from Fort Nelson had come up to warn a hunter that had shot a moose along the Liard Highway.

There were comments about safety issues associated with the low level flying required for surveys. In November open water on lakes and rivers create fog and mist making it hard to see out the windows. Survey planes need to have good heaters to keep the windows clear. Also low flying planes may disturb wildlife in areas where harvesters are hunting and trapping. It was noted that low flying aircraft can disturb wildlife and harvesters on the land. ENR advises local First Nations when and where surveys will be taking place to minimize the disturbance to those out on the land. ENR also endeavours to use local harvesters as observers in the survey aircraft. In most cases the surveys are flown over the traditional areas used by observers, so harvesters can get a bird's eye view of their harvesting areas.

Delegates were highly supportive of another large-scale survey in winter 2017/18. They felt that with large-scale surveys six years apart a decrease in moose number would be noticed. The small-scale surveys might miss changes. There was much discussion about whether a November survey would be better or a February survey would be better. There was a need to consider harvesters use of the land, survey flight paths, how low a level to fly the survey, animal stress, animal behaviour, the presence of antlers on bulls, the length of daylight, the amount of freezing and snow cover, foggy weather and

survey plane windows, timing after major storms/snowfalls, and the efficiency of flying blocks based upon habitats in the block.

Delegates thought that it might be best to split the large-scale survey into two surveys, one in November and one in February. Then there could be a check to compare results between them. Most of the moose harvest occurs in fall with much less harvest between November and February so you might be able to combine the results of both surveys. They were pleased that ENR was planning community consultation in the design of the survey and to make sure that blocks were defined properly. Also ENR would be hiring local harvesters as observers from all the communities involved in the survey.

There was a question about why ENR surveys areas where there are no moose. The time could be used more wisely if they survey only areas where moose are known to be. It was noted that historic surveys were usually restricted to much smaller areas generally adjacent to water courses. These areas were of higher moose density than elsewhere. When extrapolated over a larger harvesting landscape these survey results would lead to overestimating moose density which could lead to localized overharvesting. Including areas of known low moose density in the surveys provides a better estimate of moose density at the landscape level.

There was a suggestion that maybe we should concentrate less on surveys but concentrate more on the harvesters out on the land. There was definite agreement that the best information would require a combination of surveys and harvesters because harvesters could not access everywhere.

Harvesting along the highway right-of-way and the increasing number of harvesters that are hunting the highway right-of-ways in the Dehcho was a real concern of delegates and voiced repeatedly during the round table. It was noted that many harvesters do not have a lot of time to hunt (weekend hunters) and many resort to hunting along the highway system.

It was noted that enforcing a no shooting corridor along the highway is difficult and it would have to prohibit everyone from hunting the corridor. This would infringe on hunting rights on public lands. An alternative to banning hunting corridors is educating youth and designing a hunter safety course which trains hunters to harvest properly and respectfully. ENR is working on a hunter training package for new residents. When dangerous incidents happen ENR needs them reporting along with written statements provided by harvesters. Legislation takes a long time to change and needs documentation. Highway hunting is not going to stop.

Delegates reiterated that respect of the animal, the use of all of the harvested animal, and taking only what is needed must be instilled with the hunter education program. Also, education on proper butchering and use of the carcass is important because it would lead to less meat wastage.

There was concern that with restrictions on barren-ground caribou harvest that harvest pressure will be transferred to moose and bison in the Dehcho. Delegates wondered if there were harvest records that could check on this. Unfortunately harvest records are not ideal. For resident hunters there is a voluntary questionnaire that they fill out. Not all questionnaires are returned.

Another issue is that the region where a tag for an animal is purchased is not necessarily the region where an animal was successfully harvested. It was noted that if the information was requested and answered on the questionnaire that knowing the location of the harvest was more important than the location of tag purchase. In the Dehcho, ENR has no record of aboriginal harvest.

It was suggested that there should be monitors in communities that could go out with hunters to check what is taken from traditional harvesting areas. Local First Nations do not know what is being harvested on the land and they see parked vehicles with U.S. license plates. Vehicles with U.S. plates are those of non-resident big game hunters who hunt with outfitters in the Mackenzie Mountains. It was noted that harvest by these hunters is documented by ENR. These hunters have to check in at ENR offices where the harvest is checked and export permits are issued. ENR Fort Simpson produces a detailed annual report on the harvest by non-resident hunters in the Mackenzie Mountains. Copies of the most recent report were available at the back table and all copies have gone. To ensure the communication of this harvest to First Nations, in future ENR could forward a hard copy of the report to local First Nations.

Some delegates wondered if ENR could stop non-resident hunters from hunting trophy animals in the mountains. ENR noted that non-resident hunters come to the NT to hunt trophy animals in the Mackenzie Mountains. The harvest is distributed over a huge area, a large amount of meat from their harvest is distributed to local communities and non-resident hunters and the outfitting industry put a lot of money into the NT.

There needs to be more stewardship and co-management between First Nations and ENR.

Round table discussions on bison survey and collaring, harvest studies, species at risk and the impact of social media

The process of acquiring tags was a topic of discussion. There used to be only two tags available for male bison from the Nahanni population, one each for the communities of Fort Liard and Nahanni Butte. Currently, there are seven tags available for male bison. It was acknowledged that the way tags had been allocated for hunting bison from the Mackenzie population was quite different from the way they are allocated for the Nahanni population. Delegates not from Fort Liard and Nahanni Butte indicated they had an interest in acquiring tags to harvest bison from the Nahanni population, especially with the limited access to barren-ground caribou. It was understood that since the available tags had already been issued that none were currently available.

It was pointed out that bison had historically been transported to the Fort Liard and Nahanni Butte areas in the past and released. People have been living with them for years now and especially in Fort Liard they have put up with them being a nuisance within the community and destroying personal property. Fort Liard annually provides one tag to the school leaving the remaining four tags available for the community. Now we're finding people from all over NT want bison tags. Issuing bison tags is something we (Fort Liard) will discuss with ENR.

Delegates were supportive of another bison survey so that there was a more recent population estimate. The result might affect the number of tags available. Some delegates questioned whether each community could have a bison tag. Delegates of Fort Liard were highly supportive of an extended survey area for the upcoming survey. They especially liked the inclusion of the Kotaneelee Valley where they said bison had been seen more frequently by local harvesters. There was comment that bison seen in the Kotaneelee valley appeared to be in better shape than those on the Liard. Delegates wanted to see local harvesters used as survey observers. There would be discussion with local bands about the new survey area for the March 2017 survey.

Delegates from Fort Providence wondered if Mackenzie bison had moved more up on to the Horn Plateau area after the extensive wildfires in the Mackenzie bison Sanctuary. ENR would need to rely on observations of people out on the land or doing other work in the area because there are no collared bison in the Mackenzie population. Wolves are taking bison in the Mink-Sharun-Fawn Lakes areas.

Fort Providence delegates indicated that they used to provide tags for trophy hunts of bison from the Mackenzie population. The hunter kept the head but the community kept all the meat. Back then the population was estimated to be 1700 bison and only five tags were issued a year and they were not all necessarily used. The Nahanni population is only 400 animals but seven tags are available annually. Some delegates questioned if seven tags wasn't too many. It was noted that limiting the harvest to 1-2% was consistent and that the situation with harvesting bison in the Mackenzie herd was quite different.

Issued tags had only represented a portion of the Mackenzie harvest in past years.

Delegates wondered whether the Mackenzie population had rebounded after the anthrax outbreak. There was concern that with the wildfires and wolves in some areas would keep numbers down. It was noted that a recent population survey had been conducted and a new estimate would be forthcoming.

Delegates voiced the real need for better harvest reporting by everybody (residents and First Nations alike). They especially felt that information on the location of the harvest was most important and should be collected and reported. Resident tags can be purchased in any region but the harvest may not occur in the region where the tag was purchased. Just reporting the number of tags used and where they were purchased from does not accurately account for harvest pressure.

There was concern amongst delegates that there was too much time and money going to endangered and threatened non-edible wildlife. The birds and animals that they eat are much more of a concern than songbirds, bats, frogs etc. that they do not consume.

Delegates felt that social media was a powerful tool that could have good and bad results. They believed that there was a time and place for using it. A photo could tell or mislead a story instantaneously anywhere in the world.

Some delegates felt strongly that this and other new technologies (ipads, ipods) had no place out on the land. When taking out and introducing youth to the land all technology stays at home. There needs to be a relationship made between the individual and the land, technology gets in the way of this relationship. Learning about the land is a way of life. There is more camaraderie with others when on the land and a need to conduction oneself in a respectful way.

Round table discussions on trail cameras, wildlife disease, collaring male caribou, working with trappers and sharing trapper information

There was some discussion about domestic animals, like sheep and goats, and the push for communities to look at ways to provide more food locally. It was noted that the Dehcho Land Use Plan has restrictions on agriculture and grazing animals. Currently there is no legislation restricting areas from domestic animals. At the last workshop there was a presentation on separating wildlife from domestic animals because of the high risk in disease transmission that could devastate wild sheep and goat populations. The Village of Fort Simpson is wrestling with a bylaw related to residents having sheep and goats on their property. There is the potential for municipal legislation to contravene proposed legislation elsewhere.

There was comment that possibly there should be more caribou research looking at the boundary of the ranges of boreal and northern mountain caribou and whether there is overlap. It was noted that to properly address this issue would require a multiyear project that would require a huge amount of resources.

There was a suggestion that ENR work more closely with active trappers to collect useful information. Trappers could be provided with a log book and maps. Each time they went out on their trails they could provide wildlife and weather observations and comment on the conditions of animals. Sharing this information collected over time would give an idea of seasonal patterns and would ultimately mean more eyes on the ground directly observing wildlife and the conditions. The old traditional trails go where the animals are; they are better trails to travel on than overgrown seismic lines. There is a need to get back to using the traditional trails more.

Some delegates commented that it would be useful for ENR to hold workshops showing how to properly handle harvested wildlife. It was indicated that fur handling courses are offered by ENR and that there is a video primarily about caribou hunting that has already been produced and will be a part of a hunter safety package.

Delegates wondered if there had been any black bear studies. Some people still harvest them. The fat has traditionally been used for making lard and butter and it is important to cook the meat properly. ENR indicated that they had been collecting samples from bears as part of a disease monitoring program. Black bears can carry a parasite (*Trichinella*) that is very dangerous to humans who consume improperly cooked infected meat. Less than 5% of the black bears sampled over the past 14 years have been infected but of those infected, three had infections that were a cause of concern to humans consuming the meat. One delegate asked if a human ate berries from the same bush that a black bear had eaten from could they get the parasite. It was

indicated that you cannot get the infection from eating berries from the same bush. You get the infection from eating undercooked infected meat.

General Comments made at the Workshop

There is still a concern about continuing meat wastage by harvesters, more so as it pertains to barren-ground hunting, but not restricted to barren-ground caribou.

Delegates stressed the need for more stewardship and co-management. We must all work together in harmony for wildlife.

It is important to continue to eat wild meat over store-bought meat because it is healthy, and good for you.

Delegates question the picking and choosing of resources to spend on species at risk (SAR). Also, there is an overwhelming amount of correspondence related to SAR both territorially and federally with lots of species. There is too much stuff for First Nations to go through. They do not have the capacity to keep up with all the documents.

One delegate noted that he had attended a number of these workshops and that they were a great forum for information exchange. But, he suggested that maybe for future workshops there should be a facilitator, instead of the ENR biologist running the workshop. A facilitator might be better able to keep the discussions focused on wildlife issues, which is what the workshops are about.

There was an active discussion about what key action items ENR should follow up on after the 2016 workshop. Consensus was reached on the 15 action items that follow:

Action Items from the October 2016 Regional Wildlife Workshop

I. ENR to ensure the Final Report of this workshop is distributed to all First Nations on a timely basis.

II. ENR to secure funding to host another Regional Wildlife Workshop at about the same time of year in two years; the format and the arrangement of covering the costs for two delegates per First Nation to attend the workshop should remain the same.

III. ENR should post a copy of Final Report of this workshop on the ENR website.

IV. ENR should conduct an aerial survey of the Nahanni wood bison population in March 2017. The survey area will be defined through consultation with its First Nations partners. ENR should deploy as many of the 10 collars available for bison prior to the survey.

V. Boreal caribou range plan community meeting outputs have been provided to all communities, but not all communities have responded. ENR should pursue requesting feedback from those communities that have not responded.

VI. ENR should continue with the trail camera program and provide a brief report for next workshop.

VII. ENR should provide results from the moose contaminant study as and when received to its First Nations partners. A final report documenting

the complete results of all analyses and comparing to the previous study will be prepared after all analyses have been completed.

VIII. ENR should work with Parks Canada to produce maps showing the locations of collared northern mountain and boreal caribou in the SW Dehcho.

IX. ENR should deploy the eight female and five male collars on boreal caribou in February 2017. Additional male collars may need to be deployed if adult male survival is lower than that of females. Each First Nation partner will have one collar made available to them so they can advise ENR on where to deploy that collar on a female caribou in their traditional areas.

X. ENR should conduct a large-scale moose survey in winter 2017/18. ENR needs to consult with First Nations with respect to the timing of the survey and defining survey blocks.

XI. ENR should pursue working with local trappers to collect observation data of wildlife while out on the land.

XII. ENR should provide preliminary results from the summer 2016 vegetation study work to its First Nations partners once they become available.

XIII. At this and future wildlife workshops, ENR should collect info from each community or First Nation on whether they feel that numbers of different wildlife species have gone up or down or remained the same since the previous workshop and what the general condition of harvested wildlife has been over the past year.

XIV. ENR should continue to work with DOT to increase the number of bison warning signs on the Liard Highway as part of a public safety issue.

XV. ENR should continue to pursue avenues to separate domestic animals (primarily sheep and goats) from areas inhabited by wild sheep and goat populations.

A listing of action items from previous wildlife workshops.

2014 workshop

I. ENR to ensure the Final Report of this workshop is distributed to all First Nations on a timely basis.

II. ENR to secure funding to host another Regional Wildlife Workshop at about the same time of year in 2 years; the format and the arrangement of covering the costs for 2 delegates per First Nation to attend the workshop should remain the same.

III. ENR should ensure a wide distribution of Final Report of this workshop including having it posted on the ENR website.

IV. ENR should conduct a Nahanni bison population survey in March 2016 and have collars deployed on bison prior to the survey.

V. ENR should pursue boreal caribou range management planning, with the Dehcho regional management plan as first priority.

VI. ENR should pursue a trail camera program where one camera per First Nation partner is deployed on a trail within their traditional area. Its location will be suggested by the First Nation.

VII. ENR should make completion of the moose contaminant study the highest priority in the moose program, with the small-scale moose survey planned for November 2015 of lesser priority.

VIII. ENR should deploy up to 9 collars (including 2 iridium units) on boreal caribou in the Dehcho in February 2015. Each First Nation partner will

have one collar made available to them so they can advise ENR on where to deploy that collar in their traditional areas.

IX. ENR should pursue taking ultrasound measures of fatness from captured caribou during the February 2015 collar deployment. Pending discussion of the results of this trail, ultrasound measures may be continued in future deployments.

X. ENR should facilitate classification surveys of BC collared caribou by advising local First Nations if, when, and where such surveys would occur on their traditional areas.

XI. ENR with DOT should pursue increasing the number of bison warning signs on the Liard Highway.

XII. ENR should actively explore avenues to separate domestic animals (primarily sheep and goats) from areas inhabited by wild sheep and goat populations; not permitting domestic sheep and goats west of the Liard River was suggested.

2012 Workshop

I. ENR to ensure the Final Report of this workshop is distributed to all First Nations on a timely basis.

II. ENR to secure funding to host another Regional Wildlife Workshop at about the same time of year in 2 years; the format and the arrangement of covering the costs for 2 delegates per First Nation to attend the workshop should remain the same.

III. ENR should work with DFN to seek funds to ensure summer youth ecology camps, exploring options to offer CTS credits for youth attending the camps. Camp policies should continue to be “tailor” made

for each camp and reviewed prior to each camp to minimize difficulties for facilitators.

IV. Delegates were unanimous in supporting the development of a Nahanni bison management plan and want ENR to proceed in this direction.

V. ENR should ensure a wide distribution of the Final Report of this workshop including having it posted on the ENR website.

VI. ENR should provide the Dehcho First Nations Leadership with the list of the workshop action items in time for their winter leadership meeting.

VII. ENR should conduct another large-scale geospatial moose survey along the Mackenzie and Liard River Valleys no later than November 2017.

VIII. ENR should reduce the frequency of small-scale moose monitoring surveys to one every two or three years; additional consultation with First Nations is necessary to determine a schedule for the next small-scale survey.

IX. ENR should actively seek to collect biological samples from harvested moose in order to reassess the level of contaminants in moose; harvesters will be reimbursed at $75 per complete set of samples.

X. ENR should schedule another Nahanni Bison population survey in the next 2-3 years and consult with local First Nations regarding collaring bison prior to the survey.

XI. ENR should deploy up to 10 collars on boreal caribou in the Dehcho in February 2013. Each First Nation partner will have one collar made available to them so they can advise ENR on where to deploy that collar in their traditional areas.

XII. ENR should try to deploy the one “high tech” collar they acquired on a female boreal caribou in February, 2013.

2010 Workshop

I. ENR to distribute the Final Report of this workshop to First Nations on a timely basis.

II. ENR to secure funding to host another Regional Wildlife Workshop in 2 years; the timing of the workshop should remain.

III. ENR should work with DFN to seek funds to provide future summer youth ecology camps, and if possible extend the length of such camps. Camp policies should be "tailor" made for each camp or at least reviewed prior to each camp to lessen difficulties for facilitators.

IV. ENR should try to communicate with the schools concerning ecology camps; Career Technology Studies (CTS) credits for high school students may encourage more students to participate in these camps. The number of students participating in camps is sometimes an issue.

V. ENR should ensure a wide distribution of the Final Report of this workshop, not limited to the agencies and First Nations participants.

VI. ENR should post the final report of the 2010 Regional Wildlife Workshop on the ENR website. They should try to post final reports of previous workshops.

VII. ENR should provide hard copies of the final report for the 2010 Regional Wildlife Workshop to Dehcho First Nations Leadership in time for their winter leadership meeting, posters should be made available as well.

VIII. ENR should distribute the large scale geospatial moose survey maps to their First Nations partners so local harvesters can update survey blocks and modify the survey area for a more accurate moose survey.

IX. ENR should conduct another large scale geospatial moose survey November 2011 along the Mackenzie and Liard River Valleys covering a similar area to surveys in winter 2003/04.

X. ENR should endeavour to deploy as many of the 7 available collars on Nahanni wood bison prior to conducting a Nahanni wood bison population survey in March 2011.

XI. ENR should extend the current moose and bison surveys south of 60°N latitude to include traditional harvesting areas of the Acho Dene Koe Band in northeastern British Columbia.

XII. ENR should forward letters to First Nations requesting them to provide ENR with suggestions and guidance for future deployment of collars on boreal caribou. There will be no collaring in February 2011 but at least 1 collar will be available for each First Nation to deploy in February 2012. ENR should keep a minimum of 25-30 active collars on boreal caribou for each calving season, depending on mortalities through 2011. ENR will request First Nation permission to deploy collars in areas where mortalities have occurred.

XIII. ENR should follow up with the Dehcho First Nations' Grand Chief on the formation of a working for boreal caribou.

XIV. ENR requests that Dehcho First Nations submit names for membership on the Nahanni Bison Management Plan committee.

XV. ENR should get hard copies of the South Slave moose survey circulated to all First Nation involved, once it is available to the general public.

XVI. ENR should get hard copies of the northeastern British Columbia boreal caribou and moose survey reports distributed to appropriate Dehcho First Nations.

2008 Workshop

I. ENR to distribute the Final Report of this workshop to First Nations on a timely basis.

II. ENR to secure funding to host another Regional Wildlife Workshop in 2 years; the timing of the workshop should remain.

III. ENR requests that Dehcho First Nations submit names for membership on the Nahanni Bison Management Plan committee.

IV. ENR should work with DFN to seek funds to provide future summer youth ecology camps, and if possible extend the length of such camps.

V. ENR should ensure a wide distribution of the Final Report of this workshop, not limited to the agencies and First Nations participants.

VI. ENR should look into making a brief presentation of the Final Report of this workshop at a DFN Leadership meeting, likely in January 2009.

VII. ENR should endeavor to deploy as many of the 11 available collars on Nahanni Bison as soon as possible.

VIII. ENR should extend the current moose and boreal caribou programs to include traditional harvesting areas of the Katlodeeche First Nation.

IX. ENR should forward letters to First Nations requesting them to provide ENR with suggestions and guidance for future deployment of collars on boreal caribou. Information requested would include where to deploy collars, how many collars to deploy, type of collars to deploy and whether to pursue the deployment of collars in February 2009. (8 collars will be available).

X. ENR should follow up with the Grand Chief on the formation of a working group for boreal caribou.

XI. ENR to provide workshop to Jean Marie River and Trout Lake on fur handling and wolf snaring techniques.

XII. ENR to follow up with ITI regarding access to Western Harvester Assistance Program for Jean Marie River and distribute information on moose and caribou hide program.

XIII. ENR to include discussion of predator management programs when developing bison management plans and the boreal caribou action plans.

2006 Workshop

I. ENR to ensure the final report of the workshop is distributed to all First Nations on a timely basis.

II. ENR to ensure that these workshops become a biannual event, and that participation by elders and youth of the region is actively supported and encouraged. The current timing is good.

III. ENR to ensure that a bison management plan is developed for the Nahanni Bison Herd.

IV. ENR to initiate discussion with trappers in the Dehcho communities to stimulate cooperation in designing and conducting basic research and monitoring programs.

V. ENR to continue seeking proposals for hosting the summer youth ecology camp so that the camp curricula can be varied and can be held in different locations in the Dehcho.

VI. ENR to seek funding for conducting an additional youth ecology camp during a different season of the year, preferably starting with a winter camp when students could be taught trapping.

VII. ENR to actively pursue a collaring program for Nahanni Bison to provide baseline information on movement and range of distribution.

VIII. ENR to pursue the idea of a working group for boreal caribou in the Dehcho by presenting it as a topic for discussion at the November, 2006 DFN leadership meeting in Fort Providence.

IX. ENR to ensure that the 5 GPS collars and all available satellite collars are deployed on boreal caribou throughout the region in January 2007.

X. ENR to ensure that once the results of the elemental analyses from moose organs are received, that they are analyzed and a plain language report of the results is circulated as soon as possible.

2004 Workshop

I. ENR to ensure that the final report of this workshop is distributed to all First Nations on a timely basis.

II. ENR to ensure that these workshops become a biannual event, and that participation by elders and youth of the region is actively supported and encouraged.

III. ENR to ensure that a bison management plan is developed for the Nahanni population.

IV. ENR to initiate discussions with trappers in Dehcho communities to stimulate cooperation in conducting basic research and monitoring program.

V. ENR to discuss changes and modifications to the current youth ecology camp location, timing, and format with local communities and DFN and investigate other available options for the camps.

VI. ENR to continue to promote and support community wildlife monitoring programs.

VII. ENR to support any self-management programs related to wildlife harvest that may be initiated by local First Nations.

2002 Workshop

I. ENR to ensure the summary and hard copy of the presentations covered at the workshop is distributed to all Dehcho First Nations.

II. ENR to arrange meetings and discussions with those First Nations that were unable to send delegates to the workshop (Trout Lake, Kakisa, Fort Liard). For the Kakisa meeting the Regional Biologists from both the South Slave and Dehcho should attend.

III. ENR to circulate letters to schools in the Dehcho indicating that there is now a Regional Biological Program with ENR and that they are available to make school presentations if requested.

IV. ENR to explore options and develop a proposal for how a science camp/research station could be established in the Dehcho.

V. ENR to identify ways that moose populations in the Dehcho could be monitored at regular intervals.

VI. ENR to identify ways that the Nahanni bison population could be monitored at regularly.

VII. ENR to identify ways that the status of boreal caribou in the Dehcho could be clarified and the potential impacts of oil and gas exploration and development on boreal caribou could be studied in the Cameron Hills area and possibly other key areas in boreal caribou range in the Dehcho.

VIII. ENR to identify ways that community-based monitoring of wildlife health could be implemented in the Dehcho.

IX. ENR to identify ways that monitoring the harvest of wildlife in the Dehcho could be enhanced.

X. ENR to identify appropriate indicators for monitoring and assessing environmental and landscape change (including those resulting from climate change) that could be established in the Dehcho.

XI. ENR to identify studies that are needed to support protected areas initiatives in the Dehcho.

XII. ENR to maintain contact and dialogue with all Dehcho First Nations to ensure that all research and monitoring programs are developed and implemented together.

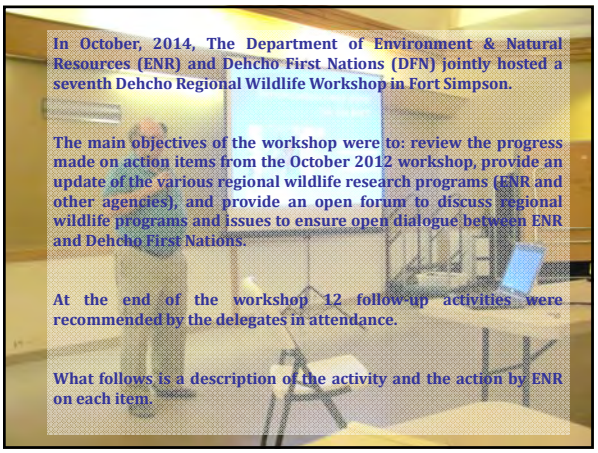
Appendix 1.

Review of 2014 Dehcho Regional Wildlife Workshop Action Items

Presented by Nic Larter, ENR Fort Simpson

Dehcho Regional Wildlife Workshop
Fort Simpson, NT

18-19 October, 2016



In October, 2014, The Department of Environment & Natural Resources (ENR) and Dehcho First Nations (DFN) jointly hosted a seventh Dehcho Regional Wildlife Workshop in Fort Simpson.

The main objectives of the workshop were to: review the progress made on action items from the October 2012 workshop, provide an update of the various regional wildlife research programs (ENR and other agencies), and provide an open forum to discuss regional wildlife programs and issues to ensure open dialogue between ENR and Dehcho First Nations.

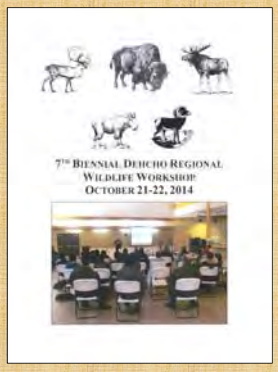
At the end of the workshop 12 follow-up activities were recommended by the delegates in attendance.

What follows is a description of the activity and the action by ENR on each item.

Item #1

Ensure that the final report of the workshop is distributed to all First Nations in a timely basis.

Action:
On 9 January, 2015 hard copies and digital copies of the final report were forwarded to all First Nations. The report was posted on the ENR website. Audio files were made available upon request.



Item #2

Secure funding to host another Regional Wildlife Workshop in 2016. The current timing of the workshop is good.

Action: Secured funding to conduct 8th Biannual Dehcho Regional Wildlife Workshop, covering the costs for 2 participants from each First Nation. Encouraged each First Nation to send 2 participants to the Workshop and to include youth, elders, harvesters and council members as participants. Maintained the timing of the workshop.

Item #3

Ensure a wide distribution of the Final Report from the 2014 workshop, including having it posted on the ENR website.

Action: The Final Report was widely circulated to all First Nations, participating agencies, and made available on the ENR website 19 December, 2014.

http://www.enr.gov.nt.ca/sites/default/files/2014_dehcho_regional_wildlife_workshop.pdf

Item #4

Conduct a Nahanni bison population survey in March 2016 and have collars deployed on bison prior to the survey.

Action: Despite a number of attempts we were unable to deploy collars on bison and therefore we deferred the survey until March 2017.

Of note due to fiscal constraints the survey would likely have been deferred even if all collars had been deployed by March 2016.

Item #5

Pursue boreal caribou range management planning, with the Dehcho regional management plan as first priority

Action: Meetings with the Dehcho Boreal Caribou Working Group (DBCWG) and communities including Sambaa K'e, Nahanni Butte, Fort Liard, Wrigley, Fort Simpson, Jean Marie River, Kakisa, Fort Providence, Hay River, Fort Smith and Fort Resolution were held during 2015-16.

Important areas for caribou were mapped.

Item #6

Pursue a trail camera program where one camera per First Nation partner is deployed on a trail within their traditional area. Its location will be suggested by the First Nation.

Action: Six trail cameras were purchased and deployed. Most cameras were located with assistance of local harvesters.

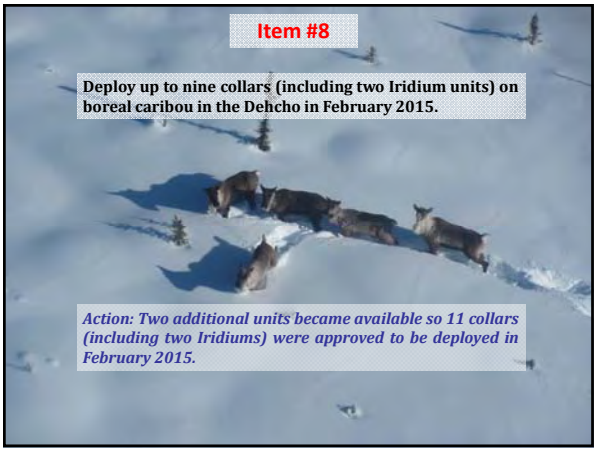
Item #7

Make completion of the moose contaminant study the highest priority in the moose program; the small-scale moose survey planned for November 2015 of lesser priority.

Action: Just met goal of samples from 40 moose by January 2016. Lab analyses completed on all samples. Analysis ongoing, preliminary results provided. Small-scale survey was completed November 2015.

Item #8

Deploy up to nine collars (including two Iridium units) on boreal caribou in the Dehcho in February 2015.



Action: Two additional units became available so 11 collars (including two Iridiums) were approved to be deployed in February 2015.

Item #9

Pursue taking ultrasound measures of fatness from captured caribou during the February 2015 collar deployment.

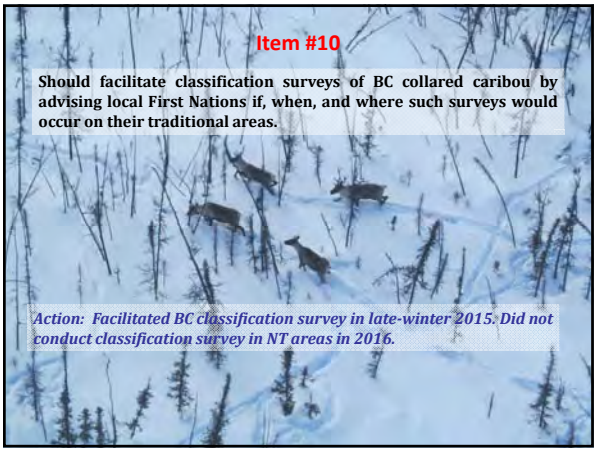
February Dehcho & South Slave fatter

February NEBC less fat

Action: ENR received approval to take non-invasive ultrasound measurements of fatness from captured caribou during the 2015 and 2016 deployments.

Item #10

Should facilitate classification surveys of BC collared caribou by advising local First Nations if, when, and where such surveys would occur on their traditional areas.



Action: Facilitated BC classification survey in late-winter 2015. Did not conduct classification survey in NT areas in 2016.

Item #11

Should pursue with DOT to increase the number of bison warning signs on Highway 7 - the Liard Highway.

Action: Discussions are continuing, unfortunately more signs have gone missing which means more need replacing at more cost. There is agreement that this is a public safety issue. The proposed amalgamation of DOT and DPW has become an issue.

Item #12

ENR should actively explore avenues to separate domestic animals (primarily sheep and goats) from areas inhabited by wild sheep and goat populations; not permitting domestic sheep and goats west of the Liard River was suggested.

Action: Wildlife Act WG and Stakeholder Wildlife Act Advisory Group met spring 2016, drafting regulations for public consultation to prohibit certain alien (harmful) species from some areas of NT (i.e. wild sheep range). This includes domestic sheep, goats, llamas, alpacas, and wild boar.

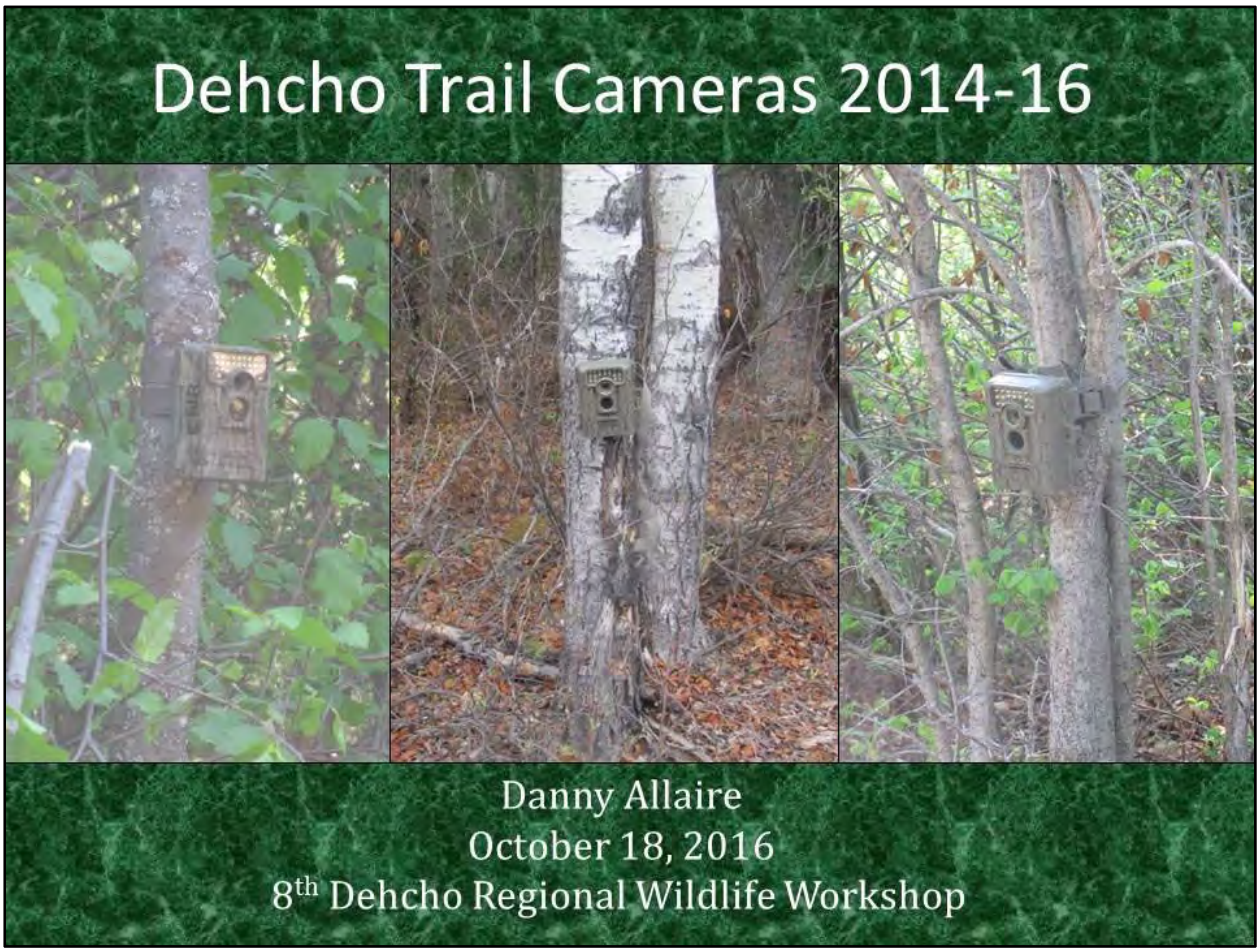
Programs/Projects Dehcho ENR Undertook/Participated in Since 2002

- Problem Bear Disease/Parasites Monitoring
- Diseased/Parasitized/Injured Wildlife Sampling
- Wolf Carcass/Stomach Collection and Disease Monitoring
- Small Mammal Trapping and Hare Turd Counts
- Beaver Heavy Metal and Contaminant Level
- Tourist and Staff Wildlife Observation
- Edéhzhie and area Wildlife Survey
- Sambaa K'e Candidate Protected Area Wildlife Survey
- Boreal Caribou Surveys/Satellite, GPS, VHS Collar Deployments
- Boreal Caribou Disease and Parasite Study
- Boreal Caribou Harvest Sampling (Age, Health, Condition)
- Boreal Caribou Occupancy Model Refinement
- South Slave Boreal Caribou Classification Surveys
- Nahanni Bison Sex/Age Classification Survey
- Nahanni Bison Population Surveys/Satellite, GPS, VHF Collar Deployments
- Nahanni Bison Disease Monitoring
- Youth Summer Ecology Camps
- Moose Population Surveys – Mackenzie River Valley
- Moose Population Surveys – Liard River Valley
- Moose Small-scale Population Monitoring Surveys
- Moose Harvest Sampling (Age, Health, Condition) Heavy Metal, Contaminant, Radionuclide and Persistent Organic Pollutant Levels
- Dall's Sheep Surveys Nahanni/Liard Ranges
- Dall's Sheep Horn Growth
- Dall's Sheep, Mountain Goat, Mountain Caribou and moose Heavy Metal, Radionuclide, Pollutant and Contaminant Levels
- Non-Resident Hunter Harvest Monitoring/Sampling
- Mountain Goat Surveys Flat River, Ragged Range
- Monitoring EnCana Gravity Survey
- Monitoring Wildlife Observations from Cantung, Enbridge, Mackenzie Fibre Link
- Mosquito Trapping for West Nile Surveillance
- Trichinella Occurrence in Different Wildlife Species
- Dehcho Trail Camera Experiment
- Grouse DNA Sampling
- Participated in NT Small Mammal Monitoring Program
- Participated in Wolverine Carcass Collection
- Participated in Barren-ground Caribou survey
- Participated in Dene Nation Contaminant Study
- Participated in Trout Lake Track Count Study
- Participated in Wrigley Community Caribou Hunt
- Participated in BC Government Porcupine Survey and bison classification survey
- Participated in University of Alberta Mink Study
- Participated in University of Calgary Amphibian Study
- Participated in DFO Fish Tagging Studies
- Participated in University of Alberta Small Mammal/Linear Development Study
- Participated in Bear/Wolf Growth with Age Study with Florida Fish & Wildlife
- Participated in NT Bat Monitoring Program
- Participated in NT Insect and Spider Monitoring Program
- Participated in Mackenzie Mountains Dall's Sheep DNA Study with BC, YT and U. of Alberta
- Participated in DFO Arctic Salmon Study
- Participated in NASA Dall's Sheep Range Study
- Participated in DNA hair snagging study in Mackenzie Mountains
- Participated in Boreal Caribou Body Condition and Vegetation Study with BC, ON, OR
- Participated in COSEWIC ladybug and insect study
- Participated in Tamarck biogeographical refugia study with University of Illinois (Urbana)

Appendix 2.

Dehcho Trail Camera Trials

Presented by Danny Allaire, ENR Fort Simpson



Dehcho Trail Cameras 2014-16

By; Danny Allaire
October 18, 2016
8th Dehcho Regional Wildlife Workshop

Trail Camera Deployment

2014 Deployment

- Started pilot project 2014 with 2 cameras.
- First camera set up on the Enbridge Right-Of-Way.
- Second camera set up near RBTM on Wrigley Highway.

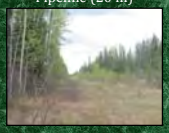
2015 Deployment

- Bought additional 5 cameras and deployed them in 2015.
- 2 cameras were assigned to First Nation harvesters to deploy near their harvesting areas (PKFN, LKFN).
- 1 camera was assigned to Fort Liard ENR office to deploy near the community (ADKB).
- 2 cameras were deployed near First Nation communities that approved the wildlife research (SKDB, NBDB).

Trail Camera Details

- Cameras will be set up along an animal trail, seismic line, road, winter road, waterway or harvester trail.

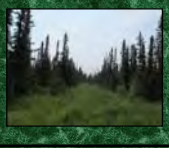
Pipeline (20 m)



Small side road (10 m)

Winter road (20 m)

Seismic line (10 m)



Waterway (50-100 m)

Harvester trail (3 m)

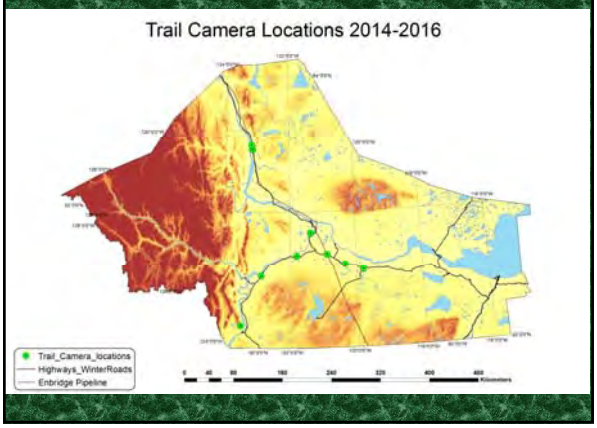
Trail Camera Details

- Cameras are motion sensitive and photos can be taken at night; when motion is detected the camera will take 3 photos.
- Temperature, date and time will be recorded on the photo.
- Cameras can take over 20,000 photos.
- Camera batteries need to be changed every 6 months.
- Cameras will be deployed within the vicinity of each community: Wrigley, Fort Simpson, Jean Marie River, Nahanni Butte, Fort Liard and Trout Lake.

Trail Camera Objectives

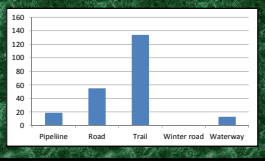
- To document frequency of trail use by all wildlife species, especially wolves.
- To document seasonal frequency of all wildlife trail use.
- To document presence of rare wildlife (eg. cougars, deer, coyotes).
- To collect and compile photos of wildlife in their natural habitat without disturbing or influencing their behaviour.
- Each location chosen will have a camera set up for at least a year.

Trail Camera Locations 2014-2016



Trail Camera Results

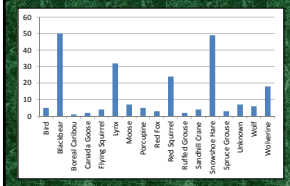
- Cameras set up at RBTM and near Fort Liard are missing.
- Two cameras were not deployed properly, no photos.
- Trail cameras placed on roads, waterway, seismic line and traditional harvester trail.
- Harvester trail received most photos so far.
- 2015 cameras haven't been in the field for long.
- Photos were taken at night and during the day.

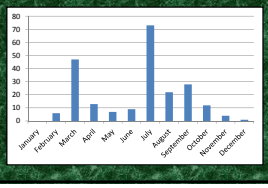


Trail Camera Results

- 222 trail camera photos that contain wildlife compiled so far.
- Most large ungulates and predators have been photographed.
- Photos taken during every month except January.
- Most photos taken during July.
- Most photos taken of Black bear, Snowshoe Hare, Lynx, Squirrel and Wolverine.
- Not all photos are in focus, some are blurry.
- Some photos taken of wildlife are too close to camera to determine species.

Trail Camera Results





Learning how to use Trail Cameras

- Placement of camera is crucial to getting wildlife photos.
- May take awhile to get wildlife photos.
- Animal have to physically walk in front of the camera to trigger it.
- Could get 1000's of photos taken of non-wildlife.
- Branches have to be cleared in front of the camera, wind will move the branches and trigger the camera.
- Do not leave cameras set up near waterways during ice breakups. Recorded 1000's of photos of ice moving.
- Cameras need to be set up far enough from target area to get a complete photo of any wildlife walking by.
- Traffic noise could play a factor in limiting wildlife photos; not very many photos of predators near roads.

Learning how to use Trail Cameras

- Wolf photos were late at night near roadways and most photos were away from highways.
- Need to find better places to take photos of wolves.
- Some areas chosen had a lot of photos of people and vehicles. Need to avoid these areas in the future.
- Not all photos taken were of wildlife in their natural state. During the day some animals heard the camera and 2nd-3rd photos were taken of them looking at the camera.
- Photos taken at night had a flash, animals noticed the flash.
- No rare wildlife photos were taken so far.
- Harvesters need to be shown how to set up cameras in the field. Some cameras were not turned on properly.

Learning how to use Trail Cameras

- Winter road/road camera, vehicle traffic noise may limit wildlife photos. Winter road not accessible in summer.
- Waterway camera, probably too close to road to get a lot of wildlife photos. Do not set up camera during ice breakup.
- Pipeline camera, too close to pump station, noise. Other areas of pipeline might be better for wildlife photos.
- Harvester trail camera, animals remember trails they use, they come back regularly to use the same trail.
- Seismic lines, need to set up cameras on more lines.
- Animal trails, need to find some trails for cameras.
- Limited where cameras could be set up, batteries need to be changed and memory cards need to be exchanged.

Next Steps

- Going to continue setting up cameras in the field.
- Will try to broaden locations to set up cameras.
- Will teach other harvesters how to set up cameras in the field.
- Will provide instructions for setting up camera to harvesters.
- Harvester trails that have been established for long periods of time attract a lot of wildlife.
- Will concentrate half of the cameras to harvester trails.
- Going to take long term approach to collecting wildlife photos.
- Will adapt using the trails cameras when new techniques are found by either the harvesters or myself.

Daylight photos

Night time photos

Public Education

Career Day April 2015

Career Day April 2016

Presented at Science 10 class at TSS in Fort Simpson, May 2014

Appendix 3.

Dehcho Boreal Caribou Program

Presented by Nic Larter, ENR Fort Simpson

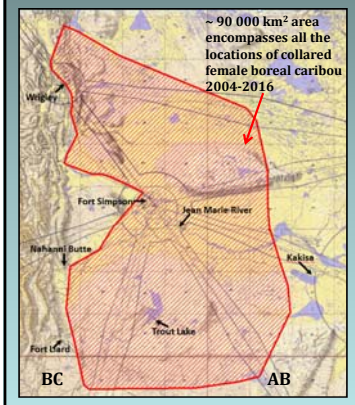
Boreal Caribou Program

- Program Update
- Long Lived Caribou
- Collaring Male Caribou
- Collaborative Work
  - Vegetation Study
  - Wolf Survey

Dehcho Wildlife Workshop

October 18, 2016

Collared Caribou Range



- At First Nations request, 11 and 9 collars were deployed February 2015 and 2016, respectively to ensure ≥30 collared females for the calving season.
- Collars were deployed all throughout the Dehcho in areas requested by our First Nations partners.
- No collars were deployed east of Trout Lake or in Edéhzhíe at the request of First Nations.
- Collared caribou expanded the Dehcho caribou range NE of the Horn Plateau and SW into BC
- Currently 24 active collars.
- 8 collars released in 2016; 3 released in 2015.

Births and Bugs

Calving Events

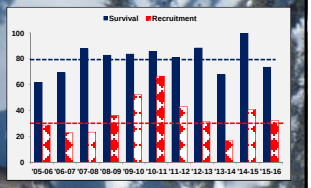
	Had Calf	No Calf	Equivocal
2004	8	0	0
2005	14	3	0
2006	16	1	1
2007	26	3	0
2008	29	1	2
2009	19	0	1
2010	30	1	0
2011	20	0	0
2012	27	3	0
2013	31	2	0
2014	31	0	0
2015	33	3	0
2016	29	1	1
Total	313	18	5

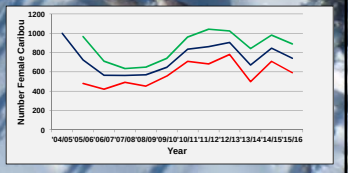
Wearing a collar does not seem to have stopped caribou from getting pregnant or bringing calves to term.

- Females get pregnant and have calves; 93% of 336 calving events produced calves based upon movement data; 92% of 145 from blood serum.
- Most individual caribou calve at close to the same date each year; some caribou calve in the same area each year, while others do not.
- One female was pregnant at 21 years.
- NT female caribou are consistently the fattest in mid-winter (based on ultrasound); good for the fetus.
- Boreal caribou have few diseases and parasites. In 2016, two captured caribou had winter ticks, the first reported in the Dehcho.

Population Vital Rates

- Average annual adult female survival is 79%.
- Average of 35.9 calves/100 collared adult females from March surveys is an estimate of recruitment.
- Some years recruitment and survival are higher, sometimes lower.
- Average rate of increase (λ) over past 11 years is 0.97; a stable population has a value of 1.00.

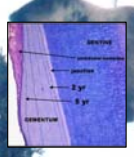




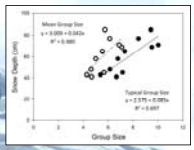
If we started the study with 1000 female caribou in 2004 and used our calculated rates of increase (λ) we would estimate 742 ± 150 female caribou the 11 years later.

Long Lived Caribou

- ENR tries to investigate death sites of collared caribou if at all possible; any teeth found at these sites are aged at Matson's Lab.
- Seven of the 25 dead caribou we could age were teenagers or older.
- One female was aged at 22 years; Matson's has aged 45,014 caribou teeth.
- Only one other caribou from Alaska, aged in 1989, was 22 years old.
- This oldest caribou had calves when she was 20 and 21 years old; her last calf survived its first winter.
- Populations are more resilient to change and disturbance it they have long lived females that produce many calves in their lifetime.



Snow Depth and Caribou Group Size



- TEK has suggested that boreal caribou group size increases with snow depth.
- ENR has measured snow depth at every capture site since 2004 and has conducted annual classification surveys reporting group sizes since 2006.
- If one plots the average snow depth versus average group size over a 10 year period the result is a significantly positive relationship just as TEK suggested.
- Makes sense as it saves energy for moving and feeding.

Collaring Male Caribou

- Currently most females get pregnant and during a short period of time.
- But what if something happened affecting males in the mating season (rut) to cause the pregnancy rate to drop and fewer calves to be born?
- Because females give birth and drive population numbers, we have only deployed collars on females in this study so far.
- Where and how does breeding happen was a topic of discussion at a recent DBCWG meeting.
  - Mating season is an important time in the life cycle.
  - Do males and females congregate during mating?
  - Where do they congregate? And for how long?
  - Are there distinct mating areas/habitats?
  - Males need to be collared to answer these questions.
- ENR proposes to collar 5 male caribou in February 2017; the collars will be programmed to release after the rut in 2019 providing information from 3 rutting periods.

Collaborative Work

- Both the Dehcho and South Slave have boreal caribou research programs which involve collared caribou.
- Caribou do not respect regional boundaries so the two regions work closely together to save time on logistics and ultimately save costs.
- We coordinate capture operations so only one commute is needed.
- We coordinate March classification surveys to reduce commuting.
- We locate caribou, visit death sites, and retrieve downed collars in each region regardless of who originally collared the caribou.

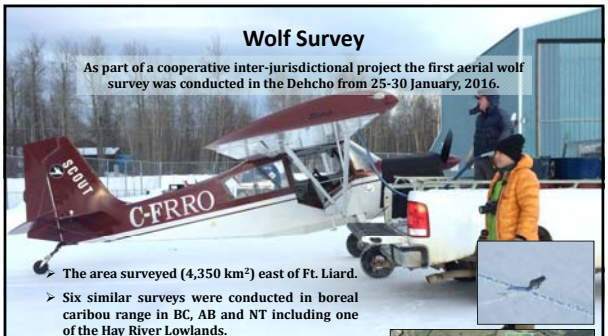
Boreal caribou classification survey flight lines: Dehcho in red, South Slave in blue.

Vegetation Sampling

- Caribou get fat in the summer from a healthy diet of nutritious plants.
- The fatter female caribou are before winter the better their chance of surviving the winter and having a calf in the spring.
- Caribou in the NT are fatter in mid-winter than their counterparts in BC.
- We are trying see if the fatness measures recorded from caribou in winter are related to the quality and quantity of the foods they eat in summer.
- Work has already been done in BC to collect plants that caribou eat during summer so they can measure plant quality and get an idea of how much of these plants are found in different habitats.
- This summer plants were sampled in different habitats in the NT to compare the availability and nutritional quality of different plants in the diet.
- Sampling sites were located adjacent to the highway from the Jean Marie River to the Kakisa Junction, and along the highway system in the South Slave.

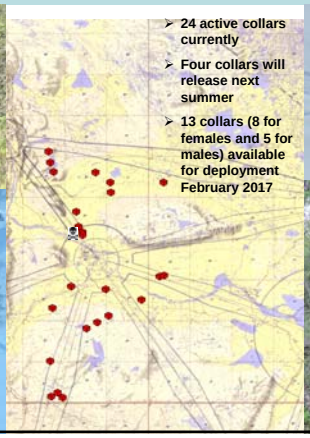
Wolf Survey

As part of a cooperative inter-jurisdictional project the first aerial wolf survey was conducted in the Dehcho from 25-30 January, 2016.



- The area surveyed (4,350 km^2) east of Ft. Liard.
- Six similar surveys were conducted in boreal caribou range in BC, AB and NT including one of the Hay River Lowlands.
- Four different packs were identified within the survey area during the survey period (21-23 wolves were counted).
- Packs varied in size from 3+ to nine animals.
- Other wildlife observed were 49 moose and 10 boreal caribou.

Continued Population Monitoring is Planned



- 24 active collars currently
- Four collars will release next summer
- 13 collars (8 for females and 5 for males) available for deployment February 2017

One female collar is available per First Nation partner for February 2017 deployment

Acknowledgements

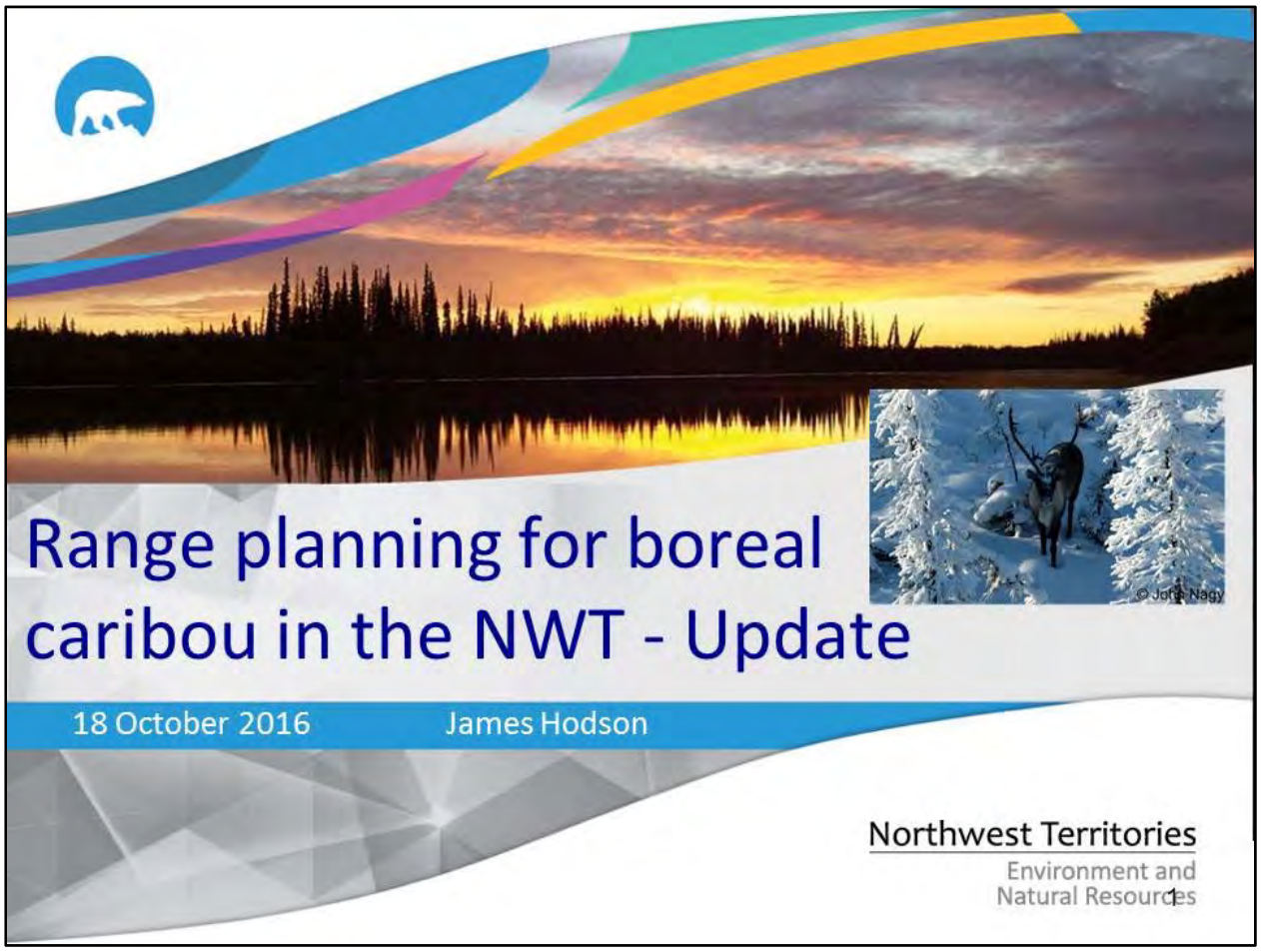
Dennis Deneron (Sambaa K'e Dene Band) has been an avid proponent of this program since its inception. As the program expanded support from other leaders has included Lloyd Chicot, Dolphus Jumbo, Keyna Norwegian, Jim Antoine, Gerald Antoine, Minnie Letcher, Eric Betsaka, Fred Tesou, Mike Matou, Peter Marcellais, Darcy Moses, Tim Lennie, David Moses, Sharon Pellisey, Stanley Sanguez, Isidore Simon, Gladys Norwegian, Marie Lafferty, Danny Peterson, Ernie McLeod, Steve Kotchea, and Harry Deneron.

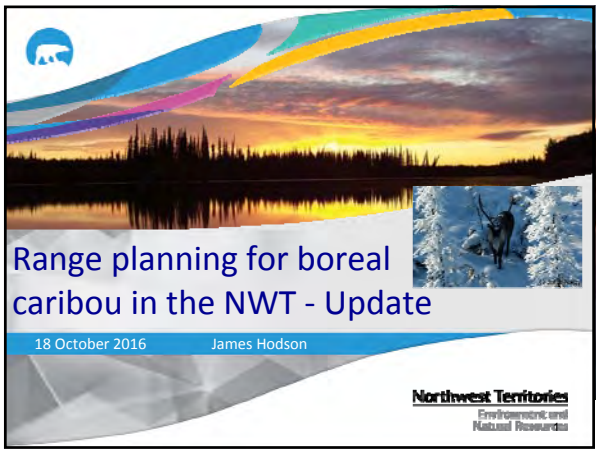
In addition to ENR, this project has received funding from the NWT Western Biophysical Program, Environment Canada, and the Cumulative Impacts Monitoring Program.

Appendix 4.

Range Planning for Boreal Caribou in the NWT - Update

Presented by James Hodson, ENR Yellowknife





Range planning for boreal caribou in the NWT - Update

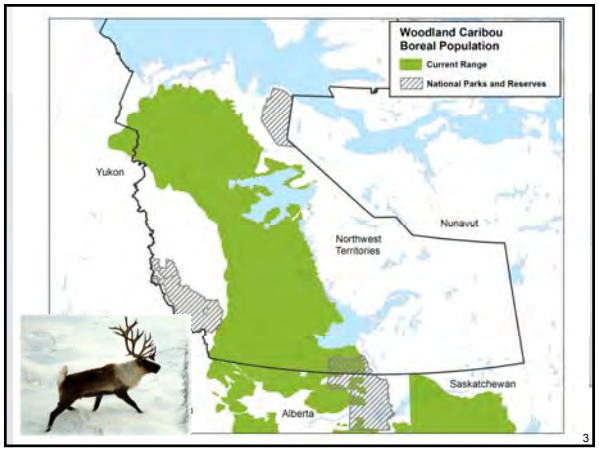
18 October 2016 James Hodson

Northwest Territories
Environment and Natural Resources

Overview

- National Recovery Strategy and Critical Habitat
- Condition of the NWT boreal caribou range
- What is the purpose of a range plan?
- Regional approach to range planning for the NWT
- Community meetings to identify Important Areas for boreal caribou
- Next Steps

2



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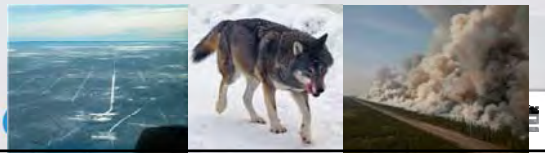
Status

- Listed as threatened under Federal and Territorial Species at Risk Acts
  - Habitat driven listings – declines more likely in landscapes with more habitat disturbance
  - Disturbance often associated with increased predation



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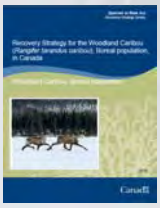
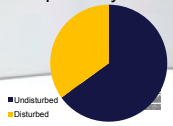
National Recovery Strategy – objectives



- Maintain or achieve self sustaining population throughout current distribution in Canada
- Critical Habitat:
  - Maintain at least 65% of the area of each range as undisturbed habitat
  - 60% chance population will remain self-sustaining
  - Biophysical attributes required by boreal caribou



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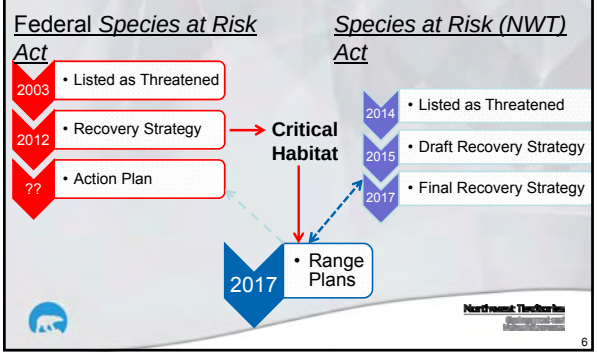
Timeline



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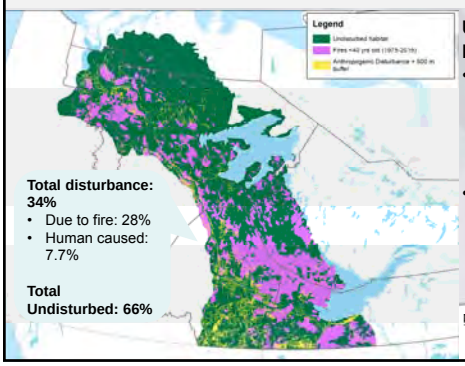
Range Plans vs. NWT Recovery Strategy

Range Plans	NWT Recovery Strategy
• Focus is on habitat	• Addresses multiple threats to boreal caribou:
• Protection and maintenance of critical habitat • Management of natural and human disturbance	• Adequate Habitat • Sustainable Harvest • Address information gaps • Collaborative + Adaptive Management
• Compliance with federal SARA	• Acknowledges national recovery strategy, critical habitat and the need for range plans

7

Range condition as of fall 2015



Total disturbance: 34%
- Due to fire: 28%
- Human caused: 7.7%

Total Undisturbed: 66%

Undisturbed Habitat =
- Areas that have not burned in past 40 years
- Areas that are >500 m from human disturbance footprint

8

Purpose of a range plan

- Outline how land and resource development activities will be managed to ensure that critical habitat is protected from destruction
- Outline how the interaction between human and natural disturbance will be managed to maintain at least 65% undisturbed habitat on an ongoing basis

© John N...

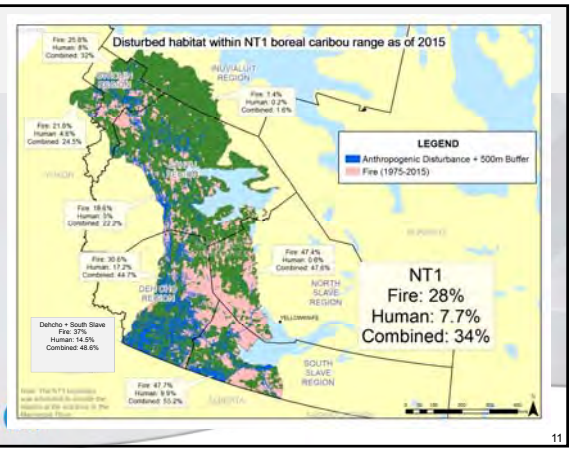
9

Regional approach to range planning

Proposed approach:

- Divide the range plan into regional plans:
  - Set regional targets that balance responsibility across the range
  - Avoid range recession
  - Coordinate plans across regional boundaries and roll them up to look at NWT as a whole
  - Start with most disturbed regions first

10



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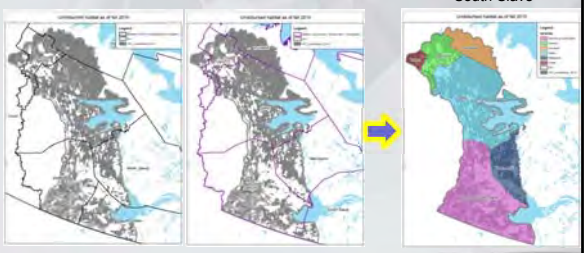
Which regional boundary to use in the Southern NWT?

ENR/ITI Boundaries | Land Claims | Combine Dehcho + South Slave



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Elements of a Range Plan

- **Regional status of habitat and population trend**
- **Regional disturbance targets** to guide regional plans
  - Short-term habitat targets (5 yr)
  - Long-term habitat targets (50 yr)
- **Important areas for caribou**
- **Forecasts of future habitat disturbance and recovery**
- **Legal and non-legal tools to protect Critical Habitat**
- **Adaptive management** elements
  - Monitoring plan implementation
  - Research and monitoring gaps and priorities

13

Identifying Important Areas for Boreal Caribou

- Identify areas based on a combination of:
  - Community-based information
  - Collar data
  - Undisturbed patch size
  - Land cover types selected by boreal caribou

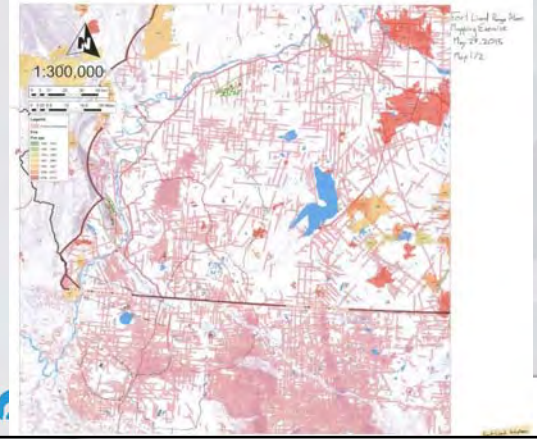
Community workshops

- Visit all communities within the boreal caribou range
- Identify areas important to boreal caribou
- ENR uses the information to classify areas as:
  - **High Importance** – *Important to caribou for all or part of the year*
  - **Medium Importance** – *Caribou sometimes seen or seen in the past*
  - **Low Importance** – *Caribou rarely seen in these areas, may be better area for other big game such as moose*
  - **Lowest Importance** – *Not likely to ever be a good area for caribou*

15

Workshops held so far

16



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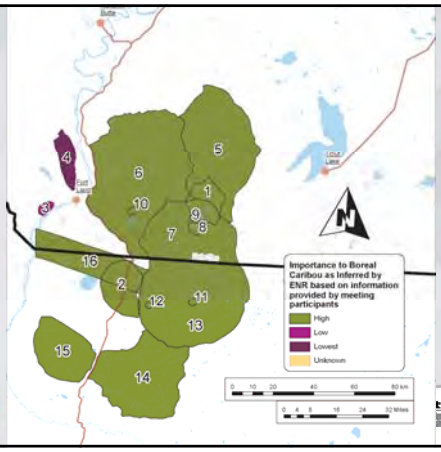


18

Range Plan Meeting Outputs

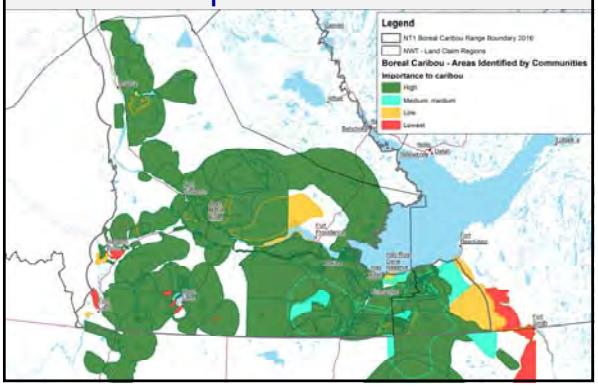
- Summary maps
- Table describing information received about each area
- Meeting notes
- Copy of meeting presentation
- Requested feedback from each community:
  - Are the summary maps correct?
  - Do you agree with the rankings?
  - Is it ok to display the maps to the public?
  - Should any information be kept confidential?

Dehcho Region

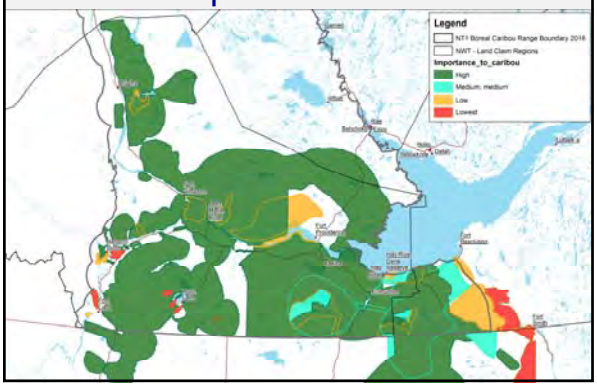
- We need to hear back from you!

Response Provided	No Response
Fort Liard (ADK/FLMC)	Jean Marie River (JMRFN)
Fort Simpson (LKFN)	Nahanni Butte (NBDB)
Hay River (KFN, HRMC)	Samba K'e (SKDB)
	Wrigley (PKFN)
	Fort Providence (DGGDC / FPMC)
	Kakisa (KGFN)

Important Areas



Important Areas



Next Steps

- Engage with other GNWT departments, Aboriginal governments and wildlife co-management partners on the proposed approach to range planning
- Finalize the overall approach to range planning
- Develop draft Regional Range Plan for Dehcho and South Slave

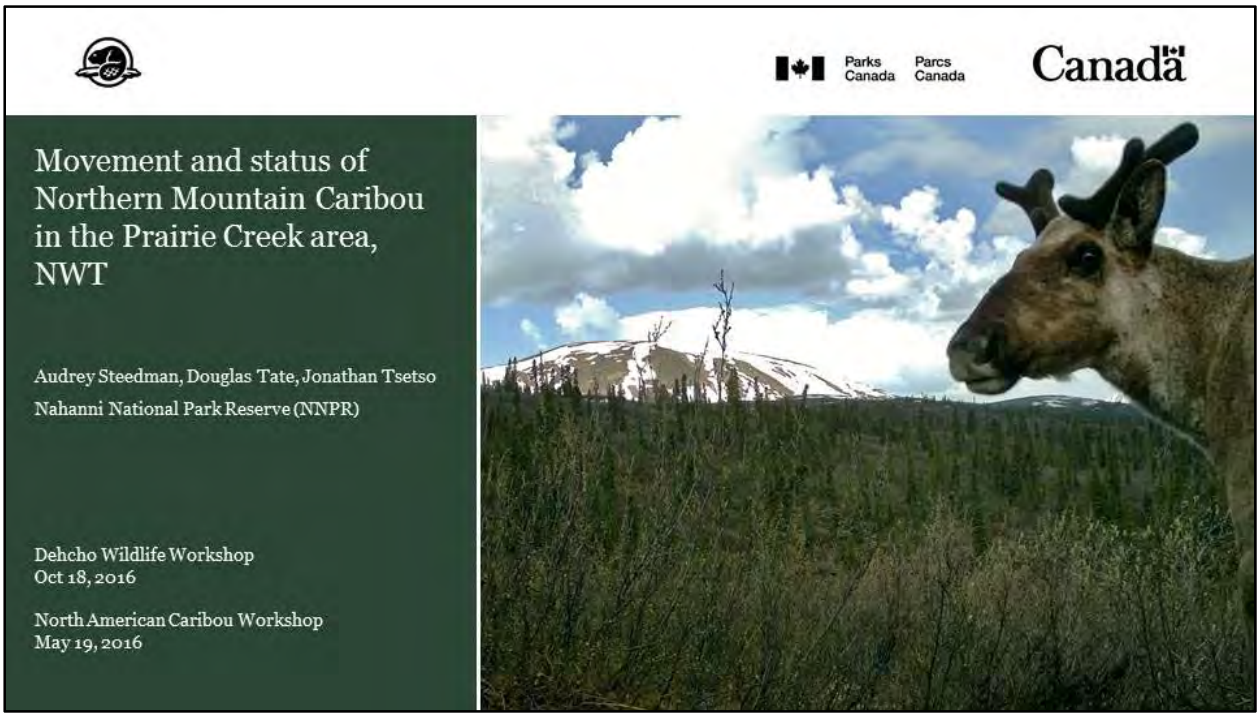
23

Thanks!

Appendix 5.

Movement and Status of Northern Mountain Caribou in the Prairie Creek area, NWT

Presented by Douglas Tate, Nahanni National Park Reserve, Fort Simpson



Parks Canada / Parcs Canada Canada

Movement and status of Northern Mountain Caribou in the Prairie Creek area, NWT

Audrey Steedman, Douglas Tate, Jonathan Tsetso
Nahanni National Park Reserve (NNPR)

Dehcho Wildlife Workshop
Oct 18, 2016

North American Caribou Workshop
May 19, 2016

Study Area - Nahanni National Park Reserve (NNPR)

- Dehcho Region of NWT.
- Park agreement signed in 1972, formally established in 1976.
- Cooperative management agreement with Dehcho First Nations signed in 2003, Nah?ą Dehé Consensus Team.
- Náàts'ihch'oh National Park Reserve created in Sahtu in 2012.
- Protect ~35,000 km2 of the South Nahanni River watershed.

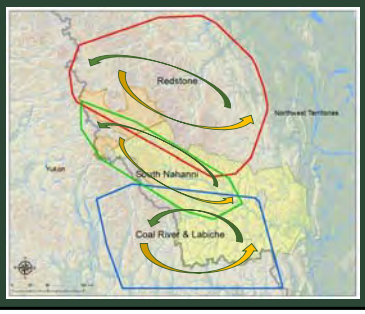
2

Northern Mountain Caribou herd ranges in Southwest NWT

- Three or four known caribou herds in region; the South Nahanni, Coal River & LaBiche herds sometimes known as the Nahanni Complex.
- Herds range in and out of park areas, and cross border with Yukon Territory.

3

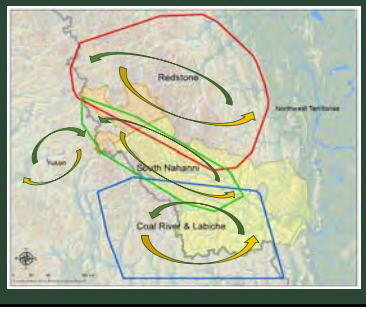
Seasonal Movements of Northern Mountain Caribou herds (1)



- General pattern of movement from lower elevation, forested valleys in winter to higher elevation tundra plateaus in spring, summer and fall.
- Ranges defined in 1990s and early 2000s.

4

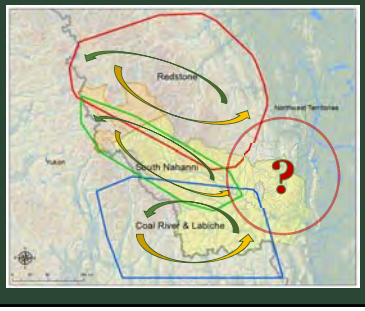
Seasonal Movements of Northern Mountain Caribou herds (2)



- Similar seasonal pattern seen in some Yukon Caribou, such as Finlayson herd
- Overlap on breeding (rut) ranges. Some examples of movement between herds.

5

Seasonal Movements of Northern Mountain Caribou herds (3)



- Area east of known ranges poorly understood.
- Observations of Caribou, but uncertain of, movements, numbers, etc.
- Between defined Mountain Caribou range and Boreal Caribou range.

6

Current Study: Prairie Creek Mine and Proposed Access Road

7

Caribou (& other wildlife) Use of Proposed Road

Traditional Knowledge – different opinions expressed

- Developer's Reports stated little or no caribou use
- Statements from consensus team members and elders from Nahanni Butte that there were Caribou in the area, and any Caribou are important to protect

Park Staff Observations – sightings of Caribou, shed antlers, tracks; mostly summer, some winter observations.

Hunting Outfitters – reports of largest numbers in fall

Aerial Surveys – showed use of area in winter.

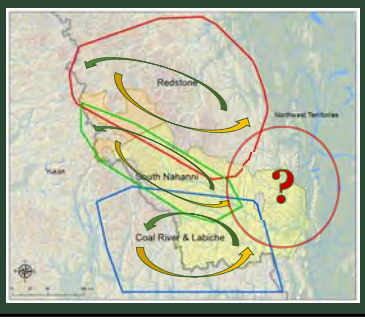
8

Caribou (& other wildlife) Use of Proposed Road (2)

9

Research Questions

- How many Caribou, do they carry diseases, are they genetically healthy?
- Do these Caribou travel with other known herds in the area?
- When do Caribou use the area near the Prairie Creek mine and access road?
- Will mine activity in the Prairie Creek area affect Caribou? Can impacts be avoided or reduced?



10

How to Study these Caribou?

- Aerial surveys had already been used; do not show seasonal movements.
- Remote Cameras do not give an estimate of number of animals.
- Traditional knowledge was a good guide, but elders said not many people travel there now to know current numbers.
- Capture & satellite collars allow disease & pregnancy testing, follow an animal's movements for years

11

How to Study these Caribou? (2)

- Consultation meetings held with Band Councils in Nahanni Butte and Liidlii Kue.
- Meetings with Liidlii Kue Harvesters' Committee, Metis Local #52 (Ft Simpson) and Nahʔą Dehé Consensus Team.
- Members shared traditional knowledge of Caribou in area, expressed concerns with development activities, discussed pros & cons of collaring. New, lighter GPS satellite collars to be used.
- Communities agreed to support study using the capture & satellite collars approach.

12

Initial Results

- Eighteen (18) female Caribou captured and collared.
- February 2015 – three (3) Caribou north of mine site in Prairie Creek valley, and three (3) farther north in the North Nahanni River valley.
- December 2015 – three (3) collared south of mine, seven (7) north of mine, and two (2) east of mine.
- No capture mortalities; all animals healthy at release.

13

Initial Results (2)

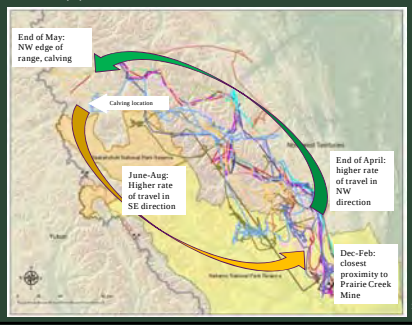
- Health:
  > Pregnancy rate 76% (no data for 1 animal), low incidence of disease
- Location & Movements:
  > All 18 collars shown on map

  Locations between December 2015 to May 2016

  Each colour is a different collar (different Caribou)

Initial Results (3)

- Movements appear to fall into two distinct patterns
- Group 1 – Migratory
  - Longer distance movements to northwest for summer
  - Similar to pattern seen in the Redstone Caribou herd



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Initial Results (4)

- Group 2 – Sedentary
  - Smaller home ranges, close to mine and road year-round. Some 'Redstone' Caribou stay in Carcajou Lake area
  - Caribou in Sundog Creek area with quite small home ranges.
  - Of two animals collared in this area, both have crossed the proposed road alignment.

16

Ongoing & Potential Future Work

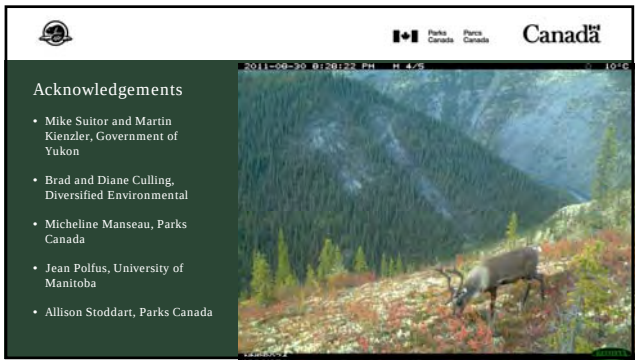
- Two years of data still to come from collars (then auto-breakaway).
- Aerial surveys (rut counts).
- Collaboration with Caribou DNA genetics work in Sahtu (SRRB, U. Manitoba, Trent U.) .
- Share findings with communities, partners, and Review Board to consider in mine road EA process.

17

Discussion

- Caribou were found to travel north, east, south and west of the proposed mine site.
- Most Caribou were north of the mine, and travelled farther northwest in summer
- Some Caribou stay close to Prairie Creek year round, and do cross the proposed road

18


Parks Canada Parcs Canada
Canada
Acknowledgements
• Mike Suitor and Martin Kienzler, Government of Yukon
• Brad and Diane Culling, Diversified Environmental
• Micheline Manseau, Parks Canada
• Jean Polfus, University of Manitoba
• Allison Stoddart, Parks Canada

Appendix 6.

Bird Monitoring in the Dehcho

Presented by Marie Fast, Canadian Wildlife Service, Yellowknife

Environment Canada Environnement Canada

Canada

Bird Monitoring in the Dehcho

Dehcho Wildlife Workshop
Fort Simpson, NT
Marie Fast
Canadian Wildlife Service
October 18-19, 2016

Canadian Wildlife Service

- Protect species at risk
- Identify important habitat for wildlife
- Establishes & manages protected areas
- Conserve migratory bird populations

Forest Bird Program

- Study forest bird populations in the boreal forest of the NWT
- Monitor populations to ensure species conservation

Samuel Haché
Forest Bird Biologist

Rhiannon Leshyk
Forest Bird Biologist

Habitat Program

- Identify important habitat for wildlife
- Establishes and manages protected areas

Marie Fast
Habitat Specialist

Danica Hogan
Habitat Specialist

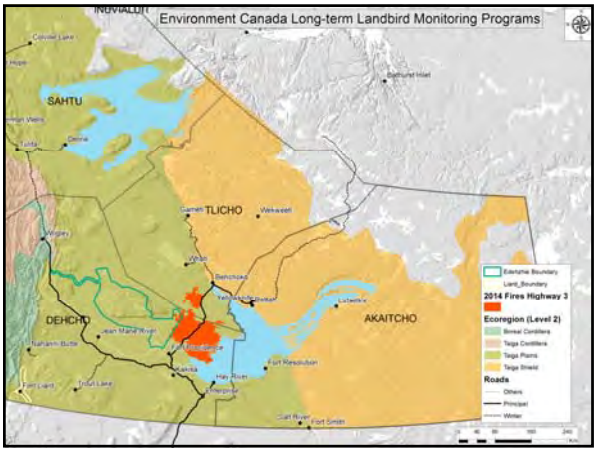
Bird Monitoring in the Dehcho

Recent Projects:

- Edéhzhíe Long-term Monitoring Program
- Post-fire monitoring program
- Information to support critical habitat identification for SAR

Ongoing:

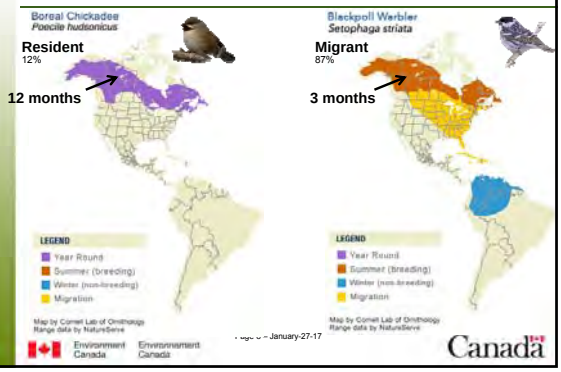
- Fort Liard Long-term Monitoring Program (20 years)
  - Next survey 2017
- Breeding Bird Surveys (20+ years)
- NWT and Nunavut Checklist - *now eBird Canada* (20+ years)



Why birds?

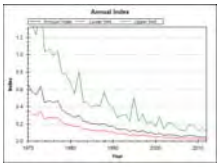
- Generally sensitive to environmental change
- Indicator of changes in other populations
- Some species are hunted
- We can identify many species by their songs

Resident and Migrant Species



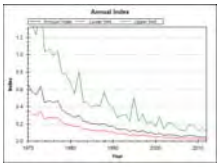
Monitoring Measures Change

- Visit the exact same location over multiple years
- Count the number of birds seen or heard



Monitoring Measures Change

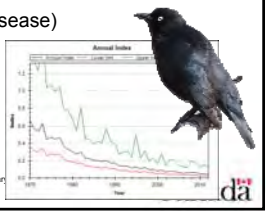
- Visit the exact same location over multiple years
- Count the number of birds observed



Long-term monitoring can tell us…

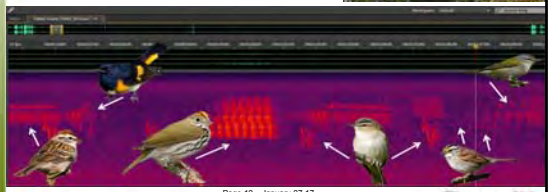
- How bird populations are changing over time (trends)
- Then we can start asking why is their population changing?
  - habitat change,
  - human disturbance,
  - large natural events (e.g. disease)
  - climate change
- Monitoring helps us mange bird populations

Rusty Blackbird populations have declined 88% over the last 40 years.



2016 Edéhzhíe Long-term Monitoring Program

- Collected bird data using ARUs
- ARUs record bird song
- Birds can be identified by song



2016 Edéhzhíe Long-term Monitoring Program

2% of the NWT boreal

7% of the Dehcho

2016 Edéhzhíe Long-term Monitoring Program

- ARUs recorded bird songs from May to July 2016
- Should have preliminary results in 2017

What can the Edéhzhíe birds tell us?

- What do boreal bird communities look like in a relatively undisturbed site?
- What are the population sizes for the area?

Recently Burnt Forest

Common Nighthawk

What can the Edéhzhíe birds tell us?

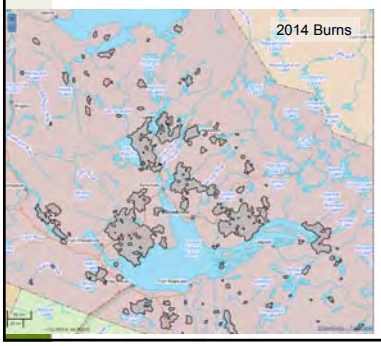
- What are the effects of wintering ground disturbance?
- How is climate change affecting bird populations?
- How do natural disturbance affect bird populations?

Bay-breasted Warbler

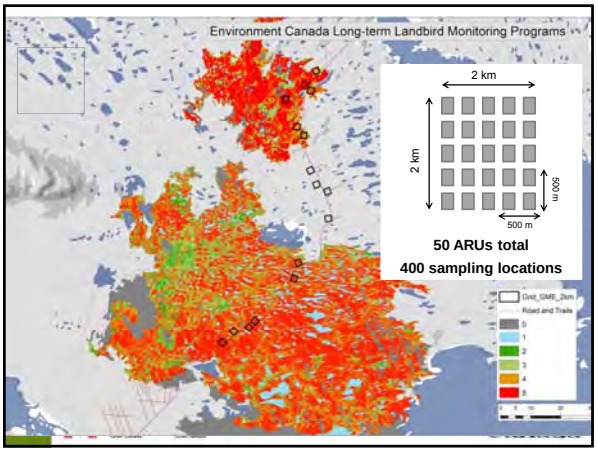
Lesser Yellowlegs

Red-necked Grebe

Post-fire long-term monitoring program



- Wildfires are expected to increase severity and frequency
- Influence of fire on bird communities
- Monitor changes over time



Post-fire long-term monitoring program

- Early findings suggest that abundance of common bird species differ between burned and unburned areas.
- The severity of the burn also impacts which bird species are found

Thank you

Dehcho First Nations

Fort Simpson
Nicolas de Pelham
Allen Bonnetrouge

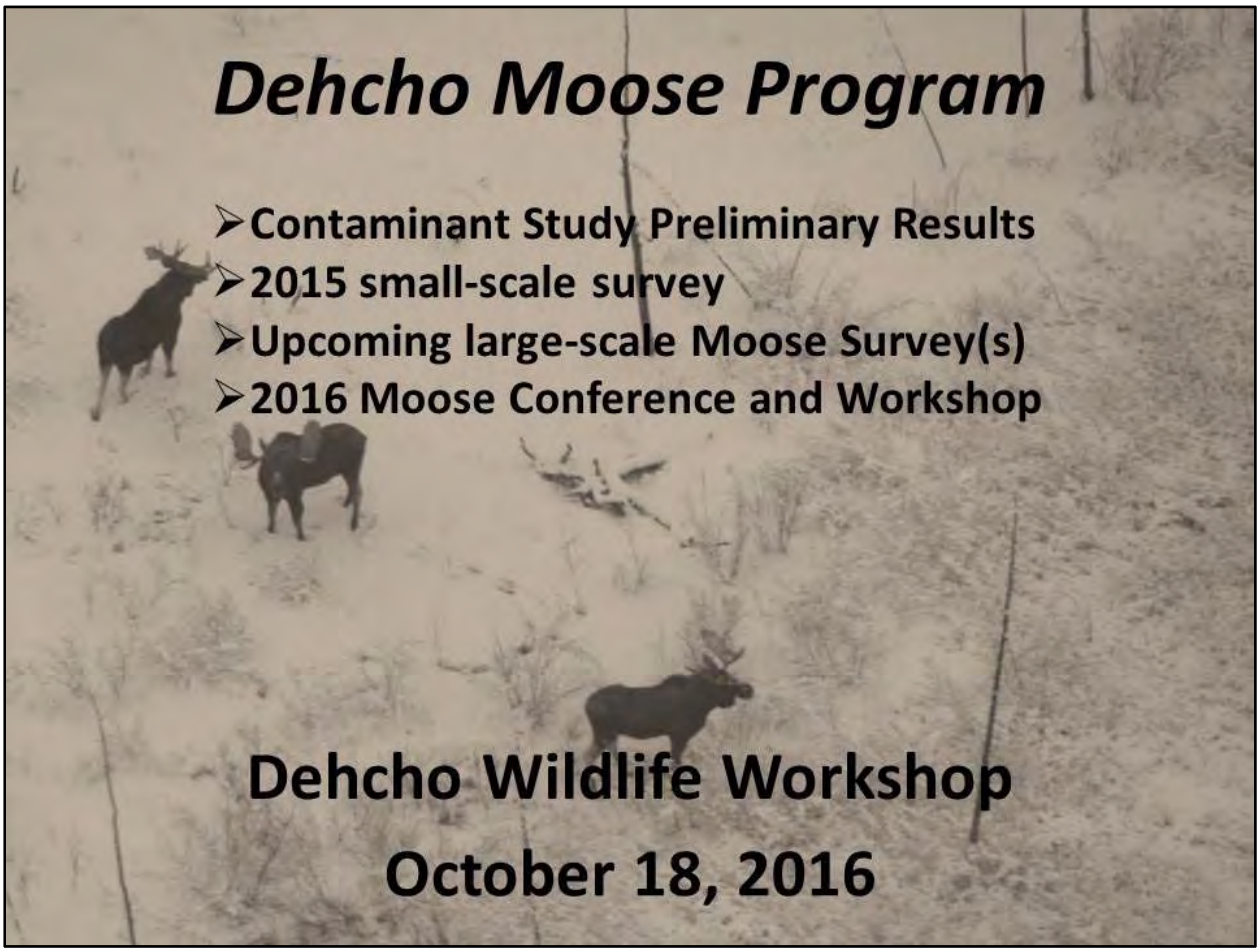
Fort Providence
Wayne Sabourin
Stephen Nadli

Questions?

Appendix 7.

Dehcho Moose Program

Presented by Nic Larter, ENR Fort Simpson



Dehcho Moose Program

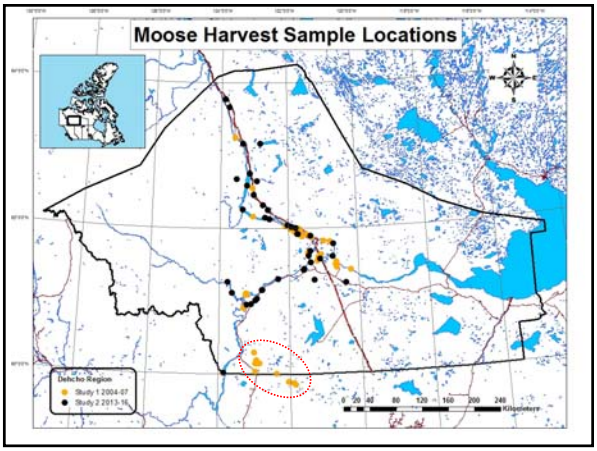
- Contaminant Study Preliminary Results
- 2015 small-scale survey
- Upcoming large-scale Moose Survey(s)
- 2016 Moose Conference and Workshop

Dehcho Wildlife Workshop
October 18, 2016

ENR was asked to report on contaminant levels from 2013-2016 and to compare them with levels from 2004-2007

- Had the levels of contaminants changed over time?
- ENR should collect biological samples from harvested moose.
- 100's of sample kits provided to band offices and harvesters.
- Many reminders in local newsletters and regional media.
- Received samples from 40 moose by January 2016.

Moose Harvest Sample Locations



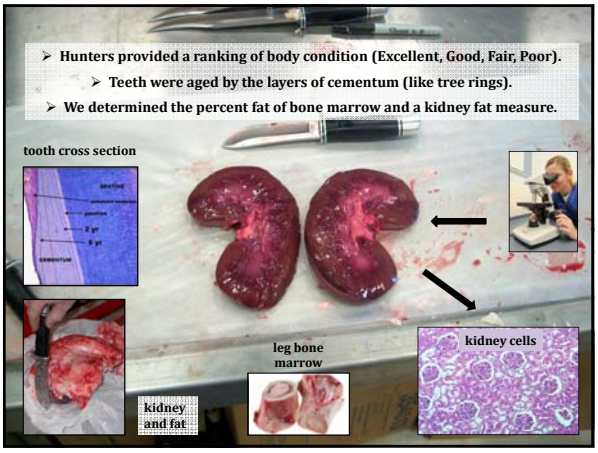
2013-2016 Sample Summary

- 38 kidney, 20 liver, and 16 muscle samples were sent to a lab to determine the concentrations of 34 different elements including Cadmium, Mercury, Lead, Zinc, and Arsenic which could be compared to 2004-2007 samples.
- Kidney fat (n=28), marrow fat (n=33), poop (n=25) for parasites, and teeth for age (n=34) were determined for comparison with 2004-2007.

Additional analyses for 2013-2016 Samples

- 23 muscle samples were analyzed for concentrations of radionuclides.
- 15 kidneys were examined under a microscope to look at cell structure.
  - Specifically to look for signs of cadmium affecting the kidneys.

- Hunters provided a ranking of body condition (Excellent, Good, Fair, Poor).
- Teeth were aged by the layers of cementum (like tree rings).
- We determined the percent fat of bone marrow and a kidney fat measure.



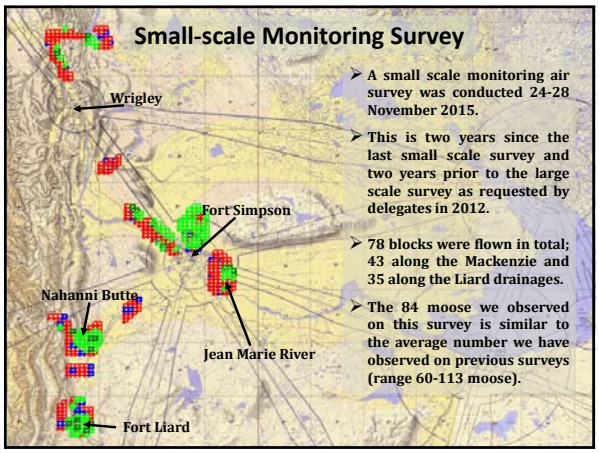
Preliminary Results

	2004-07 Study	This study	Comment
Sex ratio	♂28:15♀	♂30:10♀	Fewer ♀'s '16
Age	4.3 yr (range 0-12)	2.9 yr (range 0-10)	4 '16 ages to come
Harvest Time	53% Jan-Mar	60% Sept-Oct	More fall '16
Condition	88% Excellent/Good	92% Excellent/Good	'16 bit > '07
Marrow Fat	72.8% (10.8-96.6%)	78.2% (11.7-93.2%)	'16 bit > '07
Fat:Kidney	0.7 (0.1-3.5)	1.1 (0.1-3.0)	'16 bit > '07
Fecal Parasites	No Giardia/Cryptosp 72% Nematodiris	No Giardia/Cryptosp 20% Nematodorius 12% Monezia	Low infestations of common parasites

There was no cellular evidence of the effects of cadmium on the kidneys.

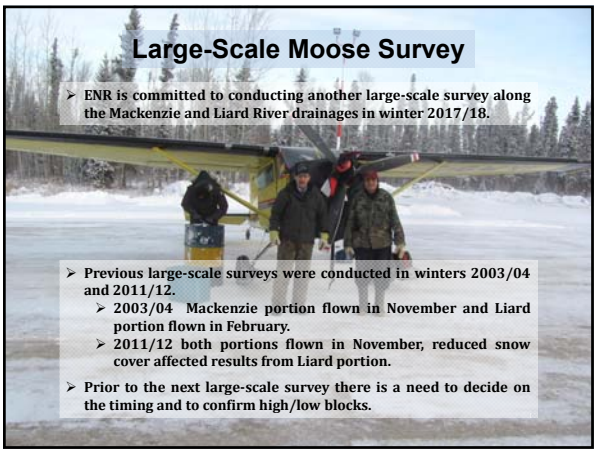
Moose continues to be a healthy food choice.

Small-scale Monitoring Survey



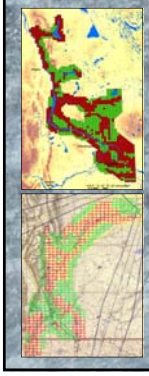
- A small scale monitoring air survey was conducted 24-28 November 2015.
- This is two years since the last small scale survey and two years prior to the large scale survey as requested by delegates in 2012.
- 78 blocks were flown in total; 43 along the Mackenzie and 35 along the Liard drainages.
- The 84 moose we observed on this survey is similar to the average number we have observed on previous surveys (range 60-113 moose).

Large-Scale Moose Survey



- ENR is committed to conducting another large-scale survey along the Mackenzie and Liard River drainages in winter 2017/18.
- Previous large-scale surveys were conducted in winters 2003/04 and 2011/12.
  - 2003/04 Mackenzie portion flown in November and Liard portion flown in February.
  - 2011/12 both portions flown in November, reduced snow cover affected results from Liard portion.
- Prior to the next large-scale survey there is a need to decide on the timing and to confirm high/low blocks.

2011 Large-Scale Moose Survey



- Mackenzie portion covers an area of about 23,300km^2 .
- Includes 1457 blocks of about 16km^2 in size.
- 870 blocks defined as high, 587 blocks as low density.
- We flew 121 blocks, approximately 8.3% coverage.

- Liard portion covers an area of about 9100km^2 .
- Includes 538 blocks of about 16km^2 in size.
- 355 blocks defined as high, 183 blocks as low density.
- We flew 67 blocks, approximately 12.7% coverage.

Community meetings will need to be held to get consensus on defining low and high blocks, and the timing of the Liard portion survey (November or February).

Since the previous survey some blocks have recently burnt while other blocks are now in burns with 10 years of regrowth.

November Survey Pros
- Males with antlers; can get accurate sex ratio
- Moose in open habitats
- Moose more active
- Moose in larger groups

November Survey Cons
- Decreasing daylight
- Moose haven't moved down from high country
- Unfrozen ground
- Little snow cover

- February surveys can provide accurate density estimates but do not provide accurate sex ratio because of antlerless males.

50th Moose Conference & Workshop
8th International Moose Symposium

Victoria Inn Hotel and Conference Centre
Brandon Manitoba Canada
September 6 - 10, 2016

- Danny and I attended this conference, presenting some results on the levels of persistent organic pollutants (DDT, PCB) in moose from the southern NT.
- 204 registered participants from 12 different circumpolar countries.
- A great opportunity to promote work from the Dehcho to a larger audience.
- Sweden harvests 90,000 moose annually and has the highest densities of moose in the world. Moose is king there as it is here.

Acknowledgements

Funding came from the Western NWT Biophysical Program and ENR.

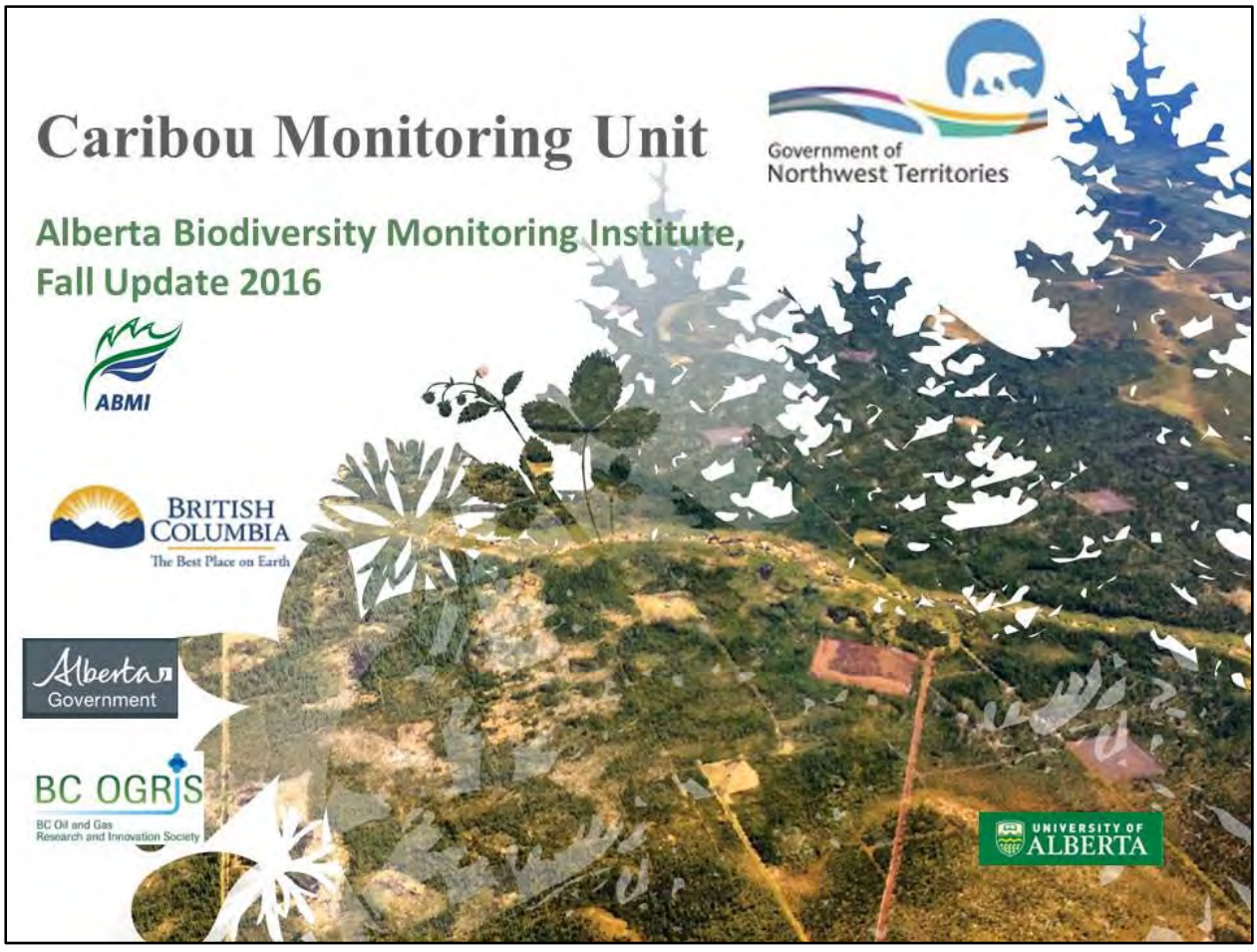
All harvesters who took the time and effort to provide samples from their harvested moose: Danny Allaire, Tumbah Antoine, Wilbert Antoine, Darrell Betsaka, Mitchell Berreault, Peter Cazon, Edward Cholo, Nicholas de Pellham, Kirby Groat, Dawn-Bell Isaiah, Gordon Isaiah, Shane Leahy, George Low, Peter Marcellais, James Mouse, Deneze Nakehk'o, Bob Norwegian, Wesley Pellisey, Roger Pilling, Dan Quevillon, Troy Ruttle, Mervin Simba, Paul Simon, Charlie Tale, Maurice Tanche, Kurt Tsetso, and Gary Yendo.

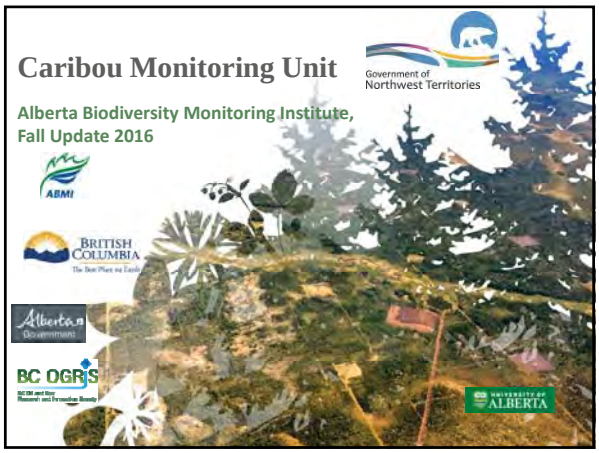
All the observers for the aerial moose survey: Douglas Bertrand, Allan Bonnetrouge, Rufus Ekendale, Ernest Hardisty, Russel Hardisty, Vincent Hardisty, Archie Horesay, Arthur Lafferty, Arthur Nande, Angus Sanguez, and Manny Vital.

Appendix 8.

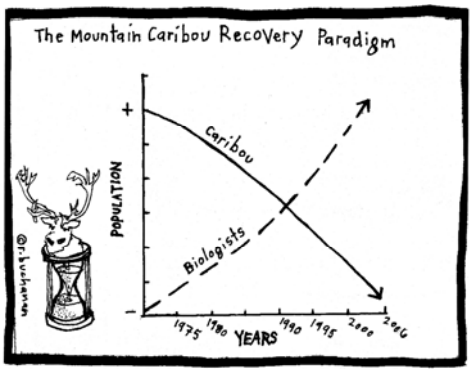
Human footprint, habitat, wolves and boreal caribou population growth rates.

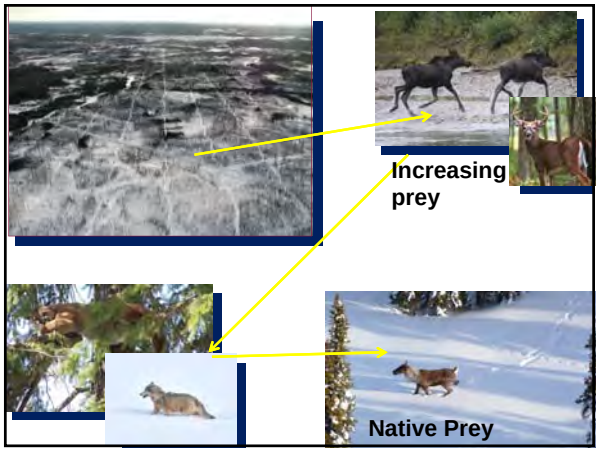
Presented by Robert Serrouya Serrouya, Alberta Biodiversity Monitoring Institute

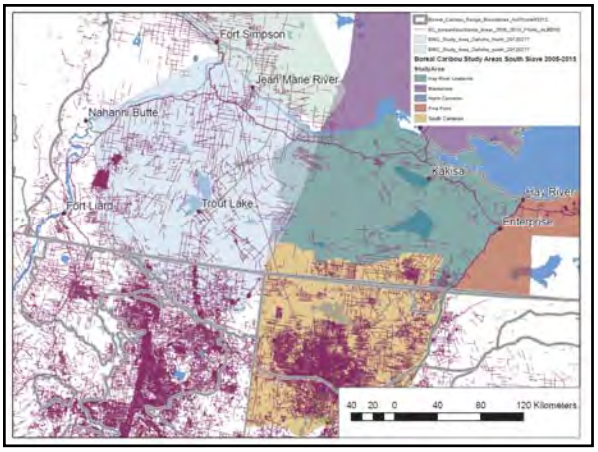




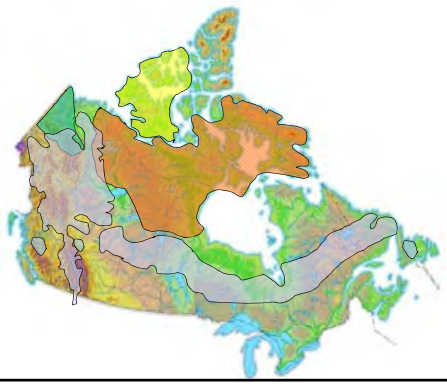
Latest results and state of knowledge

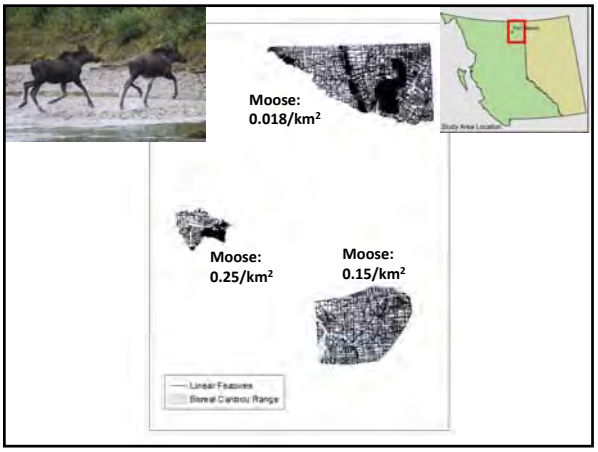


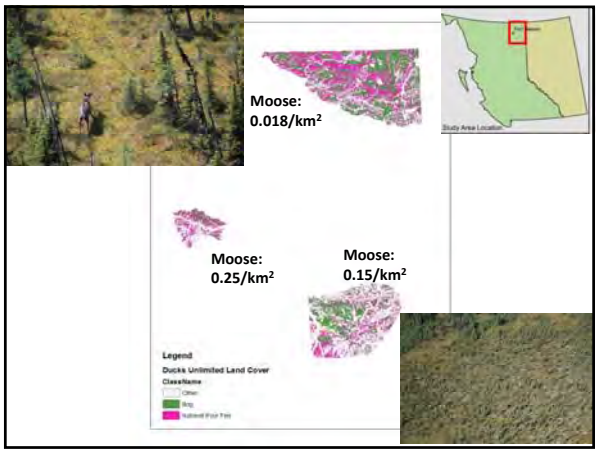




Caribou Distribution in Canada







Human footprint, habitat (climate?), wolves and boreal caribou population growth rates

Robert Serrouya[1], Harry van Oort[2], Craig DeMars[3], and Stan Boutin[1,3]

September 2016

1. Alberta Biodiversity Monitoring Institute
2. Kingbird Biological Consultants Ltd
3. University of Alberta

Are there more wolves than before?
Can people help us learn this?

How to count wolves in the forest???

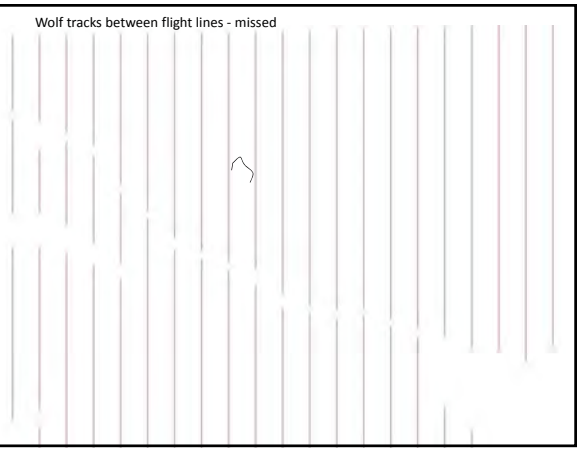
Simulations

Different spacing between transect lines

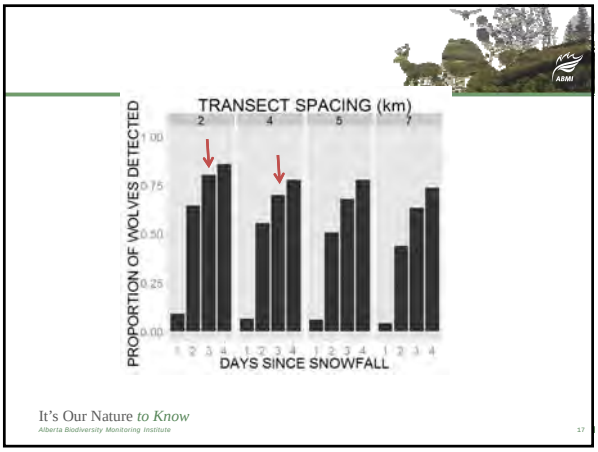
Simulations

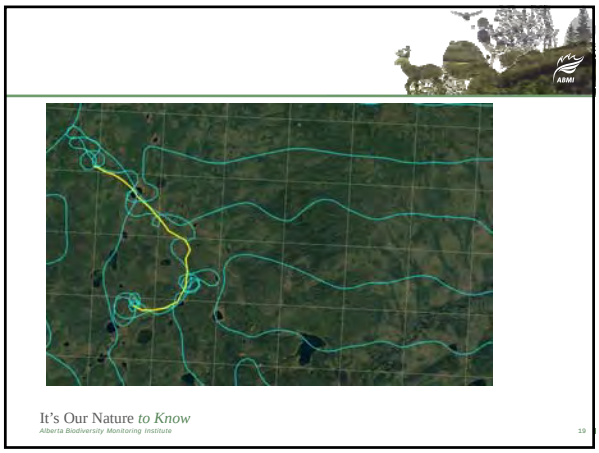
Simulations

Wolf tracks between flight lines - missed



Wolf tracks between flight lines - observed

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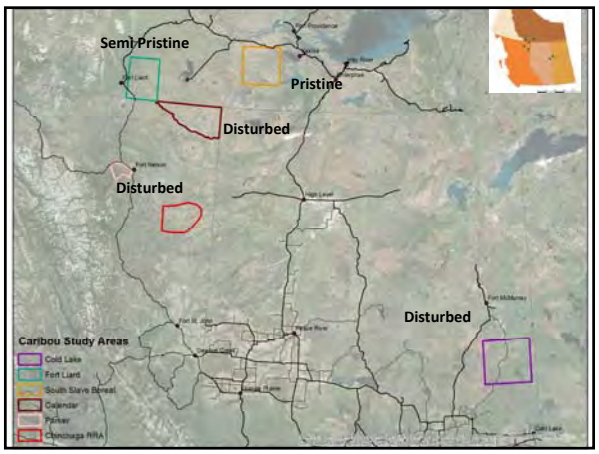
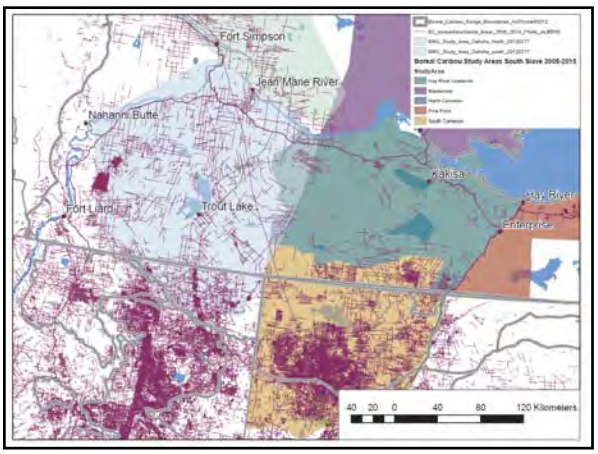
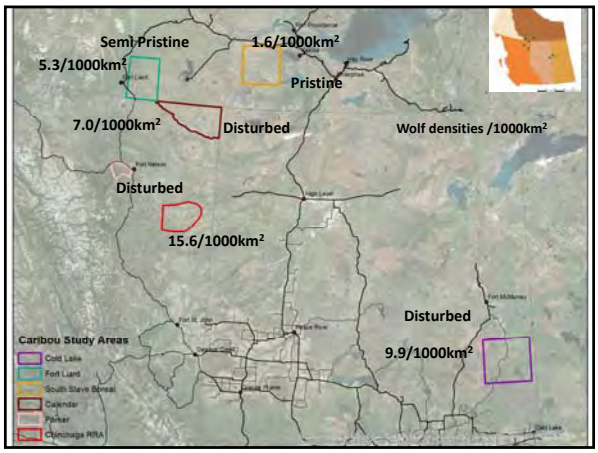
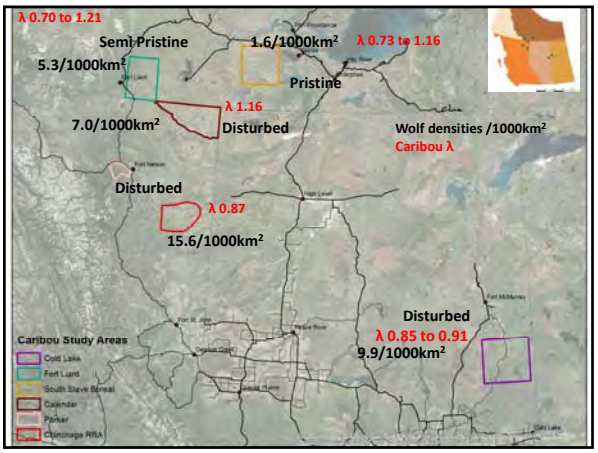
Alberta Biodiversity Monitoring Institute
19

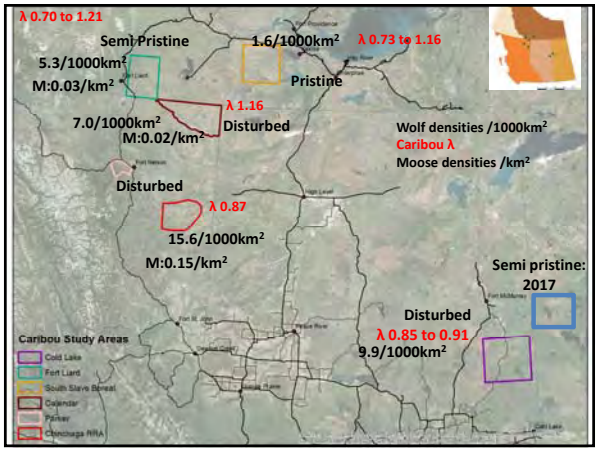

Caribou Monitoring Unit
COLLABORATION AND PARTNERSHIPS ☺
It's Our Nature to Know
Alberta Biodiversity Monitoring Institute

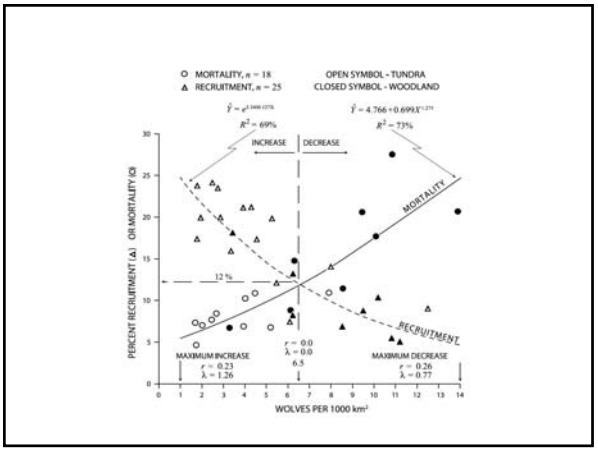

Semi-Pristine
Pristine
Disturbed
Disturbed
Disturbed
Caribou Study Areas
Cold Lake
Fort Liard
South Slave Boreal
Calendar
Pyrner
Chinchaga RRA

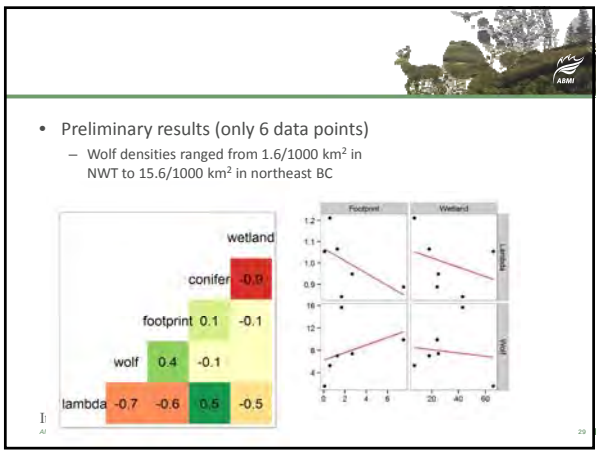

Fort Simpson
Jean Marie River
Nahanni Butte
Fort Liard
Trout Lake
Kakisa
Hay River
Enterprise
40 20 0 40 80 120 Kilometers

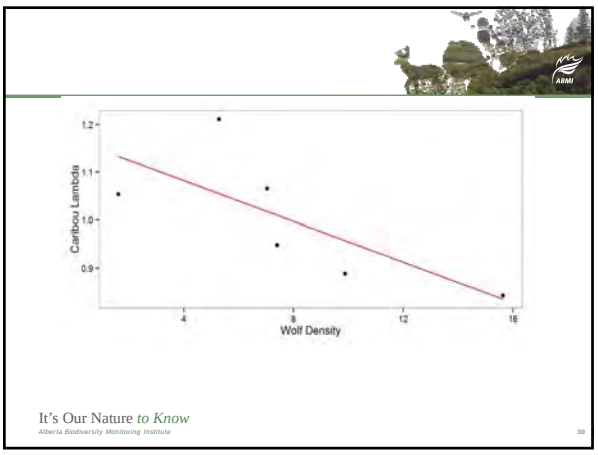

Semi Pristine
5.3/1000km²
1.6/1000km²
Pristine
7.0/1000km²
Disturbed
Wolf densities /1000km²
Disturbed
15.6/1000km²
Disturbed
9.9/1000km²
Caribou Study Areas
Cold Lake
Fort Liard
South Slave Boreal
Calendar
Parker
Chinchaga RRA

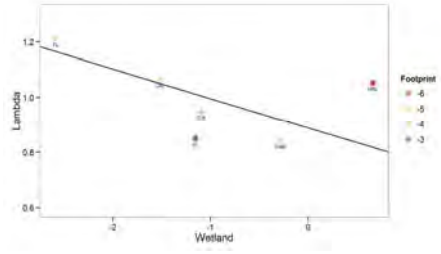

λ 0.70 to 1.21
Semi Pristine
5.3/1000km²
1.6/1000km²
λ 0.73 to 1.16
Pristine
λ 1.16
7.0/1000km²
Disturbed
Wolf densities /1000km²
Caribou λ
Disturbed
λ 0.87
15.6/1000km²
Disturbed
λ 0.85 to 0.91
9.9/1000km²
Caribou Study Areas
Cold Lake
Fort Liard
South Slave Boreal
Calendar
Parker
Chinchaga RRA


λ 0.70 to 1.21
Semi Pristine
5.3/1000km²
M:0.03/km²
1.6/1000km²
λ 0.73 to 1.16
Pristine
λ 1.16
7.0/1000km²
M:0.02/km²
Disturbed
Wolf densities /1000km²
Caribou λ
Moose densities /km²
Disturbed
λ 0.87
15.6/1000km²
M:0.15/km²
Semi pristine:
2017
Disturbed
λ 0.85 to 0.91
9.9/1000km²
Caribou Study Areas
Cold Lake
Fort Liard
South Slave Boreal
Calendar
Parker
Chinchaga RRA


MORTALITY, n = 18
RECRUITMENT, n = 25
OPEN SYMBOL - TUNDRA
CLOSED SYMBOL - WOODLAND
INCREASE
DECREASE
MORTALITY
RECRUITMENT
12 %
MAXIMUM INCREASE
MAXIMUM DECREASE
PERCENT RECRUITMENT (▲) OR MORTALITY (○)
WOLVES PER 1000 km²


• Preliminary results (only 6 data points)
– Wolf densities ranged from 1.6/1000 km² in NWT to 15.6/1000 km² in northeast BC
wetland
conifer -0.9
footprint 0.1 -0.1
wolf 0.4 -0.1
lambda -0.7 -0.6 0.5 -0.5
Footprint
Wetland
Forest
Wolf


Caribou Lambda
Wolf Density
It's Our Nature to Know
Alberta Biodiversity Monitoring Institute



Lambda ~ Footprint ($p < 0.01$) + wetland ($p < 0.01$); $R^2 = 0.92$?????

WSU	Geometric mean Lambda (n)	Collared Wolf Packs	Year of Wolf Survey	Number of wolf Packs	Min. Count	Max. Count	Wolf Density (/1000km²)
CAL	1.07 (1)	-	2015	5	32	35	7.0
CHIN	0.84 (1)	-	2015	8	52	61	15.6
CLK	0.95 (1)	1/1	2015	6	32	38	7.4
CL	0.82 (5)	3/6	2016	16	66	74	9.9
Ft Liard	0.98 (5)	-	2016	4	21	23	5.3
Hay RL	0.87 (2)	-	2016	2	8	9	1.6

WSU	Geometric mean Lambda (n)	Caribou Seen	Moose Seen	Number of wolf Packs	Min. Count	Max. Count	Wolf Density (/1000km²)
CAL	1.07 (1)	37	77	5	32	35	7.0
CHIN	0.84 (1)	3	41	8	52	61	15.6
CLK	0.95 (1)	48	100	6	32	38	7.4
CL	0.82 (5)	5	1	16	66	74	9.9
Ft Liard	0.98 (5)	10	49	4	21	23	5.3
Hay RL	0.87 (2)	33	20	2	8	9	1.6

Conclusions

1. Date are extremely preliminary
2. So, is it footprint, or habitat? So far, it's a tie.
   - Can't expect to pull the same management lever everywhere and get the same reponses
3. Climate – Sophie Gilbert is looking for climate signals on boreal caribou recruitment and survival rates.
   - We know From Kim Dawe's work that warming has played a major role in deer expansion.

Next Steps

- Add moose data to all analyses

Confounded with latitude!

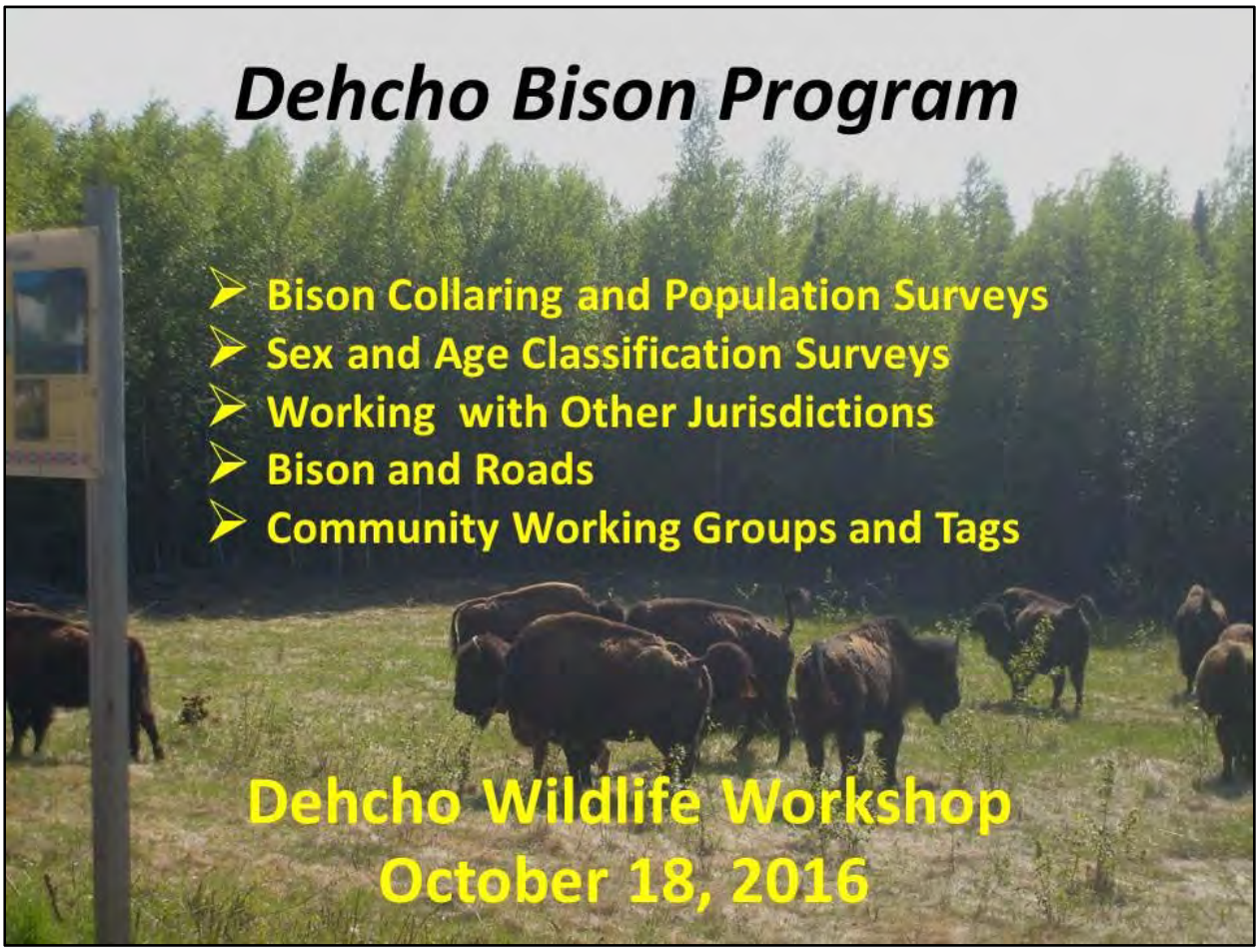
Acknowledgements

- Dehcho First Nation
- Allicia Kelly, Nic Larter, James Hodson
- Glen Watts, Jim Fink, Derek Drinnan
- Danny Beaulieu, Edward Landry, Jim Deneron and Floyd Bertrand in Fort Liard, Jon Gareau, Michael Cody, Dave Hervieux and Barb Maile and Kendal Benesh
- **Funding**: BC Oil and Gas Research and Innovation Society, NWT government, the Regional Industry Caribou Collaboration, the Canadian Energy Pipeline Association, the Environmental Studies Research Fund

Appendix 9.

Dehcho Bison Program

Presented by Nic Larter, ENR Fort Simpson



Dehcho Bison Program

- Bison Collaring and Population Surveys
- Sex and Age Classification Surveys
- Working with Other Jurisdictions
- Bison and Roads
- Community Working Groups and Tags

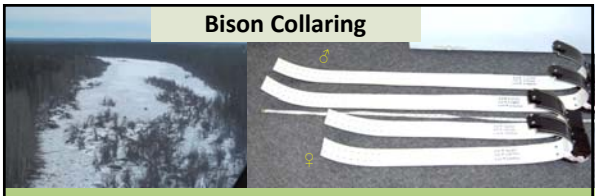
Dehcho Wildlife Workshop
October 18, 2016

Bison Collaring

- In late 2013 the last two GPS collars on female bison stopped providing location information; location data showed that bison use the river valley, road corridors and other linear features to move throughout their range.
- Collared animals play an important role in interpreting the results of aerial population surveys for wood bison because they help determine how easy bison are to see in open habitats and how difficult to see in forested habitats.

- We can then calculate a proportion of animals that were missed and adjust the population estimate accordingly.

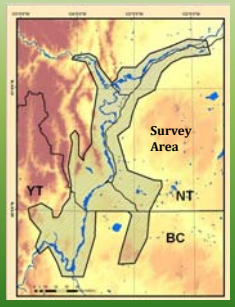
Bison Collaring



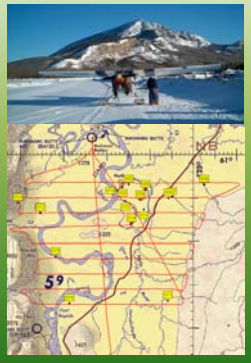
- ENR had planned to deploy up to 10 collars on bison prior to the next population survey, originally scheduled for March 2016; we held permits from both BC and YT in case bison were located outside NT.
- A combination of factors and bad luck has prevented us from deploying collars .
- Funding was not available to conduct a population survey in March 2016 so it was rescheduled for March 2017.
- Ten collars (8 female and 2 male) are available for deploying and ENR will attempt to have all collars deployed prior to the March 2017 population survey (which has received funding).

Bison Population Surveys

- Two aerial population surveys have been flown for the Nahanni wood bison population; March 2004 and March 2011.
- Population estimates were similar; 403 in 2004 and 431 in 2011.
- A third estimate is required in order to assess population trend.
- Collared bison provided measures of sightability starting in 2011.
- ENR conducts aerial strip line transect surveys of the winter range, transects are spaced about 3.5km apart.
- The survey crew consists of a pilot, recorder, and two observers; ENR will be hiring local observers for the survey.

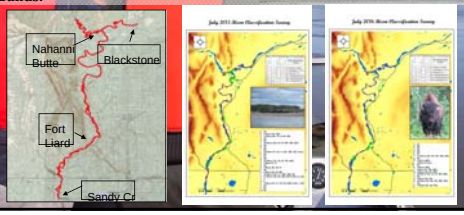


- The aircraft flies at 400 feet above ground, the wing struts are marked so a 500m transect on each side of the plane can observed.
- All animals observed are counted and recorded with a waypoint; larger groups are photographed
- The flight path is recorded using a GPS.
- For 2017 survey we will need to increase the survey area to include more of the Kotaneelee Valley and the Liard Highway corridor to Poplar River.
- Line transects may be closer and segment lengths adjusted to fly more efficiently the topography.



Sex and Age Classification Surveys

- Conducted annually since 2002; ENR and biologists from BC and/or YT participated in 2009-2013, 2016 for consistency in classifying 7 sex/ages.
- Using a boat, we cover the Liard and South Nahanni Rivers, usually north from Sandy Creek to Nahanni Park and Blackstone River; 2-3 days long.
- Conducted in mid-July when water levels are low and temperatures are high, bison frequent sandbars and the shoreline avoiding heat and insects.
- Survey tracked by GPS, with waypoints recorded for all observations.
- Maps of observations provided to Acho Dene Koe and Nahanni Butte Dene Bands.



Classification Survey Results for 15 years

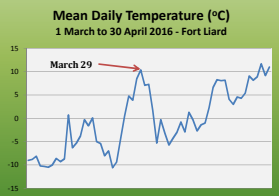
	2002	2003	2004	2005	2006	2007	2008	2009
# bison classified	131*	154	137	138	167	164	161	125
# calves/100 females	20	56	42	28	47	41	39	43
# yearlings/100 females	17	10	31	26	25	20	28	27
# mature males/100 females	48	50	40	50	72	52	56	51

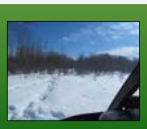
	2010	2011	2012	2013	2014	2015	2016
# bison classified	153	212	131	165	141	190	112
# calves/100 females	36	43	65	46	33	33	58
# yearlings/100 females	29	18	10	37	24	17	4
# mature males/100 females	52	40	53	53	64	38	56

* Included group of 42 classified at Beaver Camp prior to survey

- On average we observe 151 bison each survey.
- On average the cow:calf ratio is 41:100, the cow:yearling ratio is 21:100, the overwinter survival of calves is 53%, and there are 52 mature males for every 100 females.
- The low cow:yearling in 2016 is notable; fewer calves to start with but lowest overwinter survival of calves recorded at 13%, some 40% below average.

Why such low survival of bison calves? Possibly related to a late winter freezing event





- Four days of warm weather at the end of March were followed by below 0°C temperatures for 10 days.
- Snow pack began to melt and sink and then froze creating a layer of ice over the vegetation.
- Food availability dropped dramatically.
- Wolves could travel easily on the snow.
- Bison calves would have the lowest levels of stored fat and would be the most vulnerable age group to these conditions.
- This could also have affected the survival of young males (B1's); there numbers were reduced in the 2016 survey.

Working with Other Jurisdictions

- Although most of the range of the Nahanni wood bison population is in the Northwest Territories these bison range into both British Columbia and the Yukon, ignoring political boundaries.
- ENR actively solicits the participation of staff from other jurisdictions with classification surveys because such joint ventures ensure consistency in and classifying bison and communication between jurisdictions..
- BC/YT staff have participated in classification surveys 2009-2013, 2016.
- In 2013 ENR assisted with the BC classification survey of the Norquist population which is found near Liard Hotsprings.

Bison and Roads

- Bison vehicle collisions were rare on Highway 7 until fall 2004 when four accidents occurred killing four bison.
- In 2005, DOT erected additional signs, both large and small, in locations suggested by ENR based upon wildlife observations.

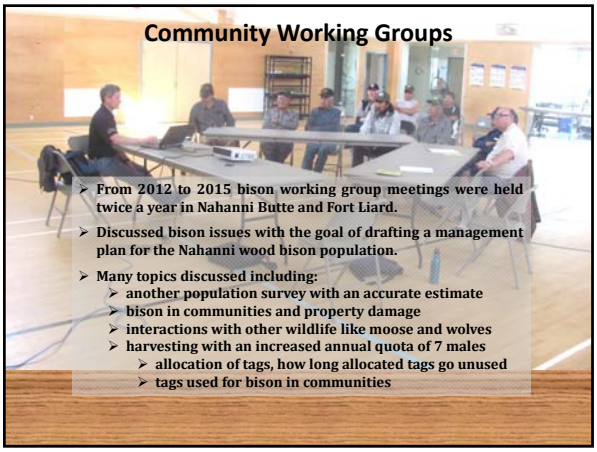
- Since 2005, the range of the bison has increased (it is not uncommon to see them as far north as the Poplar River), vehicle collisions continue almost annually (9 collisions killing 12 bison), and a majority of the original signs are no longer present.

Bison and Roads

- ENR has been working with DOT to improve highway signage as a public safety issue to remind motorists that bison are present.
- There is a need for large signs at the NT/BC border and Poplar River.

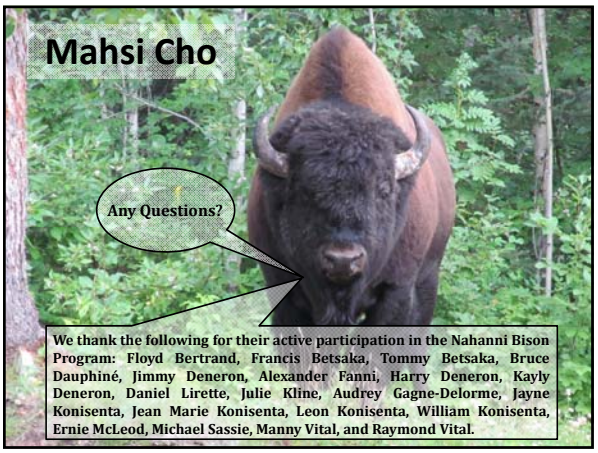
- Neighboring jurisdictions have copied the NT large sign to keep the message consistent ENR would like to copy the small BC signs which look more like a bison.

Community Working Groups



- From 2012 to 2015 bison working group meetings were held twice a year in Nahanni Butte and Fort Liard.
- Discussed bison issues with the goal of drafting a management plan for the Nahanni wood bison population.
- Many topics discussed including:
  - another population survey with an accurate estimate
  - bison in communities and property damage
  - interactions with other wildlife like moose and wolves
  - harvesting with an increased annual quota of 7 males
    - allocation of tags, how long allocated tags go unused
    - tags used for bison in communities


Nahanni Wood Bison Tags
Seven (7) male bison tags are available annually.
Tags are issued to individual GHL or NT resident hunters based upon written approval from either Acho Dene Koe Band (Fort Liard) or Nahanni Butte Dene Band (Nahanni Butte); tags are not transferable.
Resident hunters must pay the applicable license/tag fee.
Tags must be carried by harvesters while hunting bison.
Tags have been used to harvest problem bison in the community.
Wood Bison Tags


Mahsi Cho
Any Questions?
We thank the following for their active participation in the Nahanni Bison Program: Floyd Bertrand, Francis Betsaka, Tommy Betsaka, Bruce Dauphiné, Jimmy Deneron, Alexander Fanni, Harry Deneron, Kayly Deneron, Daniel Lirette, Julie Kline, Audrey Gagne-Delorme, Jayne Konisenta, Jean Marie Konisenta, Leon Konisenta, William Konisenta, Ernie McLeod, Michael Sassie, Manny Vital, and Raymond Vital.