Tłı̨chǫ Caribou Health and Condition Monitoring Program: Final Report

July 2014

Submitted by Tłı̨chǫ Government

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ACKNOWLEDGEMENTS

The principal author of this report was Kerri Garner, previous Manager, Lands Section, Department of Culture and Lands Protection. The Tłı̨chǫ Government would like to thank all participating organizations and individuals who have participated in this project both in kind and other resources including many Tłı̨chǫ Elders, harvesters, youth and translators (all names in participants lists in the Appendix, Dr. Iga Stasiak, Dr. Brett Elkin, Bruno Croft and Dr. Jan Adamczewski of GNWT-ENR, John Nishi of EcoBorealis Consulting, DCLP staff including Sean Richardson, Janelle Nitsiza, Antonia Dryneck, Skye Ekendia and Sjoerd Van der Wielen. We would also like to thank the Cumulative Impacts Monitoring Program (CIMP), whose financial support was imperative to the success of the inception of this program. Without contributions from all of the above, this project never could have been a success.

All Photos Courtesy Kerri Garner.

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ACRONYMS

TG	Tłı̨chǫ Government
WRRB	Wek’ èezhı̀i Renewable Resources Board
BNE	Bluenose East Caribou Herd
DCLP	Department of Culture and Lands Protection
ENR	Environment and Natural Resources
YKDFN	Yellowknives Dene First Nation
CHAP	Community Harvesters Assistance Program
WLWB	Wek’ èezhı̀i Land and Water Board

Tłı̨chǫ Caribou Health and Condition Monitoring Program: Final Report

SUBMITTED BY TŁĮCHǪ GOVERNMENT

INTRODUCTION

Following the decline of the Bathurst Caribou in 2009, the Tłı̨chǫ Government (TG) and GNWT-ENR have been working collaboratively with the Wek' èezhìi Renewable Resources Board (WRRB) to implement co-management of the herd[1]. Recommended actions from a joint management proposal included enhanced monitoring through harvest data collection and health and condition data collection of the Bathurst and Bluenose East caribou herds. Harvest management is a component to the overall strategy for management of barren-ground caribou herds and for better understanding the cumulative effects of all natural and anthropogenic (human-caused) influences on caribou. Community engagement and involvement are key ingredients for effective long-term harvest monitoring and to the broader issue of understanding cumulative effects.

This project is intended to move beyond the management and monitoring of harvest; it is designed to build community capacity and knowledge-sharing by actively engaging Tłı̨chǫ hunters through directed training workshops and active participation in annual biological data collection programs. Results from this project will contribute to knowledge sharing and better monitoring of health and condition indicators of the caribou herd. These herd health indicators will contribute to a more comprehensive understanding and interpretation of population trend and the underlying reasons for changes in birth and death rates of the caribou herd. Health and condition monitoring is complementary to annual composition surveys and population surveys, which are recommended for the Bathurst and Bluenose East (BNE) herd at 3 year intervals.

The goal of this project is to continue to build capacity in Tłı̨chǫ communities to become active players in the collection of biological samples, including tissues and fecal pellets from hunter-killed caribou, in order to gain a greater understanding of the health and condition of animals. By developing opportunities to train and increase knowledge-sharing in this project, we anticipate that community members will be more willing and skilled in collecting biological and harvest data collection and have a better understanding of how their data will be assessed. The intention is to 'train the trainers' and to get at

[1] http://www.wrrb.ca/content/joint-implementation-plan
http://www.wrrb.ca/content/wrrb-caribou-recommendation-report-submission

least 2 key people in each community trained on how to collect this information, so they can eventually work with community members and help train them.

The overall objectives of this project are to:

1) Refine the methodology to collect biological data based on previous year's experience and new knowledge, to develop a robust sampling methodology that is achievable for community members;
2) Continue to collect biological data that will improve the community's understanding of herd health indicators;
3) Build capacity, train and educate hunters and students on how hunting is part of a broader monitoring strategy for monitoring cumulative effects on the Bathurst and BNE caribou;
4) Inform and educate harvesters and community members about caribou conservation and management.

METHODS

This project had numerous meeting and activities to achieve its objectives. These included:

- Tłı̨chǫ Caribou Workshop
- Harvesters meeting in Wekweètì
- Harvesters meeting in Whatì
- Harvesters meeting in Gamètì
- On the Land 'Train the Trainers' Program and sample collection

ACTIVITIES CONDUCTED

Tłı̨chǫ Caribou Workshop, December 3-5, 2014, Yellowknife, NT

The Department of Culture and Lands Protection (DCLP) held the Tłı̨chǫ Caribou Workshop from Dec 3-5, 2014 in Yellowknife. A variety of Tłı̨chǫ elders, harvesters and youth participated in the workshop. In addition, a number of resource people participated from ENR (Environment and Natural Resources) and WRRB played an observer role. Sixteen community members participated in total with four from each community (See Appendix A for participant names).

Delegates were brought together to:

- discuss the history, current status and future management of the Bathurst caribou;
- *engage and gain further community commitment to the Caribou Health and Monitoring Program*;
- seek input on co-management recommendations in the Updated Joint Management Proposal being collaboratively developed with the Department of Environment and Natural Resource (ENR).

Caribou Health and Monitoring Program Overview

The Tłı̨chǫ Government through the DCLP has been working to build capacity of community members to participate in the collection of caribou health and monitoring samples in order to have a greater understanding of the overall health of the caribou. By collecting this information, it can help to give us a better understanding of the health of the caribou in between population surveys. 14 hunters were trained in 2013 and a follow up workshop was held to further plan the program. This workshop was an opportunity to share with others community members about the program (among other issues) and to gain further guidance on how to get greater commitment to the health and monitoring program overall. 16 community members attended this workshop including elders, harvesters and youth. It was a great success and a plain language overview of the workshop and issues discussed was shared with delegates soon after the workshop (See Appendix B).

The workshop was a success in further educating and informing 16 Tłı̨chǫ about caribou co-management overall and gaining further commitment of harvesters to collect samples either when hunting on their own, or during community based hunts. They also gave recommendations on how to make the program more effective.

Meeting with Harvesters in Each Community

Meetings were held by the DCLP in each community to engage in discussions about interest in participation in the Community Based Caribou Health Monitoring Program and also about proposed recommended actions for the Updated Revised Joint Management Proposal that was submitted to WRRB in June 2014. There was general support for the program overall, although the reality of implementation will still take time, effort and resources.

Wekweètì Harvesters Meeting

This meeting was held on February 6, 2014 and had 20 elders, harvesters and women in attendance. Wekweètì is an important community to engage with in this respect because it is the community that is in the middle of the restricted hunting zone R/BC/02 (See Map A) which is where only 300 Bathurst Caribou in total can be harvested (150 by Tłı̨chǫ and 150 by Yellowknives Dene First Nation (YKDFN). They are also in the middle of the Bathurst wintering range (See Map B) which is why Wekweètì has been allocated the 150 caribou for harvest by the Tłı̨chǫ Government. Biological samples have not been collected from the Bathurst herd since 2009 due to restrictions on harvest and it is important to collect samples from this herd in order to have a better understanding of the biological health of this herd.

Harvester's Meeting in Wekweètì

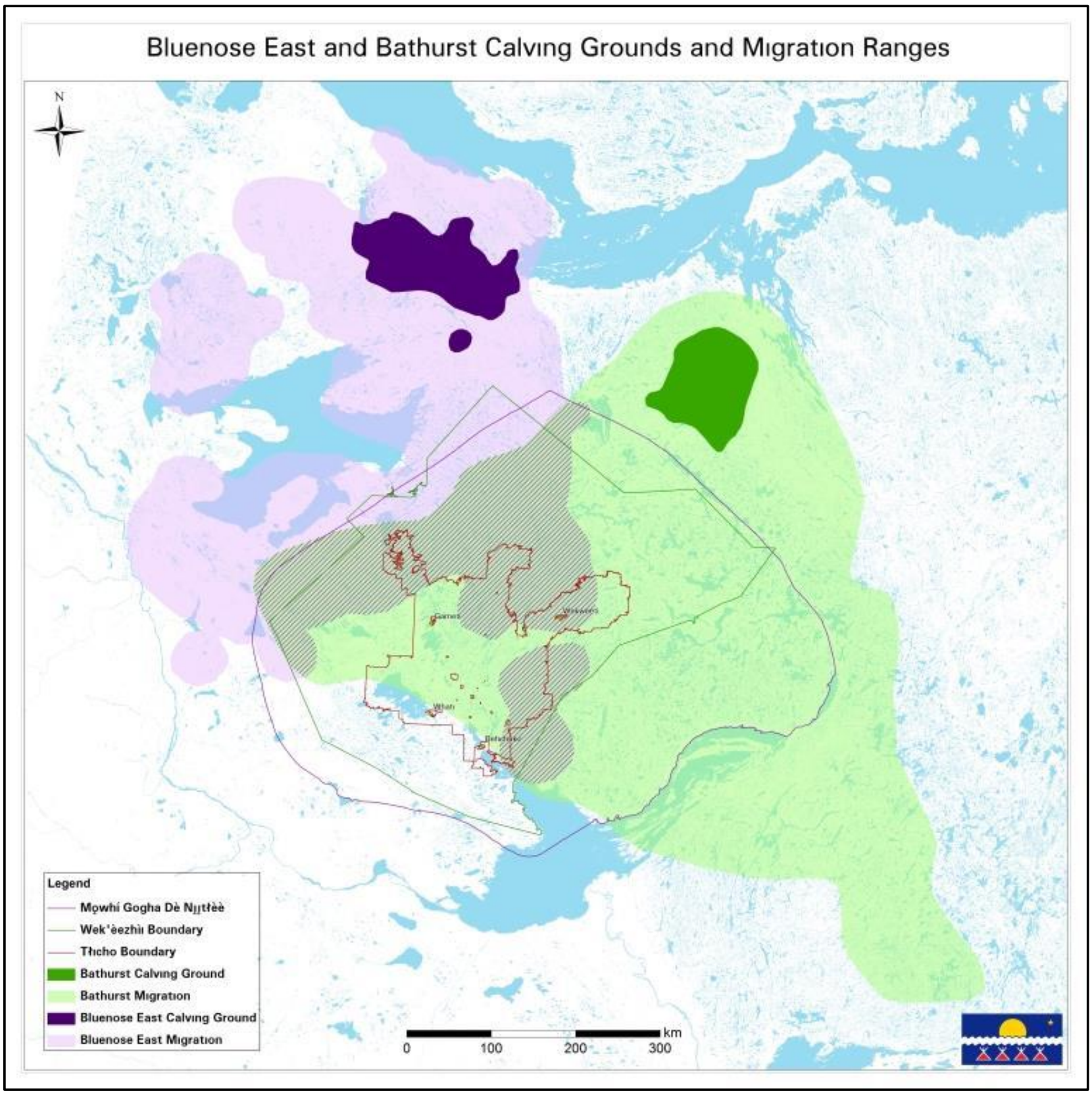
Hunters seemed overall interested in participating in the program. Some of the key recommendations made were:

- there is a need to have further training in order to increase confidence and likelihood of community members participating in the program;
- given that many harvesters in the community have close to full time employment, key harvesters may need to be targeted in order to ensure that samples are collected.

At the workshop a follow up training workshop was planned with harvesters within two weeks however due to circumstances the training did not occur. This will be done in the fall of 2014 in order to prepare harvesters for the coming hunting season as no Wekweètì hunters have participated in any of the 'on the land training' sessions to date.

Map A: Special Management Zones for Caribou Hunting

Map B: Historical Annual Range of Caribou Herds



Gamètì Harvesters Meeting

This meeting was held on March 11, 2014 with approximately 14 elders, harvesters and women. Gamètì is located in the middle of the Bluenose East Caribou winter range and this community generally harvests from that herd. People were generally interested in the program and understood the value of it. Some of the key issues and recommendations that came out of this meeting were:

- Need for further training,
- Questions as to whether every caribou harvested needs to be sampled?
- Concerns about providing personal information such as names on the sample kits and wondering if people will be held personally accountable overall.

Whatì Harvesters Meeting

This meeting was held March 11, 2014 with 6 harvesters in attendance. Though there were a small number of people at this meeting, it was an opportunity to have an engaged in depth discussion about the program overall as well as about the updated joint management proposal. Key recommendations from this meeting were:

- In order to further promote the program, promote the program on the radio in both Tłı̨chǫ and English as well as other means of communication.
- In order for hunters to be eligible for Community Harvesters Assistant Program (CHAP) funds, a requirement could be made to collect samples from a certain number of caribou harvested and to report harvest.

Overall Recommendations from All Harvesters Meetings:

- Further engagement with community members both one on one, in workshops and community meetings in each community to promote the program, its value and importance and to get more harvesters involved;
- Further communication about caribou co-management overall and about the caribou health monitoring program through radio, social media, and other communication methods;
- Need for key people/person in the community who will be the point of contact for sample kits – so that people can obtain sample bags and return full sample kits to that person who will then send to ENR;
- Dissemination of Field Guide to harvesters (See Appendix C);
- Coordination of sample collection with CHAP funding;
- Ensure that harvesters are trained if a community hunt occurs;
- Consideration of offering an incentive for collection of samples such as a gas card.

Participants Meeting at start of Ride to Base camp had an opening prayer to ensure that everyone was kept safe on the hunt.

On the Land 'Train the Trainers' Camp

On March 29-April 2, an on the land field camp was held with the intention of further 'training the trainers' as many of the participants were at the camp the year before. The intention is that in the year 2014/15 a core group of hunters in each community will be trained to collect samples, and they will be in a position to train other community members on sample collection. Though we had anticipated doing the training on a community by community basis, it was impossible this year given time restraints and how busy ENR staff were during this time of the year. One major change this year was the addition of elders and youth to the participants so they could learn about the program itself, and to ensure an exchange of traditional knowledge between elders and scientists and elders and youth (See Appendix D for participants).

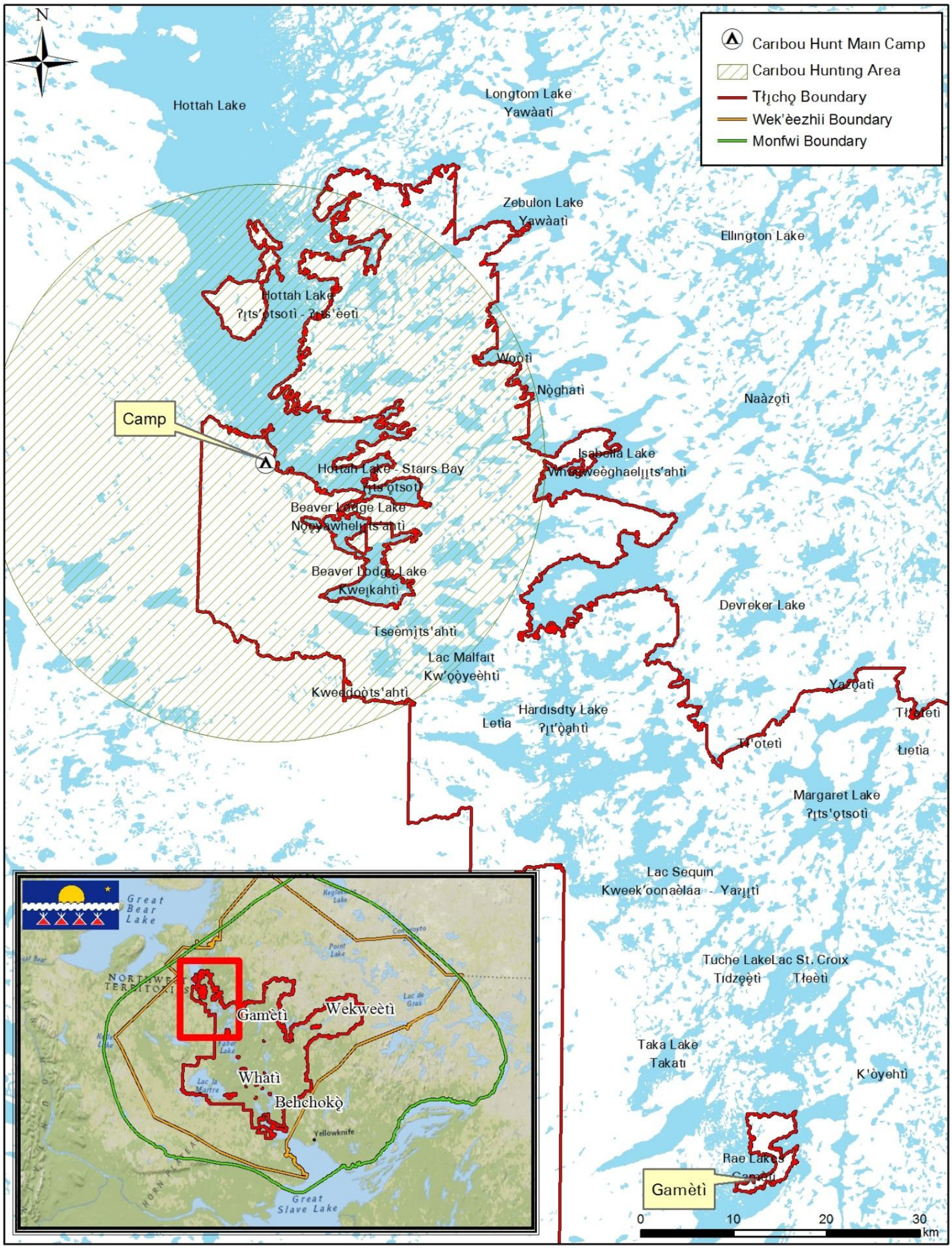
Participants listen intently at in class session prior to field camp.

First, an in class session was held where Kerri Garner (TG) gave a presentation on caribou co-management overall explaining the recent history of Tłı̨chǫ participation and why this program is important to move forward on. Dr. Iga Stasiak, wildlife veterinarian from ENR then gave a more detailed presentation on the rationale behind the sampling program and why it is important. At this time, logistics were confirmed and the actual on the land component started the following day.

The team determined where to set up base camp about 100km North of Gamètì near Hottah Lake (See Map C). The location was determined based on local knowledge of where the caribou were at the time. The objective of the team was to collect 30 samples in total. The harvesters were selected because of their on the land expertise, history with the program and interest in the program and their hunting and butchering skills that could effectively be utilized to collect biological samples that included back fat measurements, the left rear leg, the left kidney, the jaw bone, and fecal pellet samples.

ENR, Elders, Harvesters and Youth all working together to collect samples.

MAP C: CAMP LOCATION AND APPROXIMATE HUNTING AREA



RESULTS

In total 70 caribou samples were collected which included 55 cows, 5 bulls and 10 unknown. Not all were collected specifically from the organized hunt but some from other hunters who were also out hunting and decided to take samples as well. Given the location of harvest it is certain that the samples taken were from the Bluenose East Herd. In general, hunter assessment of the animal health corresponded to the analysis of the measurements taken. The Bluenose East herd is in generally good condition with the cows being in better condition than bulls which is expected for the time of year in which the samples were taken (See Figures 1 and 2 to see averaged depth of back fat for cows and bulls respectively). Figure 1 shows that back fat of the caribou in 2014 was higher than in 2012 and 2013 which indicates that the condition of the animals is better in 2014 than in 2012 and 2013. In addition, there has been an increase from 2012 in both kidney fat, back fat and bone marrow fat stores which is a positive indication of overall caribou health.

Elder showing Youth how to skin a caribou

Figure 1: Late Winter Back Fat Thickness – Adult Female Caribou

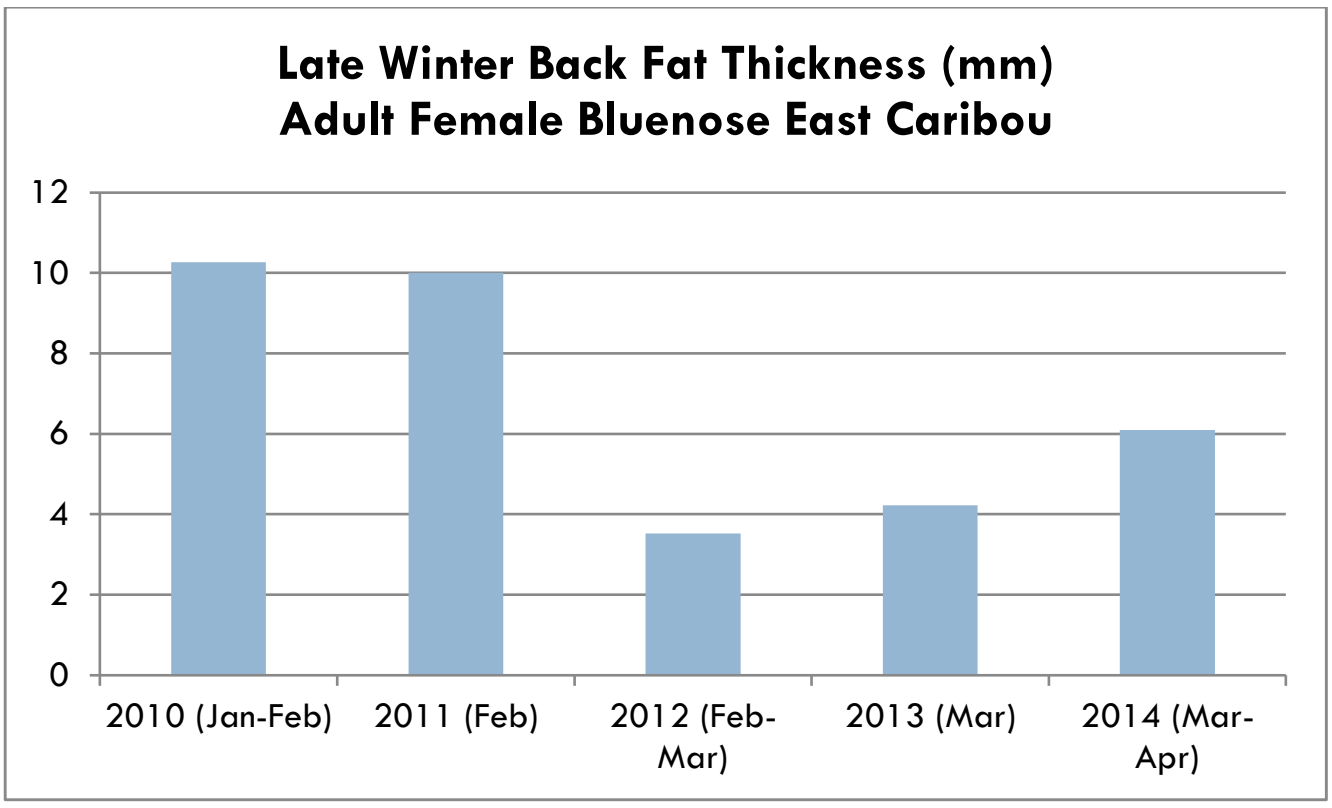
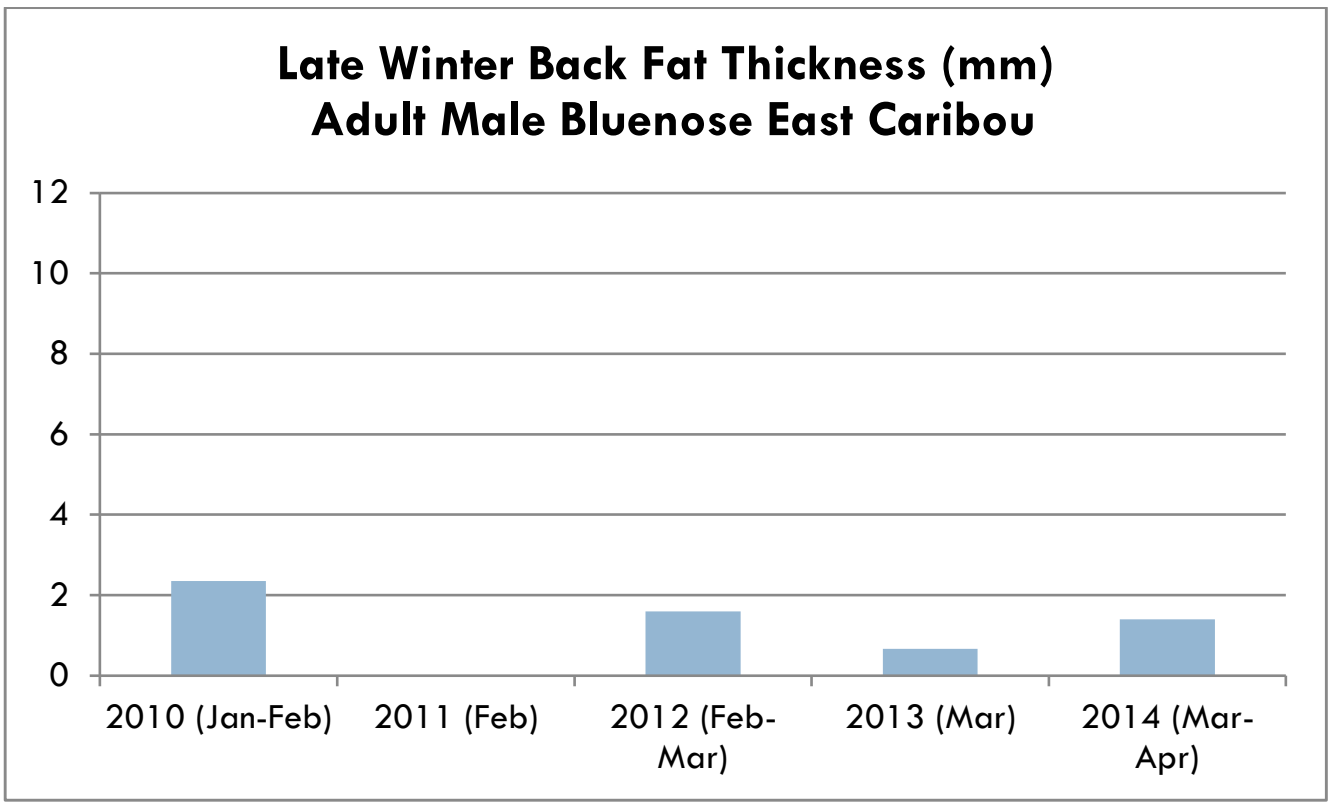
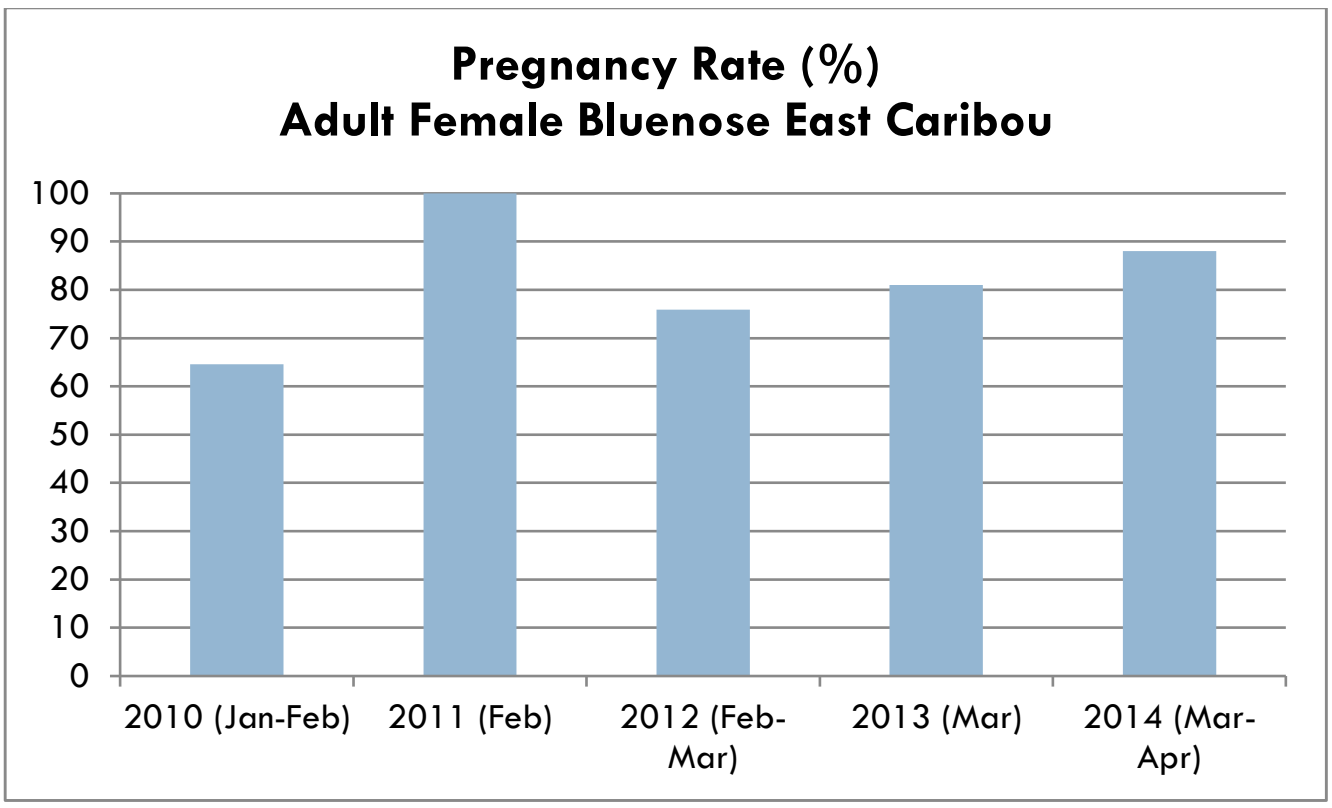


Figure 2: Late Winter Back Fat Thickness – Adult Male Caribou



Pregnancy rates of the cows were at 88% as can be seen in Figure 3. This is also higher than the past 2 years which is a good sign for the herd overall. In addition, pregnant caribou generally appear to have higher kidney fat index (aka better body condition) than those that were not pregnant (See Table 4). This supports the importance of good body condition in maintaining reproductive potential of the herd.

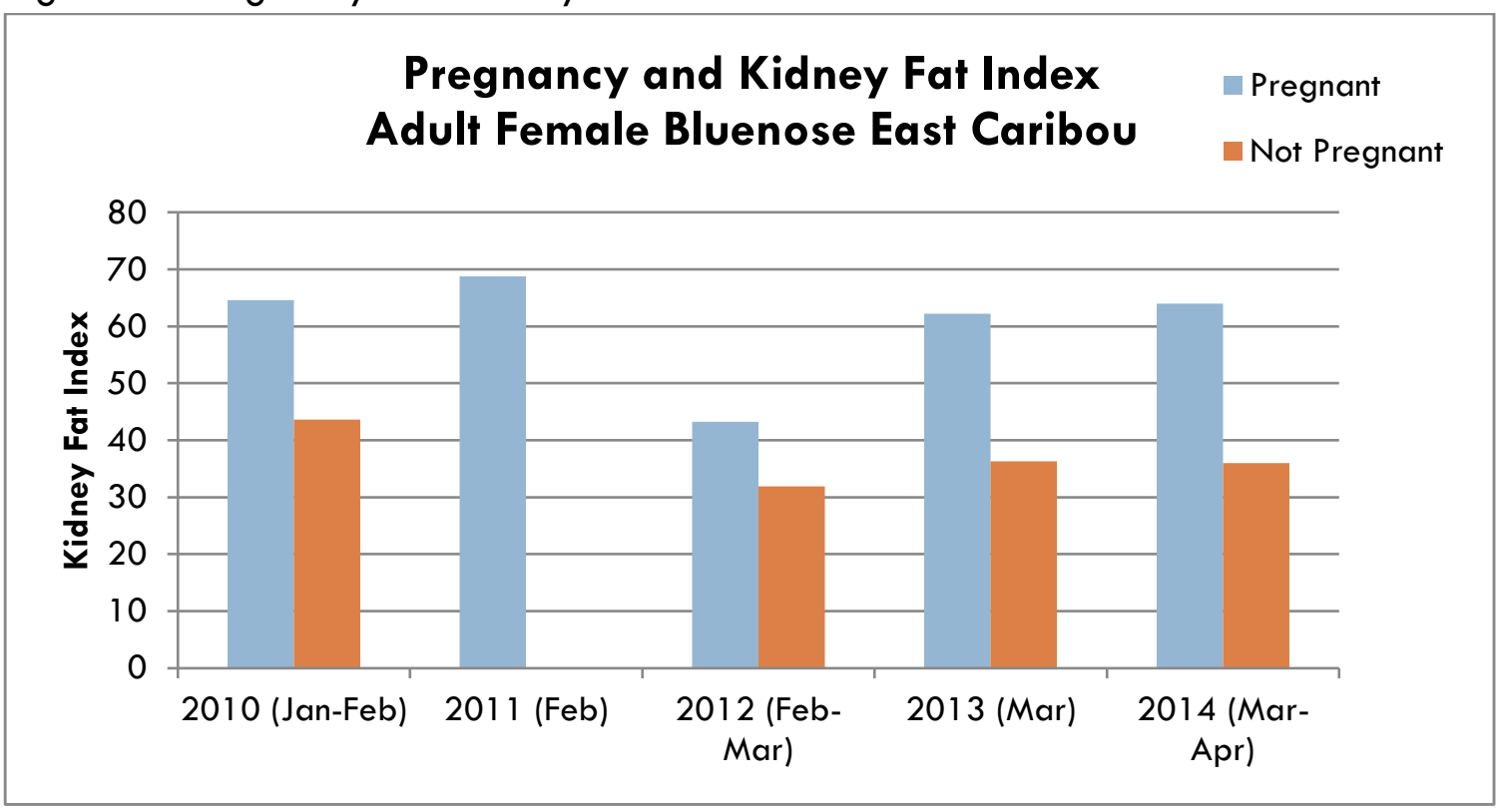
Figure 3: Pregnancy Rates of Bluenose East Cows over time



Generally, animals appeared to be in better body condition in 2014 than in the previous two years. This was reflected by a higher recorded pregnancy rate. Since interpretation is limited by a small sample size, trends are not statistically validated; however, they do give some indication of the health status of the herd. The sample size of 55 cows obtained in 2014 was larger than that from previous years; larger samples sizes, i.e., > 30, tend to provide more reliable estimates than estimates based

on small samples sizes, i.e., < 10. The participation and larger sample sizes obtained in 2014, highlights the importance of strong community involvement and hunter participation.

Figure 4: Pregnancy and Kidney Fat Index in Female BNE Caribou



Tłı̨chǫ Community Based Monitoring Results Workshop

On March 17-18, 2014, the DCLP hosted a Community Based Monitoring Results Workshop where 9 Tłı̨chǫ Elders and numerous resource people participated (See Appendix F for Participants). The overall objectives of the workshop were to:

- Update the elders on the various community based monitoring programs currently underway on Tłı̨chǫ Lands including the Tłı̨chǫ Aquatic Effects Monitoring Program (TAEMP), the Marian Watershed Stewardship Program and also the Caribou Monitoring Program;
- Obtain further guidance on how to move forward with the program as a whole.

The Elders who attended have all been engaged in caribou co-management, Land Use Planning and also the development of the Marian Watershed Stewardship Program thus far. They were chosen to attend this workshop because of their extensive knowledge of the Marian Watershed and caribou and will eventually be designated as the Fortune Minerals Elders Advisory Committee whose responsibility will be to guide the Fortune Minerals Aquatic Effects Monitoring Program (AEMP), Wildlife Effects Monitoring Program (WEMP) and closure plan; as well as to guide the development, implementation and communication of the overall Marian Watershed Stewardship Program.

The workshop was an opportunity to share results and get guidance on the future of the community based monitoring program overall including both the caribou monitoring program and also the watershed monitoring program.

LESSONS LEARNED AND RECOMMENDATIONS MOVING FORWARD

Hunters seem generally interested in the program and willing to collect samples - to a degree. It became clear during the on the land training session that collecting samples is more work than anticipated, particularly if the intention is to collect samples from all caribou that a hunter kills. The collection adds time to butchering and it also means that hunters need to keep the samples and submit them somewhere afterwards. Recommendations for the program overall are as follows:

Communication and Education

As with any community based monitoring program, communication and education are the critical factors to success.

- Further engagement with community members is required to gain full support and participation in the program. This could be done in the form of one on one, in workshops and community meetings in each community.
- Further communication about caribou co-management overall and about the caribou health monitoring program through radio, social media, and other communication methods.
- Results of the Program need to be meaningfully shared with participants and Tłı̨chǫ communities overall. This could be achieved through the above mentioned methods and an annual summary of the results.
- A website could be developed to share information about caribou specifically.

Implementation

Though there is general support of harvesters in the program, the reality of getting samples will still encounter challenges. Some of the logistical challenges are likely the easiest to solve for implementation of the program.

- DCLP to work with and train two or three key harvesters in each community on how to collect samples.
- One or two harvesters in each community to be 'hired' to be the sample kit coordinators – they would be the always have sample kits to give to hunters and to collect them and send them to ENR.
- ENR community monitors need to be fully trained on caribou co-management and sample collection methods.
- Consideration of less intensive sampling to be conducted on a certain number of caribou and full samples from a target number each year (yet still ensuring enough samples are collected to have statistically significant samples).
- TG and ENR to work closely together to ensure that samples are collected and results are communicated back to community members.

- Coordination of sample collection with CHAP (Community Hunters Assistant Program) (provided by GNWT) program such as providing field guides and training and requiring hunters to bring back samples in order to be eligible for CHAP funds the following year.
- Ensure that harvesters are trained if a community hunt occurs.
- Trained hunters who participate and provide samples with appropriate data and information could be eligible to receive a gas card that would be redeemed for a certain volume of gasoline from a store in their local community

CONCLUSION

This year's program was a success in further informing community members about the program and getting further interest and participation by community members. There is definitely interest in participating in the program, however it has become clear that further training is required, further communication is needed to obtain adequate samples and incentives will be required to get greater participation. Overall, harvesters are more informed about caribou co-management overall and about the monitoring program. It will continue to take time and resources to implement the program, but this year's results show that this information can be collected and that the information it provides will help us to gain a greater understanding of the health and condition of caribou in between survey years. The relative success of the program, with hunter participation and community engagement as key components will continue to contribute to our broader understanding of cumulative effects on caribou, and further prepare community members for caribou management in the future.

APPENDIX A: TŁĮCHǪ CARIBOU WORKSHOP PARTICIPANTS, DECEMBER 3-5, 2013

Name and Location	Affiliation
Behchokǫ̀ • James Lafferty (Harvester) • Leon Ekendia (Harvester) • Hardy Mantla (Harvester) • Lawrence Jr. Mantla (Youth) Whatì • Archie Zoe (Harvester) • Joe Louie Moosenose (Harvester) • Jimmy Nitsiza (Elders) • Bernice Beaverho (Youth) Gamètì • Charlie Gon (Harvester) • Eddie Chocolate (Harvester) • Joe Zoe (Harvester, Community Monitor) • Sam Jr. Mantla (Youth) Wekweètì • Jimmy Kodzin (Elder) • Christopher Football (Harvester) • Tracy Rabesca (Youth) • Robyn Laboline (Youth)	Tłı̨chǫ Delegates
Kerri Garner Sean Richardson Janelle Nitsiza Sjoerd Van der Wielen	Manager, DCLP Wildlife Coordinator, DCLP Socio-Economic Liaison, DCLP GIS Technician, DCLP
Bruno Croft Jan Adamczewski Iga Stasiak Roy Judas	Bathurst Biologist, ENR-GNWT Ungulates Biologist, ENR-GNWT Wildlife Veterinarian, ENR-GNWT Tłı̨chǫ Wildlife Monitor in Wekweètì – ENR-GNWT
John Nishi	Biologist, EcoBorealis Consulting (Hired by Tłı̨chǫ Government)
Boyan Tracz Susan Beaumont	Biologist, WRRB Communications Specialist, WRRB
Petter Jacobson	TK Researcher

APPENDIX B: CARIBOU WORKSHOP OVERVIEW

Tłı̨chǫ Caribou Workshop Update

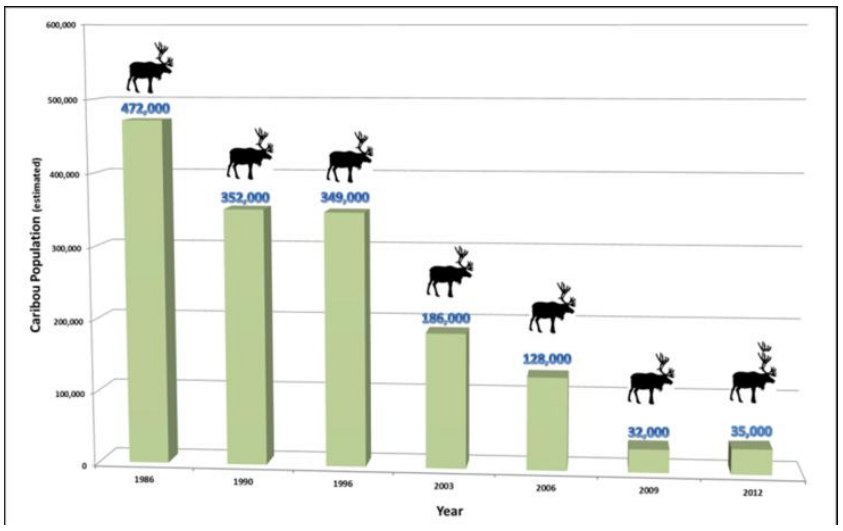
Date: Dec 3-5, 2013
Location: Yellowknife, NT

Purpose of Workshop:

The Department of Culture and Lands Protection hosted the Tłı̨chǫ Caribou Workshop from Dec 3-5 in Yellowknife. A variety of harvesters, elders and youth were brought together to discuss the history, current status and future management of the Bathurst caribou, and to seek their input on co-management recommendations with the Department of Environment and Natural Resources (ENR).

Attendees:

Behchokǫ̀ -Joe Rabesca, Hardy Mantla, Lawrence Jr. Mantla; Whatì -Jimmy Nitsiza, Joe Louie Moosenose, Archie Zoe, Mike Nitsiza, Bernice Beaverho; Gamètì -Edward Chocolate, Charlie Gon, Sam Mantla Junior; Wekweètì -Joseph Judas, Jimmy Kodzin, Chris Football, Robin Laboline; Resource People-Kerri Garner (DCLP), Sean Richardson(DCLP), Janelle Nitsiza (DCLP), Roy Judas (ENR), John Nishi (Biologist), Jan Adamczewski (ENR) and Bruno Croft (ENR).



Updated co-management proposal:

Key Issues for discussion:

- **Considering harvest** for the coming years given that the Bathurst caribou are estimated to still be at relatively low numbers of **approximately 35,000**. Though the herd seems to have stabilized we still need to **exercise caution** in our harvest and to continue with conservative recommendations, including minimizing the hunting of cows.
- **Considering increasing wolf harvest** in the coming years to reduce predation and help the Bathurst herd grow and. We discussed whether the communities would support this and the best ways to increase hunting and trapping of wolves on the Bathurst winter range that would involve Tłı̨chǫ people.
- **Considering Increasing the number of collars** on caribou as a way to improve our monitoring and understanding of the Bathurst caribou herd in order for us to understand the herd better and to make management decisions.

History of caribou co-management – from decline to co-management:

In 2009 the Bathurst Caribou declined significantly form 126,000 in 2006 to 32,000. The Tłı̨chǫ Government started to work on implementing Chapter 12 of the Tłı̨chǫ Agreement and therefore had to start working with GNWT-ENR on managing the caribou in the spirit of co-management. Difficult decisions were made by the Tłı̨chǫ Government for the long term future of Tłı̨chǫ citizens and the conservation of the caribou. Population estimates in 2012 show that the herd seems to have stabilized at 35,000. Though it has stabilized there are still a low number of breeding cows and we still must exercise caution in our harvest. The decisions made in 2010 for 150 Bathurst caribou to be harvested by Wekweeti will remain in place for the 2013/14 hunting season and an updated proposal is being developed now by TG and ENR. This workshop was about engaging with Tłı̨chǫ citizens about how to move forward with the next proposal.

Community based caribou monitoring:

The Tłı̨chǫ Government through the DCLP has been working to build capacity of community members to participate in the collection of caribou health and monitoring samples in order to have a greater understanding of the overall health of the caribou. By collecting this information, it can help to give us a better understanding of the health of the caribou in between photo census population surveys. 14 hunters have been trained and we are working to train more hunters this winter and get hunters going out on the land to collect these samples. If you are interested in this program, contact Sean Richardson at the DCLP.

PLEASE REPORT YOUR HARVEST

Next Steps:

The TG and GNWT-ENR will continue working together on the updated co-management proposal. TG is seeking guidance and advice from community members on how to move forward with this proposal. It will be submitted to the WRRB in May, 2014. The WRRB will then make recommendations and these will be in place for the 2014/15 hunting season.

For more information of If you have any ideas or thoughts, please contact us at Kerri Garner at kerrigarner@tlicho.com or Sean Richardson at seanrichardson@tlicho.com at the Department of Culture and Lands Protection.

Appendix C: Harvesters Field Book

Tłı̨chǫ Caribou Monitoring Program

Field Guide for Caribou Sample Collection

Wek'èezhìi Renewable Resources Board

This guide includes information for harvesters on how to collect samples for caribou health and condition monitoring.

This sampling guide was developed by the Department of Culture and Lands Protection in Partnership with Wek'èezhìi Renewable Resources Board (WRRB). The Tłı̨chǫ Government gratefully acknowledges the Department of Environment and Natural Resources, Government of the Northwest Territories, and the WRRB for their contributions to this booklet.

Copies are available from the Department of Culture and Lands Protection, Tłı̨chǫ Government.
P.O Box 412
Behchokǫ̀, NWT
Canada X0E 0Y0
Telephone: 1-867-392-6381
Facsimile: 1-867-392-6406

When collecting samples you should:

- Wear rubber gloves to protect yourselves.
- Place each sample in a separate plastic bag.
- Unless otherwise noted, samples should be submitted frozen or kept cool.

Cover Photo Credit: Bruno Croft, ENR, GNWT

How to use this guide

Table of Contents

What is Body Condition?

- If a caribou is in good body condition, it is strong and healthy.
- Body condition can influence caribou reproduction and survival.
- A good way to assess condition is to observe how much fat the caribou has.
- Body condition naturally changes over time.

Why is it important to monitor (observe) the health and condition of caribou?

By taking samples, you are:

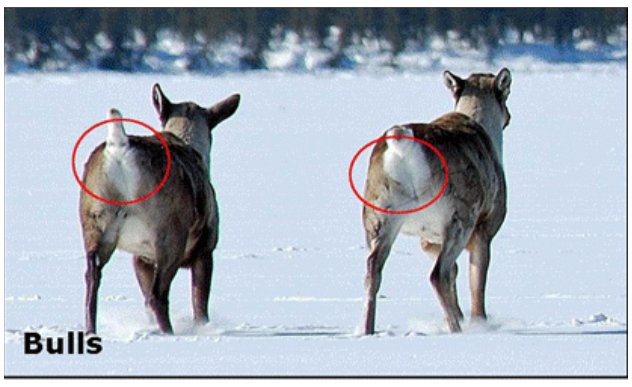
- Collecting information that will help us understand how the herd is doing. With more information, we can put together a stronger and clearer picture of the herd's health and abundance.
- Helping us understand how different factors are affecting the caribou.
- Sharing your knowledge and expertise (so that future generations will have healthy caribou herds).
- Sharing responsibility for managing caribou.

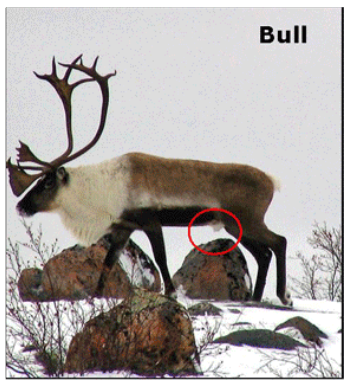
Caribou Sampling Step-by-Step

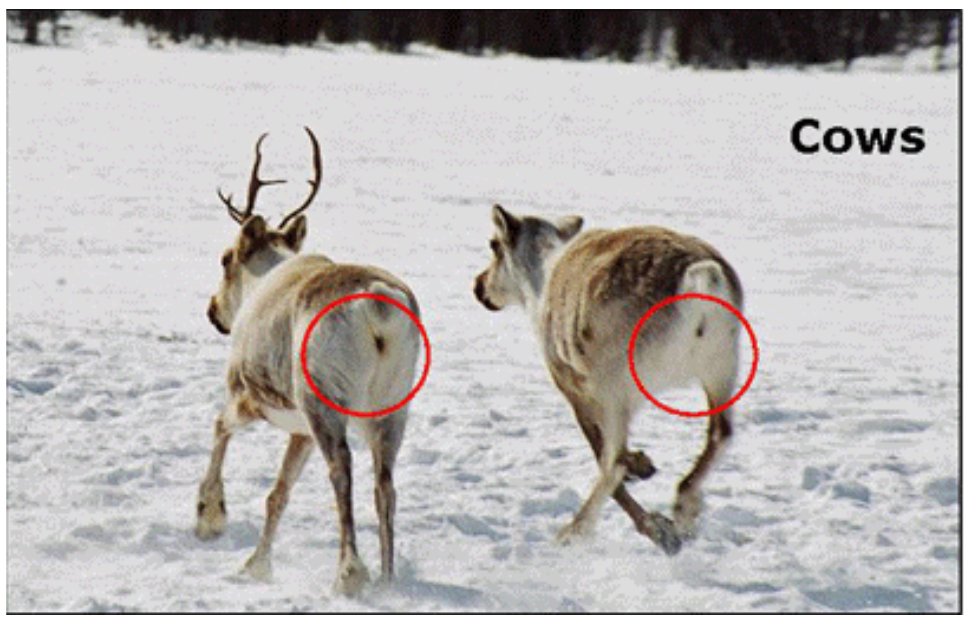
- Collect Samples
  1. Lower jaw bone with teeth (p.10)
  2. Lower back leg (p.11)
  3. Fecal pellets (p.13)
  4. Left kidney and fat (p.14)
- Measure Back Fat (p.16)
- Record Information
  1. Fill out sample card (p.8-9)
  2. Label each sample bag
- Store Samples
  1. Place each sample in a separate plastic bag
  2. Put all of the sample bags in the large outer bag provided with the sample kit
- Drop Off Sample Bags

  At Department of Culture & Lands Protection or nearest ENR Office. (p.19)

Caribou Bulls & Cows

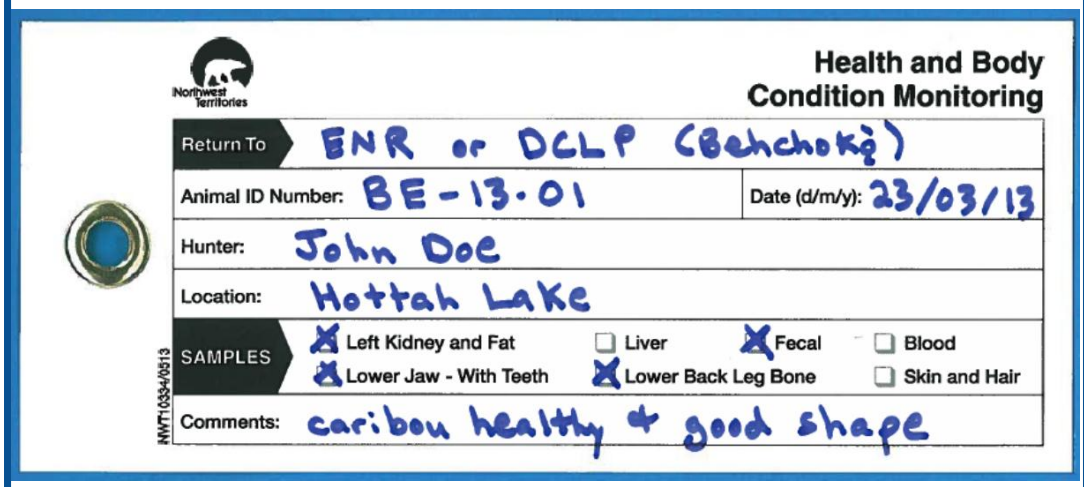






How we can tell the difference between a female(cow) and male(bull) caribou.

Sample Card-**Front**



What do we write on the sample card(front)?

Example card pictured above. Please fill in this information:

Return to: ENR or DCLP(Behchokǫ̀).

Date: Write the date.

Animal ID Number: BE-13-01

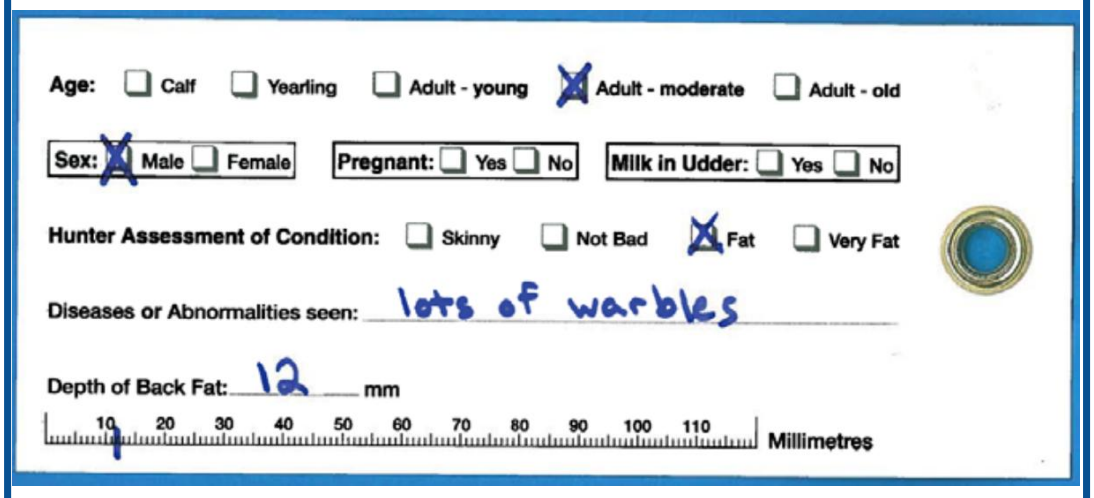
Hunter: Write your name here. (John Doe?)

Location: The place the caribou was taken. (Hottah Lake?)

Samples: Check which samples you were able to collect from the caribou.

Comments: A general description of the caribou. (Is the caribou healthy or sick?)

Sample Card-**Back**



What do we write on sample card(back)?

Back of the sample card pictured above. Please fill in this information:

Age: Check if the caribou is a calf or an adult, etc.

Sex: Is it a male or female caribou?

Pregnant: Is there a fetus in the caribou?

Condition: Is the caribou skinny, fat? etc...

Diseases or Abnormalities: Are there any signs of diseases, parasites or anything unusual?

Depth of Back Fat: Use the measurement ruler for back fat shown on the bottom of the card.

Sample 1
Lower Jaw Bone With Teeth

What can we learn from the lower jaw?

The incisor tooth on the jaw is used to determine the age of the caribou. The jaw can also be used to estimate the caribou's size.

Sample 2
Lower Back (Left) Leg

What can we learn from the lower back leg?

- The lower back leg tells us the overall size of the caribou (how big it is).
- Lower back leg can also be used to test for body condition (bone marrow) and indications of stress (hormones in the hair).

Taking the lower (left) leg sample.

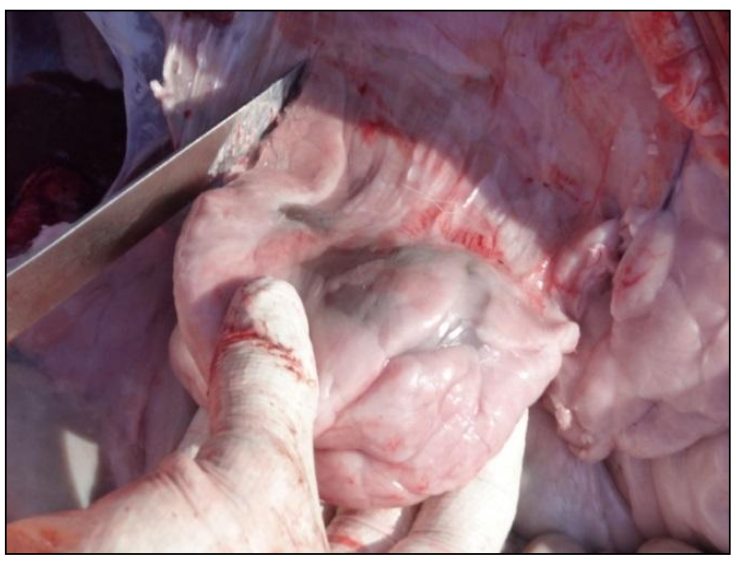
Sample 3
Fecal Pellets(Caribou Poop)

What can we learn from fecal pellets?

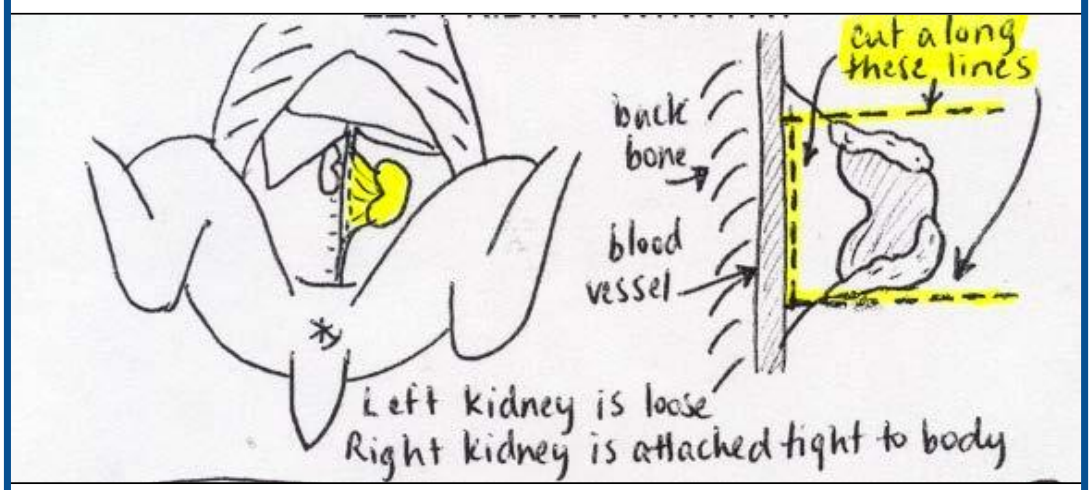
Fecal pellets can tell us:

- What the caribou has been eating (diet analysis),
- Whether the caribou has any parasites or diseases,
- And whether the caribou is pregnant.

Taking the left kidney and kidney fat sample.



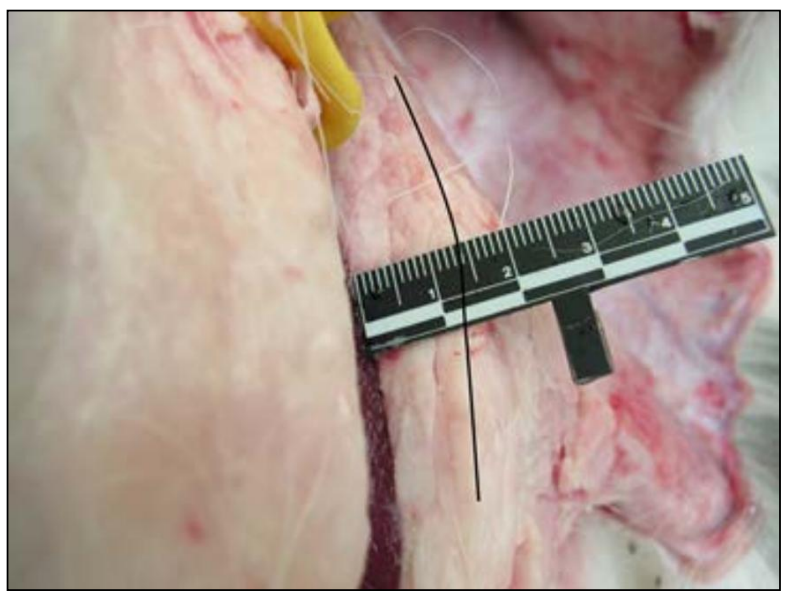
Sample 4
Left Kidney & Kidney Fat



What can we learn from the left kidney and fat?

- The kidney is tested for any environmental contaminants.
- The fat is used to determine body condition.

Measure Back Fat



Fat is used to determine body condition.

Diseases or Abnormalities

Are there any signs of diseases, parasites or anything else unusual?

Warble fly larvae (parasite) are found under the skin on the caribou's back.

- If you see any disease, parasites or anything unusual, please collect a sample and submit it to the nearest ENR office.

- Nose bot larvae in nasal cavity of a caribou

Pregnant Caribou

Pictured Left:
Womb of the female caribou.

Pictured Right:
Fetus from the womb of a female caribou.

How do we know if the caribou is pregnant?

Check the womb of the caribou and see if there is a fetus inside. Please record if the caribou is pregnant or not pregnant.

Where to Drop off Samples

Please bring all samples that were collected to the Environment of Natural Resources (ENR) office in Behchokǫ̀ or the Department of Culture and Lands Protection (DCLP).

Masí Cho
Thank You

The Department of Culture and Lands Protection thanks you for all your hard work and appreciates your contribution to the overall success of caribou monitoring on Tłı̨cho Lands. Masí Cho!

Photo Credit: Bruno Croft, ENR, GNWT

APPENDIX D: PARTICIPANTS IN ON THE LAND CAMP MARCH 29-APRIL 2, 2014

Tlicho Community Participants

BehchokǪ̀

- Russel Drybones (Harvester)
- Frank Beaulieu (Harvester)
- Leon Ekendia (Harvester)

Whatì

- Joe Louie Moosenose (Harvester)
- Archie Zoe (Harvester)
- Richard Romie (Harvester/Community Monitor)
- Bobby Nitsiza (Harvester/Community Monitor)

Gamètì

- Joe Zoe (Harvester, Community Monitor)
- Francis Zoe
- Louie and Therese Zoe (Elders)
- Alfonse and Mary Anne Apples (Elders)
- Hunter Mantla (Youth)
- Jarrett Arrowmaker (Touth)

Department of Culture and Lands Protection (TG)

- Kerri Garner, Manager, Lands Section, DCLP
- Sean Richardson, Wildlife Coordinator, DCLP
- Janelle Nitsiza, Socio-Economic Liaison, DCLP

GNWT-ENR

- Iga Stasiak, Wildlife Veterinarian, ENR

Interpreter

- Jonas Lafferty

APPENDIX E: PRELIMINARY RESULTS OF DATA COLLECTION

Bluenose East Caribou Health and Condition Monitoring

Hunter Sample Kits Winter 2010-2014

Preliminary Results

Hunter Sampling Kits:

- Information Requested:
  - Unique individual animal identification number
  - Date of harvest
  - Location of harvest
  - Hunter name
  - Comments: general & any observed abnormalities
  - Estimated age (calf, yearling, young adult, moderate adult, old adult)
  - Sex of caribou (male or female)
  - Pregnant – visual observation of fetus (yes or no)
  - Lactation status –milk in udder (yes or no)
  - Condition – hunter assessment (skinny, not bad, fat, very fat)
  - Measurement of back fat (ruler provided)
- Samples Requested:
  - Kidney + Fat
  - Incisor bar for tooth aging
  - Metatarsus (bone marrow fat analysis)

Hunter Caribou Collection & Sampling Summary:

2010

- Total caribou sample kits submitted: 114
- Sample Collection Timing:
  - 43 harvested between January 16, 2010
    - Grandin Lake
  - 71 harvested on February 13, 2010
    - Grandin Lake
- Sex composition of harvest: 49 females, 52 males, 13 not identified

2011

- Total caribou sample kits submitted: 19
- Sample Collection Timing:
  - harvested between February 7 and February 18, 2011
    - Whati (n=17, location not specified)
- Sex composition of harvest: 12 females, 2 males, 5 not identified

2012

- Total caribou sample kits submitted: 40
- Sample Collection Timing:
  - 32 harvested between on February 23, 2012 (Grandin River, Grandin Lake)
  - 8 harvested March 4-5, 2012 (Location not specified)
- Sex composition of harvest: 31 females, 6 males, 3 not identified

2013

- Total caribou sample kits submitted: 50
- Sample Collection Timing:
  - All harvested between on March 22-23, 2013 (Hottah Lake)
  - 8 harvested March 4-5, 2012 (Location not specified)
- Sex composition of harvest: 20 females, 6 males, 24 not identified

2014

- Total caribou sample kits submitted: 70
- Sample Collection Timing:
  - All harvested between on March 30th- April 1st, 2014 (Hottah Lake)
- Sex composition of harvest: 55 females, 5 males, 10 not identified

Age

Teeth submitted to Matson's Laboratory for exact age determination by cementum analysis for 2010 to 2013.

2010

Estimated Age of Harvest (hunters):

- Cows
  - 1 calf
  - 5 yearlings
  - 32 adults
- Bulls
  - 6 calves
  - 16 yearlings

- 24 adults
- 28 age not recorded

Tooth Cementum Age

2010

Age Range: 1- 11
Gender: M (bull).F (cow).U (unspecified)
N= 35

Age	Number of Animals	M.F.U
1	5	4.1.0
2	11	3.3.5
3	10	6.1.3
4	2	2.0.0
5	4	2.0.2
6	0	0.0.0
7	1	0.1.0
8	0	0.0.0
9	1	0.1.0
10	0	0.0.0
11	1	0.0.1

2011

Tooth Cementum Age

Age Range: 1- 13
Gender: M (bull).F (cow).U (unspecified)
N=16

Age	Number of Animals	M.F.U
1	3	0.2.1
2	0	0.0.0
3	4	0.3.1
4	1	0.0.1
5	1	0.1.0
6	1	1.0.0
7	3	0.2.1
8	1	0.1.0
9	0	0.0.0
10	1	0.1.0
11	0	0.0.0
12	0	0.0.0
13	1	0.1.0

2012

Tooth Cementum Age

Age Range: 1- 9
Gender: M (bull).F (cow).U (unspecified)
N=36

Age	Number of Animals	M.F.U
1	1	0.1.0
2	5	1.4.0
3	8	1.6.1
4	9	2.6.1
5	3	0.2.1
6	2	0.2.0
7	4	0.4.0
8	0	0.4.0
9	4	0.4.0

2013

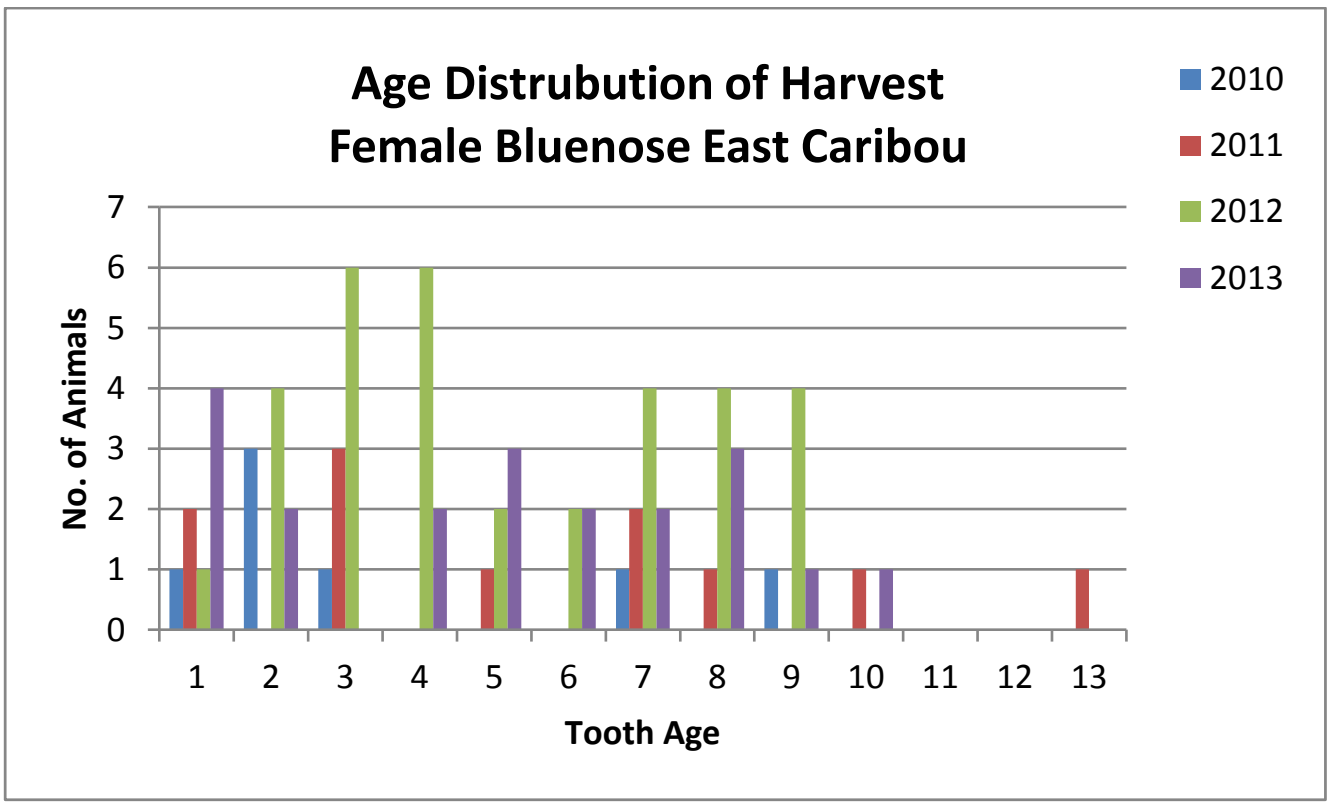
Tooth Cementum Age

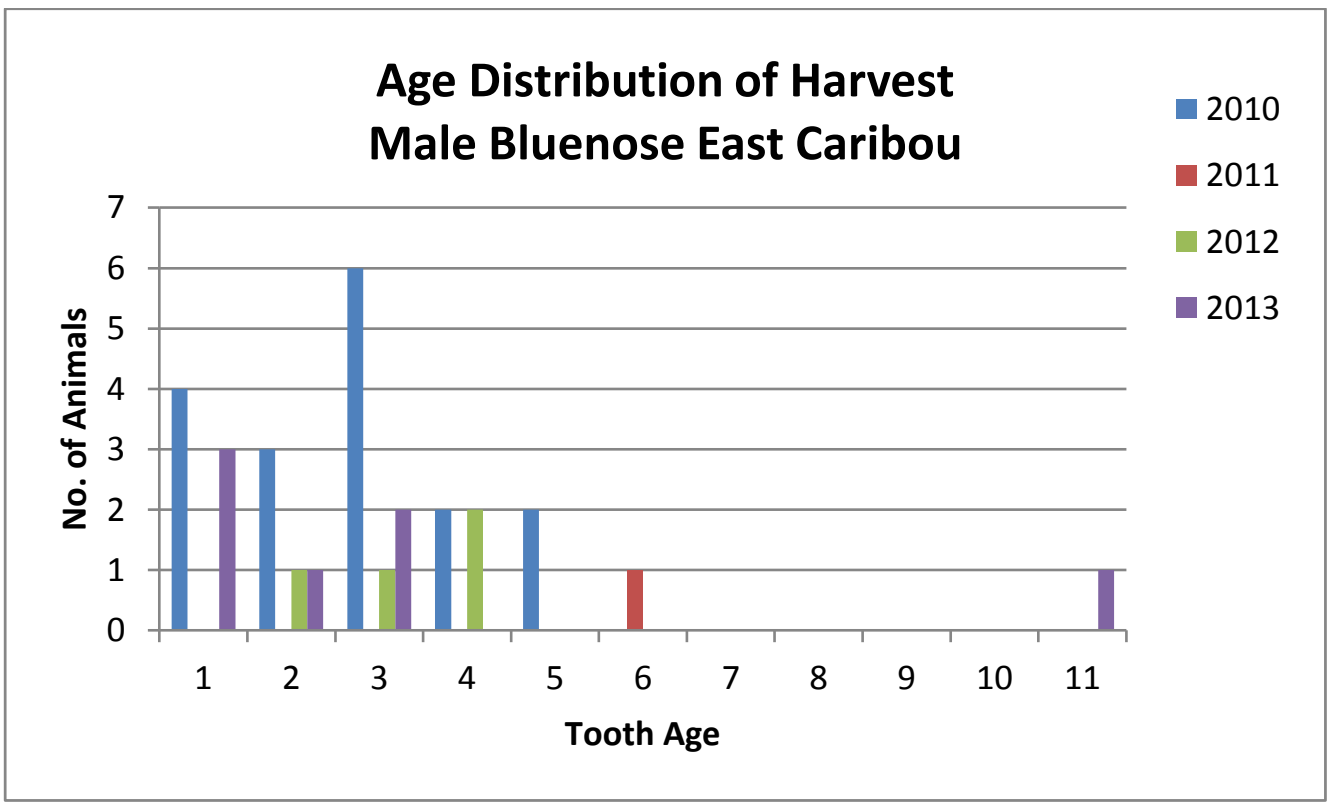
Age Range: 1- 13
Gender: M (bull).F (cow).U (unspecified)
N=29

Age	Number of Animals	M.F.U
1	8	3.4.1
2	3	1.2.0
3	2	2.0.0
4	2	0.2.0
5	3	0.3.0
6	2	0.2.0
7	2	0.2.0
8	3	0.3.0
9	1	0.1.0
10	1	0.1.0
11	1	1.0.0
12	0	0.0.0
13	1	0.1.0

2014 Age pending

Conclusion: a lot of young animals harvested in 2013. This could suggest recruitment into the population which is good.





Field Assessment of Condition (hunters):

An assessment of the body condition of each caribou was done by hunters using a subjective condition score with four categories (*skinny*, *not bad*, *fat* and *very fat*). Hunter assessments suggested caribou were generally in generally good body condition for the age, sex and time of year, with a range in condition scores for each sampling interval.

2010

Not assessed

2011

- Cows
  - Very fat: 0
  - Fat: 2
  - Not bad: 9
  - Skinny: 1

- Bulls
  - Very fat: 0
  - Fat: 0
  - Not bad: 0
  - Skinny: 2
  - Not recorded: 6

2012

- Cows
  - Very fat: 0
  - Fat: 6
  - Not bad: 21
  - Skinny: 2

- Bulls
  - Very fat: 0
  - Fat: 0
  - Not bad: 6
  - Skinny: 0
  - Not recorded: 5

2013

- Cows
  - Very fat: 0
  - Fat: 3
  - Not bad: 11
  - Skinny: 6

- Bulls
  - Very fat: 0
  - Fat: 0
  - Not bad: 1
  - Skinny: 5
- Not recorded: 25

2014

- Cows
  - Very fat: 0
  - Fat: 5
  - Not bad: 44
  - Skinny: 12

- Bulls
  - Very fat: 0
  - Fat: 0
  - Not bad: 2
  - Skinny: 3
  - Not recorded: 22

Conclusions: Bulls generally in worse body condition than cows – cows generally in good body condition. This supports what we know about cows/bulls at this time of year.

Back Fat Measurements:

Back fat measurements (mm) were taken by hunters by measuring the thickness of fat over the back at the base of the tail.

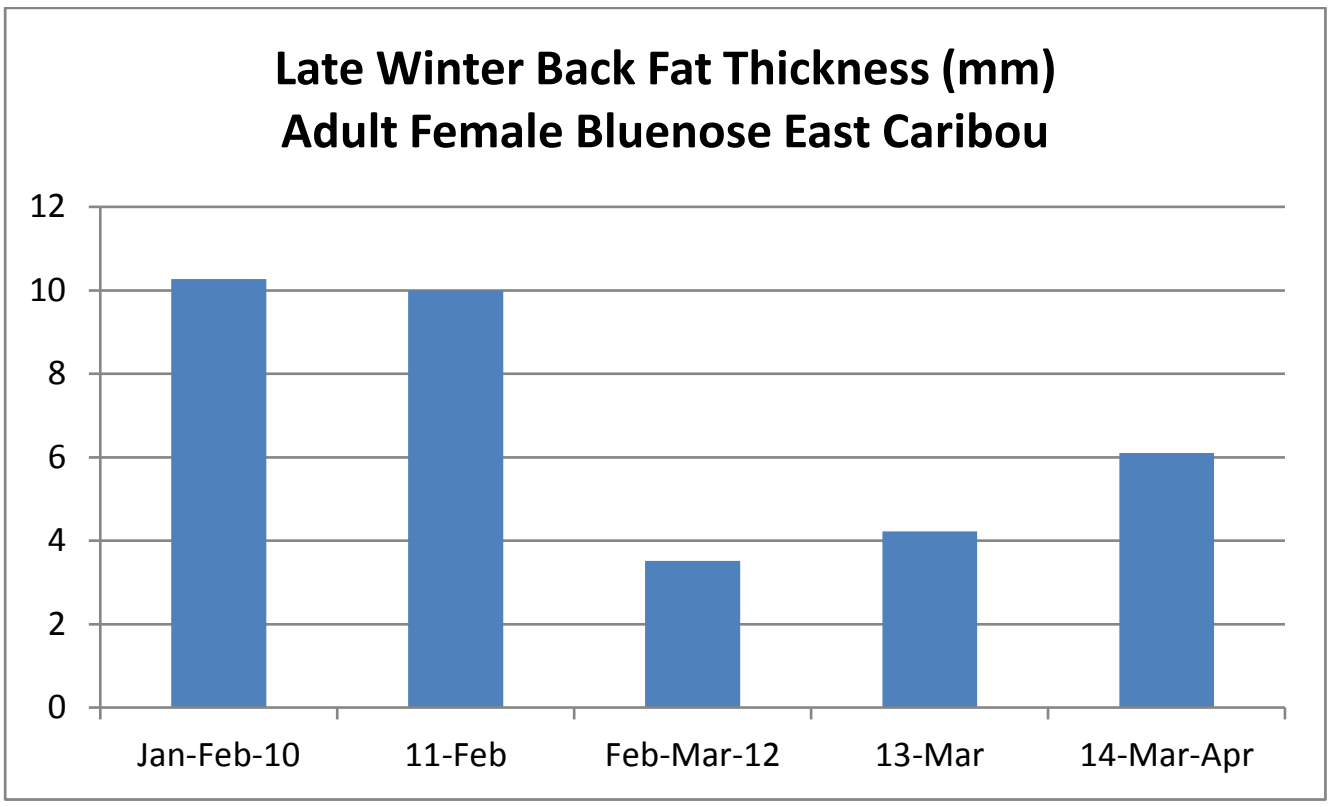
- **2010** Adult cows (n=45): mean 10.27 +/- 9.9 (range 0-38)
  Adult bulls (n=40): mean 2.35 +/- 4.0 (range 0-23)

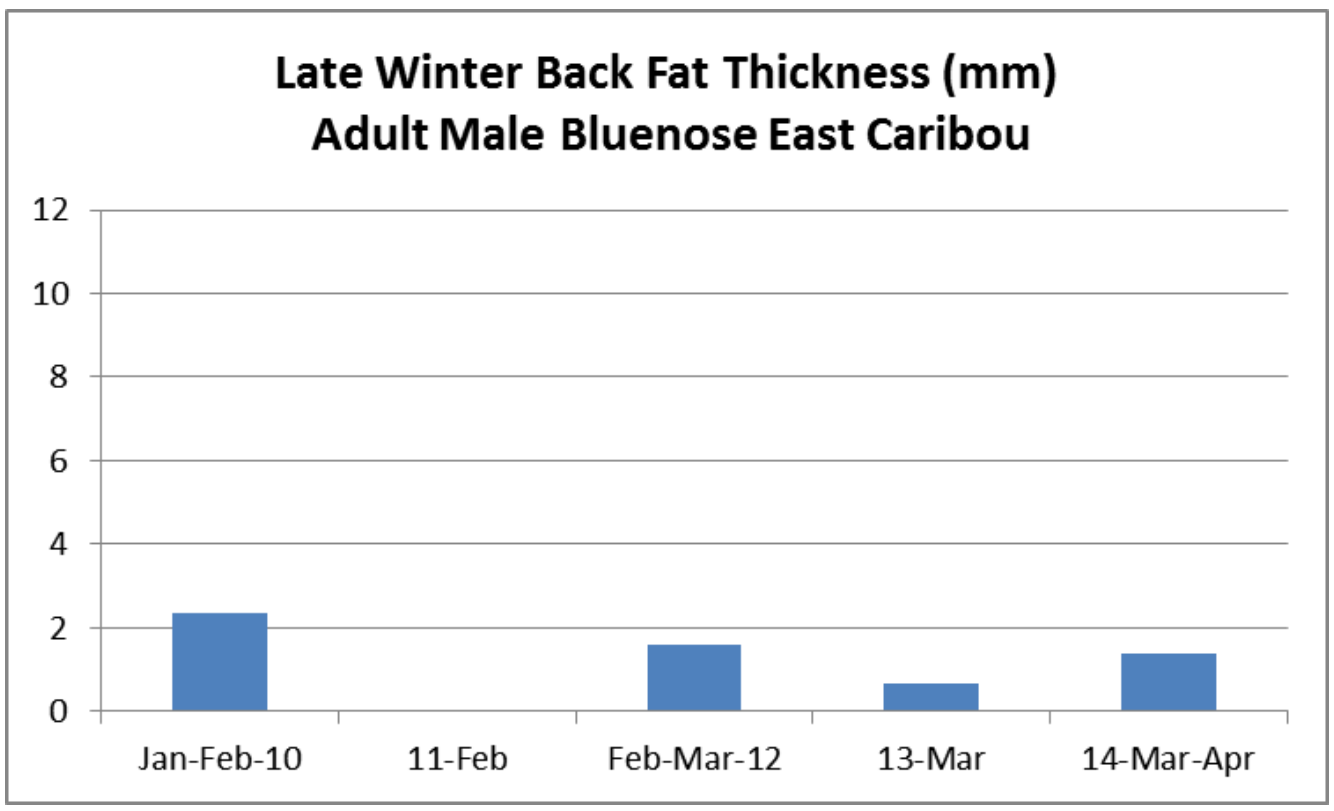
- **2011** Adult cows (n=5): mean 10.0 +/- 10.0 (range 0-20)
  Adult bulls (n=1): mean 0

- **2012** Adult cows (n=29): mean 3.52 +/- 4.46 (range 0-15)
  Adult bulls (n=5): mean 1.60 +/- 3.58 (range 0-8)

- **2013** Adult cows (n=18): mean 4.22 +/- 5.43 (range 0-15)
  Adult bulls (n=6): mean 0.67 +/- 0.82 (range 0-2)

- **2014** Adult cows (n=44): mean 6.10 +/- 7.28 (range 0-35)
  Adult bulls (n=5): mean 1.40 +/- 1.34 (range 0-3)





Conclusions: cows in generally better body condition than bulls – this supports hunter assessment of body condition data. Body condition of cows in 2014 was generally better than that in 2012 and 2013.

Kidney Fat:

Kidney fat index (KFI) is a widely used measure used as an indicator of abdominal fat reserves (Harder and Kirkpatrick 1994). Kidneys were evaluated using a standardized technique to provide a ratio of the weight of the kidney fat to the weight of the kidney X 100; the KFI is reported as a percentage and can be >100%. The amount of kidney fat was variable within and between sampling periods, with all animals having some amount of kidney fat stores.

- **2010** Adult cows (n=38): mean 58.2% +/- 27.3 (range 0.5- 114.1%)
  Adult bulls (n=39): mean 41.5% +/- 29.9 (range 12.0 – 175.8%)

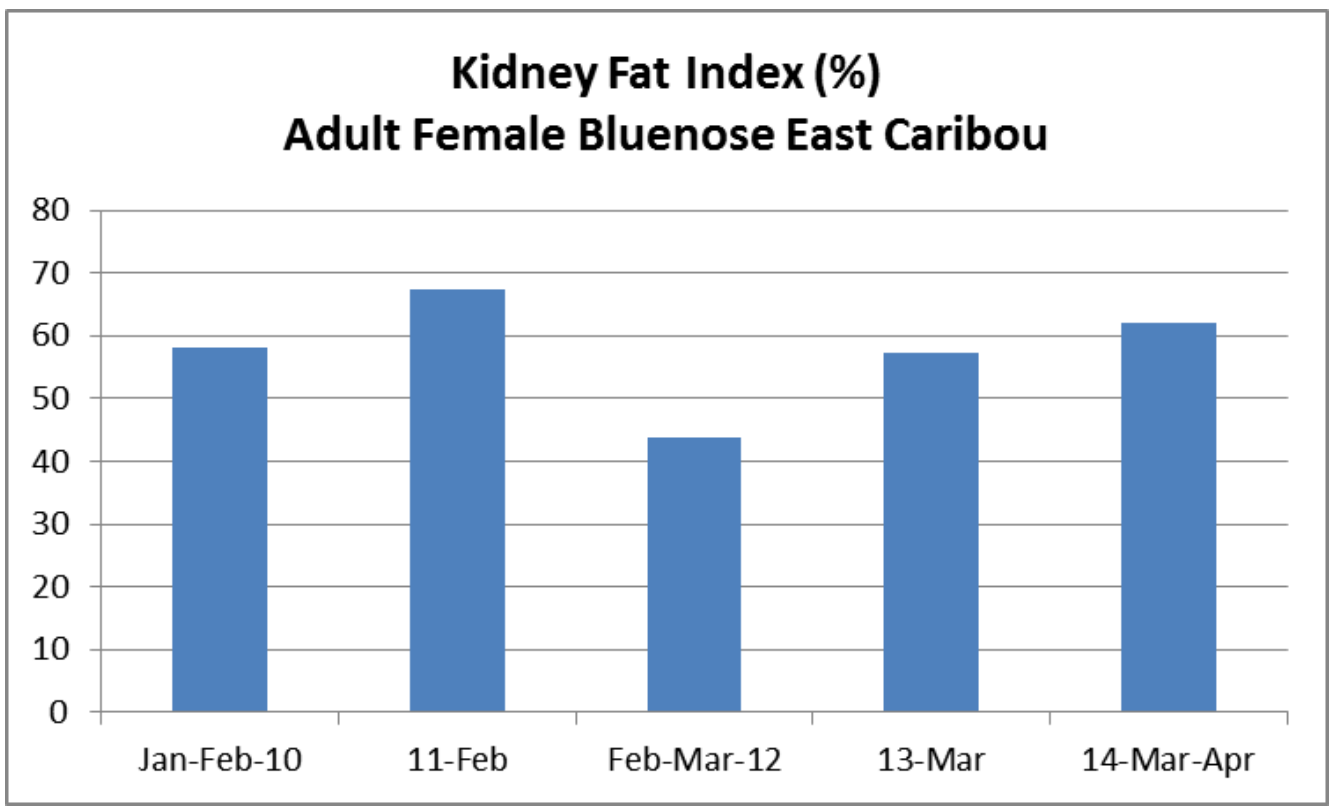
Gender not recorded (n=9): mean 42.8% +/- 7.3 (range (31.3-53.6%)

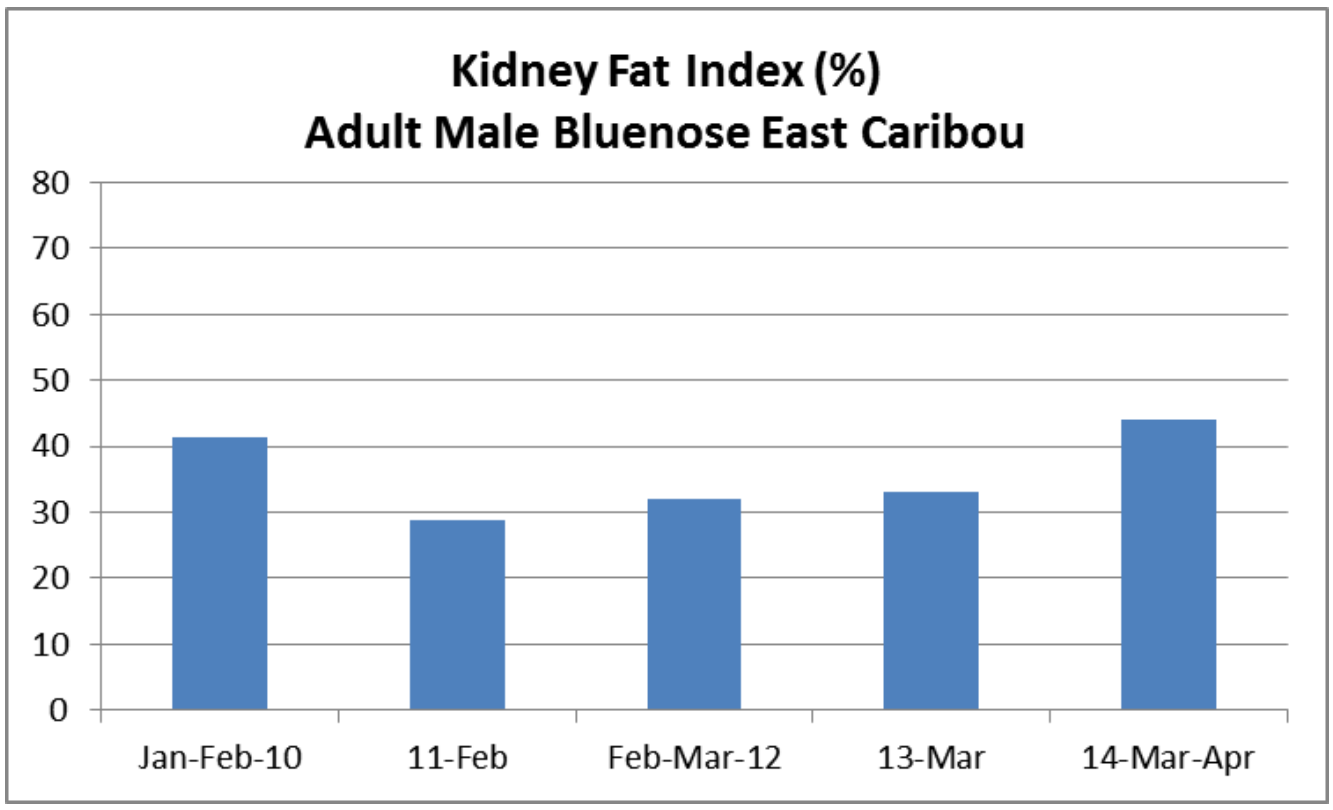
- **2011** Adult cows (n=12): mean 67.4% +/- 30.5 (range 36.6 – 155.4%)
  Adult bulls (n=2): mean 28.9% +/- 18.5 (range 15.8-42.0%)
  Gender not recorded (n=5): mean 48.9% +/- 21.6 (range (18.7-72.2

- **2012** Adult cows (n=30): mean 43.8% +/- 20.5 (range 12.43 – 92.3%)
  Adult bulls (n=6): mean 32.1% +/- 11.4 (range 20.0- 50.8%)

- **2013** Adult cows (n=21): mean 57.3% +/- 23.3 (range 25.0 – 105.1%)
  Adult bulls (n=6): mean 33.0% +/- 16.0 (range 11.5- 49.3%)

- **2014** Adult cows (n=49): mean 62.0% +/- 24.4 (range 13.0 – 129.0%)
  Adult bulls (n=5): mean 44.0% +/- 20.5 (range 25.0- 74.0%)
  Gender not recorded (n=11): mean 71.0% +/- 31.1 (range (38.0-151.0%)





Conclusions: same as above – cows in better body condition than bulls. Animals generally in good body condition. KFI >30 is generally good body condition.

Generally, there appears to be an increasing trend in back fat and kidney fat stores from 2012 to 2014.

Bone Marrow Fat:

Fat content of the bone marrow has long been related to the physiological condition of animals. Neiland (1970) reported the percent fat in the marrow of barren-ground caribou was almost identical to percent oven-dry weight. Bone marrow fat is the last reserve to be mobilized and reflects condition only at the lower end of an overall animal condition after other body fat deposits have been exhausted. The results here are reported as the % oven dry-weight of bone marrow from the metatarsus.

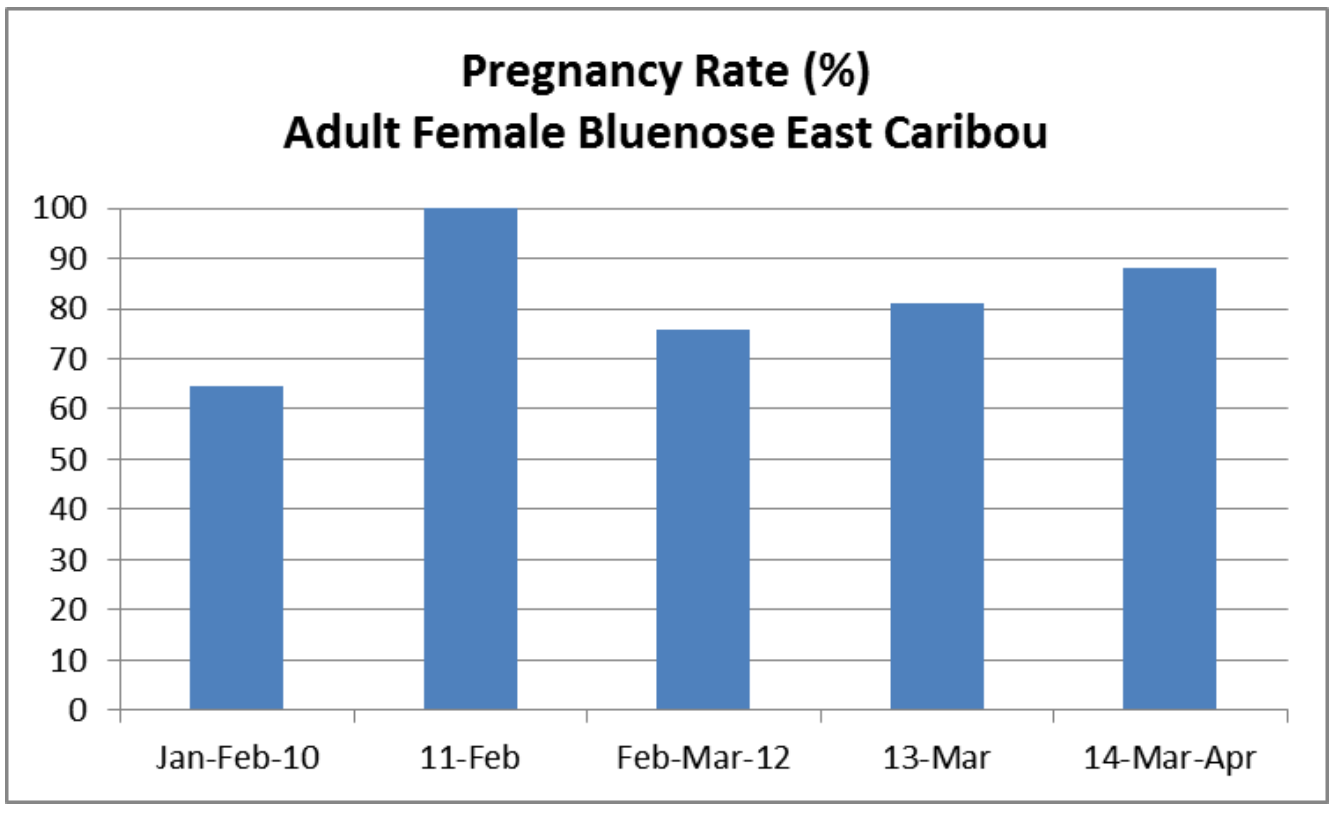
- **2013** Adult cows (n=21): mean 83.0% +/- 22 (range 37.0 – 130.8%)
  Adult bulls (n=7): mean 93.4% +/- 5.9 (range 81.5 – 97.1%)
- **2014** Adult cows (n=55): mean 92.8% +/- 5.4 (range 60.0 – 97.6%)
  Adult bulls (n=5): mean 86.6% +/- 11.0 (range 67.6 – 96.0%)
  Gender not recorded (n=10): mean 90.9% +/- 8.3 (range (68.0-97.3%)

Bone marrow fat >75% is good body condition. Based on bone marrow assessment, animals were in good body condition. Fat stores are used up in order from subcutaneous fat (under the skin) to kidney fat, to bone marrow fat. Bone marrow fat is the last to go. Generally only a good indicator of body condition at the lower end of the range, when animals are in really poor shape. In 2014, caribou had excellent bone marrow fat stores.

Pregnancy Rates:

Pregnancy rates were determined in late winter by the presence of a fetus.

- **2010** Adult cows: 31/48 (64.6%)
- **2011** Adult cows: 11/11 (100.0%)
- **2012** Adult cows: 22/29 (75.9%)
- **2013** Adult cows: 17/21 (81.0%)
- **2014** Adult cows: 44/50 (88.0%)



Pregnancy Data for Collared Caribou March 2012

Pregnancy status determined based on analysis of serum progesterone levels

2012
Pregnancy Rate: **27/37 (73.0%)**

2014
Pregnancy Rate: **7/8 (87.5%)**

Hunter assessed pregnancy rates appear to be in line with those found through analysis of serum (blood) progesterone levels from collared caribou at the time of collaring.

Kidney Fat Index in Relation to Pregnancy

- **2010** Pregnant (n=25): mean 64.6% +/- 26.2 (range 3.2- 114.1%)

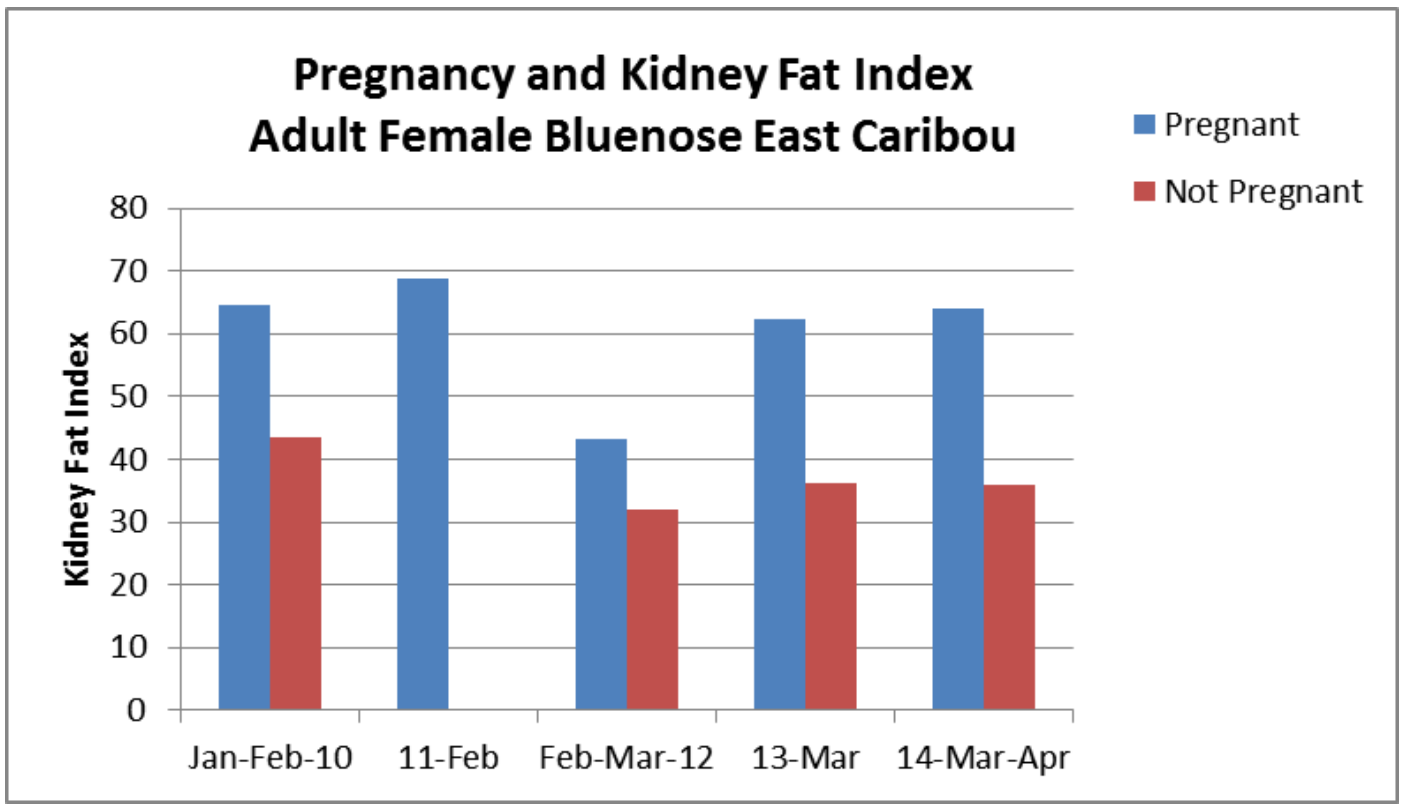
Not Pregnant (n=12): mean 43.6% +/- 27.3 (range 0.5 – 95.1%)

- **2011** Pregnant (n=11): mean 68.8% +/- 31.6 (range 36.6 – 155.4%)

- **2012** Pregnant (n=22): mean 43.2% +/- 18.2 (range 12.43 – 73.5%)
  Not pregnant (n=6): mean 31.9% +/- 12.2 (range 16.6- 50.0%)

- **2013** Pregnant (n=17): mean 62.2% +/- 21.9 (range 35.5 – 105.1%)
  Not pregnant (n=4): mean 36.3% +/- 18.3 (range 25.0- 63.4%)

- **2014** Pregnant (n=40): mean 64.0% +/- 23.3 (range 16.0 – 129.0%)
  Not Pregnant (n=4): mean 36.0% +/- 29.8 (range 13.0- 79.0%)



Pregnant caribou generally appear to have higher kidney fat index (aka better body condition) than those that were not pregnant. This supports the importance of good body condition in maintaining reproductive potential of the herd.

Generally, animals appeared to be in better body condition in 2014 than in the previous two years. This was reflected by a higher recorded pregnancy rate. Since interpretation is limited by a small sample size, trends are not statistically validated, however, they do give some indication of the health status of the herd. The sample size obtained in 2014 was larger than that in previous years which gives more strength to the data.

APPENDIX F: PARTICIPANTS IN CIMP RESULTS WORKSHOP, MARCH 16-17, 2014

Name	Position
Louie Zoe	Tłı̨cho̜ Elder from Gamètì
Charlie Gon	Same Above
Alfonse Apples	Same Above
Joseph Judas	Tłı̨cho̜ Elder from Wekweètì
Jimmy Kodzin	Same Above
Jimmy Nitzisa	Tłı̨cho̜ Elder from Whatì
Robert Mackenzie	Tłı̨cho̜ Elder from Behchokǫ̀
Charlie Apples	Same Above
Harry Apples	Same Above
Brett Wheler	A/Executive Director, Wek' èezhìi Land and Water Board (WLWB)
Elissa Berrill	Regulatory Specialist, WLWB
Kerri Garner	Manager, Lands Section, DCLP
Sean Richardson	Wildlife Coordinator, DCLP
Sjoerd Van der Wielen	GIS Coordinator, DCLP
Janelle Nitsiza	Soci-Economic Liason, DCLP
Georgina Chocolate	Senior Traditional Knowledge Researcher, DCLP
Paul Vecsei	Biologist, Golder Associates
Boyan Tracz	Wildlife Biologist, WRRB
James Rabesca	Translator