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Wildlife Research Permit Application

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APPLICANT: Terry Armstrong, Bison Ecologist, Wildlife and Fish Division

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SPONSOR(S): Department of Environment and Natural Resources (ENR), GNWT

FUNDING SOURCE(S): ENR, GNWT

ADDITIONAL LICENCES REQUIRED: None

PROJECT TITLE: Mackenzie Bison Population Monitoring

RATIONALE:

The Mackenzie population is one of three populations of wood bison in the NWT. Due to the low numbers and limited range of wood bison they are listed as Threatened both nationally and in the NWT. Their management is prescribed by the NWT *Wood Bison Recovery Strategy* and the *Mackenzie Bison Management Plan*.

The management plan calls for periodic surveys to estimate abundance and monitor herd composition. Population monitoring is especially important for wood bison in the NWT because they are listed as Threatened under both the NWT and federal Species at Risk Acts and NWT populations are hunted. Harvesting from the Mackenzie population will be re-opened in 2021 because the population had recovered sufficiently from the 2012 anthrax outbreak to meet the criteria in the management plan. Ongoing monitoring provides the information needed to determine if the harvest is sustainable at the population's current abundance. Abundance was last estimated in 2019 and the next survey is planned for 2023.

Abundance is estimated from aerial surveys every 3-4 years depending on results of the previous survey. Annual composition surveys provide data that help us detect changes in herd productivity, expressed as calf-to-cow and yearling-to-cow ratios, and changes in the ratio of breeding age males to females. These data are useful for evaluating the impact of selective hunting, differential mortality due to anthrax and other causes of death, and predation on calves.

Monitoring for anthrax-related deaths is done systematically each summer and monitoring for other diseases is done opportunistically, i.e. when ENR can sample animals harvested or killed on the highway. *Brucella abortus* (causes brucellosis) and *Mycobacterium bovis* (causes tuberculosis) have not been detected in the Mackenzie bison population. The Bison Control Area program is designed to provide a measure of protection against the spread of these disease from Wood Buffalo National Park or the Slave River Lowlands by the maintenance of a bison free zone to prevent contact of infected and non-infected bison. Monitoring the Mackenzie population for diseases provides a measure of the effectiveness of the Bison Control Area program and an assessment of the herd's disease status.

The Mackenzie Bison Management Plan identified knowledge gaps important to making management decisions, some of which can only be addressed by collecting data from telemetry collars on bison. These include determining seasonal and annual habitat use and movement patterns in the range overall, and especially near the community of Fort Providence and along the highway; providing information on where to survey to estimate bison numbers; where to look for bison on anthrax surveillance flights and classification surveys; and estimating the proportion of animals missed on population surveys and anthrax surveillance. Twenty-six female bison were fitted with GPS collars in March 2021. These data will also contribute to Laval University's Sentinel North project investigating food web dynamics among large mammals, and food security.

TIME PERIOD: 1 June 2021 - 31 December 2025

Please note: this application is for a 5-year period

LOCATION AND NEAREST COMMUNITY: Between Fort Providence and Behchokǫ̀

SPECIES STUDIED: Wood Bison

PROJECT LEADER: Terry Armstrong, Bison Ecologist, Wildlife and Fish Division, ENR

PROJECT PERSONNEL: Naima Jutha, Wildlife Veterinarian, Wildlife and Fish Division, ENR
Liam Case, Wildlife Technician, South Slave Region, ENR
Judy Williams, Wildlife Biologist, Wildlife and Fish Division, ENR
Renewable Resource Officers, ENR
Community-based participants

OBJECTIVES:

- Estimate calf-, yearling-, and bull-to-cow rations during the post-calving period.
- Estimate density and abundance of bison in the population.
- Monitor for anthrax-related deaths.
- Monitor for the presence of brucellosis and tuberculosis as well as other diseases and parasites.
- Monitor movements of collar-marked female bison and relate movements to habitat use, habitat selection and home ranges.
- Investigate deaths of collar-marked bison.

METHODS:

In July or August, bison will be classified as calves, yearlings, cows, juvenile bulls, sub-adult bulls or mature bulls. A helicopter will be used to survey the area; observers will be placed on the ground and will use binoculars and recording devices to classify bison. A drone (Unmanned Aerial System) may also be used on classification surveys.

In coordination with the composition survey, we will also conduct biweekly, fixed-wing flights of the core range to look for bison carcasses, which are usually the first indication of an anthrax outbreak in northern bison. These surveys are done between late June and mid-August. If anthrax-suspected mortalities are detected, the AERP will be activated and carcasses will be sampled and treated according to this plan. An increase in aerial surveillance would also occur if anthrax is suspected. Locations of collared female bison will be used to help find bison to classify and areas bison are using to monitor for anthrax.

Monitoring for tuberculosis and brucellosis will be done opportunistically when suspect cases are found or reported to ENR staff.

Tissue samples from bison may be collected from harvested bison, animals killed by motor vehicles, or other dead bison as opportunities arise. When collars indicate the bison wearing it is no longer moving, the animal is either dead or the collar has fallen off. These cases will be investigated to determine cause of death, if possible, and to collect tissue samples and retrieve the collar.

Population size and density will be estimated from an aerial survey conducted in late February to early March. Observers are critical to the success of population surveys and they will be hired from communities in and around the Mackenzie bison range, if possible. We estimate bison density and abundance using Distance Sampling methods. All observations of large mammals seen on bison surveys are recorded. In previous surveys, it was possible to estimate density of moose as well as bison in the study area. There is an ongoing study to determine if moose estimates obtained on bison surveys are comparable to results obtained on surveys designed specifically to estimate moose density using a Geospatial Population Estimation method (GSPE).

Bison fitted with GPS collars (collared under Wildlife Research Permit WL500919) will be monitored under this research permit. If additional collars are recommended to be deployed on Mackenzie bison, a

separate wildlife research permit would be obtained for the capture and collar deployment on any new animals.

CURRENT CONSULTATION:

The *Mackenzie Bison Management Plan* was developed by a working group made up of members from Deh Gáh Got'îê First Nation, Fort Providence Métis Council, the Hamlet of Fort Providence, NWT Métis Nation, Community Government of Behchokǫ̀, Tłı̨chǫ Government, North Slave Métis Alliance, Yellowknives Dene First Nation, Northwest Territories Wildlife Federation and ENR. Working group members brought their knowledge, input, and perspectives from their respective communities, and helped keep their communities informed of progress as they worked together to create the plan. Monitoring of the Mackenzie wood bison population has been supported by the communities in and around this population's range and they have received annual reports on work under previous Wildlife Research Permits. Results have also been presented at South Slave Regional Wildlife Workshops and presented to the Mackenzie Bison Working Group.

FUTURE COMMUNITY CONSULTATION:

ENR will report on this work to the Mackenzie Bison Working Group, the communities and agencies listed in the attached Distribution List and other interested parties. Results will also be presented a Regional Wildlife Workshops.

OPPORTUNITES FOR LOCAL PARTICIPATION:

Observers from local communities have flown on all recent population surveys and will continue to participate on future fixed-wing aerial surveys and others as opportunity permits.

MANAGEMENT OR RECOVERY PLANS:

All activities proposed in this permit follow from the *Mackenzie Bison Management Plan*.
Objectives of this program support management approaches in the *Recovery Strategy for Wood Bison (*Bison bison athabascae*) in the Northwest Territories*:

Management Approach 2.1 Manage wood bison harvest to be sustainable for the benefit of all people in the NWT.

Regular estimates of population size are required to implement sustainable harvest management and to assess the impact of previous harvest management. Monitoring herd composition is a simple and inexpensive addition to periodic population estimates that can help understand changes in population size.

Management Approach 3.1 Monitor health in all populations.

Surveillance for anthrax and monitoring for other diseases provides information on the status of the population's health and supports management and recovery decisions.

Management Approach 3.6 Develop studies to learn what factors regulate population size of bison in the NWT.

Surveillance for anthrax and monitoring for other diseases provides information on the status of the population's health and supports management and recovery decisions.

Distribution List

Deh Gáh Got'îê First Nation
Email: rm@dehgahgotie.ca, ed@dehgahgotie.ca

Fort Providence Métis Council
Email: finance_pvmetis@northwestel.net

Lands Administration Officer
Tlicho Lands Protection Department
Tlicho Government
Email: tyannasteinwand@tlicho.com

Land and Environment Coordinator
Yellowknives Dene First Nation
Email: saraht@ykdene.com

Lands and Resource Manager
North Slave Métis Alliance
Email: Catherine.Fauvelle@nsma.net

Executive Director
Wek'èezhìı Renewable Resources Board
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