

WILDLIFE RESEARCH PERMIT APPLICATION
MACKENZIE BISON POPULATION MONITORING
2019-2024

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3. **SPONSORS:** Department Environment and Natural Resources.

4. **PROJECT LEADER:** Dr. Terry Armstrong

5. **PERSONNEL:** Dr. Terry Armstrong, Bison Ecologist, ENR
Madison Hurst, Wildlife Technician, South Slave Region, Fort Smith, NT.
Judy Williams, Wildlife Biologist, Yellowknife, NT
Heather Fenton, Wildlife Disease Specialist, Yellowknife, NT.
Dean Cluff, Regional Biologist, North Slave Region, Yellowknife, NT
Kelvin Kotchilea, RRO, Behchokò, NT
Edward Landry, RRO, Fort Providence, NT
Brad McInnes, RRO, Fort Providence, NT
Community representatives

6. **SPECIES:** Bison

7. **LOCATION:** Fort Providence and Behchokò areas

8. **PERIOD:** January 2019 – December 2024

9. **OBJECTIVE AND METHODS:**

Objectives

- ◆ To estimate calf, yearling, and bull to cow ratios during the post-calving period.
- ◆ To monitor the Mackenzie bison population for the presence of brucellosis and tuberculosis in addition to other diseases and parasites.
- ◆ To monitor the Mackenzie herd for the occurrence of anthrax related mortalities in summer. If any suspected anthrax mortalities are detected, the Anthrax Emergency Response Plan (AERP) would be activated and carcasses would be dealt with according to this plan.
- ◆ To estimate density and number of bison in the Mackenzie population.

Methods

- ◆ In June or July, bison will be classified into the following categories: calves, yearlings, cows,

- juvenile bulls, sub-adult bulls and 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.
- ◆ Monitoring for tuberculosis and brucellosis will be done opportunistically when suspect cases are reported to ENR staff.
 - ◆ In coordination with the composition survey, we will also conduct biweekly fixed-wing flights of the core range (i.e., Falaise, Bologne, Calais, Mink & Mills Lakes, Birch Lake and north) to determine whether there are any fresh bison carcasses during the summer anthrax season.
 - ◆ 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.
 - ◆ Tissue samples from bison may be collected from bison harvested or killed by motor vehicles as opportunities arise.
 - ◆ Population size and density will be estimated from an aerial survey conducted in late February to early March 2019 and again in 2022 or 2023. Observers will be hired from Fort Providence and Behchok̄ if possible.
 - ◆ Bison density is currently estimated used Distance Sampling methods.
 - ◆ All observations of large mammals observed on bison surveys are recorded. In previous surveys, it was possible to estimate moose density from these observations. There is an ongoing study to determine if moose estimates obtained on bison surveys is comparable to results obtained on surveys designed specifically to estimate moose density using a Geospatial Population Estimation method (GSPE).

10. **FUNDING SOURCES:** Department of Environment and Natural Resources, GNWT.

11. **ADDITIONAL LICENCES:** N/A

12. **TITLE:** Mackenzie Wood Bison Population Monitoring 2019-2024

13. **RATIONALE:**

The Mackenzie bison population is currently afforded a measure of protection against infection with *Brucella abortus* (causes brucellosis) and *Mycobacterium bovis* (causes tuberculosis) by the maintenance of a bison free zone to prevent contact with infected bison from Wood Buffalo National Park. Monitoring the Mackenzie population for these diseases provides a measure of the effectiveness of the bison control program and an assessment of the herd's disease status.

The Mackenzie wood bison population is the result of the first attempt to re-establish a wild, free-ranging population of wood bison outside of the Wood Buffalo National Park (WBNP) and Slave River Lowlands area. Sixteen wood bison were captured in WBNP in the winter of 1963 and released near Fort Providence that summer. From this release, the 16 bison increased to 2400 animals by 1989. Hunting was initiated in 1988 with a quota for males only. A limited cow quota was implemented in 1996. By 2000, the Mackenzie population had declined to about 2000 animals but had expanded its range outside the Mackenzie Bison Sanctuary both west and north, and some had become established north-east of the North Arm of Great Slave Lake.

In addition to rapid population increase in the early years, there have also been some catastrophic losses from the Mackenzie population. In 1989, 177 bison drowned after floundering in spring ice; in 1993, 172 bison died from anthrax; and in July and August of 2012, the Mackenzie population suffered the largest reported anthrax outbreak in northern Canada when at least 440 animals died. In response to this loss of animals, all hunting of the population was initially halted for at least one year, but it has remained closed as recommended in the Mackenzie

Bison Management Plan in an effort to enable the population to recover so sustainable harvesting can be reinstated.

In 2008 and 2012, ENR conducted aerial surveys and estimated there were over 1500 bison in the Mackenzie herd, down about 20% from previous estimates in 1998 and 2000. Following the 2012 anthrax outbreak the population was estimated at 700 in 2013 and 850 in 2016. The next estimate is planned the winter of 2019.

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.

The Mackenzie Bison Management Plan identified a number of 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; estimating survival rates; 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.

14. COMMUNITY CONSULTATION:

Communities will receive project updates through program reports as they become available, meetings with department staff, and community representatives will be hired to participate in the research program.

15. ENDORSEMENTS:

See attached recommendation form.

Distribution List:

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Recommendation Form NWT Wildlife Research Permit

The Committee or Board

Name: _____

Community: _____

SUPPORTS or DOES NOT SUPPORT

the application of:

Dr. Terry Armstrong
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Fax: 867-872-4250
Email: Terry_Armstrong@gov.nt.ca

for the issue of a Wildlife Research Permit.

Signature: _____ **Date:** / /

of President, Committee or Board.

Title of project: Mackenzie Bison Population Monitoring 2014-2024

Recommended Terms and Conditions:

Reasons for decision: