North Slave Region Moose Population Survey – Additional Information

Note: Because the Wildlife Research Permit application form requests that text sections be limited to < 100 words, more information is provided here, should any Indigenous Government or Indigenous Organizations want to review the proposed project and activities in more detail.

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Rationale:

Moose are an important food source for resident and Indigenous hunters in the NWT, including the North Slave Region. Harvest pressure on moose may increase as harvest restrictions on barren-ground caribou continue and new public access through roads increases (e.g., Tłı̨chǫ Highway). Further proposed infrastructure such as the Arctic Security Corridor project could significantly increase public access to the Taiga Shield ecozone effectively applying more harvest pressure to the moose population there.

Moose population surveys are periodically conducted in the North Slave region to obtain population abundance and density estimates within the Taiga Shield and Taiga Plains ecozones, as well as fall sex and calf:cow ratios ('composition surveys'), to evaluate population trend and sustainability of moose harvest in the region. Previous surveys have been completed in 2004, 2007, 2012, 2016, and 2021. It has been 5 years since the last survey was completed. The goal of this project is to conduct another distance-based regional moose survey following similar study area boundaries and transects as used in the 2016 and 2021 surveys to provide comparable abundance and density estimates of moose. Survey results from 2021 (D.Cluff unpublished data) indicated an overall decline in moose density from the previous survey in 2016, dropping from 4.9 moose/100 km^2 to 3.1 moose/km^2. It is important to obtain another population density estimate to assess whether this decline has continued.

Under the Wildlife Management and Monitoring Plan (GNWT 2023) for the Tłı̨chǫ HWY, aerial moose abundance surveys were to be conducted before, during and after the construction of the road to assess whether the new access for harvesting moose created by the road might lead to a decline in moose abundance along the road corridor. In 2019, it was recommended to combine the regional North Slave moose abundance survey with the Tłı̨chǫ HWY moose abundance survey to ensure a sufficient sample size of moose observations was obtained (Rettie 2019). The Tłı̨chǫ HWY area was surveyed in 2021 before the road opened for public use, and

this survey will provide another abundance estimate to evaluate changes in moose abundance since the road opened.

Survey results coupled with age structure information obtained from tooth ageing of harvested moose will contribute to population trend analysis and modeling.

Objectives

- Conduct a fixed-wing aerial survey to measure calf:cow ratio and adult bull:cow ratio of moose within a subset of the larger moose abundance survey area during November/December 2025 (Figure 1).
- Conduct a fixed-wing aerial distance-based survey to measure moose abundance and density within the Taiga Shield and Taiga Plains ecozones north of Great Slave Lake (see map included in supplementary information attached to this application) in March 2026 (Figure 1).
- Record incidental sightings of other wildlife species seen during the survey.
- Compare abundance estimates from this survey to estimates from previous surveys to evaluate moose population trends in the region.

Key expected outcomes and deliverable from the project are:

- Brief summary report sent to Indigenous Governments and Indigenous Organizations, and the Wek'èezhìı Renewable Resources Board, shortly after completion of the survey with preliminary results.
- Comprehensive report with moose composition, abundance and density estimates with associated measures of uncertainty, and an assessment of regional moose population trends relative to results from previous surveys.

Time Period:

Previous moose surveys have occurred in November because the sightability of moose is good (leaves off trees, snow on the ground) and to take advantage of bulls still having their antlers, which allows reliable distinction from cows. However, weather in November can be problematic for flying and seems to be getting worse. Weather seriously impeded the 2016 moose survey where the lake effect is encountered (Cluff 2018).

Consequently, only the sex ratio component of the survey will be done in November/December and the abundance component will be conducted in March. Cold, clear long days will allow full-day flying while still having good visibility for detecting moose.

The fall composition survey in November or December 2025 will require a minimum of four days to complete using one plane.

The late-winter abundance survey during March 2026 will take a minimum of 10 days to complete using two planes.

Methods:

The 2025/26 moose composition and abundance survey will follow the same methods, and use the same survey transects and strata as used in the 2016 and 2021 surveys to ensure comparability of survey results and allow for an evaluation of population trend over time.

The survey for abundance will be flown with two aircraft (Found Bushhawk, Cessna 185, or similar) simultaneously, at 120-185m above ground at 160-185 kph (in calm wind conditions) over a survey area of over 44,000 km2 using a distance-based survey design (Buckland et al. 2001). Although past moose surveys (2004, 2007, and 2012) have used the geospatial survey design, the North Slave Region survey area doubled in 2016 and 2021 to include all the North Slave communities (Cluff 2018). Therefore, conducting a geospatial survey is not practical given the additional cost and low density of moose. In Alberta, distance-based sampling was more efficient in flight-hours than grid-cell based surveys while providing population estimates with similar or higher precision (Peters et al. 2014). The survey area will be split into separate strata to provide separate abundance estimates for the Taiga Shield and Taiga Plains (Tłı̨chǫ HWY) areas. The stratum south of Great Slave Lake around Łutselk'e flown in 2016 and 2021 will not be included in this survey due to budget limitations but may be flown separately in the subsequent fiscal year (26/27). A separate wildlife research permit to survey the area around Łutselk'e will be applied for at that time. A map of the proposed 2025/26 survey area, abundance survey transects and fall composition survey routes is provided in Figure 1.

Animals close to the plane and in groups have a greater probability of being detected by observers. Therefore, the perpendicular distance from the transect center line to the sighting location is needed to subsequently estimate and model visibility bias (Buckland et al. 2001). Sightability correction in distance-based surveys may provide more accurate estimates than grid-cell surveys (Peters et al 2014). Sightings of animals will be recorded by GPS (Global Positioning System) waypoints along the transect line at first discovery and at the actual location. To do this, the plane will break away from the transect line to obtain a GPS waypoint of the actual sighting location. The plane would circle the individual or group to count the number of animals present and take a picture. The aircraft will then return directly to the transect and resume flying the survey line. Transects are spaced either 4 or 8 km apart and linked to the grid used for geospatial surveys. A 4-km transect spacing is used in the Tłı̨chǫ HWY area, to improve precision of an abundance estimate for moose in that area. Other factors potentially affecting moose detection like percent tree cover, cloud cover/light conditions will also be recorded. Data analysis will be completed with the '*Distance*' package within R.

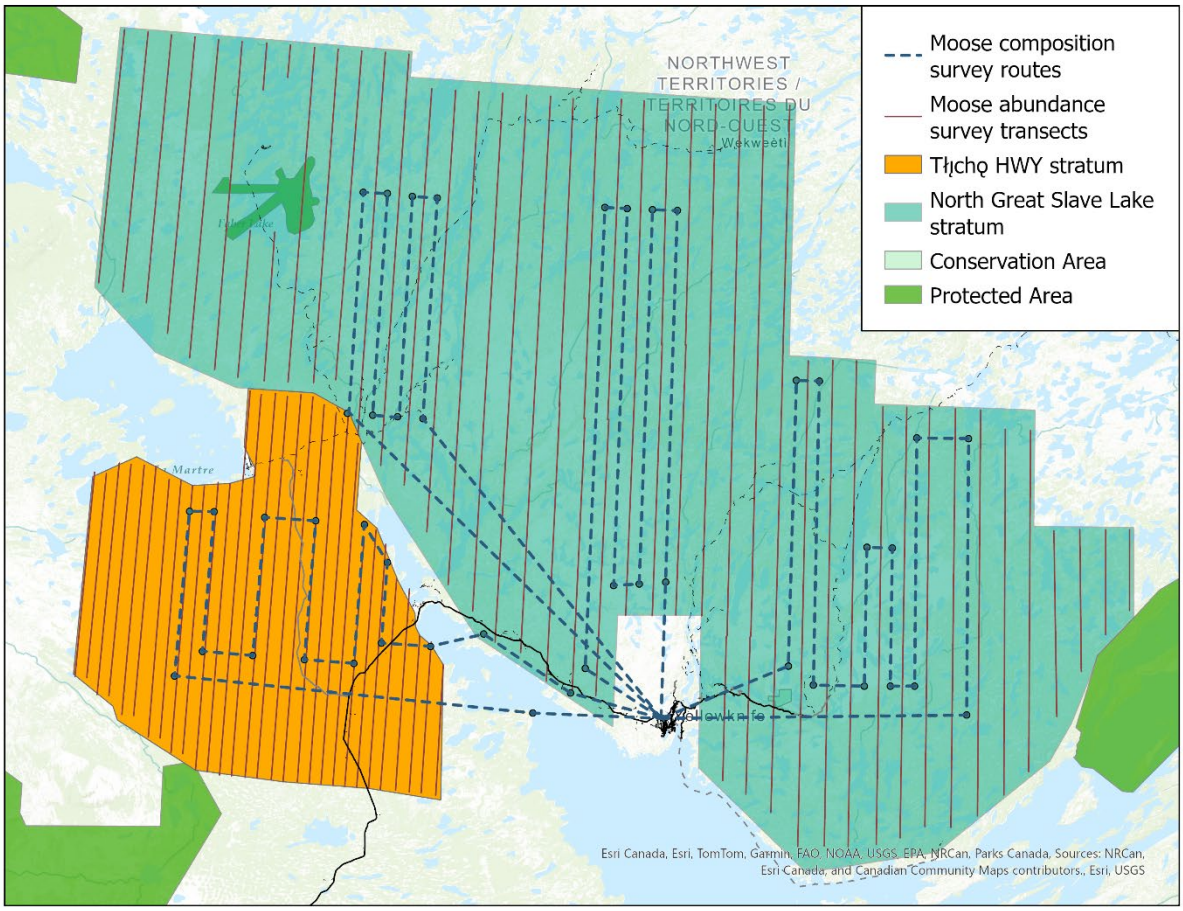

Figure 1. Proposed moose population survey area, divided into two strata – North Great Slave Lake and Tłı̨chǫ HWY. Abundance survey transects (solid lines) are spaced 10 km apart in the North Great Slave Lake stratum, and 4 km apart in the Tłı̨chǫ HWY stratum.

Community Consultation

Ongoing consultation with Indigenous Governments (Tłı̨chǫ Government, North Slave Métis Alliance, Yellowknives Dene First Nation, and Łutsël K'é Dene First Nation) and the Wek'èezhìı Renewable Resources Board, will continue through this application for a wildlife research permit. GNWT-ECC is happy to meet with these organizations to answer any questions about the permit application that may arise.

Opportunities for Local Participation

Yellowknives Dene First Nation (Dettah and N'Dilo), North Slave Métis Alliance, Łutsël K'é Dene First Nation, and Tłı̨chǫ beneficiaries, as well as Wek'èezhìı Renewable Resources Board staff will be invited to participate in this survey as observers. There will be room for two observers per

day for the fall composition survey (one plane), and four observers (2 per plane) during the March abundance survey.

Management or Recovery Plans

Periodic moose abundance surveys along the Tłı̨chǫ HWY corridor are a requirement of the Wildlife Management and Monitoring Plan (WMMP) for the Tłı̨chǫ HWY project. The WMMP requires that moose abundance surveys be conducted before, during and after construction of the Tłı̨chǫ HWY. This will be the first moose abundance survey for the Tłı̨chǫ HWY area since the road opened for public use.

References

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