

**APPENDIX C: SHEARWIND – GLEN DHU MONITORING PROTOCOLS FOR MAINLAND
MOOSE**

SHEARWIND – GLEN DHU MONITORING PROTOCOLS FOR MAINLAND MOOSE

Submitted By: NSDNR Wildlife Division and Regional Services

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OVERVIEW:

The following recommendations are designed to address information requirements in the Glen Dhu wild power development registration document, and provide a protocol for monitoring moose within and adjacent to the development footprint, compatible with recovery efforts as identified in the Recovery Plan for Moose (*Alces alces americana*) in Mainland Nova Scotia (2007). The recovery plan was prepared for the Nova Scotia Department of Natural Resources in cooperation with the Nova Scotia Moose Recovery Team. The plan defines the recovery goal(s), objectives, strategies, and actions that are deemed necessary to protect, recover, and maintain the mainland moose herd (NSDNR 2007).

See

http://www.gov.ns.ca/natr/wildlife/biodiv/species_recovery/recoveryplans/MainlandMooseRecoveryPlan.pdf

Mainland moose are subjected to a wide variety of naturally occurring and anthropogenic threats. Table 1 under Section 1.5 (Threats) in the plan, classifies the known primary threats (NSDNR 2007, p11). Several of these threats are potentially linked to activities directly and/or indirectly associated with establishment and operation of the Glen Dhu Project in the Pictou/Antigonish Highlands.

Plan recovery priorities involve monitoring, management, research, education and stewardship. The plan acknowledges that there are significant information gaps in our understanding of limiting factors affecting the remnant mainland herds, including, but not restricted to, basic demographic data, disease and mortality, extent and level of illegal harvest, habitat availability and preferences, disturbance factors, and the synergistic effects of all these and others factors.

To meet recovery objectives, the recovery plan outlines a series of approaches and conservation actions that focus on "urgent" and "necessary" priority items. Among these are specific requirements to, improve understanding of habitat suitability, availability and selection; initiate a rigorous long-term monitoring program to provide reliable data on the distribution and demographics of mainland moose; establish means of monitoring the impact severity of threats; and engage partners (including industry) in recovery activities.

Protocol for Aerial Survey of Mainland Moose

November 2008

Aircraft and Observer requirements:

Helicopter: A Bell 206, a Hughes 500 or similar aircraft, with ability to have one front seat observer/navigator and two back seat observer/recorders (one on each side). Bubble

windows for back seat observers are of significant advantage. The survey crew must be able to fly without getting motion sickness and have experience in doing moose surveys or similar work from a helicopter.

Weather:

No wind or light wind, allowing for a comfortable flight and ability to maintain desired speed. Complete ground cover of snow required. A fresh snow is desirable as it makes tracks easier to see and distinguishing tracks of other animals (i.e. deer)

Flight Requirements:

Pilots must be informed of the proper protocol and consistently apply standard survey methodologies outlined herein. The aircraft must maintain an altitude of 150 m above ground and an air speed of no more than 60 knots. In dense cover, search pattern must be tighter and or it may be necessary to fly in overlapping circles. It is important to search dense cover very thoroughly.

With intensive search, effects of flying “low and slow,” on moose behaviour, may become a problem... adjust accordingly. Confirm sex of animals as quickly as possible. Discontinue pursuit at 30 seconds.

Once the survey is started it is imperative ~~that~~ it be completed in the same or successive days, to insure independent observations.

This approach is rigorous to ensure “repeatability”.

Digital Data Standards:

Pilots are to be given the GPS coordinates of the study area in advance of the survey, which are uploaded into the aircraft system that should be set prior to the survey at NAD 83 or WGS 84.

A GPS unit with map display should be used as a navigational tool to ensure complete coverage of the study area. The GPS unit should be set to record at either NAD83 or WGS84. These data are to be saved as ArcGIS shape files and then converted to GPS exchange format (.gpx) files and imported into MapSource (Garmin Ltd.).

The location and time of each observation is to be recorded as a GPS waypoint on the aircraft’s GPS system. Waypoints and track-logs are to be saved as MapSource files and included as an appendix to the final report.

Data Recording:

Recordings are to include the following information:

- GPS point location of all observations, including location of each observation to be recorded by the front seat observer on an enlarged air photo of the area.
- Any roads or trails seen from the air that do not show on the air photo are to be digitally mapped and shown in the final survey report.
- Number of moose or deer in each separate sighting.
- Sex of each moose (may require briefly approaching the animals to determine presence or absence of vulva patch).
- Identifiable moose calves (born the previous spring).

- Identifiable yearlings (< 2 years of age) by body size and antlers if a bull. Note: Adults tend to drop antlers earlier than yearlings. Yearling bulls are the last to shed their antlers which may still be in place in March.
- Adult moose that do not have attendant young or any definite male or female characteristics should be classified as, “adult - unknown sex”.
- Unusual sightings (i.e. bear, moose carcass, moose showing unusual behaviour, moose with injuries.).
- OHVs or evidence of OHV presence in the recent past.

This annual survey is to be completed every third year. If for logistical or weather challenges it is not possible to complete the survey in the scheduled year, it is to be completed the following winter, and then resuming original schedule.

Protocol for Mainland Moose Snow Tracking Survey

November 2008-11-07

Rational:

Determining absolute numbers, densities, and distribution for wild animal populations is often difficult. Reliable results are often compromised by physical limitations of terrain, budgets, manpower, and environmental conditions. When direct observations are impractical or impossible, indirect signs of animal presence through track, browse, and scat surveys may be sufficient.

To compliment aerial surveys for moose snow-tracking surveys to assess presence, absence, and distribution, track surveys should be completed by snowmobile using the established network of trails and roads. In the absence of snow, the surveys are to be completed using all terrain vehicles or by foot.

UTM coordinates should be recorded using GPS wherever moose and deer track-ways cross survey trails, occur within or adjacent to survey trails, or localized activity occurs. (Garmin GPS units capable of uploading to ARCVIEW GIS are recommended.) Wherever possible estimate the number of moose and deer making tracks. Snow-track surveys may be done in conjunction with DNR, and possibly members of the local snowmobile club. Survey results should be presented to DNR in digital and hard copy report form annually, and contain a clean version of all field data.

Snow-track Surveys:

Track surveys should be completed using the established network of trails and roads, and completed three times annually, throughout the study area.

Timing of Surveys:

December, late January, and mid March

Observer Requirements:

Observers should work in teams of two. Participants must be able to recognize moose and deer tracks, use mapping GPS, and orienteering compass.

Participation:

Reasonable coverage can be accomplished by 2-3 machines in one day.

Weather:

Snow tracking results are best 3-7 days following a ≥ 10 cm snowfall. Surveys should not be conducted during periods of rain, snowfall, or blowing snow.

Data Recording:

UTM coordinates should be recorded using GPS wherever moose and deer track-ways cross survey trails, occur within or adjacent to survey trails, or localized activity occurs. Wherever possible estimate the number of moose and deer making tracks. Unusual sightings (i.e. a moose or deer carcass, bear den, etc.) should be photographed with a digital camera and UTM coordinates recorded. If live moose are encountered, to minimize disturbance, record a GPS location as quickly as possible and move on at least 500m before stopping to complete the record. Do not attempt to approach the animal or take pictures of it.

Digital Data Standard:

All coordinates should be recorded using a mapping GPS unit capable of uploading to ARCVIEW/ARCGIS

Reporting:

Survey results should be presented to DNR in digital and hard copy report form annually, and contain a clean version of all three track count field data sets and a map showing searched trails and observation points.