SPECIES DETECTION SURVEY PROTOCOLS

SNOW TRACK SURVEYS



Fish and Wildlife Branch Technical Report No. 2014-19
December 2014

SNOW TRACK SURVEY PROTOCOL

First Edition 201

PUBLISHED BY:

Fish and Wildlife Branch
Ministry of Environment
3211 Albert Street
Regina, Saskatchewan S4S 5W6

SUGGESTED CITATION FOR THIS MANUAL:
Saskatchewan Ministry of Environment. 2014. Snow track survey protocol. Fish and Wildlife Branch Technical Report No. 2014-19. 3211 Albert Street, Regina, Saskatchewan. 8pp.

ACKNOWLEDGEMENTS:
Alberta's Environment and Sustainable Resource Development Ministry is gratefully acknowledged for their permission to use, and provision of, their Sensitive Species Inventory Guidelines April 2013 document. The document provided a base reference and content source for consistent, comparative and authoritative references for personnel conducting respective species surveys in Saskatchewan.

Saskatchewan Snow Track Survey Protocol Acknowledgements: Sue McAdam has compiled much of the respective Saskatchewan species-specific survey protocol parameters and lead edits of the Saskatchewan protocol versions based on the Alberta Sensitive Species Inventory Guidelines April 2013 document. The Research Permit Process Renewal working group (Karyn Scalise, Sue McAdam, Ben Sawa, Andrea Benville and Ed Beveridge) has also contributed to reviews of the Saskatchewan protocol along with additional ministry-external reviewers.

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19.0 SNOW TRACK SURVEY PROTOCOL

19.1 INTRODUCTION

This survey protocol provides instruction on collecting data for the occupancy (presence/not detected) of wildlife that can be identified by their tracks and other sign left in snow in the winter months. A separate Swift Fox Survey Protocol exists for detecting swift fox during winter (see SK-ENV 17.0 December 2014).

Snow track surveys are an efficient, reliable and relatively inexpensive means of assessing the distribution of multiple species in an area (Whittington and Heuer 2012). Snow tracking is the preferred survey method as it has greater detection of species richness while minimizing disturbance relative to alternative methods such as aerial surveys, direct counts, hair traps and scent posts with remote cameras (Bayne et al. 2005, Gompper et al. 2006, Silveira et al. 2003). Conversely, if population or herd structure assessments of big game species are required, the Ministry of Environment has developed a number of aerial survey protocol (contact the Fish and Wildlife Branch for more information).

Mineral licks are important features for ungulates as they provide necessary minerals during critical periods, such as antler development, and are believed to serve as hubs for social gatherings. Mineral licks can be identified based on the high amount of use concentrated in the vicinity of ground seepages.

19.1.1 Inventory Group or Species

Snow tracking focuses on the groups in Appendix A. Species that are not listed in Appendix A may also be detected during surveys. These species are also to be recorded in the data loadform.

19.1.2 Status and Distribution

For information on the status of animals active during winter in Saskatchewan, please visit the Saskatchewan Conservation Data Centre (SKCDC). Additional information may be provided in Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports and in the Species at Risk Act (SARA) Registry documents.

19.1.3 Biology

Many large wildlife species have large home ranges and are found at low densities. This coupled with what we perceive as elusive habits make encounters with them rare. As top predators, large carnivores can only be as numerous as the prey base allows, while larger ungulates are often limited by habitat conditions that influence food choices and movement. Smaller mammals, although often more numerous, follow similar patterns. How specialized a species is in regards to food and habitat requirements may also influence densities on the landscape.

Although the likelihood of seeing an individual animal at any given time in a specific location is small, they do leave behind evidence of their having occupied an area. Provided snow conditions are favourable, tracks are readily identifiable for many of the larger mammal species. Pellets or scat and other sign can also help identify what species have passed through an area.

Resident and migratory birds that spend time in Saskatchewan during the winter may be detected during winter track surveys. Many birds will leave evidence of their passing. Bird sign includes tracks, feces, regurgitation pellets, wing patterns, feathers and holes in snow left by birds hunting prey beneath the snow.

19.2 SURVEY STANDARDS

The standards provide instructions on the areal extent of surveys to be conducted. They provide information on experience, capabilities, minimum equipment needs, survey conditions, and permit requirements.

19.2.1 Survey Area Extent

Surveys must be conducted in areas with SKCDC observations as well as in any areas that provide suitable habitat for the species in question. The proposed project area, plus the appropriate setback distances, must be assessed. All suitable habitat within this area must be surveyed. Setback distances identified in the Saskatchewan Activity Restriction Guidelines (Saskatchewan Ministry of Environment 2013a) are based on the species and the level of disturbance associated with the project.

19.2.2 Personnel

Identification of animal tracks and other sign requires a high degree of training (Zielinski and Kucera 1995). Misidentification can be a significant issue in snow surveys (Squires et al. 2004, Halfpenny et al. 1995). Personnel must be able to correctly identify tracks, scat and other sign, identify suitable habitat, and be familiar with the survey methodology. Personnel must have a well-developed search image for tracks and be able to distinguish between tracks made by different species under various snow conditions. Knowledge of specific wildlife biology, behaviour, and preferred habitat is also a desirable asset that would allow for more accurate results. Personnel must be capable of working safely in winter conditions. The need for experienced observers cannot be over-emphasized.

19.2.3 Time of Year

Track surveys must be conducted between December 1 and March 31, provided snow conditions are suitable. Surveys may be conducted outside this period if snow cover and surface characteristics allow for track retention and detection. Surveys must be separated by at least four weeks to capture different environmental conditions (Halfpenny et al. 1995).

If surveys occur within the range of the Swift Fox, they must be completed by February 15th to avoid disturbing foxes during the breeding period. Later surveys may also be more prone to freeze thaw conditions.

19.2.4 Time of Day

Winter track surveys must be done during daylight hours. Periods within one hour of sunrise or sunset must be avoided due to poor quality of light.

19.2.5 Environmental Conditions

A compendium of environmental condition standards (Saskatchewan Ministry of Environment 2013b) has been prepared to complement the survey protocols for Saskatchewan. The full range of values for the respective environmental condition (e.g., temperature, precipitation, cloud cover, noise, etc.) has been provided in the standards document with the expectation that appropriate value range(s) will be applied as per the survey protocol parameters.

Surveys must be carried out between three to five days of a snow obliterating event (Squires et al. 2004). A snow obliterating event is defined as a snowfall of one or more centimetres or an average daily wind speed of 30 km/h or more (AMBI 2010). This time period allows more opportunity for tracks to accumulate in the area (Linnell et al. 2007) and increases detection compared to surveying soon after a snow event (Squires et al. 2004, Linnell et al. 2007).

Snow must be a minimum of two to five centimeters deep and soft enough for animals to leave tracks (Halfpenny et al. 1995). Tracking surveys must also end before signs are too old to distinguish identification characteristics. Avoid surveying with freeze/thaw conditions as they may prevent tracks from being left on the surface (Halfpenny et al. 1995). Periods of extreme cold (<-30°C) during track accumulation must also be avoided (Linden et. al. 1996) as animal activity may be reduced and there are safety risks to field personnel.

19.2.6 Survey Effort

Wildlife surveys are prone to errors in failing to detect individuals that are present. Detection probability assessment methods have been devised to correct for this error. Repeated snow track surveys improves detection of wildlife occupying an area (Whittinger and Heuer 2012, Squires et al. 2004). Three survey repeats are required to obtain reasonable detection (Squires et al. 2004, Halfpenny et al. 1995, Linnell et al. 2007). Multiple repeats are especially important for detection when diverse taxa are being surveyed. If a survey is cancelled or weather conditions change dramatically before completion, the survey lines in question must be re-surveyed in their entirety.

19.2.7 Equipment List

- GPS receiver
- Compass
- Thermometer
- Meter Stick
- Ruler
- Watch
- Binoculars
- Track identification guide
- Camera
- Remote Camera (optional)
- Wild Species Loadform

19.2.8 Permit Requirements

Notification is requested for snow track surveys. Notification implies the appropriate survey protocol(s) will be used and data loadforms submitted. Survey protocols and loadforms are available on the ministry Biodiversity webpage. Please refresh your internet browser to clear any cached websites or bookmarks for this website to ensure you have the most up-to-date information and document versions. Properly conducted surveys and reliable data submissions are vital tools required to understand and manage wildlife populations and their habitat. Data submissions also facilitate and expedite environmental assessment reviews by Fish and Wildlife Branch.

19.3 SURVEY METHODS

Prior to heading into the field, survey lines must be delineated on a map so that start and finish points are known.

Record general site characteristics such as:

- general habitat type
- disturbance type
- general weather conditions (i.e., temperature, cloud cover, wind, precipitation)
- snow depth, percent snow cover, snow texture
- days since last snowfall or track obliterating event
- time of day

Snow tracking is compatible with, and may be supplemented with, remote camera data. Remote cameras collect presence/not detected data at a point location over a more varied temporal period compared to snow track surveys which collect data over linear patterns over a reduced temporal period (Whittinger and Heuer 2012, Zielinski and Kucera 1995). Collecting images may also support identification of tracks or other sign.

Surveys may be completed on foot or by vehicle. Transects done on foot, skis or snowshoes provide the most complete surveys. The best approach is to travel routes in preferred habitats and use vehicles to survey between preferred habitats. This will save time and effort (Halfpenny et al. 1995). Vehicles such as snowmobiles may be used, but must be driven at < 10 km/h while tracking so small or more obscure sign are less likely to be missed. Take rest breaks to reduce fatigue and concentration of searching for tracks (Halfpenny et al. 1995).

Each transect is to be 50 m from adjacent transects. Transects are to be broken into 250 m segments for recording data. Record start and stop coordinates of each transect and segment and keep a record of the route by using the track log function. Record the location of every species detected, environmental conditions (D'Eon et al. 2006, Halfpenny et al. 1995, Squires et al. 2004). Also record beds, middens, auditory observations, scat, scent posts etc. In addition, record the location of mineral licks identified by numerous tracks around a ground seepage area. For direct observations of animals, estimate the distance to the animal.

If there are difficulties in identifying sign, follow the trail and look for other sign (scat, etc.). Take measurements of the stride, straddle, track depth and track dimensions (Squires et al. 2004, Halfpenny et al. 1995). Photograph a clear track, making sure there is a scale to indicate size. Ensure there is enough contrast to make the track visible in the photograph.

Photographs must also be taken of rarer species such as wolverine and cougar, or species outside their range to confirm identification. In addition, following the tracks (back-tracking) to look for more visible tracks is encouraged. See Bayne and colleagues (2005) for more information on differentiating tracks, especially those of similar species.

If it begins to snow, note the time and survey conditions. If conditions become too difficult to continue, record the GPS location where tracking stopped.

19.4 SUBMISSIONS

Please refer to the Submissions section under the Standard Permit Conditions on the Ministry of Environment website. Observations should be submitted using the appropriate loadform from the Survey Protocols and Loadforms webpage. Any incidental wild species (plant or animal) observations should also be submitted to the ministry (ENV.researchpermit@gov.sk.ca) using the Plant or Wild Species Loadform, respectively.

Evidence of wild boar may be encountered during winter mammal surveys. Wild boars can cause significant damage to native flora and fauna and crops (Wilkins and Dobbs, 2012). The Saskatchewan Association of Rural Municipalities (SARM) administers The Feral Wild Boar Program (FWBP). Reports of wild boar may be submitted to the local Rural Municipality where the detection was made as well as to iMapInvasives.

*i*MapInvasives is the provincial system for submitting the occurrence of invasive plant or animal species. Any observations of prohibited, noxious or nuisance weeds, along with observations of any other invasive species, should be submitted using this website. An account is not required to submit observations. If you have any questions, please contact the SKCDC for more information.

19.5 ADDITIONAL RESOURCES

Alberta Species at Risk Reports

Alberta Status Reports

Identifying Animal Tracks and other Wildlife Tracking Skills

Montana Field Guide

Saskatchewan Activity Restriction Guidelines

Saskatchewan Activity Restriction Guidelines for Sensitive Species Background Information

Saskatchewan Conservation Data Centre (SKCDC)

The Encyclopedia of Saskatchewan

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Appendix A. Mammals and other species surveyed using snow track methodology.

Species group	Species
Ungulates	woodland caribou (*Rangifer tarandus caribou*) plains bison *(Bos bison bison*) moose (*Alces americanus*) white-tailed deer (*Odocoileus virginianus*) mule deer (*Odocoileus hemionus*) elk (*Cervus elaphus*) pronghorn (*Antilocapra americana*)
Large Carnivores	Canada lynx (*Lynx canadensis*) bobcat (*Lynx rufus*) American badger (*Taxidea taxus*) wolf (*Canis lupus*) coyote (*Canis latrans*) red fox (*Vulpes vulpes*) wolverine (*Gulo gulo*) black bear (*Ursus americanus*) cougar (*Puma concolor*)
Other Furbearers	fisher (*Martes pennanti*) marten (*Martes americana*) black-footed ferret (*Mustela negripes*) long-tailed weasel (*Mustela frenata*) least weasel (*Mustela nivalis*) short-tailed weasel (*Mustela erminea*) mink (*Neovision vision*) beaver (*Castor canadensis*) muskrat (*Ondatra zibethicus*) river otter (*Lontra canadensis*) red squirrel (*Tamiasciurus hudsonicus*) Northern flying squirrel (*Glaucomys sabrinus*) snowshoe hare (*Lepus americanus*) Nuttall's cottontail (*Sylvilagus nuttallii*)
Other Species	Porcupine (*Erethizon dorsatum*) raccoon (*Procyon lotor*) Black-tailed prairie dog (*Cynomys ludovicianus*)