

**Canada Lynx (*Lynx canadensis*)
Winter 2006 Tracking Survey Results
for the
Kibby Wind Power Project**

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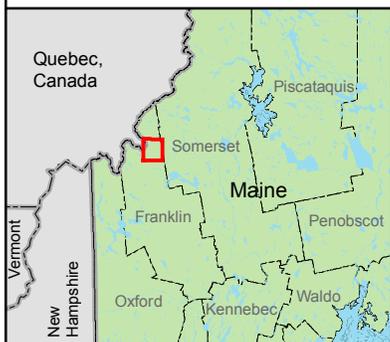
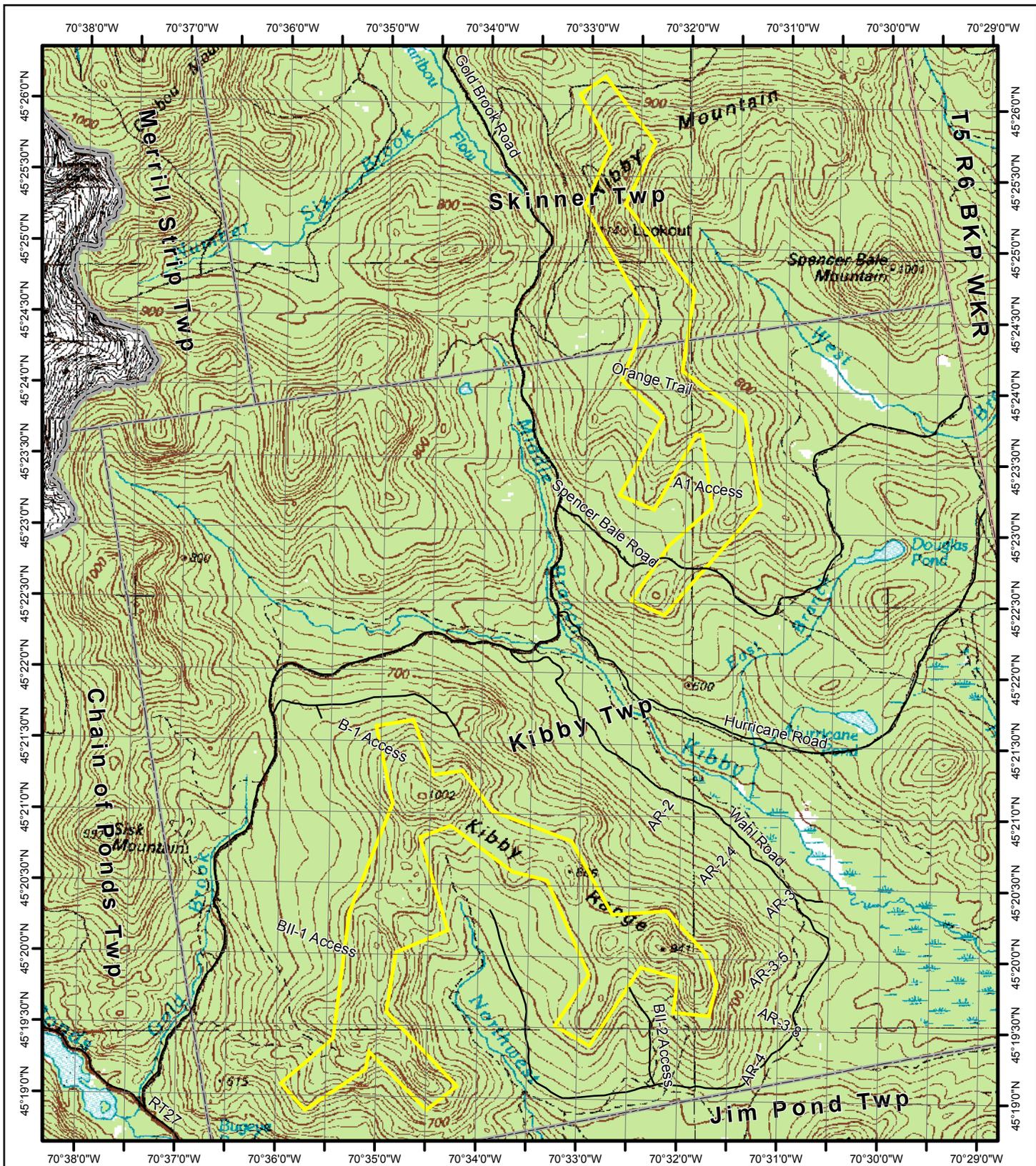
- APPENDIX A:** MDIFW Canada Lynx Survey Protocol
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1.0 PROJECT DESCRIPTION

TransCanada Energy Ltd. (TransCanada) is proposing to develop, own and operate a 100–200 megawatt (MW) wind power generating facility in the Boundary Mountains of Western Maine known as the Kibby Wind Power Project. The project is in a location for which a similar project proposal by U.S. Windpower was previously approved by the Land Use Regulation Commission (LURC).

The project will be located in Kibby and Skinner Townships (Twp.), an unincorporated area of Franklin County, Maine. At the time the study was conducted, up to four ridgelines were under consideration for turbine locations. However, the project area has been reduced to two ridges, as shown in Figure 1. The property is owned by Plum Creek, and the surrounding areas are currently actively managed for forest products. The Kibby Wind Power Project can take advantage of existing logging roads and cleared areas to access the ridgelines, and forestry activities can continue in a complementary fashion with the project in place. The project will utilize the superior wind resource found in this vicinity to create clean, renewable power generation.

The United States Fish and Wildlife Service (USFWS) has recommended that TransCanada perform presence/absence surveys for Canada lynx (*Lynx canadensis*) in the project vicinity during the winter of 2006. The Maine Department of Inland Fisheries and Wildlife (MDIFW) provided training for participants in these surveys in order to ensure optimal consistency with state-wide survey efforts.



<ul style="list-style-type: none"> Road Town Boundary County Boundary State Boundary Project Area 	<p>Data Notes: Base map: 100K USGS map; Political and road data courtesy of Maine OGIS</p>
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	 1 Kilometers
249 Western Ave Augusta, ME 04330	
<p><i>Project Area</i></p> <p>Kibby Wind Power Project</p>	
Figure: 1	

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2.0 STUDY PROTOCOL

2.1 Introduction

Canada lynx (*Lynx canadensis*) are medium-sized, elusive cats common to boreal forests throughout Canada and Alaska. The southern portion of their range extends into some areas of the northern United States, with known populations in Montana, Washington, Maine and possibly Minnesota. Populations in Maine have been historically variable, and are largely dependant on suitable habitat and associated snowshoe hare populations (which comprise their primary prey). Ideal habitat for lynx in Maine consists of softwood dominated or mixed regenerating forests, about 10-30 years in progress (MDIFW 2003).

In 2000, the U.S. Fish and Wildlife Service (USFWS) declared Canada lynx a threatened species under the Endangered Species Act. In Maine, the lynx is considered a Species of Special Concern by the Maine Department of Inland Fisheries and Wildlife (MDIFW). Several studies have been conducted, or are underway, to assess the abundance and distribution of lynx in Maine. This effort includes radio-telemetry studies, and a multi-year winter snow track survey initiated by the MDIFW in 1999 and 2003, respectively (Ray et al. 2002).

The USFWS recently proposed a large portion of the State of Maine as critical habitat for Canada lynx. This includes the northerly portion of the Kibby Wind Power Project area (Skinner Twp.). At the current time, USFWS has opted not to designate this area as critical habitat, however, much of the project area occupies an area that MDIFW ranked as having a high probability of harboring Canada lynx (personal communication with Wally Jakubus, MDIFW, December 15, 2005). For these reasons, the USFWS recommended that TransCanada perform presence/absence surveys for this species in the project vicinity during the winter of 2006. MDIFW provided training for participants in these surveys in order to ensure optimal consistency with state-wide survey efforts.

2.2 Objectives

The objective of winter 2006 Canada lynx surveys was to determine if Canada lynx are present in the general vicinity of the proposed Kibby Wind Power Project at this time.

2.3 Methods

Methods for winter 2006 Canada lynx surveys in the vicinity of the Kibby Wind Power Project were based directly upon an unpublished MDIFW protocol as provided by Jennifer Vashon, lynx biologist for the MDIFW, on January 5, 2006 (Appendix A) and discussions with USFWS and MDIFW, beginning at a meeting on December 21, 2005 (Appendix B). As requested by USFWS and MDIFW, agency personnel were included in the surveys when schedules permitted.

2.3.1 Site Selection

Surveys were performed in Kibby and Skinner Twps., as these are the townships that encompass the Kibby Wind Power Project area. Both of these townships have been determined (by MDIFW) to have a potential to harbor Canada lynx.

All surveys were conducted on existing logging roads within the general project vicinity. Roads were selected based on lack of winter use, e.g., roads that were not plowed or traversed by motorized vehicles were favored. Due to the remote location of the project area, site selection was somewhat limited by available roads. Therefore, some plowed roads were included in the survey in order to reach the total survey length per township recommend by the MDIFW protocol (see Section 2.3.3, Protocol).

2.3.2 Number of Surveys

A goal of three survey events was set for each of the townships (Kibby and Skinner) during the winter of 2006. This number of surveys was prescribed by USFWS during the December 21, 2005 meeting (see attached Meeting Notes in Appendix B). However, due to weather conditions throughout the winter of 2006, proper snow tracking conditions as defined within the accepted protocol (see Section 2.3.3, below) occurred on few occasions.

Environmental inspectors from TRC were on location within the project area throughout the season as part of meteorological tower installation efforts. Staff biologists were in daily contact with the inspectors in order to discuss weather conditions as they occurred. In February and early March, snow and/or wind events occurred almost daily, which precluded survey efforts. In late March, snow conditions degraded rapidly, and sufficient snow events occurred infrequently.

Efforts were made to exploit proper weather conditions whenever they arose, however, the goal of three survey events per township was not achieved. In total, two complete surveys of Kibby Twp. (February 16 and March 24) and 1 complete survey of Skinner Twp. were achieved (March 8). Additionally, one partial survey of Skinner Twp. was performed on March 25 before heavy snow conditions developed and abbreviated the survey.

2.3.3 Protocol

Based on MDIFW protocol (See Appendix A) each survey was to be performed no sooner than 24 hours after a snow event, and ideally could continue up to 48 hours following such an event. If, after a snow event, there was a wind strong enough to cover tracks, surveys were not to be started until 24 hours after the wind event had ended. Both the MDIFW protocol and the USFWS noted that, for the purposes of this survey, it would be acceptable to perform surveys up to 72 hours after a snowfall or wind event (see Appendix A; Appendix B).

Each survey was conducted by two observers using snowmobiles. The observers worked separately to cover a total of 55-80 kilometers (km) of roads per township, per survey. An exception to this protocol was made during the March 25 survey of Skinner Twp., when 2 observers worked together using one snowmobile. Surveys were performed by driving snowmobiles slowly along roadways, while constantly visually sweeping for evidence of tracks. For plowed roads, a truck was used in some instances. Methods are described in further detail in the MDIFW protocol (Appendix A).

2.3.4 Data Collection

Data for 2006 winter track surveys were collected by Dana Valleau and Shearon Murphy of TRC, with assistance from Bob Cordes (MDIFW) in Kibby Twp., and Bill Noble (MDIFW) in Skinner Twp. Prior to commencing surveys, TRC survey personnel spent one day training with Allen Starr of MDIFW, who is MDIFW's Eco-regional Survey Coordinator, and an expert in lynx tracking.

General tracking conditions and weather data were recorded for each survey date. Numerous parameters were required to be recorded for each lynx track discovered, consistent with MDIFW protocol. These include GPS point data, track measurement, direction of travel, number of lynx (solitary versus group), track quality, photographs, behavioral data, DNA samples (whenever possible), and habitat data. All data was collected as is described by MDIFW protocol (Appendix A), and was documented on "Northwest Eco-regional Lynx Track Survey – 2006" data sheets, as provided by MDIFW (Appendix C).

Any fisher (*Martes pennanti*) tracks observed were recorded and mapped using GPS, at the request of MDIFW. Pine marten (*Martes martes*) tracks were also recorded using GPS, but were not mapped; this data will be made available to MDIFW upon request. Detailed data collection on bobcat tracks, if found, was to be performed on one representative track intercept within the study area on a given survey date (even if several intercepts were found). Any large canid tracks (i.e., larger than coyote) observed were to be reported as soon as possible to USFWS and MDIFW. Other furbearer tracks were noted, with general descriptions of abundance, on daily data sheets.

Also, each road that was surveyed was mapped using GPS. Plowed and unplowed roads were differentiated during data collection and mapping.

3.0 RESULTS

3.1 Kibby Township

3.1.5 *Number of Surveys and Area Covered*

Two complete surveys were performed in Kibby Twp.; these occurred on February 16 and March 24, 2006. On February 16, surveyors covered 17.51 km of plowed roads, and 50.2 km of unplowed roads for a total of 67.71 km. On March 24, surveyors covered 18.14 km of plowed roads, and 38.74 km of unplowed roads for a total of 56.88 km. Roads surveyed on February 16 are depicted on Figure 2-1, and roads surveyed on March 24 are depicted on Figure 2-2.

It should be noted that, on March 8 (during a survey of Skinner Twp.), biologists also surveyed 4.65 km of plowed road and 15.25 km of unplowed roads in Kibby Twp. The results for the portion performed in Kibby are reported in this section, however, the area covered on March 8 is mapped on Figure 2-3.

It should also be noted that on March 24, surveyors covered 4.54 km of unplowed roads in Skinner Twp. (mapped on Figure 2-2). The results for the portion performed in Skinner Twp. are reported in Section 3.2, below.

3.1.6 *Tracking Conditions*

On February 16, snow tracking quality was recorded as “good” on unplowed roads, and “acceptable” on plowed roads. On March 24, snow tracking quality was recorded as “best” on unplowed roads and “acceptable” on plowed roads.

3.1.7 *Canada Lynx*

No evidence of Canada lynx was observed in Kibby Twp. during either survey event. Western Mountains Eco-Regional Lynx Track Survey – 2006 – No Lynx Tracks Found data sheets (as provided by MDIFW) were filled out after each survey (see Appendix D). Additionally, no evidence of lynx was observed during other field activities by TransCanada in the project area.

3.1.8 *Other Tracks Observed*

No fisher tracks were intercepted during the 2 formal surveys of Kibby Twp. on February 16 and March 24. However, 2 track intercepts were recorded within Kibby Twp. on March 8, when TRC examined the Spencer Bale Road in northeastern Kibby Twp. as part of tracking survey efforts in Skinner Twp. that day.

Evidence of several other furbearers including coyote, fox, marten, weasel, and raccoon was observed in Kibby Twp. All were fairly common with the exception of raccoon,

which was observed once, on February 16. The tracks of non-furbearers, such as snowshoe hare and moose, were also frequently observed. General notes on abundance were recorded on daily Western Mountains Eco-Regional Lynx Track Survey Sheets (see Appendix D). No bobcat or large canid tracks were observed.

3.2 Skinner Township

3.2.1 Number of Surveys and Area Covered

One complete and one partial survey were performed in Skinner Twp., on March 8 and March 25, 2006, respectively. On March 8, surveyors covered 14.63 km of plowed roads, and 58.46 km of unplowed roads for a total of 72.09 km. On March 25, surveyors covered 14.63 km of plowed roads and 27.71 km of unplowed roads (42.34 km total) before heavy snow developed and forced the survey to be abbreviated. Roads surveyed on March 8 are depicted on Figure 2-3, and roads surveyed on March 25 are depicted on Figure 2-4.

It should be noted that 4.54 km of unplowed roads in Skinner Twp. were surveyed on March 24 as part of survey efforts in Kibby Twp. These roads are mapped on Figure 3-2.

It should also be noted that on March 8, surveyors covered 4.65 km of plowed roads and 15.25 km of unplowed roads in Kibby Twp. (mapped on Figure 2-3). The results for the portion performed in Kibby Twp. are reported in Section 3.1, above.

3.2.2 Tracking Conditions

On March 8, snow tracking quality was recorded as “best” on unplowed roads and “acceptable” on plowed roads. On March 25, snow tracking conditions were recorded as “best” on unplowed roads and “acceptable” on plowed roads until developing weather conditions slowly began to degrade tracks. Snow tracking conditions are recorded on data sheets, included in Appendix D.

3.2.3 Canada Lynx

No evidence of Canada lynx was observed in Skinner Twp. during either survey event. Western Mountains Eco-Regional Lynx Track Survey – 2006 – No Lynx Tracks Found data sheets (as provided by MDIFW) were filled out after each survey (see Appendix D).

3.2.4 Other Tracks Observed

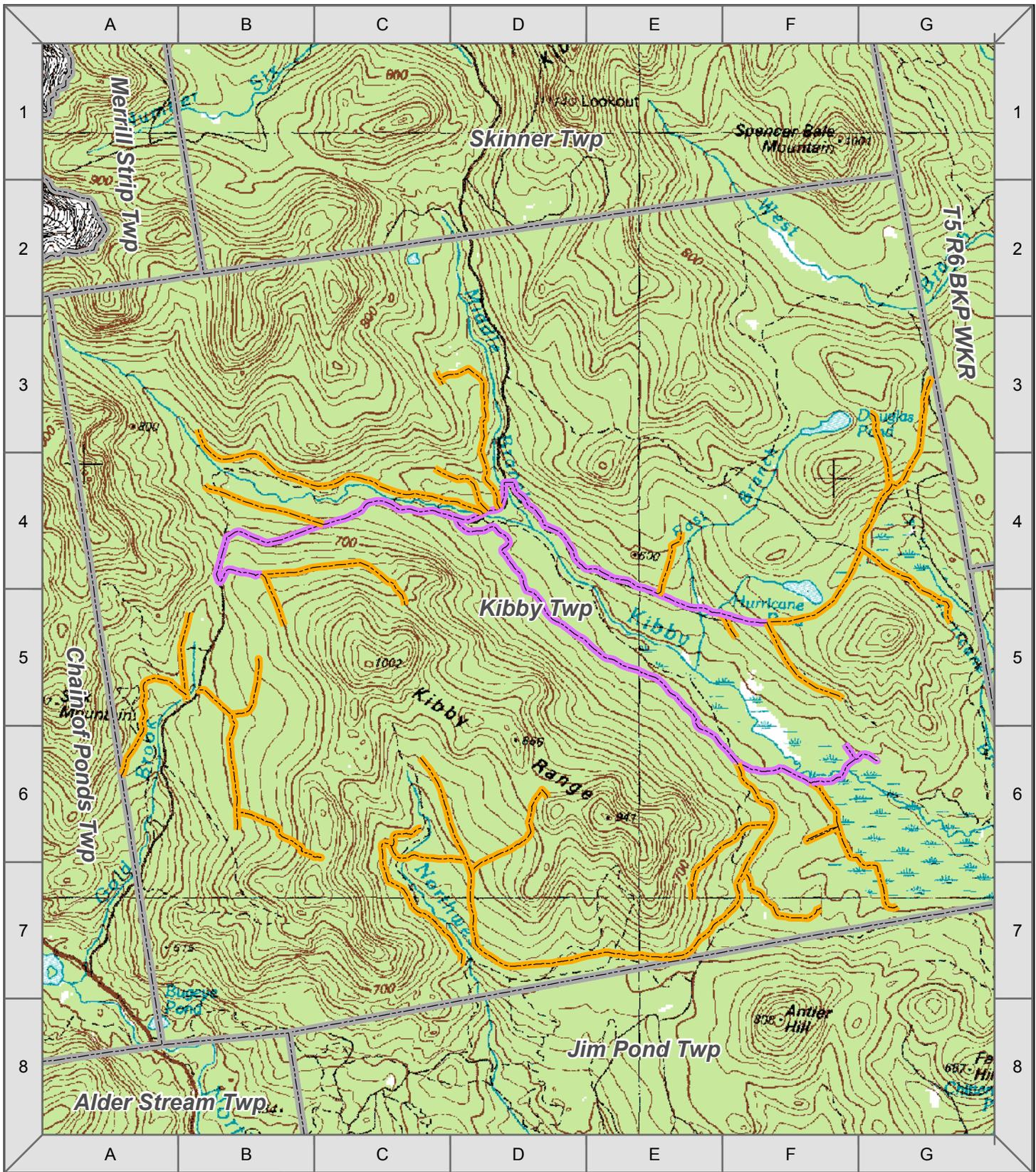
Several fisher track intercepts were observed in Skinner Twp.: each was recorded using GPS. A total of 25 track intercepts were recorded on March 8, and 7 intercepts were recorded during the partial survey on March 25. GPS locations of these track intercepts are represented on Figures 2-3 and 2-4. It should be noted that the easternmost intercept depicted on Figure 2-4 shows 2 intercepts overlapping: in actuality, 4 intercepts were

observed at this location. Due to difficulty with GPS coverage and time constraints due to incoming weather conditions, only 2 GPS points were taken.

Evidence of several other furbearers, including coyote, fox, weasel, marten, raccoon and otter was also observed in Skinner Twp. Most were common, with the exception of otter and raccoon, which were each identified once (on March 8 and 25, respectively). The tracks of non-furbearers, such as snowshoe hare and moose, were also frequently observed. General notes on abundance were recorded on daily Western Mountains Eco-Regional Lynx Track Survey Sheets (see Appendix D). No bobcat or large canid tracks were observed.

3.3 Other Regional Surveys

At least one other winter track survey was performed in the region during the winter of 2005/2006. Bill Noble, MDIFW, was in Beattie Twp. and Merrill Strip on December 15, 2005 and observed and photographed lynx tracks in both of these townships. He also observed bobcat tracks in Merrill Strip. Beattie Twp. abuts the northwest corner of Skinner Twp., and Merrill Strip abuts the western boundary of Skinner Twp.

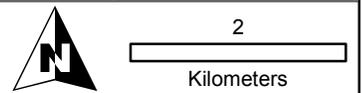


Kibby Twp Survey Results (02-16-06)

* No Lynx or Fisher Tracks

- Plowed Road = 17.51 km
- Unplowed Road = 50.20 km
- Municipal Boundary

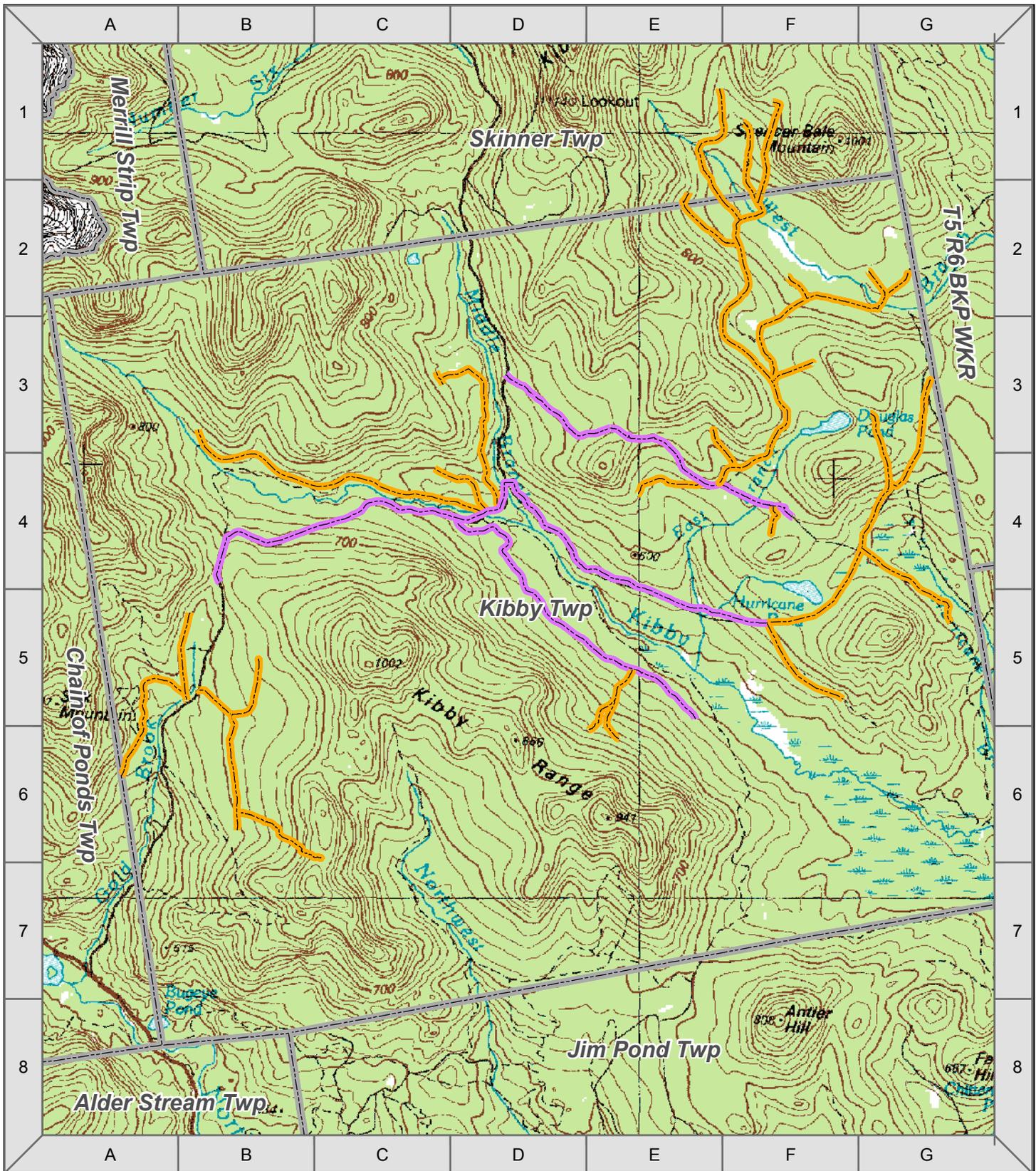
Data Source: Base Map: USGS 100k Topographic Map, Municipal Boundary, courtesy of Maine OGIS



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**KIBBY WIND
POWER PROJECT**
Canada Lynx Tracking Survey
Kibby Twp. 02-16-06

Figure: 2-1



Kibby Twp Survey Results (03-24-06)

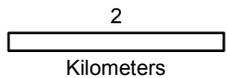
* No Lynx or Fisher Tracks

 Plowed Road = 18.14 km

 Unplowed Road = 43.28 km (38.74 in Kibby TWP)

 Municipal Boundary

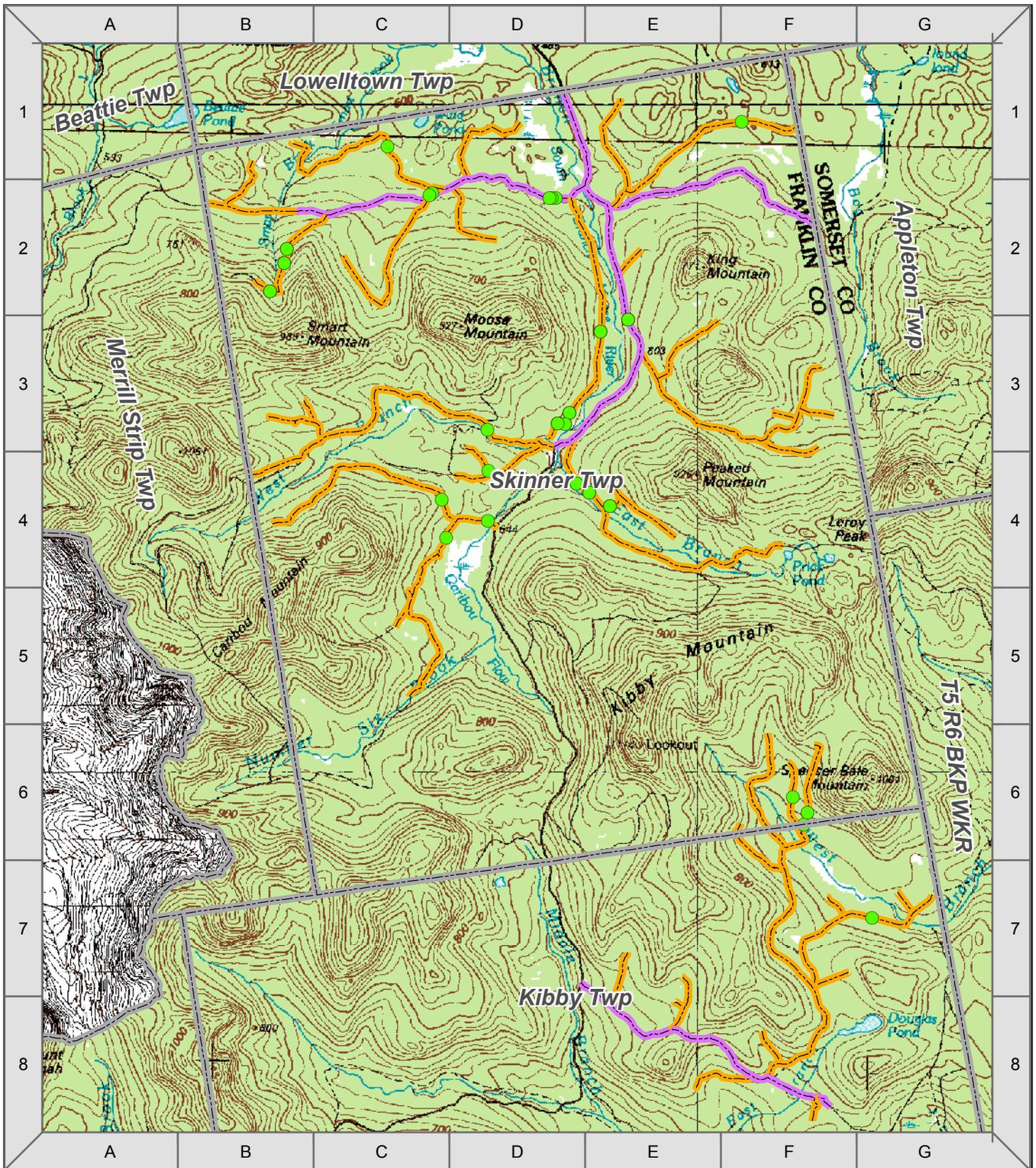
Data Source: Base Map: USGS 100k Topographic Map, Municipal Boundary, courtesy of Maine OGIS



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**KIBBY WIND
POWER PROJECT**
Canada Lynx Tracking Survey
Kibby Twp. 03-24-06

Figure: 2-2



Skinner Twp Survey Results (03-08-06)

- Fisher Track
- Plowed Road = 19.28 km (14.63 in Skinner)
- Unplowed Road = 73.7 km (58.46 in Skinner)
- Municipal Boundary

Data Source: Base Map: USGS 100k Topographic Map, Municipal Boundary, courtesy of Maine OGIS



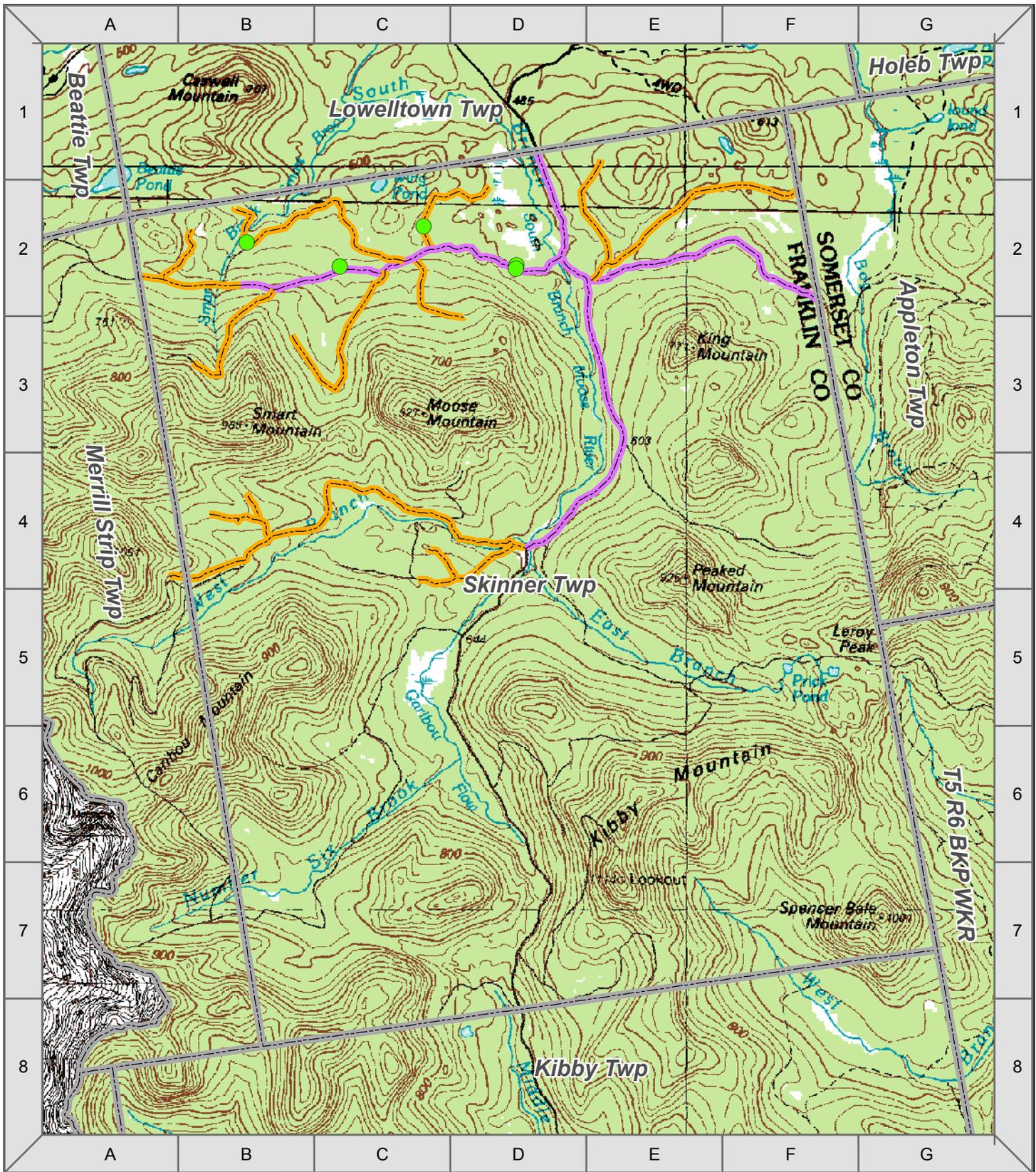
2
Kilometers



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**KIBBY WIND
POWER PROJECT**
Canada Lynx Tracking Survey
Skinner Twp. 03-08-06

Figure: 2-3



Skinner Twp Survey Results (03-25-06)

- Fisher Track
- Plowed Road = 14.63 km
- Unplowed Road = 27.71 km
- Municipal Boundary

Data Source: Base Map: USGS 100k Topographic Map, Municipal Boundary, courtesy of Maine OGIS

2

Kilometers

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**KIBBY WIND
POWER PROJECT**
Canada Lynx Tracking Survey
Skinner Twp. 03-25-06

Figure: 2-4

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4.0 SUMMARY AND CONCLUSION

No evidence of Canada lynx was observed during two full surveys in Kibby Twp., which covered 67.71 km of roads on February 16, 2006 and 56.88 km on March 24, 2006. Likewise, no evidence of Canada lynx was observed during one full and one partial survey in Skinner Twp., which covered 72.09 km of roads on March 8, 2006 and 42.34 km on March 25, 2006.

Single sets of Canada lynx tracks were observed by MDIFW personnel in two townships which abut Skinner Twp., Merrill Strip and Beattie Twp., on December 15, 2005. A set of bobcat tracks was also observed along a road in Merrill Strip.

Evidence of other furbearers, such as coyote, fox, weasel and marten, was commonly observed in both townships; general notes on abundance are included in daily data sheets (see Appendix D). Moose and snowshoe hare evidence was also common. No evidence of bobcat or large canids, however, was observed in either township.

Track intercepts of fisher were marked using GPS. Among all surveys, 2 fisher intercepts were located in Kibby Twp. (on March 8), and 32 intercepts were recorded in Skinner (25 on March 8, and 7 on March 25).

Based on the results of these surveys, it appears that Canada lynx may only be found infrequently in Kibby or Skinner Townships.

5.0 REFERENCES

Halfpenny, J.C., R.W. Thompson, S.C. Morse, T. Holden, and P.Rezendes. 1995. Chapter 5: Snow Tracking, *in*: American Marten, Fisher, Lynx, and Wolverine: Survey Methods for Their Detection. Zielinski, William J., and Thomas E. Kucera: Technical Editors. USDA Forest Service General Technical Report PSW GTR-157. August 1995.

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Ray, J.C., J.F. Organ, and M.S. O'Brian. 2002. Canada Lynx (*Lynx canadensis*) in the Northern Appalachians: Current Knowledge, Research Priorities, and a Call for Regional Cooperation and Action. Report of a meeting held in Portland, Maine, April 2002. <http://conserveonline.org/docs/2002/11/WCSlynx.pdf>

**APPENDIX A:
MDIFW Canada Lynx Survey Protocol**

Eco-regional Lynx Track Survey

Introduction

The Canada lynx (*Lynx canadensis*) is listed as Federally Threatened. A population of lynx exists in northern Maine, but the size of this population and its distribution are not known. In order to facilitate conservation of the lynx in Maine, accurate distributional information is needed, which can form the basis for estimating population size, fluctuations over time, and designing conservation strategies.

As part of the Maine Department of Inland Fisheries and Wildlife's ecoregional survey, subsets of different ecoregions are being surveyed each year to document the occurrence and distribution of rare species. Lynx have been identified as one of the rare species that will be surveyed during these efforts. To meet obligations to funding agencies, a large-scale survey of lynx presence/absence throughout the region is necessary. Due to the effectiveness of winter snow-track surveys for detecting lynx presence in Maine, based on a methodology designed and tested on a study area with radio collared lynx, winter snow track surveys have been selected as the survey method for documenting lynx occurrence. This survey will be completed over several winters in 4 subsets of ecoregions (Boundary Plateau and St John Uplands (2003), Aroostook Hills and Lowlands (2004), Eastern Lowlands (2006/07), and the Western Mtn/Central Mtns/Western Foothills (2006/07)) to identify the current distribution of lynx in Maine.

Because surveying for lynx can be very weather-dependent and time-consuming, it is necessary to focus survey efforts on those areas most likely to hold lynx. A University of Maine study (Hoving 2001) on historical and current lynx distributions and habitat characteristics produced a model predicting the probability of lynx occurrence in a given area. This model could be used to streamline survey efforts to make them as efficient as possible. However, the effectiveness of the model has never been tested in the field. As a result the University was interested in testing the predictive ability of this model by surveying not only areas identified to support lynx, but areas that had a low probability of lynx occurrence. We used this model to select survey areas during survey efforts in 2003 and 2004 in the core of lynx range in Maine. However based on an outside survey effort in the western mountains in 2005, the need to test the model conflicted with identifying lynx current distribution. As a result, for survey efforts in 2006 and 2007 at the presumed edge of lynx range in Maine, we will focus our survey efforts in areas likely to support lynx.

Objectives

2003-05 surveys:

- 1) To determine the distribution of lynx within northern Maine
- 2) To test Hoving's (2001) habitat model to determine if predicted high and medium probability lynx habitat is significantly more likely to contain lynx than predicted low probability habitat
- 3) To use new lynx occurrence data, along with more recent landcover data, to refine Hoving's (2001) model

The first two objectives will be accomplished by the current study. The third objective may be accomplished by future modeling work at the University of Maine and will not be completed in this study. However, the second and third objective will guide the methodology of data collection in this study.

2006-07 surveys:

The objective of the 2006-2007 winter survey effort in areas at the presumed edge of lynx range (western and central mtns./ western foothills and eastern lowlands) is to:

- 1) Better understand the current range limits of lynx with a systematic survey effort

Objective 2 has been dropped and survey efforts will be focused where lynx are likely to occur (e.g. lynx preferred habitat and past knowledge of lynx occurrence). We will share information from these survey efforts with researchers at the University of Maine as they address the 3rd objective.

Methods

Site Selection- 2003-05 track surveys

Test Townships

Hoving's (2001) habitat model for predicting the probability of finding a lynx in Maine was used to select townships for surveys in 2003-05. This habitat model assigns each area a probability from 0-100%. From these probabilities, 3 categories were created: 0-33%, 33-66% and 66-100%, which were labeled low (L), medium (M), and high (H) respectively. Hoving (2001) generated a map of northwestern Maine with polygons of these three categories.

From this map, we assigned each township to the L, M, or H categories using the following criteria: if the township had a minimum of 30% in the H polygon class, it was considered an H township. Townships with less than 30% in the H polygon class, but with more than 30% in either M or H, were considered M townships. All others were considered L townships.

One of the selection criteria for using a township in the survey was that no township could be used that abutted another selected township. This was done to avoid finding a lynx track in a township where lynx really do not occur because the habitat is not suitable, but a track might be found there because the lynx accidentally strayed into that township from an adjacent, suitable township. Since this study is a test of a habitat model, using this constraint will ensure that all lynx occurrences are due to the lynx actually using the township because it has good habitat. (We did not use lynx home range as the minimum separation distance between selected townships, because we are not concerned with whether the two townships are used by the same or different lynx; rather, we are concerned with whether the townships are used, based on habitat suitability. Using lynx home range as a separation distance would also have drastically reduced our sample size.) With this criterion, only 6 H townships existed in northwestern Maine – too small a number for adequate statistical analyses. Thus, we decided to lump

the H and M classes into one group, H/M. (Later analyses could split the categories again, if needed.)

All H/M townships that fit the criterion of not abutting other selected townships were chosen. In cases where two H/M townships lay adjacent to each other, since both could not be used, we selected the township with the most H or M habitat, to maximize the difference between the H/M and L townships. The result was a selection of 12 H/M townships (6 H, 6 M,) for 2003 winter snowtrack surveys in northwestern Maine. To create equal sample sizes between categories, 12 L townships were also chosen. This was done by selecting all L townships that meet the criterion of non-abutting townships, and randomly selecting 12 of these. The remaining 9 criteria-meeting L townships were listed in a random order, to be used in case some of the selected townships could not be surveyed due to logistical problems in the field.

Non-Test Townships

Other H or M townships were selected as part of the lynx distribution survey (Table 2). These townships will not be included in the habitat model test, but will be surveyed merely to increase our knowledge of lynx distribution in northern Maine. In addition to H and M townships, several other townships were selected based on 2000 Landsat TM data, which indicates habitat changes that may be important for lynx.

Site Selection- 2006-07 track surveys

During the winters of 2006 and 2007, we will be conducting winter snow-track surveys in the eastern lowlands ecoregion and the western mountains/central mountains/western foothills ecoregion. Because snow fall is more variable in these 2 ecoregions, it is more appropriate to combine these surveys over two winters rather than surveying each ecoregion in a separate year. Since, we currently have funding for the eastern lowlands and weather conditions are more variable in this ecoregion, we will give preference to the eastern lowland ecoregions when survey conditions exist in both areas.

Our approach for identifying survey areas in the western and central mountains and eastern lowlands was to work southward from the area of known lynx occurrence based on previous surveys. Survey areas were further identified based on the suitability of habitat conditions for lynx and previous reported lynx sighting. Hoving's model only identified 2 towns in these ecoregions as being suitable for lynx (e.g. H/M rated towns). To identify additional townships that had habitat conditions that would likely support lynx and snowshoe hare, we used the national 2002 Landsat TM data. To determine what habitat classification system would be appropriate given the coarseness of the available data, we evaluated the habitat classification on our lynx radio telemetry study area. As a result, townships with the greatest amount of scrub/shrub or conifer forest were selected for survey. These areas were also evaluated based on recent or historic observations of lynx (non-systematic surveys); townships with potentially suitable lynx habitat and recent and historic lynx observations were given greater preference.

Field Methodology

When to Survey:

2003-05 track surveys

If 2 townships are to be surveyed after a snow/wind event, they should be a pair of one H/M and one L township. The order in which the two categories are surveyed should be reversed for successive snow/wind events. For example, if after one snow/wind event, the first survey is an L township and then a H/M township, after the next snow/wind event a H/M township should be surveyed first and an L township second. This prevents any bias in the data from always surveying one category of townships first (which leaves less time for lynx tracks to accumulate and thus, a lesser chance of detecting lynx) and the other category second (which leaves more time for lynx tracks to accumulate and thus, a greater probability of detecting lynx). Weather patterns may be such that after some snow events, only one township should be surveyed, which is acceptable.

2003-2007 track surveys

Snow track surveys to detect lynx presence will begin 24 hours after a snow event. If, after a snow event, there is a wind strong enough to cover tracks, surveys should not be started until 24 hours after the wind event has ended. Surveys should be conducted 24-72 hours after a snow/wind event only under conditions that provide clear definition of tracks. This time delay will allow animals time to travel sufficiently following severe weather and provide a reasonable chance of detecting their presence. Ideally, track counts should be conducted 24-48 hrs after a snow or wind event, since track identification becomes difficult after 3 to 4 days. Number of hours after a snow or wind event will be recorded on the data sheet to correct for the accumulation of tracks that occur as time progresses.

On days when selected townships cannot be surveyed (more than 72 hours after a snow/wind event, and long periods of clear weather, or weather conditions are less than ideal (i.e. some wind, or light snow)), townships not selected for survey can be surveyed for lynx presence/absence, to expand our knowledge of the distribution of lynx. The strict 72-hour protocol is not necessary for these townships (although STQ ratings will determine if conditions are sufficient for identification of tracks), because we are not using them in testing the habitat model, and thus we do not need to standardize the methodology with that of the other townships. Instead, we are merely trying to find out if there are lynx in these townships, in order to assist with conservation in these areas.

Survey Protocol

Each township is to be surveyed by two people, dividing up the area between them to facilitate radio communication and safety. Track surveys will be done by snowmobile, along 55-80km of roads selected throughout the township. Snowmobiles will be driven at a slow speed while surveying for tracks. It is often necessary to stand on one knee while driving the snowmobile in order to gain a better vantage point for detecting tracks. To map your survey route, a track log on the GPS will be recorded while surveying each township. Track logs should be set to establish contact with satellites at a maximum of 30 second intervals to insure that curvature of the road and road distances are adequately recorded. Track logs should be turned off when you re-travel your survey route (e.g. on

dead end roads, turn the track log off when you are heading back to your next survey road). Track logs will be downloaded as a line onto a PC at the end of each day using the program MDNR Garmin. Each track log will be saved as an Arcview compatible file.

Since predators frequently travel roads and trails, or they may cross roads/trails several times over a short distance, following the recommendation of Stephenson and Karczmarczyk (1989), a track intercept will be defined as any trail made by a lynx encountered along the survey route that could not be connected to an adjacent lynx trail, based on visual examination from the survey route. When a lynx track is encountered, record the track intercept by obtaining a GPS waypoint (in UTM's, NAD 27) where that lynx track crosses the road. Record the UTM's on the datasheet after it has been acquired on the GPS. Obtain and record the error associated with the marked waypoint. When a lynx travels a road, obtain a waypoint where it both enters the road and leaves the road and record information for both waypoints on the data sheet. When more than 1 set of lynx tracks is identified (usually family groups), record the number of individuals observed.

At each lynx track intercept, the following additional data should be recorded:

Track measurements - For each individual set of tracks, measure and record the track length, track width, stride (toe to toe of the same foot), straddle (measure on outside of tracks), and sinking depth. Take several repeated measurements of different tracks for each of the measurement types.

Direction of travel- Use a compass to determine and record the forward direction of travel.

Number of lynx- Record the number of individual lynx (i.e. solitary individual or family group of 3).

Track Quality- Record the quality of the detected track as follows:

Rating 4: Best; every footprint registers, and detail within prints is very clear. Species identification is essentially absolute based on track details.

Rating 3: Good; every print registers, but details are weak, perhaps obscured by snow falling in print. Print details usually visible in microtopographic sites. e.g. tree wells and shadows. Identification based on track details, but gait patterns offer needed support.

Rating 2: Acceptable; some prints fail to register, and footprint details, if present are visible only in microtopographic sites. Identification based primarily on gait patterns.

Rating 1: Poor; many prints do not register. Track details lacking. Identification is essentially by gait patterns, and may be possible only in microtopographic sites.

Rating 0: Unacceptable; target species does not leave enough prints to identify gait patterns left in trails.

Photographs- Take several photographs that are close-ups of the track along with several photographs that display the stride and straddle of the track set. Include a small ruler as a scale reference in photographs. Use the same ruler in all photographs of all tracks. Record the roll number and the frame numbers in the photograph and on the data sheet.

Behavioral data- Record any behavioral observations (i.e. walking, chasing, scent marking).

DNA sample- If a DNA sample is collected, record the type of sample collected (i.e. hair or scat).

Habitat data- Describe the habitat where a lynx track was observed. For example, note if the stand is a regenerating or mature forest, note the predominate cover type (S, H, SH (>75% S), HS (>75%H)), record the height of mature (1=<25 ft, 2=26-45, 3=46+) or the height of regen. (4=1-5 ft, 5=6-15ft, 6=16-25), and record the density of forest or regen. (A=Dense (81-100%), B=Moderate (51-80%), C=Sparse (0-50%)).

The end date and end time of the last snowfall event should be recorded on the data sheet along with the start and end time of the survey. Current weather conditions should be recorded along with changes in the weather conditions throughout the survey. Snow conditions such as snow depth and snow structure (i.e. granular, loose, powder, non-supporting crust, partial supporting crust, supporting crust, and wet snow) should also be recorded.

Backtracking and collection of DNA samples

Lynx tracks should be backtracked for the obtainment of DNA samples if time allows after a township has been completely surveyed. A separate backtracking data sheet will be used for recording data. A track log will be recorded on the GPS while backtracking a lynx. Scat and hair samples should be handled with latex gloves. Scat samples should be placed in a Ziploc bag. When you return from the field, the scat should be removed from the bag to air dry and then be placed in a vial of desiccant. Hair samples can be placed in a vial of desiccant immediately. Store hair and scat samples in a cool, dry place (not frozen). All samples should be labeled with date, species, township, sample number, observer's initials, and MDIFW.

Additional data collection in 2006 and 2007 (separate data sheet)

Plowed Roads

This survey protocol was designed for unplowed roads and trails where the likelihood of detecting a lynx track if a lynx crossed a road is greater. However, under certain situations some plowed roads may be surveyed, but additional data needs to be collected to determine the value of the survey.

When surveying plowed roads, start a new track log at the beginning of the plowed road and mark the starting point with a waypoint (e.g. PRB1). At the end of the plowed road, turn off the track log and obtain a second waypoint marking the end of the plowed road (e.g. PRE1). Also, record snow conditions on plowed road following the below scores.

Best: fresh snowfall, no traffic, and not recently plowed (e.g. can read tracks in road as well as road bank).

Good: fresh snowfall, light traffic, and not recently plowed (e.g. can read tracks in road outside the tire tracks, and along the road bank).

Acceptable: high traffic and/or recently plowed (e.g. difficult to read tracks in the road), but the snow bank has fresh snow and adequate conditions to read tracks if a lynx crossed the road.

Poor: high traffic and/or recently plowed and snow conditions on bank make it difficult to read tracks.

Bobcats and Hybrids

Bobcats are more common in western and downeast Maine and bobcat/lynx hybrids have also been documented in western and central Maine (presumably the edge of both species range). Therefore, it is essential that we obtain data to provide supporting evidence that bobcat tracks are being properly identified. In addition to obtaining a waypoint at each bobcat intercept, we need to record track measurements and obtain a photograph of the track. However, you may encounter many bobcat tracks, which may hinder your ability to complete surveys within the survey area. Therefore, it is only necessary to take a photograph and obtain track measurements (individual track and trail pattern (i.e. stride and straddle)) of a representative bobcat track in each quadrant that a bobcat track is observed. When documenting a bobcat track, follow the guidelines outlined above for documenting a potential lynx track. If time allows, make an effort to obtain a DNA sample as well.

Note: if you question whether a track was left by a bobcat or lynx, record all information as you would for a lynx and include comments describing your concerns regarding the identification of the track.

Snowshoe hare and habitat conditions

At the edge of lynx ranges (2006 and 2007 survey areas), habitat is likely poorer or more patchy and snowshoe hares levels may be lower. As a result, our current survey protocol may or may not be appropriate for conducting surveys at the edge of the species range where lynx are less common. For example, if habitat appears suitable, hares are common or abundant, and bobcats (e.g. potential competitor) and lynx are not detected, it is possible that a single survey in a 100 km² area is not sufficient and additional follow-up surveys should be considered.

To help us discern the applicability of our survey protocol, a general description of habitat conditions and hare levels are needed. The percent of the survey area in various habitat classifications will be recorded as observed from your survey routes (e.g. % area mature vs. regenerating). You will record hare abundance based on your general impression of the percentage of your survey area where hares were absent (no tracks), rare (<10 tracks), common (25-75 tracks), or abundant (>100 tracks).

References

- Hoving, C.L. 2001. Historical occurrence and habitat ecology of Canada lynx (*Lynx canadensis*) in eastern North America. Thesis, University of Maine. 200 pp.
- R.O. Stephenson and P. Karczmarczyk. 1989. Development of techniques for evaluating lynx population status in Alaska. Federal Aid in Wildlife Restoration Research Final Report. Alaska Dept. of Fish and Game. 95pp.

APPENDIX B:
Meeting Notes from December 21, 2005
Meeting with USFWS and MDIFW

Meeting Notes
U.S. Fish and Wildlife Service
Maine Inland Fisheries and Wildlife Service
Augusta
12/21/05

Attending:

- Chris Cinnamon from TransCanada
- Dana Valleau and Lynn Gresock from TRC
- Mark McCollough from USFWS
- Bob Cordes from MDIFW

Purpose of Meeting:

Primary purpose was resolution regarding the need for Canada lynx tracking surveys; also an opportunity to update with regard to other ecological study issues.

Meeting Issues/Information:

- We reviewed the likely project area with Bob and Mark, identifying the potential southerly transmission line corridor and the four ridgelines.
- Mark suggested that we submit our preliminary request for review (including the transmission corridor) to the USFWS in the near future, and that he would then look on their available mapping to let us know whether any mapped communities of interest appeared in that vicinity. We agreed we would do so.

Golden Eagles and Other Raptors

- Mark noted that historic sites were located in the vicinity, near Sisk and Chain-of-Ponds, and referenced an interesting movie of golden eagles. Dana noted that he, also, had seen that film.
- Dana noted that we had looked at the known historic sites last April, and didn't see anything at that point.
- Mark said that the traditional focus for habitat of this species has been on cliff faces. Recently, nesting in white pine has been noted. This makes habitat classification quite difficult; there is a lot of white pine in Maine.
- Mark noted that USFWS would defer to Charlie Todd of MDIFW with regard to specific scope of studies appropriate regarding the golden eagle since the bird is state-listed, not federal. Note that initial conversations TRC has had with Charlie Todd have not indicated the need for extensive studies of historic nest areas.
- Mark said bald eagles are nesting in the Flagstaff area.
- Mark noted a peregrine falcon monitoring program, but said the other birds are not well studied.
- For the Bangor Hydro project transmission line, USFWS required (for areas of new cut) a flyover of the line (along a corridor of ¼ to ½ mile wide) looking for nests during the breeding season. Although most of our transmission line corridor habitat doesn't look suitable, Charlie Todd and Tom Hodgman of MDIFW can determine whether such a study should be conducted. We noted that we are expecting to do some sort of nest survey via helicopter.

Canada Lynx

- Canada lynx is a concern for the USFWS. Mark said the anticipated effects of the project on lynx, a federally-threatened species, would need to be addressed by the federal agency (FERC, Army Corps) issuing permits. Thus, it would be important to have information about the potential presence of the Canada lynx.
- Canada lynx are relatively docile. Logging doesn't seem to pose much of an impact; in fact, it creates habitat for them.
- The potential federal nexus is relatively limited for this project, and will likely occur through the U.S. Army Corps of Engineers wetland review process. The entire project, of course, will be reviewed.
- Impact concerns are largely focused on the construction phase of the project, especially on the ridgetop. It will be important to understand construction duration and timing, as well as the full footprint of the project and associated roads.
- But the first step is to determine whether the species is present.
- The species is very wide-ranging (80 square kilometers), and prefers dense, regenerating forest stands, usually present about 12-30 years after clearcutting or similar heavy harvest.
- Recent tracking studies conducted in the western mountains of Maine (including the vicinity of the project) have noted bobcat tracks; the presence of bobcats often precludes Canada lynx. USFWS and MDIFW surveys have indicated greater presence of lynx north and east of Moosehead Lake.
- The potential for wolves to be in the area was also noted. Recently, large canid tracks have been seen in Beattie and King & Bartlett, as well as just over the border in Canada. Ideally, the IFW would like to put a tracking device (radio collar) on one. We were told that, if we see a wolf during our surveys, we should contact USFWS and MDIFW immediately.
- During met tower installation, it will be useful to note tracks observed in an ancillary fashion.
- In addition, it would be prudent (and helpful to USFWS and MDIFW) to conduct a Canada lynx tracking study.
- A study protocol exists (Mark gave us a copy). Other documents provided by USFWS included: MDIFW track measurement form; efficacy of a snow track survey; northwest eco-regional lynx track survey form; rare mammals to watch for; and snow track quality. Reference books and other materials were also discussed.
- The study should be conducted at any time from now through March, and would occur optimally from 24 hours to 72 hours after a fresh snow fall. It can be all right to extend up to 72 hours after snowfall, depending on weather and site conditions. Weather can be quite sensitive, as blowing snow can also obscure tracks even with fresh snow conditions.
- Snowmobile surveys should be conducted along existing road networks in Kibby and Skinner Townships. Surveyors should attempt to survey at least 50 km of roadway per township, however, 80 km or more would be even better. We will look at the existing wood road system at the Plum Creek property and tally mileage to determine an appropriate study route.
- A survey of a town (possibly two) could be completed in one day. Two people would travel by snowmobile, looking for tracks to the woods' edge and providing

appropriate documentation (photographic and information on a standard data form, as provided, indicating such features as stride, straddle).

- Where snow banks are high, or on actively used (plowed) logging roads, the Mark noted that the survey can be conducted with observers standing in the bed of a truck (moving slowly).
- Where tracks are found in and along roadways, it is good to follow the trail to obtain as much information as possible. Additional evidence such as scats and hairs should be collected whenever possible.
- Other species tracks seen during the survey should also be noted, with a particular mention made of bobcat, coyote, marten and fisher (the MDIFW no longer does fur bearer track counts and would appreciate the information).
- Where tracks of interest are found, they should be located via GPS. Dana discussed creating a data dictionary on the GPS that would readily locate the position of each find and classify it.
- We should talk to Plum Creek for safety purposes to make sure we know where they are working during these survey events.
- Given limited funds and large areas to survey, MDIFW and USFWS can only do one survey of the township. Mark suggested that we conduct three survey events (one day each, presuming 50-80 km/township or more can be assessed in one day). If no Canada lynx tracks are found in three survey events and met tower visits, none will be presumed to be there (or it will be presumed that lynx only infrequently use these townships). Federal permit agencies will use these data. If no lynx are found, they will then conclude that the project is not likely to adversely affect this species.
- If Canada lynx tracks are found, then the federal permit agencies and USFWS would consider potential impact. If they determine that the project would likely have an adverse impact, that would trigger a formal consultation process. Right now it's premature to say what implication could result. Mark and Bob felt it quite likely, given the presence of the deer wintering yard in the Kibby Branch valley (and associated bobcats), that few lynx will be found. After that it'll depend on specific footprint and time.
- We noted that, by the time the survey is completed, preliminary project layout information is likely to be available; another meeting will be appropriate at that time to discuss potential impact implications.
- Mark noted that Canada lynx populations attain about 10 lynx per 100 km² (about the size of one township) in neighboring Quebec.
- No Canada lynx survey needs to be conducted along the transmission line route. It may be appropriate to limit construction during the denning season (late April into early June, which coincides with the mud season during which construction would be challenging in any event). Mark noted that traditional transmission line corridor management may be beneficial to snowshoe hare, the primary prey of Canada lynx.
- Mark noted that the Passamaquoddy Indians are conducting three surveys per winter for three consecutive winters in Lowelltown Township, just north of the project area. John Sewall is their biologist.
- The Penobscots are also conducting surveys, with planned work in Alder Stream Township. Kristen Dilworth is their biologist.

- Al Starr was noted as a potential contact for information about an eco-regional survey in Kibby Township.
- Bob and Mark are both potentially interested in participating in the surveys, when conducted.
- Staff from MDIFW can provide some training and show existing Canada lynx tracks for reference. Dana has already been in contact with Wally Jakubus of MDIFW in this regard.
- A master's thesis by Chris Hoving was referenced that developed a lynx habitat model; Bob and Mark thought this might be what MDIFW may have used to rank Kibby and Skinner Townships as having a high probability of supporting lynx. Kibby Township lies just south of the proposed Critical Habitat for lynx. Mark noted that designating Critical Habitat really doesn't change the review process, only adds some minor additional standards to consider while conducting USFWS review.

Other Issues Discussed

- We discussed potential recreational uses in the area, and means to document the level of usage.
- Hunting is the main use of this area, with some snowmobiling.
- Permits are issued by Plum Creek for bear baiting.
- Deer and moose harvest is tracked by township by MDIFW, but fur bearers harvests are not documented any longer.
- Mark noted they've done some digital camera trail surveys, but don't always collect relevant data that way.
- We discussed avian mortality studies, and the potential frustrations associated with the potential state of the art. USFWS sees no need to be involved with such issues for the met towers. We should coordinate with Marcia on the appropriate protocol, and she will likely reach out to MDIFW for technical input. Infra-red game finders could be a potential tool.
- Mark noted that USFWS supports renewable energy and is, in fact assessing wind resources at their refuge sites in an effort to install some wind power for public education purposes. He noted the need to balance considerations of renewable energy and environmental impact, and the care that needs to be taken in doing so.
- Mark stated that his office would continue with the USFWS review. He will try to make sure that Larry Miller is available for the next meeting, as he is providing overall windpower oversight for their group.
- We noted that it is likely a "bird group" will reconvene in mid-January to talk about next steps on study protocols for that issue.

Actions:

- USFWS and IFW correspondence on transmission line.
- Identify study route, including length of available roads, to develop site-specific study plans for the Canada lynx survey.
- Coordinate with Plum Creek to ensure safety during surveys.
- Obtain available information regarding other lynx surveys being done by MDIFW and the Passamaquoddy Indians.
- Coordinate with MDIFW with regard to training and implementation of three-day survey.

- Inform USFWS and MDIFW of survey schedule to allow for participation, if possible.
- Schedule follow-up meeting following completion of survey and availability of preliminary layout information.
- Schedule separate avian/bat meeting to address plans for spring migration surveys.

APPENDIX C:
Northwest Eco-regional Lynx Track Survey
data sheets

Western and Central Mountains Eco-regional Lynx Track Survey- 2006

Date: ___/___/___ Observer(s): _____ GPS Unit No.: _____ Town: _____

Map Datum: _____

End Date of Last Snow/Wind Event: ___/___ End Time of Last Snow/Wind: _____ County: _____

Tracking Conditions: _____

Describe snow depth, sinking depth, snow structure (e.g. crust, powder, granular, etc.), etc. STQ Code(below): 0=Unacceptable, 1=Poor, 2=Acceptable, 3=Good, 4=Best (see back)

Weather Code: _____ Comments: _____ Start: _____

CI.(1): Pt. Cldy (2): Cldy (3): Fog (4): Mist (5): Rn Shwrs. (6): Rain (7) Rnstrm (8): Hail (9): Frz. Rn. (10): Sleet (11): Snow Shwrs. (12): Snow (13): Snstrm. (14) Finish: _____

Waypoint # _____	UTMe _____	Habitat type where lynx tracks observed: Ag(1) Wetland(2) Forest(3) Other(4) _____	
Track# _____	UTMn _____	If Forest: Hardwood(111) Softwood(112) s/h(113) h/s(114)	
Track L _____	Roll # _____	Understory Height: 0-5(4) 5-15(5) 16-25(6)	
Track W _____	Frame # _____	Overstory Height: 1-25(1) 26-45(2) 46+(3)	
Stride _____	DNA Sample: Hair _____	Scat _____	History: Burn(1) Wind(2) Disease(3) Thinned(4) Herbicide(5) Partial Cut(6) Clearcut(7)
Straddle _____	Sample# _____	None	Edge: H(111) S(112) s/h(113) h/s(114) Stream(412) Beaver Flowage(423) Bog(317) Lake(421) River(411) Roads: Paved(621) Good Gravel(622) Winter Rd(624) Old Gravel(623)
Sinking D _____	STQ _____	Understory and Overstory Density: Dense(A) Moderate(B) Sparce(C) 81-100% 50-81% 0-50%	
Dir.Travel _____	No.of Lynx _____	Understory and Overstory Dominate Species: Cedar(CD) Maple(MP) Aspen(AP) Birch(BR) Alder(AD) Beech(BE) Spruce/Fir(SF) Other: _____	
Comments: _____	X = understory, Circle = overstory Plowed Roads: Y or N Start Waypoint: _____ End Waypoint: _____ Conitions: Best Good Acceptable Poor		

Waypoint # _____	UTMe _____	Habitat type where lynx tracks observed: Ag(1) Wetland(2) Forest(3) Other(4) _____	
Track# _____	UTMn _____	If Forest: Hardwood(111) Softwood(112) s/h(113) h/s(114)	
Track length _____	Roll # _____	Understory Height: 0-5(4) 5-15(5) 16-25(6)	
Track width _____	Frame # _____	Overstory Height: 1-25(1) 26-45(2) 46+(3)	
Stride _____	DNA Sample: Hair _____	Scat _____	History: Burn(1) Wind(2) Disease(3) Thinned(4) Herbicide(5) Partial Cut(6) Clearcut(7)
Straddle _____	Sample# _____	None	Edge: H(111) S(112) s/h(113) h/s(114) Stream(412) Beaver Flowage(423) Bog(317) Lake(421) River(411) Roads: Paved(621) Good Gravel(622) Winter Rd(624) Old Gravel(623)
Sinking D _____	STQ _____	Understory and Overstory Density: Dense(A) Moderate(B) Sparce(C) 81-100% 50-81% 0-50%	
Dir.Travel _____	No.of Lynx _____	Understory and Overstory Dominate Species: Cedar(CD) Maple(MP) Aspen(AP) Birch(BR) Alder(AD) Beech(BE) Spruce/Fir(SF) Other: _____	
Comments: _____	X = understory, Circle = overstory Plowed Roads: Y or N Start Waypoint: _____ End Waypoint: _____ Conitions: Best Good Acceptable Poor		

Snow Track Quality- Record the quality of the detected track as follows:

Rating 4: Best; every footprint registers, and detail within prints is very clear. Species identification is essentially absolute based on track details.

Rating 3: Good; every print registers, but details are weak, perhaps obscured by snow falling in print. Print details usually visible in microtopographic sites. e.g. tree wells and shadows. Identification based on track details, but gait patterns offer needed support.

Rating 2: Acceptable; some prints fail to register, and footprint details, if present are visible only in microtopographic sites. Identification based primarily on gait patterns.

Rating 1: Poor; many prints do not register. Track details lacking. Identification is essentially by gait patterns, and may be possible only in microtopographic sites.

Rating 0: Unacceptable; target species does not leave enough prints to identify gait patterns left in trails.

Snow conditions on plowed road will be recorded as follows.

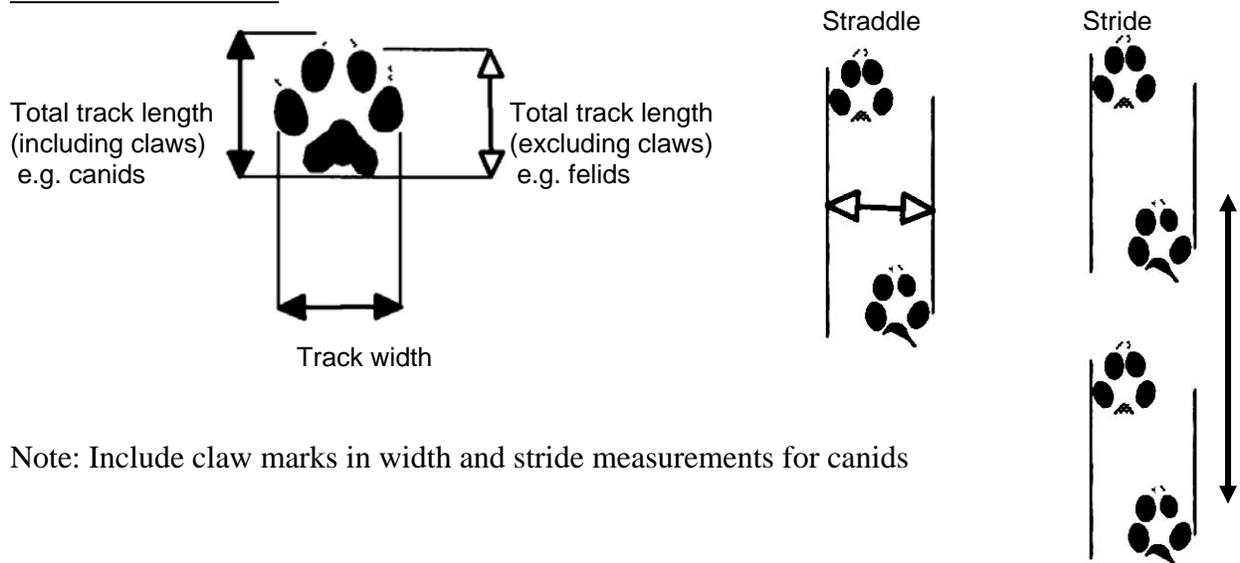
Best: fresh snowfall, no traffic, and not recently plowed (e.g. can read tracks in road as well as road bank).

Good: fresh snowfall, light traffic, and not recently plowed (e.g. can read tracks in road outside the tire tracks, and along the road bank).

Acceptable: high traffic and/or recently plowed (e.g. difficult to read tracks in the road), but the snow bank has fresh snow and adequate conditions to read tracks if a lynx crossed the road.

Poor: high traffic and/or recently plowed and snow conditions on bank make it difficult to read tracks.

Track Measurements



Note: Include claw marks in width and stride measurements for canids

Western Mountains Eco-Regional Lynx Track Survey – 2006

Additional Information

Date: ___ / ___ / ___ Town: _____

Observer(s): _____

Plowed Roads: Y or N

Waypoints: _____
 Conditions: Best Good Acceptable Poor
 Poor

Waypoints: _____
 Conditions: Best Good Acceptable

Waypoints: _____
 Conditions: Best Good Acceptable Poor
 Poor

Waypoints: _____
 Conditions: Best Good Acceptable

Best: fresh snowfall, no traffic, not recently plowed (can read tracks in rd as well as rd bank); Good: fresh snowfall, light traffic, and not recently plowed (can read tracks outside the tire tracks and along rd bank); Acceptable: high traffic and/or recently plowed (difficult to read tracks in rd), but adequate snow conditions on the snow bank; Poor: high traffic and/or recently plowed and difficult to read tracks on bank.

Bobcat Tracks (attach map)

GPS Unit No: _____

Waypoint	STQ	Width	Length	Stride	Straddle	Sinking Depth	Photo (YorN)	DNA (YorN)

Note: record a waypoint at each intercept, but only fill out the above information once in each quadrant.

Habitat Conditions (describe for township)

% Mature H _____ % Mature S _____ % Mature Mix _____
 (>40 ft tall)
 % Regen H _____ % Regen S _____ % Regen Mix _____
 (<40 ft tall)
 % recent cuts _____ % other _____

Snowshoe Hare Conditions (describe for township)

Based on presence of tracks along survey roads:

Absent (no tracks)	Rare (<10 tracks)	Common (25-75 tracks)	Abundant (<100 tracks)
____% of township	____% of township	____% of township	____% of township

Comments:

Western Mountains Eco-Regional Lynx Track Survey – 2006

NO LYNX TRACKS FOUND

Date: / /

Town: _____

County: _____

Observers: _____

GPS Unit No: _____ Map Datum: _____

End Date of Last Snow/Wind Event: / _

End Time of Last Snow/Wind Event: _____/_____

Tracking Conditions: _____

Weather Code: _____

Cl (1); Pt Cldy (2); Cldy (3); Fog (4); Mist (5); Rn Shwrs (6); Rain (7); Rnstrm (8); Hail (9); Frz Rn (10); Sleet (11); Snow Shwrs (12); Snow (13); Snstrm (14)

Start Time: _____ Finish Time: _____

Comments:

APPENDIX D:
2006 Winter Tracking Survey
Completed Northwest Eco-regional Lynx Track Survey data sheets

Western Mountains Eco-Regional Lynx Track Survey – 2006

NO LYNX TRACKS FOUND

Date: 12/16/06

Town: Kibby Twp

County: Franklin

Observers: Dana Vallera, Bob Cordes (McIFW), Sharon Murphy

GPS Unit No: GeoXT PowerPC Map Datum: NAD83

End Date of Last Snow/Wind Event: 02/14/06

End Time of Last Snow/Wind Event: 2:30^{STQ} / ^{PM}

Tracking Conditions: 3 (6000^{unplowed}) Acceptable on plowed Rds.

Weather Code: 3 / 12

Cl (1); Pt Cldy (2); Cldy (3); Fog (4); Mist (5); Rn Shwrs (6); Rain (7); Rnstrm (8); Hail (9); Frz Rn (10); Sleet (11); Snow Shwrs (12); Snow (13); Snstrm (14)

Start Time: 9:30 Finish Time: 5:00 PM

Comments: Red Sox common throughout survey area
to abundant

Snowshoe hare absent to locally abundant

Coyote + Moose common

Martin present : well distributed

Western Mountains Eco-Regional Lynx Track Survey – 2006

NO LYNX TRACKS FOUND

Date: 3/8/2006

Town: Kibby (part); Skinner

County: Franklin County

Observers: Dana Valleau, Bill Noble (MDIFW)

GPS Unit No: _____ Map Datum: NAD83

End Date of Last Snow/Wind Event: ~~3/5/06~~ 3/5/06 / 3/6/06

End Time of Last Snow/Wind Event: ? / 8:00 PM

Tracking Conditions: unplowed roads = Best; plowed roads = Acceptable

Weather Code: 1

Cl (1); Pt Cldy (2); Cldy (3); Fog (4); Mist (5); Rn Shwrs (6); Rain (7); Rnstrm (8); Hail (9); Frz Rn (10); Sleet (11); Snow Shwrs (12); Snow (13); Snstrm (14)

Start Time: 10:00 AM Finish Time: 5:00 PM

Comments: For plowed roads, we only surveyed those that were acceptable.

Red fox common throughout.

Coyote common in NE + NW Skinner

Marten abundant in Skinner Twp.

Fisher common in Skinner Twp.

Western Mountains Eco-Regional Lynx Track Survey – 2006

NO LYNX TRACKS FOUND

Date: 03/24/06

Town: Kibby

County: _____

Observers: S. Murphy, K. Murphy

GPS Unit No: _____ Map Datum: (Created Rover Site for Data)

End Date of Last Snow/Wind Event: 03/23 ~~12:00 AM~~ 12:00 AM

End Time of Last Snow/Wind Event: 12:00 / 1:00 AM (overnight duration $\approx 1/2$ ")

Tracking Conditions: Acceptable to Best (see notes *)

Weather Code: Cloudy (3)
Cl (1); Pt Cldy (2); Cldy (3); Fog (4); Mist (5); Rn Shwrs (6); Rain (7); Rnstrm (8); Hail (9); Frz Rn (10); Sleet (11); Snow Shwrs (12); Snow (13); Snstrm (14)

Start Time: 8:30 AM Finish Time: 6:00 PM

Comments: Several interruptions in day to also complete avian deterrent taping at Bill-1. Some spurs not done (see maps). Did one "new" road off of ~~Wahl~~ Wahl Rd: see GPS data.

Saw fox, coyote, raccoon, hare tracks - no marten / fisher scat. (some very old fisher but not marked due to age of tracks)

* Many unplowed roads have melted off down to gravel - quality of tracks along edges still very good. Areas where snow remains on roads still ~~good~~ "best" quality conditions.

Western Mountains Eco-Regional Lynx Track Survey – 2006

NO LYNX TRACKS FOUND

Date: 03/25/06

Town: Skinner

County: _____

Observers: S. Murphy, K. Murphy

GPS Unit No: _____ Map Datum: R032510A

End Date of Last Snow/Wind Event: 3/23

End Time of Last Snow/Wind Event: ~12:00 + 3:00 AM (overnight dusting ~1/2")

Tracking Conditions: Acceptable to Best at start, then degrading w. snowfall

Weather Code: Cloudy (3) at start, then Show Showers⁽¹²⁾ + Hail (9), then Snowstorm (14)

Cl (1); Pt Cldy (2); Cldy (3); Fog (4); Mist (5); Rn Shwrs (6); Rain (7); Rnstrm (8); Hail (9); Frz Rn (10); Sleet (11); Snow Shwrs (12); Snow (13); Snstrm (14)

Start Time: ~~9:30 AM~~ 9:30 AM Finish Time: 3:30 PM

Comments: no new snow on roads (from overnight dustings) upon arrival (though such was the case in Kibby). By about 11:00 AM, light occasional showshowers settled in. Hail/snow mix started around 1:00 PM and began to accumulate slightly. By 2:00 Heavy Snow settled in and accumulated rapidly. By 3:30, about 3-4" had accumulated and was completely obliterating tracks. Ceased survey at this time.
See map for roads covered.