Alberta Conservation Association
2015/16 Project Summary Report

Project Name: Working with Alberta's Trappers to Map Wolverine Distribution and Identify Conservation Risks

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Partnerships

Alberta Environment and Parks
Alberta Trappers' Association
Animal Damage Control – A Division of Bushman Inc.
Daishowa-Marubeni International Ltd.
Environment Canada
Harvest Operations Corp.
Shell FuellingChange Grant
Trapper Gord Homestead & Survival
University of Alberta
Individual donors – W. Sullivan

Key Findings

- Wolverines visited 18 of the 62 sites that trappers and staff monitored in the winter of 2014/15, with the frequency of visits increasing as the winter progressed from December through March.
- Lynx and fisher were more common than wolverine and visited 29 of the 62 sites.
- We identified 19 individual wolverines from their unique chest patterns using camera images from winter 2014/15.
- Using non-lethal methods, we collected hair samples from 15 marten, 143 fisher, 131 lynx, 7 coyote, 5 squirrel, 4 weasel and 80 wolverine visits during winter 2014/15 (though many may be repeat individuals).
- Analysis of previous hair samples suggests there may be different wolverine genetic types in Alberta that are specific to either the mountains or the boreal forest.
- Over the winter of 2015/16, 22 trappers from the boreal portion of the province operated 51 run poles to passively collect photos and hair samples. ACA staff operated another 11 run poles.

Introduction

We are partnering with the Alberta Trappers' Association (ATA) to identify where wolverines and other focal furbearers occur in the province and to determine the major factors influencing their distribution. We hope to better understand wolverine gene flow within Alberta and between Alberta and other jurisdictions, which will provide useful information to help conserve this species over the long term. We predict that areas with high human disturbance will have a lower probability of use by wolverines than areas with low disturbance, and areas predicted to have cooler theoretical temperatures (i.e., further north and higher elevations) will have a higher probability of use than areas with higher theoretical temperatures. Because lynx also thrive in areas that receive deep snow and have been shown to prefer thick conifer canopy inhabited by their primary prey (snowshoe hare), we predict that lynx occupancy will be greater in areas that have cooler theoretical temperatures and more conifer forest cover. We predict that fisher will be more abundant in areas with lower human disturbance and with greater deciduous or mixed canopy cover. We also predict that wolverines in the boreal forest will be more closely related to each other than they are to wolverines in the mountains.

Methods

The field component of the wolverine distribution project is largely focused on a citizen-science approach where ATA members collect wolverine population and distribution data using a run pole (baited hair trap and remote camera) field protocol (Magoun et al. 2011). We tested the method during winter 2011/12 and expanded the field program in 2012/13 to include trappers province-wide who span a variety of habitats. In 2013/14, 2014/15 and 2015/16, we decided to concentrate on the Boreal Natural Region to collect better information on an area where very little is known about wolverines. Genetic information (DNA) in hair samples will help us understand genetic relationships of wolverines across the province, and occurrence data (photographs) will provide information on the distribution of wolverines in relation to factors such as human disturbance and landscape features.

Results

Sampling was focused on boreal regions of the province during 2013/14, 2014/15 and 2015/16, within a study area that roughly stretched from Cold Lake to Grande Prairie and north to the Northwest Territories border. Camera images collected in 2013/14 were analyzed during the spring and summer of 2014. Photos collected during the winter of 2014/15 were analyzed during the spring and summer of 2015.

Between November 2014 and April 2015, volunteer trappers and ACA staff deployed 62 run pole camera stations, set up on 37 different Registered Fur Management Areas (traplines), to passively collect wolverine photographs and hair (DNA) samples. Approximately 170,000 photos of different animals were captured. Wolverines were detected at 18 of the 62 sites; unique markings identified at least 19 different wolverines; some individuals were detected in previous winters. Detections increased throughout the season (December: 16; January: 17; February: 18; March: 30), with some sites only ever being visited near the end of the season. Occupancy analysis for the 2014/15 data indicated that the closer that a site was to an area of either Lower or Upper Boreal Highlands natural subregions, the more likely that it was to have wolverine present

(Figure 1). Wolverines were less likely to occur as the road density within the surrounding township increased or the closer that a site was to a human population centre. We created a GIS layer that approximated the relationship between elevation and latitude, which influences ambient temperature. The cooler the relative theoretical climate within the township, the more likely wolverines were to occupy a given area (Figure 2). We found a high overlap in wolverine and lynx visits at individual sites. Wolverine and lynx occurred in areas that had more conifer forest cover and were located further north in latitude. In contrast, fisher occurrence was greater in areas further south in latitude and with more deciduous forest cover.

We also found a few interesting variables that did not turn out to be important for our data. Despite our initial predictions, we did not see a clear relationship between where wolverines were found and where there are areas of persistent spring snow into late April to mid-May. We did not find wolverines more often in areas closer to parks and protected areas, or find a relationship between where wolverines were and what the seismic line density was within the surrounding township.

Our DNA analyses to date suggest that there are wolverine genetic types that are most common in Alberta's mountains, genetic types that are primarily found in our boreal forest, and one genetic type that is common to both areas. Interestingly, one of the boreal genetic types has never been reported south of Grande Cache in the Rockies, but it is found in both Nunavut and the Cascade Mountains of Washington State.
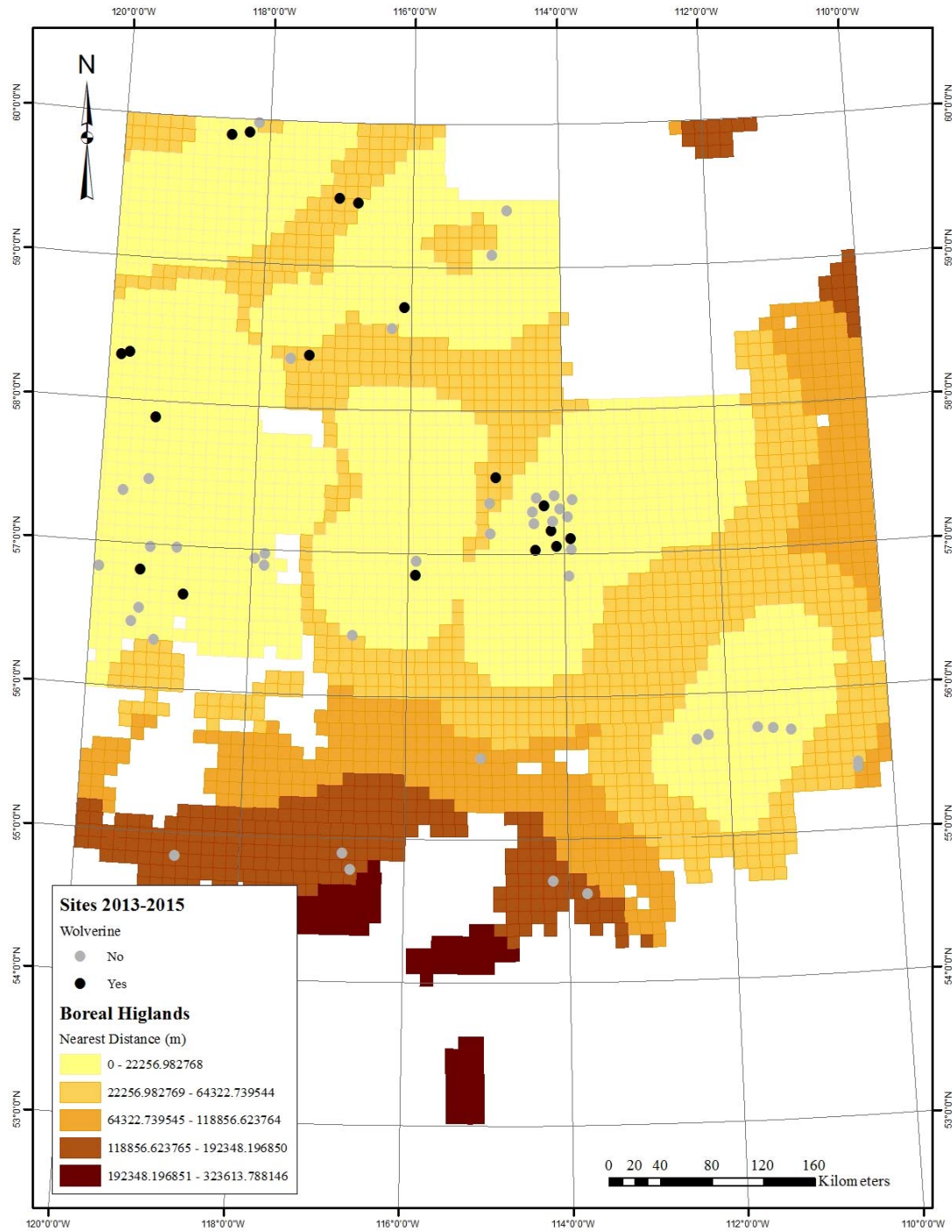
Figure 1.   Mirroring our traditional knowledge survey, which suggested that wolverines were most common in the northwest Boreal area, data from bait station cameras showed the greatest concentration of wolverine visits in the northwestern part of the boreal study area. Areas that were closer to the Boreal Highlands natural subregions (lighter colours) were more likely to receive a visit than those that were farther away (dark colours).
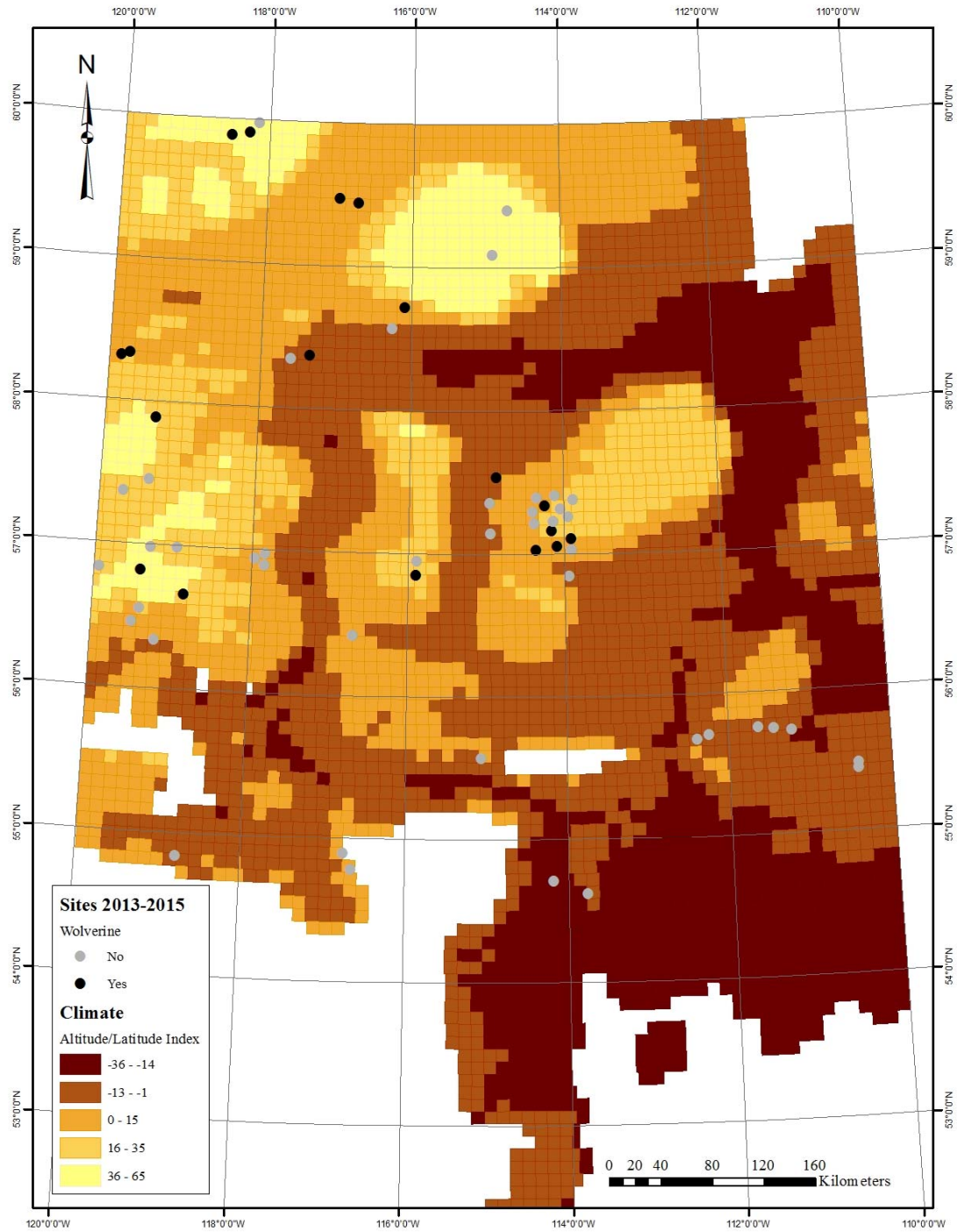
Figure 2.   Over the past two winters, we have found that wolverines tend to occur in townships predicted to have cooler theoretical climates (lighter colours; higher index value represents a cooler overall theoretical climate but does not represent an actual temperature) based on elevation and latitude.

Between November 2015 and March 2016, volunteer trappers and ACA staff deployed 43 run poles to passively collect wolverine photographs and hair (DNA) samples. Sampling was focused on Boreal regions of the province. We will be analyzing this data during the summer and fall of 2016.

Conclusions

Field data collected in partnership with trappers and biologists is starting to shed light on wolverines in an understudied part of their range. At a coarse scale, we are finding that wolverines are more likely to be found in areas close to Boreal Highland natural subregions and areas that are predicted to have cooler climates. Contrary to what we expected, we are not finding boreal wolverines to be associated with the distribution of late spring snow. Wolverine and lynx appear to have a high level of overlap and seem to prefer conifer cover, whereas fishers tend to occur in areas where the canopy cover is dominated by deciduous trees. Some of these field results mirror the conclusions of our trapper traditional knowledge survey and harvest analyses, which highlight the value of the information that this user group can contribute to discussions regarding long-term species conservation and sustainable management of the province's furbearer populations.

Communications

Presentations

- Alberta Society of Professional Biologists, April 2015
- Northern Furbearer Conference, Juneau, AK, April 2015 (two presentations)
- Cross Border Wolverine Workshop, Blairmore, AB, June 2015
- Alberta Trappers' Rendezvous, Plamondon, AB, July 2015
- Alberta Trappers Association AGM, Westlock, AB, September 2015
- Alberta Trappers' Association local meeting, Manning, AB, November 2015
- Alberta Wilderness Association, Calgary, AB, January 2016
- Daishowa-Marubeni International Inc., Peace River, AB, February 2016
- Peace River Museum and Archives, Peace River, AB, February 2016

Other

- Quarterly project newsletter
- Project progress report
- Monthly telephone and e-mail updates with participating trappers
- Annual planning meeting with ATA representatives and University of Alberta, Blairmore, AB, June 2015
- Updates on ACA's website and Facebook page
- Articles in *Alberta Trapper* magazine
- Interview for *Let's Go Outdoors* radio program and social media

Literature Cited

Magoun, A.J., C.D. Long, M.K. Schwartz, K.L. Pilgrim, R.E. Lowell, and P. Valkenburg. 2011. Integrating motion-detection cameras and hair snags for wolverine identification. Journal of Wildlife Management 75: 731–739.

Photos

This wolverine takes a break in the snow at one of the run poles on a mild March evening. Photo: Alberta Conservation Association

Although Alberta Conservation Association biologists such as Dan Sturgess look after some of the camera sites, more than 90% of the sites are run by volunteer trappers.

You just never know what you're going to find on the remote camera! This lynx is helping with a new objective for the project, which is to learn about other furbearer species, not just wolverines.