

**Alberta Conservation Association
2018/19 Project Summary Report**

Project Name: Wolverine Reporting

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Project Lead: Robert Anderson

Primary ACA staff on project: Robert Anderson and Mike Jokinen

We greatly appreciate the work of Shevenell Webb who put in a lot of effort to make this project a success.

Partnerships

Alberta Environment and Parks

Alberta-Pacific Forest Industries Inc.

Alberta Trappers' Association

Animal Damage Control – A Division of Bushman Inc.

Daishowa-Marubeni International Ltd.

Crowsnest Conservation Society

McGill University

Roadrunner Leasing and Sales Ltd.

Shell Fueling Change

TD Friends of the Environment

University of Alberta

Key Findings

- A trapper local ecological knowledge manuscript was submitted to *Wildlife Society Bulletin* in spring 2018 and accepted with revisions August 2018. The paper was resubmitted

November 2018. This manuscript describes the variables associated with where trappers reported seeing wolverine sign on their traplines.

- A wolverine den manuscript was submitted to the *Canadian Field Naturalist* spring of 2018 and accepted with revisions January 2019. The paper was resubmitted February 2019. This manuscript is a descriptive paper that discusses the characteristics of wolverine dens in the lowland boreal forest of northcentral Alberta.
- Female wolverines in the lowland boreal of Alberta appear to be selecting denning habitat that differs from what has been reported elsewhere. Seven of the eight dens were in a partially lifted root ball created by a leaning or fallen spruce tree. These were found in black spruce stands characterized by hummocky, wet, and mossy terrain subject to windthrow.

Introduction

We worked in partnership with Alberta Trappers' Association (ATA) to identify where wolverines occur in the province and to determine the major factors associated with their distribution. We collected information on Alberta's boreal wolverine population using trapper surveys, trail cameras, and radio-collared animals. Although data collection has concluded, we continue to work on sharing our findings in the scientific literature.

Methods

During this past year, we submitted two manuscripts from our wolverine work for publication in scientific journals. In the early phase of the study, we asked trappers whether they had observed wolverine sign on their traplines (i.e., Registered Fur Management Areas; RFMA). We analyzed this local ecological knowledge in relation to a suite of variables measured for each trapline. In more recent years, we focused on live capture, collaring, and recapture of wolverines, as well as the use of camera traps, to learn about the type of habitat they use. We investigated clusters of data points from reproducing females to identify the characteristics of their dens.

Results

Across the province, trapper observations of wolverines were associated with less anthropogenic disturbance. Each increase of 1% in the amount of intact forest within an RFMA increased the odds of a trapper observing wolverine sign by 4% (Figure 1). In the Boreal Forest, wolverines were more likely to be found in areas that had a cooler climate and more intact forest.

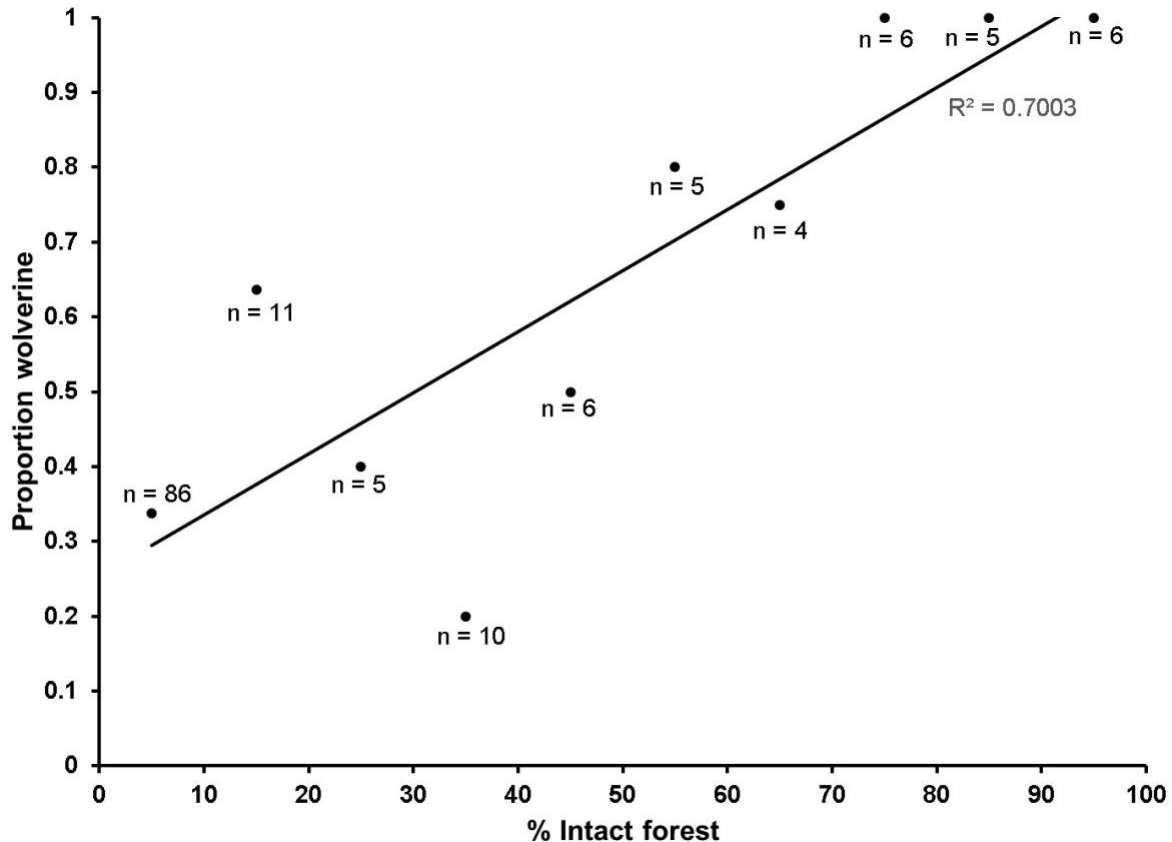


Figure 1. As the amount of intact forest in the surrounding area increased, so too did the proportion of trappers reporting that they had seen wolverine sign.

Wolverine dens have previously been documented under wind-drifted snow, large boulders, and trees in areas with deep snow (Magoun and Copeland 1998; Krebs and Lewis 2000; Dawson et al. 2010; May et al. 2012; Makkonen 2015), but these features are lacking in the boreal forests of northern Alberta. Instead, seven of the eight wolverine dens in our study were in the hollow created by a partially uplifted root mass (i.e., root ball, root wad) of a leaning or fallen spruce tree. One den was under decayed logging debris in a ~30 year old regenerating deciduous forest.

Seven of eight dens were in mature (50-120 years) or old (>120 years) black spruce stands. Two of the seven dens were in mossy formations originating from an uplifted root mass, but the trees had decayed, while the other dens were braced by the roots of intact leaning or fallen spruce trees. Root mass dens require little to no excavation by a wolverine as a natural cavity is created when a thick moss blanket separates from the soil below as the shallow roots of a leaning or fallen tree upheave. The lateral roots form the skeleton of the den, which supports a dense mat of soil and moss creating the den walls. Internal den dimensions were slightly variable in size, but den size was ultimately determined by the extent of the root heave (~1 m x 1 m). A soccer ball-sized opening (~30 cm) often created the den entryway and most dens had alternate openings or potential escape routes in the walls.

Conclusions

To address the data deficient status of the wolverine and to add to our understanding of the species for management purposes, we have been working with ATA and university researchers to learn more about the species in the province. Among the goals that we identified when we initiated this research was the desire to provide information that would be useful for conducting a status assessment. Part of that process is to publish our findings in scientific journals. This year, we made progress with two of those papers. Insights from trappers provided valuable baseline data on a sensitive species that is complementary to other research findings and stimulated hypotheses that wolverines are linked to cooler climates and less disturbed environments. Collared female wolverines used locally-available denning structures in the lowland boreal forest, despite a lack of deep snow, persistent spring snow cover, or large boulders documented in other studies.

Literature Cited

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- Makkonen, T. 2015. Den site characteristics of female wolverine (*Gulo gulo*) in Scandinavian forested landscape. M.Sc. thesis, University of Oulo, Sweden.

Communications

- Webb, S.M., R.B. Anderson, M.E. Jokinen, B. Abercrombie, B. Bildson, and D.L. Manzer. 2019. Incorporating Local Ecological Knowledge to Explore Wolverine Distribution in Alberta, Canada. *Wildlife Society Bulletin* (in Review).
- Jokinen, M.E., S.M. Webb, D.L. Manzer, and R.B. Anderson. 2019. Characteristics of Wolverine Dens in the Lowland Boreal Forest of north-central Alberta. *Canadian Field Naturalist* (not yet published at time of writing).
- Updates continued to be provided to participating trappers via the furbearer newsletter.

Photos



Trappers acquire local ecological knowledge while spending time on their traplines. We were able to tap into this resource to learn about the habitat that wolverines use in Alberta. Photo: L. Peleshok



Most of the wolverine dens that we found were under the partially uplifted roots of a leaning spruce tree. Photo: M. Jokinen