CITIZEN WILDLIFE MONITORING PROJECT

2017-2018 WINTER FIELD SEASON REPORT

May 2018

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Cover photo: Team leaders from the project discuss a set of American marten tracks during a training at the start of the winter. Photo by David Moskowitz.

Partners: Conservation Northwest, Wilderness Awareness School

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Table of Contents

Executive Summary

The Citizen Wildlife Monitoring Project (CWMP) uses trained volunteers to record the presence and movement of wildlife through snow tracking surveys and remote camera installations in the Washington Cascades and other wildlands across Washington State and British Columbia. This report summarizes snow-tracking efforts for the winter of 2017-2018. This field season was the twelfth winter of snow-tracking along Interstate 90, east of Snoqualmie Pass.

This winter was marked by a consistently good snowpack that lasted through March allowing transects to be completed from late December to mid-March. With the permanent addition of a transect west of Snoqualmie Pass and our second season of off-highway American marten track surveys, the project completed one of its busiest field seasons on record.

Project Overview

CWMP is a joint project led by Conservation Northwest and the Wilderness Awareness School. The program utilizes remote cameras year-round to document rare and sensitive species throughout core areas in the Cascades, as well as for more common species in strategically important locations. During the winter months, trained CWMP volunteers use snow tracking to monitor the presence, location, and movement of wildlife near proposed wildlife crossing sites east of Snoqualmie Pass along Interstate 90 in the Washington Cascades. Since its inception, CWMP has remained an asset to wildlife agencies and

professionals by providing supplemental monitoring efforts in areas identified as either potential core habitat or vital connectivity corridors between core habitats for some of our region's rarest wildlife. Our main project objectives are:

1. To engage and educate citizens about the detection and monitoring of sensitive wildlife species and in critical habitat areas;
2. To record wildlife presence in the I-90 corridor and along the I-90 Snoqualmie Pass East Project in strategic locations and in core habitat through remote cameras and snow tracking;
3. To record the presence of rare and sensitive species that regional and national conservation efforts aim to recover including fisher, gray wolf, grizzly bear, lynx, and wolverine;
4. To facilitate the exchange of information about wildlife, including data from monitoring efforts, between public agencies, organizations, and interested individuals.

CWMP is designed to support the conservation of our region's wildlife and wildlands by enhancing our knowledge of wildlife-habitat connections in our region, supporting the monitoring and management efforts of transportation and wildlife agencies, and providing engaging educational field experiences for volunteers.

The winter portion of CWMP is focused on snow-tracking along a 15-mile corridor on I-90 and providing data for the I-90 Snoqualmie Pass East Project. The I-90 Snoqualmie Pass East Project is a 15-mile highway improvement project that includes measures for connecting wildlife habitat, such as the construction of wildlife crossings. Construction on the Phase 1 of the I-90 Snoqualmie Pass East Project has been started with funding from the Washington State Legislature and completion is projected for the end of 2018. Near the Gold Creek transect, an underpass in this first phase section is now being used by wildlife. Construction in phase two has begun and includes an overpass near the Price Nobel transect. Construction activities were not active during the snow-tracking season.

In the past two years, CWMP has expanded its winter survey effort in the vicinity of Snoqualmie Pass. Track surveys for American marten north and south of Interstate 90 are an effort to better understand the range of this species and impact of the highway and human development on the connectivity of their population. The establishment of a new transect *west* of Snoqualmie Pass along the interstate, in conjunction with WSDOT is designed to begin to understand the current status and needs for improvement of landscape permeability along this stretch of the interstate.

A complete description of the Citizen Wildlife Monitoring Project's goals and methods, as well as a record of previous season reports, is available online at http://www.conservationnw.org/our-work/wildlife/wildlife-monitoring/.

Methodology

Study Area

Snoqualmie Pass (3022 feet, 921 meters) is the lowest pass in the Washington Cascades. Interstate 90 traverses the pass from west to east as a divided highway with two to four lanes of traffic in each direction throughout the study area. A large downhill ski complex sits at the summit of the pass, along with associated human infrastructure. A few miles east of the pass, a large irrigation water reservoir on the headwaters of the Yakima River fills much of the valley bottom. The human footprint at the pass along with the high speed and heavily trafficked interstate highway makes Snoqualmie Pass the most tenuous wildlife corridor in the Washington Cascades. Ongoing reconstruction by the Washington Department of Transportation on Interstate 90 east of Snoqualmie Pass has been designed to improve road safety for motorists and increase the permeability of the road for wildlife.

Field Methods

CWMP employs trained volunteers to walk transects adjacent to the interstate and document the tracks of wildlife. Set transects are monitored three times over the course of the winter on average and were established at locations where crossing structures either exist and are being improved or have been targeted for installation. Transects run parallel to the highway about 150 meters from the roadbed. Field teams document tracks and signs of any mammal species larger than a snowshoe hare found along the route. At least one set of tracks is trailed on each transect per visit in an attempt to document the animal's relationship to the interstate. Observations are photo-documented in the field and all photos are reviewed by expert observers out of the field to assess observer reliability. All species of high conservation value are thoroughly documented, including photo-documentation, to ensure the accuracy of identification.

American marten surveys are not along prescribed routes. Rather, general locations are assigned to a field team to survey. These survey areas are based on an attempt to fill in a more complete picture of landscapes currently occupied and unoccupied by the species adjacent to the highway corridor. This information will hopefully help identify the closed points of linkage for northern and southern populations and obstacles to connectivity for them. A route is selected based on access considerations and how to best cover the area. Teams record a GPS track of the route they take so that the project can track locations that have been surveyed and the amount of effort. Teams record tracks of American marten when they are detected as per the project protocol for on-transect surveys.

Results

Summary of 2018 Transect Data

During the winter field season 62 species detections were made across all 10 transects, 41 detections (66 %) were identified to species (8 species total, Figure 1) and the remaining 21 were ambiguous. Across detections, 33 were travelling parallel to roadway, 7 away from the roadway, and 14 towards the roadway. The remaining 7 had an unknown relationship to the roadway. Only a single level-one species was detected, a cougar at Price Noble. Two

level-two species were detected. Mule deer were found at Denny Creek and elk were found at Denny Creek, Price Noble, and Easton. It is notable that these observations were of sign other than tracks that could have persisted from the fall. It is not clear that there was any activity of either species during the winter within the study area. For detailed maps of detections for each transect site see Appendix A. Similar to past years, coyote and bobcat comprised most of detections made to species (45%).

As in years prior, Price Noble and Easton Hill remain the most species rich and species diverse of the five transects (Table 1), though this may be due to higher detection rates east of the crest, possibly due to better snow track quality (Table 2). Snow track quality (STQ) is recorded each visit with detections, and while we don't collect snow track quality during visits with no species detections, it serves as a general correlate for the ability to accurately detect and identify tracks. STQ scores of 1 denote snow conditions where all track features are obscured, and identifications are made primarily through track patterns of incomplete track sets (gaits), while STQ scores of 4 denote snow in which fine detail of individual tracks can be accurately identified and every track registers. All detections at Denny Creek, the lowest and westernmost transect, were made from scat identifications, and visits were free of snow multiple times. Thus, the odds of not detecting species that were present are much higher.

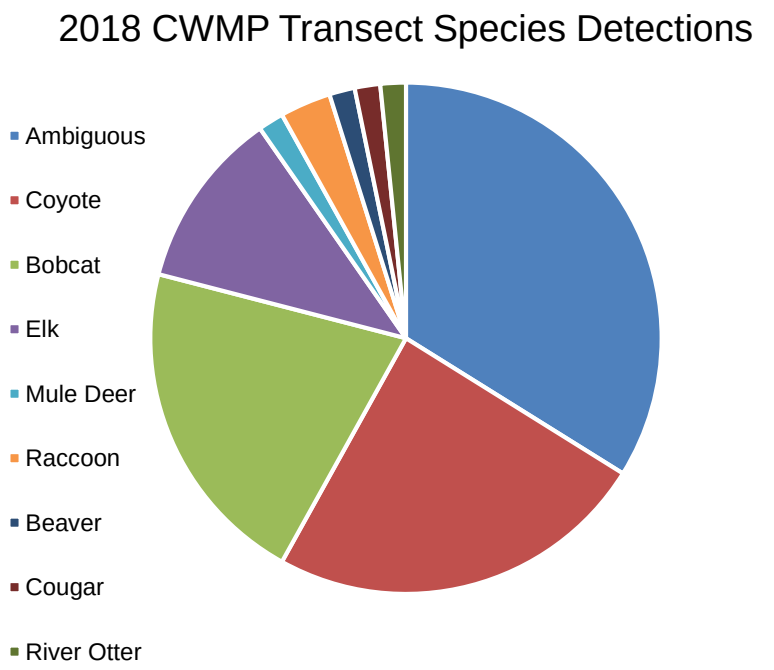


Figure 1. Total detections by species at all five transect sites on I-90 at Snoqualmie Pass during the 2018 winter monitoring season

Table 1. Distribution of species detections at the five transect survey sites during the 2018 winter monitoring season.

Species	Denny Creek North	Denny Creek South	Snoqualmie Pass North	Snoqualmie Pass South	Gold Creek North	Gold Creek South	Price Noble North	Price Noble South	Easton North	Easton South	Grand Total
Ambiguous			1	1	1		2	4	3	5	21
Coyote			3	2	1		1	2	2	4	15
Bobcat			1		1		4		5	2	13
Elk	1	2					2		1		7
Raccoon			1	1							2
Mule Deer		1									1
Beaver					1						1
Cougar							1				1
River Otter						1					1
Grand Total	*1*	*3*	*6*	*4*	*4*	*1*	*10*	*6*	*11*	*11*	*62*
Species Total	*1*	*2*	*4*	*3*	*4*	*1*	*5*	*2*	*4*	*3*	*9*

Table 2. The number of detections in four categories of snow track quality (STQ: 1 – lowest snow quality, 4 – highest snow quality) at each of the five transect survey sites.

	STQ				
Transect	1	2	3	4	NA
Denny Creek					3
Snoqualmie Pass North		3	3		
Snoqualmie Pass South		2	2	1	
Gold Creek North	3	1			
Gold Creek South		1			
Price Noble North	2	2	4		4
Price Noble South	3	2	1		
Easton North	2	4	3	2	2
Easton South	1	4	4	1	2

Summary of 2018 Trailing Events

In 2018 there were 6 trailing events. No trailing events were recorded at Denny Creek transect. At Snoqualmie Pass transect a bobcat was trailed on the North side of the highway going parallel to the roadway and no crossing behavior was detected. At Gold Creek a bobcat was trailed on the North side of the highway and a river otter on the south side of

the highway, entering the creek. No crossing behavior was detected on either side of the highway. At Price Noble a coyote was trailed on the south side of the highway foraging and heading towards Keechelus lake. No relationship to the road was determined. A cougar was trailed on the North side of the highway, but no relationship to the road was established. Finally, a bobcat was trailed at Easton transect on the North side of the highway moving parallel with the road way. No crossing behavior was detected. See Appendix B for maps of trailing events.

Summary of 2018 American Marten Surveys

This year six surveys for American marten were completed (Appendix C). Three surveys were on the North side of the highway (Amabilis Mountain, Keechelus Ridge, and Kendall Lakes), two on the South side (Hyak Lake, Twin Lakes / Mount Catherine) and one in forest between the highway's east and west lanes (Denny Creek). American Marten were only detected on the North side of the highway at Keechelus Ridge and Kendall Lakes.

Citizen Science

The Citizen Wildlife Monitoring Project completed a total of 6 marten surveys and 24 winter tracking transects along the I-90 corridor between December 31st and March 18th. This year we had an increased number of total volunteer transect days and volunteer hours, including some much needed flagging maintenance that was completed on the transects prior to the start of the season. A total of 49 volunteers logged 815 volunteer hours in the field, over 29 field days.

Volunteers spent fewer hours on administration and entering data sheets manually, thanks to increased efficiency provided by use of a mobile phone app that is able to synchronize our data from the field and be saved online. General tasks have become more efficient as well, as we continue to conduct meetings as conference calls and returning volunteers continue to strengthened the expertise of the project. Our long-term partnership with the Wilderness Awareness School has provided consistently high quality wildlife trackers as our team leaders for the project, helping to maintain the reliability of the data collected.

Table 3. *Summary of winter 2017-2018 volunteer participation hours*

Number of Volunteer Team Leaders	10
Number of Volunteers Team Members	39
TOTAL PROJECT VOLUNTEERS	**49**
Number of Transect Field Days	29
Number of Transect Volunteer Days	107
Winter Training Team Leader Hours	215

Winter Training Team Member Hours	280
Project Leadership Volunteer Hours	25
Transect Volunteer Hours	815
TOTAL VOLUNTEER HOURS	**1335**

Discussion

The results for this year's field season were relatively unremarkable in comparison to past seasons in regards to species detections and locations. Perhaps most interesting is the growing picture of American marten presence and absence being painted by project survey efforts which continue to align with prior survey efforts by others which suggests there is either limited or no connectivity between populations north and south of the interstate.

The lack of definitive evidence of either mule deer or elk using the study area likely reflects the deep and persistent snowpack from this winter in the study area. In the past, low snow years have been associated with greater activity recorded for these species in the study area.

There were several notable errors in species identification made in the field by teams which were detected and corrected by expert review of images after the field season. This suggests the need for both continued attention to recruiting and maintaining well trained observers. It also suggests the current methods for documenting tracks allows for the skill of field observers to be augmented by out of the field expert assistance.

Recommendations for Next Field Season

1. American marten surveys: Continue to carry out these surveys next year. Create a summary of areas we have surveyed and refine locations to be focused on for next year.
2. Avalanche Hazard: Because American marten surveys can take place in a wide variety of geographic locations off of Snoqualmie Pass, including potentially areas with avalanche hazards not experienced on any of our near-highway transects, the project should develop a system for identifying and mitigating or avoiding these hazards for teams carrying out these surveys. This plan will be developed during the off-season and introduced for the coming field season.
3. Marten survey area access: Surveys conducted by a project team leader who is also a trip leader for the Mountaineers, a climbing club, allowed for access to terrain that would have been harder to access by general volunteers. Consider a more formal exploration of how to tap into this potential pool of volunteers for future surveys.
4. Flagging: Preseason flagging prior to snowfall was effective in preparing for the field season. Setting up volunteer crews to do this in September or October might allow for better weather for these outings.
5. Observer Reliability and Snow Track Quality: Finish a thorough review and write up of observer reliability from this project and how this relates to observer experience and snow track quality.

Acknowledgements

We appreciate supportive grants from WDFW ALEA Cooperative Grants Program, Norcliffe Foundation, Deacon Charitable Foundation, Lucky Seven Foundation, and an anonymous foundation that supported CWMP in 2017. This project would not be possible without your generous support. The North Bend Branch of Starbucks Coffee generously stored our field equipment and offered an excellent meeting location for our field teams for the duration of the season. We thank individual advisory council members, and project collaborators for the talent, time, and guidance they provide to the project (see Appendix 1 for a complete list of our advisory council members). This year we would like to thank Glen Kalisz for his recommendations and help establishing the Denny Creek North Transect.

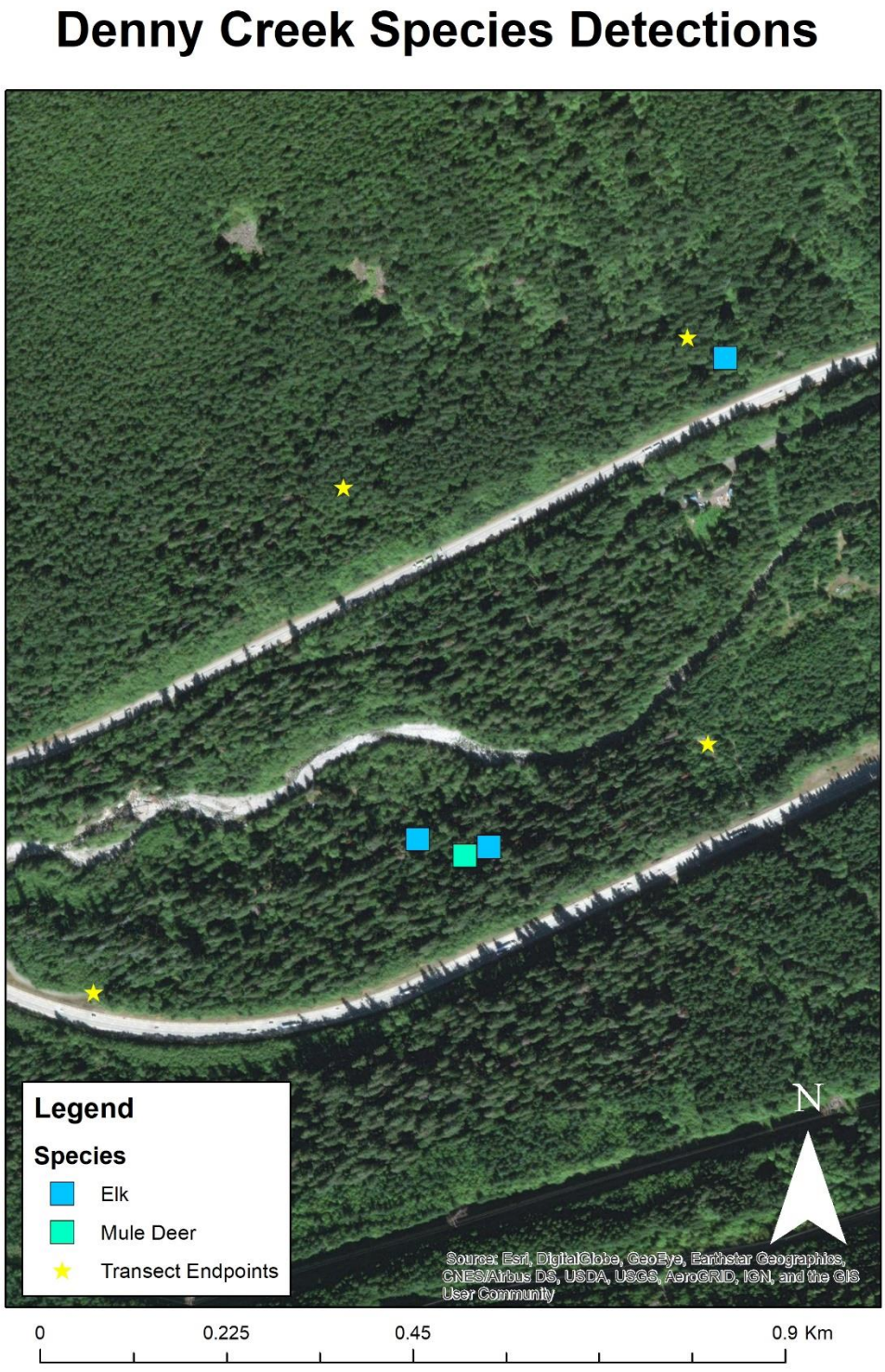
Most importantly, we are grateful for our dedicated volunteers, whose hard work and commitment to quality in and out of the field made this season possible. Without the ongoing volunteer commitments and leadership of Mallory Clarke and Adam Martin the quality of this project would be impossible to maintain.

Team Leaders: Evan Adkins, Annabel Brennan, Brian Booth, Mallory Clarke, Grace Coale, Joe Kiegel, Adam Martin, Brooke Nelson, David Snair, and Kirsten Tauber.

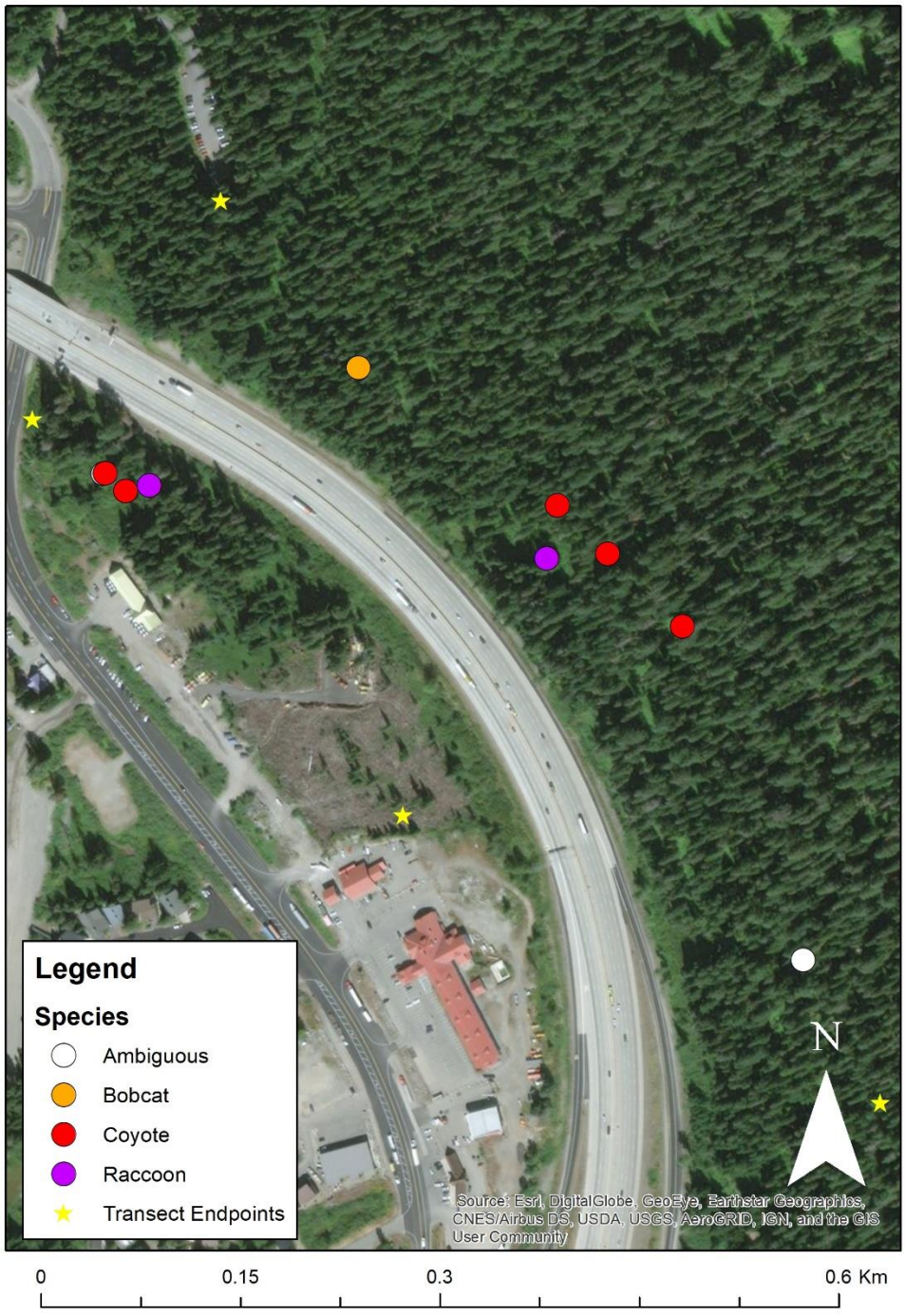
Team Members: Alberto Chavez, Allison Barfield, Andy Held, Ben Mardis, Brett Hunter, Cate Burnett, Emily Rezek, Eric Skocaj, Erica Grant, Erin Donahou, Gabrielle Orsi, Gary Boba, Grace Prescott, Guthrie Schrengohst, Hans Heuer, Jonathan Paul, Julia Moylan, Justin Bishop, Justin Roberts, Kami Koyamatsu, Kane Ayub, Kara Hollenbeck, Kathryn Hansen, Katie Southard, Kelly Fine, Kevin Stone, Kurt Kiefer, Kyle Schultheis, Lindsay Hutchison, Luke Fabian, Mandy Paul, Mary Williamson, Monica Diaz, Rich Johnson, Stephen Miller, Tim Gibbons, Todd Daniel, Travis Prescott, Tricia Enfield.

We have many volunteers and active supporters who contribute their time and expertise in various ways throughout the course of the program and the potential to miss people ever looms. Thank you to any we have missed!

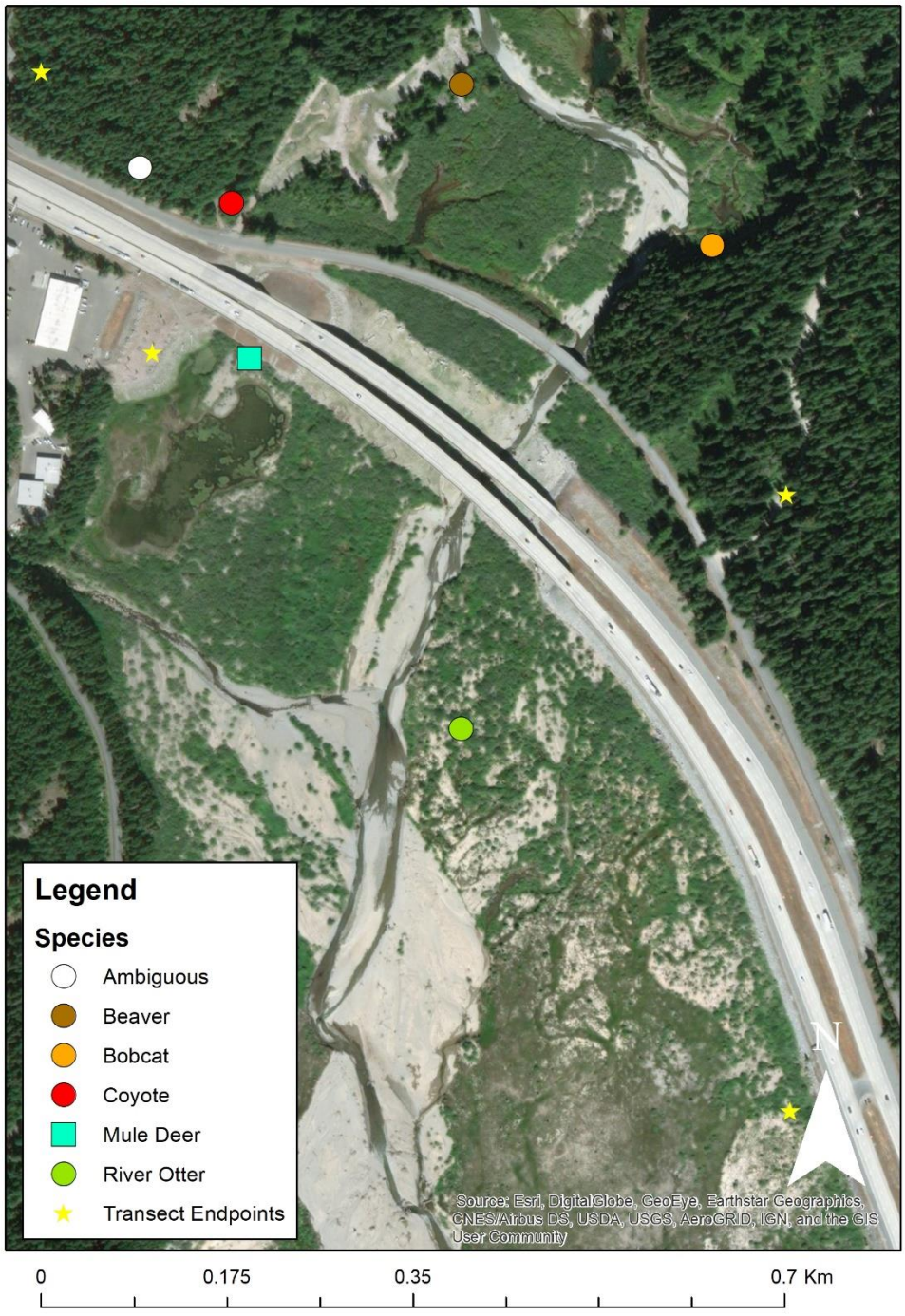
Appendix A: Species Detection Maps



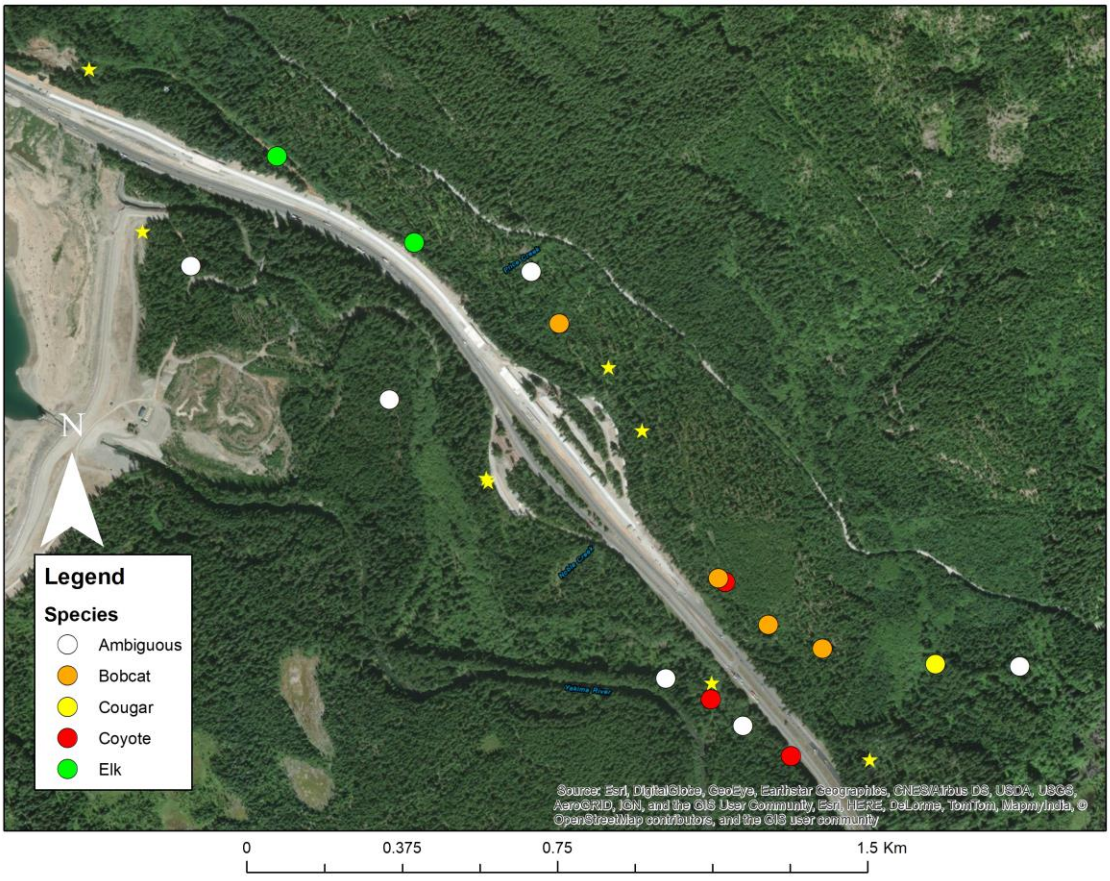
Snoqualmie Pass Species Detections



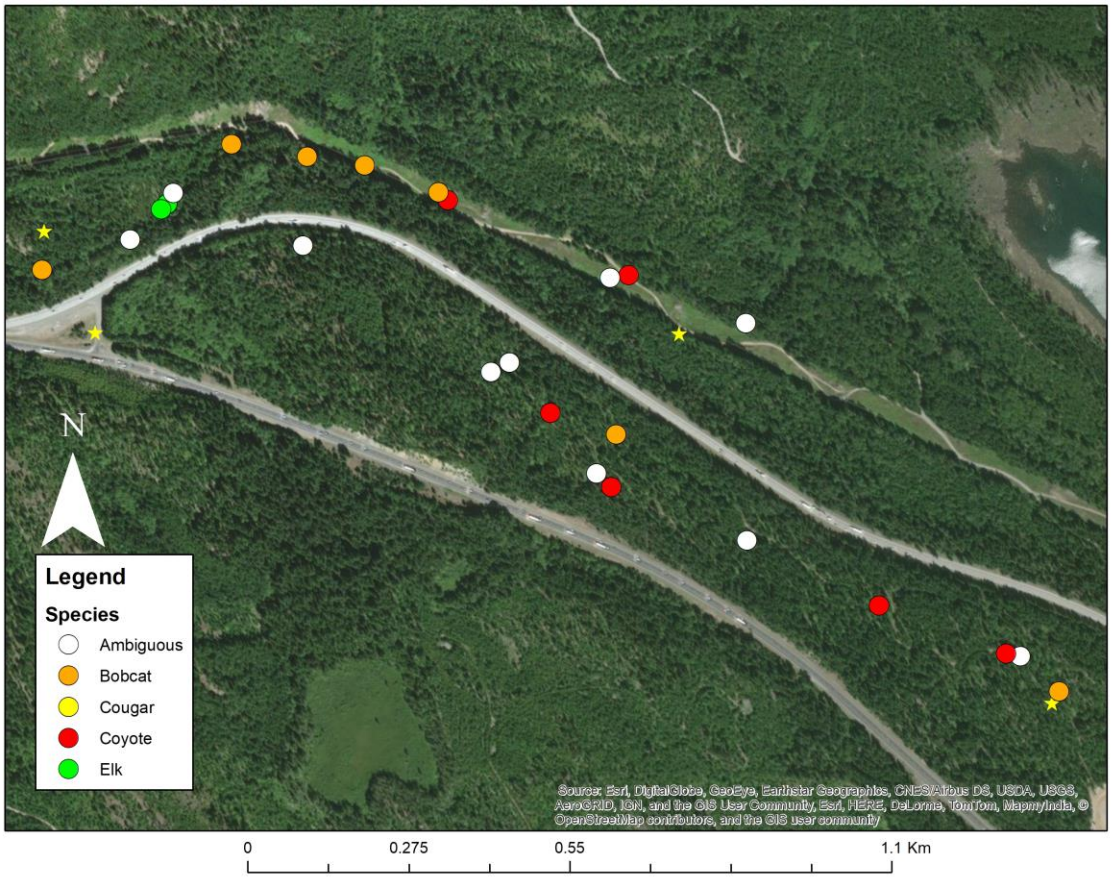
Gold Creek Species Detections



Price Noble Species Detections

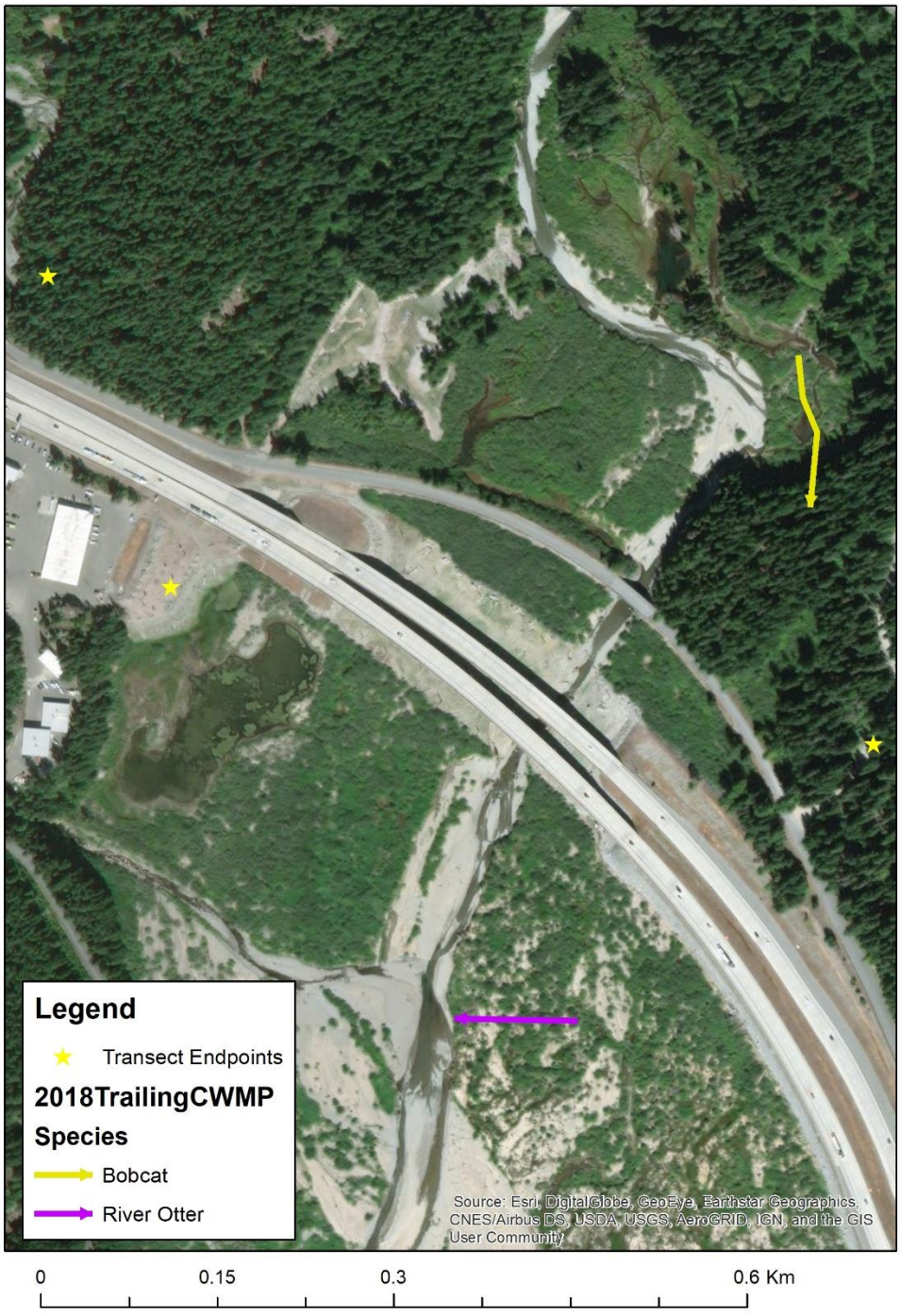


Easton Hill Species Detections

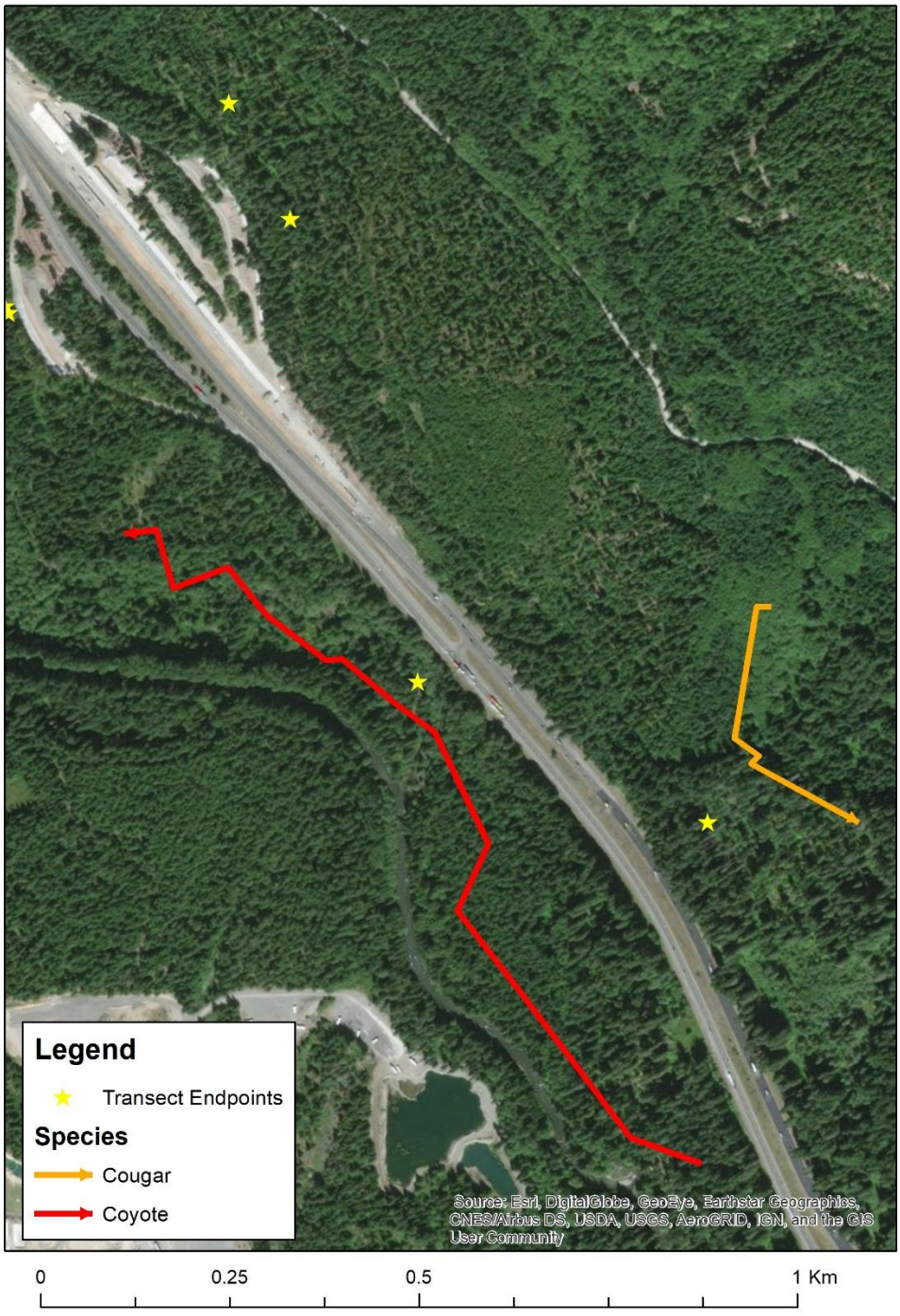


Appendix B: Trailing Events Maps

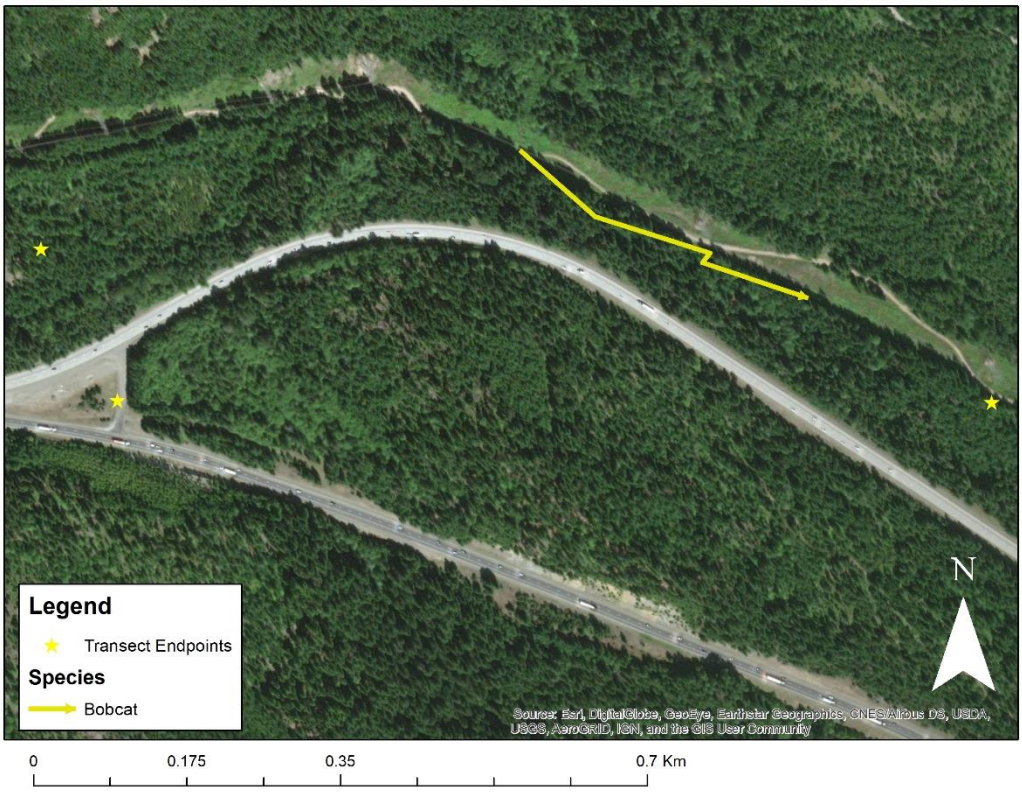
Gold Creek Trailing Events



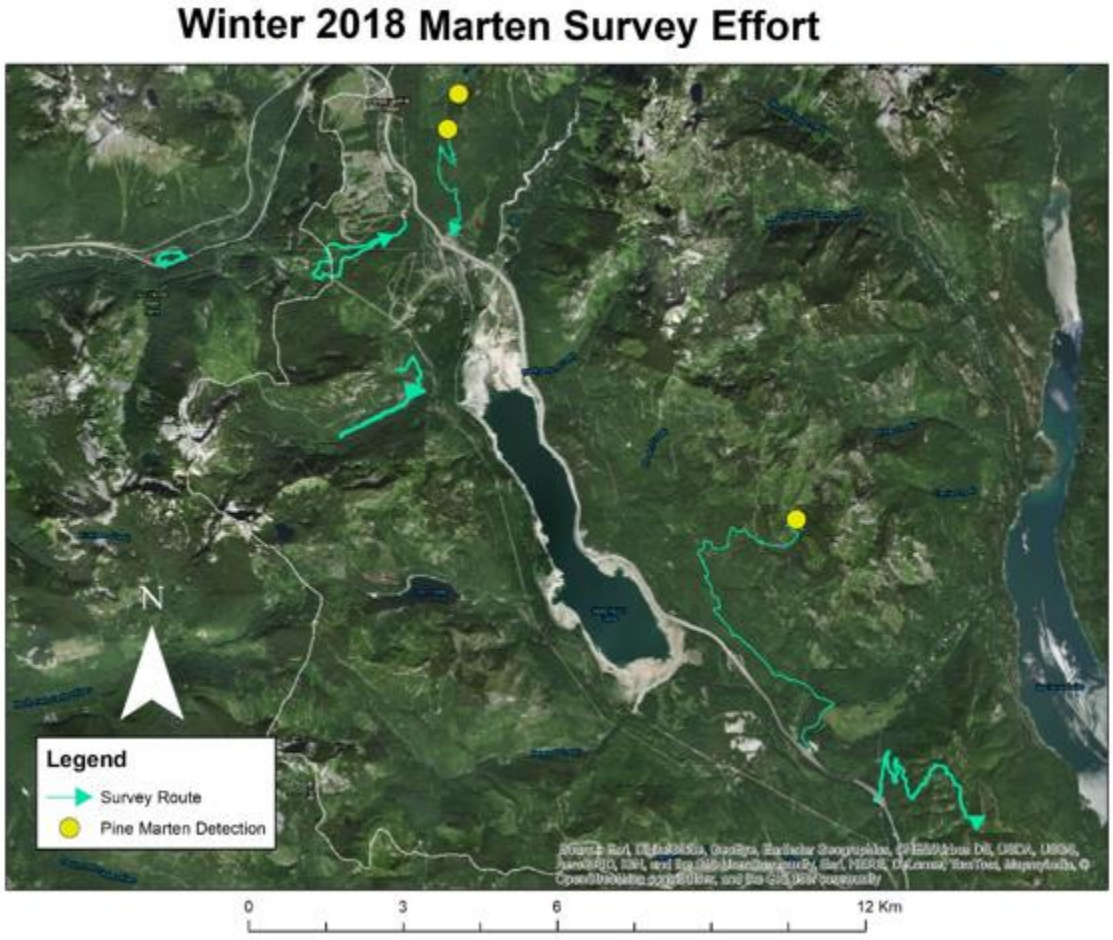
Price Noble Trailing Events



Easton Hill Trailing Events



Appendix C: American Marten Surveys



Appendix D: Advisory Council

Jocelyn Akins (Cascades Carnivore Project);
Chris Loggers (Colville National Forest);
Aaron Reid (BC Ministry of Forests, Lands and Natural Resources);
Carol Chandler, John Jakubowski (Gifford Pinchot National Forest);
Sonny Paz, Jesse Plumage (Mt. Baker Snoqualmie National Forest);
Roger Christophersen, Jason Ransom, Regina M. Rochefort, Ph.D. (North Cascades National Park);
Monte Kuk, Patty Garvey-Darda, Joan St. Hilaire, Matt Marsh, Jo Ellen Richards, John Rohrer, Aja Woodrow, Don Youkey (Okanogan-Wenatchee National Forest);
Keith Aubrey, Cathy Raley (PNW Research Station, USDA Forest Service);
Gregg Kurz (US Fish and Wildlife Service);
Bill Gaines (WA Conservation Science Institute);
Dana Base, Scott Becker, Ben Maletzke, William Moore, Annemarie Prince, Trent Roussin, David Volsen, Scott Fitkin (WA Dept. of Fish and Wildlife);
Kelly McAllister, Mark Norman, Josh Zylstra (WA Department of Transportation);
Dr. Dan Thornton (Washington State University);
James Begley, M.S. (Western Transportation Institute);
Chris Morgan (Western Wildlife Outreach and BearTrek);
Robert Long (Woodland Park Zoo)

Appendix E: Species Priority List

Tracking priority for this study in descending order

Level 1

Wolverine, fisher, Canada lynx, wolf, American marten, grizzly bear, cougar, mountain goat

Level 2

Elk, mule deer, mountain red fox

Level 3

Black Bear, bobcat, coyote, raccoon, river otter, beaver, any other wild mammals larger than a snowshoe hare encountered in the field

Do Not Record

Snowshoe hare and smaller animals

KEY

Level 1 species should be trailed wherever possible. In the case of the top 5 species (wolverine, fisher, Canada lynx, wolf and American marten), these can be trailed even before a transect is completed because they are critical rare species. Level 2 species should be trailed in the absence of Level 1 species, after completing the outward leg of your transect and where time is available. Level 3 species should only be trailed if there are no Level 1 or Level 2 species present on the transect.