Wolverine Tracking Project
2020-21 Annual Report

The Wolverine Tracking Project is a grassroots community science project in which trained volunteers conduct surveys for rare carnivores in the Mt Hood National Forest. The project has three objectives: to collect data on the occurrence of target rare carnivore species in the Mt Hood National Forest, to get people involved in their local national forest, and to teach participants about wildlife and the natural world. This report documents the summer and winter survey seasons, running from May 2020 through April 2021.

Project Description

Primary target species of this project are wolverine, gray wolf, Sierra Nevada red fox, and Pacific marten. Information is also collected on all mammal and select bird species detected, with emphasis on carnivores. This project collects data from three kinds of surveys: camera trap surveys, year-round; snow tracking surveys, during the winter season; and scat surveys done by volunteers while hiking or driving along dirt trails and roads, mostly during the summer season. Genetic samples of gray wolf and Sierra Nevada red fox are collected when encountered on all surveys. Surveys followed similar protocols to previous years; however, due to social distancing restrictions resulting from the COVID-19 virus, no group surveys were carried out this year and volunteer involvement was much more limited. See Appendix A for survey details.

2020-21 Results

SURVEY EFFORT

Camera surveys
Camera sites were divided into two general areas, as in previous years: those near Mt Hood targeting Sierra Nevada red fox, and those near the eastern edge of the National Forest boundary targeting wolves.

Spring: Due to the COVID-19 virus, the Mt Hood National Forest closed all trailheads and recreation areas from mid-March until late May. Cameras from the previous winter were left up and unattended during this time, until they could be safely retrieved in late May and early June. These camera locations are given in Figure 1.

Summer: Nine cameras were placed on the south side of Mt Hood, in the Timberline Lodge and Government Camp area, wrapping up a two year focus in this area. Eight cameras were placed along the eastern edge of the forest, spread out as much as possible to target dispersing individual wolves as well as known pack members. In addition to these cameras, one volunteer donated the use of his four personal cameras to help monitor wolves in their area of known activity, and another volunteer donated the use of his nine cameras to help search for fox on the north side of Mt Hood.

Camera volunteers were trained in May with the expectation that social distancing restrictions would be rescinded soon; however, restrictions continued throughout the summer and these volunteers were not able to go out. Cameras were instead maintained by the project coordinator and a small group of long-term volunteers.

In late summer, the Forest was hit with large forest fires and a large windstorm. Due to these events, three cameras could not be accessed before snow prevented travel to those locations, and we are still waiting to be able to retrieve them.

Winter: With protocols in place to prevent the share of equipment and maintain social distancing, a limited number of volunteers were able to help maintain cameras during the winter. Thirteen cameras were placed around Mt Hood in locations near the snow tracking transects. Seven were place along the eastern boundary of the forest, in those areas accessible during the winter, to continue monitoring for wolves. In addition, one volunteer continued placing three personal cameras along the east side as well.

Winter and summer camera survey locations are shown in Figure 2.

Scat surveys
Scat survey volunteers hiked, biked, or drove dirt trails and roads looking for scat, which they identified using visual characteristics. Surveys took place in the same two broad areas as the camera surveys. Those targeting Sierra Nevada red fox occurred at elevations above 4000 ft, and those targeting wolves occurred over a very broad area covering the eastern edge of the National Forest and likely dispersal routes. In addition to searching for scat, volunteers had the option of doing a complete species survey, recording all tracks and sign seen, following the same protocols as the snow tracking surveys. Volunteers covered 54 miles of fox surveys and 258 miles of wolf surveys and found 26 potential scats. Scat survey locations are shown in Figure 3.

Tracking surveys
Tracking volunteers were trained at the beginning of the season, but in late November the decision was made to cancel the group trips due to COVID-19. Volunteers were instead encouraged to go out with members of their household or quarantine group, and although some volunteers did so, many fewer surveys were carried out than in previous years. Nine surveys occurred from December through March. They covered 15 miles and surveyed eight of the twelve transects. Tracking survey transect locations are shown, along with their companion camera, in Figure 4.

Genetic Samples Collected
Genetic samples of gray wolf and Sierra Nevada red fox were collected when found on each camera, scat, and tracking survey. Twenty putative red fox samples were collected, five from scat surveys targeting red fox, nine from scat surveys targeting wolves, four during camera maintenance visits, one during a snow tracking survey, and one incidental. Six putative gray wolf scat samples were collected, all during the wolf scat surveys. No hair samples or urine samples were collected. Samples were given to Oregon Department of Fish and Wildlife (ODFW) for analysis. A summary of the genetic samples collected is presented in Table 1.

FINDINGS

Two gray wolves were detected by a camera at one new site, within the Area of Known Wolf Activity issued by ODFW. They are assumed to be members of the existing pack.

Sierra Nevada red fox were detected at a number of camera sites. During the period when recreation sites were closed, red fox were detected at two additional locations where they had not been detected previously, including one location that had been monitored continuously for a year a half. During the summer, Sierra Nevada red fox were detected at two locations, one above tree line and one in the sub-alpine zone. These findings corroborate with what was found the previous summer, when again they were only seen at the highest elevation sites. During the winter, three more detections of red fox occurred around Mt Hood, and one red fox was also detected at a camera set to target wolves, in an unexpected spot at an elevation of 2700 ft. This individual is thought to be a lowland subspecies of red fox; however, its location in the foothills of the Cascades opens up questions about how close in proximity these two subspecies really live.

Pacific marten were also detected at two camera sites and one companion snow tracking survey. Both were areas where they have been encountered repeatedly in the past, in montane forest habitat at elevations of over 5000 ft.

Many non-target species were also recorded including coyote, cougar, bobcat, black bear, weasel, striped skunk, deer, elk, and many hares, squirrels, and small mammals. Deer and coyote were the most abundantly detected species on the camera surveys; snowshoe hare and Douglas squirrel were most abundant in the snow tracking surveys.

The red fox detections during the Forest closure were intriguing, given the possibility that the foxes were changing their behavior and becoming bolder due to the lack of human presence. To see whether this was a trend that held true for other species, data from this period were compared with data from the previous winter to see if there were any differences that could not easily be explained by the difference in season. Results are given in Table 2, and no obvious visual trends were seen. Although the lack of humans probably did have numerous effects, especially on animals that tend to avoid humans, these effects are probably more subtle than this data can show.

Having cameras and tracking transects in similar locations over the winter also presented an opportunity to compare the results of these different survey methods. A visual examination of the results seems to show that larger mammals were detected more often by cameras than tracking, while small mammals were detected more often by tracking. Coyotes, especially, were detected more frequently by the cameras, probably as a result of the bait being deployed. Results are given in Table 3.

Results from all the camera surveys are given in Tables 4 and 5, results from the scat surveys are given in Table 6, and results from the snow tracking and complete species scat surveys are given in Table 7.

VOLUNTEERS

At the start of the summer season, 122 people were trained and registered for the project. However, due to continued social distancing restrictions, only 28 volunteers were able to go out. For the winter season, these restrictions were expected and we limited the number of volunteers we could accept to 53 people. After the trainings took place, the group survey trips were unexpectedly canceled, so only 35 people participated. In spite of the low number, volunteers put in over 2500 hours, contributing 1674 hours for the camera surveys, 695 hours for the scat surveys, and 137 hours for the tracking surveys. The number of hours devoted to scat surveys, an activity people could easily do with members of their households, actually increased this summer. Three project support volunteers also assisted this project, putting in over 1500 hours. The level of enthusiasm and commitment from volunteers is what continues to make this project a success.

Acknowledgments

Cascadia Wild would like to thank the Mt Hood National Forest, Defenders of Wildlife, and the Oregon Recreation and Community Fund for their funding and support, without which this project could not happen.

Figure 1: Camera Survey Locations Spring 2020
Green = winter only; Black = winter and previous summer

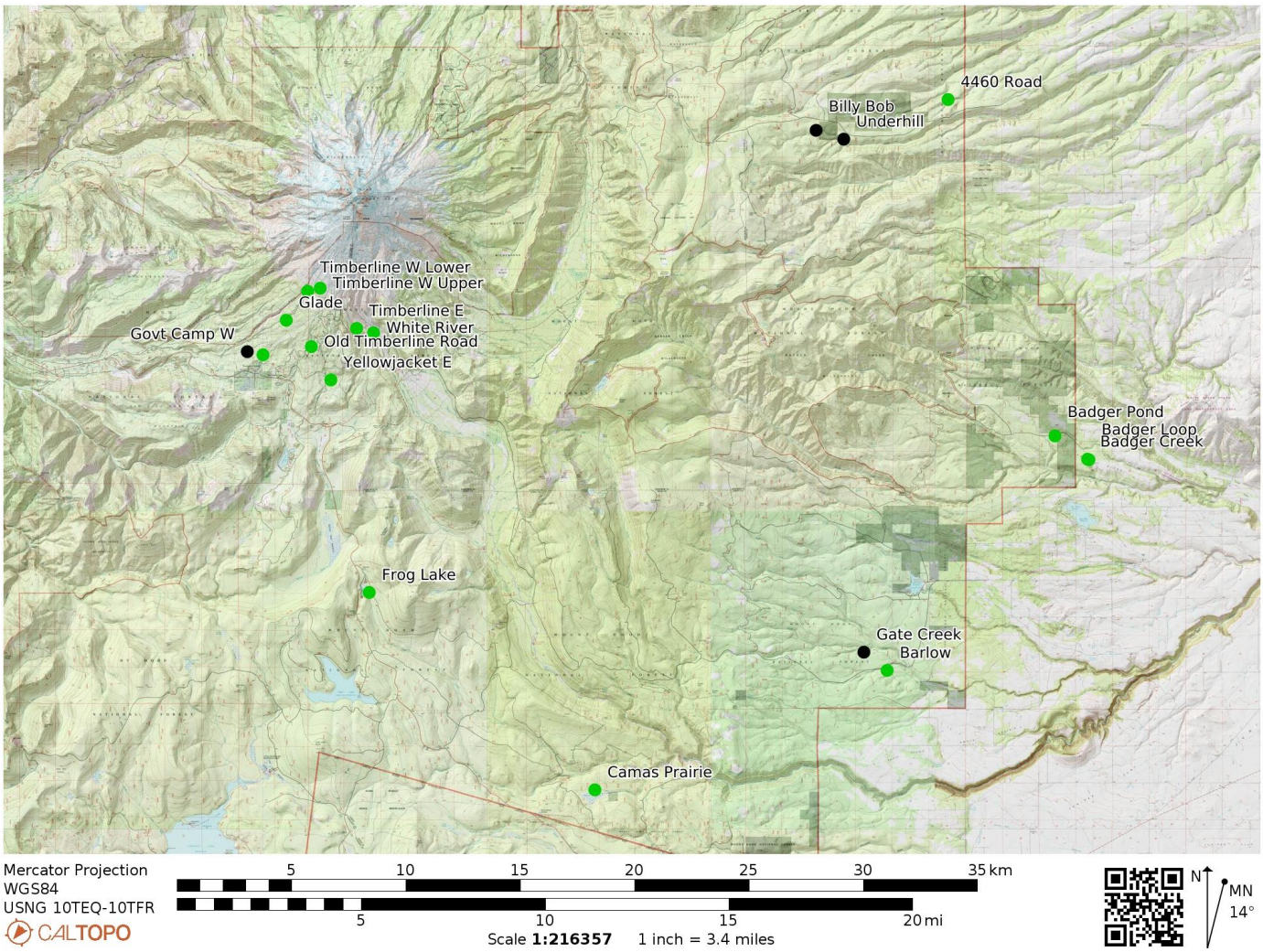

Figure 2: Camera survey locations Summer through Winter 2020-21
Red = summer only; Blue = winter only; Black = all year

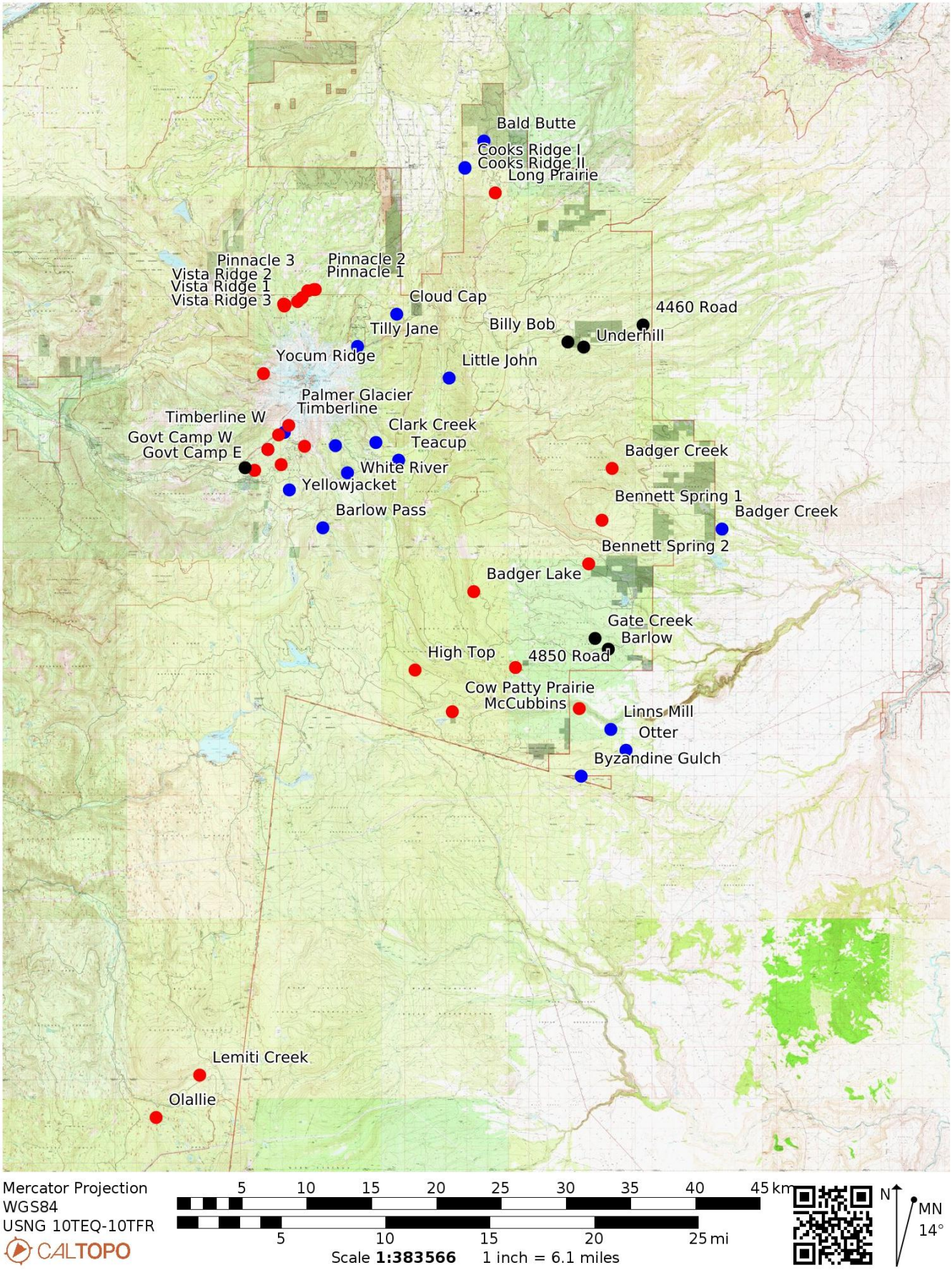

Figure 3: Scat Survey Locations 2020-21

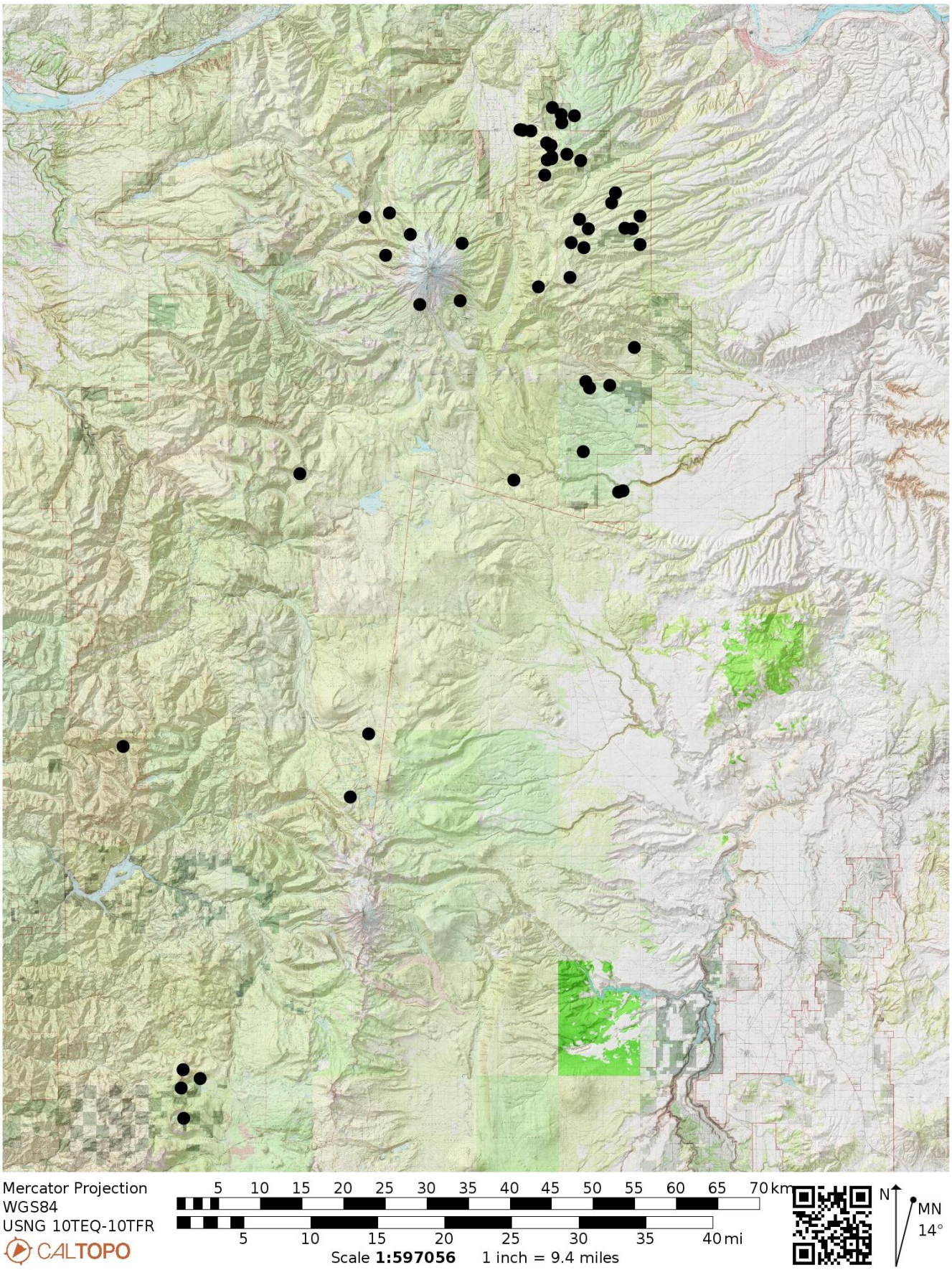

Figure 4: Tracking Survey Locations and Matching Winter Camera Locations 2020-21

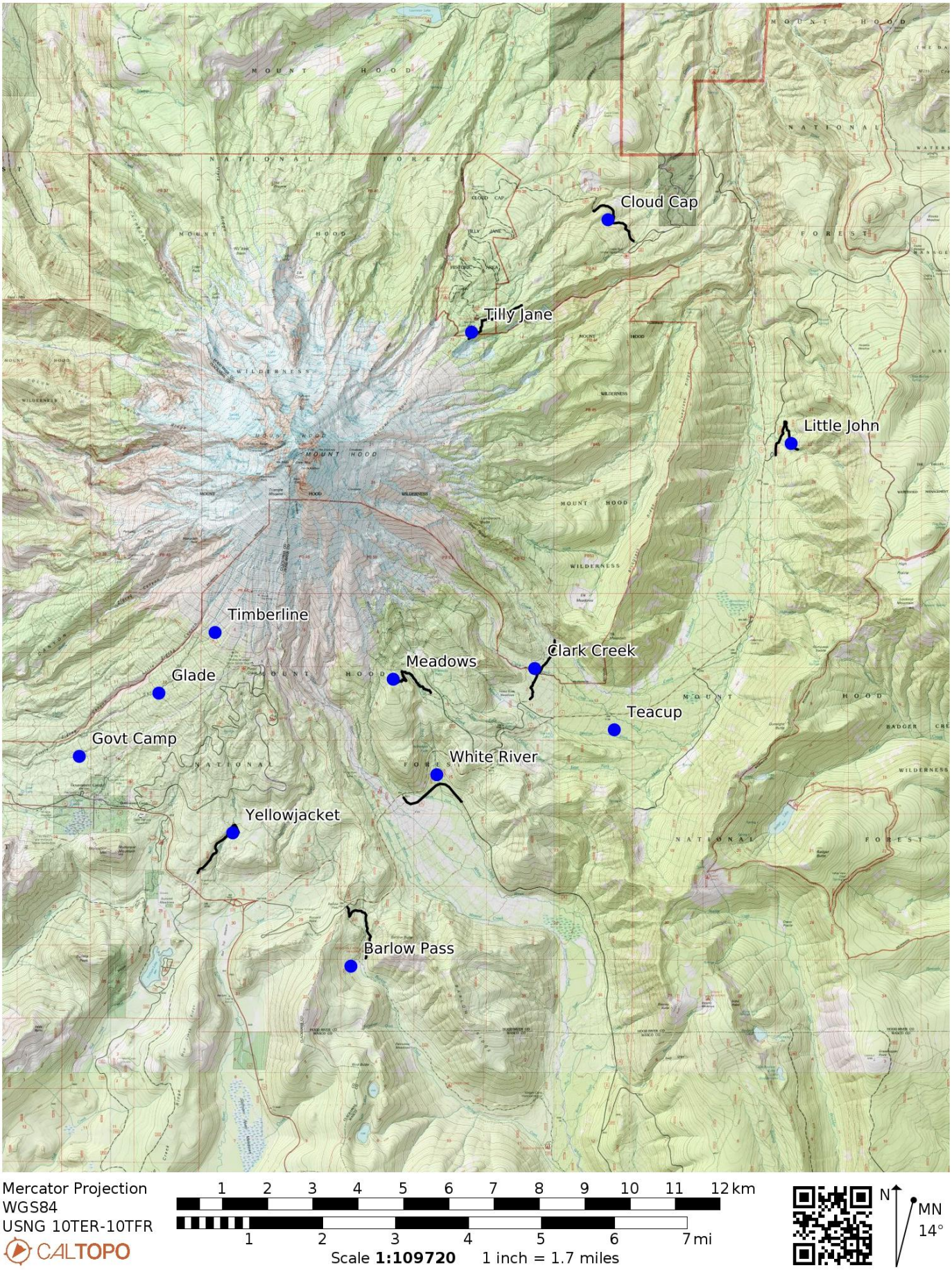

Table 1: Genetic Sample Collection Results Winter through Summer 2020-21

Genetic Samples Collected						
Survey Type	Camera	Fox	Wolf	Tracking	Incidental	**Total**
Fox	4	5	9	1	1	**20**
Wolf			6			**6**

Table 2: Comparison of Camera Survey Findings in Winter and Spring (during Forest closure) 2020

Green cameras = winter; Gray = multi-season. Light Green Detections = winter; Dark Green = spring

	MT HOOD																		EASTERN FOREST BOUNDARY													
Location	Timberline W Upper 2019-20		Timberline W Lower 2019-20		Glade II 2019-20		White River 2019-20		Old Timb Road 2019-20		Yellowjacket East 2018-20		Govt Camp East 2019-20		Govt Camp West 2019-20		Frog Lake 2019-20		Billy Bob 2019-20		Underhill 2019-20		Camas Prairie 2019-20		4460 Road 2019-20		Gate Creek 2019-20		Barlow 2019-20		Badger Pond 2019-20	
Elev (ft)	6189		5832		4986		4888		4780		4232		4120		3943		3878		3880		3200		3157		2940		2350		2282		1860	
Start	11/3/2019	1/26/2020	11/3/2019	1/26/2020	11/10/2019	3/8/2020	10/27/2019	3/7/2020	11/24/2019	3/8/2020	6/16/2019	2/22/2020	11/3/2019	3/8/2020	11/3/2019	3/8/2020	10/27/2019	2/28/2020	10/20/2019	2/23/2020	10/20/2019	2/23/2020	10/12/2019	2/26/2020	10/20/2019	2/25/2020	10/13/2019	3/14/2020	11/3/2019	3/14/2020	12/1/2019	3/14/2020
End	1/26/2020	7/6/2020	1/26/2020	7/6/2020	3/8/2020	6/3/2020	3/7/2020	6/3/2020	3/8/2020	5/26/2020	2/22/2020	6/18/2020	3/8/2020	5/26/2020	3/8/2020	6/3/2020	2/28/2020	5/6/2020	2/23/2020	5/9/2020	2/23/2020	5/9/2020	2/26/2020	6/21/2020	2/25/2020	5/9/2020	3/14/2020	5/9/2020	3/14/2020	6/21/2020	3/14/2020	6/27/2020
Species / # Days	35	162	35	128	41	87	43	52	21	79	220	117	27	26	170	85	62	68	58	76	56	22	203	116	59	74	187	56	49	99	21	105
Red Fox			X	X	X	X		X	X	X		X																				
Coyote			X	X		X	X	X			X	X	X	X	X	X	X		X	X			X	X	X	X	X	X	X	X	X	X
Mountain Lion																								X		X						
Bobcat							X				X				X				X	X	X		X		X	X	X	X	X			
Black Bear																X								X			X					
Pacific Marten				X																												
Weasel			X																													
Striped Skunk																				X	X	X	X						X			
Blacktailed Deer												X							X	X	X		X	X	X	X	X	X	X	X	X	X
Elk												X												X	X	X	X					
Rabbit/Hare			X		X								X	X									X	X			X					
Marmot		X																														
Douglas Squirrel			X	X											X	X			X		X	X	X									
Western Gray Sq																											X	X		X		X
Northern Flying Sq			X	X																												
Golden Mantled Gr Sq				X																												
Chipmunk																					X											
Mouse																					X	X										
Turkey																				X								X		X		
Sandhill Crane																								X								

Table 3: Comparison of Camera Surveys, Tracking Surveys, and Incidental Track Findings, Winter 2020-21

	MT HOOD CAMERA SITES AND TRACKING TRANSECTS																							
Location	Little John		Barlow Pass			Govt Camp West	Cloud Cap		Teacup		Yellowjacket			White River		Clark Creek		Glade	Meadows		Tilly Jane			Timberline
Type	Camera	Transect	Camera	Incidental	Transect	Camera	Camera	Transect	Camera	Incidental	Camera	Incidental	Transect	Camera	Transect	Camera	Transect	Camera	Camera	Transect	Camera	Incidental	Transect	Camera
Elev (ft)	3660	3360	3847		3800	3943	4028	3860	4162		4170		3890	4259	4230	4593	4520	5041	5713	5260	5926		5235	6055
Species																								
Red fox						X					X							X			X			
Coyote	X		X			X	X				X			X					X		X	X		
Bobcat		X		X		X	X	X	X												X			
Black Bear																						X		
Pacific Marten																			X	X	X			
Weasel				X																X	X	X		
Striped Skunk	X																							
Raccoon						X																		
Deer								X																
Elk								X	X				X											
Rabbit / Hare		X	X	X	X		X			X	X			X	X		X				X			
Douglas Sq		X	X	X	X	X		X		X			X		X		X			X		X		
Northern Flying Sq											X													
Western Gray Sq																						X		
Chipmunk																					X			
Mouse					X															X				
Owl											X													
Unknown			X		X	X	X					X			X				X		X		X	
No Species Detected																X								X

Table 4: Camera Survey Results Summer through Winter 2020-21: Mt Hood area
Red = summer, Blue = winter, Gray = multi-season

	MT HOOD CAMERA LOCATIONS																												
Location	Little John 2020-21	Barlow Pass 2020-21	Govt Camp W 2019-21	Cloud Cap 2020-21	Govt Camp E 2020	Teacup 2020-21	Yellowjacket 2020-21	Pinnacle 1 2020	Pinnacle 2 2020	White River 2020-21	Pinnacle 3 2020	Pinnacle 4 2020	Clark Creek 2020-21	Pinnacle 5 2020	Old Timberline Rd 2020	Glade 2020	Glade 2020-21	Vista Ridge 2 2020	Vista Ridge 3 2020	Vista Ridge 4 2020	Vista Ridge 4 2020	Meadows 2020-21	Timberline E 2020	Timberline W 2020	Tilly Jane 2020-21	Timberline 2020-21	Yocum Ridge 2020	Palmer Glacier 2020
Start	11/21/2020	11/1/2020	6/3/2020	11/21/2020	6/3/2020	11/8/2020	12/19/2020	5/6/2020	5/6/2020	10/31/2020	7/12/2020	6/5/2020	10/31/2020	6/5/2020	5/26/2020	6/3/2020	11/14/2020	5/30/2020	5/29/2020	5/29/2020	5/29/2020	10/31/2020	5/28/2020	7/6/2020	11/2/2020	10/26/2020	7/19/2020	7/6/2020
End	4/24/2021	4/11/2021	4/3/2021	4/16/2020	10/17/2020	4/18/2021	4/18/2021	6/3/2020	8/302020	4/16/2021	8/30/2020	7/12/2020	4/21/2021	7/12/2020	10/17/2020	11/14/2020	2/6/2021	10/7/2020	10/7/2020	10/7/2020	10/7/2020	5/1/2021	10/26/2020	10/26/2020	4/11/2021	11/21/2021	pending	10/26/2020
Days Op	154	158	304	146	136	159	119	28	116	167	49	37	110	37	144	164	84	130	131	131	131	124	147	103	140	23	pending	112
Species / Elev (ft)	3660	3847	3943	4028	4137	4162	4170	4202	4223	4259	4285	4523	4593	4757	4830	5031	5041	5123	5151	5176	5177	5713	5714	5784	5926	6055	6188	6593
Red Fox							X										X						X		X			X
Coyote	X	X		X	X		X	X	X	X					X	X			X			X	X		X		X	
Bobcat				X	X	X		X				X		X	X	X									X			
Black Bear					X						X	X				X												
Pacific Marten																						X			X			
Weasel																									X			
Striped Skunk	X																											
Raccoon					X																							
Deer					X				X						X	X			X	X	X		X	X			X	
Elk						X								X	X	X		X	X	X	X			X				
Rabbit/Hare		X		X			X			X						X									X			
Marmot											X												X					X
Pika											X																	
Douglas Sq		X									X					X							X					
Northern Flying Sq							X																	X				
Golden Mantled Gr Sq								X			X													X				X
Chipmunk																									X			
Mouse											X																	
Turkey Vulture									X																			
Owl							X																					
Unknown Mammal		X		X	X																	X	X	X	X			X
No Species Detected			X										X													X		

Table 5: Camera Survey Results Summer through Winter 2020-21, East side locations
Red = summer, Blue = winter, Gray = multi-season

	EAST SIDE AND FOREST BOUNDARY CAMERAS																								
Location	Badger Creek 2020-21	Barlow 2020-21	Otter 2020-21	Gate Creek 2019-21	Linns Mill 2020-21	McCubbins 2020	Cooks Ridge I 2020-21	Cooks Ridge II 2020-21	Bennett Spring 2 2020	Bennett Spring 1 2020	Byzandine Gulch 2020-21	4460 Road 2020-21	Cow Patty Prairie 2020	Bald Butte 2020-21	4850 Road 2020	Underhill 2020-21	Badger Creek 2020	Long Prairie 2020	High Top 2020	Billy Bob 2019-21	Olallie 2020	Lemiti Creek 2020	Badger Lake 2020	Location withheld
Start	3/10/2020	3/26/2020	12/13/2020	5/9/2020	1/2/2021	8/14/2020	12/5/2020	3/2/2021	8/22/2020	7/3/2020	12/19/2020	5/9/2020	8/3/2020	11/12/2020	8/14/2020	5/9/2020	6/27/2020	10/28/2020	7/19/2020	5/9/2020	7/2/2020	7/2/2020	8/3/2020	-
End	4/9/2021	4/25/2021	4/17/2021	4/25/2021	4/17/2021	12/1/2020	3/2/2021	4/19/2021	11/15/2020	8/22/2020	4/4/2021	5/2/2021	12/1/2020	11/28/2020	12/1/2020	3/28/2021	11/14/2020	12/5/2020	pending	3/28/2021	pending	8/15/2020	10/22/2020	-
Days Op	146	308	133	351	105	0	87	48	85	50	110	120	28	16	109	68	140	38	pending	121	pending	10	80	-
Species / Elev (ft)	1933	2315	2318	2350	2435	2574	2708	2726	2727	2807	2833	3177	3215	3240	3482	3488	3709	3795	3858	3880	3946	4125	4567	-
Gray Wolf																								X
Red Fox							X																	
Coyote	X	X		X	X				X	X	X	X	X			X			X	X			X	
Mountain Lion		X		X			X			X						X								
Bobcat		X		X												X		X		X	X		X	
Black Bear		X		X					X			X				X		X		X	X	X	X	
Mink																X								
Weasel																X								
Spotted Skunk																		X						
Striped Skunk		X		X			X	X	X	X		X				X		X						
Deer	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Elk	X	X	X	X							X				X				X	X	X			
Rabbit/Hare				X			X		X						X	X		X						
Douglas Sq		X						X				X				X	X	X						
Western Gray Sq	X		X	X			X	X	X		X													
Northern Flying Sq																X								
Golden Mantled Gr Sq																X								
California Gr Sq	X		X												X		X				X			
Chipmunk																X	X	X						
Bush tailed Woodrat																X								
Mouse				X												X				X				
Turkey		X		X								X								X				
Grouse																	X							
Bat																X								
Unknown Mammal	X	X		X			X						X		X	X		X		X	X			
No Species Detected						X																		

Table 6a: Scat Survey Results Summer through Winter 2020-21

						Red Fox			Wolf		
Location		Date	Type	Method	Distance (miles)	Scat*	Track	Sign	Scat*	Track	Sign
Mt Hood	Timberline Trail N	7/17/2020	Fox	Hike	12.92	1			Data Withheld		
	Bald Mountain	7/24/2020	Fox	Hike	6.6						
	Meadows	8/6/2020	Fox	Hike	9.68						
	Yocum Ridge	8/17/2020	Fox	Hike	4.17	3					
	Paradise Park	8/19/2020	Fox	Hike	8.33						
	McNeil Point	9/6/2020	Fox	Hike	4.3	1					
	Tilly Jane	10/3/2020	Fox	Hike	3.35						
Forest NE	Cooks Ridge	4/19/2021	Wolf	Hike	2						
		12/5/2020	Wolf	Hike	1.38						
		1/23/2021	Wolf	Hike	3.2						
		3/2/2021	Wolf	Hike	2.94						
	Lookout Mountain	6/29/2020	Wolf	Hike	2.9						
	Mosier Creek	6/18/2020	Wolf	Hike	14.43						
		6/24/2020	Wolf	Hike	10.43						
		8/3/2020	Wolf	Car	11.99						
		8/3/2020	Complete	Hike	5						
		8/4/2020	Wolf	Car	11.32						
		8/4/2020	Complete	Hike	1.78						
		8/6/2020	Wolf	Hike	3.28						
		8/18/2020	Wolf	Hike	7.31	1					
		10/27/2020	Wolf	Hike	0.98						
		10/27/2020	Wolf	Hike	3.71						
		10/28/2020	Wolf	Hike	7.17						
		11/1/2020	Wolf	Hike	2.67						
Forest East	Badger Creek	10/10/2020	Wolf	Hike	2.91	1					
		10/10/2020	Wolf	Car	3.42						
	Fifteenmile Creek	6/26/2020	Wolf	Hike	10.2						
	Fivemile Creek	9/7/2020	Wolf	Car	36.38						
		10/29/2020	Wolf	Hike	0.3						
		10/29/2020	Wolf	Hike	3.2						
		10/29/2020	Wolf	Hike	0.77						
		10/29/2020	Wolf	Car	2.6						
		11/8/2020	Complete	Bike	7.87						

Data continued in Table 6b...

Table 6b: Scat Survey Results Summer through Winter 2020-21 (continued)

						Red Fox			Wolf		
Location		Date	Type	Method	Distance (miles)	Scat*	Track	Sign	Scat*	Track	Sign
Forest East cont'd	Road 44	8/4/2020	Wolf	Hike	0.5	1			Data Withheld		
		8/5/2020	Wolf	Hike	3						
		8/5/2020	Wolf	Car	0.95						
		8/5/2020	Wolf	Hike	1.33						
		8/6/2020	Wolf	Car	2.6						
		10/1/2020	Wolf	Hike	1.3	1					
		10/1/2020	Wolf	Hike	1.3						
		10/1/2020	Wolf	Hike	4.7	1					
		10/2/2020	Wolf	Hike	3						
		10/2/2020	Wolf	Hike	0.54						
		10/2/2020	Wolf	Hike	1.4						
		10/18/2020	Wolf	Hike	4.22	1					
		11/21/2020	Wolf	Hike	1.76						
		11/21/2020	Wolf	Hike	5.05						
	Rocky Butte	10/11/2020	Wolf	Car	14.21						
Forest SE	WRWA	4/20/2021	Wolf	Hike	4.75						
	Camas Prairie	7/4/2020	Wolf	Hike	8.04						
	Camas Prairie	7/5/2020	Wolf	Hike	5.25						
	Hazel Hollow	8/8/2020	Complete	Hike	4.14						
	N Fork Rock Creek	4/20/2021	Wolf	Hike	0.27						
		4/21/2021	Wolf	Hike	0.89						
Forest S	High Rock Spring	7/21/2020	Fox	Hike	2.86	1					
	Olallie Ridge	8/16/2020	Fox	Hike	2.01	1					
	Warm Springs	8/9/2020	Wolf	Hike	6.1	2					
	Lemiti Creek	8/10/2020	Wolf	Car	6.5						
		8/10/2020	Wolf	Hike	2.77	2					
	South Pyramid	9/2/2020	Wolf	Hike	1.9						
		9/3/2020	Wolf	Hike	2.18						
		9/4/2020	Wolf	Hike	0.65						
		9/4/2020	Wolf	Hike	1.47						
		9/5/2020	Wolf	Hike	2.51						
SW	Bull of the Woods	8/3/2020	Wolf	Hike	3.2						
		8/4/2020	Wolf	Hike	1.83						
				TOTALS:	312.67	17	0	0	6	1	0

*Scat Species ID based on visual characateristics only

Table 7: Tracking Survey and Complete Species Scat Survey Results

		Snow Tracking									Complete Species			
	Location	Little John		Barlow Pass	Cloud Cap Rd	Yellowjacket	White River	Clark Creek	Tilly Jane	Hood Meadows	Mosier Creek	Mosier Creek	Hazel Hollow	Fivemile Creek
	Starting Elev (ft)	3360		3800	3860	3890	4230	4520	5235	5260	3500	4000	3200	3200
	Date	12/28/20	01/31/21	01/29/21	12/04/20	01/29/21	12/06/20	12/28/20	02/28/21	12/03/20	08/03/20	08/04/20	08/08/20	11/08/20
	Distance (miles)	1.04	2.47	2.66	2.00	1.27	1.35	1.44	1.29	2.00	5	1.78	4.14	7.87
	Snow Quality	Good	Acceptable	Good	Good	Good	Good	Good	Good	Good	N/A	N/A	N/A	N/A
Species														
Marten	Track									1				
Coyote	Track										2			
	Sign										7	6	3	5
Bobcat	Track		2		3						1			
	Sign										5	6		1
Mountain Lion	Sign											2		1
Black Bear	Sign										1	2		2
Weasel	Tracks				1					2				
Deer	Track				1						4			
	Sign										6			2
Elk	Track										3	1		
	Sign										1			2
Hare	Track	9	2	4	2	11	6	6						
Squirrel/Chipmunk	Track	11	3	8	70	4	12	7		5	4			
Mouse	Track			4						5				
Turkey	Sign										2			

Appendix A: Project Description

SURVEY STRUCTURE

Camera Surveys:
Wildlife camera surveys are carried out year-round, divided into a summer season and a winter season. Camera site locations are selected based on accessibility, habitat suitability for target species, previous detections or known habitat use, and/or to collect data for under-surveyed areas. Due to seasonal changes in access, most camera sites are moved between the summer and winter survey seasons, while some sites are maintained throughout consecutive seasons or years.

Bait for the camera sites varies with the season and target species. On most camera set ups, two different baits and lures were used: a long-range scent lure designed for canines and mustelids (Caven's Gusto) and a commercial bait (Hiawatha Valley Predator or Canine Force). During the summer, the baits were placed under a down log, and during the winter they were placed in a small wooden box nailed to a tree approximately three feet off the ground or snowline to keep them above the snow. Camera sites were generally visited approximately every 3-4 weeks to replenish the baits, retrieve memory cards, ensure the camera was still operating, and collect any genetic samples at the vicinity of the site.

Every mammal, ground bird, and bird of prey detected at a camera site is recorded, including domestic animals, unidentified humans, and unidentifiable animals. For each detection, the following data is recorded: date; time; species; number of juveniles, yearlings, or adults (if identifiable); number of males and females (if identifiable); and any relevant behavior or reaction to the bait.

Tracking Surveys:
Snow tracking surveys are carried out on snowshoes along designated, one mile-long transects. Every animal trail that crosses the survey path is recorded with a GPS waypoint, and additional written documentation and pictures are taken for all carnivore trails and a subset of other trails. Transects were chosen to cover as many different habitats as possible within the snow zone and generally follow recreational trails or closed roads. Survey dates were decided based on volunteer availability rather than snow conditions; therefore, snow track quality (the ability of the snow to record clear tracks) is variable and a snow track quality rating is also recorded.

Scat Surveys:
Scat surveys are conducted during the summer when the snow is gone or in the winter at lower elevation areas that do not receive snow. Volunteers choose where, when, and how far to survey; recommended survey locations are provided based on habitat suitability or known use by a target species. Most surveys are done on foot, with volunteers continually keeping an eye out for scat samples as they walk. Samples are photographed and collected in a paper bag. The samples and photographs are reviewed and assessed by Cascadia Wild for species confirmation.

Two types of scat surveys are carried out. Sierra Nevada red fox scat surveys are done June to October, in the vicinity of Mt Hood above 4000 ft elevation, mainly centering on the Timberline Trail and its connecting trails or offshoots. Gray wolf scat surveys are done year-round, around the eastern boundary of the Mt Hood National Forest and along likely dispersal routes.

PARTICIPANT INVOLVEMENT

Camera Survey Participants - "Camera Crew":
In normal years, camera survey volunteers are divided into groups of 3-8 people, with each group responsible for maintaining a camera site for the season (summer or winter). Volunteers are usually given three in-person trainings: a two-hour classroom session, a full-day field session, and an optional one hour GPS training. This winter, due to social distancing restrictions resulting from the COVID-19 virus, camera volunteers were required to register as a group, trainings were all on-line, and volunteers were required to provide some of their own equipment so that they did not have to visit our office. Camera volunteers were

still provided with some camera equipment, bait, handbooks, site instruction manuals, genetic sample collection supplies and instructions, and maps.

Tracking Survey Participants - “Tracking Teams” and “Tracking Leaders”:
In normal years, tracking surveys are done in groups of up to 12 people, including two tracking trip leaders. Leaders have a minimum of two seasons tracking experience and must pass written and field evaluations before being qualified to lead. Survey participants attend a two-part training, two hours in the classroom and three hours in the field. This allows participants to be further mentored during the surveys themselves, not only in animal tracking but also in related topics, such as natural history, awareness activities, and wilderness survival. The aim of this blend of topics is to increase not only participants’ knowledge but also their feelings of connection to their local area. This year, trainings were on-line and group surveys did not go out. Instead, volunteers were asked to go out with members of their household or quarantine group, and they did not receive any further mentoring beyond the training.

Scat Survey Participants - “Scat Surveyors”:
Scat survey volunteers go out on their own, provided with a detailed instructional booklet on scat collection and identification, scat collection supplies, and maps. Scat survey volunteers have the option to attend a one-hour training to cover scat identification and collection procedures. Fox scat surveys are open to anyone; wolf scat surveys are limited to returning volunteers due the sensitive nature of the data.