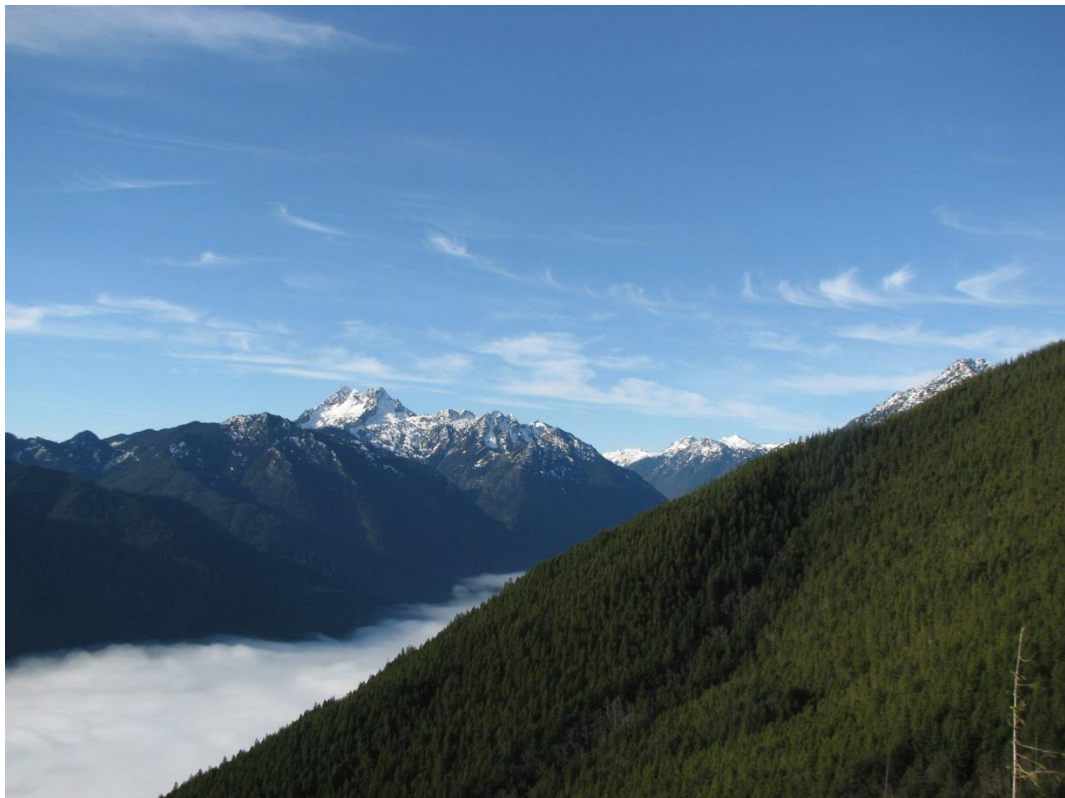




# Surveys for Pacific Marten (*Martes caurina*) on the Olympic National Forest

Winter 2014



*The Brothers, January 16, 2014*

Olympic National Forest  
1835 Black Lake Blvd. SW, Suite A  
Olympia, WA 98512-5623

### *Summary:*

In 2013, the Olympic National Forest (ONF) and the non-profit organization Adventurers and Scientists for Conservation (ASC) formed a partnership to survey for coastal Pacific marten (*Martes caurina*). There is a need to determine more fully the current status of marten on the Olympic Peninsula and with limited federal funding and personnel, volunteer programs can help fill in informational gaps. The first year of surveys was completed from January-March 2013 and a similar effort was begun in January 2014. This second season involved 21 volunteers who monitored 20 remote camera stations set up on the east side of the Forest. These stations were located in the general areas of the three verified records of marten on ONF, and due to some stations being moved a total of 24 sites were monitored for at least two weeks though most were in place for closer to ten weeks. Seventeen wildlife species were documented between January-April, including Roosevelt elk, black-tailed deer, bobcat, coyote, mink, long- and short-tailed weasels, spotted skunk, fisher, varied thrush, hairy woodpecker, common raven, crow, gray jay, Douglas squirrel, northern flying squirrel, and snowshoe hare. Additionally, there were numerous photos of rodent species. Three stations obtained photos, as well as hair samples, of at least two different fishers, a species recently reintroduced to the Olympic Peninsula (the genetic analysis is still pending). The survey effort did not document any Pacific marten.

### *Background (this section also appeared in the 2013 survey report):*

The Pacific marten is a medium-sized, semi-arboreal carnivore in the family Mustelidae (weasels) that once occurred throughout the forests of the Pacific coastal states (Zielinski et al. 2001). In Oregon and Washington, martens were found in areas down to sea level (Bailey 1936; Hagmeier 1956), however harvest of the species, a furbearer, in Washington has never been consistent (Zielinski et al. 2001). In the 1940s, a notable harvest of 83 animals was recorded from Clallam, Jefferson, and Mason counties, three of the four counties that comprise the Peninsula. Trapping records available online from the Washington Department of Fish & Wildlife (<http://wdfw.wa.gov/hunting/harvest/>) have more recently documented only seven animals being taken between 1997 and 2001. From 2002 through 2009, martens are not even listed in the reports for the Peninsula. Trapping data are not currently available online for years since 2009, though it is unlikely there were any martens harvested here during these years either (Calkins, pers. comm., 2013).

There has also been little evidence of coastal marten from remote camera surveys. During inventory efforts in the Cascade Range and on the Peninsula in 1991, a total of 39 photos of marten were obtained (out of 260 taken), only one of which was purportedly from the Peninsula (Jones and Raphael 1991). It is now believed that this photograph (Figure 1) was actually of a long-tailed weasel (Aubry, pers. comm., 2010).

Another effort using remote cameras, from March–October 1992, documented one photo of a marten (from approximately 50 cameras placed in the Hoh, Dosewallips, Duckabush, Hamma Hamma, and Gold Creek drainages) in Olympic National Park (ONP) along the Dosewallips River (Sheets 1993). This particular photograph has not been tracked down and therefore not verified. Third, extensive surveys conducted in Olympic National Park during the winters of 2001/2 and 2002/3 also produced no photos of marten, nor any of fisher (*Pekania pennanti*), another target species, out of 1,270 pictures taken (Happe et al. 2005). Finally, camera surveys done on ONF and ONP since 2009 to document fisher presence and reproduction (after the species was reintroduced on the Peninsula in 2008) have likewise not recorded any martens.

Where martens exist, they readily come to camera stations, so the lack of them during these many survey efforts would seem to be cause for concern. In 2001, Zielinski et al. stated that martens had declined on the Olympic Peninsula, a conclusion which still seems valid in 2014.



*Figure 1. Photo from 1991 camera surveys-weasel in lower left.*

In summary, there are only three verified records of marten on ONF (Figure 5), including 1) an animal that was photographed in July 1988 (Figure 2); 2) two different animals that were caught in live traps established for a spotted owl prey study in August 1990 (no photographs taken); and, 3) most recently, the discovery of a dead juvenile (Figure 3) that was found in August 2008. The animal photographed in 1988 was observed in The Brothers Wilderness dragging a snowshoe hare off the trail. The observer was able to snap a photograph as the marten tugged on its prey.



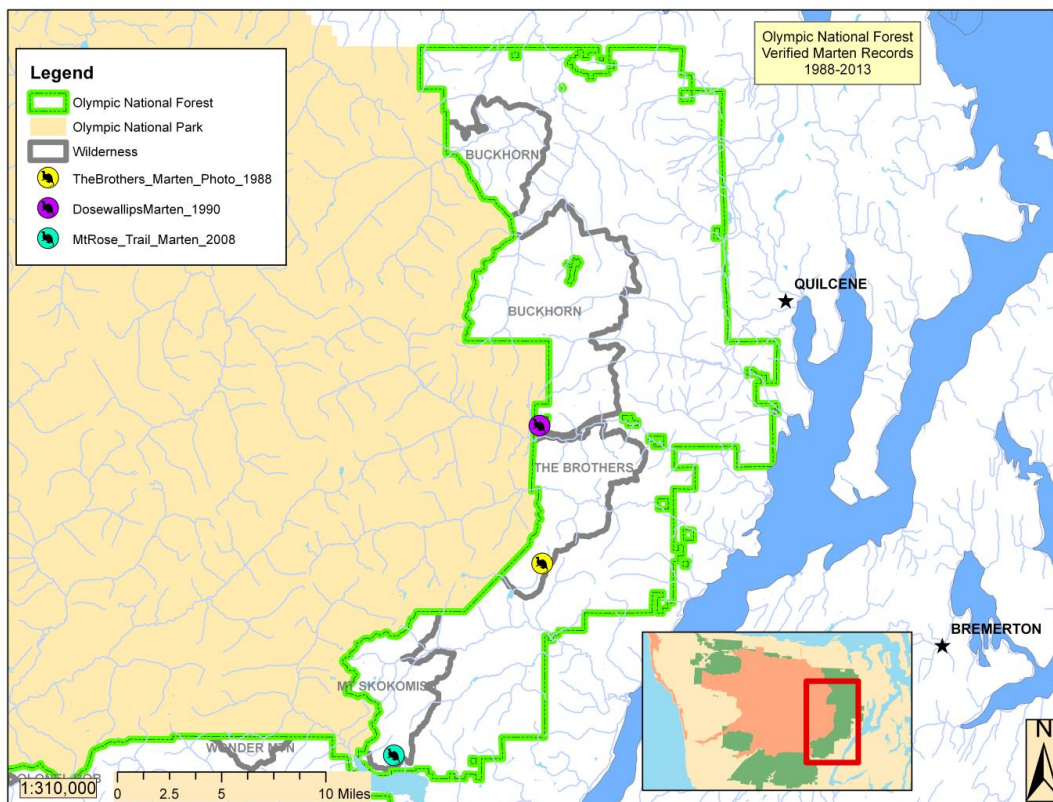
*Figure 2. Pacific marten with snowshoe hare in The Brothers Wilderness, July 18, 1988*  
*Photo: Ivy Otto*



The trapped animals were caught to the north of this animal in the Dosewallips watershed (Buckhorn Wilderness) along Bull Elk Canyon on August 7 and 21, 1990. Finally, the dead juvenile (photos below) collected in 2008 was found along the Mt. Rose Trail just north of Lake Cushman in the Mt. Skokomish Wilderness.



*Figures 3 and 4. Mt. Rose Trail marten, August 2008  
Photos: Stephen Slaughter and Danielle Munzing*



*Figure 5. Verified marten locations on Olympic National Forest, 1988-2008*

### 2014 Surveys:

Surveys during 2013 and 2014 have been focused in the same part of the forest where the four martens were documented, that is, from the Dosewallips River near Quilcene south to the Lake Cushman area. This winter, owing to an increased interest in the project and 21 volunteers being recruited, we were able to install 20 camera stations in 7 different watersheds (Figure 6). The locations of four cameras moved slight distances (1/4 mile or less) following their initial installations.

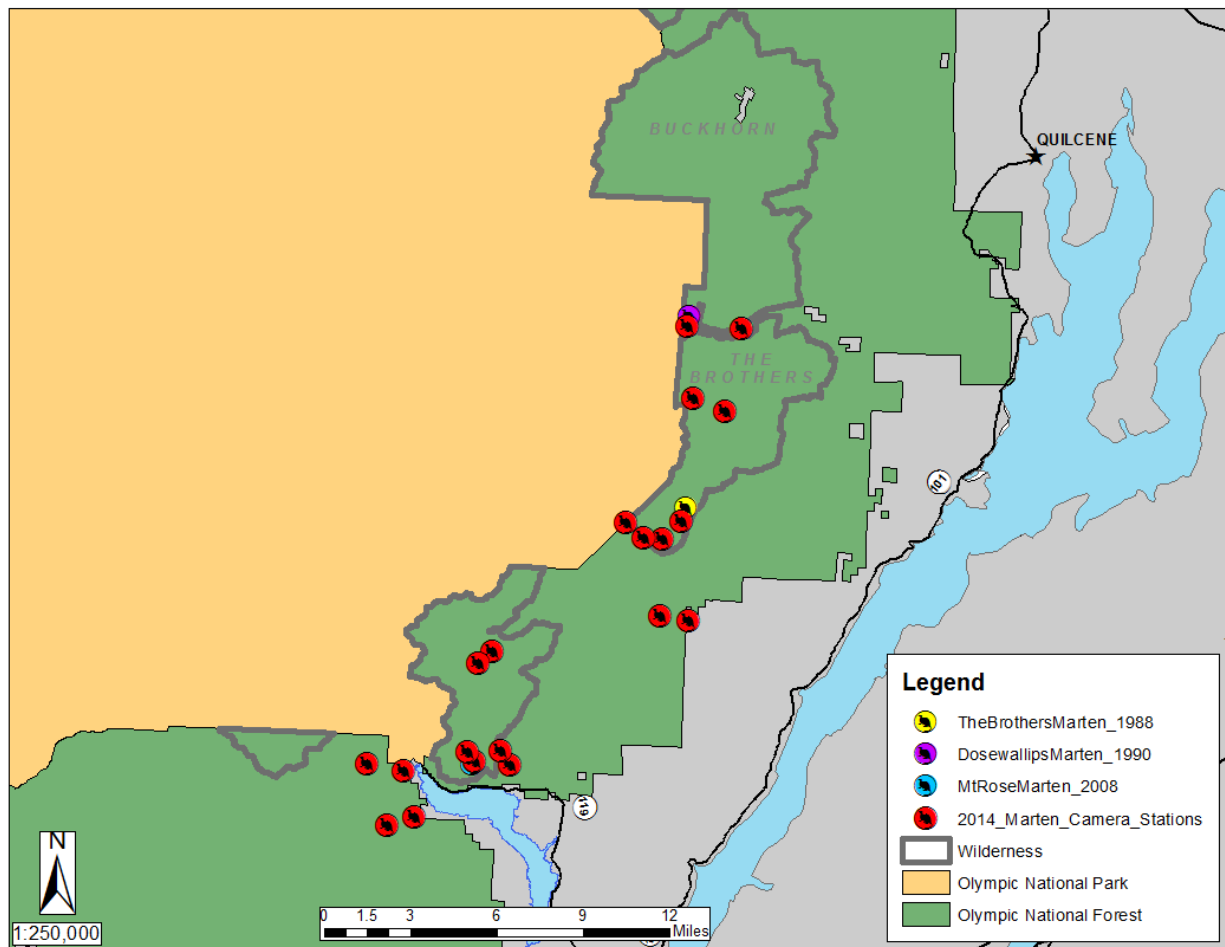


Figure 6. Note that the location of the Mt. Rose marten is hidden by this year's survey stations.

All camera stations were installed using much of the site protocol developed for non-invasive surveys for fishers on the Olympic Peninsula (Jenkins and Happe 2013). I say “much” because we didn’t follow any kind of systematic approach to where the cameras were to be installed. Rather, we simply set the cameras across a wide swath of landscape that included the historic sites, as well as areas we felt would be good marten habitat (high elevations, late-successional forest, remote landscapes). Each area selected had two cameras installed, at least one mile apart if possible, and they were checked by a team of volunteers every 2-3 weeks. We used chicken for bait, as well as Gusto lure as an attractant. ONF had six Reconyx cameras to use, 3 Rapidfire models and 3 Hyperfire models. The remaining cameras were Bushnell HDMax, which were borrowed from Patti Happe and the fisher project at Olympic National Park.

Each camera remained on the landscape between 69-76 days, with most being out approximately 71 days. The amount of time each site was functional, that is, when the bait was there (not taken by an animal) and the camera was working properly, varied widely. One site was functional for a total of only 11 days (16% of the survey period), whereas four sites were operable the entire time they were out on the landscape, 69, 70, 71, and 76 days, respectively. The average functionality considering all setups was 51 days/site (excluding two locations that were only up for two weeks before being moved).

### *Results:*

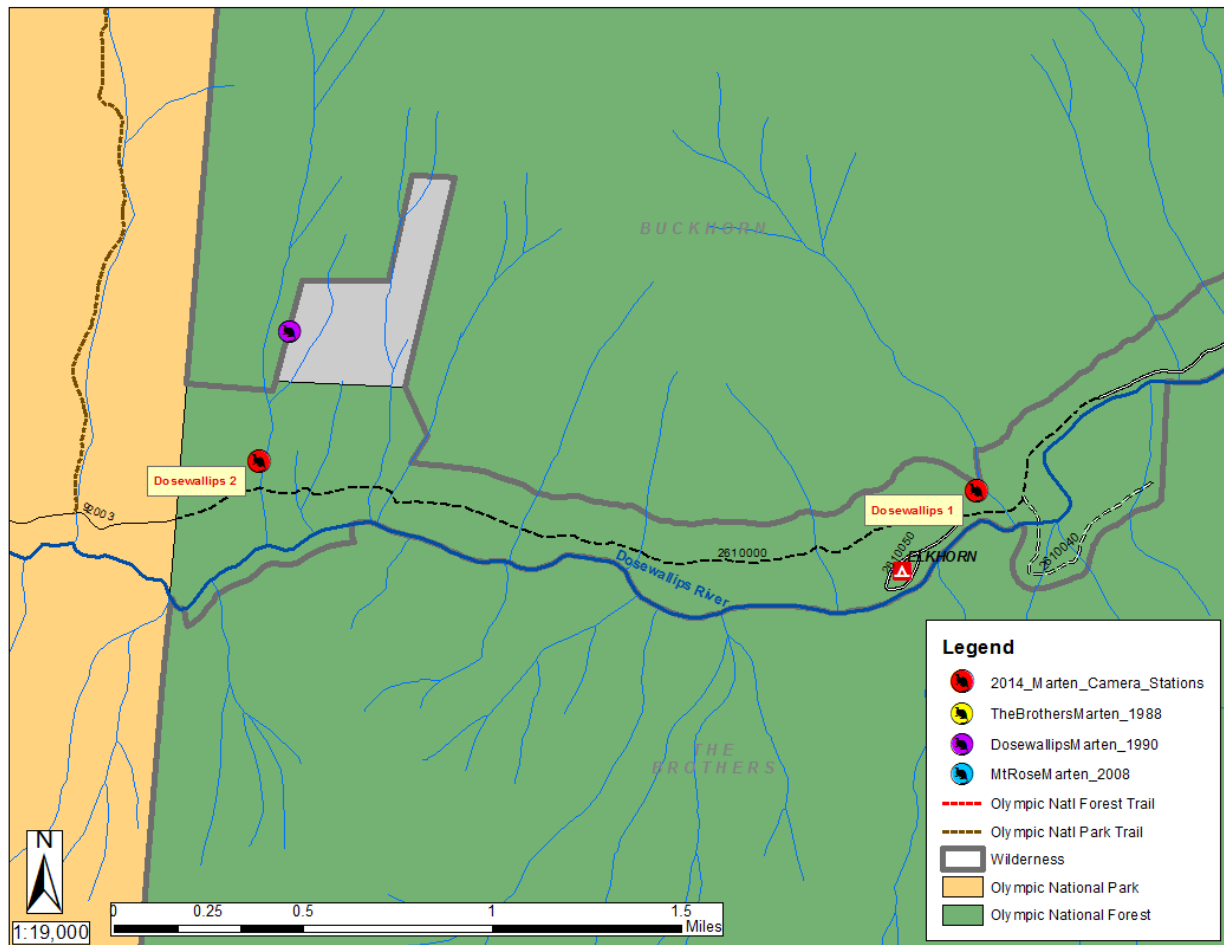
The table on the following page summarizes the results from each camera station. In some cases, it was difficult to tell from the photographs which squirrel species, northern flying or Douglas, or which weasel, short-tailed or long-tailed, had come to the station. These occurrences are noted as “squirrel spp.” or “weasel spp.”

Camera Station	Camera Model	Days Functional	Wildlife Species
Dosewallips 1	Reconyx Hyperfire	54/70; 77%	Spotted skunk, long-tailed weasel, bobcat, deer, flying squirrel
Dosewallips 2	Reconyx Hyperfire	58/69; 84%	Bobcat, deer
Duckabush 1 (first site)	Bushnell	0/13; 0%	Varied thrush
Duckabush 1 (second site)	Bushnell	56/69; 81%	Varied thrush, squirrel spp., weasel spp., rodent spp., bobcat, deer
Duckabush 2 (first site)	Bushnell	13/13; 100%	None
Duckabush 2 (second site)	Bushnell	70/70; 100%	Elk, hairy woodpecker, bobcat, short-tailed weasel, rodent spp., Douglas squirrel
Lena Lakes East 1	Bushnell	36/69; 52%	Deer, Douglas squirrel, bobcat
Lena Lakes East 2	Bushnell	51/69; 74%	Flying squirrel, bobcat, Steller's jay, weasel spp., varied thrush
Lena Lakes West 1	Bushnell	46/69; 67%	Bobcat, coyote, deer
Lena Lakes West 2	Bushnell	11/69; 16%	Bobcat
Jefferson Ridge 1 (first site)	Bushnell	15/15; 100%	Flying and Douglas squirrels
Jefferson Ridge 1 (second site)	Bushnell	56/56; 100%	Flying squirrel, snowshoe hare, crow, deer, raven
Jefferson Ridge 2	Bushnell	26/71; 37%	Douglas squirrel, deer/fawn, bobcat, flying squirrel
Mildred Lakes 1	Reconyx Hyperfire	76/76; 100%	Bobcat, coyote [also human]
Mildred Lakes 2	Reconyx Rapidfire	64/76; 84%	Coyote, mink
Mt. Ellinor 1	Bushnell	49/70; 70%	Deer, bobcat, Douglas squirrel, gray jay, flying squirrel
Mt. Ellinor 2 (first site)	Bushnell	29/42; 69%	Douglas and flying squirrel, snowshoe hare, gray jay
Mt. Ellinor 2 (second site)	Bushnell	25/28; 89%	Bobcat, gray jay, Douglas squirrel [also human]
Mt. Rose 1	Bushnell	60/76; 79%	Bobcat, flying squirrel [also domestic dog]
Mt. Rose 2	Bushnell	51/76; 67%	Deer, bobcat, coyote, Douglas squirrel [also domestic dog and human]
Copper Creek 1	Reconyx Rapidfire	35/70; 50%	Fisher [also human]
Copper Creek 2	Reconyx Hyperfire, Bushnell	48/70; 69%	Douglas squirrel, weasel spp., rodent spp., short-tailed weasel, fisher, coyote, varied thrush, squirrel spp.
Dry Creek 1	Bushnell	39/69; 57%	Fisher, Steller's jay
Dry Creek 2	Bushnell	69/69; 100%	Snowshoe hare, flying and Douglas squirrels, rodent spp.

### *Survey Areas:*

The following are discussions and information for each area surveyed. The areas are in order from north to south, beginning with those stations along the Dosewallips River.

### **Dosewallips**



### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Dosewallips 1	5286501	493210	808
Dosewallips 2	5286512	490155	1,420

Dosewallips 1 was placed just upslope from the area of Elkhorn Campground; Dosewallips 2 was just downstream of where the two martens were trapped in 1990 along Bull Elk Canyon Creek. These two stations were functional more than 75% of the survey period. Both sites are west of the Dosewallips road washout, which occurred in January 2002, and so there is no longer any vehicle traffic along this part of 2610 road. The road is however popular as a day hike and



also as a backpack entry into the Park. Bobcats and deer were the primary visitors, and it's possible the same cat was frequenting both stations.



*Dosewallips 1*

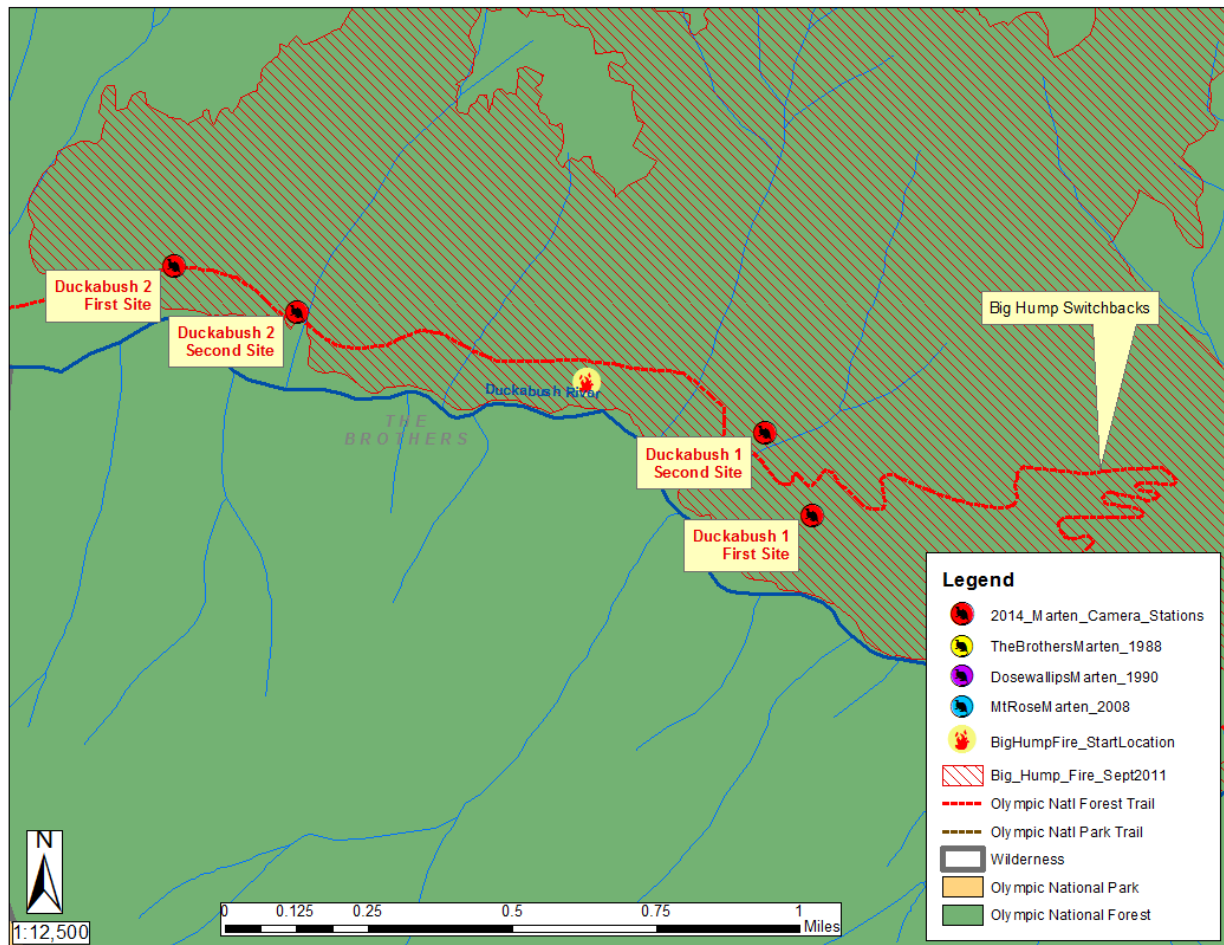


*Dosewallips 2*



*Bobcat removing sign at Dosewallips 1*

## Duckabush



### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Duckabush 1 (first site)	5281841	492453	1,520
Duckabush 1 (second site)	5282066	492311	1,390
Duckabush 2 (first site)	5282471	490643	1,373
Duckabush 2 (second site)	5282271	490967	1,309

Both stations along the Duckabush River were moved after the first check. Duckabush 1 had had problems with sunlight triggers, having been set up in a fairly burned over area of the 2011 Big Hump Fire. Duckabush 2 was moved to a more accessible, less rocky, spot, approximately ¼ mile to the east of the first site. As well as changing locations, these stations also received replacement cameras on the first check and they functioned without problems after that. Varied thrushes were a common visitor at Duckabush 1 and there was a herd of elk at Duckabush 2. Both stations had bobcats, weasels, and rodents. Interestingly, the bobcats here did not work to get the bait (as opposed to cats at other stations that worked feverishly to get the prize). During

the 2013 surveys, a fisher was documented at a station near this year's Duckabush 1 site, however there was no evidence of fisher in the drainage this season. It should be noted that the area depicted as the Big Hump Fire in the map above does not reflect intense fire conditions throughout the polygon. The burn was patchy in several areas and frequently had only an impact on the understory.

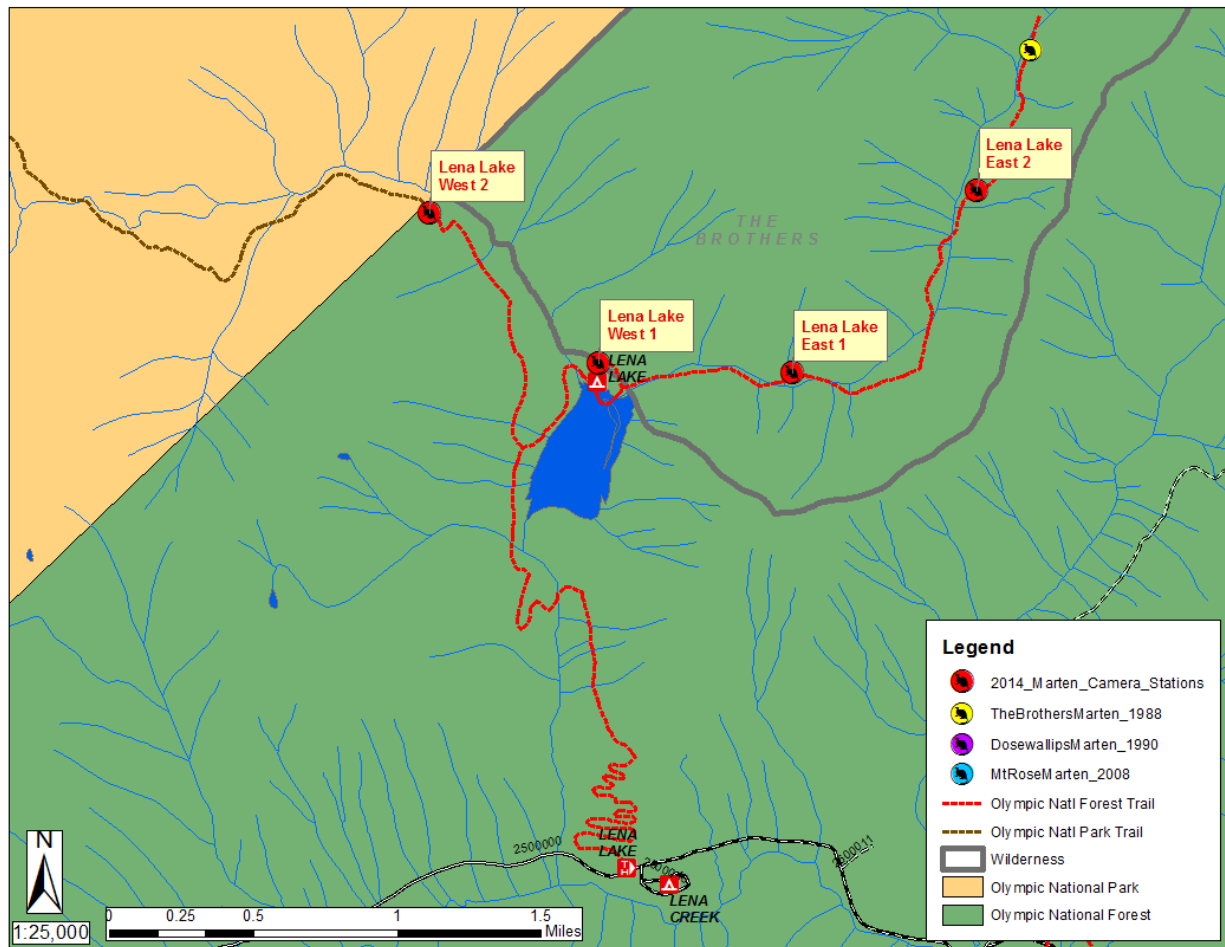


*Bobcat hissing at something at Duckabush 1*



*Elk moving through at Duckabush 2*

## Lena Lakes East and West



### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Lena Lakes East 1	5274554	489207	2,263
Lena Lakes East 2	5275611	490201	2,871
Lena Lakes West 1	5274570	488120	1,992
Lena Lakes West 2	5275372	487142	2,512

This season, given the low amount of snow and easier access into the high country, we decided to try four stations in the Lena Lakes area. Though Lena Lake itself gets quite a bit of use, the trails going to the north and west have less human traffic generally, at least in the winter. Lena Lakes East 2 was not checked as regularly as every 2-3 weeks owing to trail conditions, and there were issues with the camera at Lena Lakes West 2 triggering falsely (sunlight, shadows, or wind are possibilities). The usual visitors appeared at these stations, including bobcats, flying and Douglas squirrels, deer, and coyote.





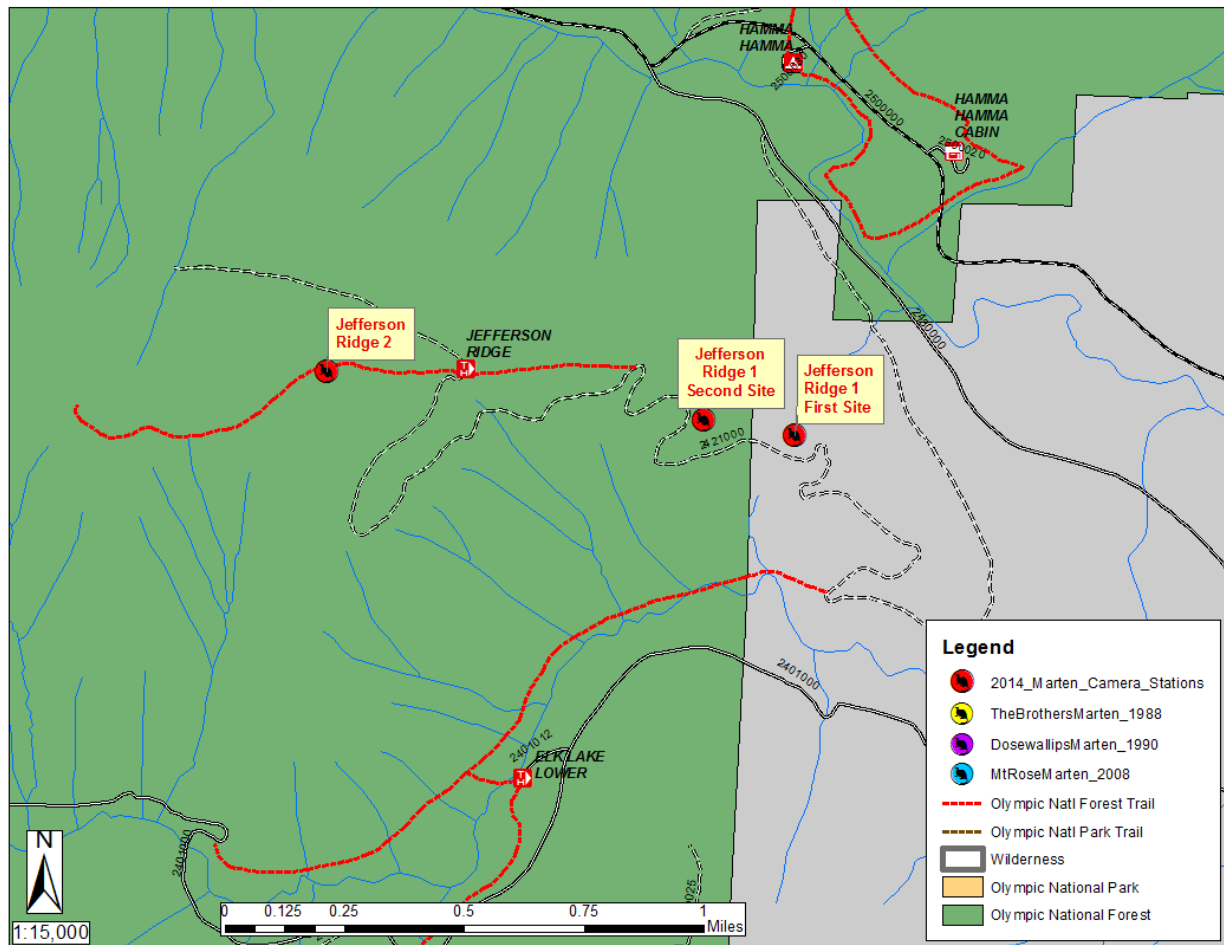
*Coyote at Lena Lakes West 1 (near the campground and lake)*



*Deer in a snowstorm at Lena Lakes East 1*



## Jefferson Ridge



### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Jefferson Ridge 1 (first site)	5270066	490821	1,711
Jefferson Ridge 1 (second site)	5270109	490512	1,959
Jefferson Ridge 2	5270224	489240	3,404

The Jefferson Ridge stations were also ones that we were able to install due to the low amount of snow this season. The first station was moved during the first check owing to it having been initially installed on private land. Once moved, that site did well and was functional the entire survey period. Jefferson Ridge 2 was not checked between 2/1 and 3/5 due to the arrival of the snow. During this time, there seemed to be issues with the camera not working as there were numerous false triggers (possibly due to the survey sign flapping) and though much of the bait was gone by the 3/5 check, there were no wildlife species recorded for this interval. Animals that were recorded for the area included a bobcat at station 2, crows, flying and Douglas squirrels, and deer.



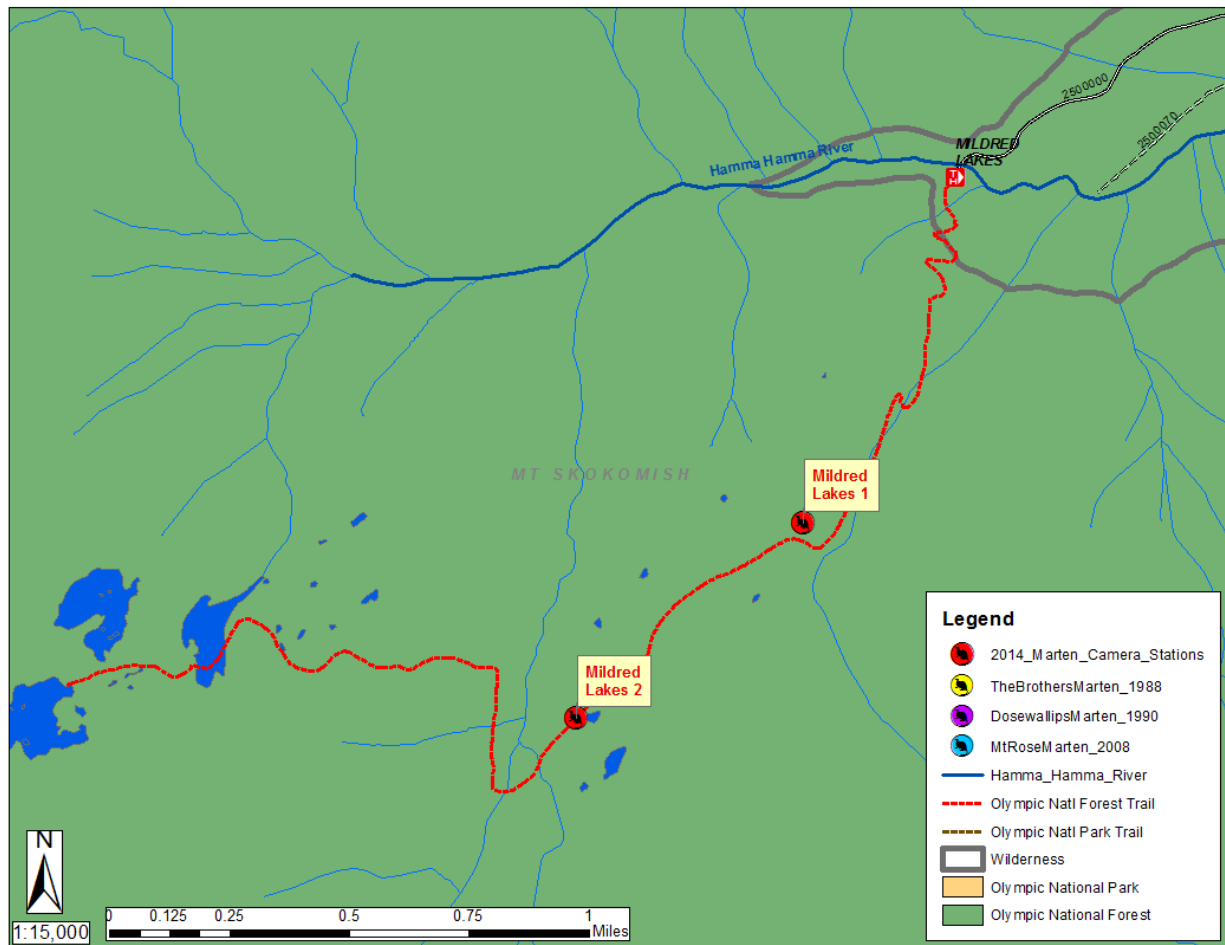
*Crows at Jefferson Ridge 1*



*Bobcat at Jefferson Ridge 2*



## Mildred Lakes



### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Mildred Lakes 1	5267942	479885	2,798
Mildred Lakes 2	5267256	479146	3,071

Both of these stations were functional the entire survey period except for 12 days at station 2 when the bait was taken by a mink. Mildred Lakes 1 had no activity until the 4<sup>th</sup> check (also the takedown) when a bobcat and a coyote appeared (not together). A hiker also wandered into the set up after dark one night. Mildred Lakes 2 had the mink come in on several occasions. I have never gotten a mink at a remote camera station, but it may not be surprising given the proximity of the site to Huckleberry Creek and a wetland complex. The only other visitor to this station was a coyote.



Bushnell  OFP\_749 26.53 In↓ 28°F 

02-16-2014 14:19:53

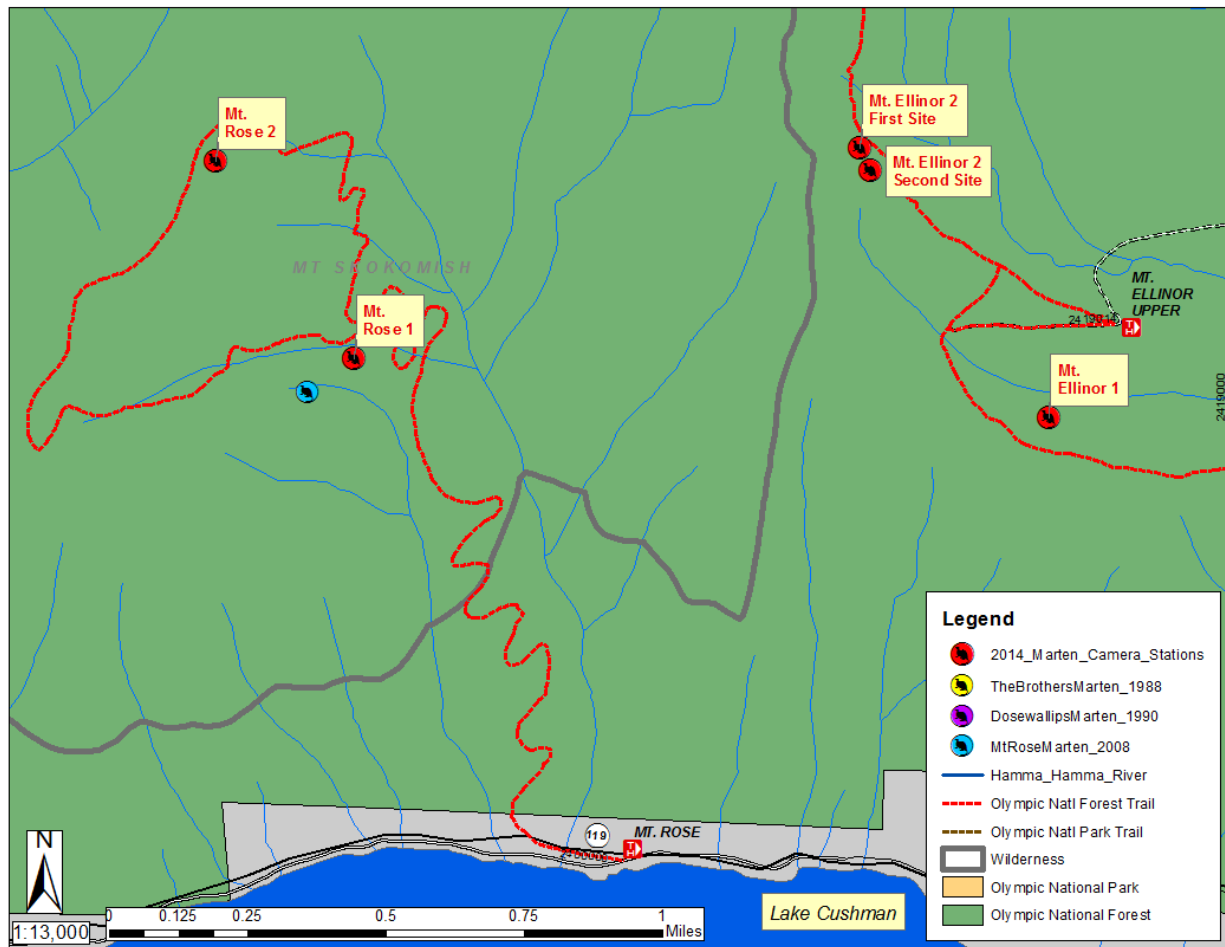


Bushnell  OFP\_749 26.38 In↑ 30°F 

02-17-2014 08:26:51

*Photos of mink on February 16 and 17, before and after a snowfall*

## Mt. Ellinor and Mt. Rose



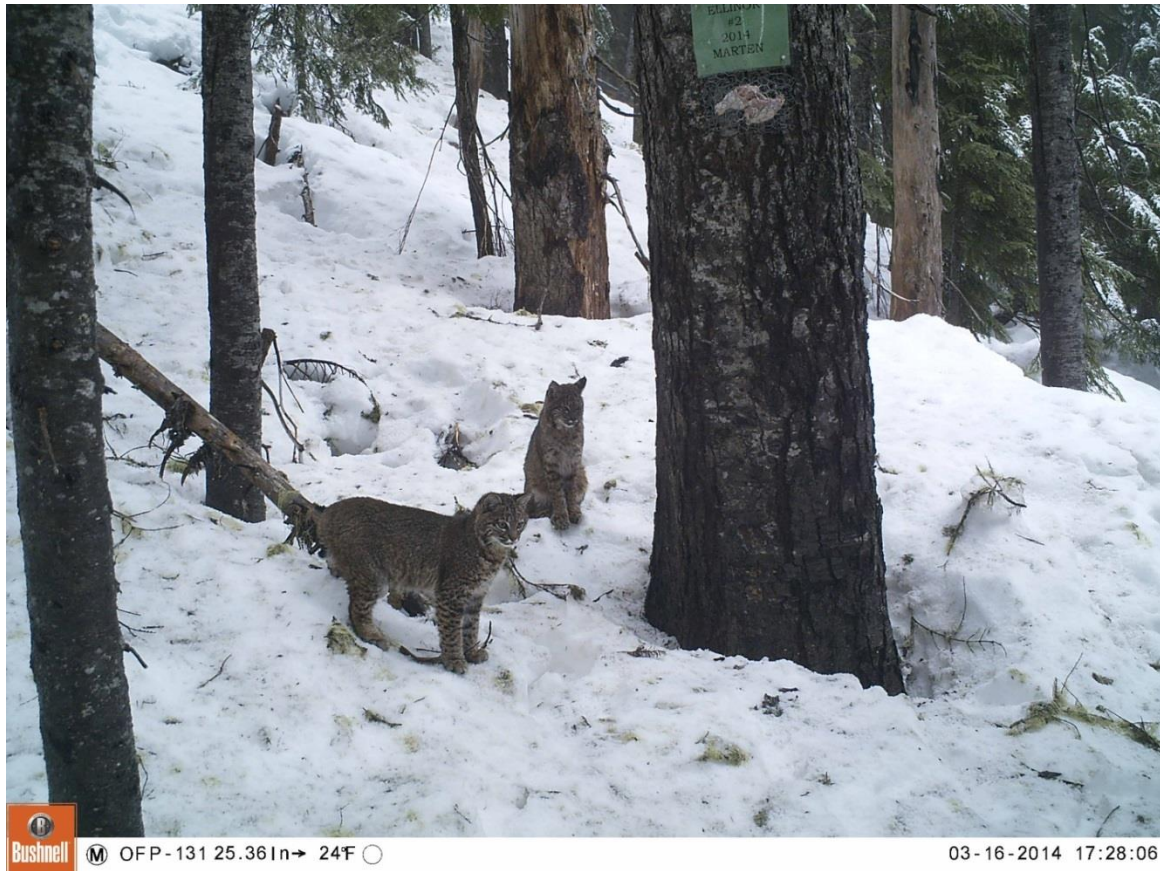
### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Mt. Ellinor 1	5261607	481155	3,380
Mt. Ellinor 2 (first site)	5262370	480578	4,510
Mt. Ellinor 2 (second site)	5262305	480612	4,407
Mt. Rose 1	5261704	479129	3,249
Mt. Rose 2	5262262	478705	3,866

These stations were all very close to where the most recent marten was found in 2008. The four stations (not including the second location for Mt. Ellinor 2), on average, were functional about 73% of the survey period. They all had a lot of bobcat activity and the bait was frequently taken. Mt. Rose also had domestic dogs show up (this is a popular trail for people and their dogs) and



Mt. Ellinor 2 also had a hiker. Both stations at Mt. Ellinor documented pairs of young bobcats, siblings presumably.

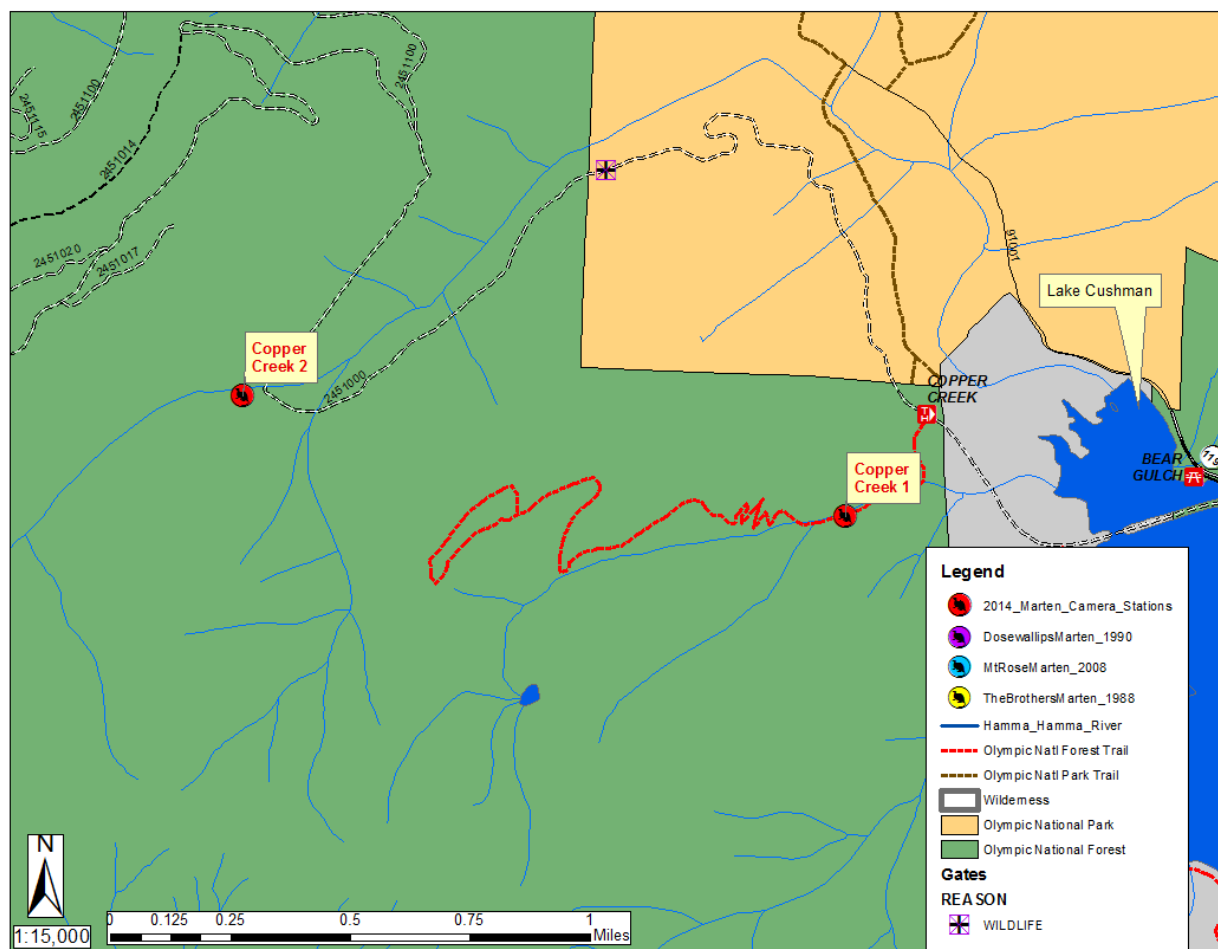


*Bobcats at Mt. Ellinor 2*



*Golden retriever at Mt. Rose 2*

## Copper Creek



### *UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Copper Creek 1	5261032	475163	1,108
Copper Creek 2	5261362	473125	1,946

Interestingly, even though these stations were functional only part of the survey period, 50 and 69% of the time respectively for stations 1 and 2, each of them documented a fisher. Copper Creek 1 had its fisher on the first check, and Copper Creek 2 had its fisher on the takedown. After the first animal came in, the volunteers installed hair snare cubbies during the second check at both sites. Hair samples were obtained and sent in for analysis (results still pending). These are two different fishers; the animal at the first station did not have a radio collar, while the one at the second site was wearing a collar. No other wildlife species besides the fisher came into Copper Creek 1; Copper Creek 2 had various prey (squirrels and rodents), as well as a short-tailed weasel and a coyote.



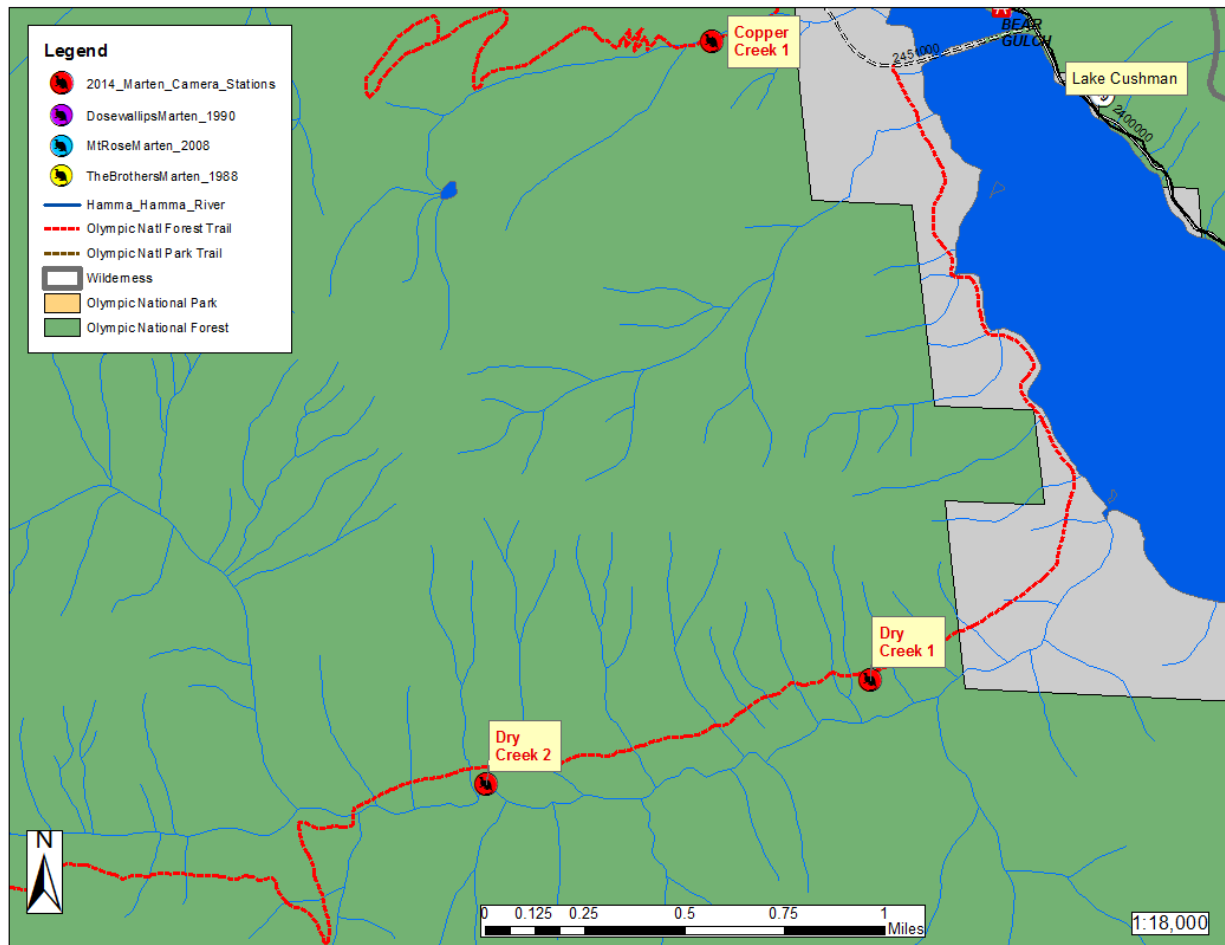


*Fisher at Copper Creek 1, January 30*



*Fisher at Copper Creek 2, March 23; collar is somewhat visible*

## Dry Creek



*UTM Locations:*

Station	UTM Northing	UTM Easting	Elevation (feet)
Dry Creek 1	5258487	475897	1,420
Dry Creek 2	5258011	474367	1,481

Dry Creek 1 also got a fisher on the first check. This may be the same animal as the one that came into Copper Creek 1 as it also didn't have a collar and the two stations were only approximately 1.6 miles apart though they were in different watersheds. This animal visited the station from January 23 through February 28. There were no additional visits between February 28 and when the station was taken down on March 27, so perhaps, if it was a female, it had begun to den and was not moving as much. Dry Creek 2 got only prey species, including snowshoe hare, flying and Douglas squirrels, and rodents. Hair snare cubbies were placed at these stations during the second check and hair was collected from the Dry Creek 1 site.





Bushnell (M) OFP\_007 28.76In→ 34°F ●

01-23-2014 09:18:51



Bushnell (M) OFP\_007 28.18In→ 19°F ●

02-07-2014 08:38:27

*Fisher at Dry Creek 1 on January 23 and February 7*

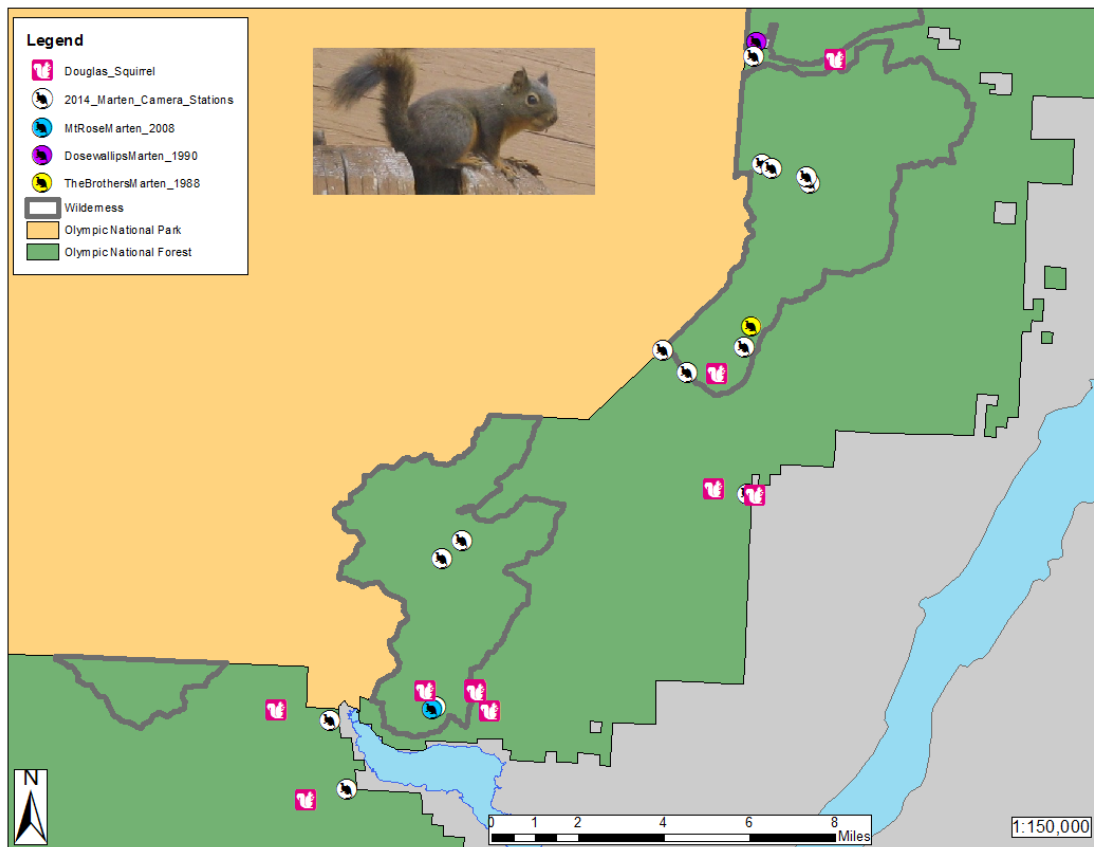
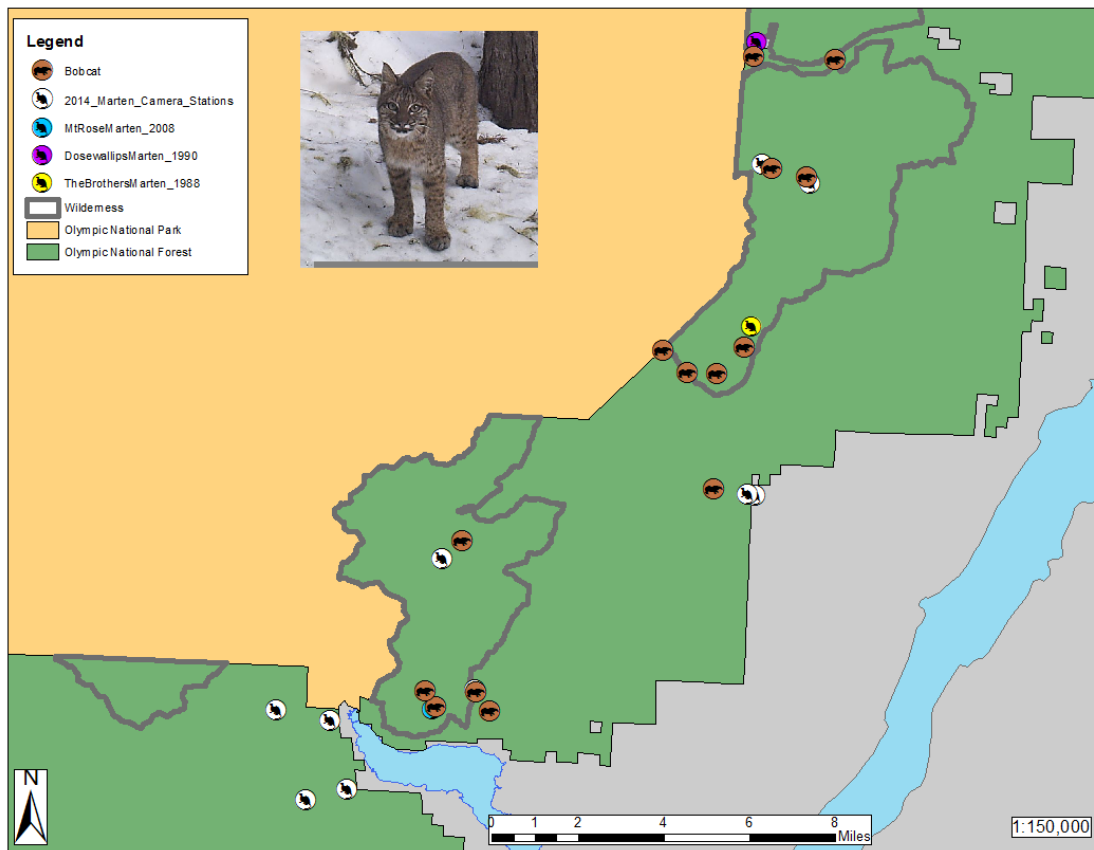


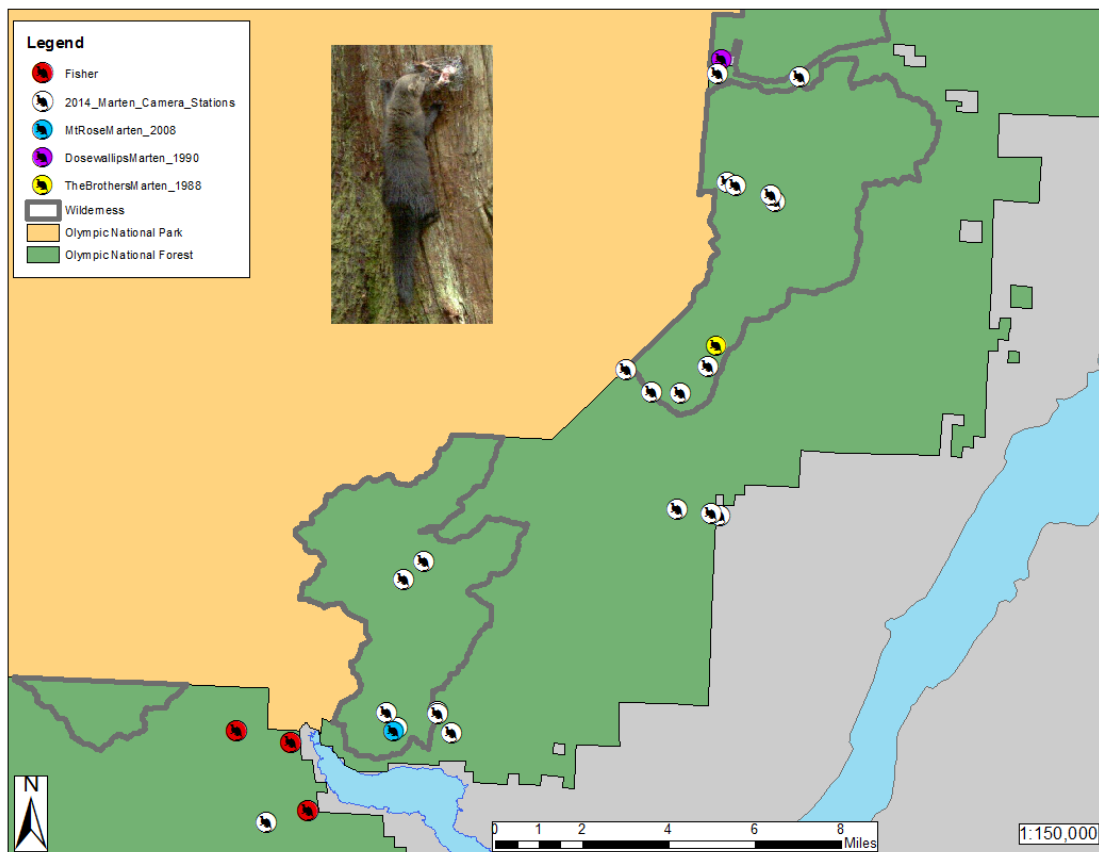
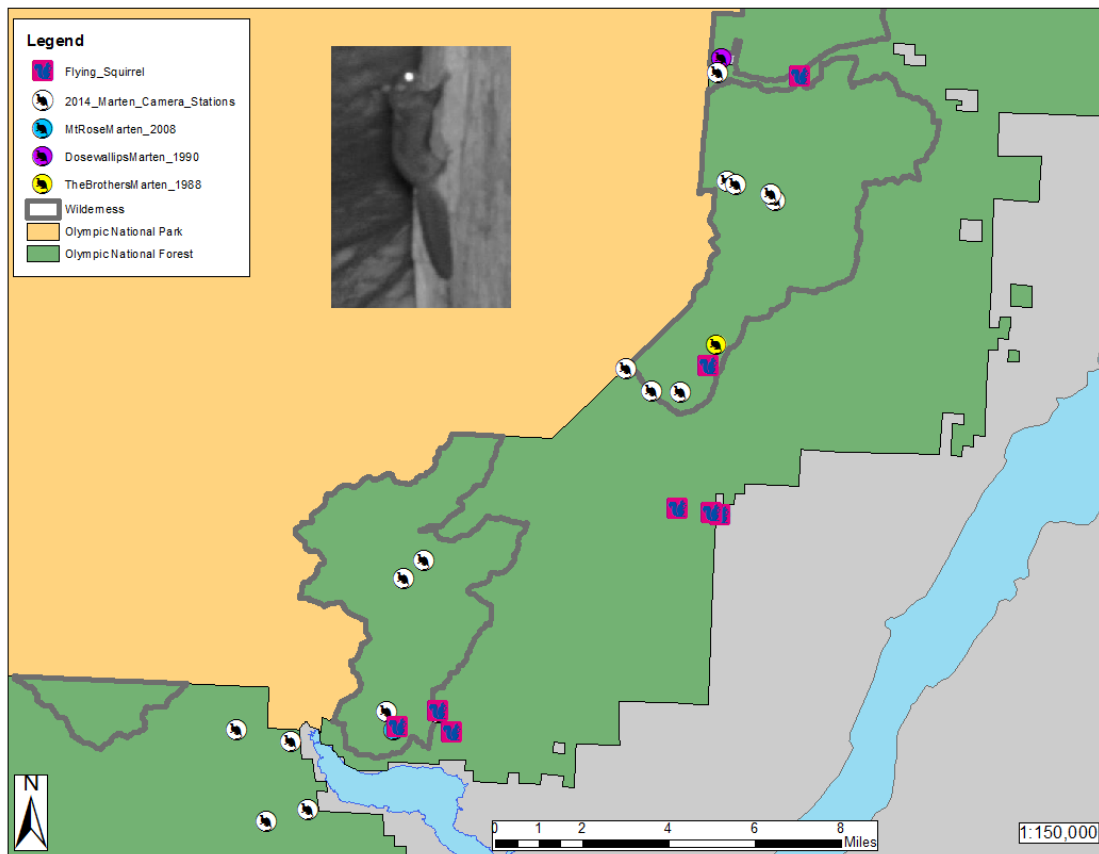
### *Discussion:*

The 2014 winter camera stations were up for approximately ten weeks, longer than they needed to be to get martens if the animals had been in the area. However, given some issues with camera malfunction last winter, we thought it would be better to have the cameras up for too long rather than not long enough. Indeed, we wouldn't have gotten the collared fisher at Copper Creek 2 if the stations had only been up six weeks (as outlined in the fisher survey protocol). In general, most of the stations were functional, with working cameras and adequate bait, for long periods of time. The fact that we didn't get any photos of martens in these areas would seem to be additional evidence of the disappearance of the animals from this part of the Peninsula, or at the very least extremely low population densities.

What exactly is going on with Pacific martens in coastal forests continues to be a mystery. However a study beginning this summer (July 2014) on the Humboldt marten (*Martes caurina humboldtensis*) in the coast range of Oregon may provide information that could help guide future survey and conservation efforts on the Olympic Peninsula. Additionally, in fall 2013 changes were made to the NatureServe designations for Pacific martens (NatureServe 2013), which more accurately reflect the situation for the coastal populations of the species versus the inland populations. Coastal marten populations in Washington and Oregon are now listed as "*Martes caurina* pop. 3 (Pacific Marten – Coastal Population)" and have a designation of "G4G5T1", which means "critically imperiled" at the population level. Conversely, interior marten populations in Washington and Oregon are now listed as "*Martes caurina* pop. 1 (Pacific Marten – Interior Population)" and are ranked as "G4G5T4T5", which means they are considered to be "secure" or "apparently secure" at both the species and population levels. This may lead to the coastal population being listed as a Forest Service sensitive species, which in turn could provide access to funds allocated for studying and conserving sensitive species.

In terms of other wildlife, we got photographs of a number of species at different stations. Bobcats were observed at the most locations, 14/20 of the sites (the three stations that got fishers did not have any bobcat activity). Other frequent visitors included: Douglas squirrel and blacktail deer (9/20 stations); northern flying squirrel (8/20); coyote and weasel spp. (5/20 each); and fisher and snowshoe hare (3/20 each). Maps for some of these species follow.





## *Acknowledgments*

ONF would like to thank several people from ASC, including Gregg Treinish, Mike Kautz, Jordan Holsinger, Julia Johnson, and Jaime Walton, for all their efforts at recruiting, training and coordinating the volunteers. In terms of media about the project, Danny Schmidt put together an informative video showcasing the dedication of the volunteers, as well as the beautiful landscape, <http://www.adventurescience.org/2014-olympic-pine-marten-monitoring.html>. Additionally, Tristan Baurick wrote about the surveys in the Kitsap Sun (February 9, 2014). Important support for the work (in terms of funding, advice, or supplies) came from Susan Piper, Kyle Noble, Michael Hutchins, and Reta Laford of ONF; Keith Aubry of the Pacific Northwest Research Station in Olympia; Patti Happe of Olympic National Park; and Jeff Lewis of Washington Department of Fish & Wildlife. Finally, none of surveys would have happened without the volunteers, who all were very dedicated, organized, and enthusiastic about the project from the installation of the cameras to the takedown: Bill Agnew, Angela Bohlke, Spencer Clanin, Lynn Dettinger, Gautam Dutta, Cambrea Ezell, April Ann Fong, Michelle Hickner, Matt Holt, Hanna Waterstrat, Brian Hawkins, Mary-Margaret Jenkins, Shane Noble, Bonnie Pullen, Cynthia Sheller, Allison Smith, Ron Staggs, Andrew Traylor, Hilton Turnbull, Craig Weiland, and Mason White. Thank you all!



Betsy Howell, Wildlife Biologist  
Olympic National Forest  
June 5, 2014

### *Literature Cited*

- Aubry, K.B. 2010. Research Wildlife Biologist. USDA Forest Service, Pacific Northwest Research Station, 3625 93<sup>rd</sup> Ave. S.W., Olympia, WA 98512-9193.
- Bailey, V. 1936. The mammals and life zones of Oregon. *North America Fauna* 55:281-285.
- Calkins, B. Upland Bird and Furbearer Section Manager. Washington Department of Fish & Wildlife, 600 Capitol Way N., Olympia, WA 98501-1091.
- Hagmeier, E.M. 1956. Distribution of marten and fisher in North America. *The Canadian Field-Naturalist* 70:148-168.
- Happe, P.J., K.F. Beirne, C.E. Cantway, D.J. Manson, and D.W. Smith. 2005. Olympic National Park Forest Carnivore Inventory, Report Series: NPS/PWR-NCCN/INV-2005-001. Olympic National Park, 600 E. Park Ave., Port Angeles, Washington 98362.
- Jenkins, K. and P. Happe. 2013. Sampling Design and Field Protocols for Non-invasive Fisher Surveys on the Olympic Peninsula, Washington. U.S. Geological Survey and Olympic National Park, 600 E. Park Ave., Port Angeles, Washington 98362.
- Jones, L.L.C and M.G. Raphael. 1991. Ecology and management of marten in fragmented habitats of the Pacific Northwest. Progress Report: Fiscal Year 1991. Pacific Northwest Research Station, Forestry Sciences Laboratory, 3624 93<sup>rd</sup> Avenue SW, Olympia, Washington 98502.
- NatureServe. 2013. NatureServe Explorer: an online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://www.natureserve.org/explorer>. (Accessed: February 5, 2014 ).
- Sheets, T.J. 1993. Washington State Pine Marten Distribution. Washington Department of Wildlife, 600 Capitol Way, N., Olympia, WA 98501-1091.
- Zielinski, W.J., K.M. Slauson, C.R. Carroll, C.J. Kent, and D.G. Kudrna. 2001. Status of American Martens in Coastal Forests of the Pacific States. *J. Mammalogy*, 82(2):478-490.