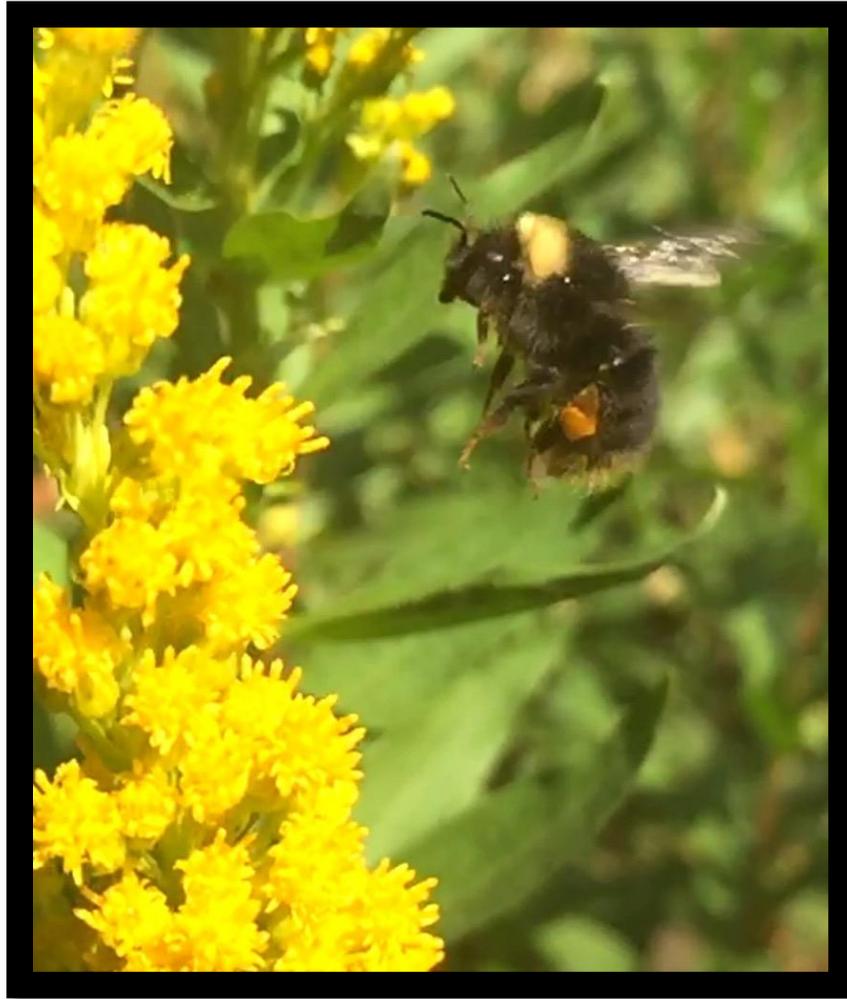


Summary Report for Western Bumble Bee Surveys  
Mt. Hood National Forest  
December 2015

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Western bumble bee landing on goldenrod.  
Photo capture from video taken at High Prairie, Mt. Hood National Forest.  
Image by Alan Dyck.

**Summary Report for 2015 Surveys Funded by the  
Interagency Special Status/Sensitive Species Program (ISSSP)  
Prepared by Alan Dyck, Mt. Hood Forest Wildlife Biologist**

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## ABSTRACT

In the summer of 2015, 24 meadow locations<sup>1</sup> and approximately seven roadside locations on the Mt. Hood National Forest (the Forest) were surveyed for presence of the western bumble bee, a species that was recently added to the Regional Forester's Sensitive Species List. The western bumble bee was detected at eight locations, six of which were new, previously unreported locations for this species. Across all surveyed locations, a total of seventeen native bumble bee species were recorded. The total number of species recorded is pending final verification by a taxa expert.

## INTRODUCTION

### BACKGROUND

In recent decades, the western bumble bee, *Bombus occidentalis*, has experienced precipitous declines throughout much of its historic range, particularly in low elevation sites west of the Cascade and Sierra Nevada Mountains in Oregon, Washington, and California where it was once common (Cameron et al. 2011). Previously widespread across the western United States and western Canada, population declines have been rapid and severe since 1998, with an estimated decline of 70-90% across much of its historic range (NatureServe 2013), and a decline in relative abundance of 75% (Jepsen 2014). Introduction of the non-native microsporidian parasite, *Nosema bombi*, is thought to have played a major role in the sudden decline of populations. The western bumble bee subspecies *Bombus occidentalis occidentalis* currently is considered critically imperiled in Oregon, Washington, and California (NatureServe 2013). Known locations of present-day populations in the Pacific Northwest are largely restricted to higher elevation sites in the Cascades and Sierra Nevada Mountain Ranges, although several low elevation populations have been discovered in the Seattle area since 2013.

Unfortunately, most of the western bumble bee's historic range has never been systematically sampled (Xerces Society 2015), so current incidence is unknown for many areas. According to Xerces Society records, the western bumble bee was historically documented at 14 locations on the Forest. In 2013, the Xerces Society conducted a survey of 16 locations on the Forest, finding western bumble bees at eight locations - one historic location and seven new locations (Hatfield et al. 2013) (using our definition of location, Hatfield et al. found the western bumble bee at four locations – one historic and three new locations). All documented finds were in higher elevation meadows and east of -121.65° W longitude.

Insect populations are notoriously variable from year to year, so repeated sampling over multiple years is necessary to sufficiently ascertain the occurrence of a particular species. In 2015, ISSSP funding supported federal inventory and monitoring efforts for the western bumble bee in western Oregon on the Mt. Hood National Forest, Willamette National Forest, and Roseburg BLM. This report details results of surveys conducted in 2015 on the Mt. Hood National Forest.

This report provides additional information and locations beyond that reported by Hatfield et al. 2013 and by Dyck and Willhite 2013.

<sup>1</sup>In this report, we use the term "location" to refer to a larger geographical vicinity such as Timberline Ski Area and "site" to refer to a more limited and distinct position on the ground where a survey or search is conducted. A location may include one or more sites. Hatfield et al. 2013 appears to use the term "locality" to indicate the geographic positions of "timed survey locations" and "point searches."

## **METHODS**

### **PROJECT AREA**

The project area encompassed lands in northwest Oregon administered by the Mt. Hood National Forest that lie in the vicinity of the Cascade Mountains Crest. Sites were selected for survey based on historical western bumble bee locations, sites surveyed in 2013 by the Xerces Society, and previously unsurveyed areas where habitat is present for the species. Surveys were conducted on all four Ranger Districts of the Forest. The surveys concentrated on sampling wet/moist meadows with abundant floral resources, roadside areas, and other areas containing forage species preferred by bumble bees.

### **SURVEY METHODS**

The primary method of survey was to conduct “walk-throughs” of pre-identified survey sites, focusing at each survey site on areas of bumble bee foraging habitat. Surveys took place during the months of July, August, and September when bumble bee foraging is typically at its peak in the Cascades.

Surveys were conducted by Forest employee specialists in the fields of wildlife biology and botany who had recently attended bumble bee workshops taught by Rich Hatfield of the Xerces Society. This training is satisfactory for teaching non-entomologists how to identify the western bumble bee and is an introduction into identifying other bumble bee species. A minimum of one person-hour of search time was spent slowly walking through areas with flowers preferred by bumble bees. The search was continued for an additional half hour when no western bumble bees were detected. During the walk-throughs, surveyors slowly walked through the meadows looking at areas with flowers and netted, photographed, or identified any bumble bees observed. Bees that were netted were transferred to vials with lids for species identification. When possible, photos were taken to provide additional documentation and to aid in verification of species identifications. GPS points were recorded for each location. Elevation, timing, and flowering data were collected to provide improved habitat information for the various bumble bee species encountered.

Specialists visited as many sites as possible during the field season, including sites at known western bumble bee locations and new locations where the western bumble bee previously has not been found but where suitable habitat exists. In addition, specialists recorded incidental sightings of bumble bee occurrence at potential habitat sites discovered during the normal course of their work.

## **RESULTS**

Bumble bee surveys occurred from July 9, 2015 to September 23, 2015. The western bumble bee was identified at eight locations (Table 1). Six of these locations were new for the species. In addition, we identified 17 species (however, the final number of species may change pending verifications by a tax expert) (Tables 2 and 3).

Survey site elevations ranged from 1,280 feet to 5,960 feet (see Appendix A and B). Although the higher elevation sites were checked in mid-May, no flowers were blooming at that time. However, the warm dry climate that occurred in the spring of 2015 subsequently created a condition where flowers bloomed and then began drying out very quickly; making it difficult in some locations to find flowers that were being visited by bumble bees. This was especially true at the Timberline Ski Area and Lodge where unshaded volcanic soils dried very quickly and the flowers did not hold their blooms long. In this

situation, it was important to look for flowers in the shade of the conifers because these flowers bloomed later due to cooler temperatures, slower snow melt, and higher soil moisture retention.

**Table 1. Surveyed locations and documented sightings of western bumble bees on the Mt. Hood National Forest, summer 2015.**

Ranger District	Area	(X) Indicates Historic Survey	(#) Indicates Historical Western Bumble Bee Record	WB indicates Western Bumble Bee Location 2015
Barlow	Bonney Butte Meadow			
	Brooks Meadow			WB
Clackamas River	Alder Flat CG	X		
	Black Wolf Meadow	X		
	Ollalie Meadows	X		
	Ripplebrook	X		
	Twin Lakes			
Hood River	Barlow Butte	X		
	Devil's Half Acre	X	#	WB
	Gibson Prairie			
	Horkelia Meadow			
	High Prairie			WB
	Gumjuwac Saddle			WB
Zigzag	Mirror Lake	X		
	Ski Bowl East	X		WB
	Snow Bunny Sno Park	X		
	Summit Meadows	X		
	Timberline	X	#	WB
	Alpine Campground	X	#	
	Little Crater Meadow			WB
	Summit Ski Area			
	High Rocks Area			
Jackpot Meadow/Dry Meadow			WB	

The elevational range of the western bumble bee locations ranged from 3,360 feet to 5,750 feet (Appendix A). This is not necessarily an indication that there are no western bumble bees at lower elevations, rather it indicates two significant conditions of our surveys, the first being that there are more meadows on the Forest at higher elevations, and the second being that the weather was unseasonably warm and dry in 2015, which affected the phenology of bumble bees and their foraging plants. Many times during the surveys when the surveyors arrived at the survey site the meadow flowers were well past their prime. This made finding bumble bees much more difficult and the numbers were lower than expected due to these dry conditions. Many of the flowers emerge soon after snow melt and this occurred earlier in 2015 than has been considered normal. Higher elevations had

flowers blooming later in the summer; therefore, there was an increased chance of finding bumble bees at the higher elevation during the time the surveyors were searching.

Table 2 shows the relative rank of species presence or how common a species was for the survey and compared to the rank by the 2013 Xerces Society survey. The 2015 rank was determined by comparing the number of survey locations where a species was found, and if there was an equal number of locations, then the perceived relative abundance of that compared to the other species. For example, *Bombus bifarius* and *Bombus flavifrons* were found at 30 locations, but *B. bifarius* was perceived to have a higher number of individuals at those sites. Individual population counts were not tallied by all surveyors so this is only a perceived abundance.

**Table 2. Bumble bee species frequency of site occurrence and relative ranking data, Mt. Hood National Forest, summer 2015.**

Species	Rank by Mt. Hood 2015 Survey	Number of sites found by Mt. Hood Specialist	Rank by Xerces 2013 Survey
<i>Bombus bifarius</i>	1	30	1
<i>Bombus flavifrons</i>	2	30	2
<i>Bombus melanopygus</i>	3	17	4
<i>Bombus insularis</i>	4	17	11
<i>Bombus mixtus</i>	5	14	3
<i>Bombus vosnesenskii</i>	6	14	5
<i>Bombus flavidus</i>	7	9	7
<i>Bombus occidentalis</i>	8	8	6
<i>Bombus appositus</i>	9	6	
<i>Bombus suckleyi</i>	10	3	12
<i>Bombus vandykei</i>	11	3	16
<i>Bombus fervidus</i>	12	3	
<i>Bombus nevadensis</i>	13	2	14
<i>Bombus rufocinctus</i>	14	2	
<i>Bombus caliginosus</i>	15	1	9
<i>Bombus sitkensis</i>	16	1	10
<i>Bombus centralis?</i> ( <i>melanopygus?</i> )	17	1	--
<i>Bombus griseocollis</i>	--	0	8
<i>Bombus sylvicola</i>	--	--	15

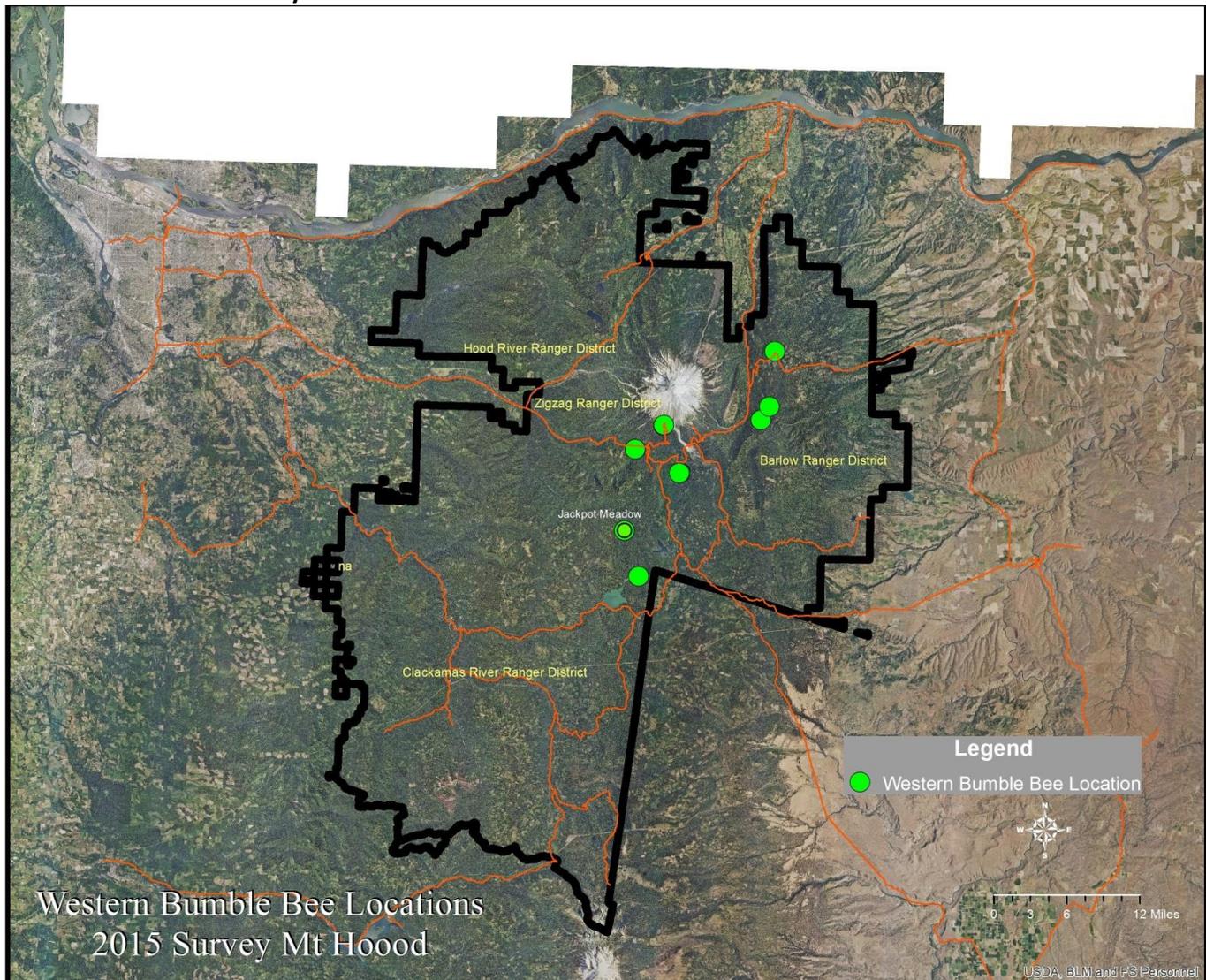


Survey Location	<i>Bombus bifarius</i>	<i>Bombus flavifrons</i>	<i>Bombus Melanopygus</i>	<i>Bombus insularis</i>	<i>Bombus mixtus</i>	<i>Bombus vosnesenskii</i>	<i>Bombus flavidus</i>	<i>Bombus occidentalis</i>	<i>Bombus appositus</i>	<i>Bombus suckleyi</i>	<i>Bombus vandykei</i>	<i>Bombus fervidus</i>	<i>Bombus nevadensis</i>	<i>Bombus rufocinctus</i>	<i>Bombus caliginosus</i>	<i>Bombus sitkensis</i>
Ski Bowl East	X	X	X	X			X	X						X		
Snow Bunny Snow Park	X	X														
Summit Meadows	X	X	X	X	X	X			X							
Timberline	X	X	X	X	X	X		X	X							
Alpine Campground	X	X	X	X	X	X										X
Little Crater Meadow	X	X		X				X		X						
Summit Ski Area	X		X													
High Rocks Area	X	X	X		X	X	X									
Jackpot Meadow/Dry Meadow	X	X		X				X			X		X			

## Locations of Western Bumble Bee on the Mt. Hood National Forest

Western bumble bees were recorded at eight different locations on the Forest during the 2015 surveys (Figure 1). Two of these locations, Timberline Ski Area and Devils Half Acre Meadow, were previously surveyed in 2013 by the Xerces Society and found to have western bumble bees. The western bumble bee site documented in 2015 at Timberline Ski Area location was a different site than the one documented by the Xerces Society in 2013. The 2015 site was outside of the proposed mountain bike park and is across the Timberline Road from the ski area. No western bumble bees were found within the proposed mountain bike park area that was surveyed. The purpose of the surveys, however, was not intended to survey the proposed mountain bike park, but to gather information about the presence of the *Bombus occidentalis* on the Forest. Several other sites surveyed in 2013 by the Xerces Society were re-surveyed in 2015, and several previously unsurveyed sites were also surveyed. In many instances, unseasonably warm weather conditions caused early blooming, which resulted in poor flower conditions at the time of the survey. Poor flower conditions are likely to have detrimentally affected detections of western bumble bees at many sites.

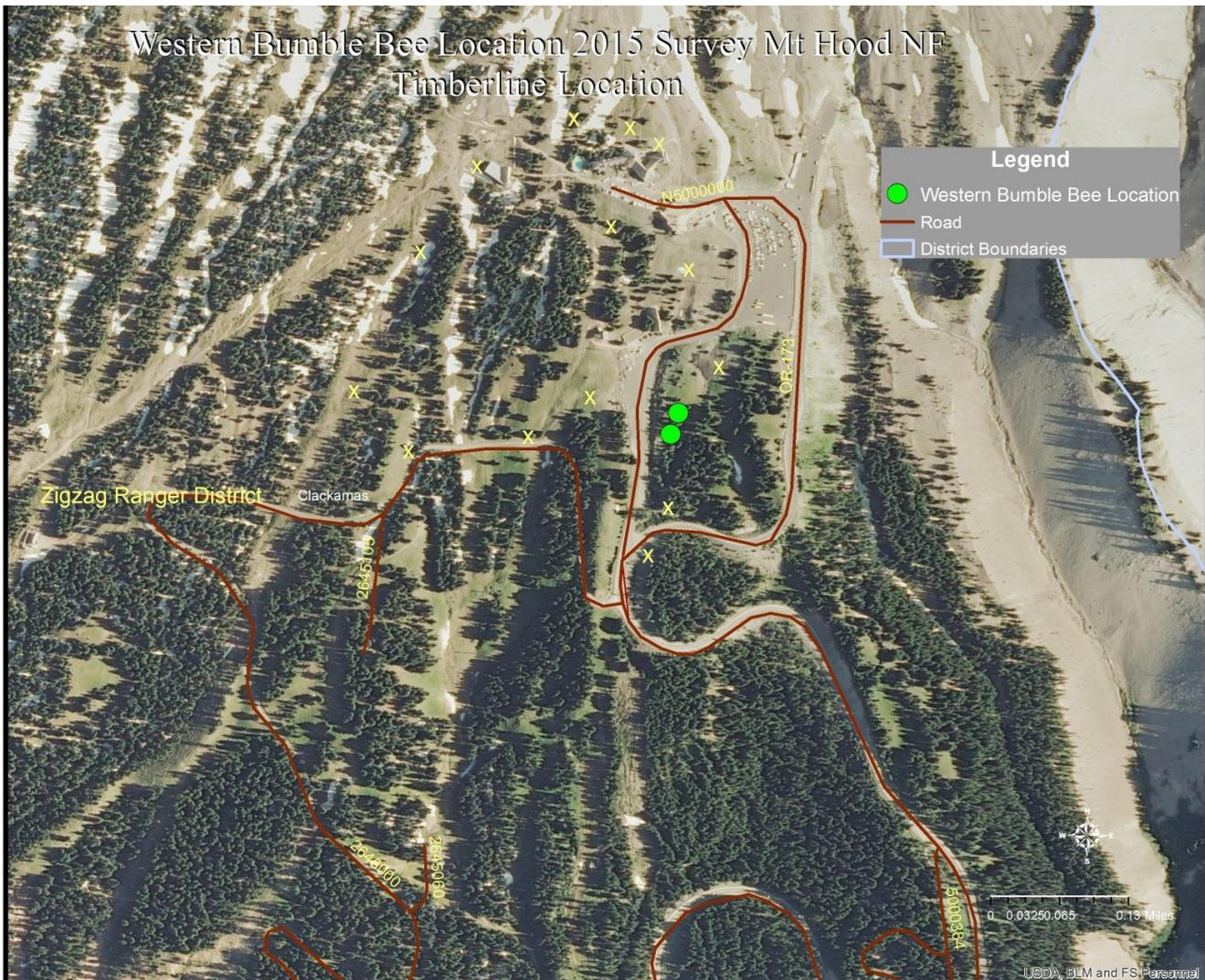
**Figure 1. Locations where the western bumble bee, *Bombus occidentalis occidentalis*, was documented during western bumble bee surveys conducted on the Mt. Hood National Forest in 2015.**



### Timberline Ski Area – Aster Field South of the East Parking Lot.

Timberline Ski Area was one of the first areas surveyed in 2015 by Alan Dyck. Western bumble bees were found on a new site in the meadow south of the east parking lot (Figure 2), and were absent on nearby sites previously reported as positive in the 2013 survey by the Xerces Society. The elevation of the new positive survey site is approximately at 5,750 feet. The fact that the western bumble bee was not found on the same sites as in 2013 is thought to be more a result of phenology changes associated with early and unseasonably warm and dry conditions than lack of species presence. It is possible the bumble bees shifted sites in 2015 to areas having more favorable floral conditions. Sites around Timberline Ski Area where western bumble bees were documented in 2015 were characterized by higher levels of conifer shading and higher plant vigor compared to the more open areas of the ski runs and north of Timberline Lodge where the flowers were declining under full hot sun exposure at the time of the survey. In contrast, the meadow just south of the east parking lot, which had a large population of bumble bees using the site, had large amounts of blooming flowers, including aster and goldenrod that were still in prime condition. The 2015 western bumble bee site was outside of the proposed mountain bike park and is across the Timberline Road from the ski area. No western bumble bees were found within the proposed mountain bike park area that was surveyed. Because bumble bees move their nest and overwintering sites annually, these surveys are not considered relevant for clearing areas for projects planned in this area.

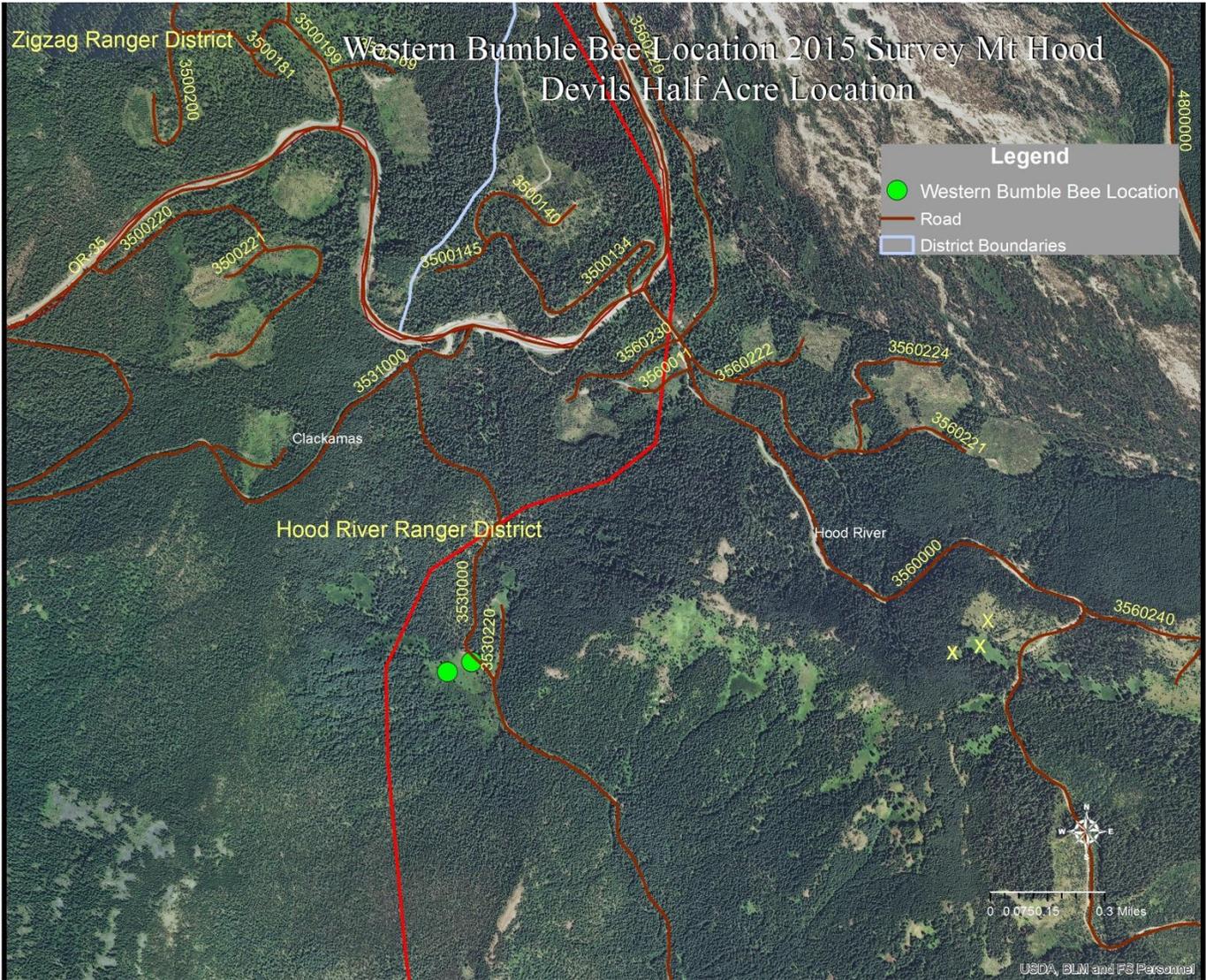
**Figure 2. Western bumble bee survey and sites for the Timberline Ski Area, July 17, 2015. A yellow “X” indicates a search area for western bumble bee with no individuals found. Green dots indicate positive finds for western bumble bee in the Timberline Ski Area.**



### Devil's Half Acre Meadow

Devil's Half Acre Meadow is a historical western bumble bee location that was surveyed in 2013 by Rich Hatfield, Xerces Society (Figure 3). The elevation of the location is approximately 3,720 feet.

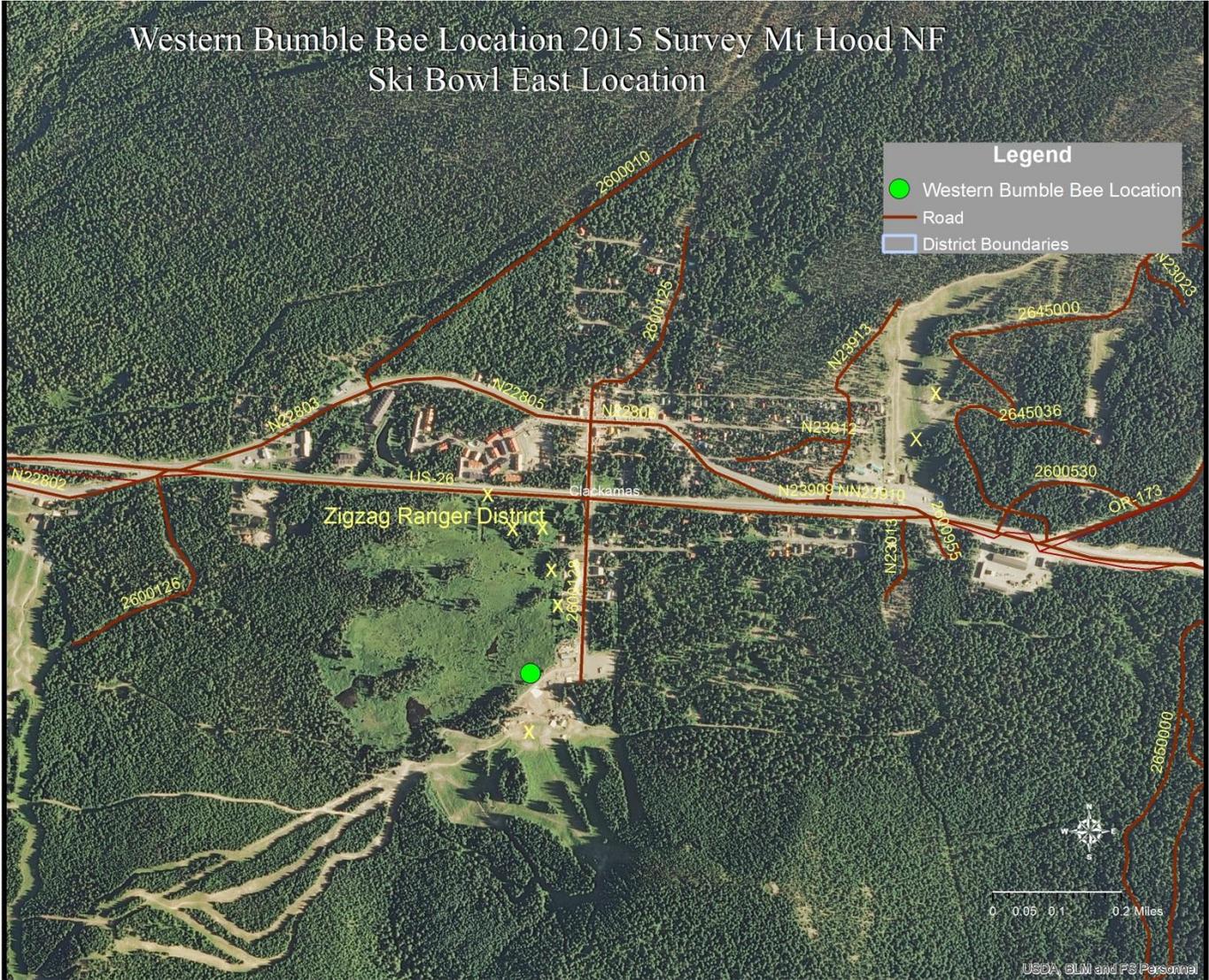
**Figure 3. Western bumble bee sites at Devil's Half Acre Meadow, July 31, 2015. A yellow "X" indicates a search area for western bumble bee on Barlow Butte where no individuals were found. Green dots indicate positive finds for western bumble bee in Devil's Half Acre Meadow.**



### Ski Bowl East

The Xerces Society surveyed Ski Bowl East in 2013 and did not find any western bumble bees during their search. The 2015 survey by Mt. Hood personnel did find two individuals not far off the parking area and roadside (Figure 4). The species was visiting *Spirea sp.* The elevation of the positive find was approximately 3,720 feet.

**Figure 4. Ski Bowl East survey and western bumble bee site, July 30, 2015. A yellow "X" indicates a search area with no individuals found. A green dot indicates a positive find for western bumble bee.**



### Little Crater Meadow

Flower resources were dwindling at Little Crater Meadow at the time of the survey. The survey period of 1.5 hours was over when a western bumble bee was found on the road edge as the surveyor was returning to the vehicle (Figure 5). The bumble bee was feeding on *Spirea sp.* Little Crater Meadow is located at approximately 3,360 feet.

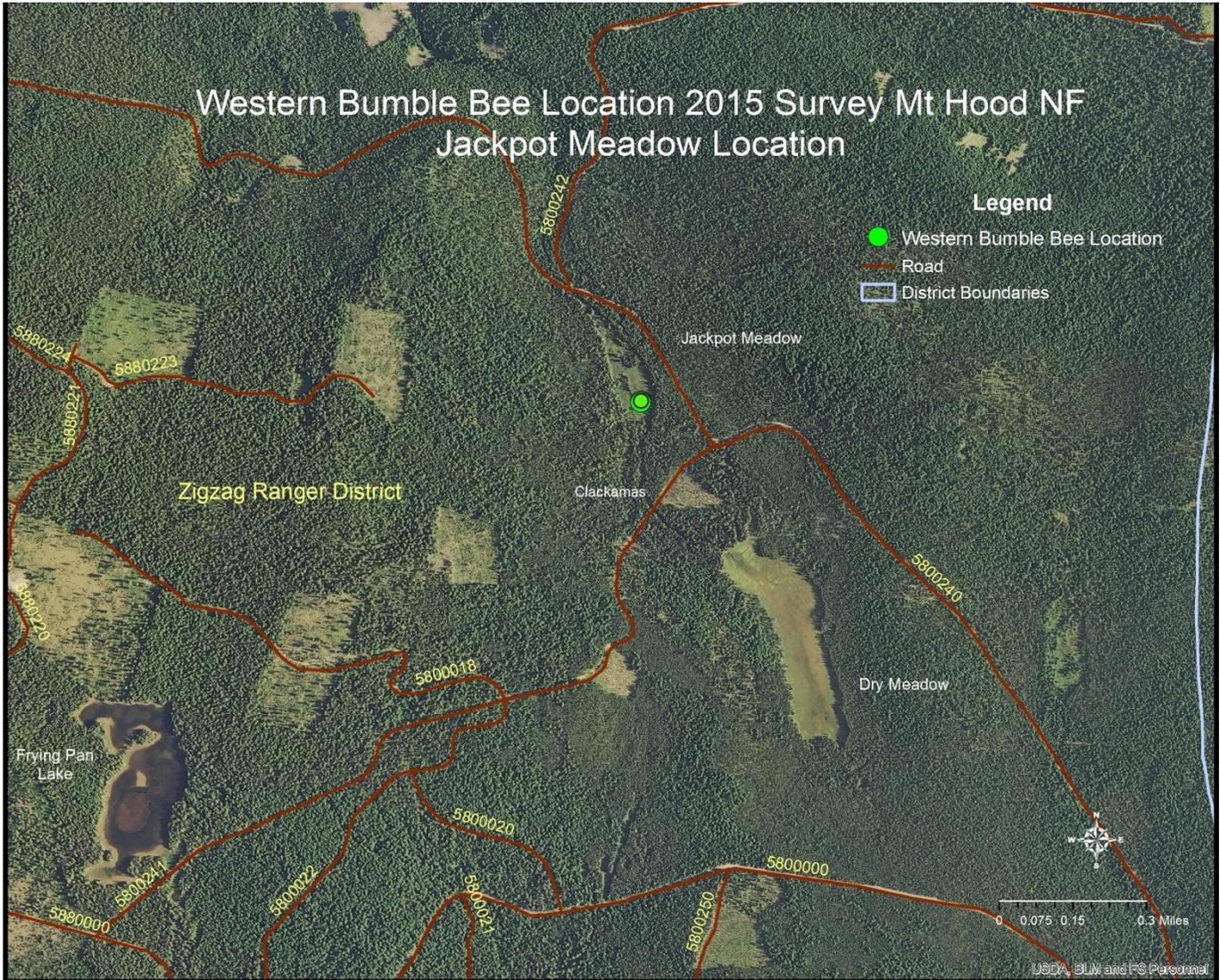
**Figure 5. Little Crater Meadow survey and western bumble bee site, July 30, 2015. A yellow “X” indicates a search areas with no western bumble bee individuals found. A green dot indicates a positive find for western bumble bee.**



### Jackpot Meadow

Both Dry and Jackpot Meadow were surveyed. No flowers were found at Dry Meadow and no bumble bees were observed there. Two western bumble bees were found feeding on marsh burnet and *Saguisorba officinalis* at Jackpot Meadow (Figure 6). Jackpot Meadow elevation is approximately 3,843 feet.

Figure 6. Western bumble bee site at Jackpot Meadow, July 21, 2015. A green dot indicates a positive find for western bumble bee.



## High Prairie

High Prairie had the highest abundance of western bumble bees of all areas surveyed in 2015. The flowers were in very good condition. Only a small portion of the prairie was surveyed so potentially there may have been an even larger population in other parts of the meadow (Figure 7). The western bumble bees were most concentrated on goldenrod. Over a dozen *Bombus occidentalis occidentalis* individuals were seen by surveyors Stephanie McKinney and Alan Dyck. Situated at an elevation of approximately 5,920 feet, this is one of the highest elevation sites surveyed. In addition, a monarch butterfly was observed feeding and flying through the meadow.

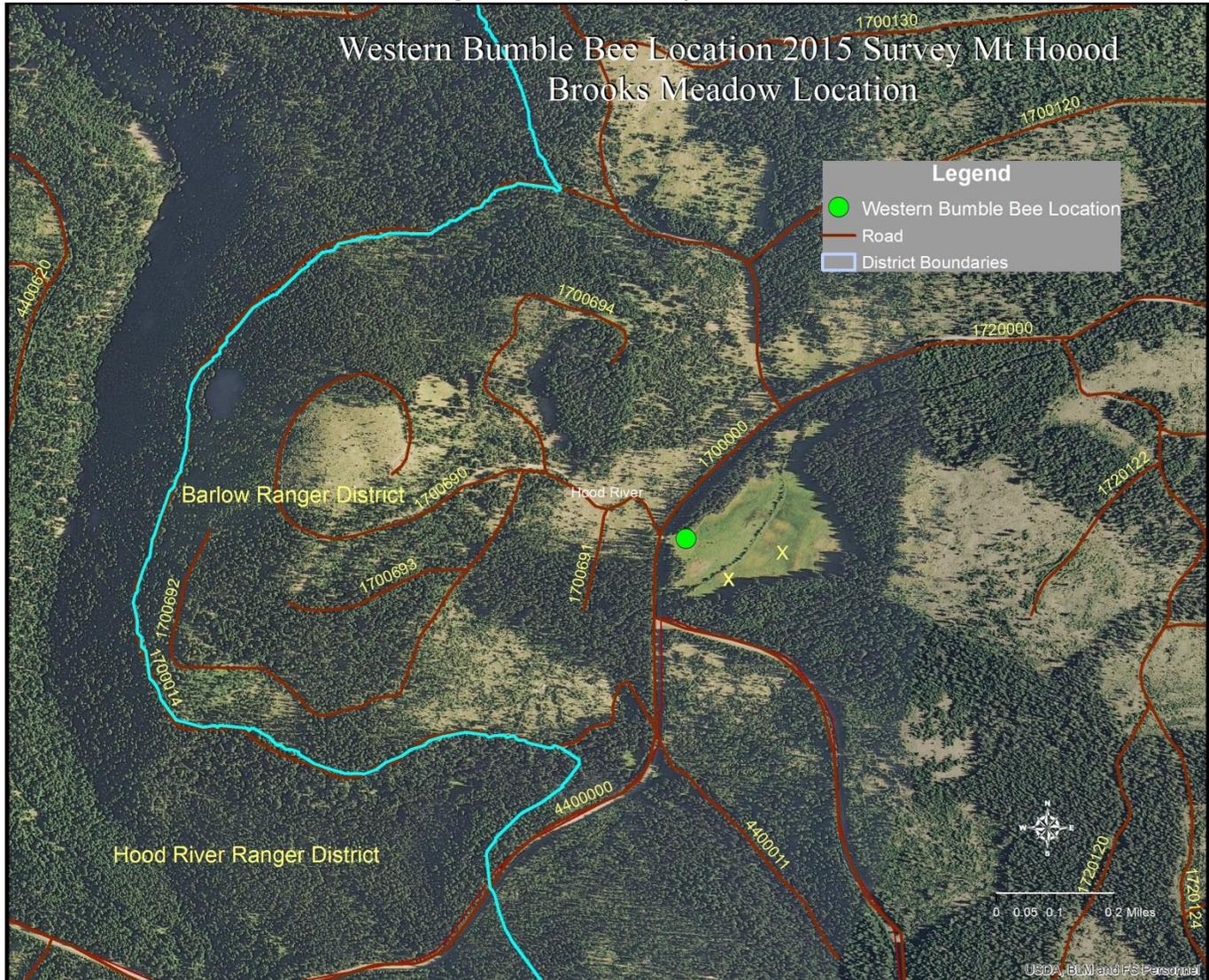
**Figure 7. Western bumble bee sites at High Prairie July 31, 2015. A green dot indicates a positive find for western bumble bee.**



### Brooks Meadow

One western bumble bee was found at Brooks Meadow by Stephanie McKinney and Alan Dyck on July 31, 2015 (Figure 8). The individual was found fairly close to the road at the end of the allotted survey time. Another western bumble bee was photographed by Susan Nugent on August 10, 2015. Brooks Meadow had very low numbers of flowers blooming on July 31. The elevation of Brooks Meadow is 4,300 feet, which is 1,600 feet lower than High Prairie, and flowers here were far more advanced in the bloom cycle. Western bumble bees were observed feeding on aster, bull thistle and *Penstemon euglaucus*. The hot dry conditions seemingly reduced the amount of blooming plants by the time the meadow was initially surveyed; however, the western bumble bee was still present ten days later.

**Figure 8. Western bumble bee site at Brooks Meadow, July 31, 2015. A yellow “X” indicates a search area for western bumble bee with no individuals found. A green dot indicates a positive find for western bumble bee.**



## DISCUSSION

The intent of the 2015 surveys was to resample some of the historical *Bombus occidentalis* locations and to sample new locations that had never been surveyed. A second objective was to allow specialists to become better acquainted with bumble bee identification, timing, locations, floral association and survey methods. Due to the decline in western bumble bee populations, it was important to discover if the locations identified by the Xerces Society in 2013 were the only locations where the species occurred. The western bumble bee is listed as a sensitive species on the Region 6 Regional Foresters Sensitive Species List for both 2011 and 2015. In 2013 an analysis was completed by Alan Dyck and Beth Willhite for the Timberline Ski Area, due to the discovery by Hatfield et al. 2013 of western bumble bees near but outside of the proposed mountain bike park. The 2013 conclusion of the effects analysis for this sensitive species was that if the Project Design Criteria were followed that the project **May Impact Individuals, but not likely to Cause a Trend to Federal Listing**. This determination was made due to several factors. The width of the bike trails will be small, the trail construction season will be altered to protect overwintering queens, surveys will be done prior to construction, trails would be re-routed if necessary to avoid nest sites, the loss of foraging habitat will be small, rehabilitation areas will incorporate native plants that are good forage plants, and although the populations have declined across the range, there is still habitat and additional populations outside of the Timberline Ski Area.

The 2015 surveys demonstrated several things, namely the year-to-year variability in insect survey results, and the existence of unreported western bumble bee populations in unsurveyed areas of the Mt. Hood National Forest above 3,360 feet elevation: there were locations where the Xerces Society located western bumble bees in 2013 but where the Mt. Hood National Forest specialist did not find the species in 2015; there was one location where the Xerces Society found no western bumble bees in 2013 but where Forest specialists did find western bumble bees in 2015; and there were seven locations that had not been surveyed by the Xerces Society where Forest specialists found western bumble bees (since one of these seven locations was a historical location, Forest specialists found a total of six new, previously unreported western bumble bee locations in 2015). If more time had been available and the surveys had been started earlier it is likely that more populations of western bumble bee would have been found.

It is encouraging that these six new locations were identified. Identification of these new locations provides additional evidence that the species is not trending toward listing at this point and that projects with small impacts on habitat will affect individuals but not decimate the population on the Mt. Hood National Forest or trend the species towards listing. As previously stated, Hatfield et al. 2013 identified three other new locations in 2013, bringing the total number of new locations documented since 2012 to nine. The 2015 survey results do not alter or affect the conclusion of the analysis by Dyck and Willhite 2013.

Future surveys should sample the lower elevations and western regions of the Forest, as recommended by Hatfield et al. 2013, so that the extent of western bumble bee occurrence on the Mt. Hood National Forest can be determined. Depending on weather conditions, this may require starting surveys as early as April and May to capture peak bloom.

## ACKNOWLEDGEMENTS

This project was funded by the Interagency Special Status and Sensitive Species Program. Special thanks go to Rich Hatfield of the Xerces Society for providing training, species identification, report and recommendations. I would also like to thank Christina Mead, Patty Walcott, Jeff Goldberg, Ed Buursma and Susan Nugent for their work on the surveys and providing their data for this report. I would also like to especially thank Christina Mead for always stepping up to take a leading role in providing good photos, data, insights, and work to make sure the surveys were done well. Thank you to Beth Willhite for her help, enthusiasm, editing, and advice on all things related to insects.

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## Appendix A: Western Bumble Bee Locations

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/17/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.647	121 42.605	5750	82 degrees, sunny, no wind	Survey
7/22/2015	<i>Bombus caliginosus</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/21/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Little Crater Meadow	45 8.859	121 44.786	3360	71 degrees sunny	Survey
7/21/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey
7/30/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/31/2015	<i>Bombus occidentalis</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus occidentalis</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus occidentalis</i>	Alan Dyck, Stephanie McKinney	Hood River	Brooks Meadow	45 25.087	121 31.301	4300	91 degrees, sunny, no wind	Survey
8/6/2015	<i>Bombus occidentalis</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	Incidental
8/10/2015	<i>Bombus occidentalis</i>	Susan Nugent	Hood River	Brooks Meadow Area / jcts of Roads 1700 & 1720	615253E	5030583N	4000ft	sunny, no wind, 80s	survey
9/1,2 & 23/2015	<i>Bombus occidentalis</i>	Susan Nugent	Hood River	Horkelia Meadow and High Prairie areas (Road 4410)	615058E	5023121N	5300ft- 600ft	sunny/cloudy, breezy, upper 60s	survey

## Appendix B: All Bumble Bee Locations

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/9/2015	<i>Bombus appositus</i>	C. Mead, P. Walcott	Hood River	Horkelia Meadow, 4410 Rd	45 23.523	121 32.435	4880	80 degrees, few clouds, no wind	Survey
7/9/2015	<i>Bombus nevadensis</i>	C. Mead, P. Walcott	Hood River	Horkelia Meadow, 4410 Rd	45 23.523	121 32.435	4880	80 degrees, few clouds, no wind	Survey
7/9/2015	<i>Bombus fervidus</i>	C. Mead, P. Walcott	Hood River	Horkelia Meadow, 4410 Rd	45 23.523	121 32.435	4880	80 degrees, few clouds, no wind	Survey
7/9/2015	<i>Bombus vosnesenskii</i>	C. Mead, P. Walcott	Hood River	Horkelia Meadow, 4410 Rd	45 23.523	121 32.435	4880	80 degrees, few clouds, no wind	Survey
7/9/2015	<i>Bombus vosnesenskii</i>	C. Mead, P. Walcott	Hood River	Horkelia Meadow, 4410 Rd	45 23.523	121 32.435	4880	80 degrees, few clouds, no wind	Survey
7/9/2015	<i>Bombus appositus</i>	C. Mead, P. Walcott	Hood River	Mt. Hood Meadows, near main parking lot	45 19.914	121 39.76	5400	70 degrees, overcast, wind 10 mph	Survey
7/9/2015	<i>Bombus vosnesenskii</i>	C. Mead, P. Walcott	Hood River	Mt. Hood Meadows, near main parking lot	45 19.914	121 39.76	5400	70 degrees, overcast, wind 10 mph	Survey
7/9/2015	<i>Bombus vandykei</i>	C. Mead, P. Walcott	Hood River	Mt. Hood Meadows, main access rd	45 19.914	121 39.76	5400	70 degrees, overcast, wind 10 mph	Survey
7/14/2015	<i>Bombus mixtus</i>	C. Mead, P. Walcott	Wasco	1700 rd, near Dogriver pipeline	45 25.688	121 31.576	4200	80 degrees, sunny, no wind	Incidental
7/14/2015	<i>Bombus vosnesenskii</i>	C. Mead, P. Walcott	Wasco	1700 rd, near Dogriver pipeline	45 25.688	121 31.576	4200	80 degrees, sunny, no wind	Incidental
7/14/2015	<i>Bombus flavifrons</i>	C. Mead, P. Walcott	Wasco	Aqueduct access rd off 1700 rd	45 25.169	121 31.602	4200	80 degrees, sunny, no wind	Incidental
7/16/2015	<i>Bombus mixtus</i>	C. Mead, P. Walcott	Wasco	4420 Rd, near Fifteenmile Trail				70 degrees, sunny, 5 mph wind	Incidental
7/16/2015	<i>Bombus vosnesenskii</i>	C. Mead	Wasco	1720 Rd, near super-connector trail	45 26.174	121 28.693	3520	85 degrees, sunny, no wind	Incidental
7/16/2015	<i>Bombus mixtus</i>	C. Mead, P. Walcott	Hood River	1700 Rd	45 27.202	121 32.023	3860	85 degrees, sunny, no wind	Incidental

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/27/2015	<i>Bombus bifarius</i>	C. Mead, P. Walcott	Hood River	Cloudcap Rd	45 24.519	121 38.756	5120	80 degrees, sunny, no wind	Incidental
7/27/2015	<i>Bombus vosnesenskii</i>	C. Mead, P. Walcott	Hood River	Cloudcap Rd	45 24.519	121 38.756	5120	80 degrees, sunny, no wind	Incidental
7/9/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Lemiti Creek	44 53.692	121 47.168	4200	80 degress, sunny, no wind	Survey
7/9/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Lemiti Creek	44 53.692	121 47.168	4200	80 degress, sunny, no wind	Survey
7/9/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Sisi Butte	44 53.585	121 50.155	5200	78 degrees, sunny, light wind	Survey
7/9/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Sisi Butte	44 53.585	121 50.155	5200	78 degrees, sunny, light wind	Survey
7/9/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Sisi Butte	44 53.585	121 50.155	5200	78 degrees, sunny, light wind	Survey
7/9/2015	<i>Bombus vosnesenskii</i>	Alan Dyck	Clackamas	Sisi Butte	44 53.585	121 50.155	5200	78 degrees, sunny, light wind	Survey
7/9/2015	<i>Bombus bifarius</i>	Alan Dyck	Marion	Olallie Meadow	44 51.684	121 45.544	4435	80 degress, sunny, no wind	Survey
7/9/2015	<i>Bombus melanopygus</i>	Alan Dyck	Marion	Olallie Meadow	44 51.684	121 45.544	4435	80 degress, sunny, no wind	Survey
7/10/2015	<i>Bombus vosnesenskii</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	85 degress, sunny, no wind	Survey
7/10/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	85 degress, sunny, no wind	Survey
7/10/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	85 degress, sunny, no wind	Survey
7/10/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	85 degress, sunny, no wind	Survey
7/15/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	76 Degrees, sunny, no wind	Survey
7/15/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	76 Degrees, sunny, no wind	Survey
7/15/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	76 Degrees, sunny, no wind	Survey
7/15/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	76 Degrees, sunny, no wind	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/15/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Shooting site Goat Mtn area	45 10.824	122 14.855		75 degrees, sunny, no wind	Incidental
7/15/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	Shooting site Goat Mtn area	45 10.824	122 14.855		75 degrees, sunny, no wind	Incidental
7/15/2015	<i>Bombus fervidus</i>	Alan Dyck	Clackamas	Shooting site Goat Mtn area	45 10.824	122 14.855		75 degrees, sunny, no wind	Incidental
7/17/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus vosnesenskii</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus sitkensis</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	Alpine Campground	45 19.265	121 41.818	5400	80 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	North of Timberline Lodge	45 19.904	121 42.678	5960	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	North of Timberline Lodge	45 19.904	121 42.678	5960	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Proposed Timberline Bike Trail	45 19.792	121 42.928	5840	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Proposed Timberline Bike Trail	45 19.792	121 42.928	5840	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Proposed Timberline Bike Trail	45 19.792	121 42.928	5840	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus flavidus</i>	Alan Dyck	Clackamas	Bunny slope Timberline	45 19.799	121 42.598	5860	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Bunny slope Timberline	45 19.799	121 42.598	5860	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Bunny slope Timberline	45 19.799	121 42.598	5860	79 degrees, sunny, no wind	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/17/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Bunny slope Timberline	45 19.799	121 42.598	5860	79 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.682	121 42.598	5765	82 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.682	121 42.598	5765	82 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.682	121 42.598	5765	82 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.682	121 42.598	5765	82 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.682	121 42.598	5765	82 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Aster field south of TL parking lot	45 19.647	121 42.605	5750	82 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus flavifrons</i>	Alan Dyck	Marion	Road 4690 bridge over Clackamas R.	44 52.228	121 49.488	3730	84 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus suckleyi</i>	Alan Dyck	Marion	Road 4690 bridge over Clackamas R.	44 52.228	121 49.488	3730	84 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus insularis</i>	Alan Dyck	Marion	Road 4690 bridge over Clackamas R.	44 52.228	121 49.488	3730	84 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Sisi Butte	44 53.585	121 50.155	5200	82 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Road 6350	44 49.816	121 54.219	3800	84 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Road 6350	44 49.816	121 54.219	3800	84 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Road 6350	44 49.816	121 54.219	3800	84 degrees, sunny, no wind	Survey
7/20/2015	<i>Bombus mixtus</i>	Alan Dyck	Marion	Twin Lakes	44 49.98	121 59.502	3598	80 degrees , sunny, windy	Survey
7/20/2015	<i>Bombus rufocinctus</i>	Alan Dyck	Marion	Twin Lakes	44 49.98	121 59.502	3598	80 degrees , sunny, windy	Survey
7/20/2015	<i>Bombus bifarius</i>	Alan Dyck	Marion	Twin Lakes	44 49.98	121 59.502	3598	80 degrees , sunny, windy	Survey
7/20/2015	<i>Bombus flavifrons</i>	Alan Dyck	Marion	Twin Lakes	44 49.98	121 59.502	3598	80 degrees , sunny, windy	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/20/2015	<i>Bombus insularis</i>	Alan Dyck	Marion	Twin Lakes	44 49.98	121 59.502	3598	80 degrees , sunny, windy	Survey
7/22/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/22/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/22/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/22/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/22/2015	<i>Bombus vandykei</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/22/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/22/2015	<i>Bombus caliginosus</i>	Alan Dyck	Clackamas	Mirror Lake	45 17.831	121 47.688	4120	60 degrees Sunny	Survey
7/21/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Little Crater Meadow	45 8.859	121 44.786	3360	71 degrees sunny	Survey
7/21/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Little Crater Meadow	45 8.859	121 44.786	3360	71 degrees sunny	Survey
7/21/2015	<i>Bombus suckleyi</i>	Alan Dyck	Clackamas	Little Crater Meadow	45 8.859	121 44.786	3360	71 degrees sunny	Survey
7/21/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Little Crater Meadow	45 8.859	121 44.786	3360	71 degrees sunny	Survey
7/21/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Little Crater Meadow	45 8.859	121 44.786	3360	71 degrees sunny	Survey
7/21/2015	No Bumblebees found	Alan Dyck	Clackamas	Dry Meadow	45 11.817	121 46.079	38500	71 degrees sunny	Survey
7/21/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey
7/21/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey
7/21/2015	<i>Bombus vandykei</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey
7/21/2015	<i>Bombus nevadensis</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey
7/21/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	73 degrees sunny	Survey
7/21/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	73 degrees sunny	Survey
7/21/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	73 degrees sunny	Survey
7/21/2015	<i>Bombus vosnesenskii</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	73 degrees sunny	Survey
7/21/2015	<i>Bombus flavidus</i>	Alan Dyck	Clackamas	High Rocks Area	45 10.15	121.53.67	4590	73 degrees sunny	Survey
7/30/2015	<i>Bombus occidentalis</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/30/2015	<i>Bombus rufocinctus</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/30/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/30/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/30/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/30/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/30/2015	<i>Bombus flavidus</i>	Alan Dyck	Clackamas	Ski Bowl East	45 17.912	121 45.43	3800	94 degrees	Survey
7/24/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Black wolf meadow	45 8.822	121 51.628	4150	65 dgreees, sunny	Survey
7/24/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Black wolf meadow	45 8.822	121 51.628	4150	65 dgreees, sunny	Survey
7/24/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Black wolf meadow	45 8.822	121 51.628	4150	65 dgreees, sunny	Survey
7/24/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	Black wolf meadow	45 8.822	121 51.628	4150	65 dgreees, sunny	Survey
7/17/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Summit Ski Area	45 18.244	121 44.716	4000	85 degrees, sunny, no wind	Survey
7/17/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Summit Ski Area	45 18.244	121 44.716	4000	85 degrees, sunny, no wind	Survey
7/30/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Snow Bunny	45 17.33	121 43.618	3875	97 degrees	Survey
7/30/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Snow Bunny	45 17.33	121 43.618	3875	97 degrees	Survey
7/31/2015	<i>Bombus occidentalis</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus flavifrons</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus suckleyi</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus insularis</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus appositus</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus bifarius</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey
7/31/2015	<i>Bombus melanopygus</i>	Alan Dyck, Stephanie McKinney	Hood River	Devils Half Acre	45 16.308	121 40.869	3720	89 degrees sunny	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/31/2015	<i>Bombus flavifrons</i>	Alan Dyck	Hood River	Barlow Butte Meadow	45 16.359	121 39.239	4840	87 degrees sunny	Survey
7/31/2015	<i>Bombus flavidus</i>	Alan Dyck	Hood River	Barlow Butte Meadow	45 16.359	121 39.239	4840	87 degrees sunny	Survey
7/31/2015	<i>Bombus bifarius</i>	Alan Dyck	Hood River	Barlow Butte Meadow	45 16.359	121 39.239	4840	87 degrees sunny	Survey
7/31/2015	<i>Bombus occidentalis</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus flavifrons</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus appositus</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus insularis</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus vosnesenskii</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus bifarius</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus melanopygus</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus mixtus</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus flavidus</i>	Alan Dyck, Stephanie McKinney	Hood River	High Prairie	45 21.139	121 31.912	5920	85 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus occidentalis</i>	Alan Dyck, Stephanie McKinney	Hood River	Brooks Meadow	45 25.087	121 31.301	4300	91 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus flavidus</i>	Alan Dyck, Stephanie McKinney	Hood River	Brooks Meadow	45 25.087	121 31.301	4300	91 degrees, sunny, no wind	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/31/2015	<i>Bombus insularis</i>	Alan Dyck, Stephanie McKinney	Hood River	Brooks Meadow	45 25.087	121 31.301	4300	91 degrees, sunny, no wind	Survey
7/31/2015	<i>Bombus bifarius</i>	Alan Dyck, Stephanie McKinney	Hood River	Brooks Meadow	45 25.087	121 31.301	4300	91 degrees, sunny, no wind	Survey
8/4/2015	No Bees Found	Alan Dyck	Clackamas	Alder Flat Campground	45 5.058	121 3.748	1280	81 degrees, sunny no wind	survey
7/30/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
7/30/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
7/30/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
7/30/2015	<i>Bombus mixtus</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
7/30/2015	<i>Bombus melanopygus</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
7/30/2015	<i>Bombus appositus</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
7/30/2015	<i>Bombus vosnesenskii</i>	Alan Dyck	Clackamas	Summit meadow	45 17.087	121 44.241	3660	96 degrees , windy	survey
8/4/2015	<i>Bombus appositus</i>	Alan Dyck	Clackamas	Ripplebrook work center	45 5.298	122 1.259	1870	78 degrees, sunny	survey
8/4/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Ripplebrook work center	45 5.298	122 1.259	1870	78 degrees, sunny	survey
8/4/2015	<i>Bombus flavidus</i>	Alan Dyck	Clackamas	Ripplebrook work center	45 5.298	122 1.259	1870	78 degrees, sunny	survey
8/4/2015	<i>Bombus flavifrons</i>	Alan Dyck	Clackamas	Ripplebrook work center	45 5.298	122 1.259	1870	78 degrees, sunny	survey
8/6/2015	<i>Bombus flavifrons</i>	Alan Dyck, Mark Boyll	Hood River	Bonney Meadows	45 15.842	121 34.855	5200	78 degrees, sunny	survey
8/6/2015	<i>Bombus bifarius</i>	Alan Dyck, Mark Boyll	Hood River	Bonney Meadows	45 15.842	121 34.855	5200	78 degrees, sunny	survey
8/6/2015	<i>Bombus bifarius</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	
8/6/2015	<i>Bombus flavidus</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	Incidental
8/6/2015	<i>Bombus vosnesenskii</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	Incidental
8/6/2015	<i>Bombus insularis</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	Incidental
8/6/2015	<i>Bombus occidentalis</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	Incidental
8/6/2015	<i>Bombus flavifrons</i>	Alan Dyck	Hood River	Gumjuwac Saddle	45 20.145	121 32.71	5520	76 degrees, sunny	Incidental

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
8/10/2015	<i>Bombus bifarius</i>	Nugent	Hood River	Brooks Meadow Area / jcts of Roads 1700 & 1720	615253E	5030583N	4000ft	sunny, no wind, 80s	survey
8/10/2015	<i>Bombus occidentalis</i>	Nugent	Hood River	Brooks Meadow Area / jcts of Roads 1700 & 1720	615253E	5030583N	4000ft	sunny, no wind, 80s	survey
9/1,2 & 23/2015	<i>Bombus occidentalis</i>	Nugent	Hood River	Horkelia Meadow and High Prairie areas (Road 4410)	615058E	5023121N	5300ft-600ft	sunny/cloudy, breezy, upper 60s	survey
9/10 & 23/2015	<i>Bombus bifarius</i>	Nugent	Hood River	Gibson Prairie area (Road 1700)	T1S-R10	Sec 15	4000ft	sunny/cloudy, breezy, upper 60s	survey
7/2/2015	<i>Bombus flavifrons</i>	Jeff Goldberg & Ed Buursma	Clackamas	Alder Flat Campground	45 5.058	121 3.748	1280	79 degrees 3mph wind	Survey
7/2/2015	<i>Bombus mixtus</i>	Jeff Goldberg & Ed Buursma	Clackamas	Alder Flat Campground	45 5.058	121 3.748	1280	79 degrees 3mph wind	Survey
7/2/2015	<i>Bombus bifarius</i>	Jeff Goldberg & Ed Buursma	Clackamas	Ripplebrook Helibase	45 4.971	122 3.278	1490	81 degrees	Survey
7/2/2015	<i>Bombus flavidus</i>	Jeff Goldberg & Ed Buursma	Clackamas	Ripplebrook Helibase	45 4.971	122 3.278	1490	81 degrees	Survey
7/2/2015	<i>Bombus vosnesenskii</i>	Jeff Goldberg & Ed Buursma	Clackamas	Ripplebrook Helibase	45 4.971	122 3.278	1490	81 degrees	Survey
7/2/2015	<i>Bombus flavifrons</i>	Jeff Goldberg & Ed Buursma	Clackamas	Ripplebrook Helibase	45 4.971	122 3.278	1490	81 degrees	Survey
7/2/2015	<i>Bombus centralis?</i> ( <i>melanopygus?</i> )	Jeff Goldberg & Ed Buursma	Clackamas	Ripplebrook Helibase	45 4.971	122 3.278	1490	81 degrees	Survey
7/22/2015	<i>Bombus bifarius</i>	Jeff Goldberg & Ed Buursma	Marion	Olallie Meadow	44 51.684	121 45.544	4435	76 degrees	Survey

Date	Species	Observer	County	Location	Latitude	Longitude	Elevation (m)	Weather/Temperature	Notes
7/22/2015	<i>Bombus mixtus</i>	Jeff Goldberg & Ed Buursma	Marion	Olallie Meadow	44 51.684	121 45.544	4435	76 degrees	Survey
7/22/2015	<i>Bombus insularis</i>	Jeff Goldberg & Ed Buursma	Marion	Olallie Meadow	44 51.684	121 45.544	4435	76 degrees	Survey
7/22/2015	<i>Bombus fervidus</i>	Jeff Goldberg & Ed Buursma	Marion	Olallie Meadow	44 51.684	121 45.544	4435	76 degrees	Survey
7/22/2015	<i>Bombus melanopygus</i>	Jeff Goldberg & Ed Buursma	Marion	Olallie Meadow	44 51.684	121 45.544	4435	76 degrees	Survey
7/21/2015	<i>Bombus insularis</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey
7/21/2015	<i>Bombus bifarius</i>	Alan Dyck	Clackamas	Jackpot Meadow	45 12.054	121 46.351	3843	70 degrees sunny	Survey