2016 Western Bumble Bee Surveys:
Medford Bureau of Land Management
Ashland Resource Area

Bombus occidentalis found on Mt. Ashland (photo credit: Ellen Myers)

17 January 2016

Species Status:
Bombus occidentalis (Western Bumble bee) G2G3, S1S2
R6 Regional Forester's Sensitive Species (USFS)
Oregon State Director's Sensitive Species (BLM)
State of Oregon – NA
ORBIC List 2

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Abstract

The Medford Bureau of Land Management, Ashland Resource Area conducted surveys for Western bumble bee (*Bombus occidentalis*) during the 2016 field season at 15 historic survey sites and 8 purposive survey areas within the Ashland Resource Area of Medford Bureau of Land Management (includes 1 survey site on USFS- Mt. Ashland). Surveys were primarily concentrated at historic survey locations, in meadow habitat and purposively along open roadside edges with blooming flora. One location of *Bombus occidentalis* was observed on Mt. Ashland (Siskiyou Mountains Ranger District USFS) during a two-day intensive cooperative agency survey. In addition, 13 total *Bombus* species were observed across all Ashland Resource area survey locations. Additional surveys are recommended primarily focused on historic locations and during peak periods of native flowering flora at purposive areas.

Introduction

Bombus occidentalis (hereafter *B. occidentalis*) was historically widely distributed across the west coast of North America from Alaska to central California, east through Alberta and western South Dakota, and south to Arizona and New Mexico (Williams et al. 2014). A generalist forager and native pollinator, this species and many other *Bombus* species play an integral role in the health of natural ecosystems and production of agricultural crops (Cameron 2011).

In the past decade *B.occidentalis* has suffered a substantial decline of 50% from its historic range (Hatfield et al. 2015). Although previously widely distributed, *B. occidentalis* has undergone a decline in relative abundance of 75% and average decline of 40.32% based on relative abundance, range, and persistence (Jepson et al. 2014, Hatfield et al. 2014). The species was very common in Oregon, but is now restricted to high elevation sites (Jepson et al. 2014, Hatfield et al. 2015). It's projected that the species will near extirpation in 60-70 years if population decline trends continue (Hatfield et al. 2015).

The decline of *B. occidentalis* is speculated to be largely due to a fungal pathogen, *Nosema bombi*, which is hypothesized to have been introduced from Europe in the early 1990s via development of commercial bumble bee colonies (Cameron et al. 2011). Although Cameron et al. (2016) found that *Nosema bombi* was already present in the United States before commercial colony trade, rearing and export of *B.occidentalis* is possibly causing its apparent local extinction in the western states. Individuals were not detected in any surveys from 2003-2007 and in very low numbers from 2008-2015 (Hatfield et al. 2015).

In, 2006, Medford Bureau of Land Management, Ashland Resource Area conducted *Bombus* surveys. In 2005, 2006 and 2007, Robin Thorp conducted similar surveys under contract for the BLM. The Target species during those years was *Bombus franklini*. None were detected by BLM staff. However, on August 9th, 2006 one *B. franklini* worker was seen on Mount Ashland by Robbin Thorp. *B. occidentalis* were detected by BLM staff at limited sites during those survey years. In 2016, Medford Bureau of Land Management, Ashland Resource Area conducted surveys in the Rogue Valley area of southwestern Oregon on BLM owned lands and USFS Mount Ashland area. Surveys were conducted with the objective to detect presence of *B.occidentalis*; record presence of all native bumble bee species; and document habitat characteristics and in some cases document plant species used by bumble bees.

Methodology

The 2016 survey effort included 15 survey sites and 8 purposive survey areas within the Ashland Resource Area of Medford BLM (Figure 1). The survey sites were based on historic survey areas of *B.occidentalis* derived from surveys conducted during 2005, 2006 and 2007 (Figure 1). Additional locations were chosen at the discretion of the local wildlife technicians, which was based on habitat characteristics primarily meadow habitat or open roadside with blooming flora. Surveyors noted survey time, but it was not correlated with acreage covered.

Presence and number of any bumble bee species encountered was documented and site information collected, including: time searched, aspect, elevation, and any other noteworthy habitat characteristics or site disturbance. Bumble bee species that were not readily identified in the field had photo vouchers taken of them and were sent to Robbin Thorp for identification.

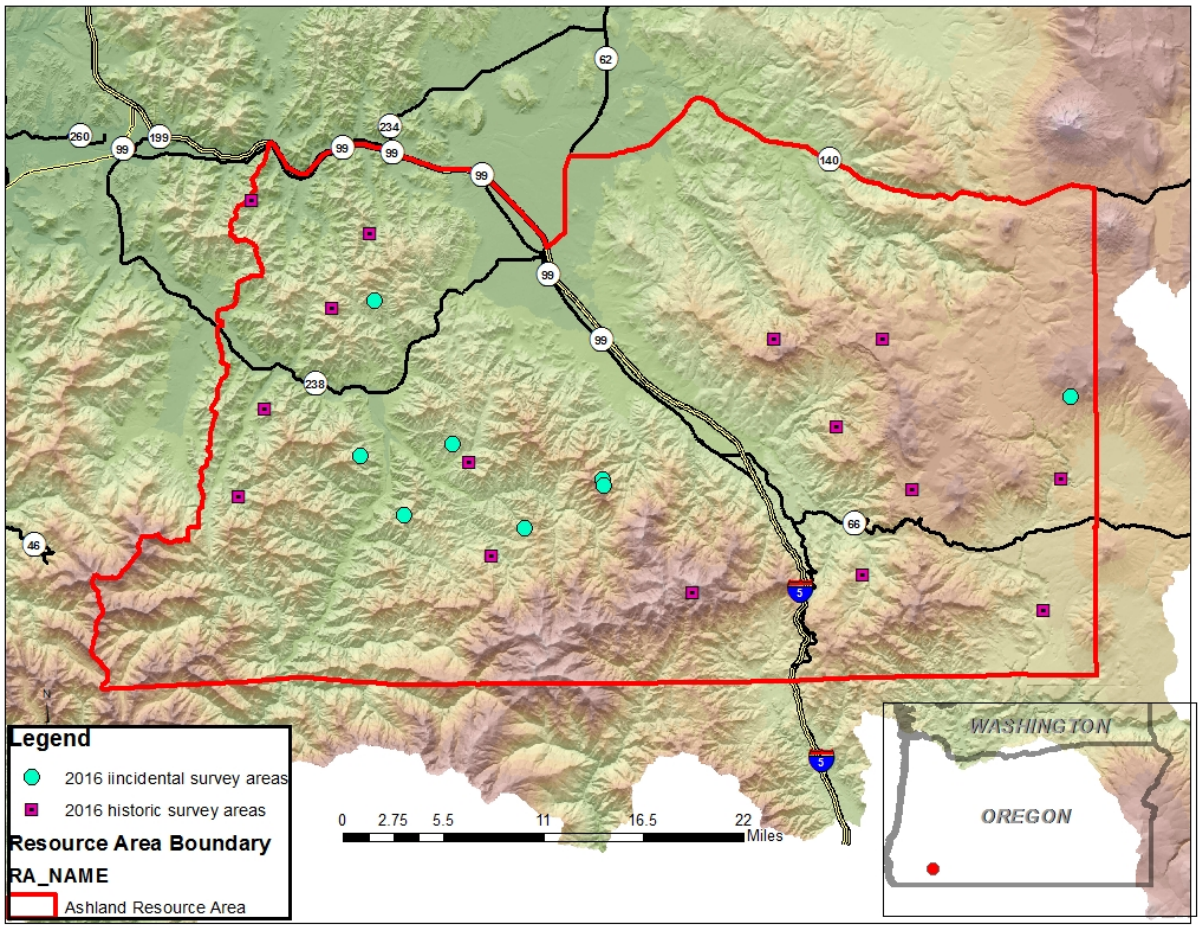

Figure 1. Map of 2016 *B.occidentalis* historic site and purposive survey area locations.

Results

Surveys were conducted starting 28 June 2016 and were last conducted 09 September 2016. This resulted in the documentation of 14 different *Bombus* species (Appendix A and B). *B.occidentalis* was recorded at one site on Mt. Ashland on 19 July 2016 during a cooperative agency survey, but not at any BLM survey areas or sites. *B. Vosnesenskii* was detected at all survey sites and areas where *Bombus* were present during survey visits and made up the majority of *Bombus* species detected.

The Mt. Ashland survey site is high elevation meadow and the general location is where the last known *Bombus franklini* was documented by Dr. Robbin Thorp. This survey was a 2-day effort coordinated by US Fish and Wildlife Service and included roughly 40 surveyors for two 8-hour days. Two *B.occidentalis* were documented and verified on site by Dr. Robbin Thorp. One individual was specifically documented on *Orthocarpus cuspidatus*. Other documented use by *B.occidentalis* on Mt. Ashland included visits primarily to *Lupinus* spp.

Figure 2. Location on Mt. Ashland where *B.occidentalis* was documented during surveys (19-July 2016).

Figure 3. *Orthocarpus cuspidatus* on Mt.Ashland. *B.occidentalis* observed using.

Training

Wildlife technicians working for Medford Bureau of Land Management, Ashland Resource Area attended bumble bee training on June 13-14, 2016 at the start of the field season to facilitate and improve survey efforts Additionally, a multiagency survey and training was organized by USFWS and held on Mt. Ashland on July 19-20, 2016. All of these trainings were led and facilitated by Dr. Robbin Thorp.

Discussion

The 2016 survey efforts detected a single location of *B.occidentalis*, which was the same location as one of the historic records reported in the past. Additional survey efforts are recommended for the Medford Bureau of Land Management, Ashland Resource Area. It would be beneficial for future surveys to focus on the historic *B.occidentalis* locations and to revisit the same location multiple times, concentrating on dates encompassing peak bloom of native flora within the same field season to increase the probability of detection. Analysis of habitat use and floral species preference by *B.occidentalis* cannot be determined by the current survey efforts and data collection, but are also recommended.

Gratitude

A large part of this report in content and layout, was created by Sheila Colyer, Rogue – Siskiyou National Forest. Medford BLM owes many thanks to her efforts.

Appendix A. *Bombus occidentalis* 2016 survey result summary table for Ashland Resource Area, Medford Bureau of Land Management historic survey sites.

Site #	Survey Location Name	Legal	Visit No.	Elevation (feet)	Date	Survey Effort (Minutes)	Total No. Bombus Individuals Observed	Bombus species observed
1	Mt. Isabelle	T37S R3W section 31	1	4400	7/15/2016	204	304	*B. vosnesenskii, B. insularis, B. nevadensis,*
2	Ninemile	T39S R4W Section 29	1	3000	9/8/2016	236	0	
3	Little Hyatt	T39S R3E Section 20	1	4600	7/1/2016	155	15	*B. vosnesenskii, B. insularis, B. bifarius, B. flavidus*
3	Little Hyatt	T39S R3E Section 20	2	4800	7/15/2016	210	14	*B. vosnesenskii, B. flavifrons, B. appositus*
4	Hinkle Gulch	T38S R4W Section 33	1	2200	9/8/2016	102	0	
5	Grizzly Peak	T38S R2E Section 7	1	4800	7/1/2016	*	4	*B. vosnesenskii*
5	Grizzly Peak	T38S R2E Section 7	2	4800	7/18/2016	*	6	*B. vosnesenskii, B. appositus*
5	Grizzly Peak	T38S R2E Section 7	3	4800	7/29/2016	107	29	*B. vosnesenskii, B. insularis, B. bifarius, B. appositus*
6	Galls Creek	T37S R3W Section 9	1	3100	7/22/2016	182	209	*B. vosnesenskii, B. appositus, B. flavifrons*
7	Buck Rock	T40S R2E Section 13	1	4200	7/14/2016	*	0	

Site #	Survey Location Name	Legal	Visit No.	Elevation (feet)	Date	Survey Effort (Minutes)	Total No. Bombus Individuals Observed	Bombus species observed
8	Conde Creek	T38S R3E Section 7	1	4900	7/14/2016	88	16	*B. vosnesenskii, B. appositus*
9	Mt. Ashland	T40S R1E Section19, 20, 21	1	6800	7/22/2016	180	117	*B. vosnesenskii, B. insularis, B. bifarius, B. appositus*
9	Mt. Ashland	T40S R1E Section19, 20, 21	2	6800	9/8/2016	900	108	*B. vosnesenskii, B. insularis, B. bifarius, B. appositus, B. flavifrons, B. vandykei*
10	Birdseye Creek	T37S R4W Section 5	1	3425	7/15/2016	418	200	*B. vosnesenskii, B. insularis, B. appositus, B. flavifrons*
10	Birdseye Creek	T37S R4W Section 5	2	2685	7/11/2016	227	80	*B. vosnesenskii, B. insularis, B. bifarius, B. appositus*
11	Kenney Meadows	T40 R2W Section 9	1	2490	7/29/2016	166	12	*B. vosnesenskii, B. insularis, B. flavifrons*
12	Arrastra Creek	T39S R1W Section22	1	4650	7/22/2016	111	189	*B. vosnesenskii, B. insularis, B. mixtus*

Site #	Survey Location Name	Legal	Visit No.	Elevation (feet)	Date	Survey Effort (Minutes)	Total No. Bombus Individuals Observed	Bombus species observed
12	Fredenberg	T39S R4E Section 23	1	3630	7/18/2016	185	180	*B. vosnesenskii, B. flavifrons, B. mixtus, B. caliginosus*
13	Cove Creek	T39S R2E Section 3	1	3900	7/22/2016	72	9	*B. vosnesenskii, B. insularis, B. bifarius*
14	Sterling Mine Ditch	T39S R2W Section 17	1	2250	7/15/2016	376	30	*B. vosnesenskii, B. insularis, B. bifarius*
15	Box O	T40S R4E Section 27	1	3100	7/1/2016	135	7	*B. vosnesenskii*

Appendix B. *Bombus occidentalis* 2016 survey result summary table for Ashland Resource Area, Medford Bureau of Land Management purposive survey areas.

Purposive Site #	Survey Area	UTM E	UTM N	Legal	Visit No.	Elevation (feet)	Date	Survey Effort (Minutes)	Total No. Bombus Individuals	Bombus Species
1	rd 39s-2w-27	508233	4663921	T40S R2W Section 2	1	3400	7/6/2016	20	30	*B. vosnesenskii*
2	rd 39s-3w-8	493775	4670300	T39S R3W Section 17	1	3000	7/13/2016	60	24	*B. vosnesenskii, B. insularis, B. flavifrons*
3	Keno road	556536	4675508	T38S R4E Section 26	1	5000	8/22/2016	220	64	*B. vosnesenskii, B. insularis, B. bifarius, B. appositus, B. flavifrons, B.huntii, B. suckleyi, B. melanopygus, B. occidentalis*
4	Hukill Hollow	501923	4671301	T39S R2W Section 7	1	2550	7/26/2016	80	22	*B. vosnesenskii*
5	rd 39s-3w-27.2	497618	4665076	T39S R3W Section 35	1	3400	7/5/2016	32	122	*B. vosnesenskii, B. melanopygus*
6	rd 39-1-21.1	515170	4668209	T39S R1W Section 21	1	5700	6/28/2016	22	26	*B. vosnesenskii, B. insularis*
7	rd 38s-3w-10 & 33	494990	4683970	T37S R3W Section 33	1	3100	8/16/2016	75	19	*B. vosnesenskii*
8	Arrastra Creek	515283	4667637	T39S R1W Section22	1	4650	7/22/2016	111	189	*B. vosnesenskii, B. insularis, B. mixtus*

References

Cameron, S. A., J. D. Lozier, J. P. Strange, J. B. Koch, N. Cordes, L. F. Solter, and T. L. Griswold. 2011. Patterns of widespread decline in North American bumble bees. Proceedings of the National Academy of Sciences 108:662–667.

Cameron, S.A., H.C. Lim, J.D. Lozier, M.A. Duennes, and R. Thorp. 2016. Test of the invasive pathogen hypothesis of bumble bee decline in North America. Proceedings of the National Academy of Sciences. Vol. 113 No. 16: 4386-4391.

Jepsen, S. and S. Foltz Jordan. 2013. Bombus occidentalis Species Fact Sheet. Prepared by the Xerces Society for Interagency Special Status / Sensitive Species Program (ISSSSP). Portland, Oregon.

Hatfield, R, S. Colla, S. Jepsen, L. Richardson, R. Thorp, and S. Foltz Jordan. 2014. Draft IUCN Assessments for North American Bombus spp. for the North American IUCN Bumble Bee Specialist Group. The Xerces Society for Invertebrate Conservation, www.xerces.org, Portland, OR.

Hatfield, R., Jepsen, S., Thorp, R., Richardson, L., Colla, S. & Foltz Jordan, S. 2015. *Bombus occidentalis.* The IUCN Red List of Threatened Species 2015.

Mitchell, C. 2015. 2015 SW Oregon Integrated Western Bumble Bee Survey Project Summary Report of Findings. http://www.fs.fed.us/r6/sfpnw/issssp/inventories/reports.shtml

Williams, P.H., Thorp, R.W., Richardson, L.L. and Colla, S.R., 2014. Bumble bees of North America: an identification guide. Princeton University Press.