

The Pacific Northwest Bumble Bee Atlas: *Summary and Species Accounts*

A collaboration between the Xerces Society, Idaho Department of Fish and Game, and
Washington Department of Fish and Wildlife



Appendices to the Final Report Submitted to the U.S. Fish and Wildlife Service

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The Pacific Northwest Bumble Bee Atlas

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Report Developed for the U.S. Fish and Wildlife Service

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Photographs and Artwork

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Front cover—Hunt Bumble bee (*Bombus huntii*) on Steens Mountain, Oregon, photo by Xerces Society / Rich Hatfield.

Page 2—Icons from the Noun Project: classroom by Krisada; catching butterfly by ProSymbols.

Page 5—Icons from the Noun Project: catching butterfly by ProSymbols.

Page 5 and Species Summaries—Bumble bee illustrations by Paul Williams (identification and color patterns) and Elaine Evans, Rich Hatfield (bee body design).

Page 6—Habitat association photos: Woodland by Leif Richardson; Shrub/Scrub by Xerces Society / Rich Hatfield; Riparian by Stephanie McKnight; Meadow by Xerces Society / Michele Blackburn; Developed by Xerces Society / Eric Lee-Mäder; Agricultural by Stephanie McKnight.

Page 10—Icons from the Noun Project: vial by Sumana Chamrunworakiat; mouse by Camila Bertoco.

Page 14—Indiscriminate Cuckoo Bumble Bee (*Bombus insularis*) by Xerces Society / Rich Hatfield.



Western Bumble Bee (*Bombus occidentalis*), is currently under review for ESA listing by the U.S. Fish and Wildlife Service. Photo: Xerces Society / Rich Hatfield.

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Executive Summary: PNWBBA

Bumble bees (*Bombus* spp., Apidae) are important pollinators throughout much of the world, particularly in the Northern Hemisphere. They are essential to the health of wildlands and natural areas as pollinators of many plant families, and their long tongues and ability to fly in inclement weather make them significant contributors to the global agricultural industry. Unfortunately, there have been alarming reports of bumble bee population declines from multiple continents.

Notably, many species of bumble bees have been considered for listing as endangered under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA). The Rusty-Patched Bumble Bee (*B. affinis*), native to much of eastern North America, was protected under the law in 2017, and in the western United States, Franklin's Bumble Bee (*B. franklini*), native to a small portion of southern Oregon and northern California, was listed as endangered in 2021. The Western Bumble Bee (*B. occidentalis*), Suckley Cuckoo Bumble Bee (*B. suckleyi*), and American Bumble Bee (*B. pensylvanicus*) are all currently under review for ESA listing by the U.S. Fish and Wildlife Service. Likewise, several North American species have been recently added to State Wildlife Action Plans (SWAPs) as Species of Greatest Conservation Need (SGCN). Washington and Idaho's SWAPs include the Western, Morrison (*B. morrisoni*), and Suckley Cuckoo bumble bees. The Yellow (*B. fervidus*) and Hunt (*B. huntii*) bumble bees are also included as SGCN in Idaho.

An incomplete picture of the habitat needs and status of these animals is a barrier to effective conservation. Most data used to describe the range and habitat associations of these essential pollinators has been mined from museum specimens and pieced together from smaller studies. Large-scale, regional efforts, specifically directed toward understanding bumble bee populations, are lacking, but would significantly improve our ability to direct conservation efforts and manage our public lands more effectively.

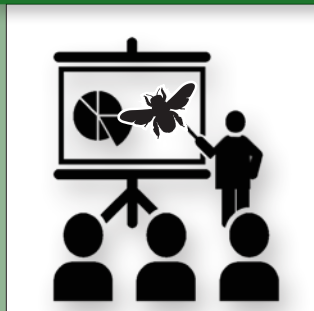
To address this need, we launched the Pacific Northwest Bumble Bee Atlas (PNWBBA) in 2018 across Oregon, Washington, and Idaho. Our goal was to establish a framework to direct survey effort throughout the region, and then recruit volunteers to conduct surveys. Using this large group of trained volunteers, we would quickly be able to produce a regional snapshot of bumble bee distribution, health, and habitat needs. We developed a sampling design based on multiple biological and logistical criteria (see Methods), and ultimately selected a network of 396 equal-area grid cells to be the structure and focus of our survey effort (see Figure 1).

The objective of the Pacific Northwest Bumble Bee Atlas is to provide a complete picture of the status of bumble bees and their habitat needs across the Pacific Northwest. To accomplish this, the PNWBBA implemented the following strategies to develop a conservation snapshot of PNW bumble bees to inform habitat management on public lands:

DEVELOP SURVEY FRAMEWORK



RECRUIT VOLUNTEERS



COLLECT DATA ON BUMBLE BEES



INFORM HABITAT MANAGEMENT





Morrison Bumble Bee (*Bombus morrisoni*), a rare species with SGCN status in Washington and Idaho, was reported from 44 observations across all three states during the three years of the project. Photo: Xerces Society / Rich Hatfield.

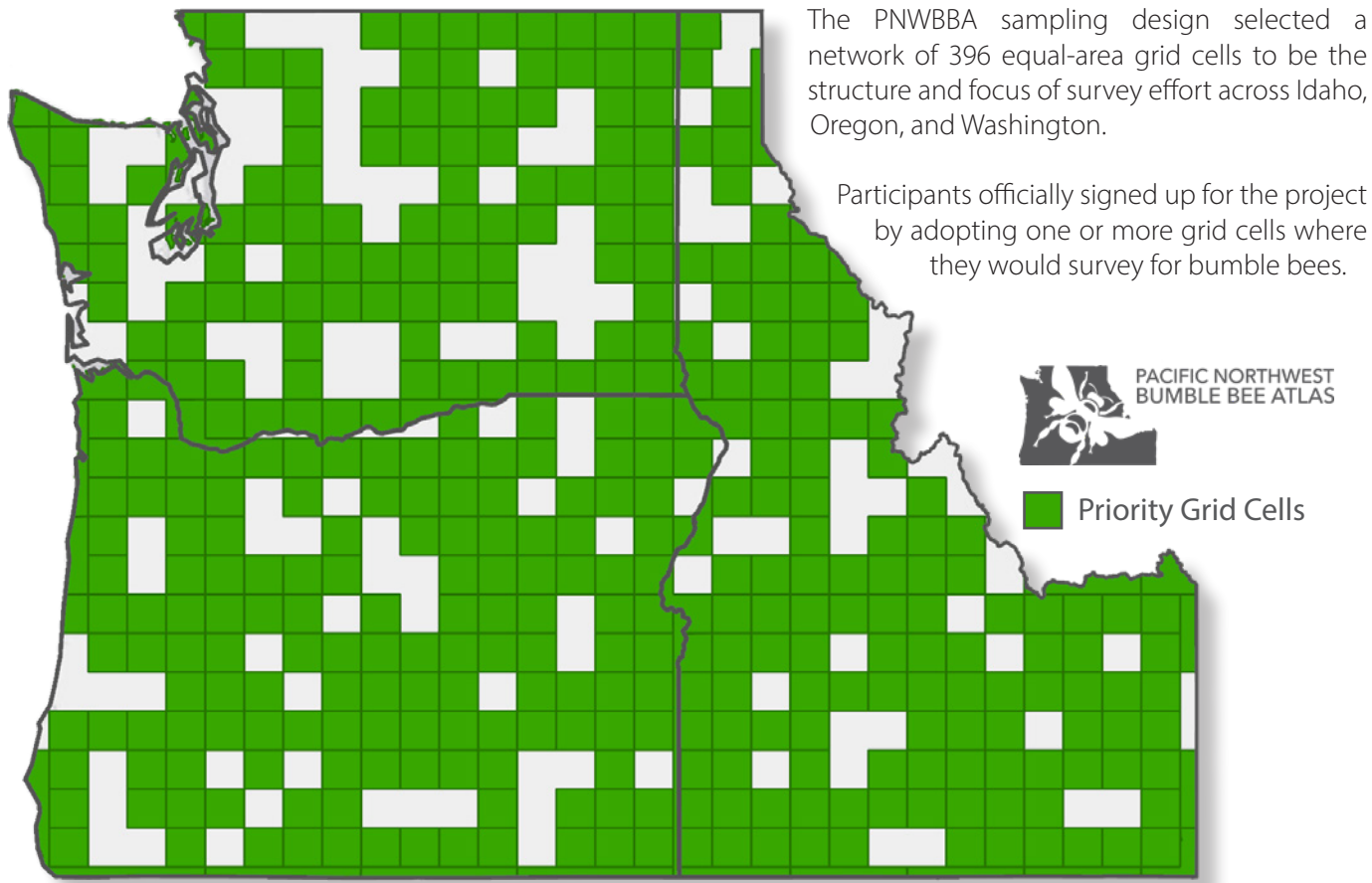


Figure 1: Priority grid cells selected for surveys. Map created by Xerces Society / Rich Hatfield.

The PNWBBA began in 2018 as we recruited project participants and encouraged them to attend training workshops to understand the goals of the project and how to contribute. We also recorded our workshops and made the videos available online to provide volunteers the opportunity to self-train and/or refresh their skills outside of in-person events. Over the three-year project period, more than 875 people attended our training workshops and hundreds more viewed our training materials online.





Participants officially signed up for the project by adopting a grid cell, selecting one (or more) of the 396 grid cells where they would focus their survey effort. Throughout the course of the project, 629 individuals adopted 379 of the 396 grid cells (96%). Adopting a grid cell was a commitment to implement our standardized bumble bee survey and habitat assessment protocols (see Methods for details). Participants submitted their bumble bee and habitat data online and all bumble bee observations were independently verified by a bumble bee expert to confirm species.

A total of 1,542 surveys were completed by 276 participants across all three states. These surveys took place in 370 of our 396 priority grid cells (93%), resulting in 13,731 bumble bee observations. Additionally, 994 participants submitted an additional 7,783 bumble bee sightings as incidental observations (that were not part of an official survey) for a total of 21,514 total bumble bee observations in the three years of the project. From these bumble bee observations, we documented 25 different species, including 1,007 observations of four of the five SGCN species

(Western, 298 observations; Morrison, 44; Hunt, 415; and Yellow, 350 [Table 1]); the Suckley Cuckoo Bumble Bee was not detected during our surveys. Historically, 27 species were present in our region. The PNWBBA did not detect the Suckley Cuckoo Bumble Bee, Franklin's Bumble Bee, or the Ashton Cuckoo Bumble Bee (*B. bohemicus*, only two historic records), but did detect the Common Eastern Bumble Bee (*B. impatiens*) for the first time.

For all species, and each species individually, we classified the surveys conducted by project participants into six different habitat types: woodland/forest, shrub/scrub, riparian, grassland/meadow, developed (including roadside), and agricultural. Generally, bumble bees preferred grassland/meadow habitats, and were found less often than expected in shrub/scrub habitats, though this varied by species (see Figure 2 and individual species summary pages).

Table 1: Observations of Species of Greatest Conservation Need (SGCN) from Official Surveys.

SPECIES	DETECTIONS
Western Bumble Bee (<i>Bombus occidentalis</i>) 	298
Morrison Bumble Bee (<i>Bombus morrisoni</i>) 	44
Hunt Bumble Bee (<i>Bombus huntii</i>) 	415
Yellow Bumble Bee (<i>Bombus fervidus</i>) 	350

PNWBBA SURVEY EFFORT AT A GLANCE

TOTAL # OF
OBSERVATIONS

13,731



TOTAL # OF
SURVEYS

1,542



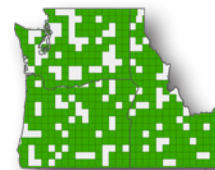
TOTAL # OF
PARTICIPANTS

276



TOTAL # OF GRID
CELLS ADOPTED

379



HABITAT ASSOCIATIONS

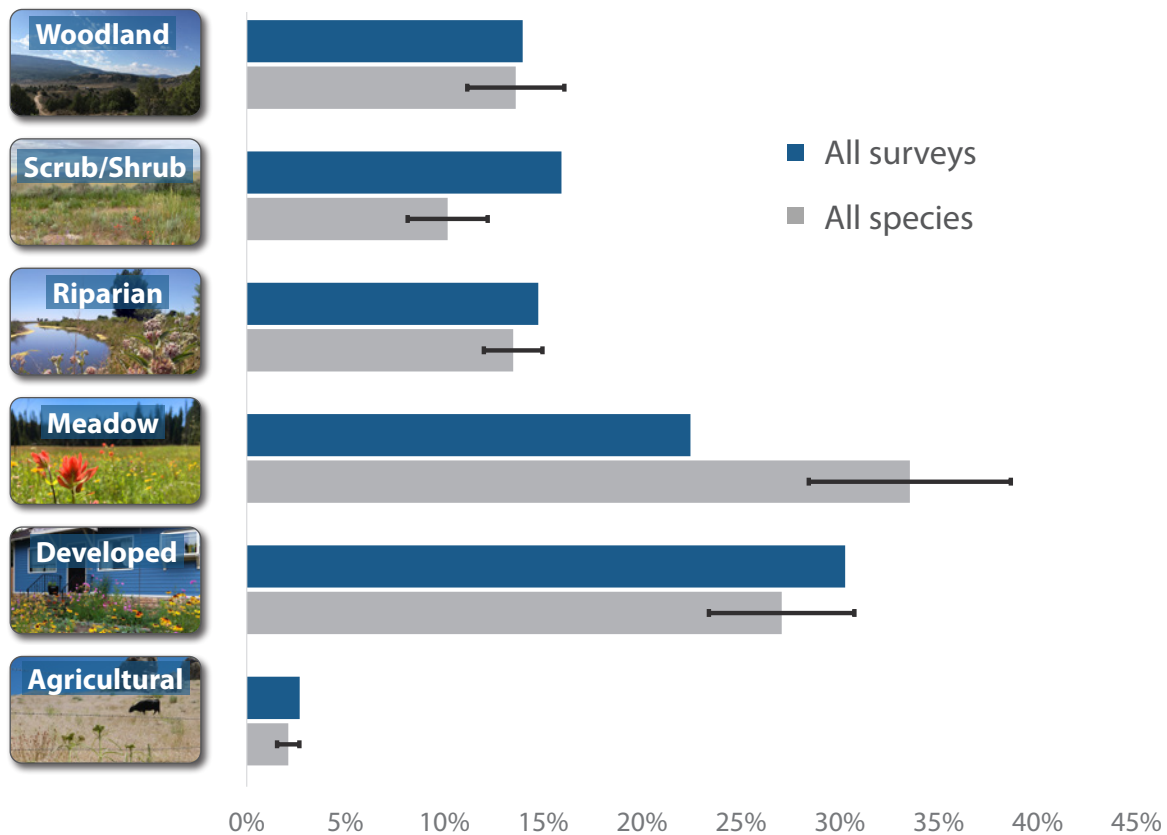


Figure 2: Habitat types in which we found bumble bees (gray bars), compared to where surveys were conducted (blue bars); error bars represent +/- 1 SE.

Using the data collected through the course of the project, we produced individual species profiles; these are presented in the pages that follow. For each species we developed region-specific elevation profiles, phenology, habitat associations, plant associations, and detection maps with species distribution models. For the five SGCN species, we also analyzed historic relative abundance (proportion of all bee observations accounted for by one species) in Level III Ecoregions, compared to what we found in the PNWBBA. Throughout these species' profiles, we also use Level III Ecoregions to discuss where we detected each species (see Figure 3). In each species profile we refer to its conservation status, referring to assessments conducted for the International Union for the Conservation of Nature (IUCN) Red List (see Methods for more details).

This is one of the largest bumble bee monitoring efforts ever undertaken, and now represents one of the most comprehensive regional datasets for bumble bees in the world. These data will be essential for conservation planning and decision making and are an invaluable resource for a critical species group. Since the data are largely effort-based and repeatable, they will also serve as essential baseline data to which future conditions can be compared.

To this end, we would like to thank everyone that contributed to this project. While there are too many people to list here individually, every single bumble bee observation (or survey that did not find any) helped contribute to this wealth of information, which we will be using for years to come. The accomplishments listed above, and in the pages that follow, would not have been possible without the large team of dedicated bumble bee enthusiasts that contributed to this project. We give our humble and heartfelt thanks to each and every individual that contributed.



Photo of the Western Bumble Bee (*Bombus occidentalis*) documented in northern Washington by a PNWBBA participant. Photo: Bumble Bee Watch / Ben Turnock.



Figure 3: Level III Ecoregions for Oregon, Washington, and Idaho.

THE PACIFIC NORTHWEST BUMBLE BEE ATLAS 2018-2020



The rare High Country Bumble Bee (*Bombus kirbiellus*) was detected in the Pasayten Wilderness in Washington in 2019 (A); photo of a chilled Western Bumble Bee (*B. occidentalis*) submitted to the PNWBBA project (B); Rich Hatfield (Xerces) demonstrates netting techniques to PNWBBA participants in eastern Oregon (C); during the first year to the project, Rich Hatfield (Xerces) and Ross Winton (IDFG) test survey techniques with other IDFG staff (D); PNWBBA survey site within the Pasayten Wilderness in the Okanogan-Wenatchee National Forest (E); a PNWBBA participant documents the Western Bumble Bee (*B. occidentalis*) in the Washington Cascades (F); Rich Hatfield (Xerces) describes bumble bee identification at a PNWBBA training event (G). Photos: Xerces Society / Rich Hatfield (A, E); Bumble Bee Watch / John Kolts (CC-BY-NC) (B); Steve Lenz (C); IDFG (D); Bumble Bee Watch / Kevin Schafer (CC-BY-NC) (F); Lisa Robinson (G).

Project Design

Our goal was to establish equal-area grid cells to direct survey effort throughout the region, and recruit volunteers to conduct surveys. To be consistent with the spatial scale of the North American International Union for the Conservation of Nature (IUCN) Red List assessments (Hatfield et al. 2015), we started with a 50 km x 50 km grid, which we clipped to individual state boundaries, and, where necessary, re-shaped into approximately equal-area grids. Ultimately, we divided the three-state region into 528 grid cells. Then, using a stratified, random approach, considering historic and recent sightings of bumble bees that are listed as Species of Greatest Conservation Need (SGCN) in the State Wildlife Action Plans of Idaho and Washington, historic and recent survey effort, and spatial distribution within level III ecoregions we selected 396 (75%) priority grid cells to be the focus of our survey effort.

Volunteer Training & Recruitment

Once we established the grid cell network, we began the process of recruiting and training participants to conduct surveys. Through the course of the project, we conducted 14 daylong training workshops: four in Washington, three in Idaho, five in Oregon, and two virtual webinars. Our webinar workshops were recorded, and then posted to our website (pnwBumbleBeeAtlas.org) so that individuals could review the material and/or self-train. Workshop participants learned about bumble bee ecology and conservation, how to participate in the project, and how to photograph and identify bumble bees. Overall, we directly trained 877 individuals and several hundred more have used our online resources.

Survey Protocols

Interested participants that attended a workshop or used our online materials to self-train then signed up to participate in the project by adopting a grid cell: a commitment to implement our standardized protocols to conduct two surveys within the study window (June to August) through the course of the project (2018–2020). To fulfill their commitment, volunteers had two survey options: point surveys or roadside surveys. A point survey took place in a one-hectare plot of suitable habitat for bumble bees (ideally with flowering resources suitable to attract bumble bees). Volunteers would spend

With net in hand, Rich Hatfield (Xerces) demonstrates survey techniques for PNWBBA participants. Photo: Ellen Homestead.



SURVEY PROTOCOL

ADOPT A GRID CELL



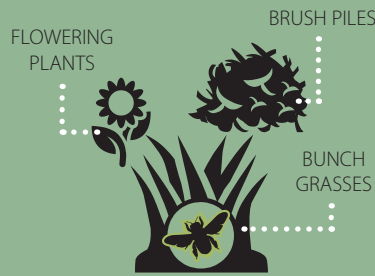
1 Participants adopt a grid cell and plan surveys within 1 acre plot or roadside with suitable habitat

CAPTURE & PHOTOGRAPH



2 Participants survey site, capture and place bumble bees in vials, and photograph each individual bee

ASSESS HABITAT



3 Participants characterized the site including habitat features important to bumble bees

SUBMIT DATA



4 Participants submit both bumble bee and habitat data online

45 person-minutes (individual survey time was equal to the 45 minutes divided by the number of surveyors) actively searching for bumble bees within the plot. A roadside survey consisted of five 15 person-minute surveys (active search time) on patches of suitable habitat, each separated by at least ½ mile.

During the active search time, surveyors captured each individual bumble bee they encountered with an insect net (or equivalent), then transferred the bumble bee into a vial which was placed into a cooler to induce cold anesthesia (Ebadi, Gary, and Lorenzen 1980). Surveyors documented the plant that each bumble bee was observed visiting, or recorded its behavior (e.g., nest searching, patrolling); the time spent transferring bumble bees into vials and the cooler was excluded from the active search time. At the end of the active search time, each individual chilled bumble bee was photographed with details sufficient for species identification and then released near the point of capture.

At each survey location (the one-hectare plot for a point survey, and each of the five suitable habitat plots along a roadside survey), a rapid habitat assessment was also done. The habitat assessment asked volunteers to characterize the site that they surveyed including: (1) the habitat type of the survey area as well as the surrounding area (meadow, shrubland, riparian area, etc.); (2) the proportion of the survey area that had flowering resources; (3) nest site features (evidence of rodent tunnels, brush piles, bunch grasses, etc.); (4) any observable management practices (mowing, agriculture, honey bee hive presence, etc.); and (5) which flowering plants were observed blooming within the survey plot.

Surveyors submitted their bumble bee data to the community science website Bumble Bee Watch (BumbleBeeWatch.org), and habitat data (including surveys where no bumble bees were detected) using a web survey. All observations of bumble bees were independently verified by a bumble bee expert to confirm species.

Incidental Sightings

In addition to the standardized surveys described above, some project participants submitted incidental sightings. These sightings were opportunistic with no associated effort. However, we used these observations to help describe individual bumble bee species patterns in the Pacific Northwest, as well as their phenology and host plant usage. The number of observations on each species profile page includes incidental sightings.

PNW Bumble Bee Distribution

To further understand bumble bee distributions across the Pacific Northwest, we created regional species distribution models. Using environmental variables and known species locations, maximum entropy (Maxent 3.4.4; Phillips et al. 2006; Phillips and Dudík 2008; Phillips et al. 2017) produces a correlative model of relative likelihood, or probability, of suitable habitat across the study area based on environmental similarity to known occupied sites. Previous modeling efforts have focused primarily on climatic environmental covariates at a variety of spatial scales to model bumble bee distributions (e.g., Koch and Strange 2009; Cameron et al. 2011; Sirois-Delisle and Kerr 2018; Koch et al. 2019). In addition to climate variables, we included topographic and vegetative covariates (n=19) that, to varying degrees, reflect temperature, water, and light resources which may contribute to bumble bee distributions either directly (e.g., temperature) or indirectly (e.g., habitat, flowering resources). For example, some topographic variables (e.g., elevation) may serve as proxies for local temperature patterns (e.g., cold air drainage, Dobrowski et al. 2009), whereas others (e.g., slope) act as surrogates for light or solar radiation.

We supplied Maxent with species locations documented during the PNWBBA project (both surveys and incidental observations) from March 2018–November 2020. These locations were carefully evaluated to ensure observational, spatial, and temporal accuracy, resulting in a total of 6,582 locations (median 288, range 24–815 per species) available for use in the modeling effort. Limited sample sizes prohibited modeling distributions of 3 of the 24 species (*frigidus*, *impatiens*, and *kirbiellus*). Following recommended approaches, we calculated species-specific model parameters using the *enmSdm* package (Smith 2017) in R 4.0.0 (R Core Team 2020) and implemented 10-fold cross-validation with jackknifing to measure importance of each variable to the resulting model. Final models represent the average of 10 replicates using the optimized parameters and most important variables. For each species, we imported mean model output into ArcGIS 10.8.1 (ESRI 2020) and, for comparative purposes, binned model values using Maxent-calculated thresholds to identify low, medium, and high habitat suitability.

Maxent accurately predicted species distributions for all 21 bumble bees modeled (median Area Under Curve [AUC] = 0.88, range 0.813–0.967). Averaged over 10 replicate runs, the most important model variables varied across species but typically included the percent of appropriate land cover type within 10 km (e.g., forest-associated species included the percent of forest), forest canopy cover (for forest-associated species), slope, precipitation, and temperature. Jackknife tests indicated variables with the most useful information when used in isolation included percent developed (for 4 species), percent forested (4 species), percent grass/shrub (4 species), elevation (2 species), mean annual temperature (3 species), summer heat moisture (2 species), and temperature difference (2 species). Variables with the most information that was not present in other variables included percent developed (1 species), forest canopy cover (7 species), elevation (3 species), slope (8 species), and number of frost-free days (2 species).

To calculate the extent of known occurrence for each species we created alpha hull polygons using all species observations from 2018–2020. The extent of known occurrence applies only to the three states that were included in this study and not the species entire range.

Phenology Charts

To develop the phenology charts for each species, we converted the date of each observation to the day of year (DOY), and then summed the number of observations by DOY across all three years of the project. Finally, using a 15-day moving average (7 days before and 7 days after each DOY), we created a histogram showing the approximate pattern of each species activity throughout the region. For comparison, we also included a line showing the pattern of all observations. On each chart we show vertical lines which show the study window (June 1 to August 31). Because most of our search effort took place within the study window, the phenology between the vertical lines is likely the most accurate in these reports.

Habitat Associations

When project participants conducted a survey, they included a rapid habitat assessment. Originally, the rapid habitat assessment included thirteen different options. To simplify the data for summary, we reclassified these thirteen different habitat types into six different habitat types using the National Land Cover Database (NLCD, Homer et al. 2020) as a guide: woodland/forest, shrub/scrub, riparian, grassland/meadow, developed, and agriculture. For each species we present the proportion of observations found in each habitat type, along with the average proportion of observations of all species found in each habitat type (+/- 1 SE).

Host Plants

Project volunteers submitted host plant information with each bumble bee observation. We downloaded these data, and standardized all plant names using the World Flora Online database (WFO 2021). Due to the number of observations (21,521), we did not verify host plant information for all sightings. However, we did verify host plant information (when photos of the plants were available) for all SGCN bumble bee species (1,007 observations), and from data submitted in 2019 (7,712 observations). From that subset of the data, we determined that observations by project volunteers were generally accurate to plant genus (>90%). Additionally, when errors were made, we observed that, in general, they were not for the most common plants visited by bumble bees, but rather the rarer or obscure species. Because of this, we determined that it was reasonably accurate to summarize the top 10 host plants to genus for each bumble bee species (when there was sufficient data). On each species profile page plants marked as multi-species appeal represent the top ten plant genera visited by the most species of bumble bees. Important food plants are the top ten plant genera that appeared most frequently in all species top 10 plant associations.

Elevation Profiles

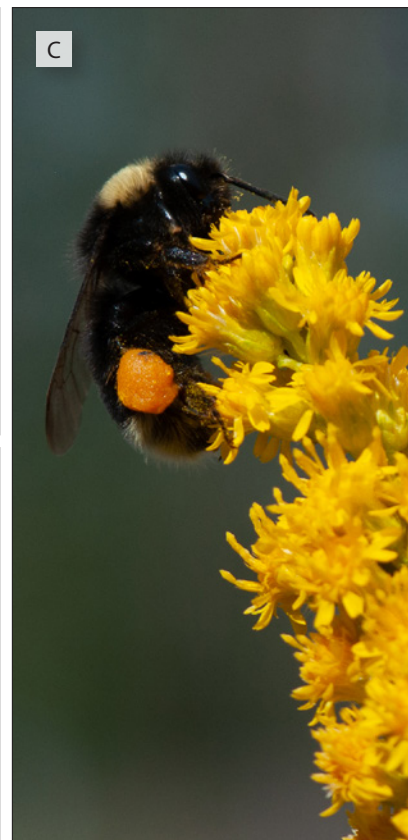
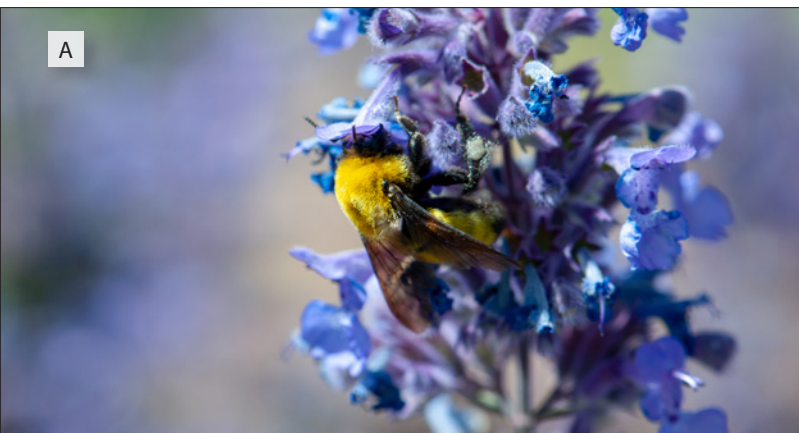
Elevation profiles for bumble bee species collected during the Pacific Northwest Bumble Bee Atlas project, 2018–2020, were determined using 1/3rd arc-second (approximately 10 m) Digital Elevation Models (DEMs) produced and distributed by the USGS 3D Elevation Program (3DEP) (available online <http://ned.usgs.gov>). We created scatterplots of elevation by latitude for each observed species location using Excel (Version 2107, Microsoft 365 Apps for enterprise).

Relative Abundance

For our five SGCN species, we analyzed the historic relative abundance (RA, proportion of all bee observations accounted for by one species) in Level III Ecoregions, compared to what we found in the PNWBBA. To compare historic RA to RA found in the PNWBBA, we used historical collections records stored in the Bumble Bees of North America Database (Richardson 2021). In this historic database, we included only records of bumble bees collected in the three PNW states, and all records prior to the PNWBBA were considered “historic.”

For all species, we compared records from the PNWBBA to historic collection records to report observed changes in relative abundance through time. Using Richardson (2021) for these comparisons, we included only records of bumble bees collected in the three PNW states, and all records prior to the year 2000 were considered “historic.” To remove duplicate records and to reduce collection bias error (e.g., differences in observers’ tendencies to collect one vs. multiple specimens per species per collecting event), we filtered this dataset to retain only one record per species-caste per collecting event. We computed RA from the resulting dataset of 11,948 individual bumble bee records, and used this statistic as a comparison to help us interpret bumble bee species commonness as observed by PNWBBA surveyors.

Host plant information was summarized for each species based on submitted habitat plant association data. The top 10 genera for each species are provided in the species summaries that follow. Below are a few examples of plants favored by bumble bees in the PNW: (A) Morrison Bumble Bee (*Bombus morrisoni*) on *Salvia*; (B) Hunt Bumble Bee (*B. huntii*) on *Agastache*; (C) Western Bumble Bee (*B. occidentalis*) on *Solidago* (D) White-shouldered Bumble Bee (*B. appositus*) on *Cirsium*; (E) Hunt Bumble Bee (*B. huntii*) on *Chamaenerion*. Photos: Xerces Society / Rich Hatfield (A-D); Stephanie McKnight (E).



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- WFO 2021: World Flora Online. Published on the Internet; <http://www.worldfloraonline.org>. Accessed on: 05-10-2021.



SPECIES SUMMARY

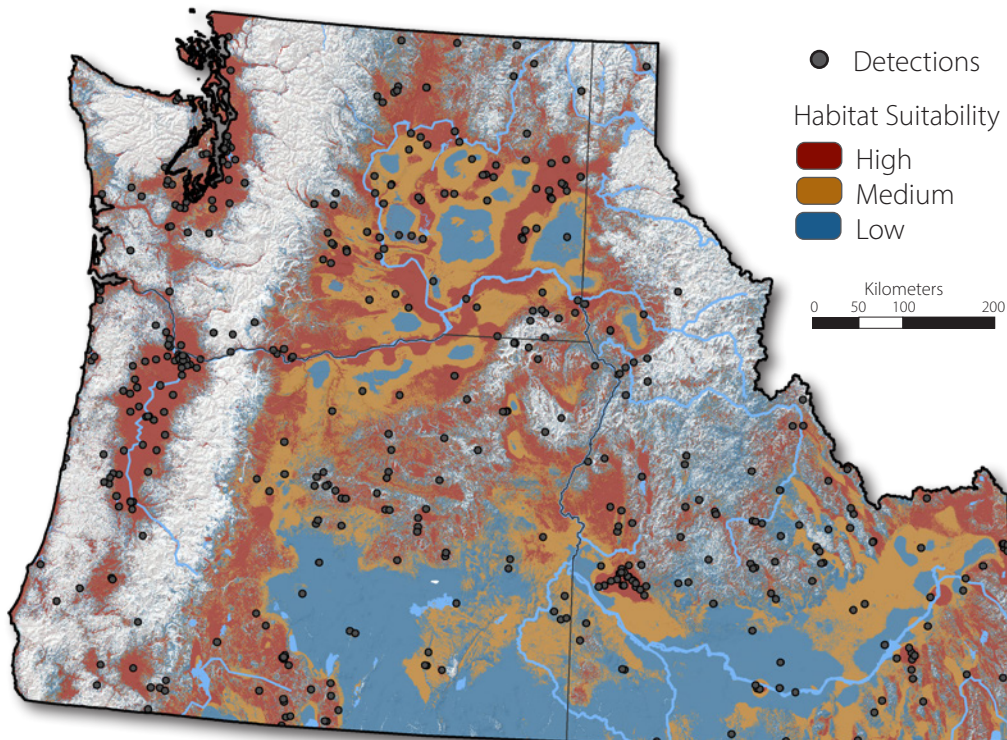
Overview

The Yellow Bumble Bee ranges widely across the continental US and adjacent southern Canada. This species has a strong shift in black/yellow color patterns from mostly yellow in the east, to largely black along the Pacific Coast (where it is sometimes recognized as a separate species, *B. californicus*); in the Pacific Northwest, both extreme color patterns and their intermediates are found. We detected this species less often than would be expected from historic data, supporting its current IUCN Red List status of Vulnerable. Atlas surveyors made observations primarily in the lower elevation Willamette Valley, Puget Lowland, and Snake River Plain Ecoregions; lesser numbers were observed in the Columbia Plateau, Blue Mountains, and Idaho Batholith Ecoregions. This species was strongly associated with shrub habitats, but also occurred in developed, meadow, and riparian areas. It was observed most often on flowers of thistles, paintbrush, and clover.



Yellow Bumble Bee (*Bombus fervidus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

988



OF SURVEYS WITH
DETECTIONS

259 of 1542



OF GRID CELLS
WITH DETECTIONS

188 of 364



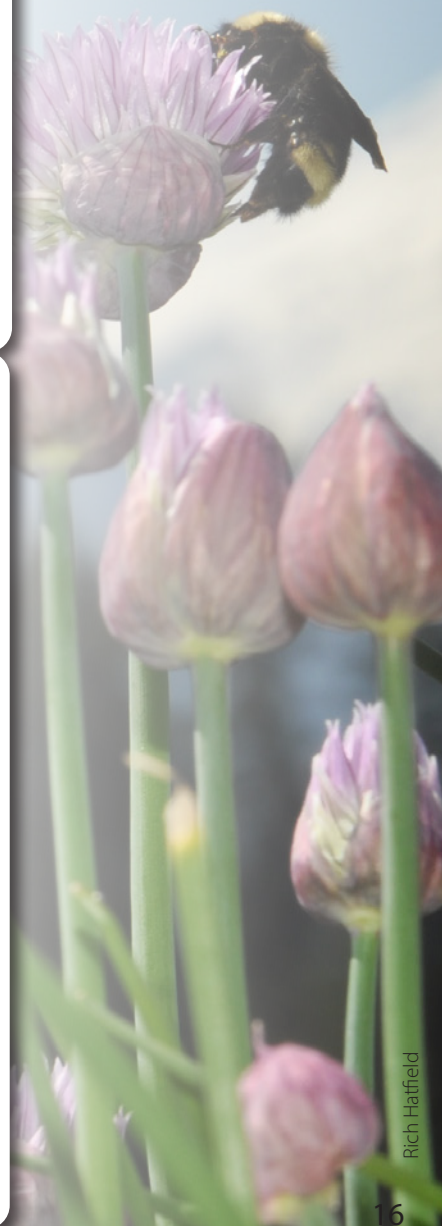
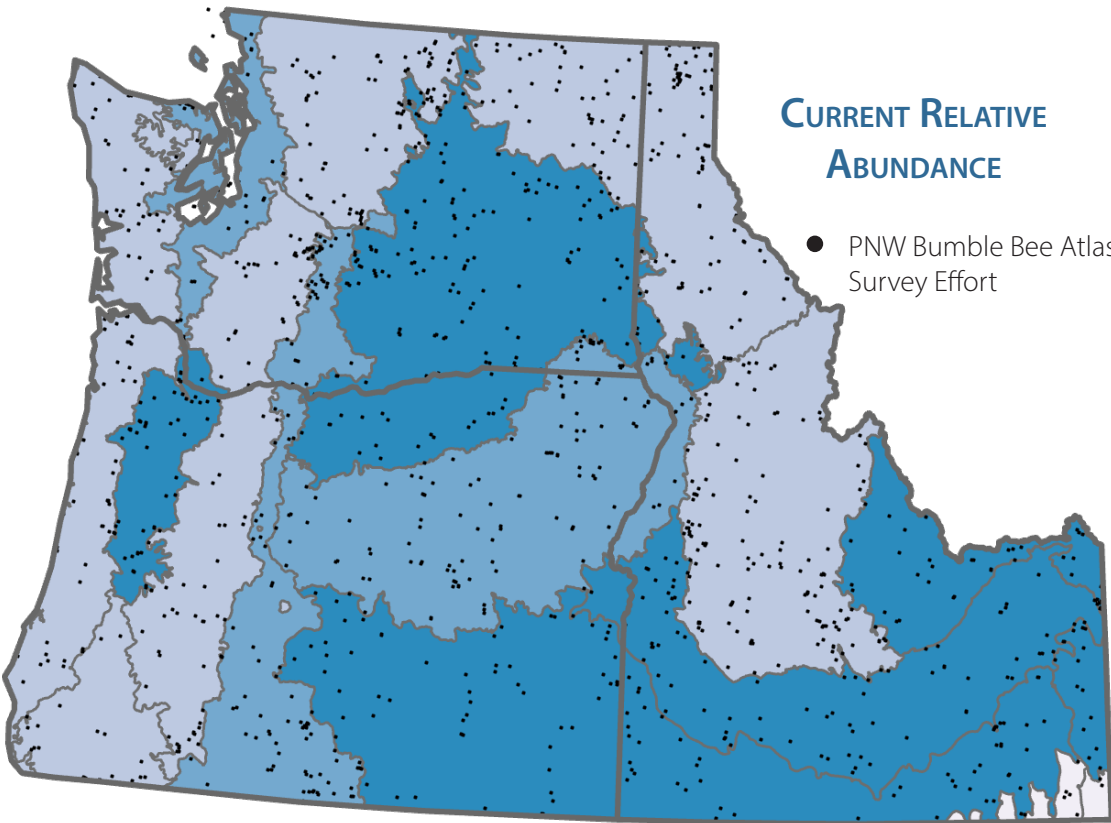
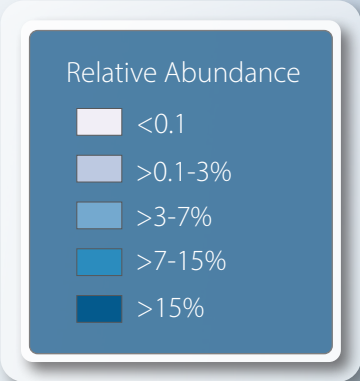
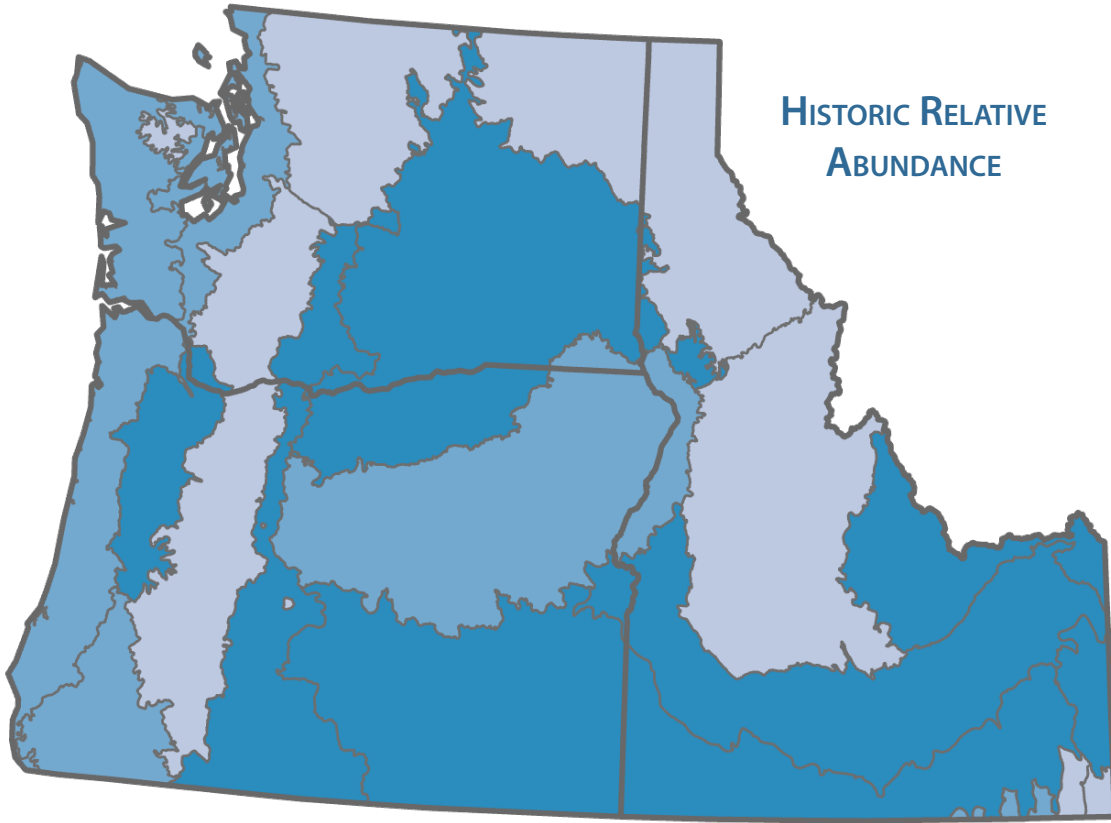
EXTENT OF KNOWN
OCCURRENCE

36,417 km²





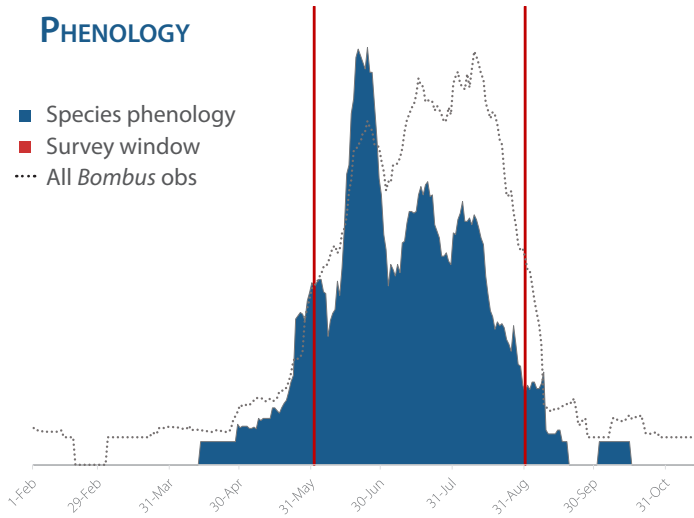
Relative Abundance Maps





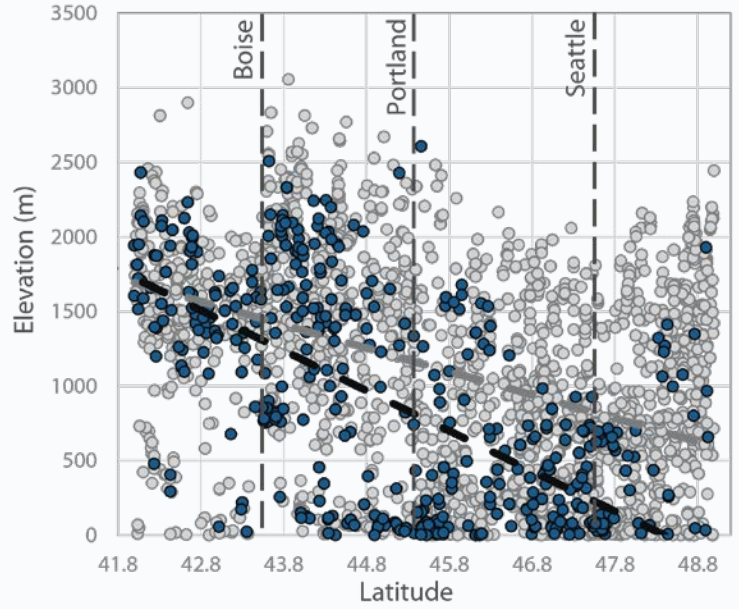
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus fervidus*
- All species



PLANT ASSOCIATIONS

Top 10 Genera

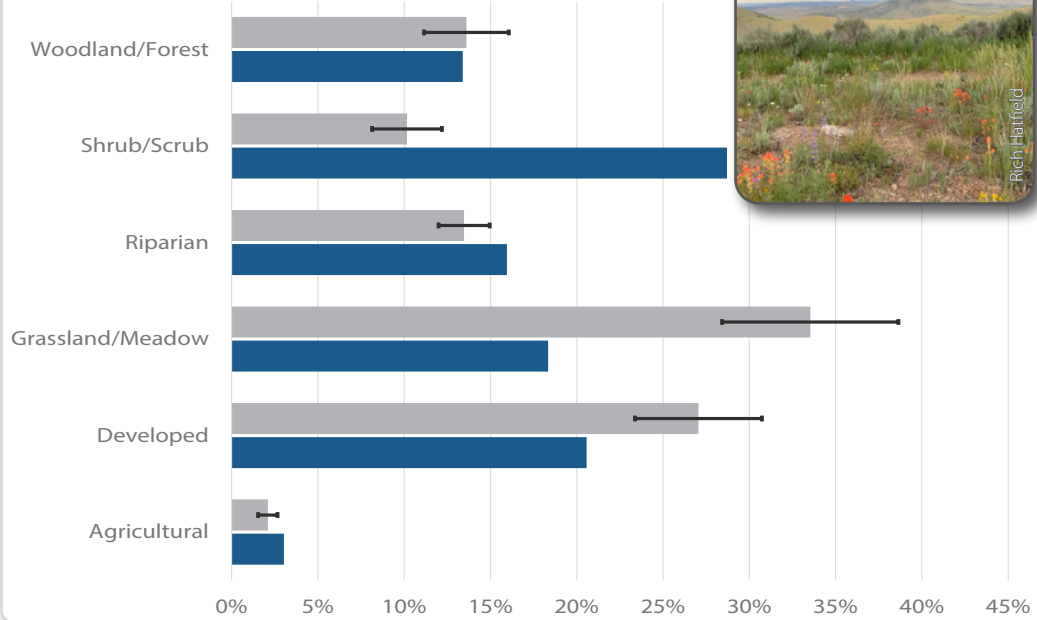
- 1 *Cirsium*
- 2 *Castilleja*
- 3 *Trifolium*
- 4 *Vicia*
- 5 *Delphinium*
- 6 *Penstemon*
- 7 *Carduus*
- 8 *Prunella*
- 9 *Agastache*
- 10 *Thermopsis*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus fervidus*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

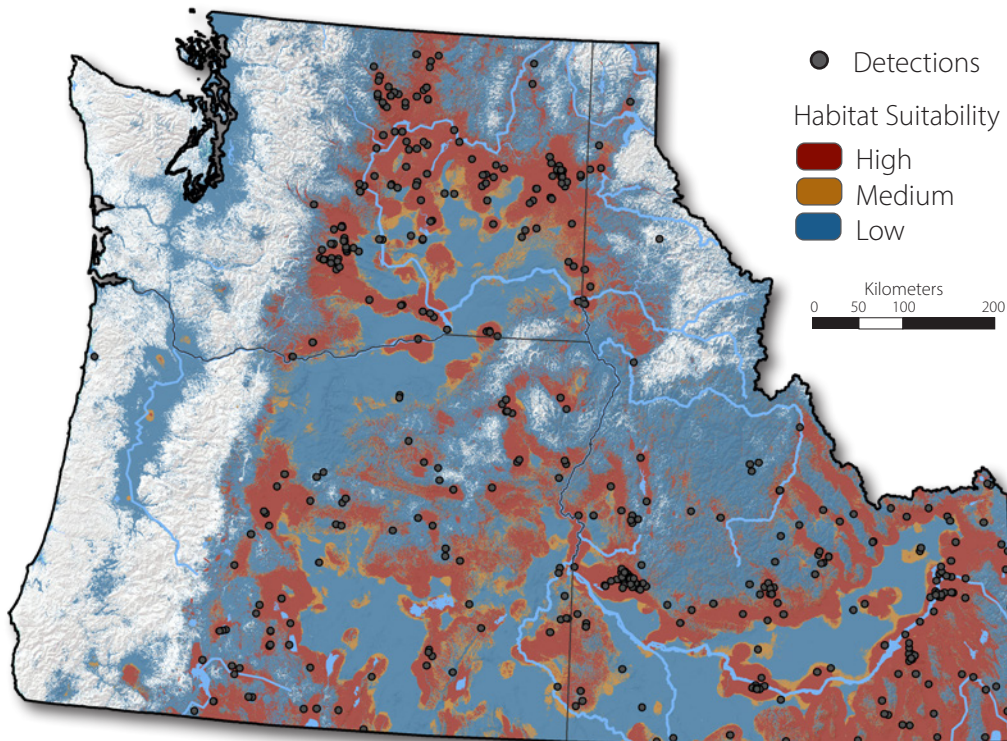
Overview

The Hunt Bumble Bee is a common species found throughout most of the western US and adjacent Canada. Its range extends eastward into the Great Plains and south to the mountainous regions of central Mexico. It accounts for about 5% of bee observations made in the Pacific Northwest Bumble Bee Atlas, roughly equivalent to its historic relative abundance in the region. The Hunt Bumble Bee was located primarily in the Eastern Cascade, Blue Mountains, Columbia Plateau, Middle Rockies, and Snake River Plain Ecoregions. The bee was most commonly observed in shrublands, developed areas, and riparian zones, where it was found on catmint, lupines, and teasel, among other flowers. Hunt Bumble Bee is considered to be stable across its range.



Hunt Bumble Bee (*Bombus huntii*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

982



OF SURVEYS WITH
DETECTIONS

202 of 1542



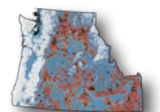
OF GRID CELLS
WITH DETECTIONS

142 of 364



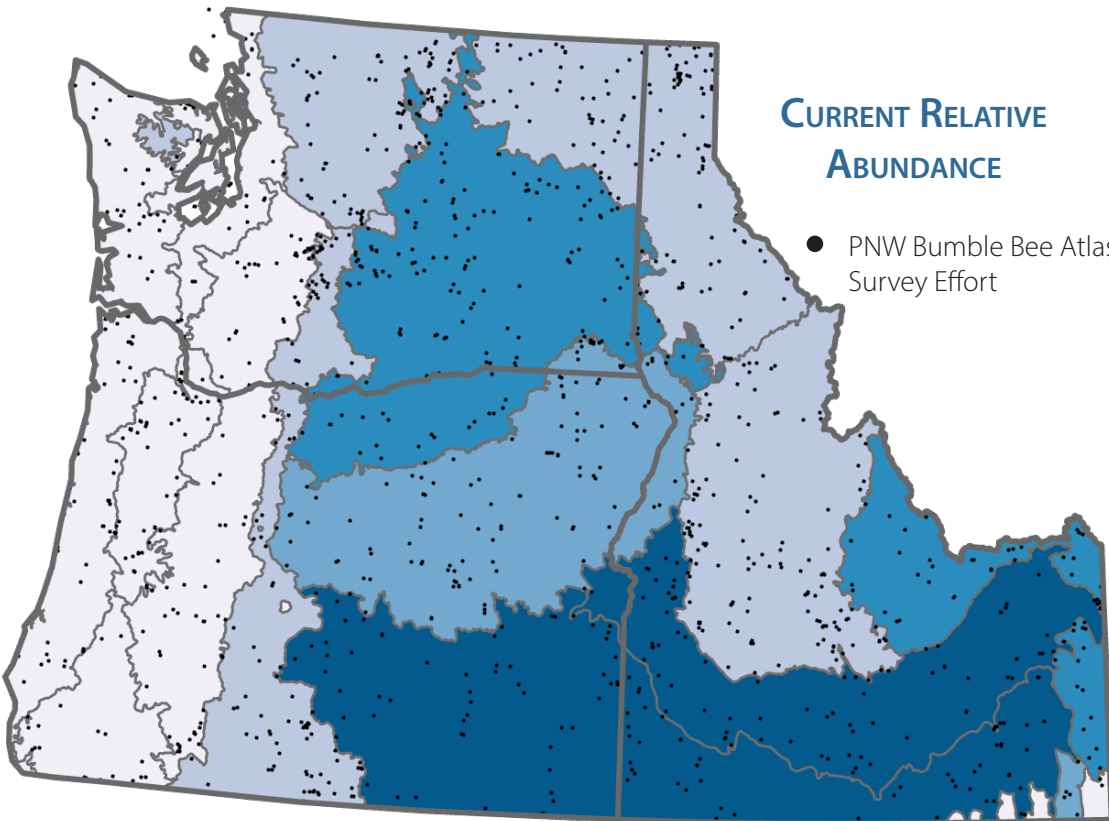
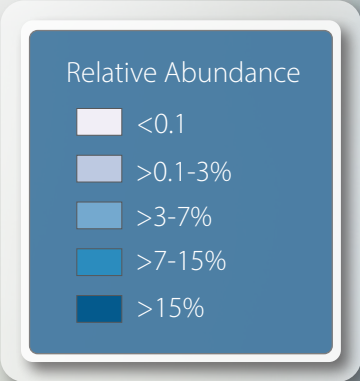
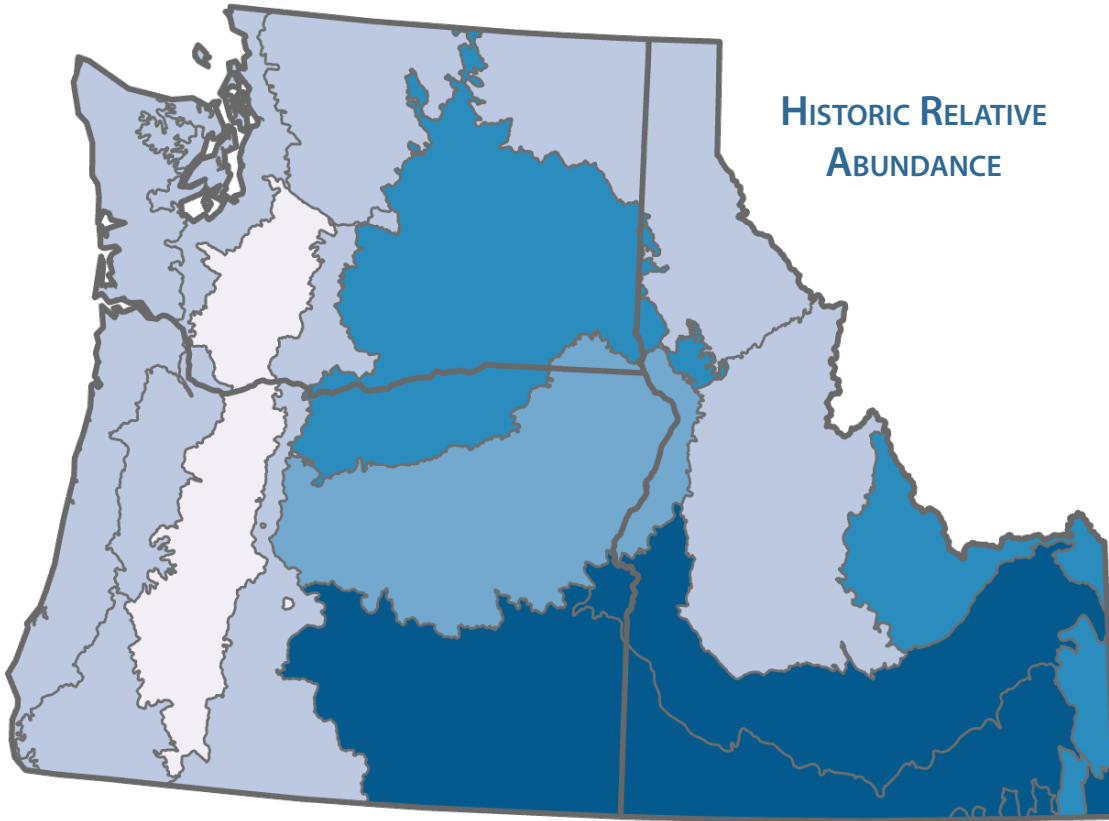
EXTENT OF KNOWN
OCCURRENCE

34,198 km²





Relative Abundance Maps

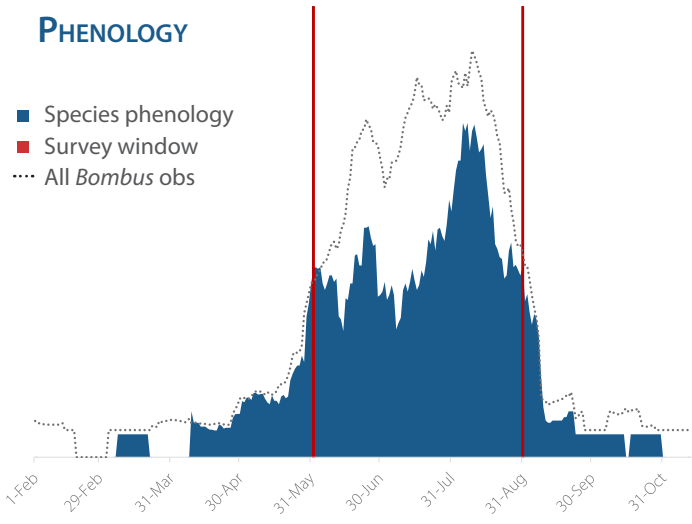


Rich Hatfield



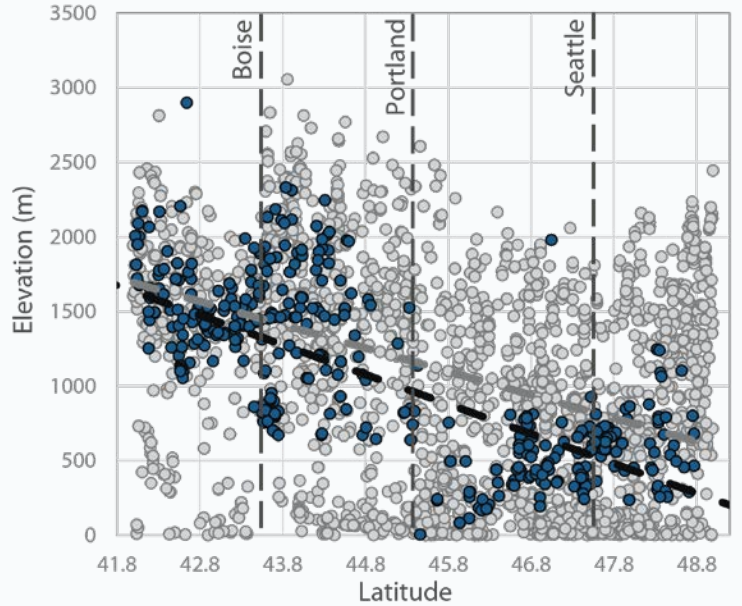
PHENOLOGY

■ Species phenology
■ Survey window
····· All *Bombus* obs



ELEVATION PROFILE

● *Bombus huntii*
○ All species



PLANT ASSOCIATIONS
Top 10 Genera

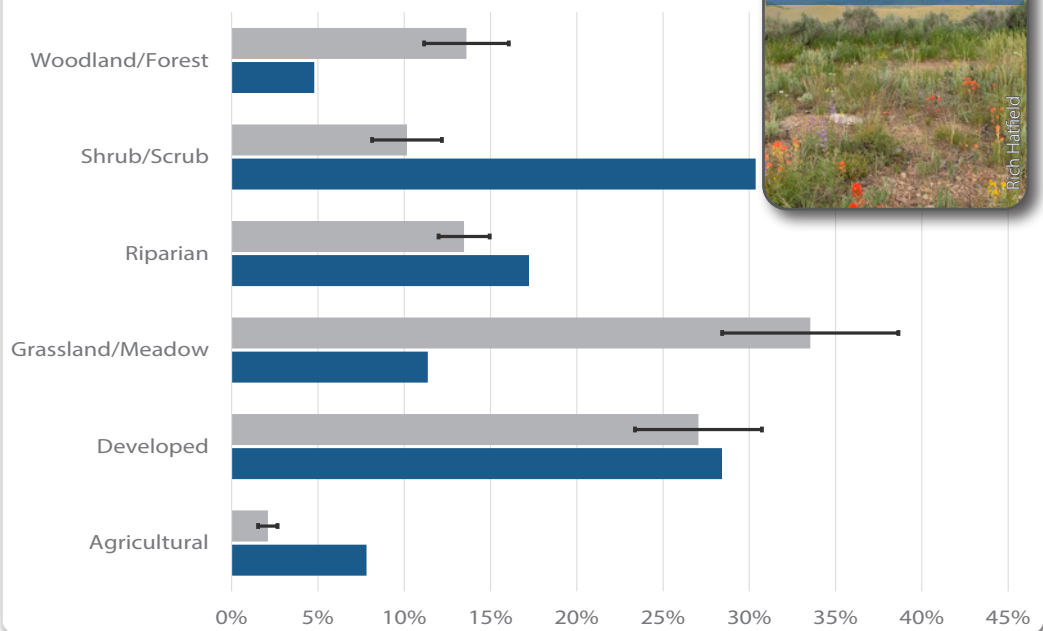
- 1 *Nepeta*
- 2 *Lupinus* 🌸
- 3 *Dipsacus*
- 4 *Cirsium* 🌸
- 5 *Helianthus*
- 6 *Salvia*
- 7 *Centaurea* 🌸
- 8 *Lavendula* 🌸
- 9 *Ericameria*
- 10 *Penstemon* 🌸

🌸 multi-species appeal
🌸 important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

■ *Bombus huntii*
■ All species



Credits

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SPECIES SUMMARY

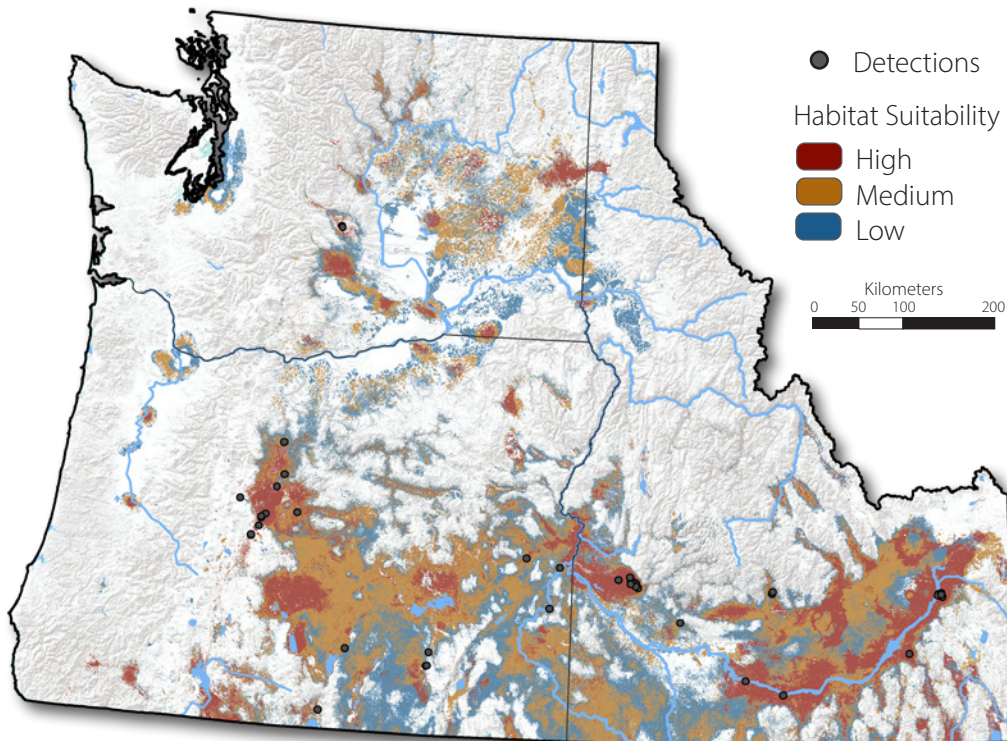
Overview

The range of Morrison Bumble Bee occurs almost entirely within the Intermountain West, with a few records known from adjacent British Columbia. While still found broadly throughout this range, the species appears to be in decline in many areas, and is considered vulnerable to extinction. In the Atlas project, Morrison Bumble Bee accounted for less than 0.5% of all observations, a decline over historic relative abundance. The majority of observations were made in the Eastern Cascade, Northern Basin and Range, and Snake River Plain Ecoregions; it was far less common on the Columbia Plateau, another region where it was repeatedly collected in the past. Considered a species associated with high plains shrublands, the bee was unexpectedly common in developed areas where it commonly fed on non-native plants, including crown vetch, teasel, and lavender.



Morrison Bumble Bee (*Bombus morrisoni*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

71



OF SURVEYS WITH
DETECTIONS

12 of 1542



OF GRID CELLS
WITH DETECTIONS

21 of 364



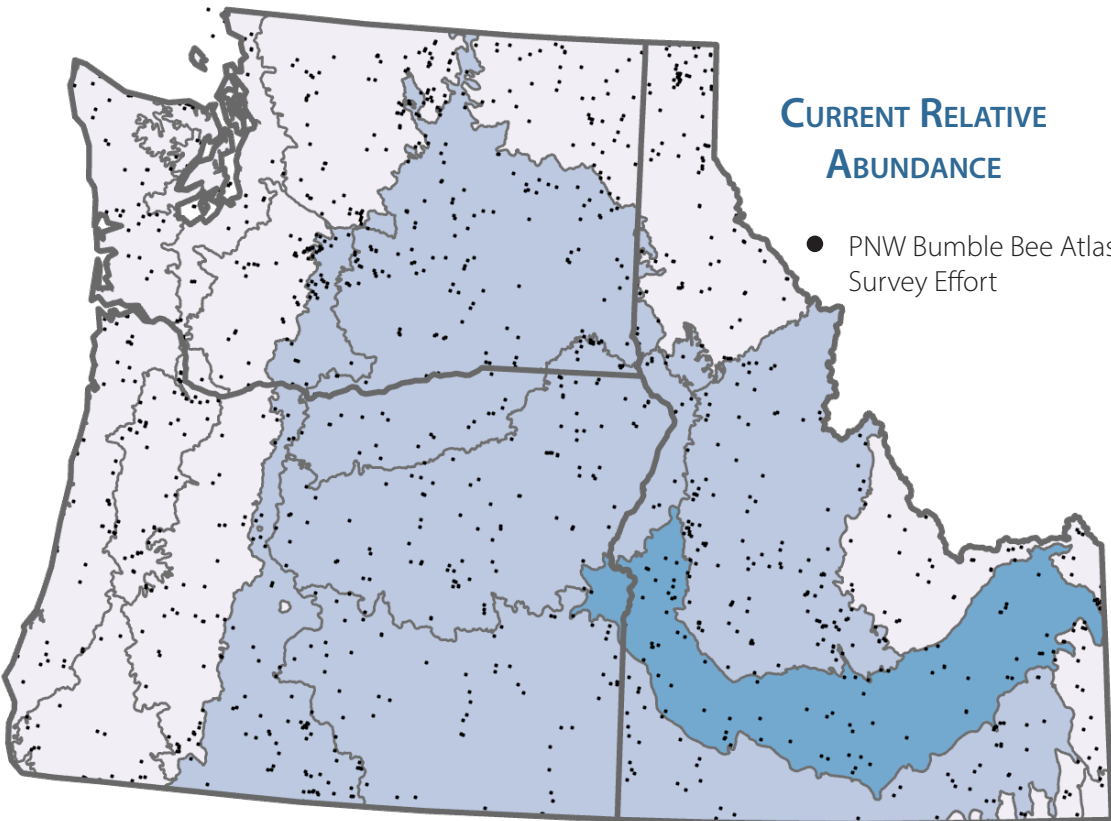
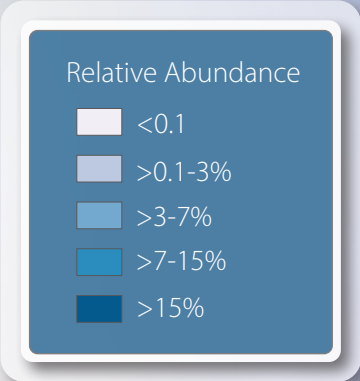
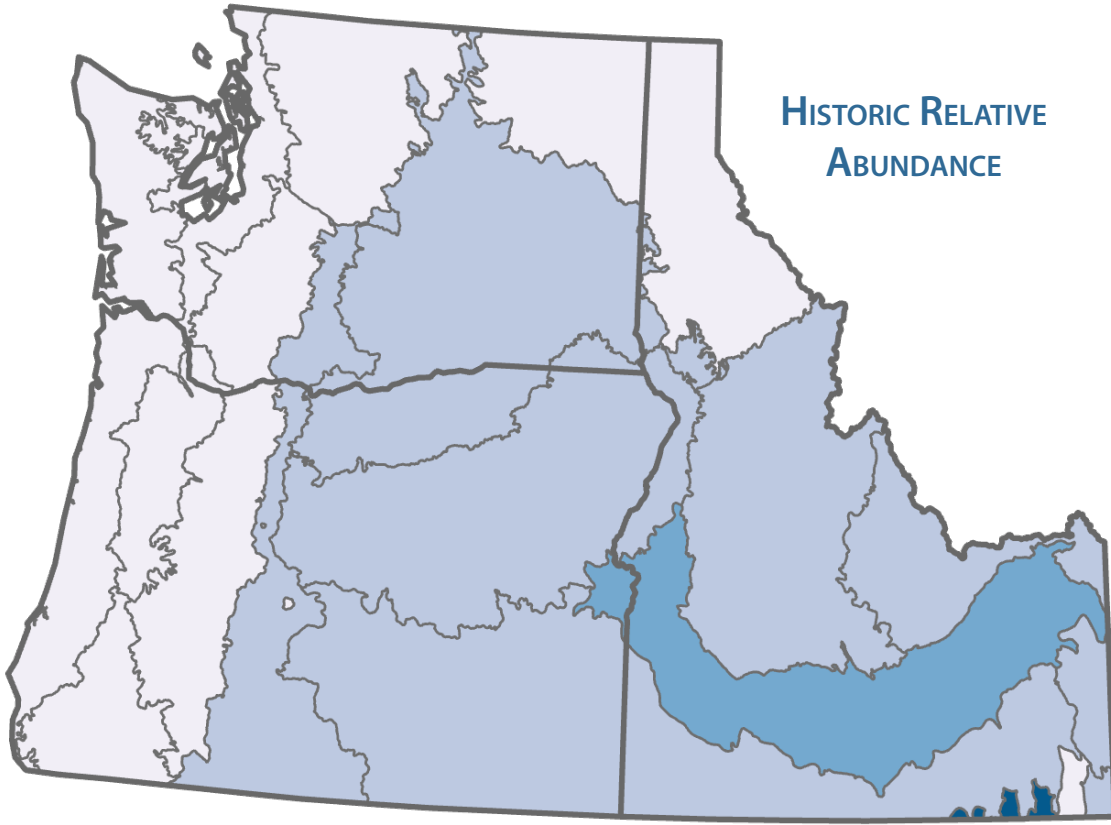
EXTENT OF KNOWN
OCCURRENCE

2,900 km²





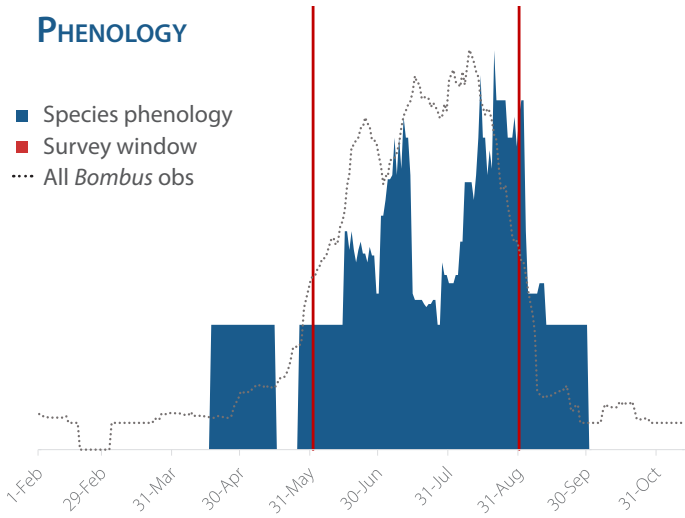
Relative Abundance Maps





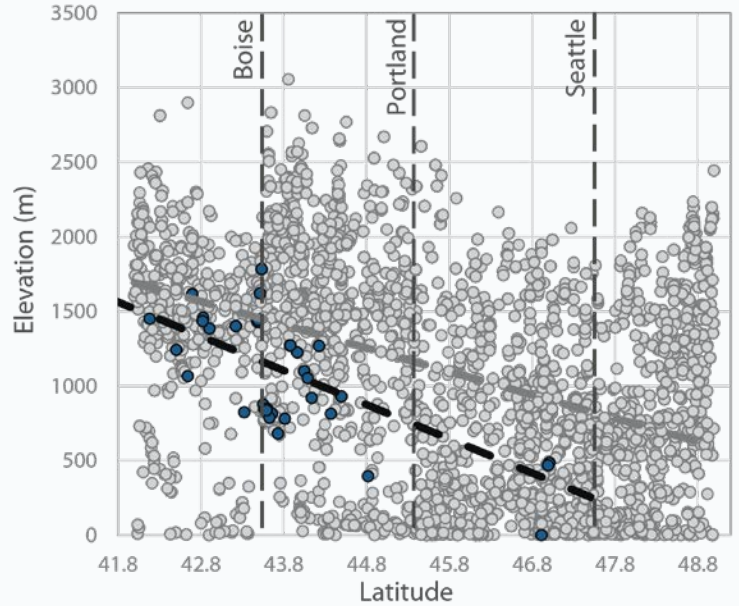
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus morrisoni*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

- 1 *Securigera*
- 2 *Dipsacus*
- 3 *Lavandula*
- 4 *Lythrum*
- 5 *Melilotus*
- 6 *Monarda*
- 7 *Nepeta*
- 8 *Zauschneria*
- 9 *Zinnia*

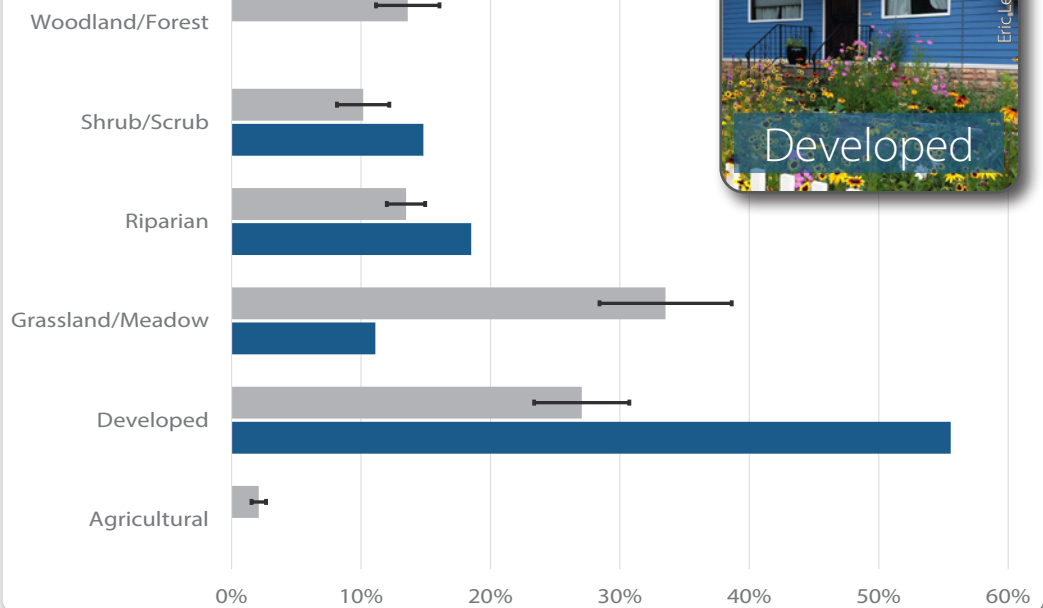
10 *Cirsium*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus morrisoni*
- All species



Credits

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SPECIES SUMMARY

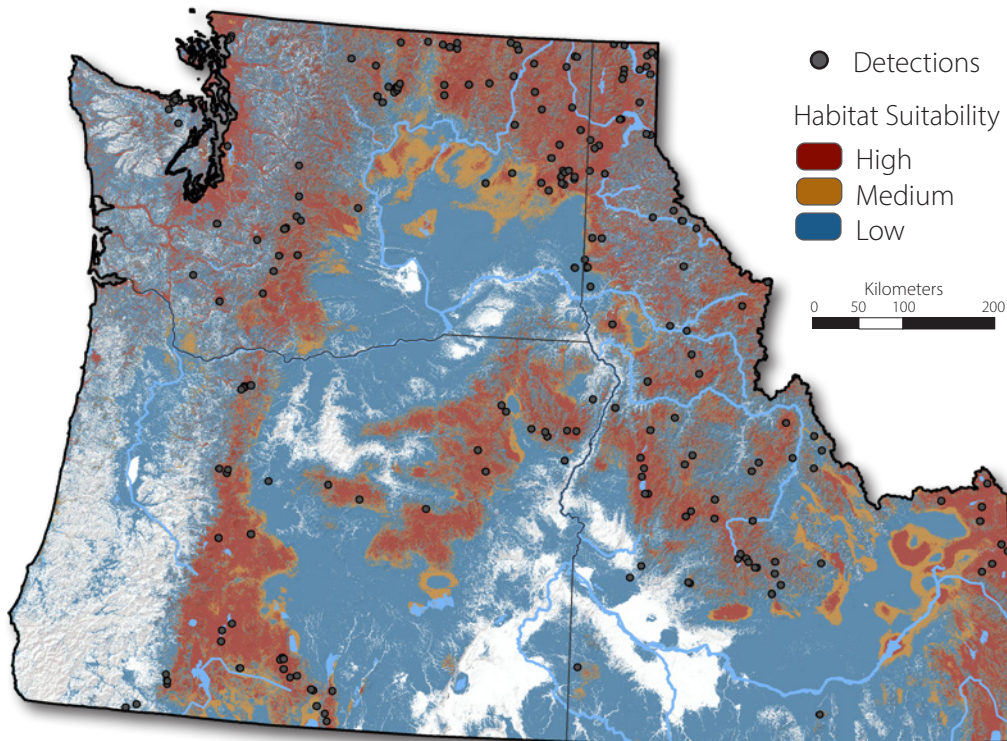
Overview

The range of the Western Bumble Bee extends from Alaska south through much of the mountain and coastal west, although some northern populations are now considered to be a separate species. Populations crashed in the 1990s, likely due to a combination of pathogen exposure and other factors, and the species is currently petitioned for protection under the US Endangered Species Act. It was historically the most common bumble bee in the Pacific Northwest, accounting for more than 15% of all observations, yet it comprised less than 2% of observations by Atlas surveyors. We found *B. occidentalis* most often in the Cascade, Idaho Batholith, and Northern Rockies Ecoregions. Strikingly, it was largely absent from the Coast Range and Willamette Valley Ecoregions, where it was once common. It was associated with forests, meadows, and developed areas. *B. occidentalis* was often found on plants with small flowers, including knapweeds, thistles, and meadowsweet.



Western Bumble Bee (*Bombus occidentalis*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

393



OF SURVEYS WITH
DETECTIONS

114 of 1542



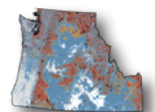
OF GRID CELLS
WITH DETECTIONS

105 of 364



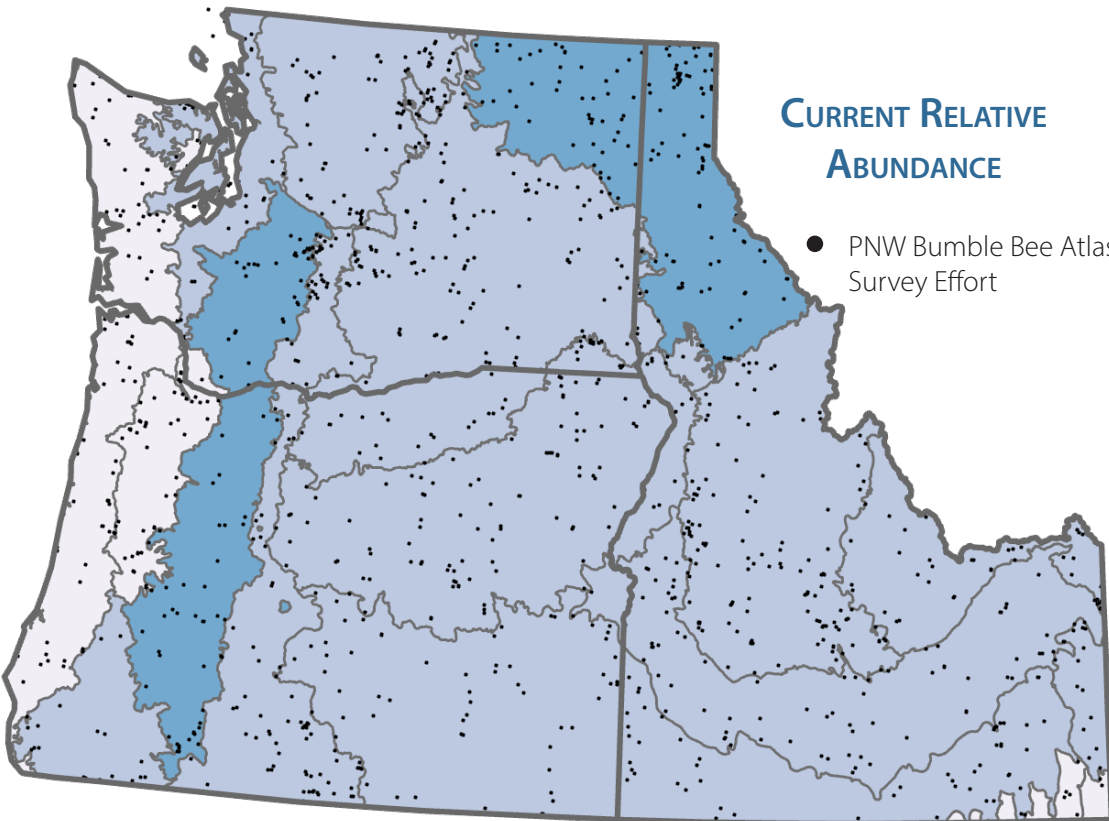
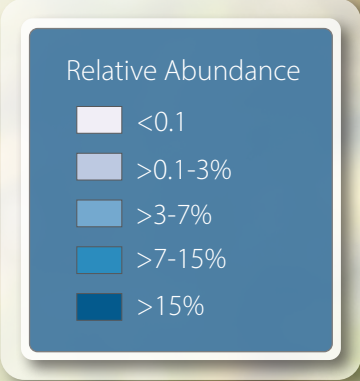
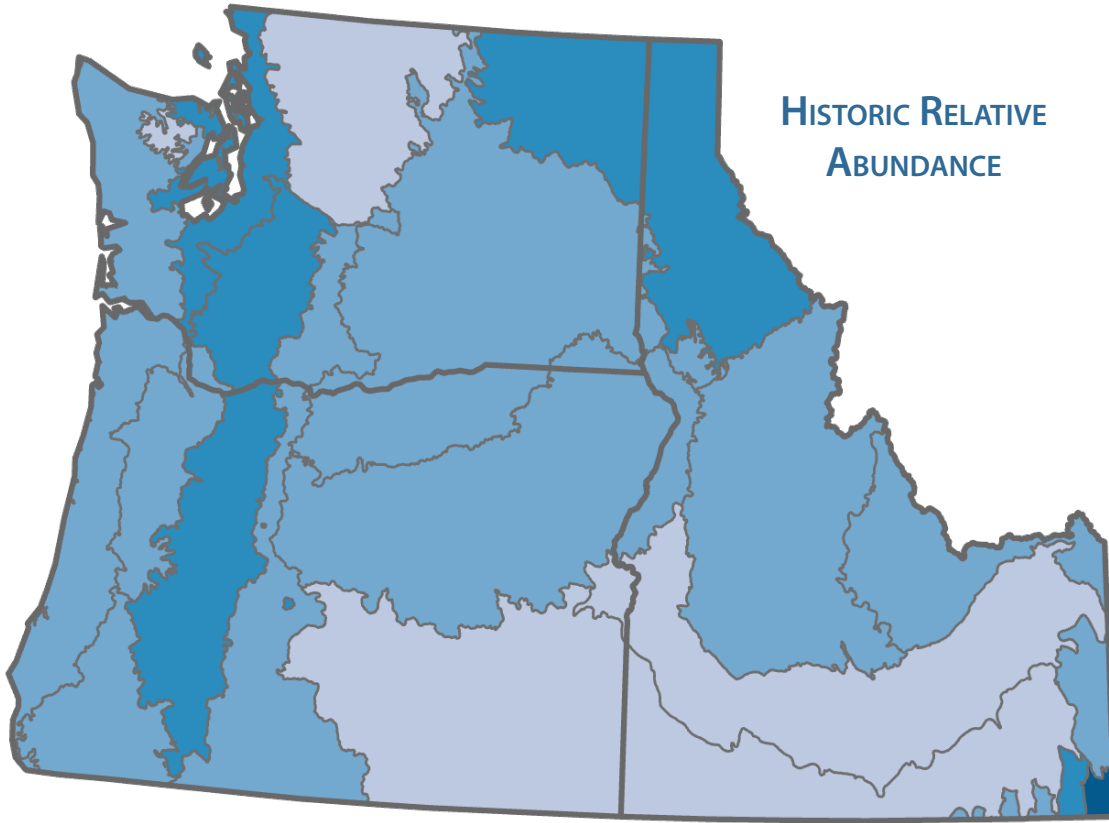
EXTENT OF KNOWN
OCCURRENCE

18,450 km²





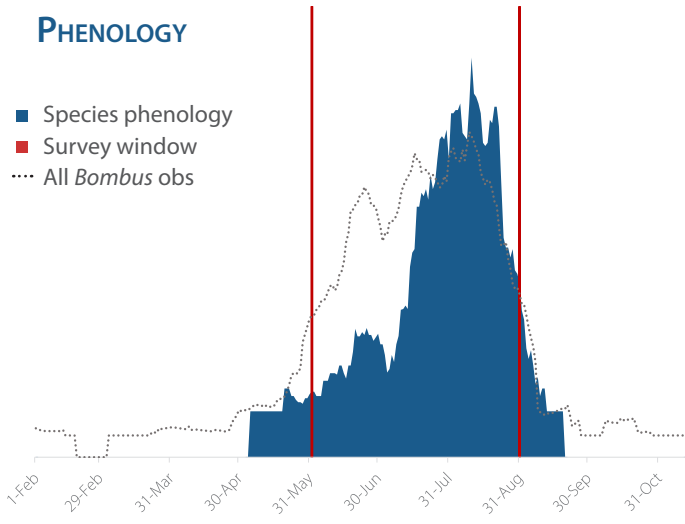
Relative Abundance Maps



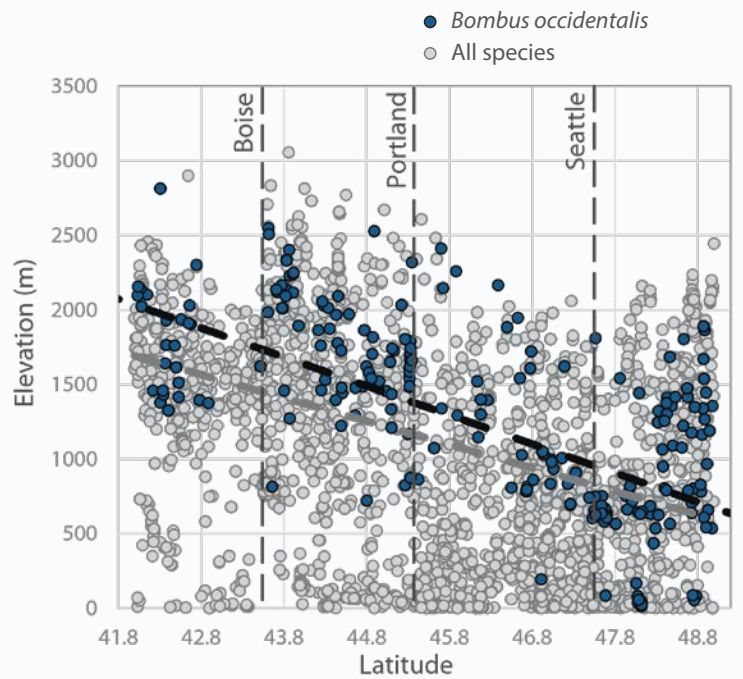


PHENOLOGY

- Species phenology
- Survey window
- ⋯ All *Bombus* obs



ELEVATION PROFILE



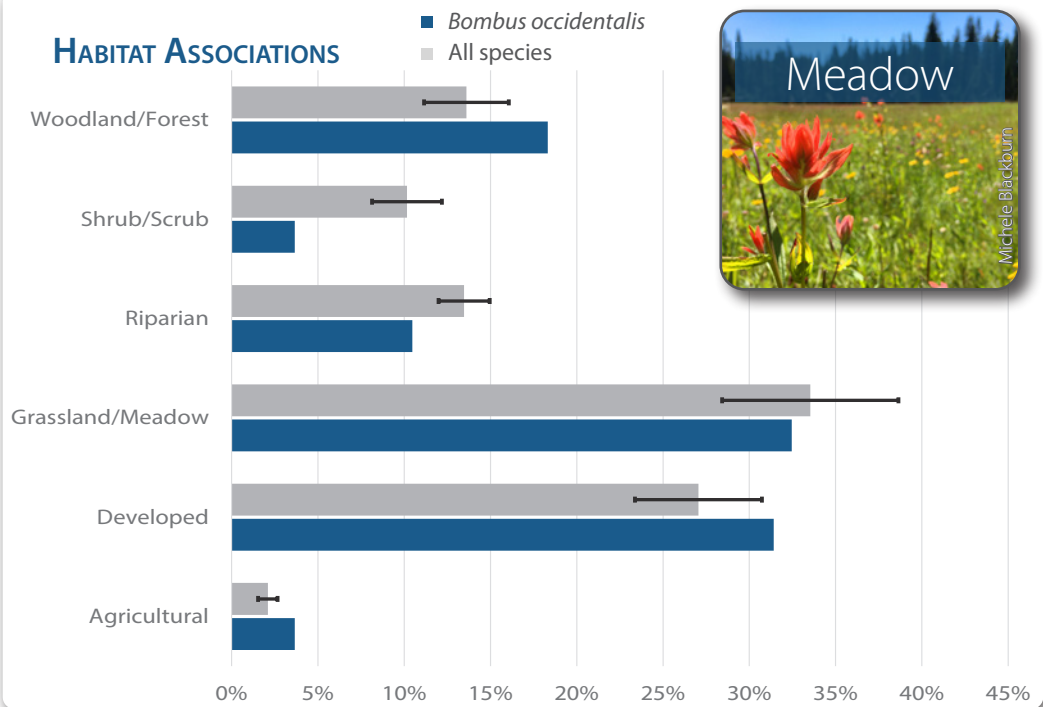
PLANT ASSOCIATIONS
Top 10 Genera

- 1 *Centaurea*
- 2 *Cirsium*
- 3 *Spirea*
- 4 *Lupinus*
- 5 *Lavandula*
- 6 *Solidago*
- 7 *Chamaenerion*
- 8 *Anaphalis*
- 9 *Hypericum*
- 10 *Origanum*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Credits

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SPECIES SUMMARY

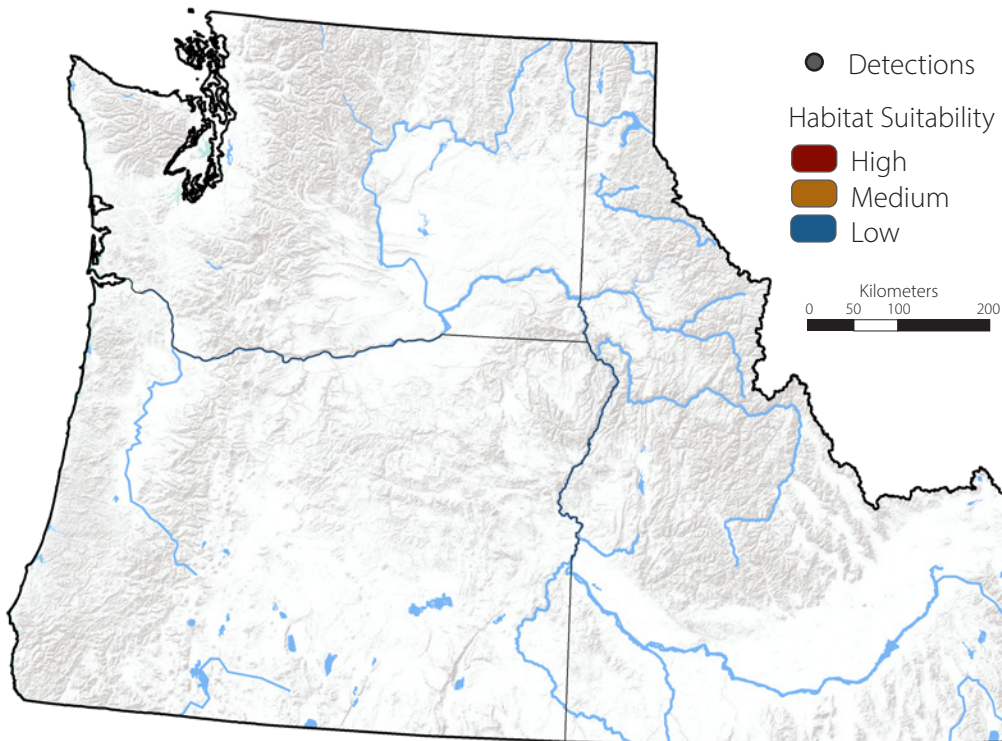
Overview

The Suckley Cuckoo Bumble Bee is an imperiled species found historically from Alaska south through the Rocky Mountains to Colorado, and south in the Cascades and Klamath Mountains to northern California. The bee also occurs in prairie habitats of Saskatchewan, Alberta, and Manitoba down through Nebraska, and there is a disjunct population found in eastern Canada. Reflecting its imperiled status in North America, we did not observe this species during the Pacific Northwest Bumble Bee Atlas. Suckley Cuckoo Bumble Bee is a social parasite that (in the western US) primarily lives in nests of Western Bumble Bee, and the rarity of its host is likely to affect its own survival. This species has been assessed as critically endangered, and has been petitioned for listing under the Endangered Species Act.



Suckley Cuckoo Bumble Bee (*Bombus suckleyi*).
(Cory Sheffield).

Detection Map



OBSERVATIONS

0



OF SURVEYS WITH
DETECTIONS

0 of 1542



OF GRID CELLS
WITH DETECTIONS

0 of 364



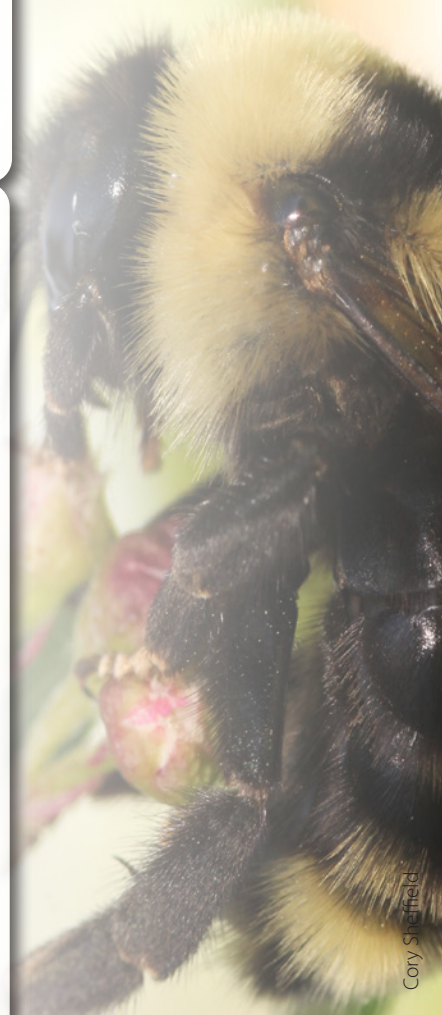
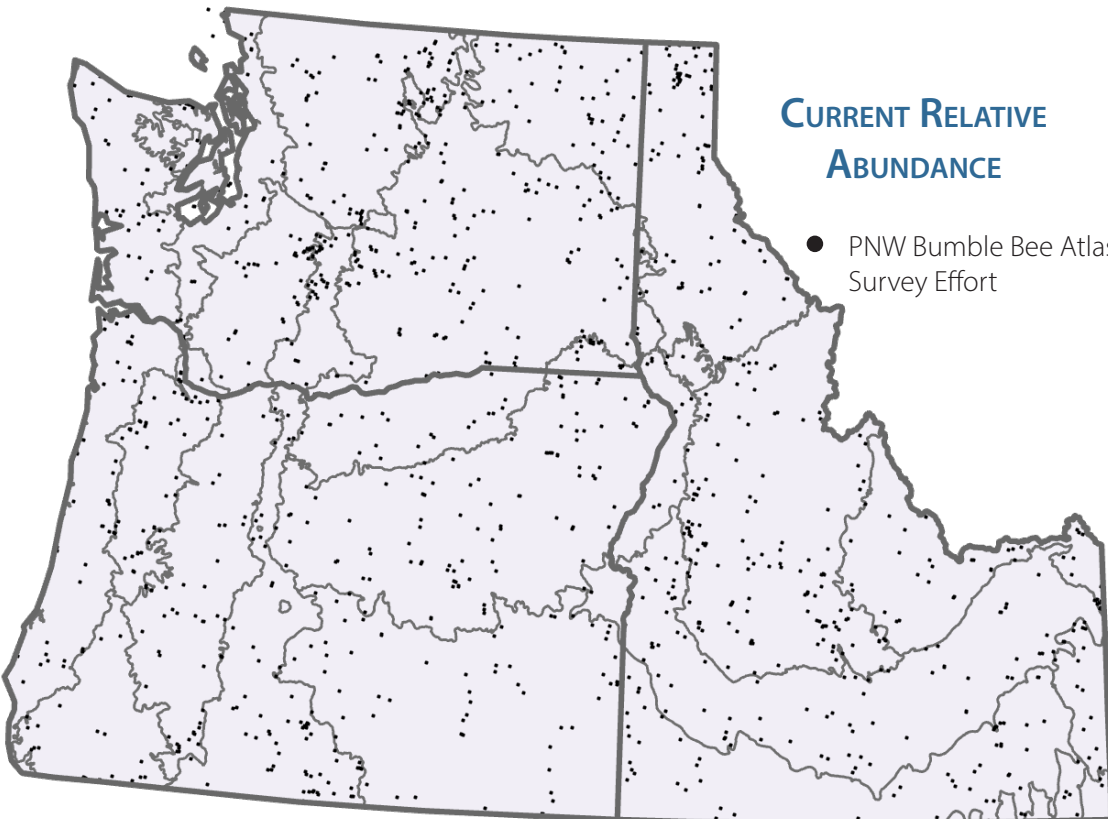
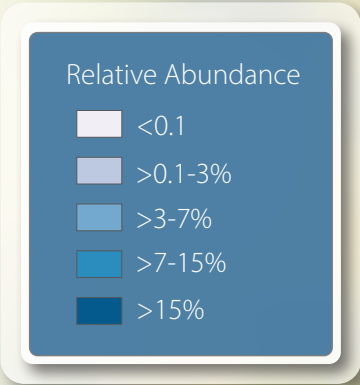
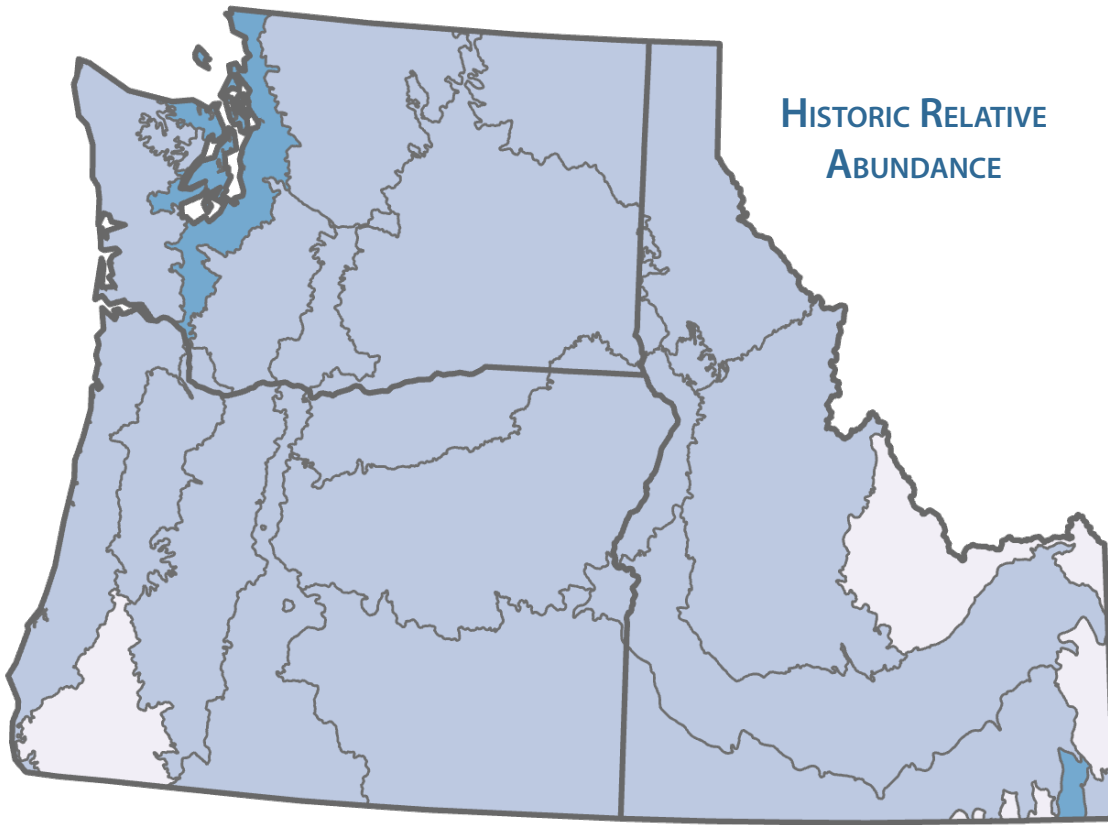
EXTENT OF KNOWN
OCCURRENCE

?





Relative Abundance Maps



Cory Sheffield



PHENOLOGY



Insufficient
Data

ELEVATION PROFILE



Insufficient
Data

PLANT ASSOCIATIONS
Top 10 Genera

1 ?

2 ?

3 ?

4 ?

5 ?

6 ?

7 ?

8 ?

9 ?

10 ?



multi-species appeal



important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Insufficient
Data

Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

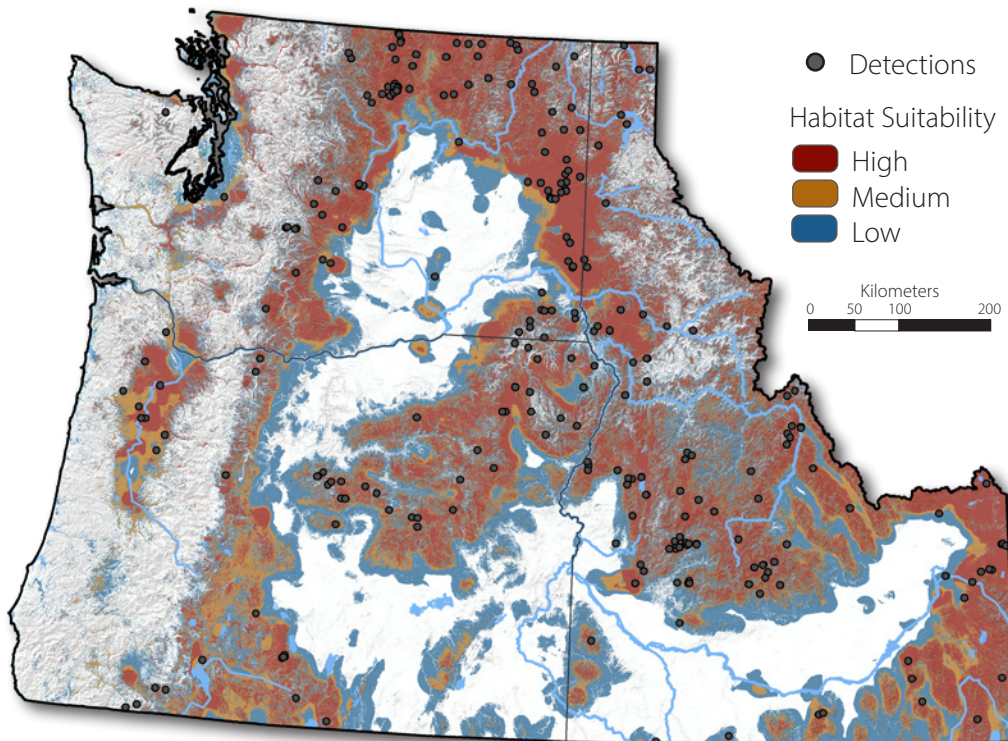
Overview

The White-shouldered Bumble Bee occurs in montane areas of the western US and adjacent Canada. This species was found broadly throughout the region, but accounts for less than 3% of all observations made by Pacific Northwest Bumble Bee Atlas surveyors, on par with its historic relative abundance in the region. It was most commonly observed in the Blue Mountains, Idaho Batholith, Northern Rockies, and Willamette Valley Ecoregions. *B. appositus* was most often recorded in higher elevation forests and meadows, and was less likely to occur in developed areas than most other bumble bee species. Favored host plants observed during the Atlas project include thistles, larkspurs, and penstemons.



White-shouldered Bumble Bee (*Bombus appositus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

537



OF SURVEYS WITH
DETECTIONS

170 of 1542



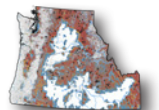
OF GRID CELLS
WITH DETECTIONS

125 of 364



EXTENT OF KNOWN
OCCURRENCE

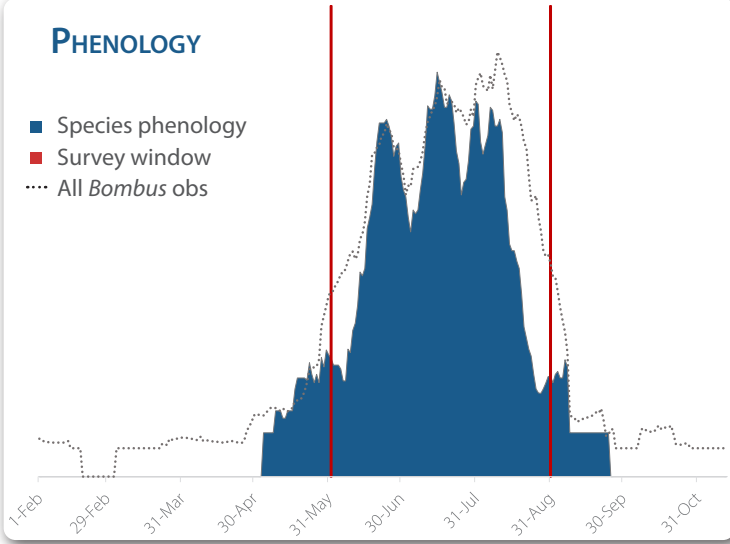
22,982 km²





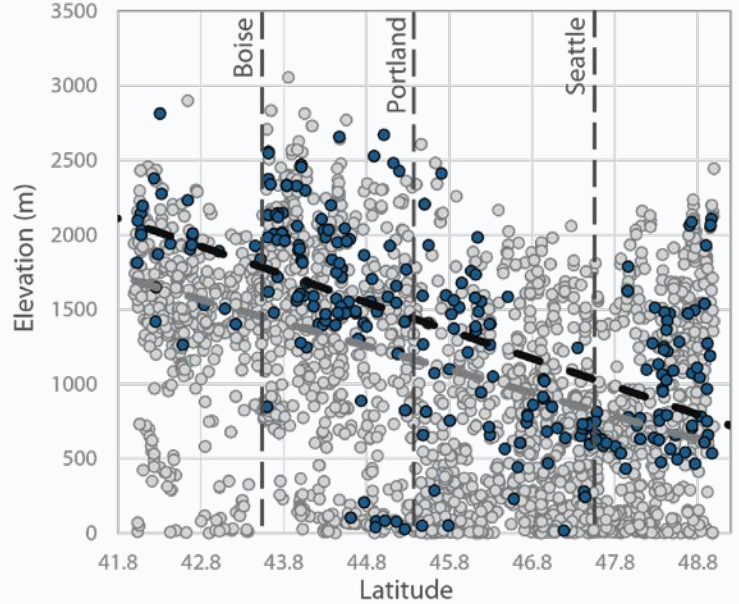
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus appositus*
- All species



PLANT ASSOCIATIONS

Top 10 Genera

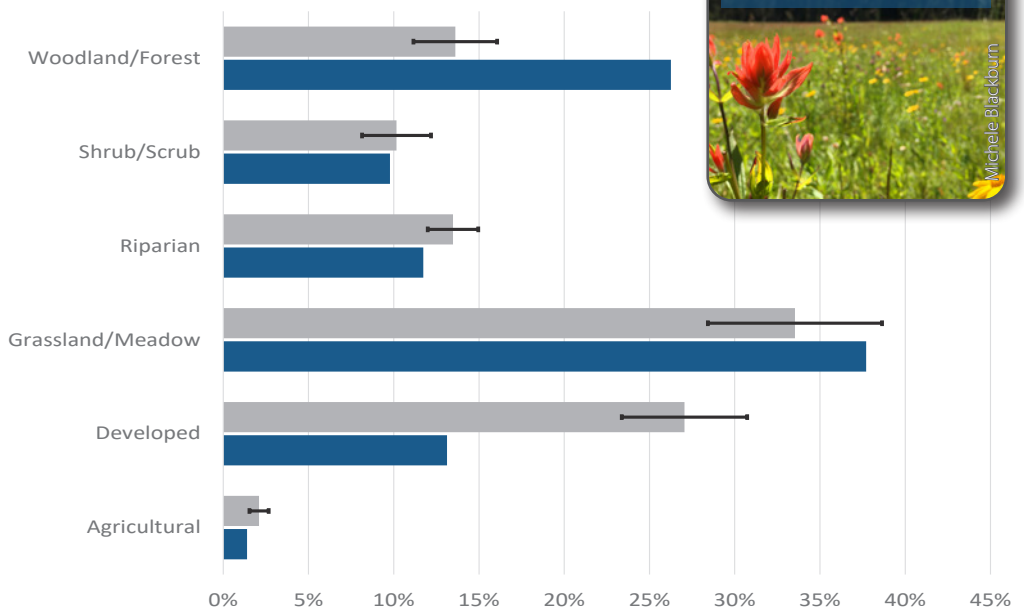
- 1 *Cirsium*
- 2 *Delphinium*
- 3 *Penstemon*
- 4 *Dipsacus*
- 5 *Vicia*
- 6 *Agastache*
- 7 *Thermopsis*
- 8 *Monarda*
- 9 *Trifolium*
- 10 *Aconitum*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus appositus*
- All species



Credits

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SPECIES SUMMARY

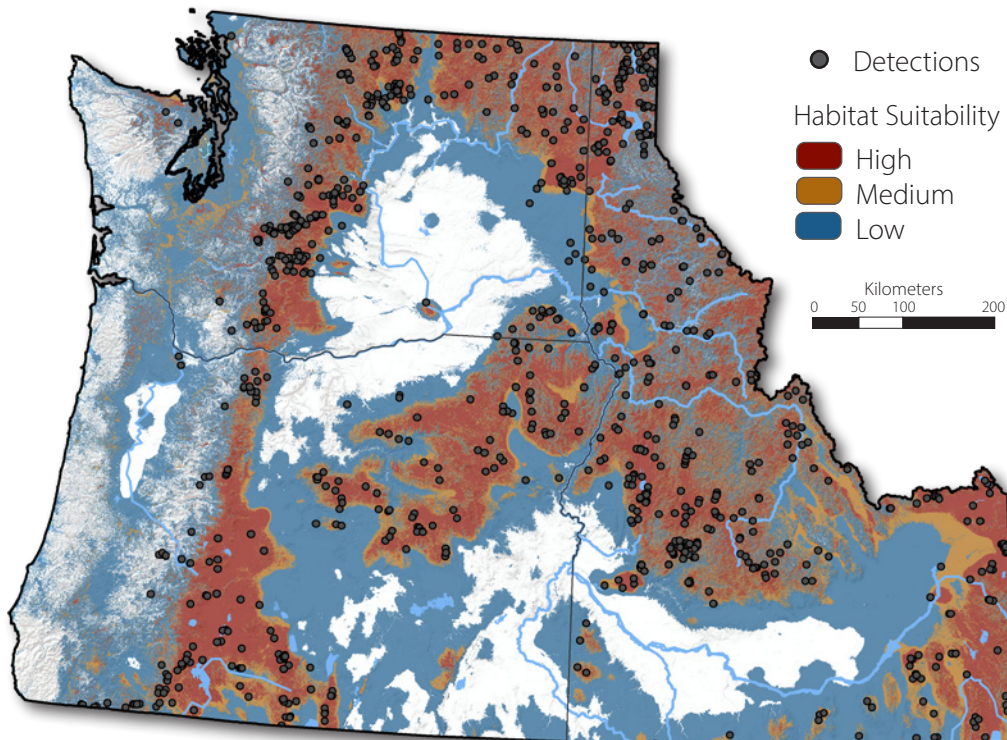
Overview

The Two-form Bumble Bee was the most common species recorded in the Pacific Northwest Bumble Bee Atlas, accounting for more than 20% of all observations. This represents an increase in relative abundance compared to historical data, suggesting that its populations may be increasing in the region. The species was most commonly observed in the Eastern Cascade Foothills, Northern Cascade, Northern Rockies, Blue Mountains, and Idaho Batholith Ecoregions. Despite its prevalence, *B. bifarius* was largely absent from the Puget Lowland during the survey, an ecoregion with numerous historic records. Surveyors located the bee in a range of habitats, especially forests, meadows, and riparian areas, but the species was generally less common than others in developed, shrubland, and agricultural areas. It was most often associated with lupines, fireweed, and thistles. The prevalence of this species in the Pacific Northwest Bumble Bee Atlas reflects its overall status, which has been assessed as stable.



Two-form Bumble Bee (*Bombus bifarius*) on Common Camas (*Camassia quamash*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

4430



OF SURVEYS WITH
DETECTIONS

603 of 1542



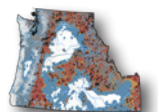
OF GRID CELLS
WITH DETECTIONS

204 of 364



EXTENT OF KNOWN
OCCURRENCE

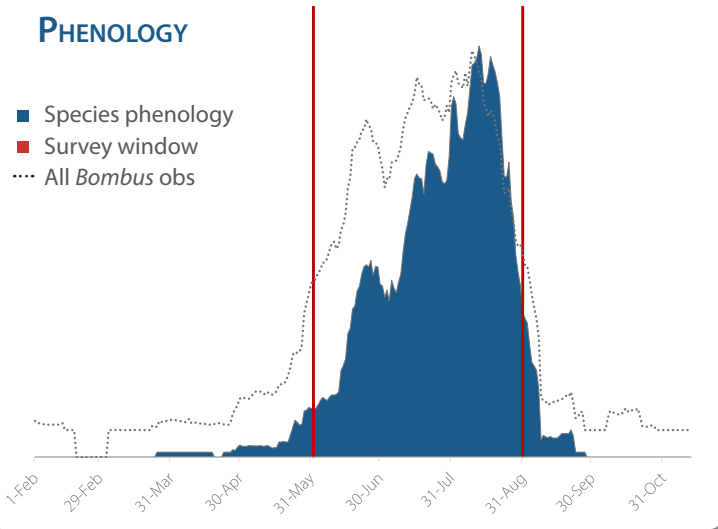
63,879 km²



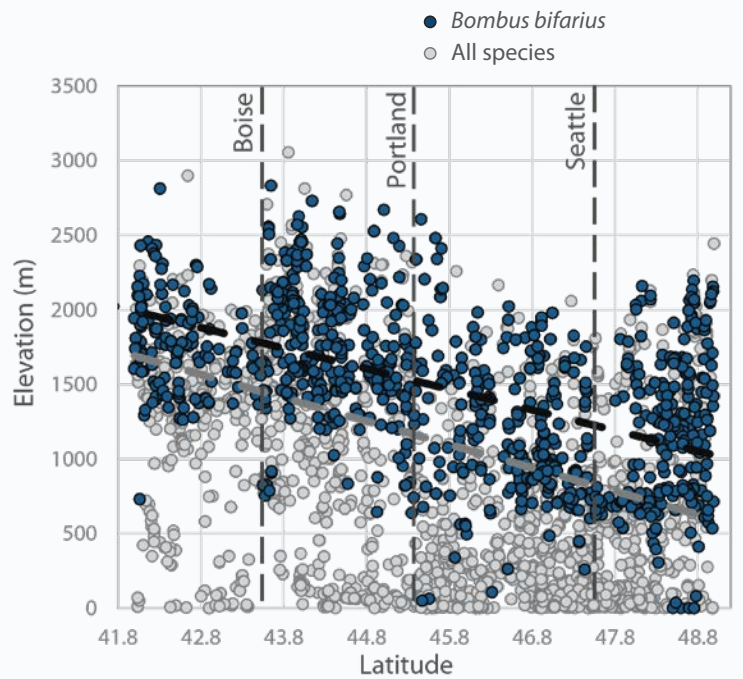


PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE



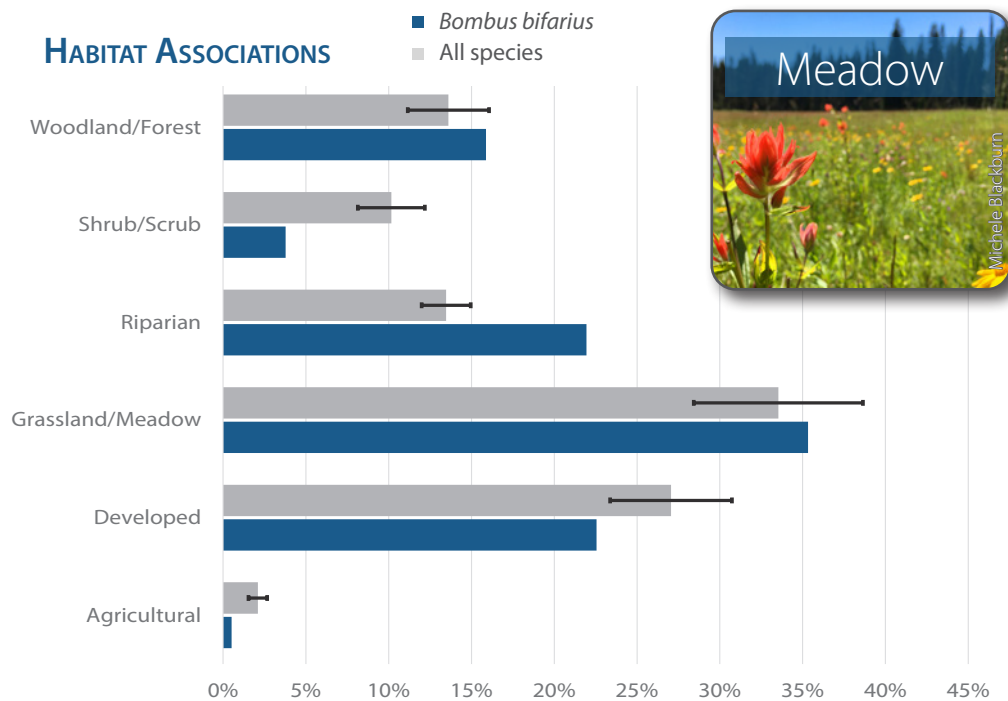
PLANT ASSOCIATIONS
Top 10 Genera

- 1 *Lupinus*
- 2 *Chamaenerion*
- 3 *Centaurea*
- 4 *Penstemon*
- 5 *Aster*
- 6 *Trifolium*
- 7 *Solidago*
- 8 *Spirea*
- 9 *Cirsium*
- 10 *Senecio*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Credits

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SPECIES SUMMARY

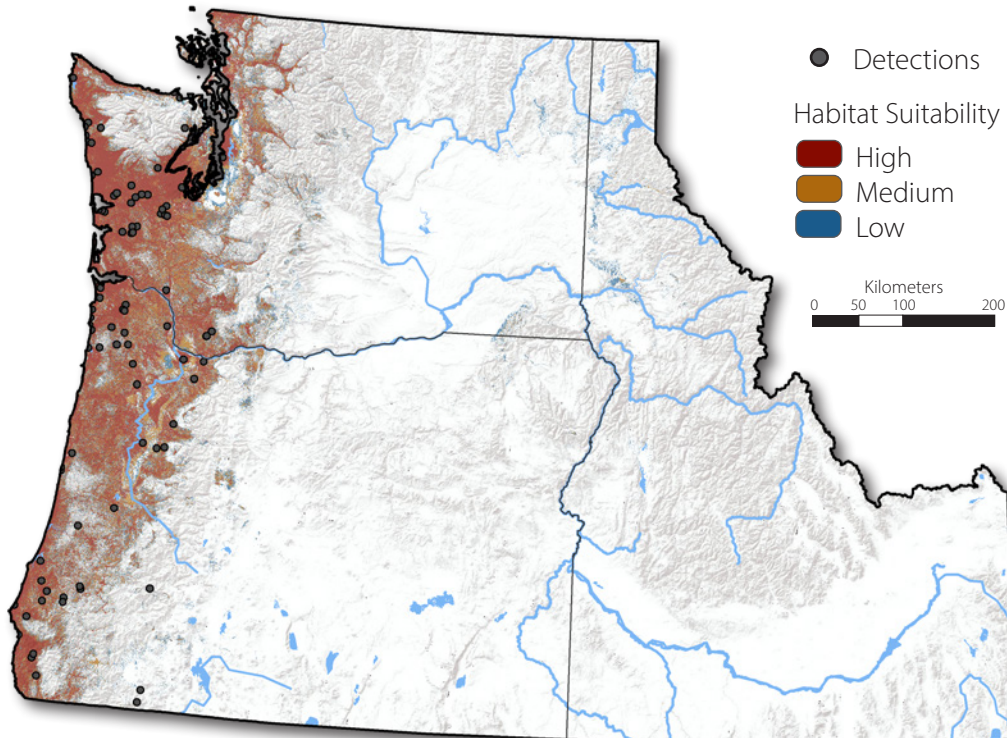
Overview

The Obscure Bumble Bee occupies a narrow coastal range from southern California to southern British Columbia. Never particularly common in comparison to other bumble bees, this species accounted for only around 1% of observations in the Pacific Northwest Bumble Bee Atlas, roughly half as common as in the historical baseline data. We most often observed this species at lower elevations in the Coastal Range, Willamette Valley, and Puget Lowland Ecoregions. It was also historically present in the Cascade Ecoregion in Oregon, but was mostly absent in this region throughout the Atlas. *B. caliginosus* was strongly associated with developed landscapes, and was most commonly sighted on raspberries and blackberries, self-heal, and clovers. This bee is considered to be declining across its range, and is a species of conservation concern. However, it closely resembles the very common *B. vosnesenskii*, and as a result may have been overlooked in some areas.



Obscure Bumble Bee (*Bombus caliginosus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

222



OF SURVEYS WITH
DETECTIONS

50 of 1542



OF GRID CELLS
WITH DETECTIONS

36 of 364



EXTENT OF KNOWN
OCCURRENCE

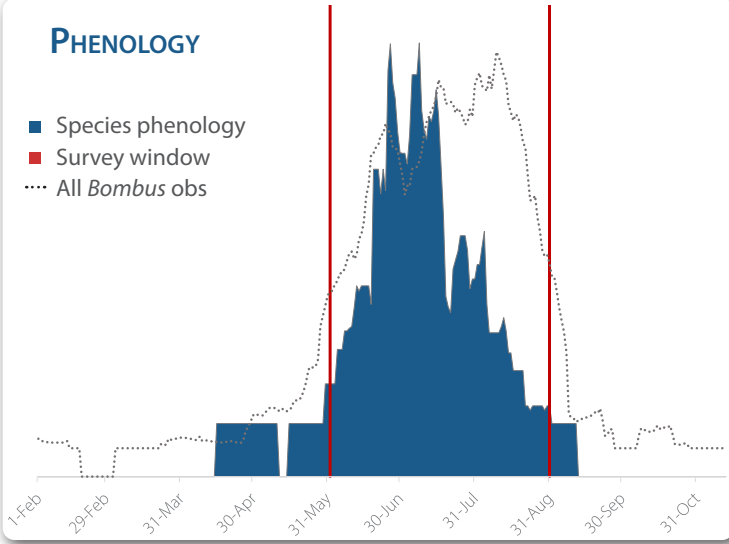
6,465 km²





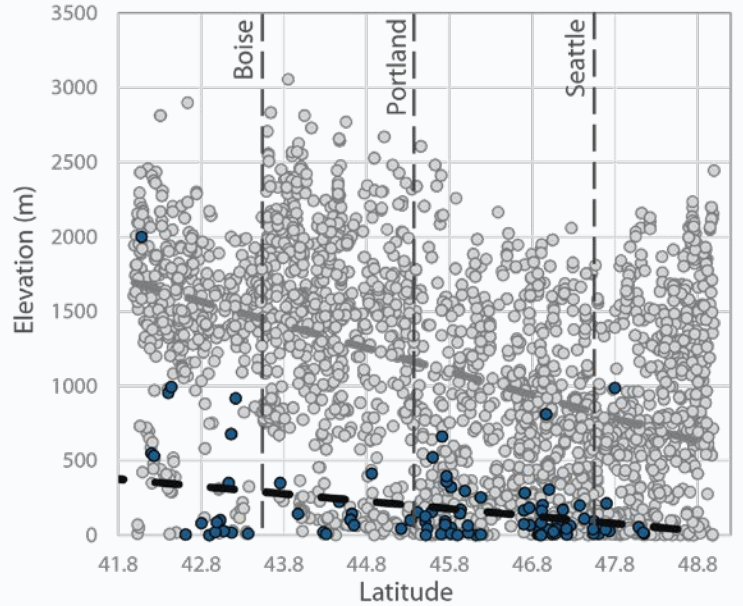
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus caliginosus*
- All species



PLANT ASSOCIATIONS

Top 10 Genera

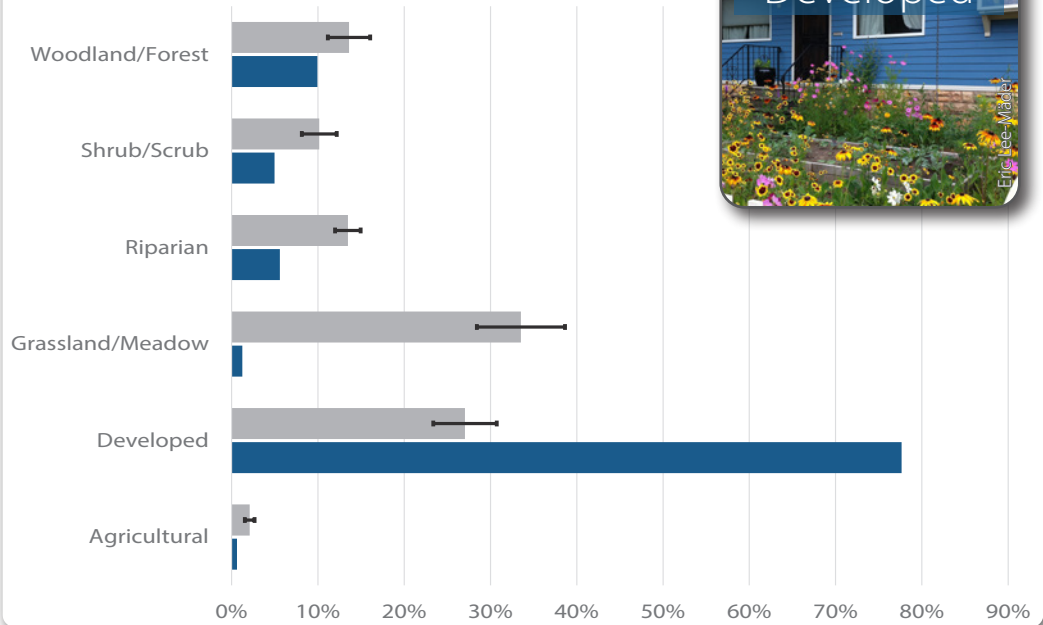
- 1 *Rubus* 🍷
- 2 *Prunella*
- 3 *Trifolium* 🍷
- 4 *Chamaenerion* 🍷🍷
- 5 *Hypericum* 🍷
- 6 *Perovskia*
- 7 *Cirsium* 🍷🍷
- 8 *Gaultheria*
- 9 *Symphoricarpos* 🍷🍷
- 10 *Cakile*

- 🍷 multi-species appeal
- 🍷 important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus caliginosus*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

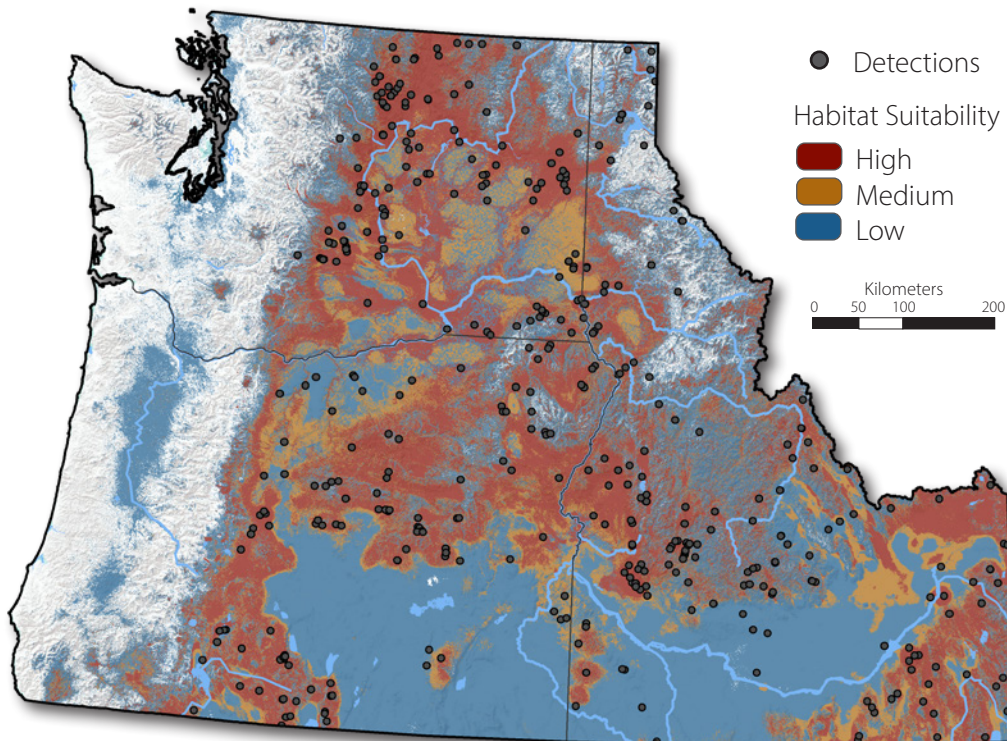
Overview

The Central Bumble Bee is broadly distributed across the Intermountain West. Observations of this bee comprise about 5% of Pacific Northwest Bumble Bee Atlas records, on par with their relative abundance in historical collections made in the region. Pacific Northwest Bumble Bee Atlas surveyors recorded Central Bumble Bee east of the Cascades, with the majority of records coming from the Columbia Plateau, Blue Mountains, and Idaho Batholith Ecoregions. It was most often detected in shrublands and riparian areas and was less abundant in meadows and developed areas. The Central Bumble Bee was observed most often on hyssop, fiddleneck, and penstemon flowers.



Central Bumble Bee (*Bombus centralis*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

1106



OF SURVEYS WITH
DETECTIONS

265 of 1542



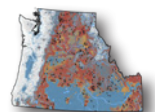
OF GRID CELLS
WITH DETECTIONS

172 of 364



EXTENT OF KNOWN
OCCURRENCE

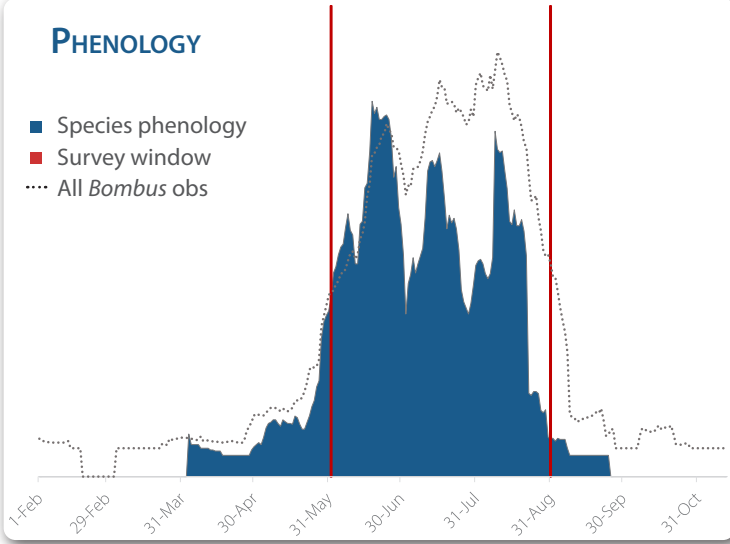
35,724 km²





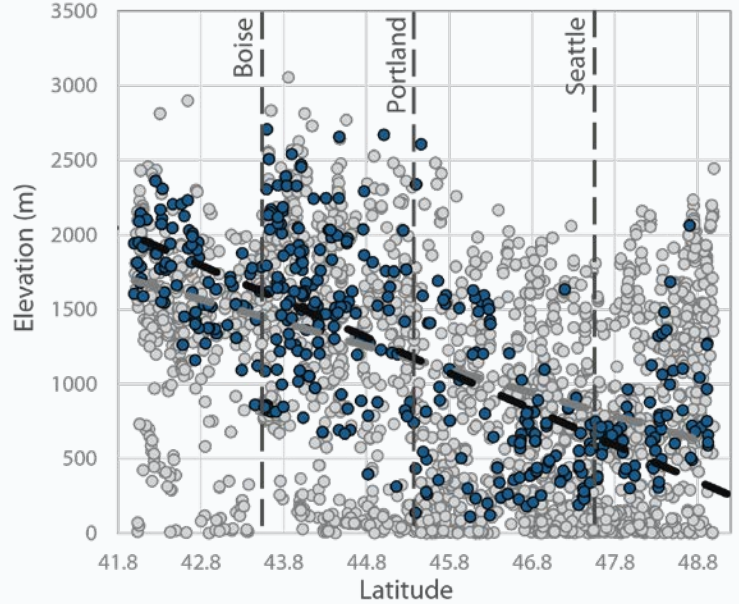
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus centralis*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

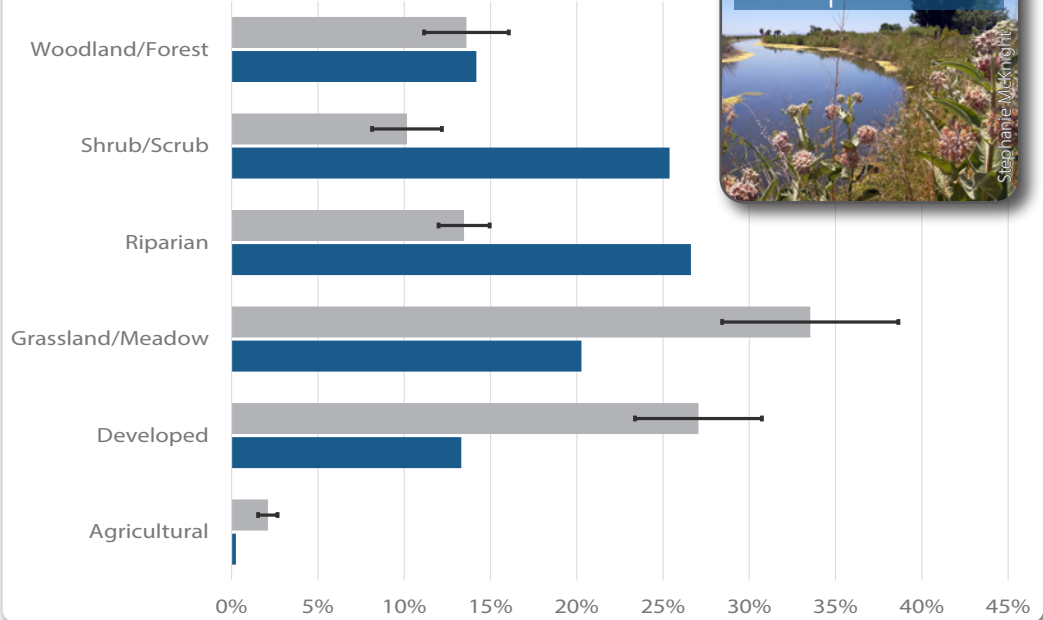
- 1 *Agastache*
- 2 *Phacelia*
- 3 *Penstemon*
- 4 *Lupinus*
- 5 *Symphoricarpos*
- 6 *Chamaenerion*
- 7 *Salvia*
- 8 *Cirsium*
- 9 *Carduus*
- 10 *Geranium*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus centralis*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





Bombus flavidus

IUCN STATUS: LEAST CONCERN

SPECIES SUMMARY

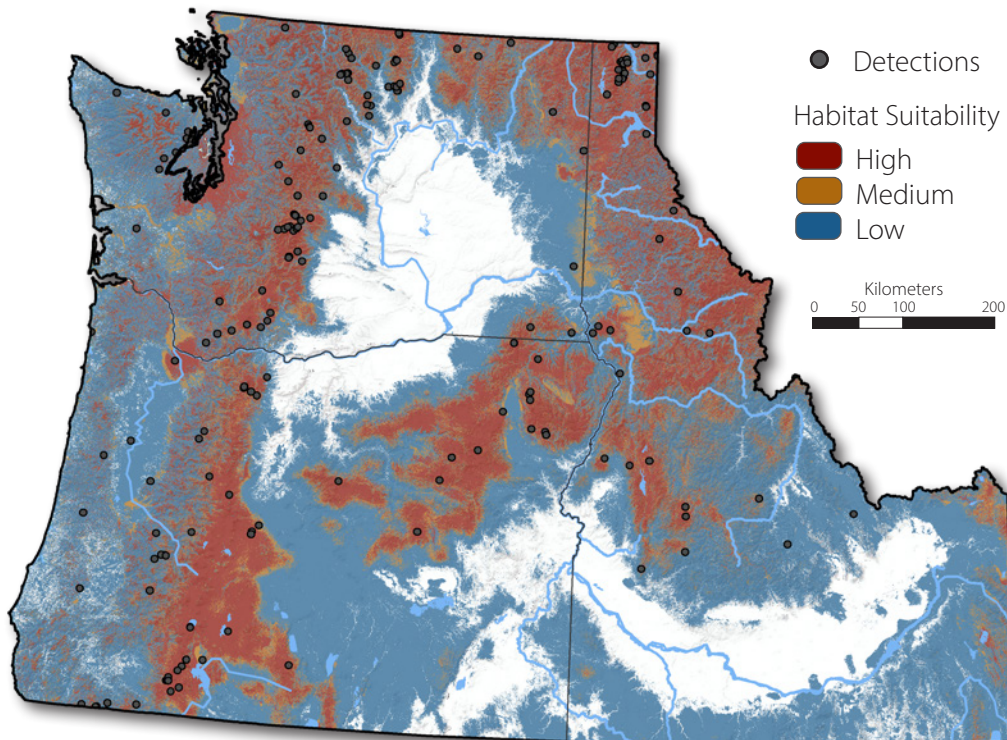
Overview

The Fernald Cuckoo Bumble Bee ranges widely across the Northern Hemisphere in both North America and Eurasia, with populations on this continent known from eastern Canada west to the Pacific Coast, with range extensions southward at higher elevations through the Appalachian, Rocky, and other mountain ranges. Most Atlas observations were made in the Cascade, Northern Cascade, Blue Mountains, and Northern Rockies Ecoregions. While its relative abundance is nearly equivalent between historic and recent periods across the Pacific Northwest, it was found less frequently than expected in Oregon's Coast Range and Willamette Valley Ecoregions. Atlas surveyors commonly detected this species in meadows, riparian zones, and developed areas, where it foraged on a variety of plants including goldenrod, fleabane, and dogbane. A cuckoo bumble bee, this species invades the nests of other bumble bees, forcing host colony workers to rear its offspring.



Fernald Cuckoo Bumble Bee (*Bombus flavidus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

319



OF SURVEYS WITH
DETECTIONS

118 of 1542



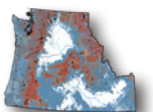
OF GRID CELLS
WITH DETECTIONS

84 of 364



EXTENT OF KNOWN
OCCURRENCE

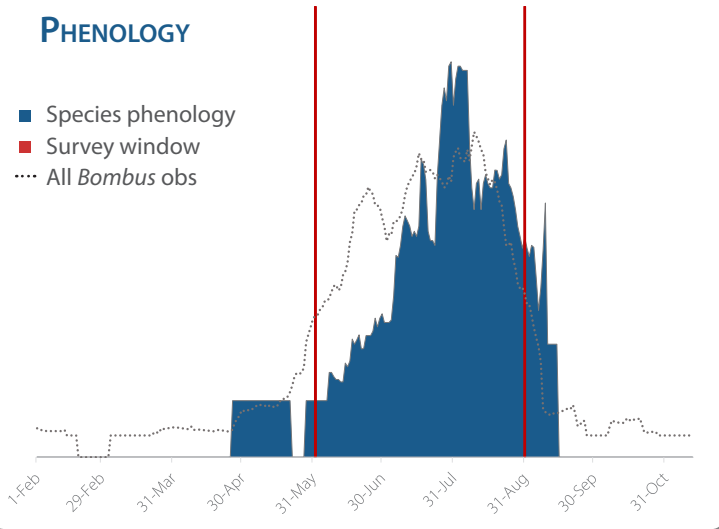
14,990 km²





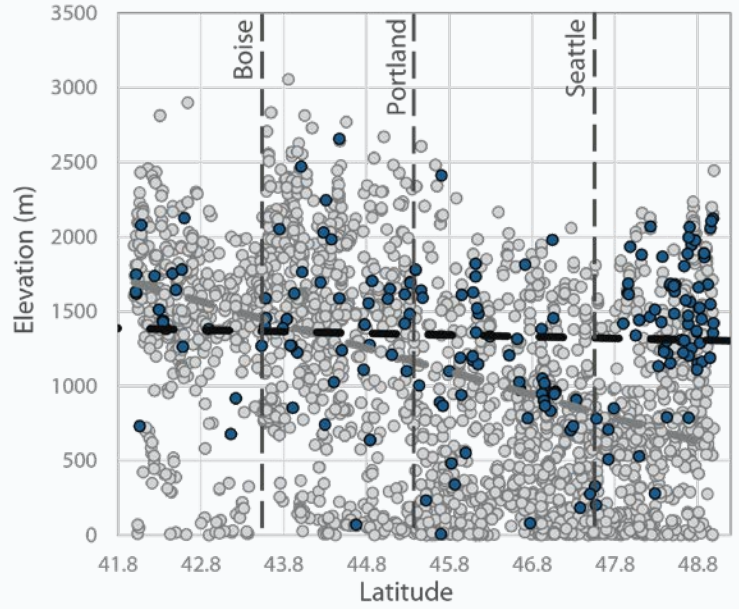
PHENOLOGY

- Species phenology
- Survey window
- ⋯ All *Bombus* obs



ELEVATION PROFILE

- *Bombus flavidus*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

- 1 *Solidago*
- 2 *Erigeron*
- 3 *Apocynum*
- 4 *Aster* 🐝
- 5 *Senecio*
- 6 *Centaurea* 🐝
- 7 *Cirsium* 🐝
- 8 *Anaphalis*
- 9 *Chamaenerion* 🐝

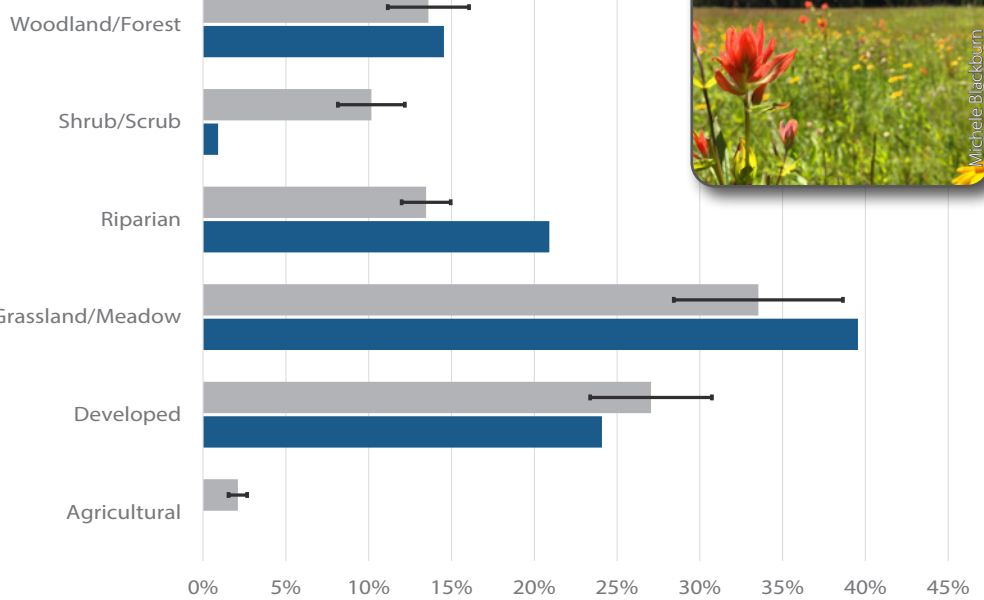
- 10 *Symphoricarpos* 🐝

- 🐝 multi-species appeal
- 🌻 important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus flavidus*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





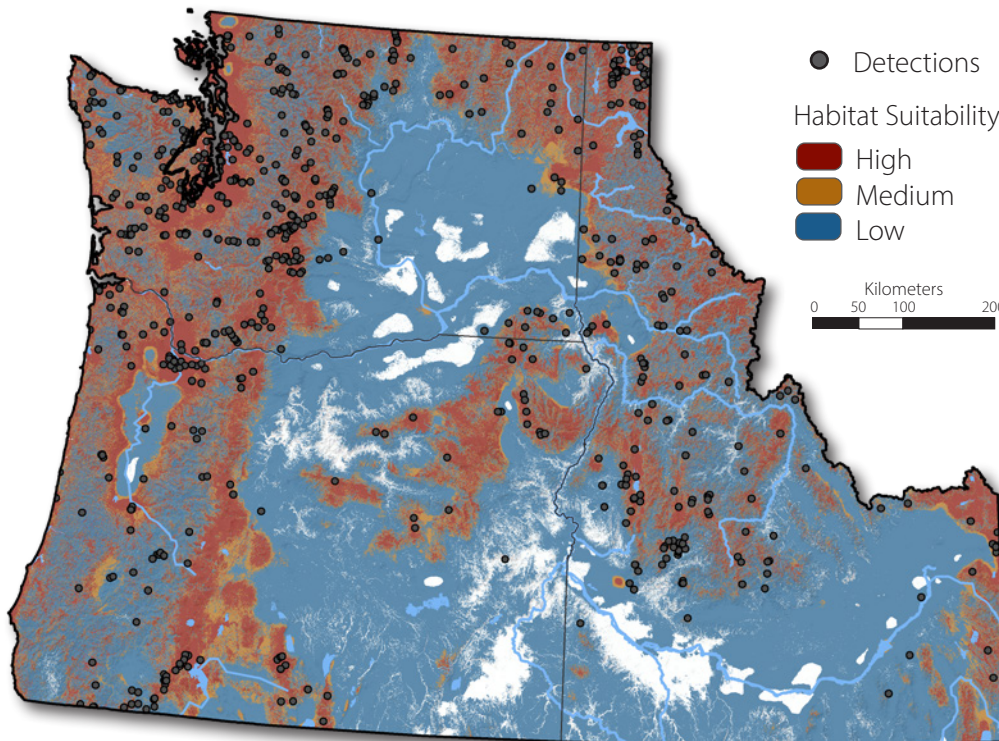
Overview

The Yellow Head Bumble Bee ranges widely across the western US, from Alaska south through coastal and montane regions to California, Arizona, and New Mexico. It was among the most commonly encountered species in the Pacific Northwest Bumble Bee Atlas, accounting for more than 10% of all observations. This species was commonly recorded in all of the mountainous ecoregions of the Pacific Northwest and was also extremely common in the Puget Lowland Ecoregion. It was most often found in forested, developed, and meadow habitats, where its preferred host plants were penstemons, fireweed, and clovers. The Yellow Head Bumble Bee appears to have a robust population in the Pacific Northwest, and is considered to be stable across its range.



Yellow Head Bumble Bee (*Bombus flavifrons*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

2015



OF SURVEYS WITH
DETECTIONS

433 of 1542



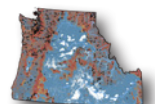
OF GRID CELLS
WITH DETECTIONS

195 of 364



EXTENT OF KNOWN
OCCURRENCE

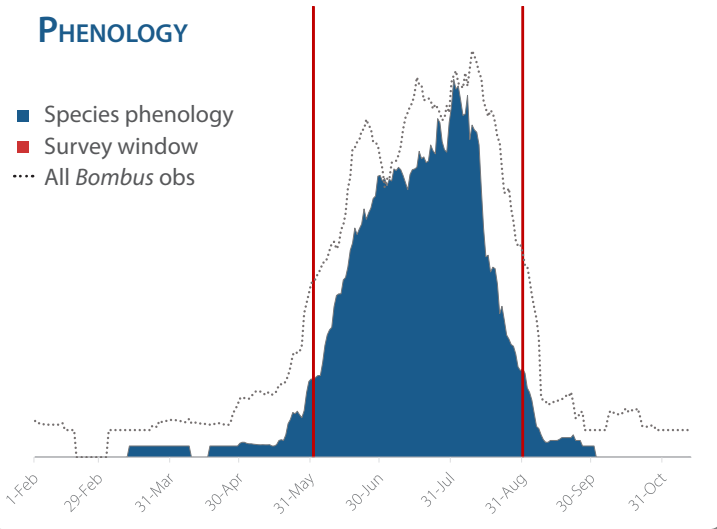
50,430 km²



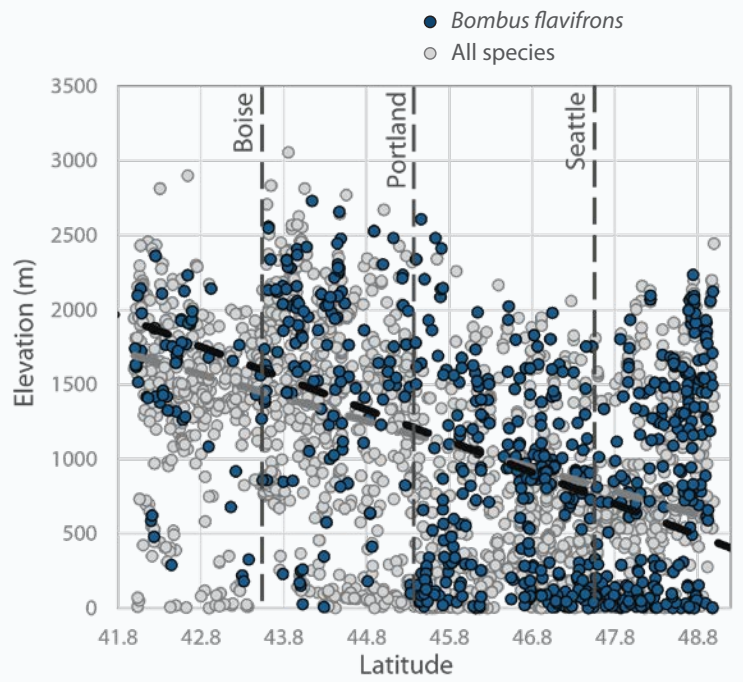


PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE



PLANT ASSOCIATIONS

Top 10 Genera

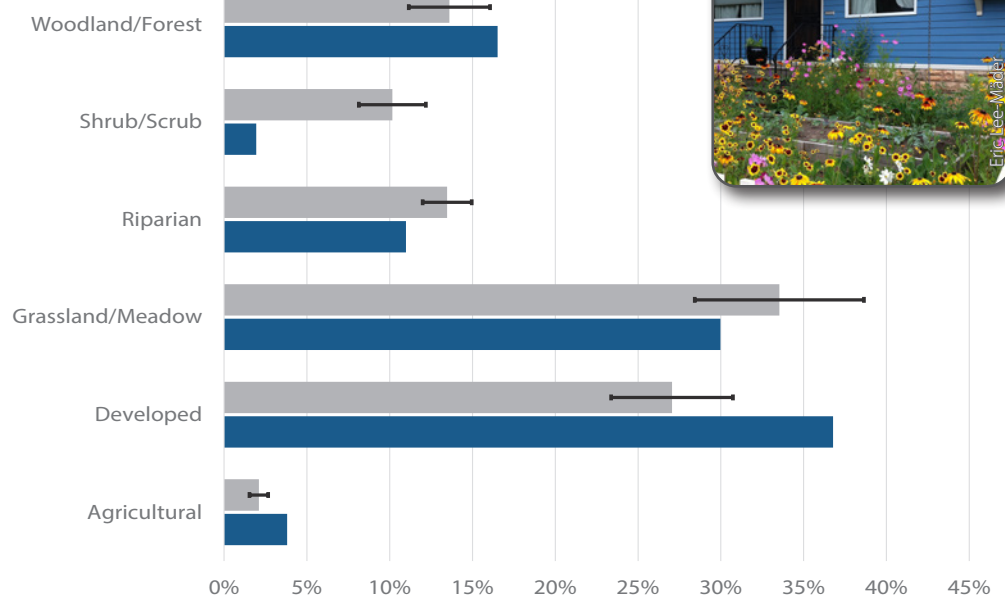
- 1 *Penstemon*
- 2 *Chamaenerion*
- 3 *Trifolium*
- 4 *Rubus*
- 5 *Cirsium*
- 6 *Agastache*
- 7 *Symphoricarpos*
- 8 *Aconitum*
- 9 *Lavandula*
- 10 *Hypericum*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus flavifrons*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

IUCN STATUS: CRITICALLY ENDANGERED

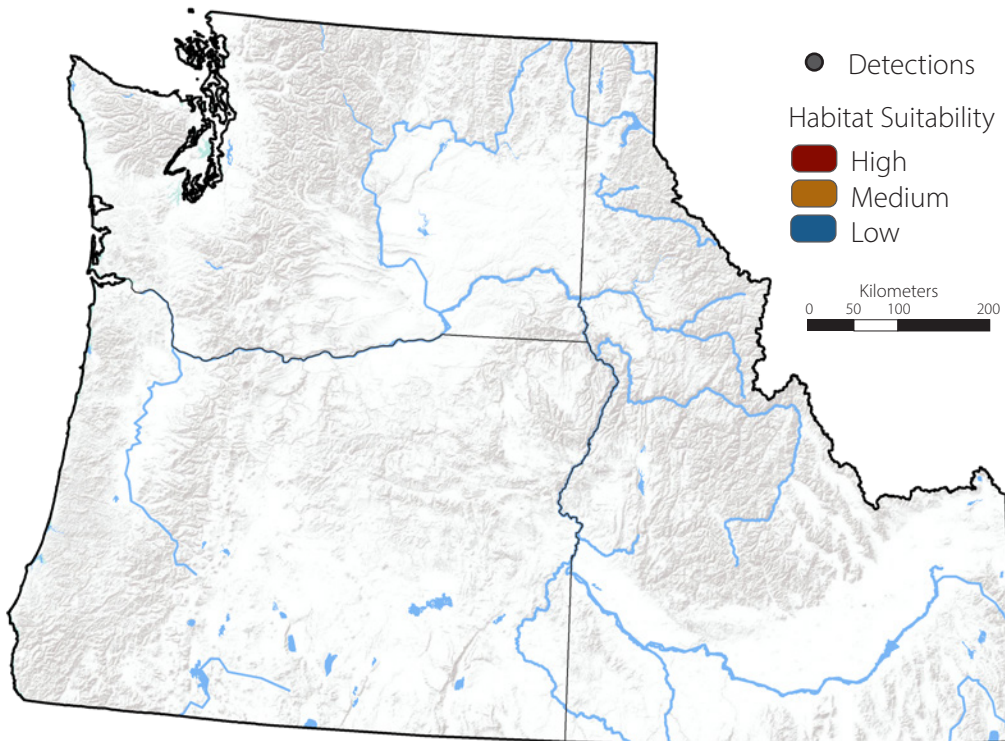
Overview

The Franklin Bumble Bee has an extremely small global range, occurring only in a 60 km x 100 km area of the Siskiyou and Klamath Mountains straddling the Oregon-California border. A close relative of the Western Bumble Bee, the species was documented to be in decline in the 1990s, and the last known observation was made in 2006. Unfortunately, this species was not observed during the Pacific Northwest Bumble Bee Atlas. Franklin Bumble Bee was officially listed as Endangered by the U.S. Fish and Wildlife Service in 2021.



Franklin Bumble Bee (*Bombus franklini*).
(USFWS / Brendan White).

Detection Map



OBSERVATIONS

0



OF SURVEYS WITH
DETECTIONS

0 of 1542



OF GRID CELLS
WITH DETECTIONS

0 of 364



EXTENT OF KNOWN
OCCURRENCE

?





PHENOLOGY



Insufficient
Data

ELEVATION PROFILE



Insufficient
Data

PLANT ASSOCIATIONS
Top 10 Genera

- 1 ?
- 2 ?
- 3 ?
- 4 ?
- 5 ?
- 6 ?
- 7 ?
- 8 ?
- 9 ?
- 10 ?



multi-species appeal



important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Insufficient
Data

Credits

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SPECIES SUMMARY

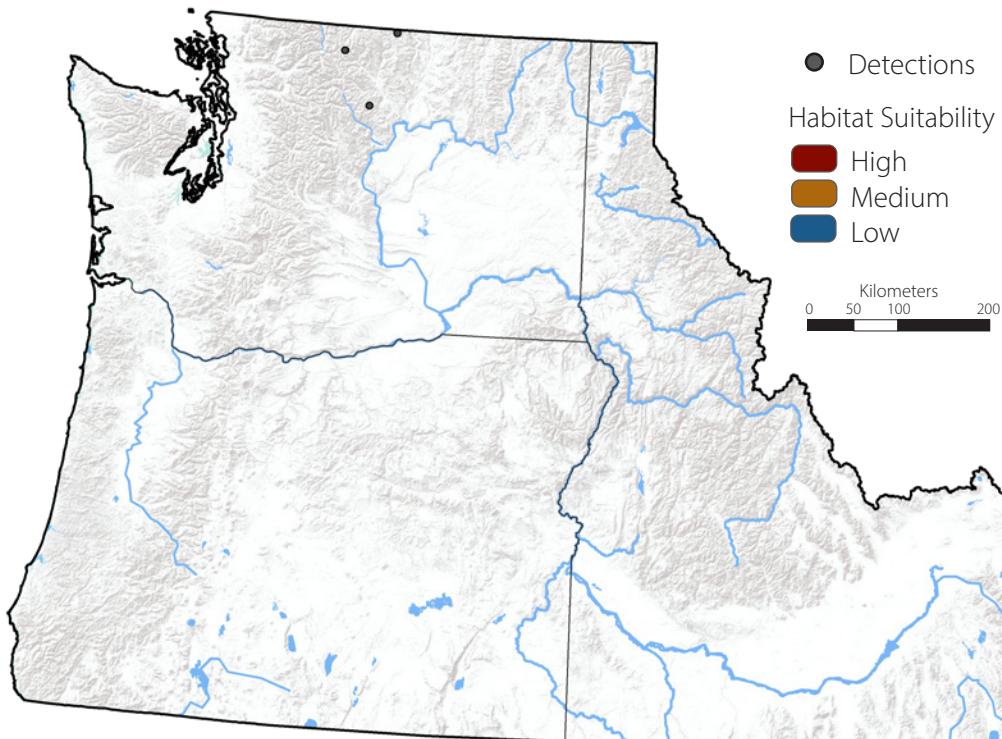
Overview

The Frigid Bumble Bee is found from Alaska to the eastern maritime provinces of Canada, with populations sparingly distributed at high elevations sites southward into the Pacific Northwest, along the Rocky Mountains, and into a few Midwestern and New England states. The Pacific Northwest Bumble Bee Atlas documented this species just four times, all in the North Cascade Ecoregion of Washington. This paucity of records likely reflects the fact that the bee is at the edge of its range in the Pacific Northwest. Volunteers recorded host plants for Frigid Bumble Bee as fleabane, fireweed, and an aster. The species is considered stable across its range.



Frigid Bumble Bee (*Bombus frigidus*).
(David Jennings).

Detection Map



OBSERVATIONS

4



OF SURVEYS WITH
DETECTIONS

3 of 1542



OF GRID CELLS
WITH DETECTIONS

2 of 364



EXTENT OF KNOWN
OCCURRENCE

257 km²





PHENOLOGY



Insufficient
Data

ELEVATION PROFILE



Insufficient
Data

PLANT ASSOCIATIONS
Top 10 Genera

1 ?

2 ?

3 ?

4 ?

5 ?

6 ?

7 ?

8 ?

9 ?

10 ?



multi-species appeal



important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Insufficient
Data

Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





BROWN-BELTED BUMBLE BEE

Bombus griseocollis

IUCN STATUS: LEAST CONCERN

SPECIES SUMMARY

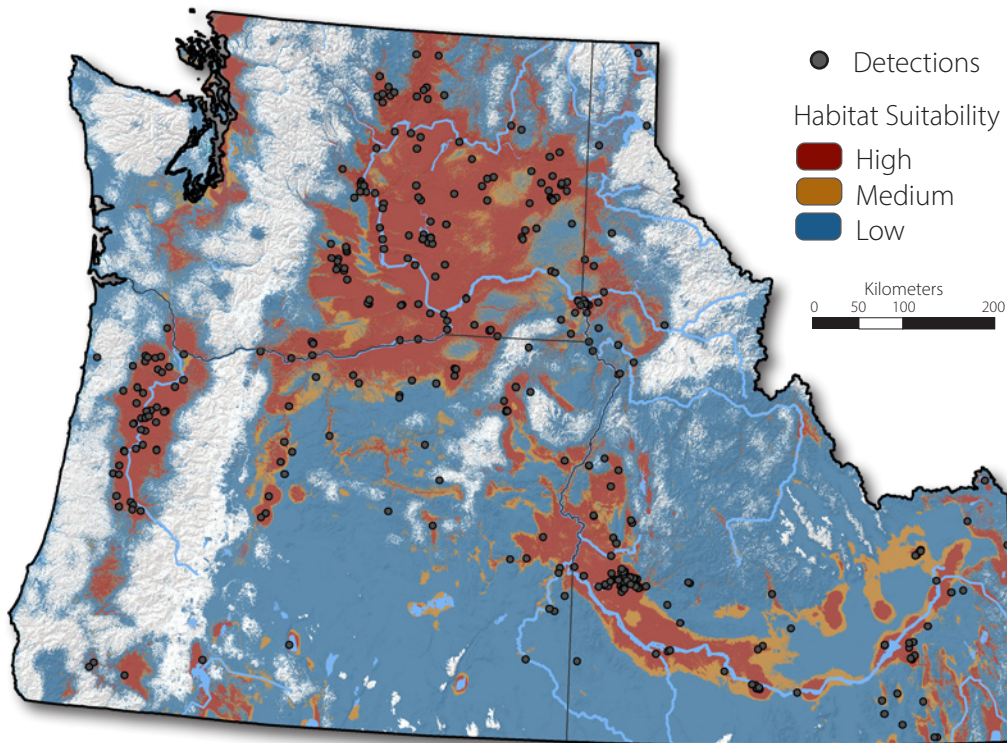
Overview

The Brown-belted Bumble Bee is a widespread species that occurs in every eastern US state and adjacent Canadian provinces, as well as across the Great Plains and into the Pacific Northwest; it is largely absent from the Southwestern US. It accounts for about 5% of bee observations in the Pacific Northwest Bumble Bee Atlas, a modest increase over historic baselines for the region. Volunteers located the Brown-belted Bumble Bee most often in the Willamette Valley, Snake River Plain, Blue Mountains, and Columbia Plateau Ecoregions. This species was found at lower elevations than most other species in the Atlas, and was most often associated with riparian, developed, and meadow habitats where favored host plants included milkweeds, sunflowers, and thistles. This species is stable or potentially increasing in abundance across its range.



Brown-belted Bumble Bee (*Bombus griseocollis*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

936



OF SURVEYS WITH
DETECTIONS

171 of 1542



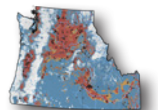
OF GRID CELLS
WITH DETECTIONS

124 of 364



EXTENT OF KNOWN
OCCURRENCE

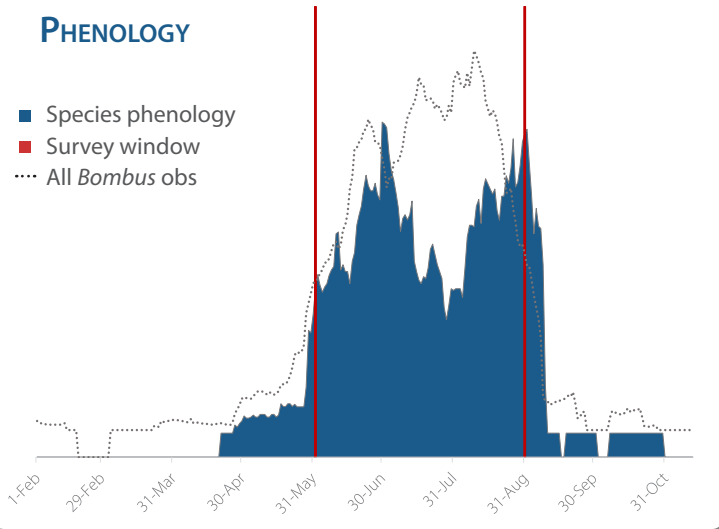
27,131 km²





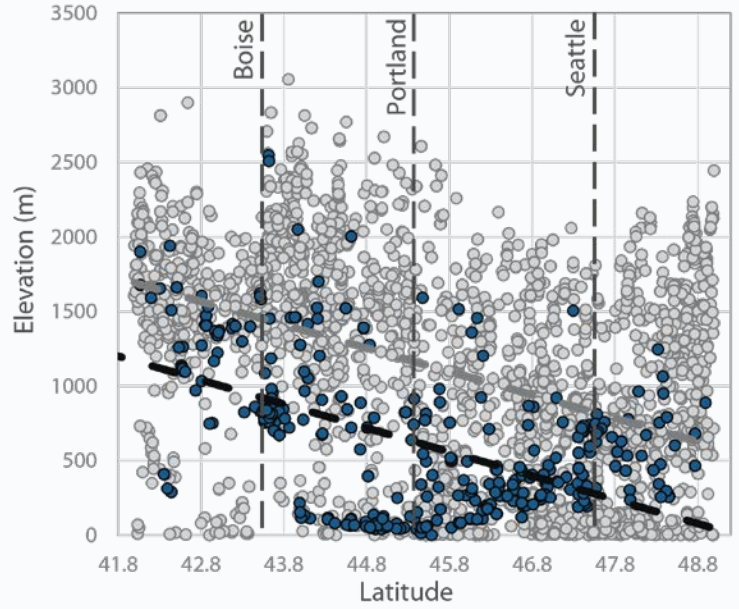
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus griseocollis*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

- 1 *Asclepias*
- 2 *Helianthus*
- 3 *Cirsium*
- 4 *Dipsacus*
- 5 *Vicia*
- 6 *Centaurea*
- 7 *Agastache*
- 8 *Lythum*
- 9 *Onopordum*

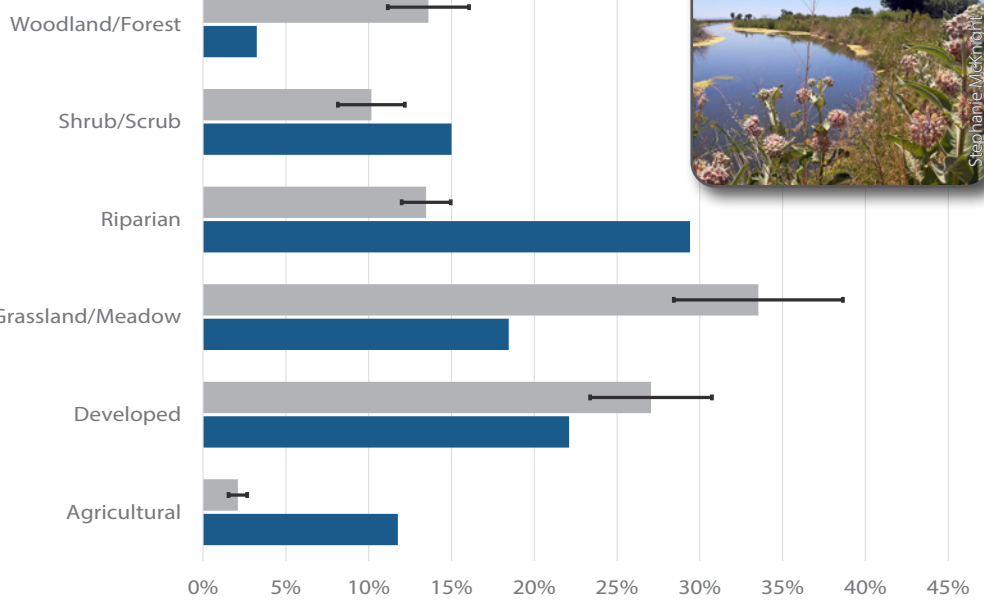
10 *Rubus*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus griseocollis*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





Bombus impatiens

IUCN STATUS: LEAST CONCERN

SPECIES SUMMARY

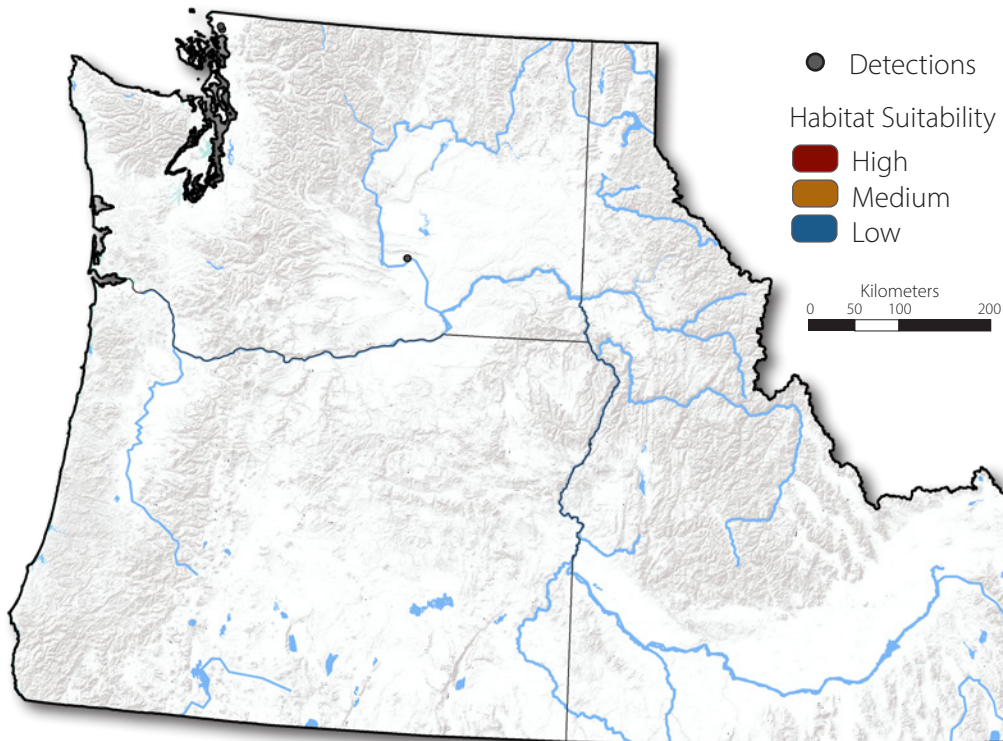
Overview

The Common Eastern Bumble Bee is the most abundant species found in the eastern US and adjacent southern Canada. It has recently been documented in numerous areas of the West, probably due to its widespread introduction as a pollinator of greenhouse and field crops. Many of these observations likely represent individuals escaped from greenhouses and farms, but a breeding population is established around Vancouver, BC and extending south into western Washington. We documented four observations of this bee during the Atlas, one along the Columbia River east of Yakima, two near Bellingham, WA, and one near Seattle, WA. The Common Eastern Bumble Bee is stable or increasing across its range.



Common Eastern Bumble Bee (*Bombus impatiens*).
(Leif Richardson).

Detection Map



OBSERVATIONS

4



OF SURVEYS WITH
DETECTIONS

1 of 1542



OF GRID CELLS
WITH DETECTIONS

2 of 364



EXTENT OF KNOWN
OCCURRENCE

299 km²





PHENOLOGY



Insufficient
Data

ELEVATION PROFILE



Insufficient
Data

PLANT ASSOCIATIONS
Top 10 Genera

- 1 ?
- 2 ?
- 3 ?
- 4 ?
- 5 ?
- 6 ?
- 7 ?
- 8 ?
- 9 ?
- 10 ?



multi-species appeal



important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Insufficient
Data

Credits

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SPECIES SUMMARY

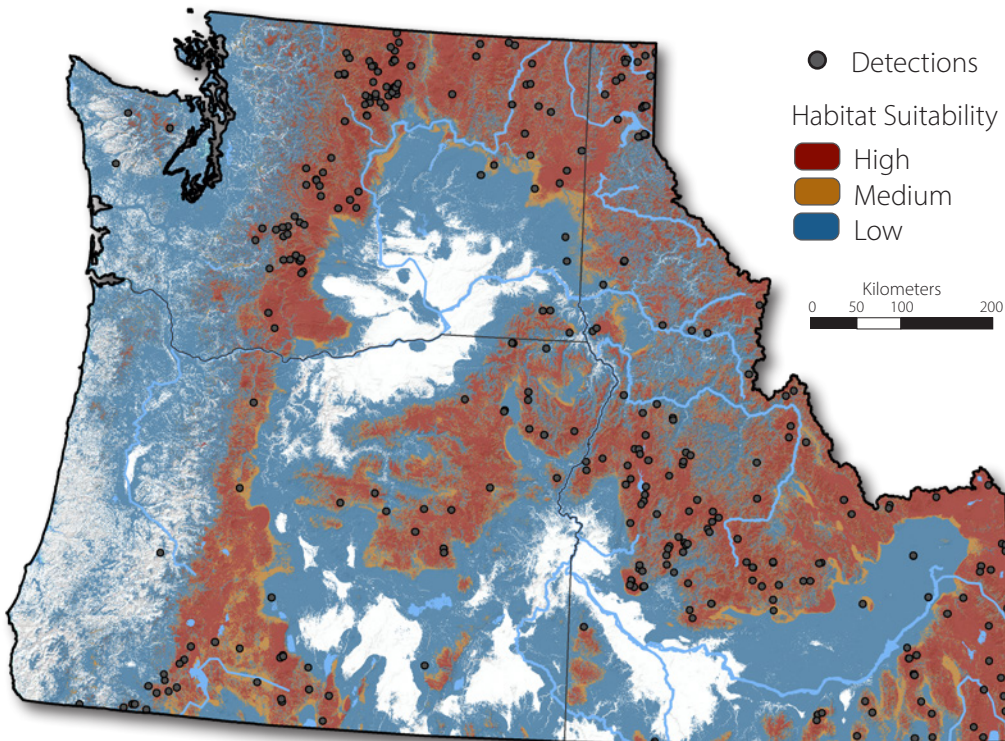
Overview

The Indiscriminate Cuckoo Bumble Bee is broadly distributed over northern and montane North America. It accounted for around 3% of observations in the Atlas, similar to its historical relative abundance in the region. Atlas surveyors observed this species most often in the Cascade, Northern Cascade, Northern Rockies, and Idaho Batholith Ecoregions, and generally at higher elevations than other species. This species is a social parasite of other bumble bees, and has been documented breeding in the nests of at least eight host species that occur in the region. This species was found equally across most of the habitat types surveyed, where it was most often observed on fireweed, thistle, and coneflowers. Because cuckoo bumble bees do not gather their own pollen, we can assume that these are nectar resources for the bee. While many species of parasitic bumble bees around the world are in decline, *B. insularis* has been assessed as stable.



Indiscriminate Bumble Bee (*Bombus insularis*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

660



OF SURVEYS WITH
DETECTIONS

417 of 1542



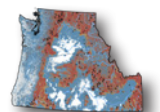
OF GRID CELLS
WITH DETECTIONS

138 of 364



EXTENT OF KNOWN
OCCURRENCE

26,173 km²

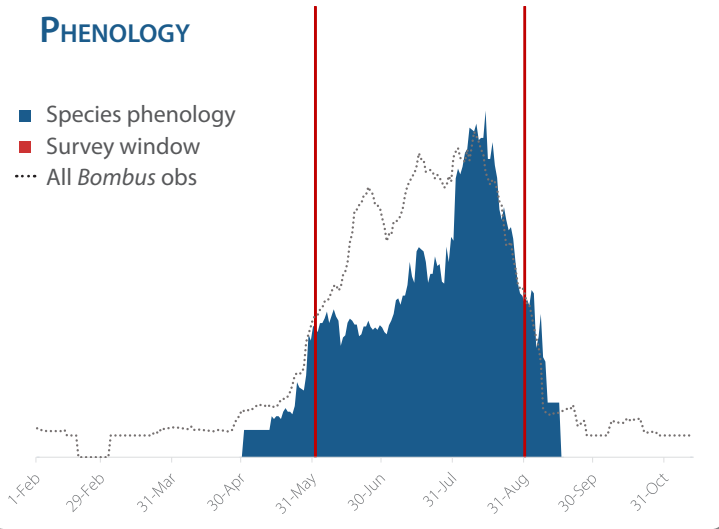




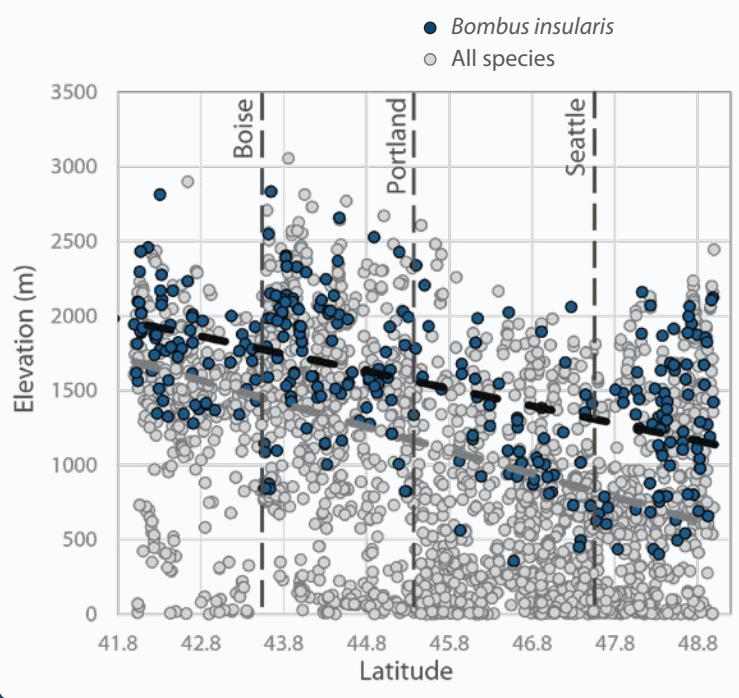
Bombus insularis

PHENOLOGY

- Species phenology
- Survey window
- ⋯ All *Bombus* obs



ELEVATION PROFILE



PLANT ASSOCIATIONS

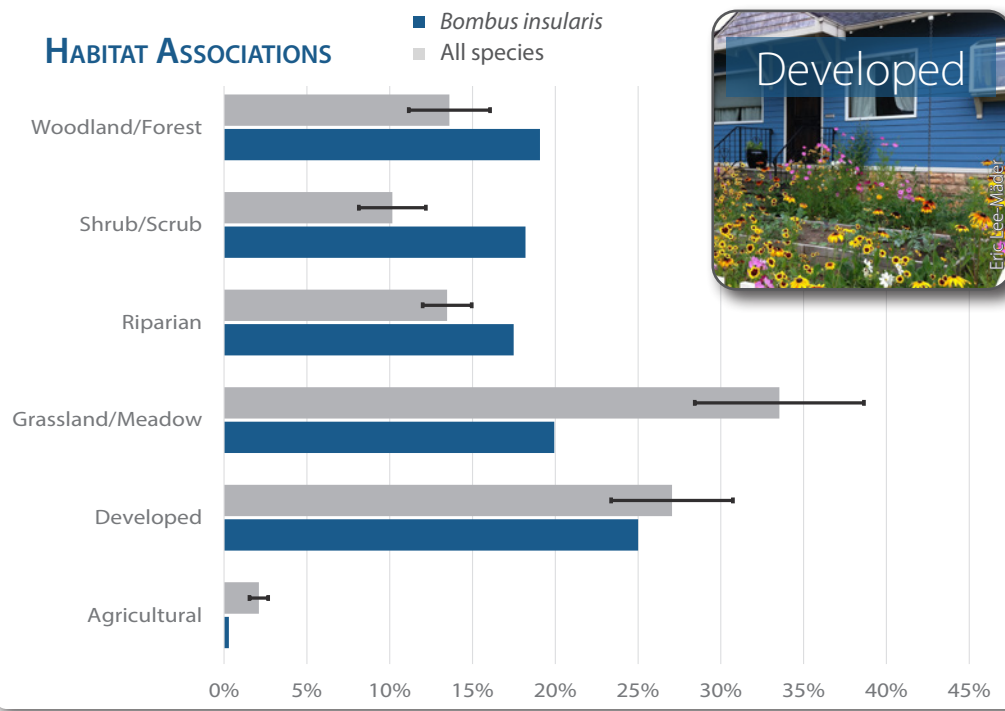
Top 10 Genera

- 1 *Chamaenerion*
- 2 *Cirsium*
- 3 *Rudbeckia*
- 4 *Erigeron*
- 5 *Senecio*
- 6 *Aster*
- 7 *Solidago*
- 8 *Symphoricarpos*
- 9 *Symphyotrichum*
- 10 *Arnica*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

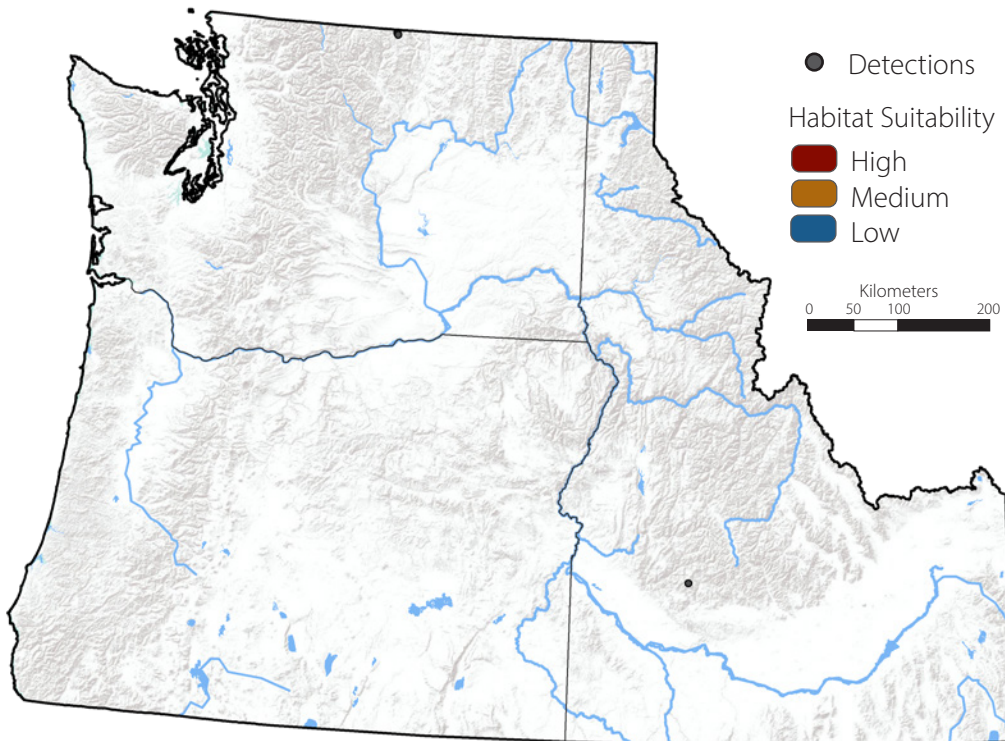
Overview

The High Country Bumble Bee occurs only in arctic and alpine areas of North America, with its range extending south from Alaska and arctic Canada into the Rocky Mountains to New Mexico; isolated populations also occur in the Sierra Nevada Mountains of California and sparingly at high elevation in the Pacific Northwest. Always uncommon in the region, the bee was located at several sites in the Northern Cascade Ecoregion. Unexpectedly, an Atlas surveyor also found the species east of Boise in the Idaho Batholith Ecoregion. While this species was too uncommon in the Atlas to draw general conclusions about foraging preferences, we observed it on hyssop, paintbrush, and arnica. We currently lack the data necessary to assess the status of High Country Bumble Bee across its range, but related species with similar distributions are thought to be especially vulnerable to climate change, given their restriction to high elevation and arctic habitats.



High Country Bumble Bee (*Bombus kirbiellus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

5



OF SURVEYS WITH
DETECTIONS

3 of 1542



OF GRID CELLS
WITH DETECTIONS

2 of 364



EXTENT OF KNOWN
OCCURRENCE

257 km²





PHENOLOGY



Insufficient
Data

ELEVATION PROFILE



Insufficient
Data

PLANT ASSOCIATIONS
Top 10 Genera

1 ?

2 ?

3 ?

4 ?

5 ?

6 ?

7 ?

8 ?

9 ?

10 ?



multi-species appeal



important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Insufficient
Data

Credits

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Bombus melanopygus

IUCN STATUS: LEAST CONCERN

SPECIES SUMMARY

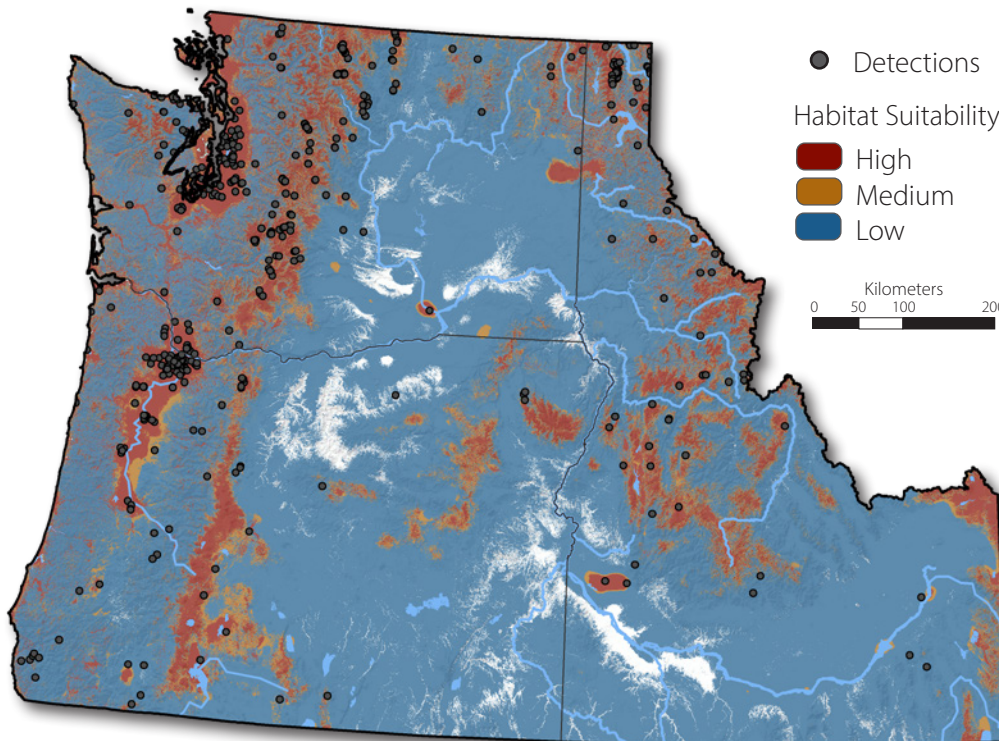
Overview

The Black Tail Bumble Bee occurs across a broad latitudinal range from Alaska south to Baja California and through the Rocky Mountains to Arizona and New Mexico; it is also found sparingly eastward across the boreal and subarctic regions of Canada. This species accounts for around 4.5% of the observations made during the Pacific Northwest Bumble Bee Atlas, similar to historic observations. The Black Tail Bumble Bee was abundant in surveys from the Willamette Valley and Puget Lowland Ecoregions. We also documented it in a range of other areas, including the Cascade, Northern Cascade, and Northern Rockies Ecoregions. Strongly associated with meadows, development, and forests, this species was most often observed foraging on rhododendron, lupines, and fleabane. Black Tail Bumble Bee has been assessed as stable across its range.



Black tail Bumble Bee (*Bombus melanopygus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

914



OF SURVEYS WITH
DETECTIONS

160 of 1542



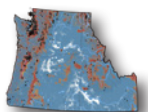
OF GRID CELLS
WITH DETECTIONS

115 of 364



EXTENT OF KNOWN
OCCURRENCE

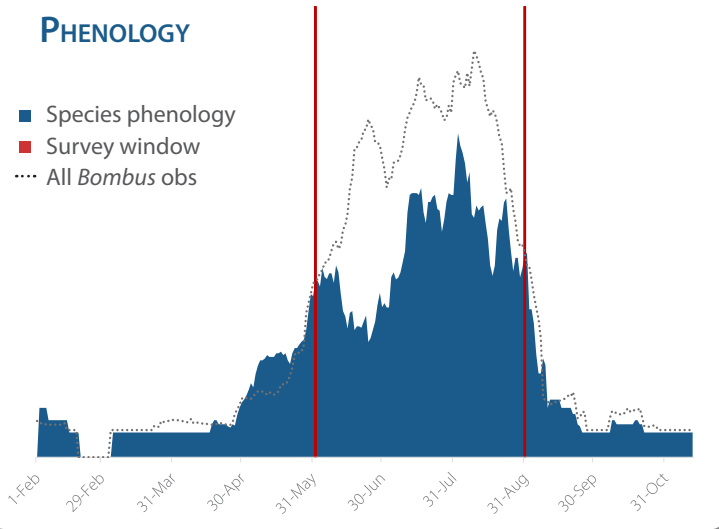
28,062 km²





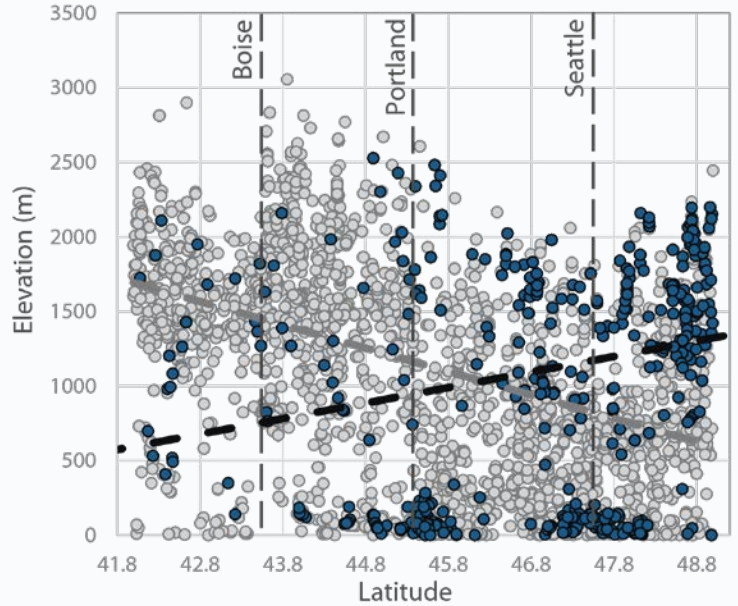
PHENOLOGY

■ Species phenology
■ Survey window
····· All *Bombus* obs



ELEVATION PROFILE

● *Bombus melanopygus*
○ All species



PLANT ASSOCIATIONS
Top 10 Genera

1 *Rhododendron*

2 *Lupinus* 🐝

3 *Erigeron*

4 *Chamaenerion* 🐝

5 *Trifolium* 🐝

6 *Rubus* 🐝

7 *Dodecatheon*

8 *Vaccinium*

9 *Phyllodoce*

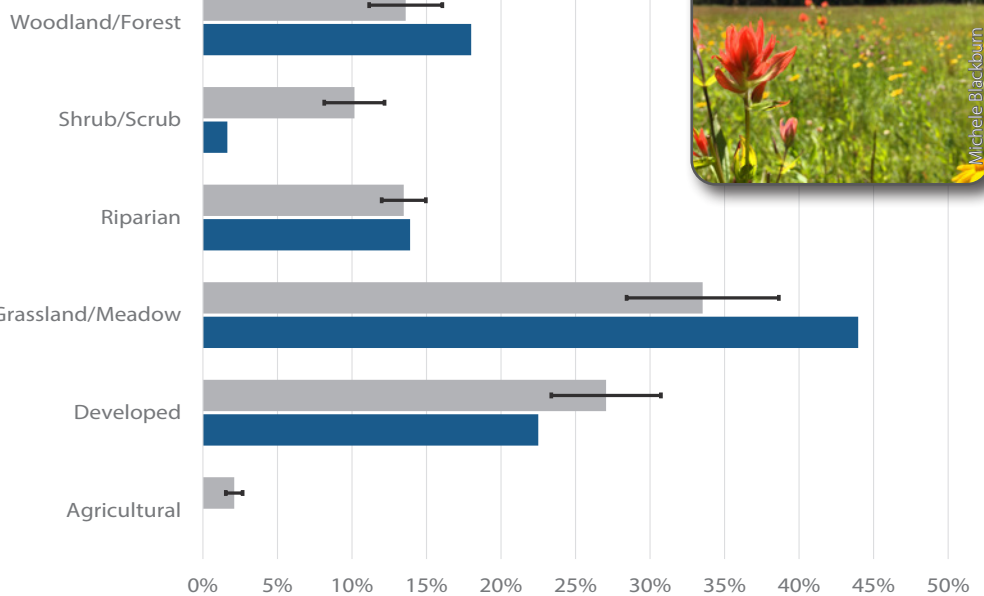
10 *Symphoricarpos* 🐝

🐝 multi-species appeal
🌸 important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

■ *Bombus melanopygus*
■ All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

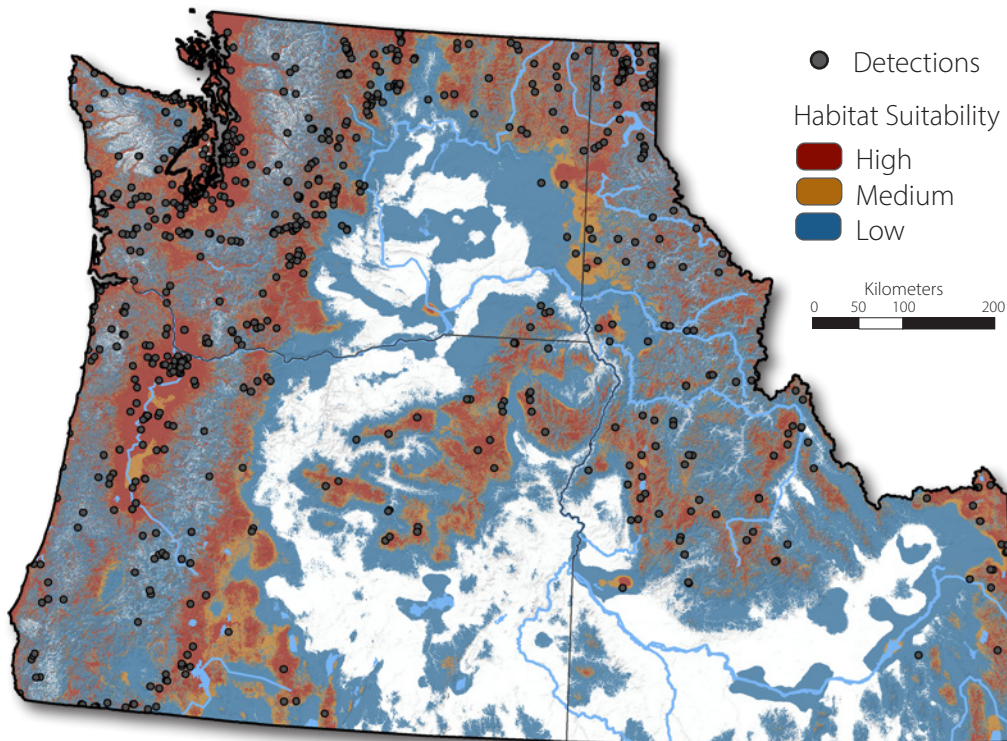
Overview

The Fuzzy-horned Bumble Bee ranges from Alaska and boreal/subarctic Canada southward through the Rocky Mountains and other mountainous areas of the West. It is also found at lower elevations along the Pacific Coast as far south as San Francisco. This species accounts for 8% of observations made by Pacific Northwest Bumble Bee Atlas surveyors, similar to its relative abundance in historic data from the region. Atlas surveyors made many observations of this bee in the Coast Range, Willamette Valley, and Puget Lowland Ecoregions; it was also present in the Blue Mountains, Northern Rockies, and Idaho Batholith Ecoregions. It was strongly associated with habitats of developed areas near the Pacific Coast, as well as meadows, forests, and riparian areas. Raspberry, snowberry, and lupines were the most common forage plants identified. This species has been assessed as stable across its range.



Fuzzy-horned Bumble Bee (*Bombus mixtus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

1733



OF SURVEYS WITH
DETECTIONS

387 of 1542



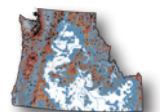
OF GRID CELLS
WITH DETECTIONS

188 of 364



EXTENT OF KNOWN
OCCURRENCE

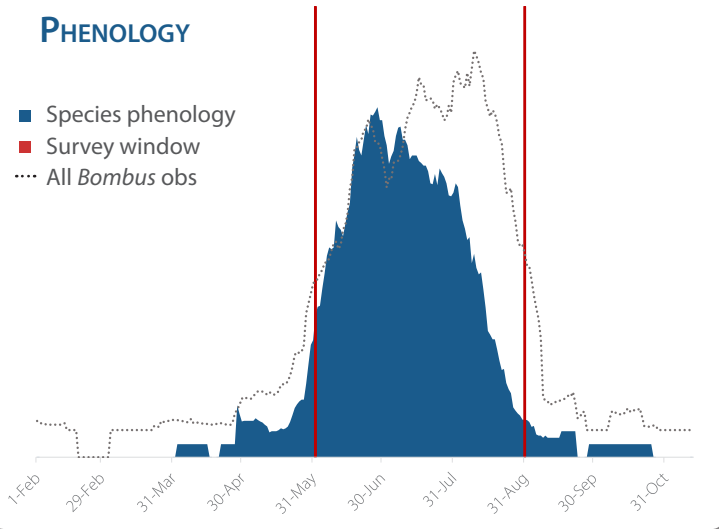
50,102 km²





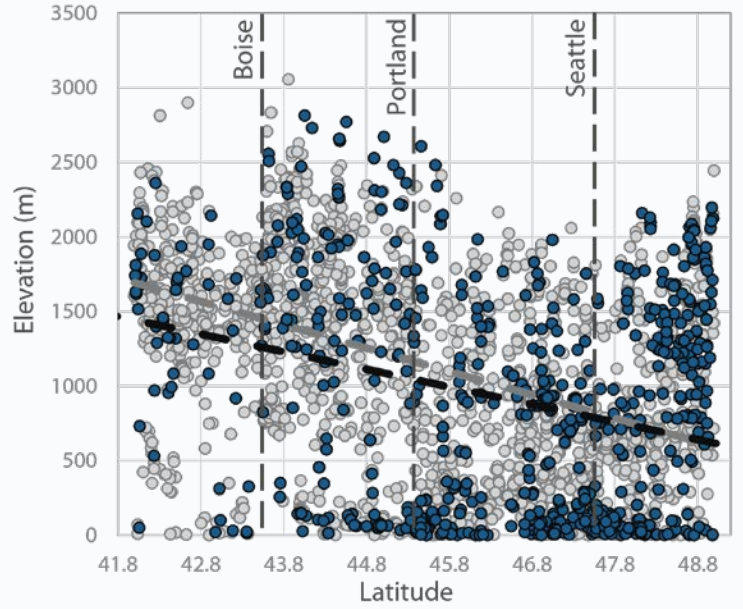
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus mixtus*
- All species



PLANT ASSOCIATIONS

Top 10 Genera

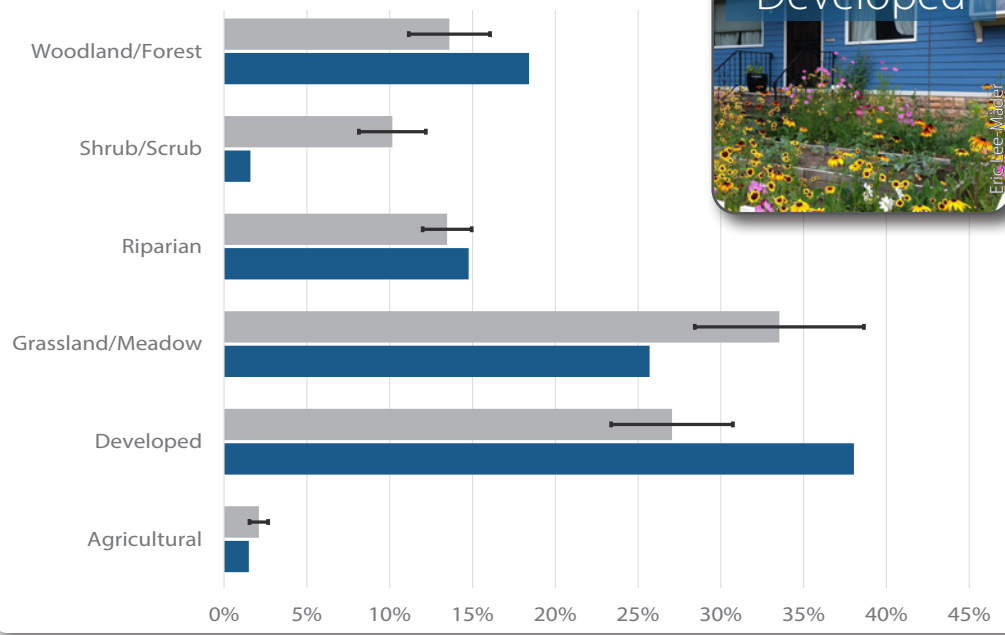
- 1 *Rubus*
- 2 *Symphoricarpos*
- 3 *Lupinus*
- 4 *Spirea*
- 5 *Chamaenerion*
- 6 *Lavandula*
- 7 *Rosa*
- 8 *Pedicularis*
- 9 *Trifolium*
- 10 *Cirsium*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus mixtus*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





Bombus nevadensis

IUCN STATUS: LEAST CONCERN

SPECIES SUMMARY

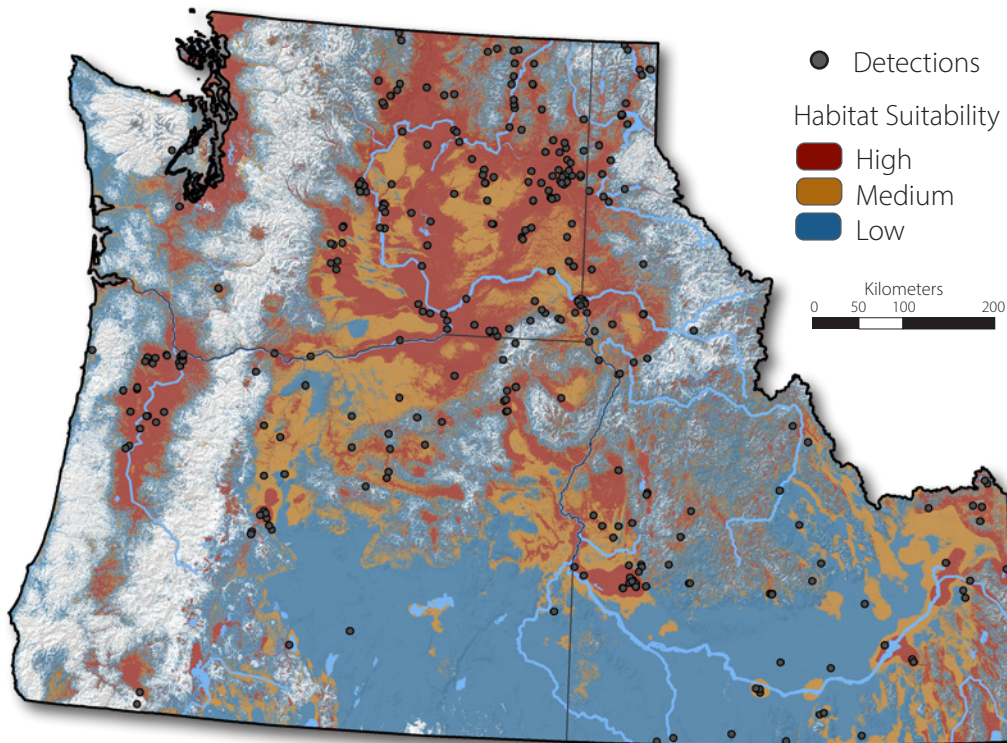
Overview

The Nevada Bumble Bee is found throughout the western US and Canada. It comprised around 3% of the observations made in the Pacific Northwest Bumble Bee Atlas, a modest increase over its historic relative abundance in the region. Volunteers most often recorded this species in the Willamette Valley, Columbia Plateau, and Snake River Plain Ecoregions. It was most often associated with shrubland habitats, followed by meadows and forests. Favored host plants include vetch, penstemons, and lupines. Nevada Bumble Bee is considered stable across its range.



Nevada Bumble Bee (*Bombus nevadensis*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

634



OF SURVEYS WITH
DETECTIONS

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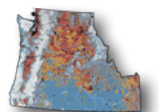
OF GRID CELLS
WITH DETECTIONS

120 of 364



EXTENT OF KNOWN
OCCURRENCE

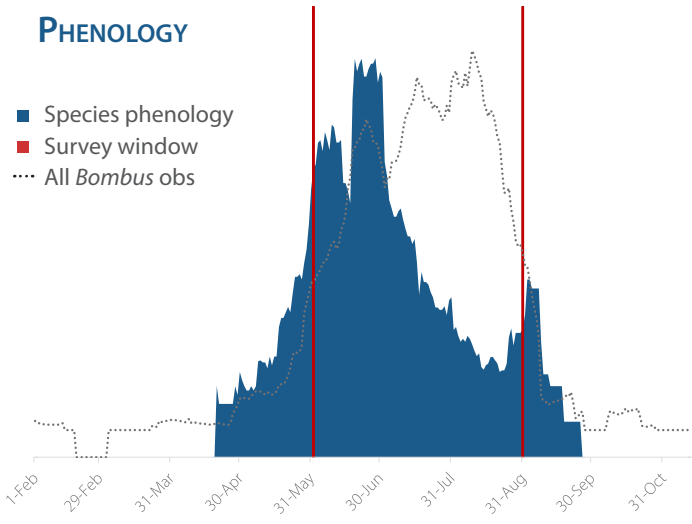
26,222 km²





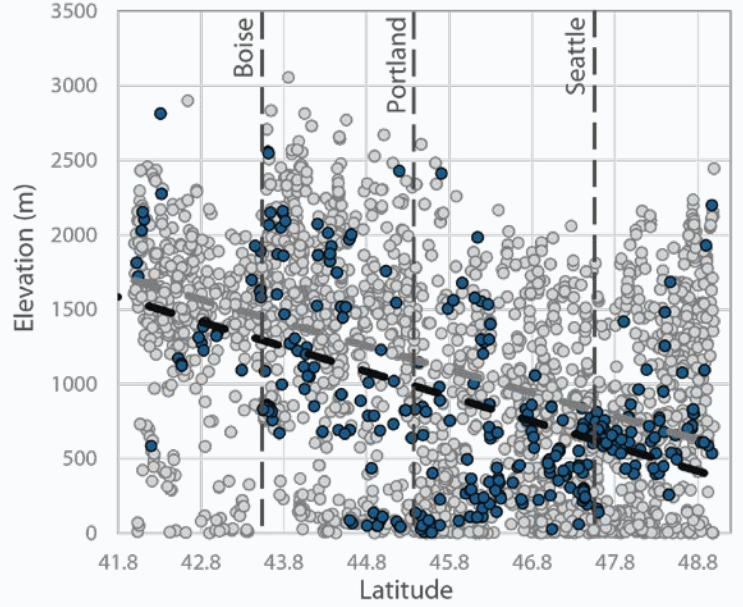
PHENOLOGY

■ Species phenology
■ Survey window
····· All *Bombus* obs



ELEVATION PROFILE

● *Bombus nevadensis*
○ All species



PLANT ASSOCIATIONS
Top 10 Genera

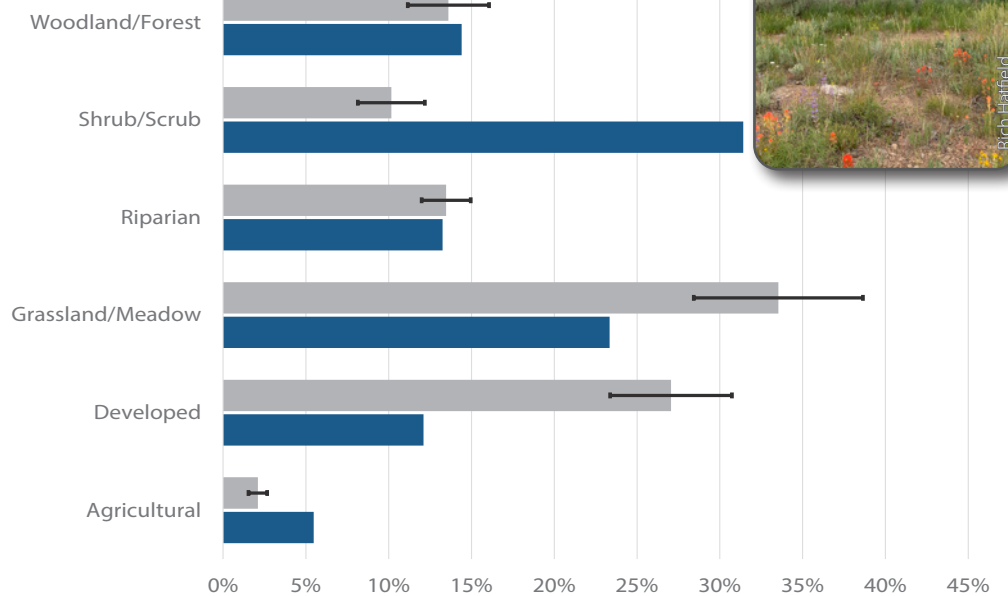
- 1 *Vicia*
- 2 *Penstemon*
- 3 *Lupinus*
- 4 *Wyethia*
- 5 *Delphinium*
- 6 *Dipsacus*
- 7 *Monarda*
- 8 *Thermopsis*
- 9 *Cirsium*
- 10 *Agastache*

multi-species appeal
 important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

■ *Bombus nevadensis*
■ All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





Bombus pensylvanicus

IUCN STATUS: VULNERABLE

SPECIES SUMMARY

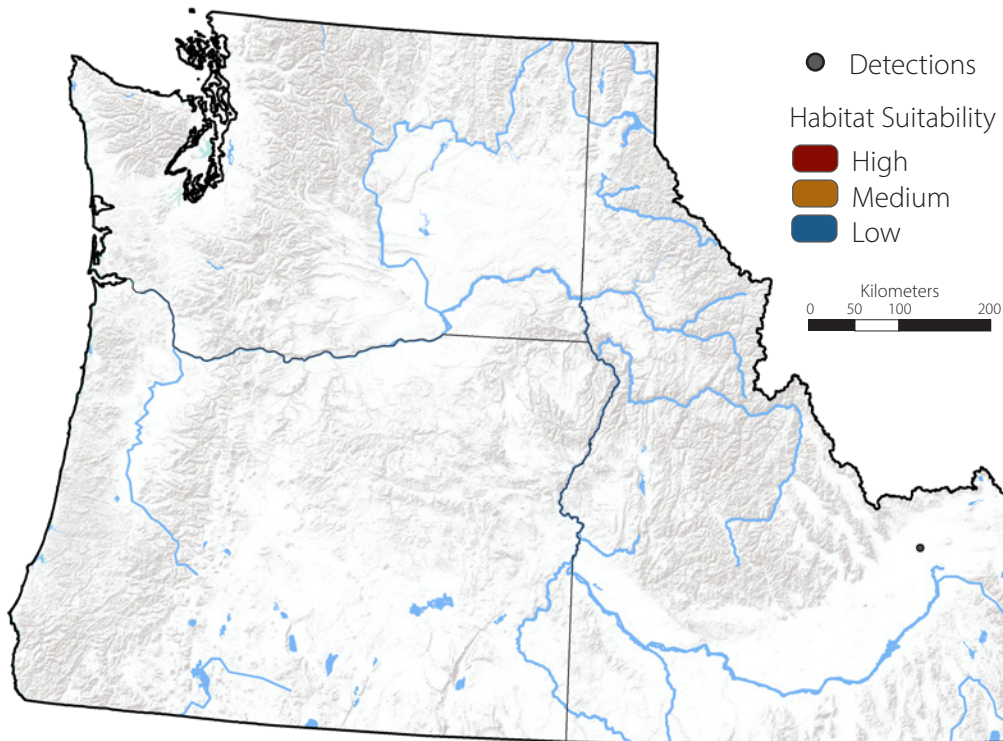
Overview

The American Bumble Bee is found across much of the eastern US and adjacent southern Ontario and Quebec. In the northern US most observations are east of the Rockies, while the species is broadly distributed through the Southwest and into Mexico and Central America. Populations are also known from California, and there are unconfirmed reports that it occurs in Oregon. Pacific Northwest Bumble Bee Atlas surveyors did not relocate the American Bumble Bee in Oregon, but made a single observation in eastern Idaho, the first known for that state. This species has been assessed as vulnerable across its range, and is currently under review to determine if it warrants federal protection under the Endangered Species Act.



American Bumble Bee (*Bombus pensylvanicus*).
(Barbara Driscoll).

Detection Map



OBSERVATIONS

1



OF SURVEYS WITH
DETECTIONS

1 of 1542



OF GRID CELLS
WITH DETECTIONS

1 of 364



EXTENT OF KNOWN
OCCURRENCE

?





PHENOLOGY



Insufficient Data

ELEVATION PROFILE



Insufficient Data

PLANT ASSOCIATIONS
Top 10 Genera

1 ?

2 ?

3 ?

4 ?

5 ?

6 ?

7 ?

8 ?

9 ?

10 ?



multi-species appeal



important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS



Insufficient Data

Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

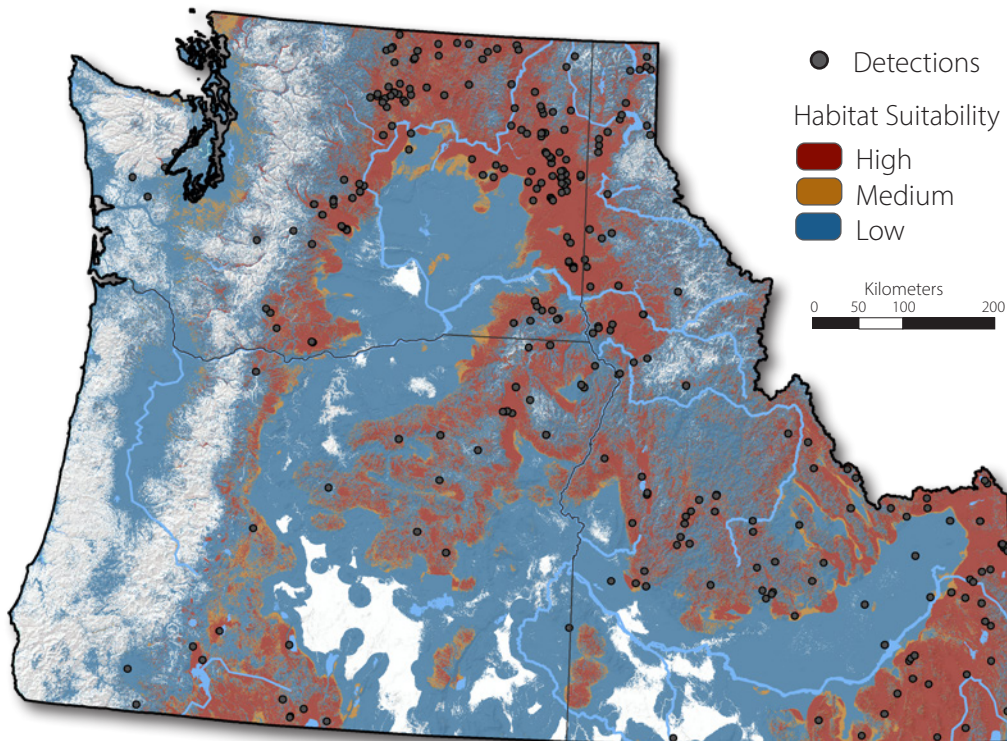
Overview

The Red-belted Bumble Bee occurs throughout the northern US and adjacent areas of Canada from the Pacific Coast east to Newfoundland. Its distribution extends south through upper elevations of the Intermountain West. This species accounts for more than 4% of all observations in the Pacific Northwest Bumble Bee Atlas, a modest increase in relative abundance when compared to observations made in the past. Atlas surveyors observed this bee mainly east of the Cascades, and most commonly in the Northern and Middle Rockies, Blue Mountains, Idaho Batholith, and Basin and Range Ecoregions. It was most often recorded in meadows, forests, and developed areas. Red-belted Bumble Bee has a very short tongue, and was found foraging most often on lupines, knapweeds, and snowberry. This species is considered stable across its range.



Red-belted Bumble Bee (*Bombus rufocinctus*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

872



OF SURVEYS WITH
DETECTIONS

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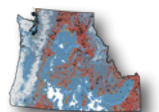
OF GRID CELLS
WITH DETECTIONS

131 of 364



EXTENT OF KNOWN
OCCURRENCE

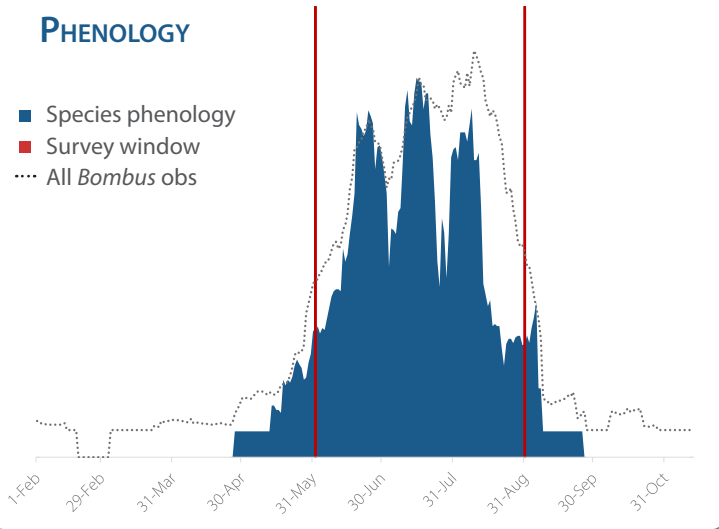
24,992 km²





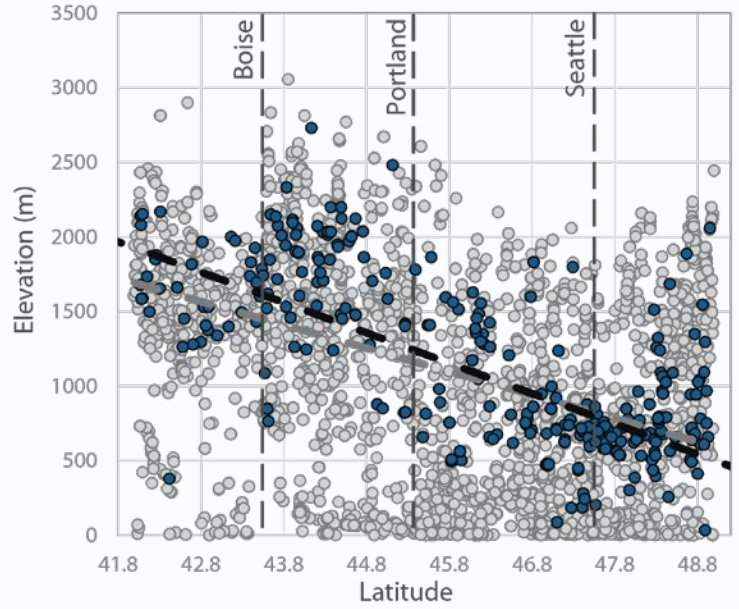
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus rufocinctus*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

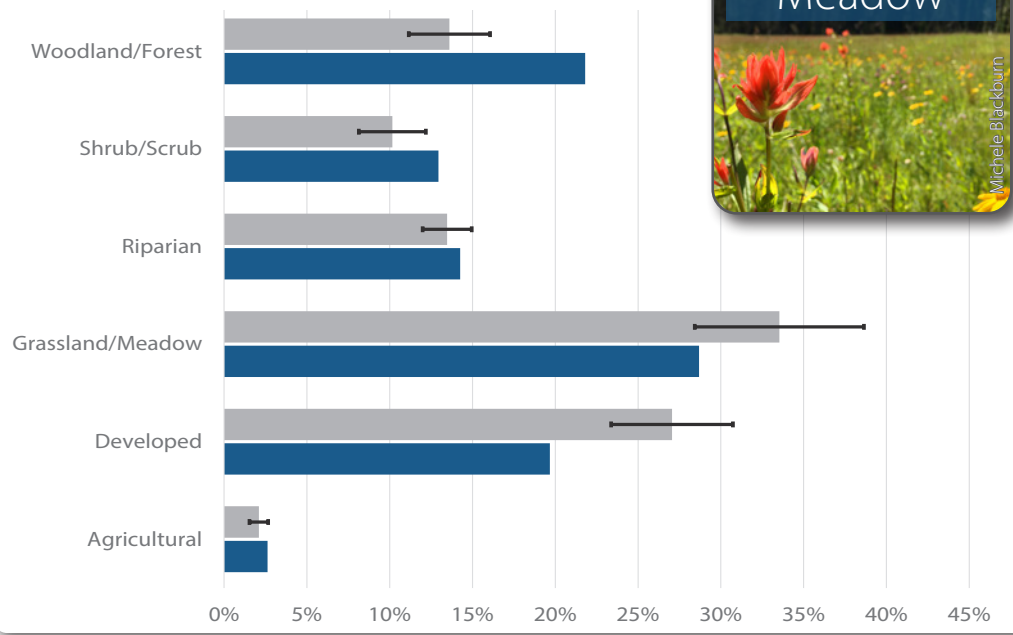
- 1 *Lupinus*
- 2 *Centaurea*
- 3 *Symphoricarpos*
- 4 *Geranium*
- 5 *Trifolium*
- 6 *Cirsium*
- 7 *Penstemon*
- 8 *Rosa*
- 9 *Apocynum*
- 10 *Dipsacus*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus rufocinctus*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

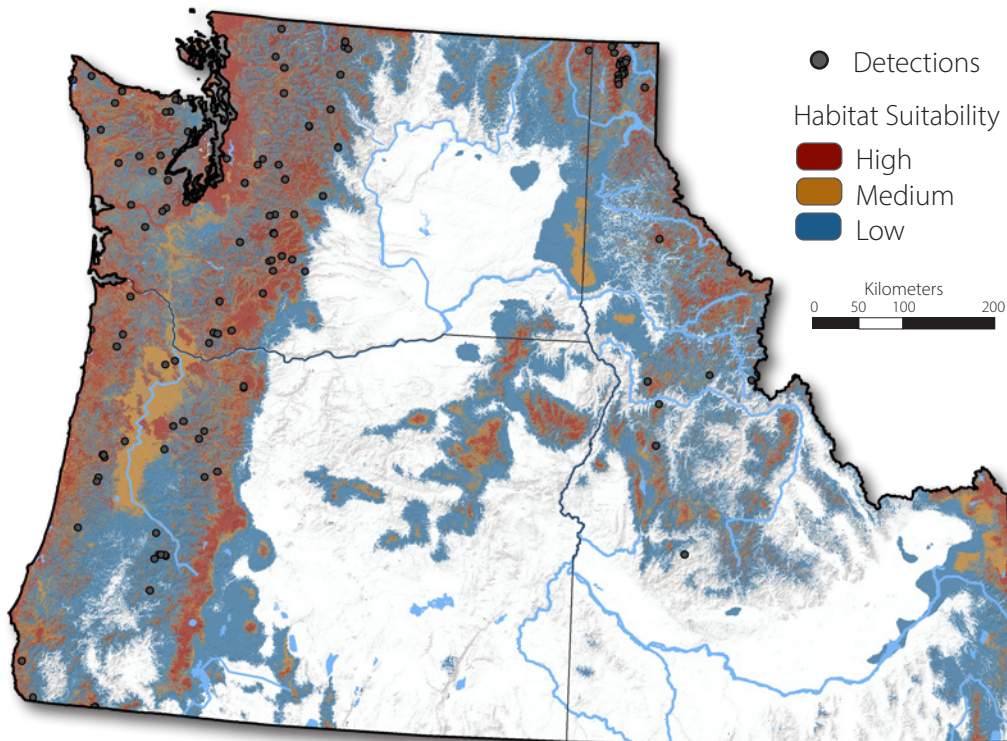
Overview

The Sitka Bumble Bee is strongly associated with coastal and mountainous habitats, occurring from Alaska to California within about 300 km of the Pacific Ocean, with the exception of populations farther inland in the Rocky Mountains of the northern US and adjacent Canada. Sitka Bumble Bee accounts for ~1% of all observations made in the Atlas, a decline when compared to historical relative abundance in the Pacific Northwest. Atlas surveyors found this bee in similar areas to its historical distribution, including the Klamath Mountains, Coast Range, Willamette Valley, Puget Lowland, Cascade, North Cascades, and Northern Rockies Ecoregions. Atlas surveyors also made observations of the bee in the Idaho Batholith, where it had not previously been detected. It was strongly associated with meadows and developed areas, where it foraged on lupines, fireweed, and raspberries. This species is considered stable across its range.



Sitka Bumble Bee (*Bombus sitkensis*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

242



OF SURVEYS WITH
DETECTIONS

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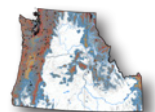
OF GRID CELLS
WITH DETECTIONS

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EXTENT OF KNOWN
OCCURRENCE

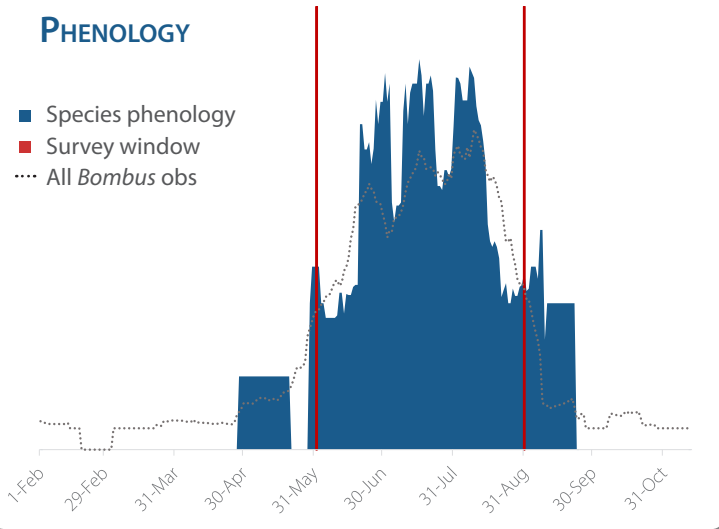
10,213 km²





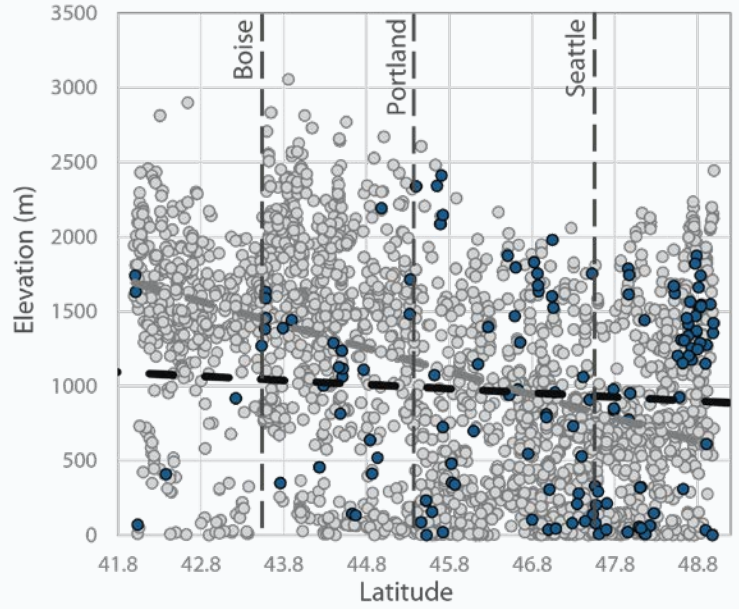
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus sitkensis*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

- 1 *Lupinus*
- 2 *Chamaenerion*
- 3 *Rubus*
- 4 *Solidago*
- 5 *Trifolium*
- 6 *Aster*
- 7 *Lavandula*
- 8 *Lotus*
- 9 *Rhododendron*

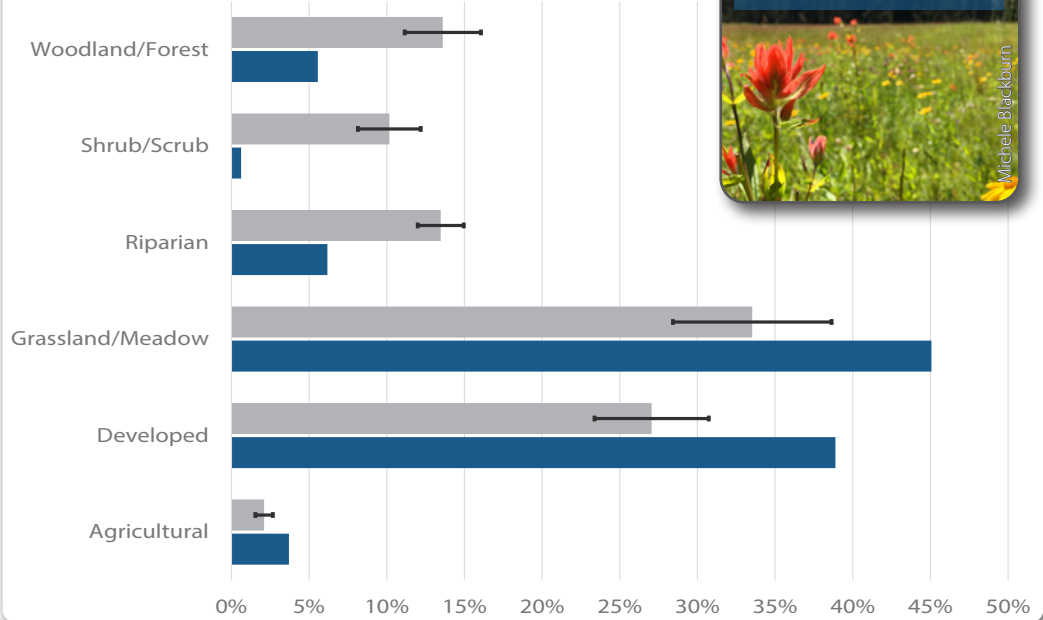
10 *Senecio*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus sitkensis*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

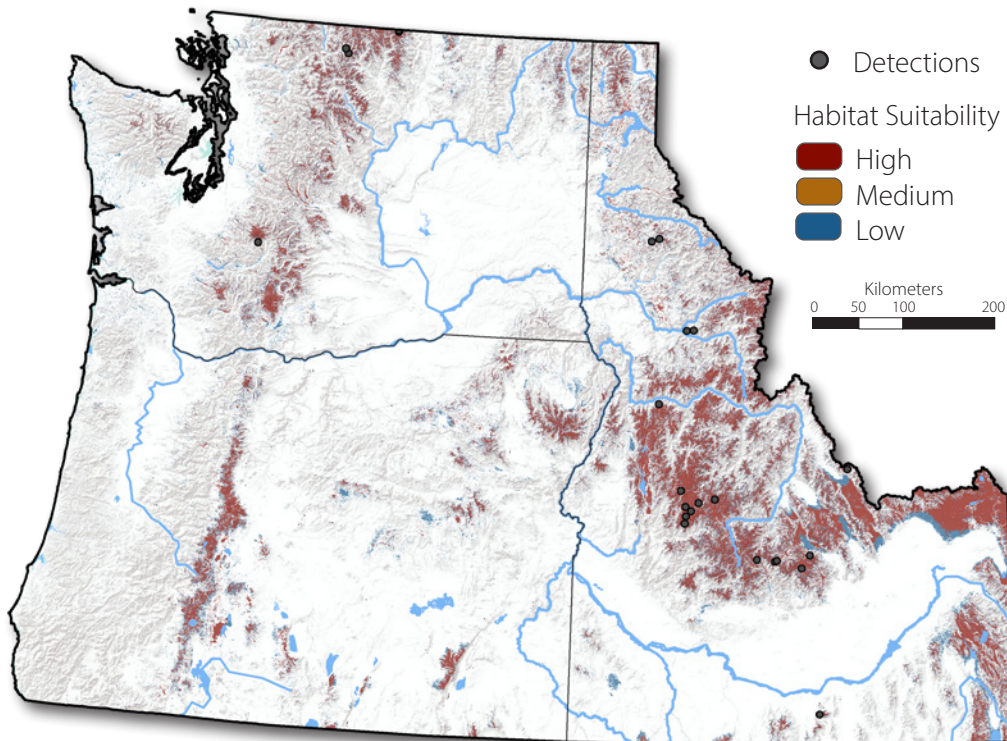
Overview

The Forest Bumble Bee is a species of northern latitudes and mountains, ranging from Alaska east to Labrador, and in the west, south through higher elevations of the Sierra Nevada and Rocky Mountains. Its historic distribution in the Pacific Northwest is reflected by sparse observations at upper elevations in the Cascade, Blue, Sawtooth, and Bitterroot Mountain ranges. Most Atlas observations were in the Idaho Batholith and Northern Rockies Ecoregions, with lesser numbers reported from the Cascade, Northern Cascade, and Blue Mountains Ecoregions. Meadows were the most common habitat type where this species was found, though it was also found in shrub and riparian habitats. Most commonly reported host plants were penstemons, asters, and fireweed. This species' status has been assessed as stable.



Forest Bumble Bee (*Bombus sylvicola*).
(David Jennings).

Detection Map



OBSERVATIONS

54



OF SURVEYS WITH
DETECTIONS

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OF GRID CELLS
WITH DETECTIONS

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EXTENT OF KNOWN
OCCURRENCE

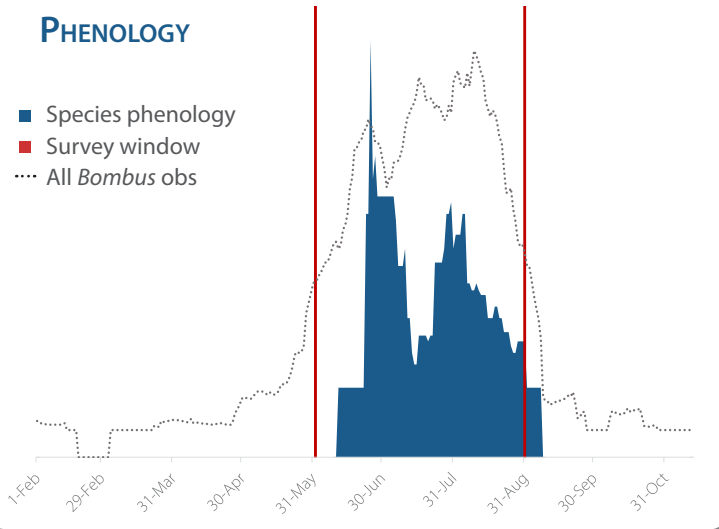
2,152 km²





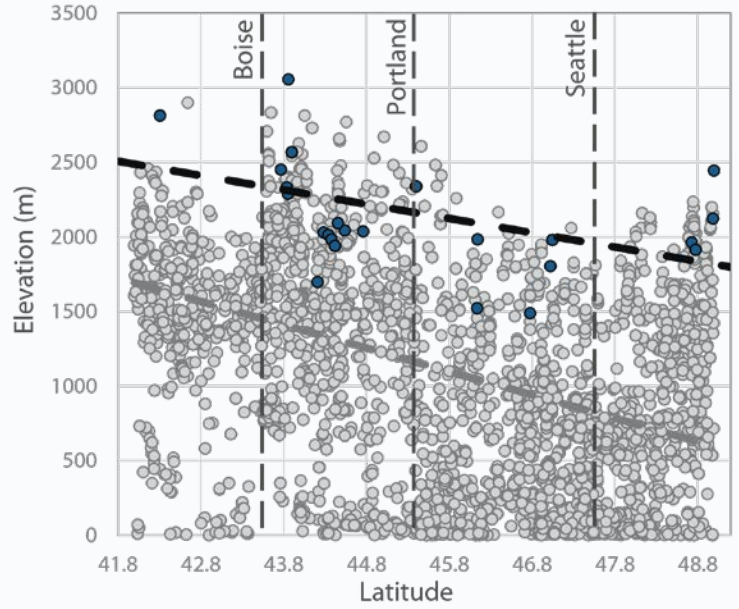
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus sylvicola*
- All species



PLANT ASSOCIATIONS

Top 10 Genera

- 1 *Penstemon*
- 2 *Aster*
- 3 *Chamaenerion*
- 4 *Cassiope*
- 5 *Senecio*
- 6 *Arnica*
- 7 *Eurybia*
- 8 *Anaphalis*
- 9 *Castilleja*
- 10 *Eremongone*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus sylvicola*
- All species



Credits

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SPECIES SUMMARY

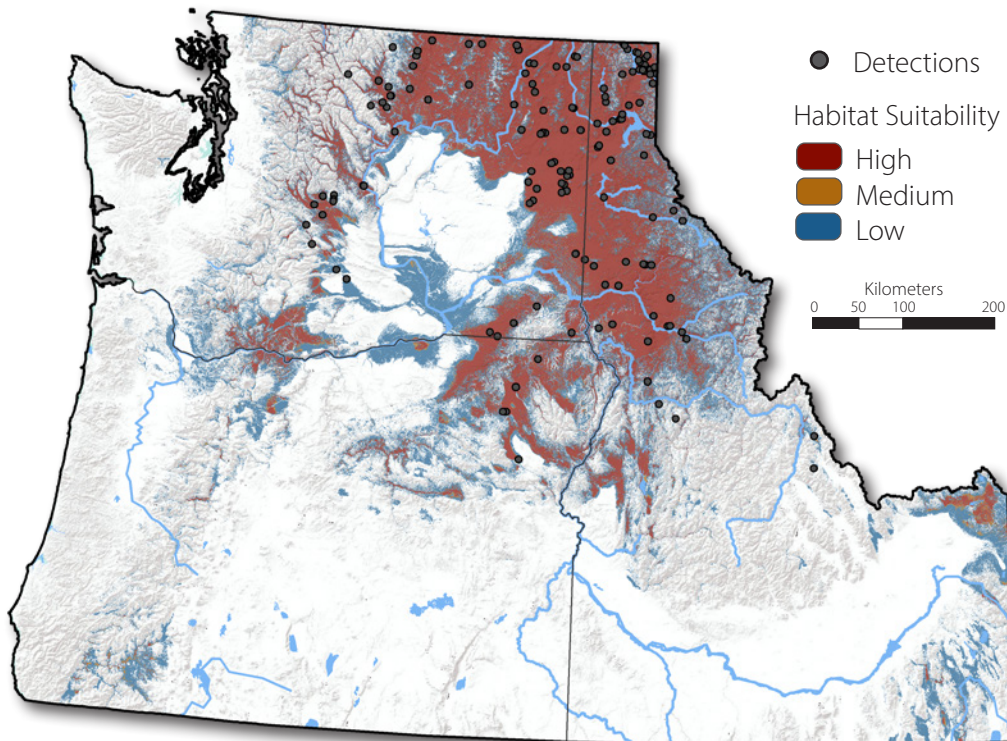
Overview

The Half-black Bumble Bee occurs mainly in the northeastern US and adjacent areas of Canada. It is found southward through the Appalachian Mountains, as well as westward through the Canadian prairie regions and into the upper elevations of the Pacific Northwest. The species accounts for over 2% of all observations made during the Atlas, a modest increase over historical baselines for the region. Volunteers recorded Half-black Bumble Bee mainly in the North Cascade (where it had only scarcely been detected before) and Northern Rockies Ecoregions, with observations also made in the Blue Mountains and Idaho Batholith Ecoregions. This species was strongly associated with developed areas, forests, and riparian areas in the Atlas, where favored host plants included knapweed, lavender, and snowberry. Half-black Bumble Bee has been assessed as stable or increasing across its range.



Half-black Bumble Bee (*Bombus vagans*).
(Leif Richardson).

Detection Map



OBSERVATIONS

428



OF SURVEYS WITH
DETECTIONS

81 of 1542



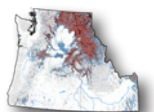
OF GRID CELLS
WITH DETECTIONS

55 of 362



EXTENT OF KNOWN
OCCURRENCE

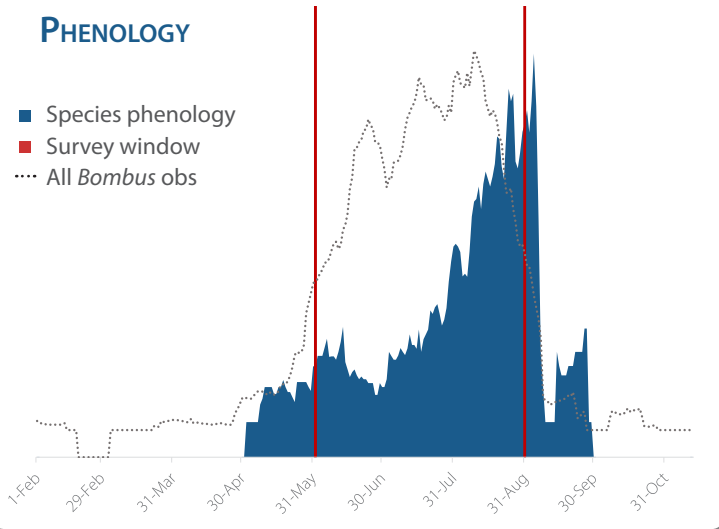
12,724 km²





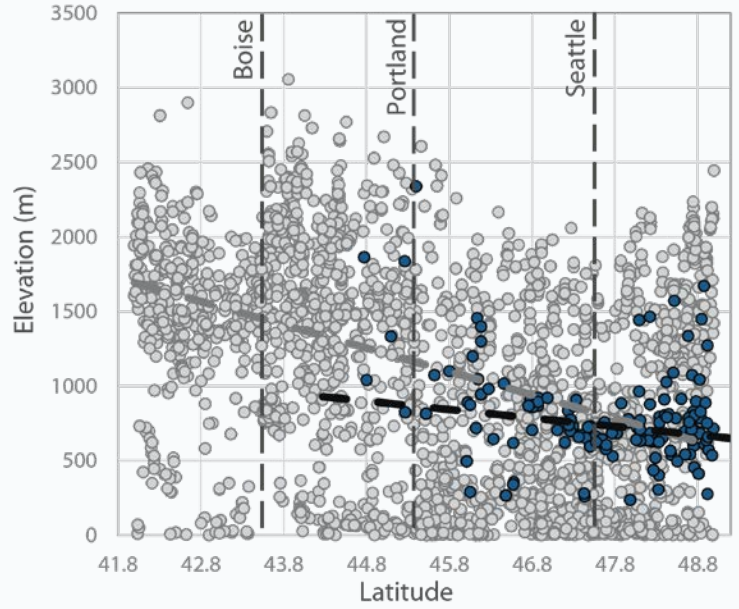
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus vagans*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

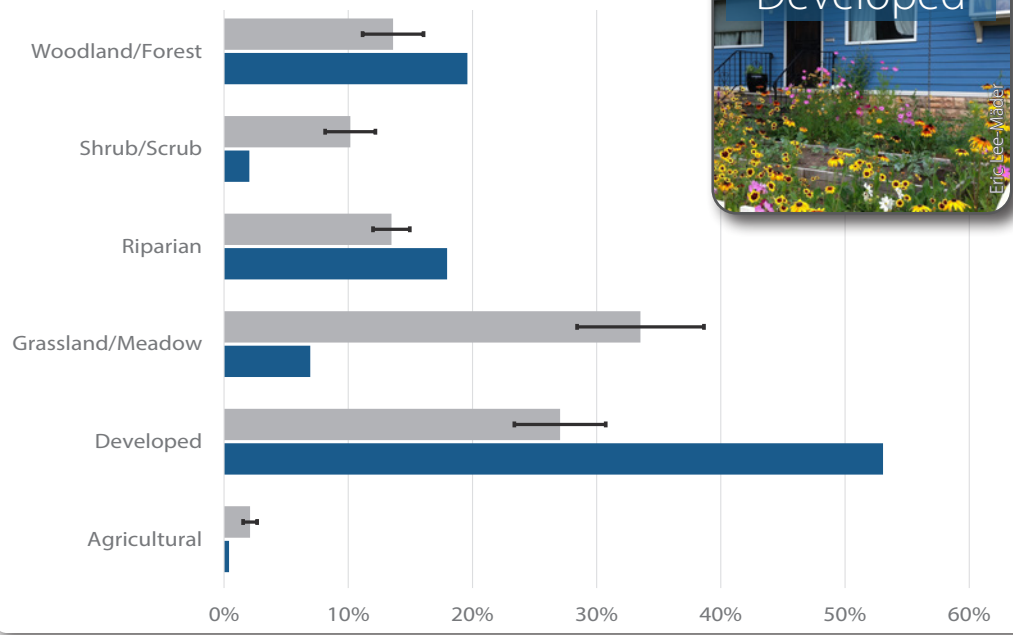
- 1 *Centaurea*
- 2 *Lavendula*
- 3 *Symphoricarpos*
- 4 *Agastache*
- 5 *Helianthus*
- 6 *Trifolium*
- 7 *Chamaenerion*
- 8 *Cirsium*
- 9 *Hypericum*
- 10 *Dipsacus*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus vagans*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.





SPECIES SUMMARY

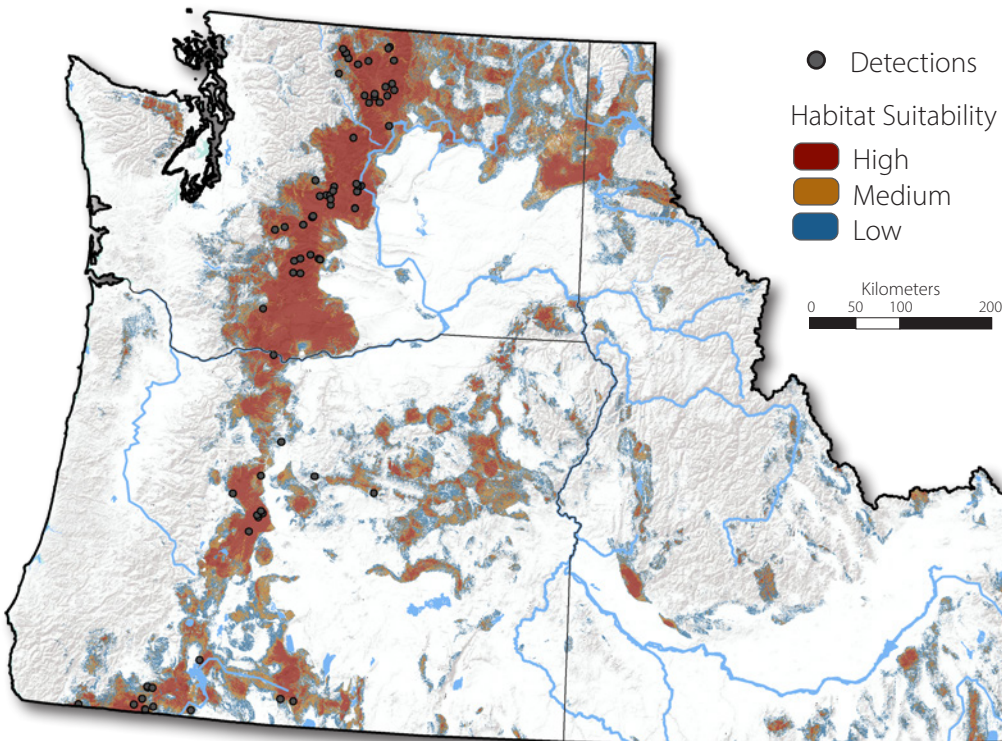
Overview

The Van Dyke Bumble Bee is associated with habitats within 500 km of the Pacific Coast, occurring only in British Columbia, Washington, Oregon, and California. Pacific Northwest Atlas surveyors found this species at a relative abundance less than 1%, a modest decrease in relative abundance over historical baselines for our region. It was most commonly observed in the Klamath Mountains, Eastern Cascade, and North Cascade Ecoregions. The species was not located west of the Cascades by Atlas surveyors. Van Dyke's Bumble Bee was strongly associated with forested habitats in the Atlas; other commonly documented habitats include shrublands and riparian areas. Favored host plants for this species include phacelias, penstemons, and lupines. Van Dyke Bumble Bee has been assessed as stable throughout its range.



Van Dyke Bumble Bee (*Bombus vandykei*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

154



OF SURVEYS WITH
DETECTIONS

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OF GRID CELLS
WITH DETECTIONS

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EXTENT OF KNOWN
OCCURRENCE

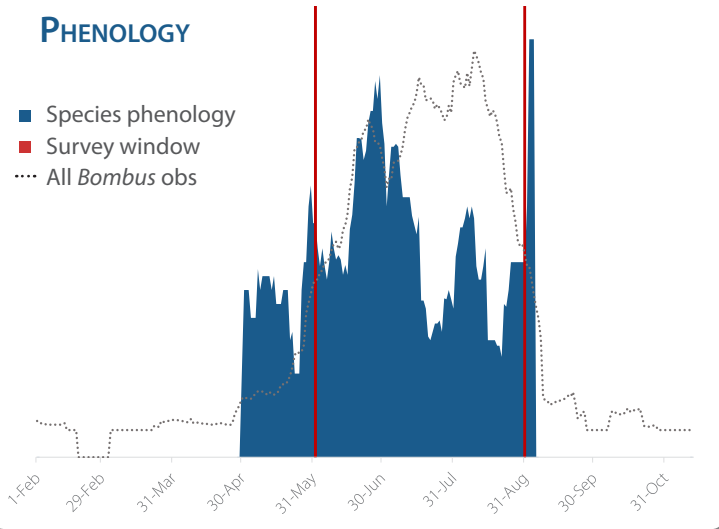
6,063 km²





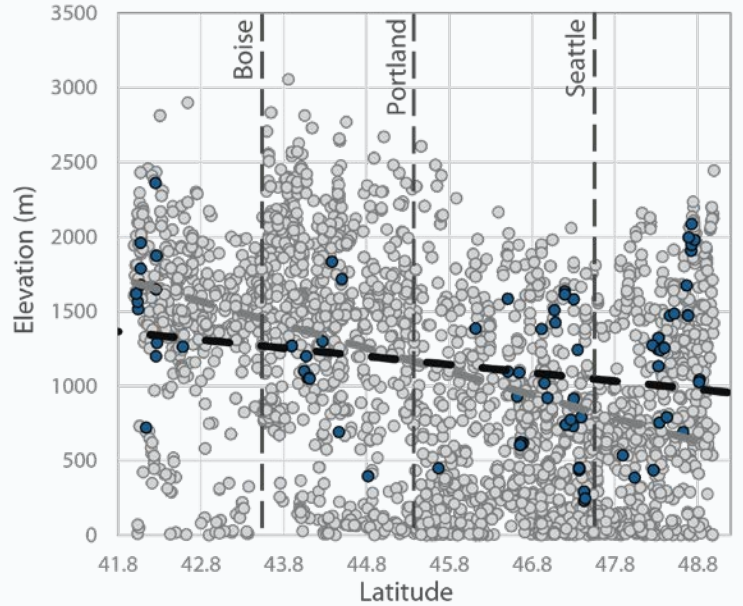
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus vandykei*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

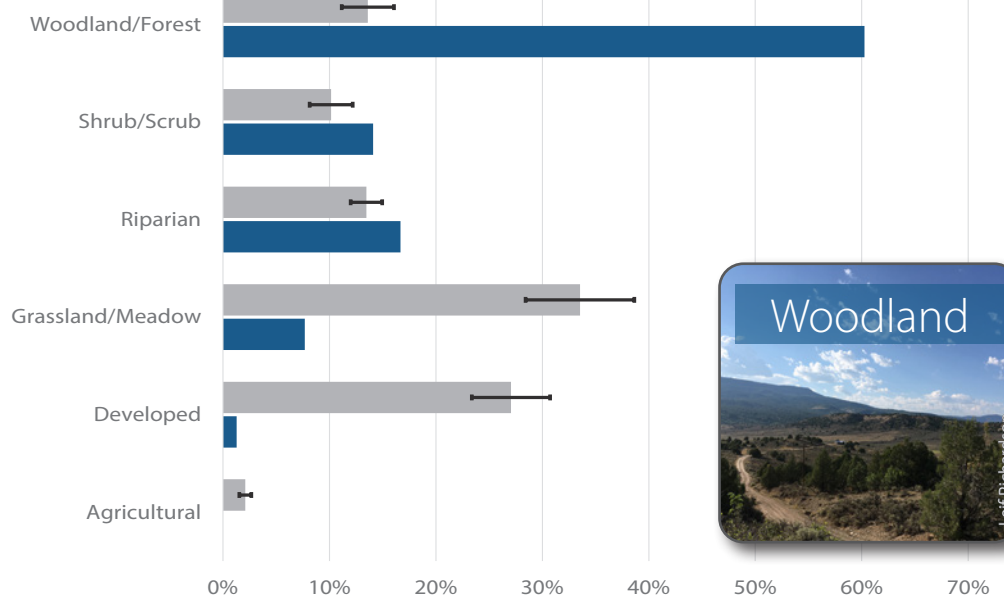
- 1 *Phacelia*
- 2 *Penstemon*
- 3 *Lupinus*
- 4 *Chamaenerion*
- 5 *Rubus*
- 6 *Agastache*
- 7 *Symphoricarpos*
- 8 *Delphinium*
- 9 *Centaurea*
- 10 *Cirsium*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus vandykei*
- All species



Credits

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SPECIES SUMMARY

IUCN STATUS: LEAST CONCERN

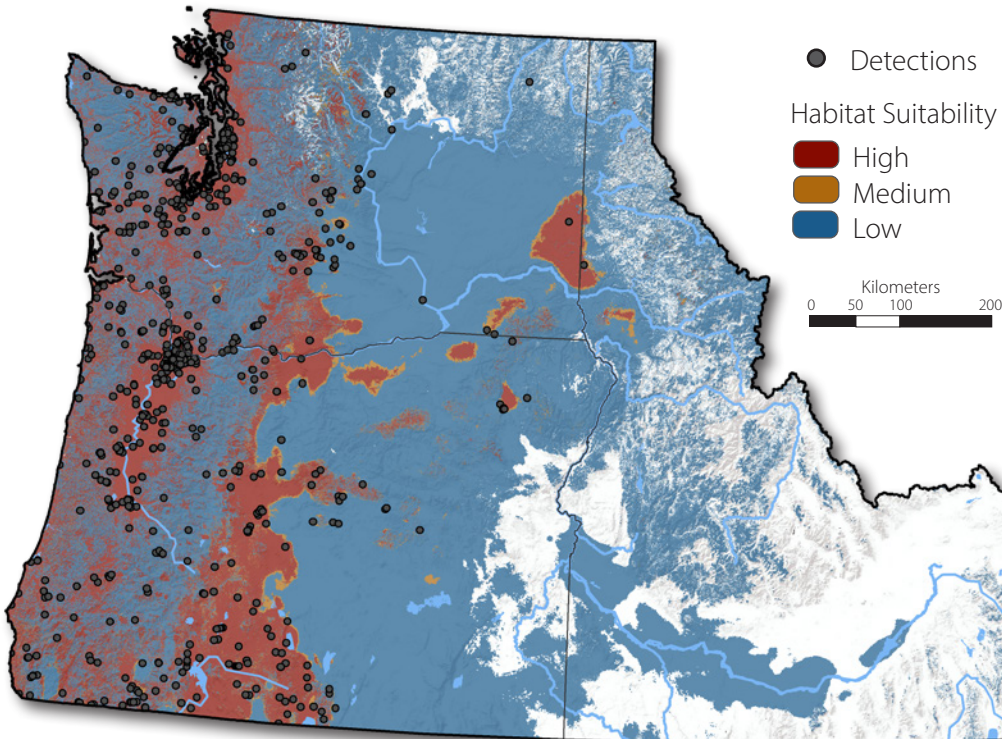
Overview

The Vosnesensky Bumble Bee ranges from British Columbia south to Baja California, with nearly all populations occurring within 500 km of the Pacific Coast. It was the second most common species in the Atlas, accounting for more than 11% of observations, an increase over its historical relative abundance in the Pacific Northwest. *B. vosnesenskii* was most commonly found in the Coast Range, Willamette Valley, Puget Lowland, and Eastern Cascade Foothills Ecoregions. Atlas surveyors also found the bee in historically occupied areas of the Blue Mountain and Columbia Plateau Ecoregions, including some of the only known observations in Idaho. The species was most commonly associated with developed and meadow habitats in the Atlas, but was found in all other habitat categories as well. The most important host plants for this species were phacelias, lupines, and raspberries. It has been assessed as stable, and is one of the most common species found throughout its range.



Vosnesensky Bumble Bee (*Bombus vosnesenskii*).
(The Xerces Society / Rich Hatfield).

Detection Map



OBSERVATIONS

2209



OF SURVEYS WITH
DETECTIONS

275 of 1542



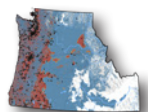
OF GRID CELLS
WITH DETECTIONS

120 of 364



EXTENT OF KNOWN
OCCURRENCE

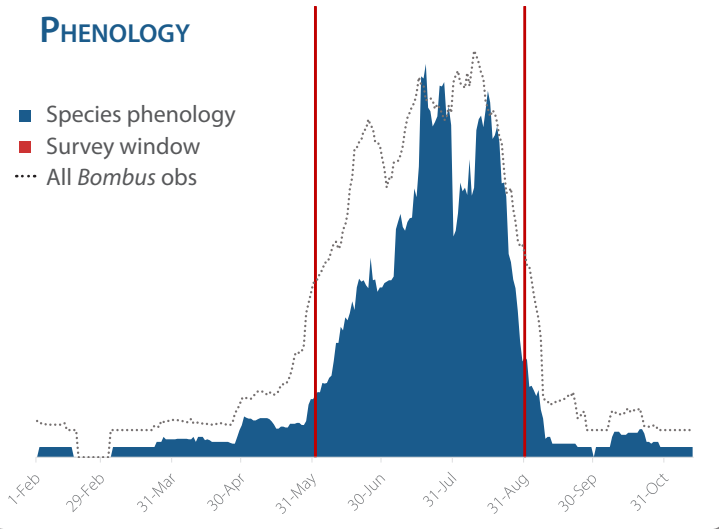
42,560 km²





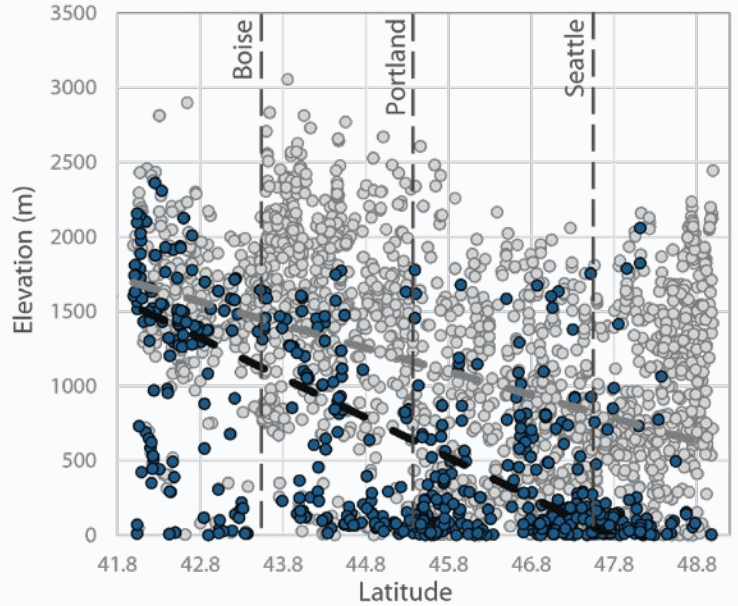
PHENOLOGY

- Species phenology
- Survey window
- All *Bombus* obs



ELEVATION PROFILE

- *Bombus vosnesenskii*
- All species



PLANT ASSOCIATIONS
Top 10 Genera

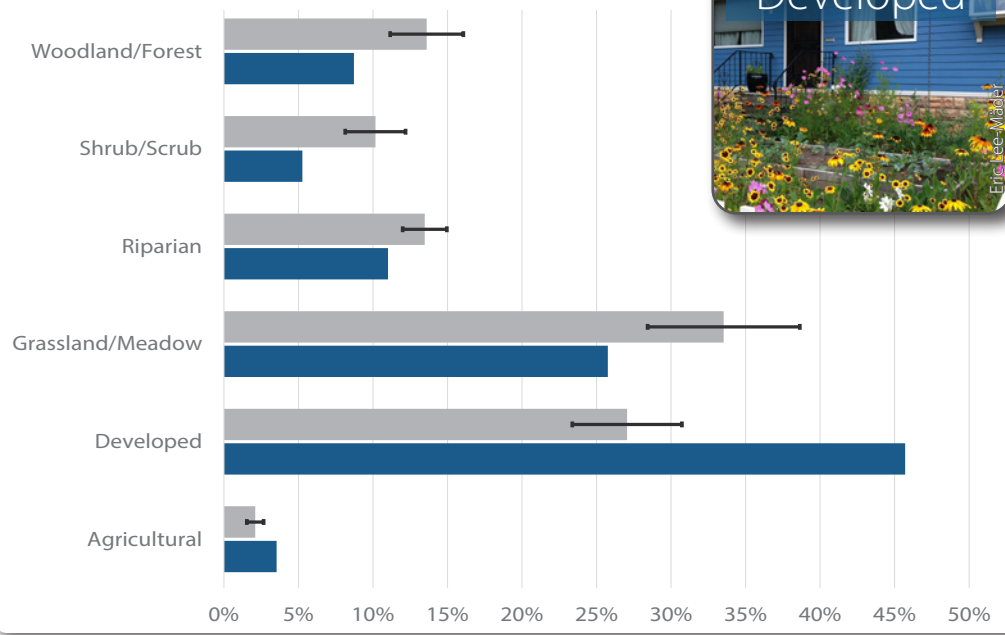
- 1 *Phacelia*
- 2 *Lupinus*
- 3 *Rubus*
- 4 *Spiraea*
- 5 *Hypochaeris*
- 6 *Lavandula*
- 7 *Trifolium*
- 8 *Chamaenerion*
- 9 *Penstemon*
- 10 *Hypericum*

- multi-species appeal
- important food plant

Jessa Kay Cruz

HABITAT ASSOCIATIONS

- *Bombus vosnesenskii*
- All species



Credits

We are grateful to the many individuals who collected data for this project from 2018-2020. See the Methodology section for a discussion on data analysis and for artwork and other credits. Primary funding for the PNW Bumble Bee Atlas was provided by a Competitive State Wildlife Grant through the U.S. Fish and Wildlife Service's Wildlife and Sportfish Restoration Program.

