WESTERN BUMBLE BEE (Bombus occidentalis occidentalis)

October 2022

Photo 1 – Western bumble bee. Photo credit: Xerces Society/Rich Hatfield

Status

State: On September 30, 2022, the western bumble bee was given Candidate status under the California Endangered Species Act (CESA). Candidate species are given protection under CESA until a determination is made on their listing status.

Federal: On March 16, 2016, a finding was published in the Federal Register that listing the western bumble bee as threatened or endangered may be warranted and its listing status is currently under review.

Species Information and considerations for timber harvest planning

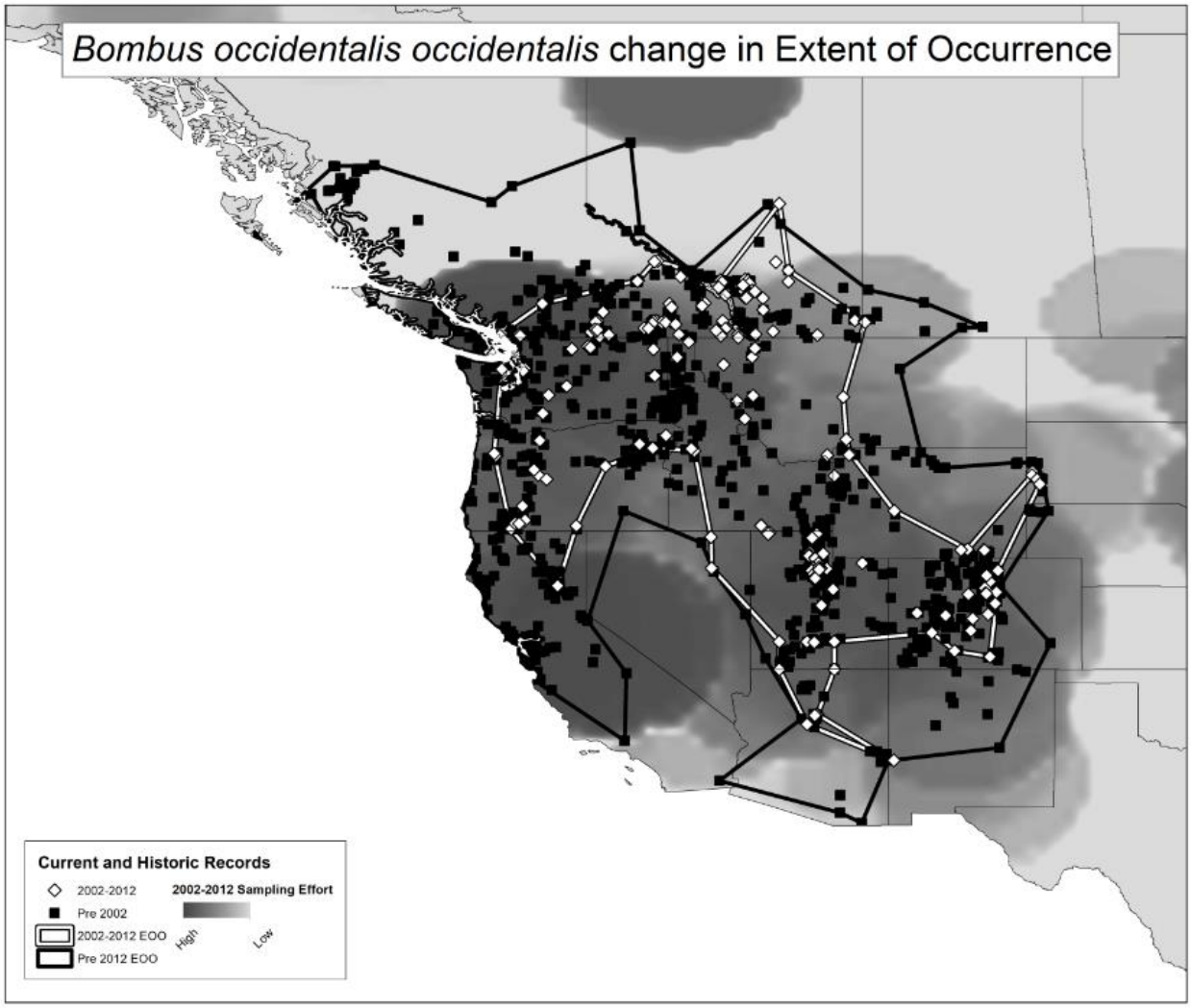
Species Information

The western bumble bee was historically found in much of California and is now thought to be limited to mostly high elevation meadows and coastal areas. Meadows and grasslands with abundant flowering resources are considered preferred habitat for the western bumble bee. The western bumblebee is a generalist forager and has been observed visiting a wide diversity of flowering plants.

The annual cycle for the western bumble bee includes an overwintering and nesting/flight period. The flight period is the period when bumble bees actively forage. The flight period for the western bumble bee queen is from February to late November. The flight period for workers and males is from early April to early November. Nesting occurs during the active flight period. Nest sites are primarily under ground in cavities such as squirrel burrows but have also

been found above ground in logs. Little is known about the overwintering or hibernating sites, but they have been observed in shallow mounds of earth.

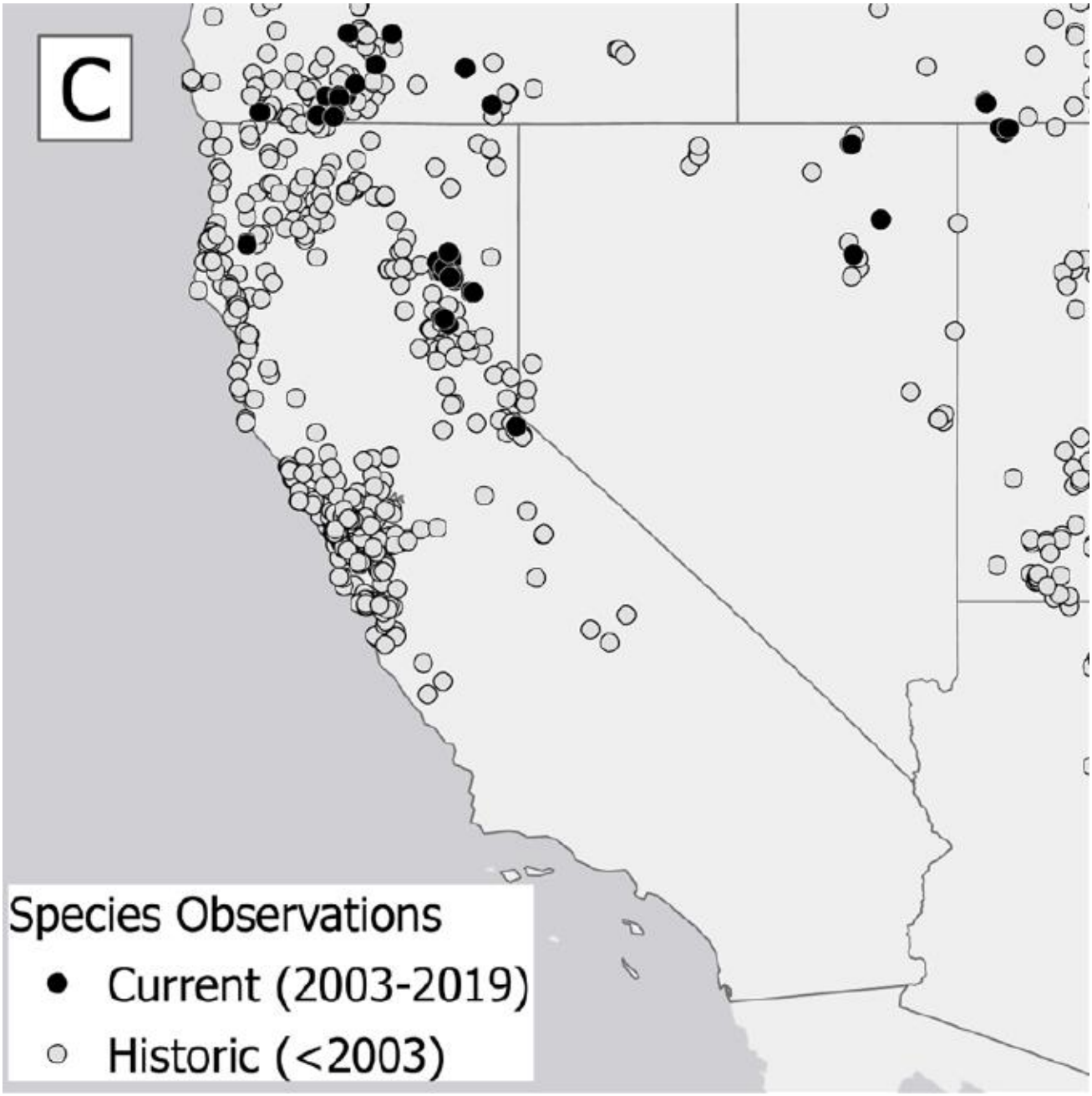
Map 1 – Created by the International Union for Conservation of Nature's Red List of Threatened Species (IUCN) to display the estimated range contraction in years 2002 to 2012 versus the range prior to 2002.



Surveys

Surveys were conducted across a wide geographic range in California in 2019 in regions formally occupied by the western bumble bee, but none were found during this recent survey effort (Fisher et al. 2022). A study by the Institute for Bird Populations 2015-2021 did find 6 western bumble bees out of 11,000 total bumble bees captured. These 6 detections were in the northeastern part of California on the Tahoe and Plumas National Forests.

Map 2 - Current (filled circles, 2003–2019) and historic (open circles, before 2003) records of western bumble bumble bee. Data from: Richardson 2019 and The Xerces Society et al. 2019 (Hatfield and Jepson 2021).



Threats

Threats to this, and other bumble bee species include: landscape scale habitat alteration that reduces diverse floral availability and access to nesting and overwintering sites, fire suppression leading to forest density increase and encroachment into open areas, toxic effects and habitat

loss due to herbicide, grazing, competition with managed bees, disease, pesticides, insecticides (including neonicotinoids), fungicides, population dynamics, and climate change.

Information above compiled from: A Petition to the State of California Fish and Game Commission - The Xerces Society, Report to the Fish and Game Commission Evaluating the Petition to List Four Species of Bumble Bees and sources cited therein.

Photo 2 – Habitat for the western bumble bee. Photo Credit: Jess Burns

Considerations for timber harvest planning

For projects within the range of the western bumble bee, the species should be addressed within the timber harvesting document. Given that the western bumble bee needs a diverse supply of flowers throughout the colony's flight period, open meadows and other wet areas are considered the bees most important habitat type. Since meadows and wet areas are afforded protection measures under the FPRs, it is not expected that habitat modification will result. Discuss all standard, and any additional protection measures that would minimize negative effects to meadows and wet areas. Timber harvesting that promotes open areas mixed in forested areas, or restores meadows from encroaching conifers, have the potential to provide a benefit to the species by increasing the abundance of flowering plants. Include discussion on any potential benefits to the species that may result from the proposed project.

Herbicide use that reduces the abundance of diverse floral resources has been listed as a potential threat to bumble bees. If herbicide use is proposed, discuss any resource protection measures that will be used to mitigate any negative impacts on diverse floral availability including season and extent of use.

References

Fisher, K., Watrous, K. M., Williams, N. M., Richardson, L. L., & Woodard, S. H. (2022). A contemporary survey of bumble bee diversity across the state of California. *Ecology and Evolution*, 12, e8505. https://doi.org/10.1002/ece3.8505

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

Hatfield, G. R. and S. Jepsen. 2021. A conservation conundrum: protecting bumble bees under the California Endangered Species Act. The Xerces Society for Invertebrate Conservation, Portland, OR.

Additional Information

Petitions to List Species Under the California Endangered Species Act

Xerces Society - Western bumble bee species information

USFWS - Petition to list the Western Bumble Bee Review

Factors affecting bee communities in forest openings and adjacent mature forest | Treesearch (usda.gov)

The Pacific Northwest Bumble Bee Atlas: Summary and Species Accounts | Xerces Society

Postharvest Bee Diversity is high but declines rapidly with stand age in regenerating douglas fir forests - Rivers and Betts 2021_Forest Science (oregonstate.edu)

Wild bee distribution near forested landscapes is dependent on successional state | Forest Ecosystems

Forest-bee-pollinators – Oregon Department of Forestry

Importance of Forests in Bumble Bee Biology and Conservation | BioScience | Oxford Academic (oup.com)

Western bumble bee: Declines in United States and range-wide information gaps | U.S. Geological Survey (usgs.gov)

IUCN Assessments for North American Bombus spp. for the North American IUCN Bumble Bee Specialist Group (researchgate.net)

Bumble Bees of the Western United States - USFS

Petition to Federally list the Suckley Cuckoo Bumble Bee under ESA

Research in Progress – Evaluating the response of native pollinators to fuel-reduction treatments in managed conifer forests, Oregon State University.pdf