5-YEAR REVIEW
California Jewelflower (*Caulanthus californicus*)

GENERAL INFORMATION:

Species: California jewelflower (*Caulanthus californicus*)
Date listed: July 19, 1990
FR citation: 55 FR 29361
Classification: Endangered

State Listing:
The California jewelflower was listed as endangered by the State of California in 1987 (California Department of Fish and Wildlife 2020).

BACKGROUND:

Most recent status review:
U.S. Fish and Wildlife Service (Service). 2013. *Caulanthus californicus* (California jewelflower) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento, California. Finalized August 2013. 27 pp.

FR Notice citation announcing this status review:
U.S. Fish and Wildlife Service (Service). 2019. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 58 Species in California, Nevada, and the Klamath Basin of Oregon. Federal Register 84:36116–36118. Published July 26, 2019.

Critical Habitat Designation:
No critical habitat has been designated.

ASSESSMENT:

Information acquired since the last status review:
This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Sacramento Fish and Wildlife Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review and the opening of a 60-day public comment period on July 26, 2019 (84 FR 36116). We did not receive any information about this species from the public in response to the notice. We also contacted State and Federal agencies, species experts, universities, and other partners to request any data or information we should consider in our review. Additionally, we conducted a literature search, a review of information in our files, and obtained data from the California Natural Diversity Database (Diversity Database).

Distribution

The overall species distribution of California jewelflower remains the same as described in our 2013 review (Service 2013). The historical distribution of California jewelflower is known from 40 herbarium specimens, which were collected in 7 counties between 1880 and 1973 (Service 2013). Nearly half of the historic collection sites were on the floor of the San Joaquin Valley in

Fresno, Kern, and Tulare Counties. Several other collections came from two smaller valleys southwest of the San Joaquin Valley: the Carrizo Plain in San Luis Obispo County, and the Cuyama Valley in Santa Barbara County. Three collections were made from the Sierra Nevada foothills at the eastern margin of the San Joaquin Valley in Kern County. The remainder of the historic sites were in the foothills west of the San Joaquin Valley in Fresno, Kern, and Kings Counties. As of 1986, all natural occurrences of California jewelflower on the San Joaquin and Cuyama Valley floors had been extirpated (Service 2013).

At the time of listing (1990), California jewelflower was known from three localized areas: the mouth of Santa Barbara Canyon in Santa Barbara County, the southern portion of the Carrizo Plain in San Luis Obispo County, and the Paul Paine Preserve (owned by The Nature Conservancy) in Kern County (Service 1990). At the time of our 2013 status review, there were 34 presumed extant occurrences: one introduced occurrence in Kern County; 7 occurrences in Santa Barbara County; 22 occurrences in San Luis Obispo County; 3 occurrences in Fresno County; and 1 occurrence in Kings County. A summary of past and current distribution can be found in Table 1 below. Four occurrences (numbers 81, 82, 83, and 84) have been added to the Diversity Database since our 2013 review (Diversity Database 2020). All four of these occurrences are in Kern County and do not extend the range of the species. The status of the one remaining extant occurrence in Kings County (occurrence number 5) has been changed to "possibly extirpated" since our last review. Table 1 in Appendix A summarizes the number of occurrences over time. Currently, there are 37 Diversity Database occurrences that are presumed extant.

Table 1. Number of extant occurrences of California jewelflower (*Caulanthus californicus*) by county. Data from Diversity Database (2020) and Service (1990; 2013).

	Time of listing (1990)	**2013 Status Review**	**Current**
Fresno	0	3	3
Kern	1	1	5
Kings	0	1	0
San Luis Obispo	8	22	22
Santa Barbara	1	7	7
Total	**10**	**34**	**37**

Abundance

Population sizes for this species can vary from year to year based on rainfall trends and other environmental conditions. California jewelflower has a long-lived seedbank that stays dormant when conditions are not right for emergence (Bureau of Land Management 2020). Long-term monitoring of the Kreyenhagen Hills occurrences has been established by the Bureau of Land Management's Central Coast Field Office. This monitoring occurred every few years from 1991-2006, and has occurred annually since 2007 (Bureau of Land Management 2020). While the

number of individual California jewelflower plants varies greatly from year to year, the Kreyenhagen Hills occurrences are showing an overall decline in size.

Threats

At the time of listing, the primary threats to the species were identified as destruction and adverse modification of habitat due to agricultural conversion and urbanization, as well as competition with nonnative grasses. Threats to the species identified at the time of the 2013 5-year review include: habitat conversion, mining, oil and gas exploration and development, off-road vehicle use, solar power development, uncontrolled grazing, competition from nonnative grasses, nitrogen deposition, loss of pollinators, loss of genetic diversity, and climate change. There is no evidence that the status of these threats has changed. Currently, the primary threats to the species throughout its range include: habitat loss and fragmentation due to agricultural and urban development, oil, gas, and other mining exploration, competition with nonnative grasses, and climate change (Diversity Database 2020). As described in the last review, climate change has the potential to alter the timing and synchronicity of ecosystem processes, including the germination, growth, and pollination of California jewelflower. Climate change will likely affect the structure, composition, and productivity of plant communities (Service 2013).

Development projects that are subject to sections 7 and 10 of the federal Endangered Species Act (Act) typically include habitat compensation, which can reduce the severity of overall habitat loss typically associated with these projects. Habitat compensation can occur via a variety of mechanisms, including the purchase of credits at approved conservation banks or through permittee responsible mitigation. However, there are currently no conservation banks or permittee-responsible mitigation that cover this species.

Conservation

Habitat Conservation Plans

Habitat Conservation Plans are planning documents required as part of an application for an incidental take permit. They describe the anticipated effects of the proposed taking; how those impacts will be minimized, or mitigated; and how the Habitat Conservation Plan is to be funded. Habitat Conservation Plans can apply to both listed and non-listed species, including those that are candidates or have been proposed for listing. Regional Habitat Conservation Plans develop large-scale conservation strategies within a specific region that are designed to conserve functional ecological systems and the covered species that depend on them. Such Habitat Conservation Plans aim to avoid a fragmented conservation landscape by working with local land use authorities and a designated implementing entity to conserve, enhance, and manage a preserve system. Project-level Habitat Conservation Plans are designed to fully offset the impacts associated with the permitted activity by contributing to a larger conservation design.

Being included as a covered species under a Habitat Conservation Plan can result in habitat being set aside and managed for the species as mitigation for impacts associated with covered activities, such as planned urban development, within the Habitat Conservation Plan permit area. In addition to mitigation, avoidance, minimization, and other conservation measures (e.g. monitoring, seasonal work windows, habitat management, etc.) are implemented. Habitat

Conservation Plans can also utilize banks, in-lieu fee programs, or other mechanisms to preserve habitat in perpetuity and contribute to a regional conservation strategy.

The following are Habitat Conservation Plans that include this species and the year the permit for the Habitat Conservation Plan was issued: PG&E San Joaquin Valley Operations & Maintenance Habitat Conservation Plan 2007, Nuevo-Torch 1999, Kern Water Bank 1997, and Chevron Pipeline 1996. More information about Habitat Conservation Plans that include California jewelflower as a covered species can be found at: https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=Q2Y8.

Recovery Permits

Recovery permits, also referred to as 10(a)(1)(A) permits, allow scientists to take listed species as a means to ultimately contribute to the recovery of the listed species. The data acquired from some actions covered under recovery permits (e.g., occurrence, abundance, distribution, etc.) allow the Service to make informed decisions for the species that will enhance their survival and recovery. Recovery permits can be issued for activities that directly aid the recovery of a species, such as seed collecting, reintroductions, habitat restoration, removal or reduction of threats, and educational programs. The Service's recovery permitting program aids in the conservation of listed species by ensuring permittees have adequate field experience and qualifications for conducting activities with the target listed species and, for most species, ensures that permittees are following standardized protocols while surveying. The recovery permitting application process ensures that scientific proposals are crafted using the recommended actions laid out in the Recovery Plan for the target species. There is currently no protocol survey guidance for California jewelflower; however, there are minimum qualifications to obtain a recovery permit for the species. Minimum qualifications can be found at: https://www.fws.gov/sacramento/es/Permits/.

New information acquired through the recovery permitting program, in partnership with the Bureau of Land Management, is presented in the Abundance section above. The Santa Barbara Botanical Garden has used a recovery permit to collect and store seeds of this species for future research and conservation needs.

Conclusion:
After reviewing the best available scientific information, we conclude that California jewelflower (*Caulanthus californicus*) remains an endangered species. Although there has been an increase in the number of occurrences reported in the Diversity Database, these new sightings do not expand the known range of the species, and many of the identified occurrences have not been visited in some time. Most of the occurrences that have been verified as extant have not been regularly surveyed, so their current status is unknown, and the last extant occurrence in Kings County is now possibly extirpated. As described below, we recommend a comprehensive evaluation of these sites to determine the status of the species at these locations.

RECOMMENDATIONS FOR FUTURE ACTIONS:

The following recommendations for future actions are from the 2013 5-year review (Service 2013), scientific literature, and as a result of discussions with species experts.

1. Protect existing habitat in the San Joaquin Valley for the California jewelflower.
2. A comprehensive evaluation should be completed for all known occurrences (both extant and extirpated). The site-specific evaluation should include, at minimum, whether the species is present, the estimated population/occurrence size, and an in-depth analysis of threats at that location.
3. Implement and/or continue yearly surveys utilizing a standardized methodology to determine trends in the range-wide status of the species as well as population/occurrence abundance.
4. Conduct studies that advance the understanding of the species' propagation requirements, knowledge of the physical and chemical elements of the soil required for successful re-establishment, the presence and role of mutualistic soil fungi, the species and role of pollinators, genetics, and seed dispersal mechanisms.
5. Analyze the potential for habitat degradation due to climate change and nitrogen deposition, as well as threats to pollinators from regional pesticide use. Appropriate measures to ameliorate these threats should be implemented.

Field Supervisor, Sacramento Fish and Wildlife Office

Approve MICHAEL SENN Digitally signed by MICHAEL SENN Date: 2020.08.12 16:48:50 -07'00' Date _____

LITERATURE CITED

Bureau of Land Management. 2020. Bureau of Land Management Central Coast Field Office. Annual Report for *Caulanthus californicus* (California jewelflower) in the 2016, 2017, 2018, and 2019 seasons. 12 pp.

California Department of Fish and Wildlife. 2020. State and Federally Listed Endangered, Threatened, and Rare Plants of California. State of California Natural Resources Agency, Department of Fish and Wildlife Biogeographic Data Branch, California Natural Diversity Database. January 2, 2020.

[Diversity Database] California Natural Diversity Database. 2020. Natural Heritage Division. California Department of Fish and Wildlife, State of California. Element Occurrence Reports for *Caulanthus californicus*. Unpublished cumulative data current to January 2020.

[Service] U.S. Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; determination of endangered status for five plants from the Southern San Joaquin Valley. Federal Register 55: 29361-29370. July 19, 1990.

[Service] U.S. Fish and Wildlife Service. 2013. *Caulanthus californicus* (California jewelflower) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento, California. Finalized August 2013. 27 pp.