

*Orcuttia californica*  
(California Orcutt Grass)

**5-Year Review:  
Summary and Evaluation**



Photo by Michael Galloway (CalTrans)

**U.S. Fish and Wildlife Service  
Carlsbad Fish and Wildlife Office  
Carlsbad, California**

**August 2023**

## 5-YEAR REVIEW

### *Orcuttia californica* (California Orcutt Grass)

#### GENERAL INFORMATION

**Species:** *Orcuttia californica* (California Orcutt grass), a plant species

**Date listed under the Endangered Species Act:** August 3, 1993

**Federal Register citation:** Service 1993 (58 FR 41384)

**Classification:** Endangered

**Recovery Plan:** Final, September 3, 1998. Vernal Pools of Southern California Recovery Plan.

**Recovery Priority Number:** 11C

**Critical Habitat Designation:** No critical habitat has been designated for this species.

#### BACKGROUND

Under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 et seq.), the U.S. Fish and Wildlife Service (Service), referred to as “we” in this document, maintain lists of endangered and threatened wildlife and plant species (referred to as the List) in the Code of Federal Regulations (CFR) at 50 CFR 17.11 (for wildlife) and 17.12 (for plants). Section 4(c)(2)(A) of the Act requires us to review each listed species’ status at least once every 5 years.

**Most recent status review:** Service. 2011. *Orcuttia californica* (California Orcutt grass) 5-Year Review: Summary and Evaluation. Prepared by the Carlsbad Fish and Wildlife Office, Carlsbad, California. 38 pp. + appendices.

We initiated the previous status review for California Orcutt grass on March 25, 2009 (Service 2009, pp. 12878–12883). The review was finalized on March 11, 2011 and recommended no change in status.

**Federal Register notice announcing this status review:** On May 20, 2021, we published a *Federal Register* notice announcing initiation of this 5-year review of this species, and the opening of a 60-day period to receive information (Service 2021, pp. 27462–27464).

**Species Overview and Habitat:** *Orcuttia californica* (California Orcutt grass) is an inconspicuous annual grass restricted to southern California and northern Baja California, Mexico. This species is closely associated with deep ephemeral vernal pools underlain by clay soils. At the time of listing, *O. californica* was considered depressed in distribution and abundance because of threats associated with loss and degradation of its vernal pool habitat. Threats included urban and agricultural development, grazing, altered hydrology, offroad vehicle use, trampling, grazing, and nonnative plants. Because of these threats and that the species was known to be extant in only four areas in Riverside and San Diego Counties, *O. californica* was

federally listed as endangered on August 3, 1993 (Service 1993, pp. 41384–41392). The species was listed as endangered by the State of California in 1979.

## ASSESSMENT

### Information acquired since the last status review

This 5-year review was conducted by the Service’s Carlsbad Fish and Wildlife Office. Data for this review were solicited from the public and interested parties through a Federal Register notice announcing this review on May 20, 2021 (Service 2021, pp. 27462–27464). We also contacted Federal partners and other species experts to request data or information to consider in our review. Additionally, we conducted a literature search and a review of information in our files.

### SUMMARY OF NEW INFORMATION SINCE 2011

We received updated information regarding species occupancy and abundance as well as updated threat descriptions through element occurrence (EO) data from the California Natural Diversity Database (CNDDDB)<sup>1</sup>, responses to our Federal Register notice initiating this 5-year review, and in response to subsequent requests to subject matter experts including the City of San Diego, the Nature Conservancy, Marine Corps Air Station (MCAS) Miramar, CalTrans, and the Center for Natural Lands Management. However, the species distribution remains generally the same as described in our latest status review (Service 2011, pp. 5–6), and this information does not alter our understanding of the species’ current distribution.

### Occurrence status

*Orcuttia californica* is currently extant in Ventura, Los Angeles, Riverside, Orange, and San Diego counties from 25 occurrences (Extant and Presumed Extant only) (Table 1).

*Orcuttia californica* is variously associated with other federally listed vernal pool taxa including *Eryngium aristulatum* var. *parishii* (San Diego button celery), *Pogogyne abramsii* (San Diego mesa mint), *Pogogyne nudiuscula* (Otay mesa mint), *Navarretia fossalis* (spreading navarretia), San Diego fairy-shrimp (*Branchinecta sandiegonensis*), and Riverside fairy-shrimp (*Streptocephalus woottoni*).

*Orcuttia californica* has a particular need for focused surveys. Compared to other vernal pool dependent species (i.e., Riverside fairy shrimp) *O. californica* requires deep pools that are inundated for relatively long periods, and this species only germinates in relatively wet years. Because of these specific requirements, pools that support *O. californica* are relatively rare, and this species may be missed by general vernal pool surveys that do not specifically account for the species’ unique habitat requirements. Therefore, many occurrences need focused surveys to update their current statuses as shown with an “\*” in the “2023 Status” column of Table 1. Other

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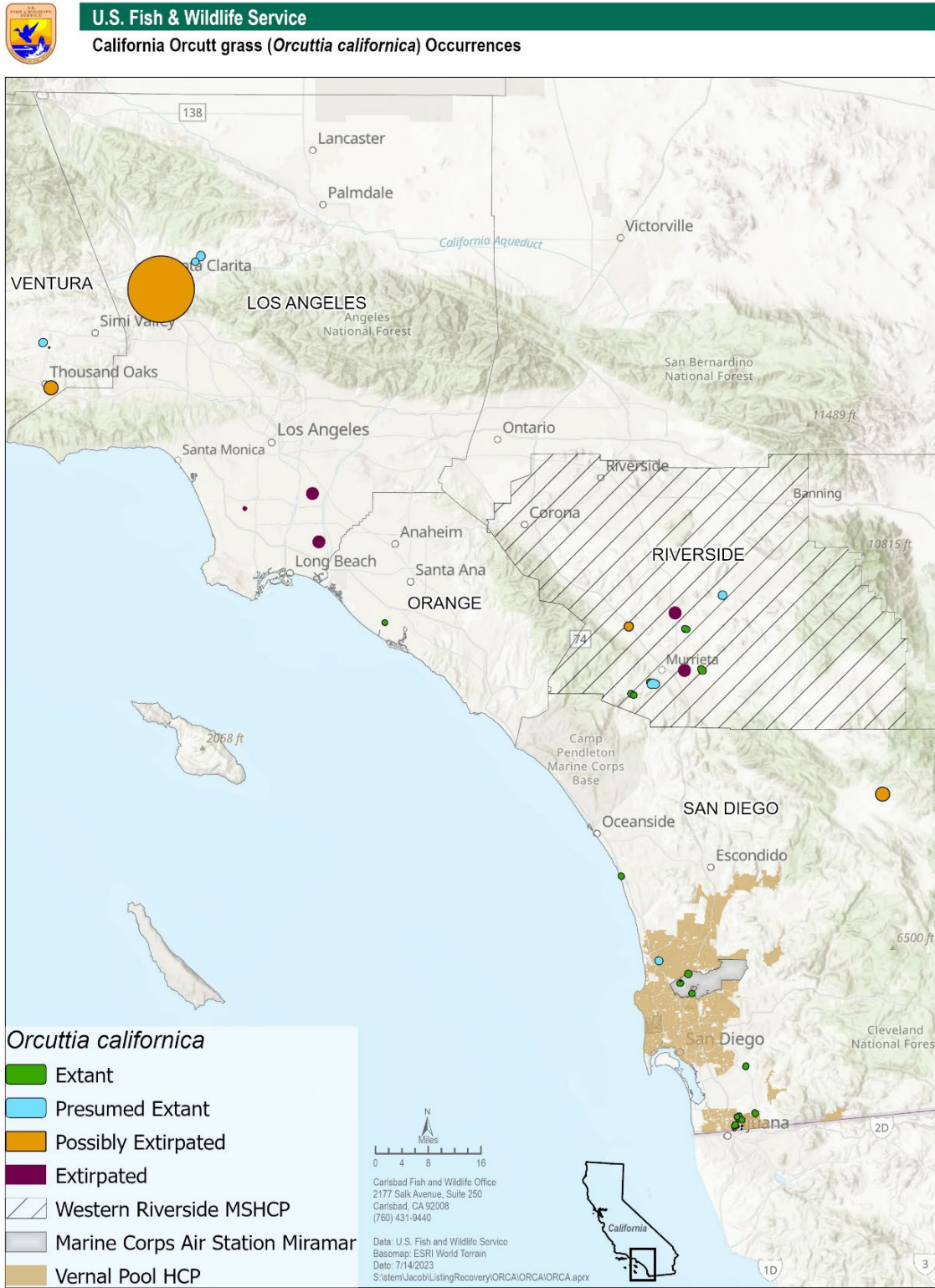
<sup>1</sup> The California Natural Diversity Database (CNDDDB) is an inventory of the status and locations of rare plants and animals in California. The CNDDDB assigns “Element Occurrence” (EO) numbers to unique locations of rare taxa that are greater than 0.25 miles (0.40 kilometers) apart. In this document, we use the term “occurrence” to refer to occurrences based on a general geographic location which may include more than one CNDDDB EO.

occurrences were described with vague location descriptions and will potentially require intense searches to find their locations, followed by focused surveys to assess their current statuses.

Based on the information received, we updated the *Orcuttia californica* occurrence status in Table 1. In this review, EOs attributable to a single geographic occurrence location are grouped together by CNDDDB EO reference number where possible. The CNDDDB assigns different EO numbers to occurrences that are more than a quarter mile (400 meters) apart. We consider an occurrence location to be extant if the species was observed within the last 10 years. If the species has not been observed in the last 10 years but suitable habitat is present, we consider the occurrence is presumed extant. If the species has not been observed for over 10 years and the habitat is small, degraded, or partially developed, we consider the occurrence is possibly extirpated. If the species has not been observed for greater than 20 years and the habitat is no longer suitable, we consider the occurrence to be extirpated.

Nine occurrences changed from presumed extant to possibly extirpated. These changes largely reflect the specific status definitions described above and include four locations that are unlikely to be surveyed in the future because their locations are too vague. One location, EO 40 in Riverside County, changed from possibly extirpated to extant based on an observation in 2017. Finally, the following seven locations were not known in 2011: EO 47 in Orange County; EO 48 and Anderprises on Otay Mesa; EO 49 on the San Diego National Wildlife Refuge; and MV22, F35, and Kiosk pool on MCAS Miramar. Six of these new locations are new because *O. californica* was introduced as part of habitat restoration efforts. The new Otay Mesa pools and the Shinohara pool (EO 49) were seeded from Cal Terraces North (EO 39), and the MCAS Miramar pools from the Congressman pool (EO 6). We assume EO 47 in Orange County was extant in 2011 but had not been detected.

In summary, the species is extant or presumed extant at 25 locations within the United States. A total of 18 locations in the United States are considered extirpated or possibly extirpated. Overall, the species remains distributed in a small number of relatively large pools in San Diego (15 locations), Riverside (7 locations), Los Angeles (3 locations), Ventura (3 locations), and Orange (1 location) Counties. The addition of Orange County does not expand the previously understood distribution of the species. The previous status review (Service 2011, p. 6) considered two locations in Baja California, San Quintin and Mesa de Colonet, to be potentially occupied. Since that time, the population at Mesa de Colonet has been confirmed as recently as 2019, and a previously unknown population was identified in 2017 approximately 17 miles west of the town of Chapala. The San Quintin population and a historically occupied location near the Tijuana Airport are almost certainly extirpated (Sula Vanderplank 2023, pers. comm.). This information does not substantially alter our understanding of the distribution of *O. californica*.



**Figure 1.** Map showing distribution of each known occurrence for *Orcuttia californica* in the United States.

**Table 1.** 2023 Occurrence table for *Orcuttia californica*. For plant observations, the year is always given, and the numbers of plants is provided when count data are available. Current threats to *O. californica* occurrences are preceded by letters corresponding to the five-factor analysis described in section 4(a)(1) the Act. An asterisk (\*) indicates that the site needs to be surveyed to confirm status.

County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
Ventura	Tierra Rejada Vernal Pool Preserve	EO 28	1992 (10,000), 2005 (26,125)	2011	Presumed Extant	Presumed Extant*	Mountains Recreation and Conservation Authority	A. Altered hydrology E. Nonnatives, Isolation	Conserved
Ventura	Thousand Oaks	EO 33			Presumed Extant	Possibly Extirpated	Private	vague locality	Unknown
Ventura	East of Tierra Rejada Valley and SR 23	EO 35	2003 (24)	2011	Presumed Extant	Possibly Extirpated*	Private	A: Development	Unknown
Los Angeles	Los Angeles, Rosecrans and Western	EO 12	1943, 1944, 1946, 1963		Extirpated	Extirpated	Unknown		Unknown
Los Angeles	Near Lakewood	EO 13	1977		Extirpated	Extirpated	Unknown		Unknown
Los Angeles	Near Downey	EO 14	1977		Extirpated	Extirpated	Unknown		Unknown
Los Angeles	Cruzan Mesa	EO 29	1993, 1995, 2003, 2005		Extant	Presumed Extant*	Private	A: Development, OHVs	Not Conserved

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County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
Los Angeles	Plum Canyon	EO 30	1996 (100), 2003		Presumed Extant	Presumed Extant*	Unknown		Not Conserved
Los Angeles	Near Newhall	EO 32			Presumed Extant	Possibly Extirpated	Unknown	Vague locality	Unknown
Orange	Fairview Park	EO 47		2011 (8), 2017	N/A	Extant	City of Costa Mesa	A. Recreational users, fire management	Conserved
Riverside	Stowe Pools, E of Homeland	EO 27	1992 (350,000), 1993, 2001 (10), 2005 (4,266), 2006		Presumed Extant	Presumed Extant*	Private	A: Development, OHV activity. C: Grazing	Not Conserved but in CRD (Conceptual Reserve Design)
Riverside	Menifee Valley	EO 2	1941		Extirpated	Extirpated	Unknown		
Riverside	S of Bell Mtn., E of Menifee Rd.	EO 40	2001, 2009 (3)	2015 (1,000)	Possibly Extirpated	Extant	Private	A: Development (farming)	Not Conserved
Riverside	NE of intersection Menifee and Scott Rds.	EO 31	2001 (10-100)		Presumed Extant	Possibly Extirpated*	Private	A: Residential and agricultural development	Not Conserved
Riverside	Elsinore Trough	EO 42	Collected 1988		Presumed Extant	Possibly Extirpated	Unknown	Vague locality	Unknown

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County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
Riverside	Murrieta Hot Springs	EO 1	1927		Extirpated	Extirpated	Unknown		Unknown
Riverside	Skunk Hollow	EO 24	1984, 1991 (1,000s), 2010	2017, 2019, 2020, 2023 (17,000+)	Presumed Extant	Extant	CNLM	A. OHV, trespass, fire management. E: Fragmentation, climate change	Conserved
Riverside	Mesa de Burro, E and W sides	EO 16	1977, 1979, 1980, 1982 (1,000s), 1986, 1988, 2005, 2009 (3,080)		Presumed Extant	Presumed Extant	TNC-Santa Rosa Plateau Nature Preserve	E: Nonnatives (thatch build-up), Climate Change	Conserved
Riverside	Mesa de Burro, N end	EO 18	1982 (10,000), 1982, 1988, 2005 (301), 2008 (100), 2009 (10,000), 2023	2015 ("Large population")	Presumed Extant	Extant	TNC-Santa Rosa Plateau Nature Preserve	E: Nonnatives (thatch build-up), Climate Change	Conserved



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County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
Riverside	Mesa de Colorado, S side	EO 21 (CP9)	1982 (50-100), 1982, 1986, 1988, 2009, 2010, 2023	2011, 2014, 2015, 2016	Presumed Extant	Extant	TNC-Santa Rosa Plateau Nature Preserve	E: Nonnatives (thatch build-up), Climate Change	Conserved
Riverside	Mesa de Colorado, W side	EO 20 (CP1)	1982 (1,000-10,000), 1986, 1988, 1995, 2010	2014, 2016	Presumed Extant	Extant	TNC-Santa Rosa Plateau Nature Preserve	E: Nonnatives (thatch build-up), Climate Change	Conserved
San Diego	Warner Valley	EO 41	1988		Presumed Extant	Possibly Extirpated	Likely Private	Vague location	Unknown
San Diego	Carlsbad, Poinsettia Train Station	EO 34 (JJ2)	2005	2020 (100), 2023 (2000+)	Presumed Extant	Extant	North County Transit District	E: Nonnatives	Conserved
San Diego	N of runways, S of Rose Canyon	EO 43 (HH1+)	1994		Presumed Extant	Possibly Extirpated	MCAS Miramar	A: Military activities, altered hydrology. E: Nonnative Plants	DOD Level I Management Area (U.S. Marine Corps 2018)
San Diego	N of runways, S of Miramar Pond	EO 44 (HH, HH1+)	2002	2019 (3,000)	Presumed Extant	Extant	MCAS Miramar	A: Military activities, altered hydrology. E: Nonnative Plants	DOD Level I Management Area (U.S. Marine Corps 2018)

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County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
San Diego	W side Hwy 163, 1mi N of Clairmont Mesa Blvd. (Congressman Pool)	EO 6 (U25)	1979, 1982	2011 (500), 2017	Presumed Extant	Extant	MCAS Miramar	A: Highway maintenance, OHVs	DOD Level I Management Area (U.S. Marine Corps 2018)
San Diego	NE of intersection of Harris Plant Road and Kearny Villa Rd	(MV-22)		2023		Extant (introduced from EO6)	MCAS Miramar		DOD Level I Management Area (U.S. Marine Corps 2018)
San Diego	SW Miramar Road and I-15	(F-35)		2023		Extant (introduced from EO6)	MCAS Miramar		DOD Level I Management Area (U.S. Marine Corps 2018)
San Diego	Antares Dr (Kiosk Pool)	(Z6-7)		2023		Extant (introduced from EO6)	MCAS Miramar		DOD Level I Management Area (U.S. Marine Corps 2018)
San Diego	Lonestar Ridge West	EO 3 (J29)	1979, 1989	2020	Presumed Extant	Extant (introduced from J14)	CalTrans	E: Nonnatives	Conserved
San Diego	Headwaters Dennery Canyon (Cal	EO 39 (J2S, J2W)	2003, 2010	2017 (50), 2018, 2019, 2020	Presumed Extant	Extant	City of San Diego	E: Nonnatives	Conserved

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County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
	Terraces North)								
San Diego	Corporate Center South (CalTerraces South)	EO 38 (J14)	2003	2021	Presumed Extant	Extant	City of San Diego	E: Nonnatives, trash	Conserved
San Diego	Otay Mesa W of Finger Canyon (South Otay 1 acre)	EO 7 (J13N)	1979, 1985, 1986, 1990 (2,500), 2003	2020 (5)	Presumed Extant	Extant	City of San Diego	A: Trespassing and OHV use. E: Nonnatives	Conserved
San Diego	N of Wruck Canyon (Goat Mesa)	EO 11 (J16-J18)	1981		Presumed Extant	Possibly Extirpated	City of San Diego	A: Trespassing and OHV use. E: Nonnatives	Conserved
San Diego	Spring Canyon	EO 10 (J12)	1979, 1985, 1986		Presumed Extant	Possibly Extirpated*	Private	A: Trespassing and OHV use. E: Nonnatives	In MHPA but not conserved
San Diego	W. of Spring Canyon (Slump Block Pools)	EO 9 (J11E)	1969, 1979, 1985, 1986, 1990 (2,000)		Presumed Extant	Possibly Extirpated*	Private	A: Trespassing and OHV use. E: Nonnatives	In MHPA but not conserved
San Diego	Arnie's Point SE of mouth Wruck Canyon	EO 37 (J15)	2004 (3), 2005 (7)		Presumed Extant	Possibly Extirpated	Customs and Border Protection,		Not Conserved

2023 5-year Review for *Orcuttia californica*

County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
							U.S. Border Patrol		
San Diego	SE of Brown's Field	EO 4 (J28)	1979		Possibly Extirpated	Extirpated	Private	A: Trespassing, littering, and OHV use. E: Nonnatives	In MHPA but not conserved
San Diego	S of Siempre Viva Rd.	EO 5 (J19)	1980		Possibly Extirpated	Extirpated	Private		Not Conserved
San Diego	Peñasquitos Substation	EO 45 (H33)	2007, 2009		N/A	Presumed Extant*	San Diego Gas and Electric	E: Nonnatives	Conserved
San Diego	Dennery West	EO48 (J31)		2019	N/A	Extant	CalTrans		Conserved
San Diego	Shinohara	EO 49		2019	N/A	Extant (introduced from EO39)	Service		Conserved
San Diego	S of I-905, between Caliente Ave and Heritage Rd (Anderprises)	(J14)		2023	N/A	Extant (introduced from EO39)	CalTrans		Conserved
Baja California	Colonet Mesa		1979, 1980, 1985	2017, 2019	Presumed Extant	Extant	Unknown		Partially Conserved
Baja California	San Quintin				Presumed Extant	Extirpated	Unknown		Unknown

2023 5-year Review for *Orcuttia californica*

County	Occurrence location	EO (SD Group)	Plant Observations Prior to 2011	Plant Observations Since 2011	2011 Status	2023 Status	2023 Ownership	2023 Threat Update	Conservation Status
Baja California	17 miles west of the town of Chapala			2017	N/A	Extant	Unknown		Unknown
Baja California	Tijuana Airport		1969		N/A	Extirpated	Unknown		Unknown
Baja California	Laguna Grande		2010		N/A	Presumed Extant	Unknown		Unknown

## Threats

Threats to *Orcuttia californica* identified in the listing rule included habitat loss and degradation due to urban and agricultural development, grazing, off-highway vehicle (OHV) use, trampling, invasion from weedy nonnative plants, and other factors (Service 1993, pp. 41386–41390). In the 2011 5-year review, we discussed Factor A threats (present or threatened destruction, modification, or curtailment of habitat or range) to *O. californica* from habitat loss associated with urban and agricultural development, highway construction, OHV use, habitat destruction via trampling, altered hydrology, military activities, and illegal dumping. We also discussed Factor E threats (other natural or manmade factors affecting a species' continued existence) from competition with nonnative plants, loss of pollinators, fire suppression measures, small population size, and climate change and drought (Service 2011, pp. 8–26).

Many of the threats described in 2011 remain the same in 2023. Competition from nonnative species is specifically called out as a concern for 17 occurrences (EO 3, 4, 7, 10, 11, 16, 18, 19, 20, 21, 28, 34, 38, 39, 43, 44, and 45) and is a threat for all occurrences at varying levels (City of San Diego 2020; CDFW 2022, database). Climate change remains a widespread threat and is specifically listed as a concern for 5 occurrences (EO 16, 18, 20, 21, and 24) (CNLM 2021; CDFW 2022, database). Isolation and fragmentation are particularly problematic for *O. californica* because it requires relatively rare, deep pools and is often surrounded by development with two occurrences notably threatened (EO 24 and 28; CDFW 2022, database). Recreation, trespass, and fire management are also common threats that affect most pools but especially affect 10 occurrences (EO 6, 7, 9, 10, 11, 24, 27, 29, 38, and 47; City of San Diego; CDFW 2022, database).

Habitat protection and management has reduced threats in some locations. Improved and more regular management and monitoring provided by the City of San Diego through their Vernal Pool Habitat Conservation Plan (VPHCP) have reduced threats from development, OHV use, and habitat destruction. Implementation of the Integrated Natural Resources Management Plan (INRMP) at MCAS Miramar reduces the threat of military activities and OHV use and provides monitoring and routine management, decreasing the threat of nonnatives (EO 34 and 44) as well as habitat restoration and species introductions (MV22, F34, and Kiosk pool). Occurrences that are conserved as part of the Western Riverside Multiple Habitat Species Conservation Plan (WRMSHCP) are protected from the threat of development and at reduced risk from threats associated with recreation and trespass (EO 24 and potentially EO 27).

### *Summary of Threats*

Nonnative plants are currently the most widespread threat to *Orcuttia californica*, followed by human access and disturbance including OHV use, altered hydrology, fire management, and development. Since the previous 5-year review, threats from development, altered hydrology, and OHV use have been reduced in intensity in some areas, particularly in the City of San Diego. Military activities continue to pose a threat to most occurrences on MCAS Miramar; however, most vernal pools containing *O. californica* in MCAS Miramar are afforded a high level of protection under the INRMP.

## Conservation

Since listing, efforts have been made to conserve and restore high quality habitat supporting *Orcuttia californica*. Efforts have also been made to ameliorate threats associated with habitat loss and degradation to improve species viability. In 1998, the Service published the Recovery Plan for Vernal Pools of Southern California, outlining a recovery objective to conserve and enhance southern California vernal pool ecosystems, with specific emphasis on stabilizing existing populations of *O. californica* and other listed species so that they may be reclassified from endangered to threatened status (Service 1998, p. 153). A recovery plan clarification for the Vernal Pools of Southern California was published in 2019 amending the 1998 recovery plan and providing more specific terminology for delisting (Service 2019, p. 2).

Vernal pool conservation of *Orcuttia californica* is primarily implemented through the City of San Diego's VPHCP, MCAS Miramar's INRMP<sup>2</sup>, and private conservation organizations in Riverside and Ventura counties (e.g., the Nature Conservancy, Center for Natural Lands Management, and Mountains Recreation and Conservation Authority).

### ***San Diego Vernal Pool Habitat Conservation Plan***

Implementation of the VPHCP will preserve a network of vernal pool habitat in a matrix of open space; protect the biodiversity of these unique wetlands; and define a formal strategy for long-term conservation, management, and monitoring of vernal pools. The VPHCP also requires the restoration of vernal pool habitat and the re-introduction of covered species, including *Orcuttia californica*, into restored areas to expand or reintroduce species populations in historically occupied complexes and maintain viability of covered species (City of San Diego, p. 10). Within the City of San Diego, all City-owned vernal pools occupied by *O. californica* are conserved and managed. This includes three pools known to be occupied and an additional pool where *O. californica* may be extirpated. An additional four vernal pools known to be occupied by *O. californica* in the past are within the City of San Diego's jurisdiction and are subject to management under the VPHCP. These vernal pools are all within Otay Mesa and will be addressed under the Southwest Village Plan.

Specific goals for *Orcuttia californica* within the VPHCP are described in the City of San Diego Vernal Pool Management and Monitoring Plan (City of San Diego 2020, p. 10). These goals include conservation of 58 pools occupied by *O. californica*, ongoing management of conserved pools, and restoration of specific pools and subsequent introduction of the species consistent with the recovery plan (Service 1998, entire). The pools targeted for restoration and/or introduction are J11 (EO 9), J12 (EO 10), J13 (EO 7), J14 (EO 38), J16-18 (EO 11), J20-21, J21, J27, and J28E.

### ***MCAS Miramar Integrated Natural Resources Management Plan***

The MCAS Miramar INRMP continues to guide conservation and management of special status species, including *Orcuttia californica*, vernal pool habitat, and other resources on the installation. The INRMP has been updated since the previous 5-year review and major changes

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<sup>2</sup> Technically the vernal pools within MCAS Miramar are not legally conserved.

included additional survey data and an updated inventory of the vernal pools and seasonally ponded features on MCAS Miramar (U.S. Marine Corps 2018, pp. 92–94).

In 2013, the Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations was agreed to by the Service, Department of Defense, and the Association of Fish and Wildlife Agencies. This memorandum primarily identified areas where the Service can support the ongoing implementation of military INRMPs, such as offering staff expertise on natural resources, including through cooperative agreements (U.S. Marine Corps 2018, pp. 3–4).

The implementation of management actions under the INRMP is contingent upon the availability of funding, which varies annually. Some activities are performed on a regular basis, such as yearly removal of invasive plants in upland areas, surveys for federally listed birds and butterflies, and annual on-site educational programs about sensitive natural resources. Other management actions are carried out as the need arises or opportunistically, including fence and signage repair and informal observations of sensitive plant species. However, due to budgetary constraints, regular invasive plant removal within vernal pools and focused surveys of listed plant species are not currently feasible. Nonetheless, MCAS Miramar biologists have expressed their intent to establish a more formalized approach to recording their observations of listed vernal pool species in the future (Black 2023, pers. comm.).

### ***Western Riverside Multiple Habitat Species Conservation Plan***

The WRMSHCP is a regional plan that covers 146 species, including *Orcuttia californica*. Several occupied pools in Riverside County were conserved before the WRMSHCP was permitted (e.g., Santa Rosa Plateau and Skunk Hollow). The Stowe Pool was conserved in 2022. The Scott Pool is within a conceptual reserve design area and is anticipated to be conserved per the WRMSHCP in an expansion of the Salt Creek Vernal Pool Complex. Other occupied pools will be afforded some level of protection (i.e., a minimum of 90 percent conservation of habitat mapped under the policy) under the Protection of Species Associated with Riparian/Riverine and Vernal Pool Policy of the WRMSHCP (RCIP 2003, pp. 6-20 to 6-25).

### ***Seed Banking***

There are 10 accessions of *Orcuttia californica* seed stored at approved conservation seed banks, including California Botanic Garden and San Diego Zoo Wildlife Alliance (California Plant Rescue 2023). Accessions date back to 1996 with the most recent collection in 2017.

## **CONCLUSION**

Since 2011, we received new information regarding the distribution, threats, and conservation of *Orcuttia californica*. We updated the status of the vernal pool complexes based on this information (**Table 1**). After reviewing the best available scientific information, we conclude that *O. californica* remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act in our 2011 status review remains largely the same, although threats associated with development have been ameliorated due to conservation actions, as described above. Therefore, we recommend no change in listing status at this time.



## RECOMMENDATIONS FOR FUTURE ACTIONS

The recommended actions listed below are to be initiated over the next 5–10 years. The actions are intended to reduce threats to *Orcuttia californica* and provide information to better understand the biological and physical factors limiting the population growth and distribution. We recognize that conservation of *O. californica* will require cooperation and coordination with partners to minimize impacts from current threats, aid future restoration, and maximize effectiveness of limited funding.

- 1) Work with partners to identify opportunities for conservation or preservation of *Orcuttia californica* occurrences on private lands. Support land acquisition to meet Habitat Conservation Plan goals. Work with local, State, and Federal partners to identify and leverage funding (i.e., section 6) to acquire *O. californica* habitat.
- 2) Adaptively manage *Orcuttia californica* occurrences to maintain, enhance, or restore habitat and reduce threats.
  - a. Manage nonnative plant species in vernal pool habitat.
  - b. Coordinate with partners to develop a nonnative plant species prevention and eradication program for all vernal pool habitat where *O. californica* is extant.
  - c. Ensure the correct plant species pallet from a nearby source is being selected for areas during restoration projects inside and outside of the known range for *O. californica*.
- 3) Monitor occurrences (evaluate habitat quality, and threats) and assess management effectiveness.
  - a. Conserve *Orcuttia californica* seed in an off-site seed bank.
  - b. Work with partners in Baja California, Mexico to survey additional areas for *O. californica* and identify conservation opportunities.
- 4) Determine those specific vernal pool attributes associated with occurrence of *Orcuttia californica*.
- 5) Model species' response to climate change and assess options to translocate the species into projected suitable habitat.
  - a. Develop hydrological monitoring and modeling to determine characteristics and identification of pools and complexes likely to be impacted by prolonged drought, and lack of seasonal rainfall caused by climate change effects to El Niño/Southern Oscillation.

## REFERENCES CITED

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## Personal communications

- Black, C. 2023. Biologist, MCAS Miramar, San Diego California. Videoconference with Dimitri Pappas, Fish and Wildlife Biologist, Carlsbad Fish and Wildlife Office, Carlsbad, California. Dated June 6, 2023. Subject: MCAS Miramar INRMP Discussion. Purpose of meeting was to understand how management actions under the 2018 INRMP have been implemented and prioritized in practice.
- Center for Natural Lands Management (CNLM) 2021. Electronic communication in response to request for comments on Five Year Review dated July 19, 2021.
- Vanderplank, S. 2023. Director of Terrestrial Ecosystem Conservation at Pronatura Noroeste; Adjunct Professor at San Diego State University. Electronic communication to Eric Porter dated July 8, 2023.

**FIELD OFFICE APPROVAL**

**Lead Field Supervisor, Fish and Wildlife Service**

Approved

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Field Supervisor