Navarretia fossalis
(Spreading navarretia)

5-Year Review:
Summary and Evaluation

Photo by Sally Brown (U. S. Fish and Wildlife Service)

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

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5-YEAR REVIEW

Navarretia fossalis
(Spreading navarretia)

GENERAL INFORMATION

Species: *Navarretia fossalis* (Spreading navarretia), a plant species
Date listed under the Endangered Species Act: October 13, 1998
Federal Register citation: Service 1998a (63 FR 54975)
Classification: Threatened
Recovery Plan: Final, September 3, 1998. Vernal Pools of Southern California Recovery Plan.
Recovery Priority Number: 8

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's (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 2009. *Navarretia fossalis* (spreading navarretia) 5-year Review: Summary and Evaluation. Carlsbad Fish and Wildlife Office, Carlsbad, CA. 59 pp.

We initiated a status review for *Navarretia fossalis* in 2009. The review was finalized on August 10, 2009 and recommended no change in listing status.

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

Species Overview and Habitat: *Navarretia fossalis* (spreading navarretia) is an annual herb in the Polemoniaceae (phlox family) family. It is dependent on the ephemeral inundation cycle found in vernal pool habitat and alkali playas but may also occur in man-made depressions and ditches that have the same hydrological dynamics. *Navarretia fossalis* is found in vernal pools, alkali playas, and other ephemerally wetted habitats in California, United States and Baja California, Mexico. Plants produce a spreading stem up to 15 centimeters (6 inches) in height with hairless linear leaves that turn spiny and sharp when dry. The plant has white or pale purple flowers that typically bloom from April through June and produces seeds that become sticky when wet. *Navarretia intertexta* and *N. prostrata* occur in similar habitats and can be distinguished from *N. fossalis* by the size and shape of the calyx, the position of the corolla (inner floral leaves), and the form of the corolla lobes (Day 1993, p. 846).

Vernal pools and vernal swales are often clustered into pool "complexes" (Bauder 1986, pp. 1-1, 4-1-4-31; Keeler-Wolf et al. 1998, pp. 60–61, 63–64), and may form dense, interconnected mosaics of small pools, or a sparse scattering of larger pools. Vernal pool complexes are often interconnected by a shared watershed. Both the pool basin and the surrounding watershed are essential for a functioning vernal pool system (Hanes and Stromberg 1998, p. 48).

In western Riverside County, *Navarretia fossalis* occurs on alkali playa/seasonally flooded alkali vernal plain habitat in the San Jacinto River floodplain and Salt Creek Plain. Seasonally flooded alkali vernal plain includes alkali playa, alkali scrub, alkali vernal pool, and alkali annual grassland components, and is associated with alkali soils in western Riverside County (Ferren and Fiedler 1993; Service 1994; Ferren et al. 1996). This habitat has a hydrologic regime that includes sporadic flooding in combination with slow drainage on the alkaline soils. Local flooding occurs on a seasonal basis and large-scale flooding occurs less frequently, approximately every 20 to 50 years.

ASSESSMENT

Information acquired since the last status review

This 5-year review was conducted by the Service's Carlsbad Fish and Wildlife Office. Information for this review was 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 species experts to request data or information to consider in our review including the City of San Diego and Marine Corps Air Station Miramar (MCAS Miramar). Additionally, we conducted a literature search and a review of information in our files.

SUMMARY OF NEW INFORMATION SINCE 2009

Distribution and Occurrence Status

To update *Navarretia fossalis* occurrence[1] status, we reviewed Element Occurrence (EO) data from the California Natural Diversity Database (CNDDB, CDFW 2023), and monitoring data from the City of San Diego, California Department of Transportation (Caltrans), MCAS Miramar, Marine Corps Base Camp Pendleton (MCB Camp Pendleton), San Diego Management and Monitoring Program (SDMMP), Western Riverside County Regional Conservation Authority (RCA), and two new surveys from Baja California (Clark and Dodero 2009; Campos et al. 2019). Based on this new information we updated the *N. fossalis* occurrence table (Appendix A, Table A1) and added additional occurrences that were not considered in the 2009 5-year review.

In this review, occurrences attributable to a single geographic location are grouped together by existing site name[2], vernal pool complex group or series, and corresponding CNDDB EO reference number(s). In Table A1, the larger, more broadly described occurrences (e.g., San Jacinto River) may include more than one EO. An occurrence is considered extant if the species was observed within the last 10 years. The occurrence is presumed extant if the species was not observed in the last 10 years, but suitable habitat is present. The occurrence is considered possibly extirpated if the species was not observed for over 10 years and the habitat is degraded

[1] The California Natural Diversity Database (CNDDB) is an inventory of the status and locations of rare plants and animals in California. The CNDDB assigns "Element Occurrence" (EO) numbers to unique locations of rare taxa that are greater than 0.40 kilometers (0.25 miles) 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 CNDDB EO.

[2] For occurrences where there are no pre-existing site names, we used the general location names used in the 2009 5-year review.

or partially developed. 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.

The range of *Navarretia fossalis* extends from northwestern Los Angeles County to western Riverside County, and coastal San Diego County in California, to northwestern Baja California, Mexico (Figure 1). At the time of listing, 34 populations were considered extant in the United States, including populations contained in the listing rule and in the Recovery Plan. Nearly 60 percent of these populations were concentrated at three locations: Otay Mesa in southern San Diego County, alongside the San Jacinto River in western Riverside County, and near Hemet in western Riverside County (Bramlet 1993, pp. 10, 14; Bauder 1986a, pp. 4-11, 4-14). At listing, *N. fossalis* occupied less than 300 acres (120 hectares) of habitat in the United States (Service 1998b, p. 54978).

In 2009, of 51 occurrences that were examined, 48 occurrences were considered extant. This included 17 occurrences that had not been known at listing, 12 occurrences where suitable habitat remained but the species had not been located during surveys, and 7 occurrences that had not been surveyed since listing. The 2009 review did not include 9 occurrences in Baja California, or 12 occurrences that had not been seen since prior to listing. In addition, the 2009 review considered the occurrences at Cruzan Mesa, the San Jacinto River, Upper Salt Creek, and Otay Lakes each to be single populations, while this review includes multiple occurrences at those locations.

Currently, of 100 *Navarretia fossalis* populations we examined, 55 are extant, 17 are presumed extant, 6 are possibly extirpated, and 22 have been extirpated. Of the 22 extirpated occurrences, 12 had not been seen since prior to listing, though two of these (EO 2, 58) were included as extant in the 2009 review. In addition, 3 were in Baja California, and 2 were extirpated in the early 2000s (EO 77, EO 1) but the adjacent mitigation areas (EO 20, 53) were addressed as extant in the 2009 review. Finally, 3 were documented as extirpated in the 2009 review; However, one of these (EO 69) was observed in 2020 but has since been extirpated. Two additional populations (EO 46, EO 76) have been extirpated in the time since the last review.

Of the 4 extant or presumed extant occurrences in Los Angeles County, none are conserved. There are 21 extant and presumed extant occurrences in western Riverside County, and 15 of these are conserved or partially conserved, including vernal pool restoration sites at Tres Cerritos (EO 73 north) and Schleuniger (EO 89) that have been implemented since the 2009 review. In addition, numerous sites have been conserved in Western Riverside County since the 2009 review, including Warren-Devonshire (EO 73 south), Stowe (EO 24), part of Eastern Salt Creek (EO 67), Mesa de Colorado (no EO), and several parcels along the San Jacinto River. Much of this conservation can be attributed to work by the Western Riverside County RCA in accordance with the requirements of the Western Riverside County Multiple Species Habitat Conservation Plan.

In San Diego County, there are 41 extant and presumed extant occurrences, including 8 on MCB Camp Pendleton that are being managed per their Rare Plant Management Plan and 2018 Integrated Natural Resources Management Plan (INRMP) (USMC 2018a), and 5 on MCAS Miramar that are being managed per their 2018 INRMP (USMC 2018b). Of the remaining 28 extant and presumed extant occurrences in San Diego County, 25 are conserved or partially

conserved. Since the 2009 review, vernal pool restoration has been implemented on MCB Pendleton and MCAS Miramar, and at Poinsettia Commuter Station (EO 35), Del Mar Mesa / Zamudio (EO 60), Nobel (EO 56), Cal Terraces South (EO 51), Proctor Valley (no EO), Anderprises (EO 34), and Lonestar (EO 87). In addition, *Navarretia fossalis* has been observed on conserved lands at Otay Ranch Preserve (EO 75).

The previous status review did not examine locations in Baja California, Mexico. Since that time, populations have been confirmed at four locations, including Mesa Jesus Maria (Clark and Dodero 2009), a roadside ditch on the road to Sierra Juarez, Valle de las Palmas, and Complejo Medina (Campos et al. 2019). Recent surveys have not been conducted at two locations, La Rumorosa and La Mision. And three occurrences, at San Quintin, Ejido Erendira, and Tijuana Airport are almost certainly extirpated (Campos et al. 2019, pp. 28–30).

In summary, *Navarretia fossalis* is extant or presumed extant at 66 locations within the United States, and 53 of these occurrences are either being managed in accordance with INRMPs or are fully or partially conserved. A total of 25 locations are considered extirpated or possibly extirpated. Overall, the species remains distributed primarily in western Riverside (21 locations) and San Diego counties (41 locations) with a small number of occurrences in Los Angeles County (4 locations). The species is also extant or presumed extant at 9 locations in Baja California, Mexico. This information does not substantially alter our understanding of the distribution of *N. fossalis.*

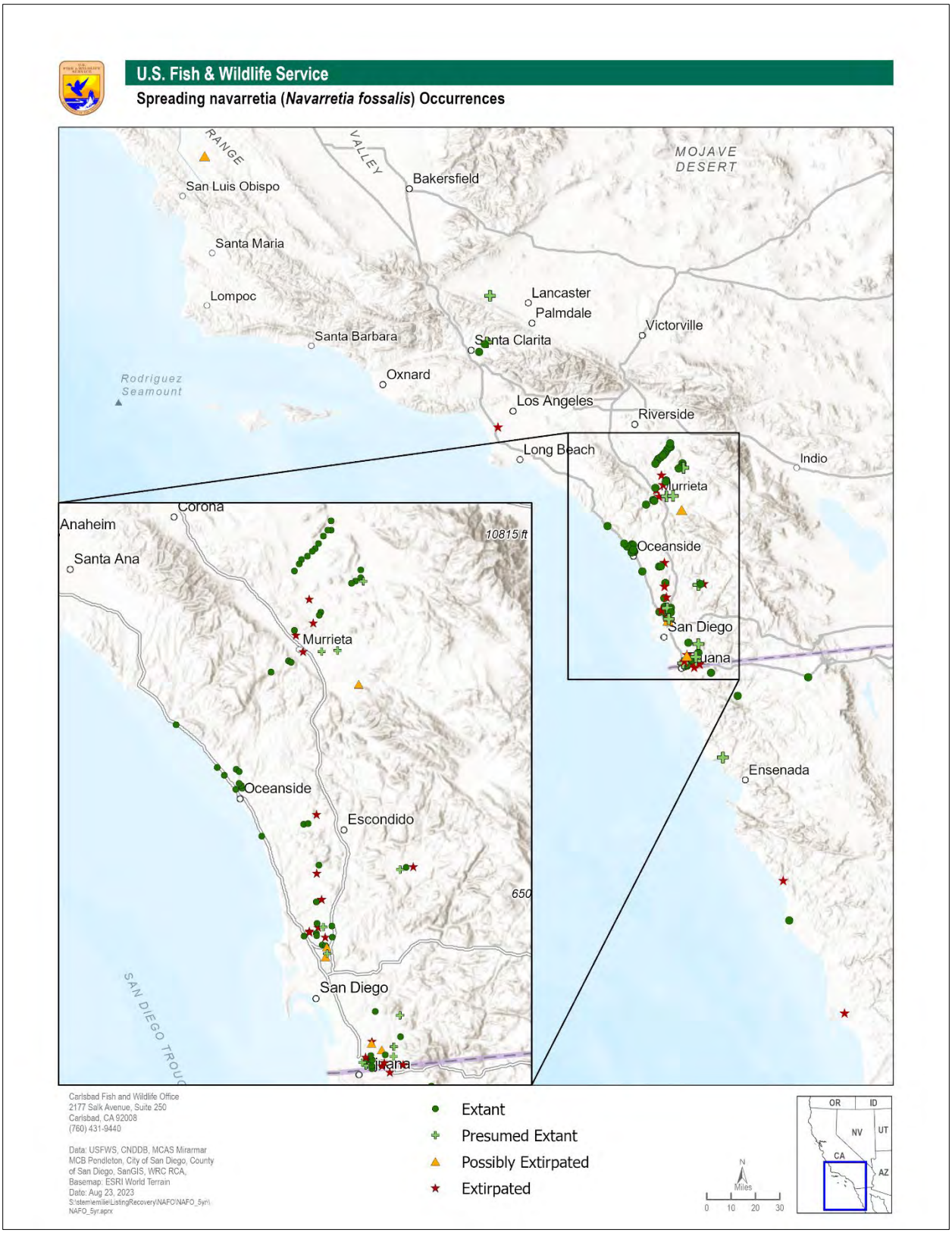

Figure 1. Distribution of *Navarretia fossalis* occurrences.

Threats

Threats to *Navarretia fossalis* identified in the listing rule included habitat loss and degradation due to urban and agricultural development, grazing, off-highway vehicle (OHVs) use, trampling, invasion from weedy nonnative plants, and other factors. In the 2009 5-year review, we discussed Factor A threats (present or threatened destruction, modification, or curtailment of habitat or range) to *N. fossalis* from habitat loss associated with urban and agricultural development, highway construction, OHV use, military activities, altered hydrology, and illegal dumping. We also discussed Factor E threats (other natural or manmade factors affecting a species' continued existence) from competition with nonnative plants, fire suppression measures, small population size, climate change and drought (Service 2009, pp. 21–23).

Many of the threats described in 2009 remain the same in 2023. Competition from nonnative species is listed as a threat for 18 occurrences and is a threat at some level for all occurrences. Human disturbance from OHV use, trails, and recreation threatens 14 occurrences. Changes in hydrology and flood control are a concern for 9 occurrences.

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 INRMPs at MCAS Miramar and MCB Pendleton reduces the threat of military activities and OHV use and provides monitoring and routine management, decreasing the threat of nonnatives and increasing habitat restoration and species introductions. Occurrences that are conserved as part of the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) are protected from the threat of development and at reduced risk from threats associated with recreation, trespass, and manure dumping.

Summary of threats

Nonnative plants are considered the most widespread threat to *Navarretia fossalis* as of this review. In addition, human disturbance from OHV use, trails, recreation, and changes in hydrology and flood control remain significant threats to the species. Since 2009, threats from development, altered hydrology, and OHV use have been reduced in intensity in the City of San Diego, and threats from development, recreation, trespass, and manure dumping have reduced in intensity in western Riverside County.

Conservation

Since listing, efforts have been made to conserve and restore high quality habitat supporting *Navarretia fossalis*. 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 ensure long-term conservation of *Navarretia fossalis* (Service 1998a, p. 60). A recovery plan clarification for the Vernal Pools of Southern California was published in 2019 amending the 1998 recovery plan by providing more specific terminology for delisting (Service 2019, entire).

Vernal pool conservation of *Navarretia fossalis* is primarily implemented through the City of San Diego's VPHCP, the Western Riverside MSHCP, and INRMPs[3] for MCAS Miramar and MCB Pendleton.

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 their long-term conservation, management, and monitoring. The VPHCP also requires the restoration of vernal pool habitat and the re-introduction of covered species, including *Navarretia fossalis,* into restoration areas to expand/restore species populations in historically occupied complexes to maintain viability of covered species. Within the City of San Diego VPHCP, all City-owned vernal pools occupied with *Navarretia fossalis* are conserved and managed. This includes 13 populations known to be occupied, and an additional population where *N. fossalis* may be extirpated. An additional three populations known to be occupied by *N. fossalis* in the past are within the City of San Diego's jurisdiction and are subject to management under the VPHCP.

Specific goals for *Navarretia fossalis* within the VPHCP are described in the City of San Diego Vernal Pool Management and Monitoring Plan (City of San Diego 2020, p. 2). These goals include conservation of 94 pools occupied by *N. fossalis* within seven sites, ongoing management of conserved pools, and restoration of specific pools and subsequent introduction of the species consistent with the recovery plan (Service 1998a, entire).

Western Riverside Multiple Species Habitat Conservation Plan

The Western Riverside County MSHCP is a regional plan that covers 146 species, including *Navarretia fossalis*. Several occupied pools in Riverside County were conserved before the Western Riverside County MSHCP was permitted (e.g., Mesa de Burro and Johnson Ranch). *Navarretia fossalis* is afforded some level of protected under the Western Riverside County MSHCP within the Conceptual Reserve Design, and by Section 6.1.2 Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, and Section 6.1.3 Protection of Narrow Endemic Plant Species, which require surveys, mapping, and documentation, as well as avoidance, minimization, or offsetting conservation through a determination of biologically equivalent or superior preservation (RCIP 2003).

MCAS Miramar Integrated Natural Resources Management Plan

The MCAS Miramar INRMP continues to guide conservation and management of special status species (including *Navarretia fossalis*), vernal pool habitat, and other resources on the installation. The INRMP has been updated since the previous 5-year review and is currently in the 2018 iteration, where major changes include updated survey data and an updated inventory of the vernal pools and seasonally ponded features on-site (USMC 2018b, entire).

[3] While the vernal pools within MCAS Miramar and MCB Pendleton are not legally conserved, ongoing management and monitoring occur to occupied vernal pools subject to available funding.

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 educational programs on-site regarding sensitive natural resources. Other management actions are carried out as the need arises or opportunistically, including fence and signage repair and informal observations of listed plant species. However, due to budget 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 2023a).

MCB Camp Pendleton Integrated Natural Resources Management Plan and Rare Plant Management Plan

Navarretia fossalis is included in the Camp Pendleton INRMP (USMC 2018a) and the Camp Pendleton Rare Plant Management Plan (USMC 2017). Measures for avoidance and minimization of impacts to vernal pools and all vernal pool species, including *Navarretia fossalis*, are specified in Camp Pendleton's Range and Training Area Standard Operating Procedures. In addition, MCB Camp Pendleton is developing a Rare Plant Management Plan to improve the plant's habitat and to manage populations to be self-sustaining. The Rare Plant Management Plan includes management actions and a monitoring program.

Management actions for *Navarretia fossalis* include no net loss of vernal pools, Level 3 Range Restriction (no off-road vehicle travel, no bivouacking, and no digging within a 50-meter (164 feet) buffer), invasive plant eradication, maintaining fences and signage, repairing anthropogenic damage to pool hydrology, establishing 13 new populations and enhancing occupied pools, offsetting impacts to the species 2:1 for National Environmental Policy Act actions, and providing all monitoring and management information to the Service. The Rare Plant Management Plan proposed that the 50-meter (164 feet) buffer would be reduced, but this has not been implemented and would require consultation with the Service.

The monitoring program includes conducting census count monitoring each year for the life of the plan within each occupied vernal pool, collecting data on invasive plant species, cover, and thatch depth, monitoring threats from human activity, monitoring for hydrological impairments, and monitoring for success of newly established populations (Kenney 2021, p. 22).

Critical Habitat

In 2010 we designated 6,720 ac (2719 ha) of critical habitat for *Navarretia fossalis* (Service 2010, entire). Approximately 3,516 ac (1423 ha) (52 percent) of designated critical habitat is currently conserved, and approximately 1,656 ac (670 ha) (25 percent) are anticipated to be conserved in the future within the preserve designs for the City of Carlsbad's Multiple Habitat Conservation Program (MHCP), the City of San Diego and County of San Diego's Multiple Species Conservation Program (MSCP), and the Conceptual Reserve Design for the Western Riverside MSHCP. A total of approximately 77 percent of *N. fossalis* critical habitat is anticipated to be conserved.

CONCLUSION

Since 2009, we received new information regarding the distribution, and conservation of *Navarretia fossalis*. We updated the status of the vernal pool complexes based on this information. After reviewing the best available scientific information, we conclude that *N. fossalis* remains a threatened species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act in our 2009 status review remains largely the same, although some threats associated with development have been ameliorated due to conservation actions, as described above. Though no change in the listing status is recommended at this time, recent conservation efforts (i.e., adoption of the VPHCP, implementation of the MSHCP) may warrant a Species Status Assessment in the future to help evaluate new information and inform future recommendations for the species.

RECOMMENDATIONS FOR FUTURE ACTIONS

These actions are intended to help reduce impacts from threats to *Navarretia fossalis* over the next 5 years. We recognize that cooperation and coordination with our partners will aid future restoration efforts for this species. The recommended actions listed below includes actions from the past 5-year review and new actions that are relevant to the conservation of *N. fossalis*:

1. Work with partners to identify opportunities for conservation of *Navarretia fossalis* 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 *Navarretia fossalis* habitat.

2. Survey or monitor occurrences to provide more information about the status of the species (abundance, spatial distribution, and threats) and assess management effectiveness. Recovery Plan Criteria 3 and 4 require that populations are monitored and stabilized.

    a. Standardize methods for sampling abundance of *Navarretia fossalis* to analyze abundance trends. Use quantitative indices in data collection protocols (Supports Recovery Plan Criteria 3 and 4).

3. Adaptively manage vernal pool habitat to maintain, enhance, or restore habitat and maintain population viability over time.

    a. Manage nonnative plants in vernal pool habitat. Coordinate with partners to develop best practices for nonnative species prevention and eradication to benefit *Navarretia fossalis* habitat.

4. Maintain or enhance *Navarretia fossalis* genetic diversity. Conduct a population genetics study to characterize genetic variation and structure in *N. fossalis* and determine the species' breeding system. Based on study results, develop best management practices to maintain genetic diversity within the species (Supports Recovery Plan Criterion 4).

5. Work with partners in Baja California, Mexico to survey additional areas for *Navarretia fossalis* and identify conservation opportunities.

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Personal Communications

Black, C. 2023. Biologist, MCAS Miramar, San Diego California. Email to Sally Brown, Fish and Wildlife Biologist, Carlsbad Fish and Wildlife Office, Carlsbad, California. Subject: RE: spreading navarretia 5-year review, Miramar records.

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.

Galloway, M. 2023. Environmental Scientist, California Department of Transportation, San Diego California. Email to Sally Brown, Fish and Wildlife Biologist, Carlsbad Fish and Wildlife Office, Carlsbad, California. Subject: RE: Lonestar West report.

McMillan. S. 2023a. Senior Habitat Restoration Ecologist / Botanist, Dudek, San Diego, California. Email to Sally Brown, Fish and Wildlife Biologist, Carlsbad Fish and Wildlife Office, Carlsbad, California. Dated July 6, 2023. Subject: RE: Poinsettia spreading navarretia and open drain.

McMillan. S. 2023b. Senior Habitat Restoration Ecologist / Botanist, Dudek, San Diego, California. Email to Sally Brown, Fish and Wildlife Biologist, Carlsbad Fish and Wildlife Office, Carlsbad, California. Dated July 6, 2023. Subject: RE: Spreading navarretia Pacific Street Superior Ready Mix EO14.

APPENDIX A

Table A1. 2023 occurrence table for *Navarretia fossalis*.

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Luis Obispo	I mile NNE of Creston	70	1953	N/A	N/A	Possibly Extirpated	Agriculture (CDFW 2023)
Los Angeles	Cruzan Mesa East (Plum Creek, Mint Canyon)	31	1993, 1995, 2003	N/A	Extant	Presumed Extant	Includes former EO 32 (CDFW 2023)
Los Angeles	Cruzan Mesa West (Plum Creek, Mint Canyon)	41	1996, 2003, 2008	2010, 2019 (<10)	Extant	Extant	(CDFW 2023)
Los Angeles	Golden Valley / E of Golden Valley Rd, N of Golden Valley High School	94	N/A	2017	N/A	Extant	(CDFW 2023)
Los Angeles	Inglewood	40	1906	N/A	N/A	Extirpated	Urban (CDFW 2023)
Los Angeles	NW of Antelope Valley Poppy Preserve / Lancaster Rd, Fairmont	86	N/A	2010 (60,000), 2011 (60,000)	N/A	Presumed Extant	Solar, wind energy development proposed (CDFW 2023)

[4] Number of individuals provided in parentheses when available.

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
Riverside	San Jacinto River, San Jacinto Wildlife Area / N of Ramona Exwy	27, 33, 37	EO 27: 1991 (326), 1992, 1993, 1995; EO 33: 1993, 1995 (100,000), 2005 (30), 2006 (200), 2007 (200), 2009 (200); EO 37: 1992 (1331)	EO 27: 2011 (2); EO 33 2011 (50), 2012 (250-1000), 2014 (100); EO 37: 2010 (100-250)	Extant	Extant, Conserved	Includes former EOs 36 and 38; Agriculture (EO 27 south polygons) (CDFW 2023)
Riverside	San Jacinto River / Ramona Exwy to Nuevo Rd	22, 23	EO 22: 1990 (20), 1991 (550); EO 23: 1991 (>10,000), 2000 (529), 2007; 2000 (361,000 for EOs 22, 23, 28, 39, 47, and 17 combined)	EO 22: 2010 (30), 2012 (12), 2010 (10), 2012 (12)	Extant	Extant, Partially Conserved	Includes former EO 28; 120 acres conserved Riverpark (Glenn Lukos Associates 2000, CDFW 2023, WRCRCA 2023)
Riverside	San Jacinto River / Nuevo Road to I-215	39, 47, 74, 93	EO 39: 1992, 2000 (1526), 2006 (3609); EO 47: 1994, 1993 (50,000+), 2000 (5,520); EO 74: 2000 (165); 2000 (361,000 for EOs 22, 23, 28, 39, 47, and 17 combined)	EO 47: 2020 (<50); EO 93: 2016 (3)	Extant	Extant, Partially Conserved	Includes former EO 65; 370 acres conserved (Glenn Lukos Associates 2000, CDFW 2023, WRCRCA 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
Riverside	San Jacinto River / W of Case Rd	17	1995 (1425); 2000 (361,000 for EOs 22, 23, 28, 39, 47, and 17 combined)	N/A	Extant	Extant	Flood Control Proposed west of I-215 (Glenn Lukos Associates 2000, CDFW 2023)
Riverside	San Jacinto River / W of Goetz Rd, N of Yosemite Ave	90	N/A	2015 (2000)	N/A	Extant Conserved	Flood Control Proposed west of I-215; 113 acres conserved (CDFW 2023, WRCRCA 2023)
Riverside	Warren-Devonshire, Hemet / S of Devonshire Ave, both sides of Warren Rd	73 South Polygon	1995 (4)	N/A	N/A	Extant Conserved	Conserved (RECON 1995, CDFW 2023, WRCRCA 2023)
Riverside	Tres Cerritos / NE of Celeste Ave, Old Warren Rd (JP Ranch)	73 North Polygon	N/A	2012	N/A	Extant, with Created Pools, Conserved	Mitigation for development, 3.5 acres (Service 2004a)
Riverside	Stowe Pool / N of Stowe Rd, W of California Ave (Upper Salt Creek)	Part of 24	1991 (75,000), 1992 (300,000), 1993 (500), 1994, 1996 (300,000), 2003, 2005, 2006 (31,000)	2019, 2020	Extant	Extant, Conserved	Includes former EOs 30, 66, 71; Conserved as mitigation, 57.25 acres (CDFW 2023, WRCRCA 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
Riverside	Western Salt Creek Plain / E of California Ave, N and S of Stetson Ave, W of San Diego Canal (Upper Salt Creek)	Part of 24	1991 (75,000), 1992 (300,000), 1993 (500), 1994, 1996 (300,000), 2003, 2005, 2006 (31,000)	2019, 2020	N/A	Extant, Partially Conserved	Includes former EOs 30, 66, 71; Conserved, 216.08 acres (CDFW 2023, WRCRCA 2023)
Riverside	Metropolitan Water District (MWD) Preserve / E of California Ave, N and S of Stetson Ave, W of San Diego Canal (Upper Salt Creek)	Part of 24	2001 (489)	2019, 2020	Extant	Extant Conserved	Includes former EOs 30, 66, 71; Conserved as mitigation, Eastside Pipeline, 40 acres, MWD (AMEC 2001, CDFW 2023)
Riverside	Avalon Pool / SW of Salt Creek Plain, S of Stowe Rd, W of Avalon St	85	2006 (430)	N/A	N/A	Extant	(CDFW 2023)
Riverside	Stetson - Warren, Hemet / SW of W Thornton Ave and Fisher St (Benchmark Pacific, Pulte Homes)	48	2005 (450), (1000)	N/A	Extant	Presumed Extant	Detention basin surrounded by development, Flood control (CDFW 2023)
Riverside	Eastern Salt Creek Plain and Hemet Ryan Airport / N of Stetson Ave, both sides of Warren Rd, East of MWD Pipeline	67	1993 (2000), 2006 (3,700)	2010 (200-250)	N/A	Extant, Partially Conserved	Includes former EO 68; Conserved, 100.13 acres (CDFW 2023, WRCRCA 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
Riverside	Menifee Pool / S of Newport Rd, W of I-215, N of La Piedra Rd (Countryside)	46	1998, 2003 (50), 2005	N/A	Extant	Extirpated	Seeds not salvaged (LSA 2006, RWQCB 2007, CDFW 2026)
Riverside	Wickerd Pool / Wickerd Rd and Lindenberger Rd	72	2001, 2009 (17,007)	2015 (500+)	Extant	Extant	Development under construction in watershed (CDFW 2023)
Riverside	Scott Pool / NE of Scott St and Menifee Rd	42	2001	N/A	Extant	Presumed Extant	Surrounded by development, impacts from telephone pole, gas line (Helix 2002, AMEC 2006, CDFW 2023)
Riverside	5 miles NE of Murrieta on I-215 toward Perris	64	1922	N/A	N/A	Extirpated	Agriculture, Development (CDFW 2023)
Riverside	Clayton Ranch Pool / S of Clinton Keith Rd, under Mustang Spirit Ln	63	2003, 2004 (450)	N/A	Extirpated	Extirpated	Seeds salvaged 2004, moved to EO 89 (Service 2004b)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
Riverside	Schleuniger Pool / N of La Estrella Rd and Crest Meadow Dr (mitigation for Clayton Ranch)	89	N/A	2017 (2,120), 2017 (3,000)	N/A	Extant Restored Conserved	Created as mitigation for EO 63 (CDFW 2023, WRCRCA 2023)
Riverside	Date Street / S of Murrieta Hot Springs Rd, W of Date St (Old School House II, Tentative Tract 29863)	62	2001 (5-7)	N/A	Extant, proposed for development	Presumed Extant	Development proposed, habitat altered by social trails (PCR 2001, CDFW 2023)
Riverside	Madison Pool / NE of Murrieta Hot Springs Rd and Jefferson Ave	69	1998	2020 (4)	Extirpated	Extirpated	Ponded area developed 2022 (CDFW 2023)
Riverside	Johnson Ranch / Small pool E of Skunk Hollow and N of Murrieta Hot Springs Rd	43	2008 (1)	N/A	Extant	Presumed Extant Conserved	(CDFW 2023)
Riverside	Northwest Mesa de Burro / Santa Rosa Plateau	44 (B1-3)	1975, 1977, 1993, 2009 (20,000)	2013 (25-100), 2015 (thousands)	Extant	Extant Conserved	(CDFW 2023)
Riverside	Central Mesa de Burro / Santa Rosa Plateau	88 (vicinity of B7)	2009 (5)	N/A	N/A	Extant Conserved	(CDFW 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
Riverside	Mesa de Colorado / SE of Via Volcano and Avocado Mesa Rd, Santa Rosa Plateau (Moore parcel, NAFO-15)	N/A	N/A	2021 (100)	N/A	Extant Conserved	11.31 acres conserved (WRCRCA 2023b)
Riverside	Los Caballos Road (Vail Lake)	45	1993	N/A	Extant	Possibly Extirpated	Agriculture (CDFW 2023)
San Diego	Stuart Mesa / Oscar 1 North Training Area, Mass 3, MCB Camp Pendleton (NAFO-001)	21	1987 (3 pools), 1989 (200), 1998 (2), 2004 (2), 2009 (2)	2010, 2011 (200), 2020 (292,005, 4 pools)	Extant	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)
San Diego	Wire Mountain North / Y 1-6, MCB Camp Pendleton (NAFO-004)	81, 82	EO 81: 1998 (5), 2002 (5); EO 82: 1998 (5), 2009 (4)	EO 81: 2011 (1); EO 82: 2011 (210); 2020 (369,284, 30 pools)	Extant, restored in 2004	Extant Restored	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)
San Diego	Camp Del Mar / Between Wire Mt Rd and RR tracks MCB Camp Pendleton (NAFO-002)	83	1998 (3)	2011 (11), 2020 (5,093, 11 pools)	Extant	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	Oscar 1 South / Ridge west side of Ysidora Basin, MCB Camp Pendleton (NAFO-003)	84	1998 (2), 2004 (1), 2009 (1)	2019 (6,357, 1 pool)	N/A	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)
San Diego	San Onofre Management Area (SOMA) / MCB Camp Pendleton (NAFO-005)	N/A	N/A	2020 (171, 5 pools)	N/A	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)
San Diego	White Beach South / MCB Camp Pendleton (NAFO-006, Cocklebur Mesa)	N/A	N/A	2020 (28, 2 pools)	N/A	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)
San Diego	Wire Mountain North / MCB Camp Pendleton (NAFO-007)	N/A	N/A	2020 (6 pools)	N/A	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	White Beach North / MCB Camp Pendleton (NAFO-008)	N/A	N/A	2019 (12, 1 pool)	N/A	Extant	Managed according to Rare Plant Management Plan USMC 2017 and INRMP USMC 2018a (Kenney 2021)
San Diego	Poinsettia Commuter Station	35 (JJ 1, JJ 3)	1989	2019 (500+), 2020 (500+), 2021 (500+), 2022 (500+), 2023 (2000+)	Extant, preserved	Extant Restored Conserved	Surrounded by development; 7.99 acres conserved (Dudek 2019, 2020, 2021, 2022, City of Carlsbad 2023, McMillan 2023a)
San Diego	Pacific Street /San Marcos / L 9-10 / Superior Ready Mix and Universal Boot	14 (L 9-10)	1979, 1983, 1986, 1995, 2003 (40), 2009	2023 (212)	Extant, proposed for development	Extant	Development proposed; Includes former EOs 15 and 18 (McMillan 2023b)
San Diego	Upham / San Marcos	14 (L 1-6)	1979, 1983, 1986, 1995, 2003 (40), 2009	N/A	Extant	Presumed Extant	Includes former EOs 15 and 18; Not seen 2018, 2020, 2021, 2022 (CDFW 2023, Helix 2023)
San Diego	Bent Avenue / San Marcos (Fry's, Linda Vista-Bent)	29 (L 11-13)	1979, 1993	2016, 2020 (4 pools), 2021	Extant, preserved	Extant Conserved	Surrounded by development; 4.8 acre Frys Vernal Pool Preserve with 15 natural pools and 8 created pools (Dudek 2020b, CDFW 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	N of Twin Oaks Valley Rd / San Marcos	16	1937	N/A	N/A	Extirpated	Not seen 2009, Urban (CDFW 2023)
San Diego	Santa Fe Valley Vernal Pool Preserve (Starwood, Crosby Estates)	80 (D6++4S)	2004 (228+)	2011, 2016 (1413), 2019 (3)	Extant, restored 5 and created 1 pool to mitigate disturbance to 3 pools	Extant Restored Conserved	5 restored and 1 created pool; mitigation for disturbance to 3 pools (CDFW 2023)
San Diego	DD 1 / Santa Fe Valley	13 (DD 1)	1979	N/A	Extant, possibly extirpated	Extirpated	Urban (CDFW 2023)
San Diego	Ramona T / South of Ramona Airport	61	1995, 2005	N/A	Extant, preserved	Presumed Extant Conserved	(CDFW 2023)
San Diego	Cummings Ranch / Ramona Grasslands	12 (T 2, E 5)	1979, 1986, 1989 (2000-5000), 2003 (150+)	N/A	Extant	Extant Partially Conserved	TET easement (TET 1994, CDFW 2023)
San Diego	Downtown Ramona / N side of Main St just E of Pala St.	26	1988 (2)	N/A	N/A	Extirpated	None found 1989, Urban (CDFW 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	Penasquitos North / Mesa at the head of Deer Canyon	5 (H 30)	1979	N/A	N/A	Extirpated	None found 2009, SR-56 and housing (CDFW 2023)
San Diego	Del Mar Mesa / Zamudio	60 (H 1-15)	1986	2019 (147, 5 pools)	N/A	Extant, Restored, Conserved	100 found in large CDFW pool, seed introduced into 4 restored pools on Zamudio, mitigation for I-805 (Caltrans 2019)
San Diego	Carroll Canyon Preserve	57 (D 5-8)	1991 (1 pool), 2003, 2009 (118)	2016 (500), 2017 (1731)	Extant, preserved	Extant Conserved	15.93 acre preserve, City of San Diego (SDMMP 2021)
San Diego	X 1-4 / MCAS Miramar	south of 7 (X 1-4)	1979 (52 pools)	N/A	Extirpated	Extirpated	DOD Level I Management Area (USMC 2018b, Black 2023b)
San Diego	HH1+ / MCAS Miramar	59 and 92 (HH1+)	1994 (200)	2011 (I pool), 2019	Extant	Extant	Occurs naturally in 1 pool, Fencing and signage installed around 2010. DOD Level I Management Area (USMC 2018b, Black 2023b)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	EE1, EE2 / MCAS Miramar	58 (EE 1, EE 2)	1982	N/A	Extant	Extirpated	Fenced, within flightline, DOD Level I Management Area (USMC 2018b, Black 2023b)
San Diego	U North / MCAS Miramar	west part of 3 and 79 (U North)	1979, 2009	2011 (>500, 3 pools)	Extant, preserved, restored 2003	Extant, Restored	Introduced, Fenced, DOD Level I Management Area (USMC 2018b, Black 2023b)
San Diego	F North / MCAS Miramar	east part of 3 (F North)	1979	N/A	Extant	Possibly Extirpated	DOD Level I Management Area (USMC 2018b, Black 2023b)
San Diego	Z 6-7 / MCAS Miramar (Kiosk demonstration pool)	N/A (Z 6-7)	N/A	2011 (1 pool)	N/A	Presumed Extant	Introduced (Black 2023b)
San Diego	AA1West+ / MCAS Miramar	91 (AA 1 West+)	N/A	2021, 2023	N/A	Extant, Restored	Introduced, DOD Level I Management Area (USMC 2018b, Black 2023b)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	MV 22 / MCAS Miramar	N/A (MV 22)	N/A	2023 (390, 7 pools)	N/A	Extant Restored	Introduced, DOD Level I Management Area (USMC 2018b, Black 2023b)
San Diego	Nobel Drive / Nobel Dr and I-805	56 (X 5)	2003 (1 pool), 2008, 2009 (87)	2014 (1), 2015 (8), 2016 (1), 2017 (1), 2019 (2), 2023 (2)	Extant, preserved	Extant Restored Conserved	526 sq ft vernal pool restoration 2019; ~50 acres conserved, City of San Diego (CDFW 2023)
San Diego	New Century / Kearny Mesa, W of Ruffin Rd, N of Balboa Ave (Spectrum, BB2)	N/A (N 8)	1998 (70)	N/A	Extant, preserved, with restored and created pools	Presumed Extant Restored Conserved	4.44 acres conserved with 18 pools, (City of City of San Diego 20232023)
San Diego	Miramar Industrial / N of Carroll Canyon and Miramar Rd	6 (I 5, I 8)	1979	N/A	N/A	Extirpated	Urban (CDFW 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	Miramar Industrial / N of Miramar Rd, 1 mile E of I-805 (Bob Baker, Eastgate Miramar)	7 (I 6 B, I 6 C)	1979	N/A	N/A	Extirpated	City of y2023o
San Diego	Montgomery Field	4 (N 5-6)	1979	N/A	Extant, proposed for development	Possibly Extirpated	Not found 1986, 2021 (City of San Diego 2022, CDFW 2023)
San Diego	Sweetwater Reservoir	11 (S 1-3)	1979, 1985 (3 or 4 pools), 1992	2015 (302)	Extant, impacts to 3 pools from SR-125 work	Extant Conserved	Impacts to 3 pools from SR-125 (CDFW 2023)
San Diego	Proctor Valley	N/A (R 1)	N/A	N/A	Extant, Part of MSCP Cornerstone Lands	Presumed Extant Restored Conserved	Part of MSCP Cornerstone Lands (City of San Diego 2022)
San Diego	M 2 / SW of Heritage Rd and Olympic Pkwy	2 (M 2)	1979	N/A	Extant	Extirpated	Not found 1986, gravel in pool (CDFW 2023)
San Diego	M 4 / County Landfill (Bellavista)	N/A (M 4)	1993 (47)	N/A	Extant, County Landfill, Part of MSCP County subarea plan	Possibly Extirpated	(SANDAG 2000)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	West Otay Mesa A & B	54 (J 32)	2003 (3 pools)	N/A	Extant, Preserved and restored	Presumed Extant Conserved Restored	(CDFW 2023, City of San Diego 2023)
San Diego	Sweetwater High School District J 3 / San Ysidro High School	1 (J 3)	2003 (<50)	N/A	Extant, Preserved and restored	Extirpated	Developed early 2000s (CDFW 2023)
San Diego	Sweetwater High School District J 33 / San Ysidro High School	53 (J 33)	2003 (3 pools)	N/A	Extant, Preserved and restored	Extant Restored Conserved	(CDFW 2023)
San Diego	K 2	10 (K 2)	1979 (1 pool)	N/A	Extant, Part of MSCP Cornerstone Lands	Possibly Extirpated	Not Found 1986 (CDFW 2023)
San Diego	Otay Lakes	49 (K 5, 11)	2003 (2 pools), 2009 (53)	2017 (19)	Extant, Part of MSCP Cornerstone Lands	Extant, Conserved	Part of MSCP Cornerstone Lands (CDFW 2023, SDMMP 2023)
San Diego	Otay Lakes	49 (K 3-4)	2003 (2 pools), 2009 (53)	2017 (19)	Extant, Part of MSCP Cornerstone Lands	Extant, Conserved	Part of MSCP Cornerstone Lands (SDMMP 2021, CDFW 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	Otay Mesa (Ocean View Hills Parkway)	77	1993 (2 pools), 1995 (2 pools)	N/A	N/A	Extirpated	Developed early 2000s (CDFW 2023)
San Diego	Cal Terraces North (Otay Mesa Road Helix, Otay Mesa Road RECON)	20 (J 2 S)	1985 (80), 2003 (79 created pools)	2010, 2017 (100), 2019, 2021 (2 pools)	Extant, Partially restored and preserved	Extant Partially Restored Conserved	(City of San Diego 2022, CDFW 2023)
San Diego	Cal Terraces South / Otay Mesa Rd and Heritage Rd	51 (J 14)	1995, 2003 (4 created pools)	2020 (2 pools) 2021 (1 pool)	N/A	Extant Restored Conserved	12.91 acres conserved (City of San Diego 2022, CDFW 2023)
San Diego	J 13 N / South Otay	19 north polygon (J 13 N)	1986 (4 pools), 2003 (2 pools)	N/A	Extant, Partially restored and preserved	Presumed Extant Partially Restored Partially Conserved	1 of 2 occupied pools conserved (City of San Diego 2022, CDFW 2023)
San Diego	J 13 S / South Otay	19 south polygons / J 13 S	1986 (4 pools)	N/A	Extant	Presumed Extant	Not found 2003 (City of San Diego 2022, CDFW 2023)
San Diego	Anderprises / Otay Mesa Rd, Heritage Rd, Anderprise	34 (J 14)	1991, 1995, 2003	2022 (712 in 8 pools), 2023 (63 in 2 pools)	Extant, Caltrans plans to restore and preserve as mitigation	Extant Restored Conserved	Conserved, Mitigation (Galloway 2023)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	Goat Mesa Wruck Canyon	78 (J 16-17)	N/A	2011, 2017 (225), 2020 (3 pools)	Extant, conserved and enhanced	Extant Conserved	Conserved, mitigation bank (City of San Diego 2022, SDMMP 2023)
San Diego	Lonestar (Otay Ranch, New Millennium)	87 (J 29-30)	N/A	2017 (1 pool)	Extant, partially restored as mitigation for SR-125	Extant Restored Conserved	Introduced 2014, mitigation for SR-125 (CDFW 2023)
San Diego	Robinhood Ridge	55 (J 4-5)	2003 (4 pools), 2009 (50)	2017 (21), 2019	Extant, preserved, with restored and created pools	Extant Restored Conserved	(SDMMP 2021, City of San Diego 2022)
San Diego	Arnie's Point	52 (J 15)	2004 (250, 6 pools), 2006 (400, 6 pools), 2007 (10 pools)	N/A	Extant, preserved, with restored and created pools as mitigation for border fence	Extant Restored Conserved	Mitigation for border fence, 2002 (City of San Diego 2022, CDFW 2023)
San Diego	Sunroad (Sunroad Centrum, Otay 250)	8 (J 22)	1979, 1985 (2 pools), 1986 (3 pools), 1991 (12)	N/A	Extant, partially preserved	Possibly Extirpated Partially Conserved	Proposed to be conserved and restored (RECON 2021)

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
San Diego	Otay Mesa South of Siempre Viva Road by TJ Airport	50 (J 19)	1967	N/A	N/A	Extirpated	Paved (CDFW 2023)
San Diego	Empire Center / SW of Otay Mesa Rd and La Media Rd	9 (J 27)	1979, 1986 (1 pool)	N/A	N/A	Extirpated	Includes former EO 25; Urban except 6.38 acres conserved with 10 pools, species not seen since 1986 (City of San Diego 2022, CDFW 2023, City of San Diego 2023)
San Diego	Otay Business Park, Port of Entry	76	2009 (3)	N/A	N/A	Extirpated	Salvaged (CDFW 2023)
San Diego	Otay Ranch Preserve, mouth of O'Neal Canyon	75	N/A	2011 (1), 2012	N/A	Presumed Extant, Conserved	Otay Ranch Preserve (CDFW 2023)
Baja California	Complejo Medina Vernal Pool Complex / Colonet	N/A	N/A	2019	N/A	Extant Conserved	Jardin Botanico San Quintin (Campos et al. 2019)
Baja California	Valle de las Palmas / Tecate	N/A	N/A	2019	N/A	Extant	Threatened by grazing, agriculture

County	Site name/location (aliases)	EO (SD Group)	Plant observations prior to 2009[4]	Plant observations since 2009	2009 status	2023 status	Notes 2023
							(Campos et al. 2019)
Baja California	Roadside ditch on road to Sierra Juarez	N/A	N/A	2019	N/A	Extant	(Campos et al. 2019)
Baja California	Tijuana International Airport	N/A	N/A	N/A	N/A	Extirpated	Urban (Campos et al. 2019)
Baja California	La Rumorosa	N/A	N/A	N/A	N/A	Presumed Extant	(Campos et al. 2019)
Baja California	La Mision	N/A	N/A	N/A	N/A	Presumed Extant	Type locality (Campos et al. 2019)
Baja California	Ejido Erendira	N/A	N/A	N/A	N/A	Extirpated	Agriculture (Campos et al. 2019)
Baja California	San Quintin (Ejido Papalote)	N/A	N/A	N/A	N/A	Extirpated	Urban (Campos et al. 2019)
Baja California	Mesa Jesus Maria / Tijuana	N/A	N/A	2009	N/A	Extant Conserved	Meseta del Bosque National Park (Clark and Dodero 2009)

FIELD OFFICE APPROVAL

Lead Field Supervisor, Fish and Wildlife Service

☒ Approved

SCOTT SOBIECH

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Date: 2023.08.31 14:09:52 -07'00'

Scott A. Sobiech
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