

Interim Core Map Documentation for the California Orcutt Grass

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Interim Core Map Developer: U.S. Environmental Protection Agency (EPA), Office of Pesticide Programs

Species Summary

The California Orcutt grass (*Orcuttia californica*; Entity ID 785) is an endangered aquatic plant. The U.S. Fish and Wildlife Service (FWS) has not designated a critical habitat for the species. This species is found in southern California and requires vernal pools to grow and reproduce. The California Orcutt grass is currently found in the counties of Ventura, Riverside, Orange and San Diego of southern California. The historical distribution also extended into Los Angeles County and northwestern Baja California, Mexico. Additional information on the species is provided in **Appendix 1**.

Description of Core Map

The core map for California Orcutt Grass is based on biological information, specifically vernal pools areas found within the species range and known locations identified by FWS (all FWS locations are within the species range for this species except for one observation in Orange County). FWS known location data are more recent than the range data. The range map and many of the known locations and species range are available from FWS. Known location geodata from FWS was available for roughly 21 of the 25 extant and presumed extant locations identified by FWS in Table 1 of the 2023 Five-Year Review. Vernal pool habitat locations are taken from California Fish and Wildlife Services (CA FWS) Areas of Conservation Emphasis (ACE) habitat data, version 3.0. The outer extent of this core map is defined by vernal pool locations from the ACE dataset. The vernal pool locations are within the species range and one spot in Orange County, all available FWS known locations for this species are found inside of the range except for one in Orange County. Cultivated land was not removed from the core map because these areas are identified as potential locations for vernal pools. Additional information on the data used is provided in **Appendix 2**.

Figure 1 depicts the resulting interim core map for the California Orcutt grass. The size of this core map is approximately 49,000 acres. Landcover categories within the core map area include CA FWS identified known vernal pool habitats. Landcover categories within the core map area are included in **Table 1**. Landcover is predominantly grassland herbaceous and scrub/shrub habitats or developed areas.

The core map developed for the California Orcutt grass is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the species. This core map incorporates information developed by FWS and made available to the public; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate species expert feedback from FWS. This interim core map has an "average" (3) best professional judgment classification to describe major uncertainties/limitations. The map is based on known locations described by FWS, which coincide with suitable clay soil habitat locations. This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.



Figure 1. Interim core map for the California Orcutt grass.

Table 1. Percentage of Interim Core Map Represented by NLCD¹ Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Landcover (Value)	% of core map represented by landcover	% of core map represented by example pesticide use
Forestry	Deciduous Forest (41)	0%	1%
Forestry	Evergreen Forest (42)	0%	
Forestry	Mixed Forest (43)	1%	
Agriculture	Pasture/Hay (81)	2%	6%
Agriculture	Cultivated Crops (82)	4%	
Mosquito adulticide, residential	Open space, developed (21)	9%	28%
Mosquito adulticide, residential	Developed, Low intensity (22)	8%	
Mosquito adulticide, residential	Developed, Medium intensity (23)	8%	
Mosquito adulticide, residential	Developed, High intensity (24)	3%	
Invasive species control	Woody Wetlands (90)	1%	65%
Invasive species control	Emergent Herbaceous Wetlands (95)	0%	
Invasive species control	Open water (11)	0%	
Invasive species control	Grassland/herbaceous (71)	27%	
Invasive species control	Scrub/shrub (52)	35%	
Invasive species control	Barren land (rock/sand/clay; 31)	2%	
Total Acres	Interim Core Map Acres	~49,000	

¹ Dewitz, J., 2023, National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release, <https://doi.org/10.5066/P9JZ7AO3>

Evaluation of Known Location Information

There are four datasets with known location information:

- Descriptions of locations provided by FWS;
- Occurrence locations in iNaturalist;
- Occurrence locations in the Global Biodiversity Information Facility (GBIF);
- Occurrence locations in NatureServe

EPA evaluated these occurrence data before selecting the type of and developing the core map. FWS appeared to have the finest resolution of the location information, providing a map that depicted the current known locations all in southern California. The locations occurred in the counties of Ventura, Riverside, Orange, and San Diego of southern California, and only one location in Orange county is outside of the current species range. The historical distribution also extended into Los Angeles County and northwestern Baja California, Mexico. (**Figure A1-1 in Appendix 1**). Occurrences in iNaturalist, GBIF and NatureServe did not support further expanding the core map outside of the FWS range and known locations, the occurrences from the database overall aligned with those from FWS. **Appendix 1** includes more information on the available known location information.

Approach Used to Create Core Map

The core map was developed using the “Process EPA Uses to Develop Core Maps for Draft Pesticide Use Limitation Areas for Species Listed by the FWS and their Designated Critical Habitats”² (referred to as “the process”). EPA developed the core map using the 4 steps described in the process document:

1. Compile available information for a species;
2. Identify core map type;
3. Develop the core map for the species; and
4. Document the core map.

For step 1, EPA compiled available information for the California Orcutt grass from FWS, as well as observation information available from various publicly available sources (including iNaturalist, GBIF, and NatureServe). The information compiled for the California Orcutt grass, is included in **Appendix 1**.

Influential information that impacted the development of the core map included:

- Range, occurrences, and known locations of the California Orcutt grass are in southern California. None of the known locations from FWS are found outside of the current species range except for one in Orange County.
- The species require vernal pool habitat to grow and reproduce.
- The vernal pools must be deep and coincide with clay soils.

For step 2, EPA used the compiled information to identify the core map type including species range and known location information. The extant populations are located near either the species’ range or known locations identified by FWS and require vernal pools to grow and reproduce. Therefore, EPA based the core map on the vernal pool habitats from the CA FWS that intersect with/are near the species’ range or known locations identified by FWS. The entire range of the species was not used as the core map because the range contains habitats where the species does not occur, and none of the known locations

² Dated 2024, available online at: <https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas>

are found outside of the species range except for one in Orange County. EPA also checked that the identified vernal pools coincide with clay soils as defined by the Soil Survey Geographic Database (SSURGO) since the species requires clay soils, and they all did. The clay soil data did not shrink the size of the interim core map below the extent of the vernal pools that intersect FWS known locations.

For step 3, EPA used the best available data sources to generate the core map. Data sources are discussed in the process document, including the state dataset from California identifying vernal pool complexes. For this core map, EPA used the vernal pool habitats identified by CA FWS that intersect within the species' range or known locations identified by FWS. **Appendix 2** provides more details on the GIS analysis and data used to generate the core map.

Discussion of Approaches and Data that were Considered but not Included in Core Map

The species range was considered but was not selected as the core map because the range map includes substantial habitats in addition to vernal pools. Additionally, the range map was last updated in 2015 and does not include some areas with known populations as of the Five-Year Review (2023). These known locations identified in the 2023 Five-Year Review are included in the core map.

Appendix 1. Information Compiled for California Orcutt Grass During Step 1

1. Recent FWS documents/links and other data sources

- Five Year Review (2023) (https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/6447.pdf)
- Recovery Plan Clarification for the Vernal Pools of Southern California (2019) (https://ecos.fws.gov/docs/recovery_plan/Vernal%20Pools%20of%20Southern%20California%20Clarification.pdf)
- Vernal Pools of Southern California Recovery Plan (1998) (https://ecos.fws.gov/docs/recovery_plan/980903a.pdf)

2. Background information

- **Status:** Federally listed as endangered in 1993
- **Resiliency, redundancy, and representation** (the 3Rs)
 - Resiliency: Presumed low. "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." (Five-Year Review 2023)
 - Redundancy: Presumed low. "*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.” (Five-Year Review 2023).

Representation: Presumed low. “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.” (Five-Year Review 2023)

- **Habitat**
 - This species is closely associated with deep ephemeral vernal pools underlain by clay soils.
- **Diet**
 - Photosynthesis
- **Taxonomy**
 - Aquatic plant
- **Relevant Pesticide Use Sites**
 - Herbicides
- **Recovery Criteria/Objectives (from 1998 Vernal Pools of Southern California Recovery Plan)**
 - Existing vernal pools currently occupied by species and their associated watersheds should be secured from further loss and degradation in a configuration that maintains habitat function and species viability.
 - Remaining vernal pools and their associated watersheds contained within the complexes identified in Table 4 of the recovery document must be secured in a configuration that maintains habitat function and species viability (as determined by prescribed research tasks).
 - The existing vernal pools and their associated watersheds contained within the complexes identified in Table 5 of the recovery document are secured in a configuration that maintains habitat function and species viability (as determined by recommended research).
 - Secured vernal pools are enhanced or restored such that population levels of existing species are stabilized or increased.
 - Population trends must be shown to be stable or increasing for a minimum of 10 consecutive years prior to consideration for reclassification. Monitoring should continue for a period of at least 10 years following reclassification to ensure population stability.
 - All 74 geographic areas and associated vernal pool complexes as identified in Appendices F and G of the 1998 Recovery Plan under each of the specific management areas are protected and managed to ensure long-term viability.
 - The U.S. Fish and Wildlife Service must determine that the following factors are no longer present, or continue to adversely affect the species: (1) the present or threatened destruction, modification, or curtailment of their habitat range; (2) over utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms;

and (5) other natural and manmade factors affecting their continued existence (50 CFR 424.11).

- Population trends for the species continue to be stable or increasing for 10 consecutive years after threats have been sufficiently ameliorated or managed (completion of delisting criterion 2) prior to consideration for delisting.
- **Recovery Actions (from 1998 Vernal Pools of Southern California Recovery Plan)**
 - Conduct surveys and research essential to the conservation of the species.
 - Secure the existing vernal pools and their associated watersheds.
 - Where necessary reestablish vernal pool habitat to the historical structure.
 - Manage and monitor habitat and listed species.

3. Description of Species Range

- Figure A1-1 depicts the FWS range. The range was last updated on Oct. 21, 2015. Total acreage of range is around 3 million acres.
- The species is generally restricted to vernal pools in four counties of southern California. The historical distribution also extended into Los Angeles County and northwestern Baja California, Mexico. (Five-Year Review 2023).



Figure A1-1. FWS range for California Orcutt Grass. Total acreage of range is around 3 million acres.

4. Critical Habitat

- Not available for this species

5. Known Locations

- Known Locations Described in FWS Recovery Documents
 - “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.” (Five-Year Review 2023)

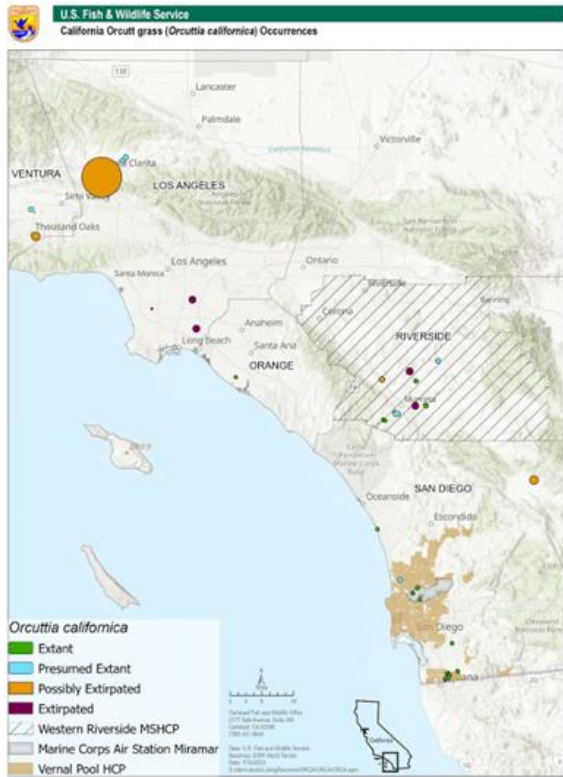


Figure A1-2. Known location information from FWS. Map extracted from most recent FWS Five-Year Review 2023.

- **Occurrences included in Public Databases**
EPA queried iNaturalist, GBIF, and NatureServe.

iNaturalist (available [here](#)) included 81 research grade observations out of 99 total observations from April 2017-June 2025. These appear to be consistent with FWS known location and range data.

GBIF (available [here](#)) included roughly 210 georeferenced occurrences. These locations align with the known locations from FWS. The remaining georeferenced occurrences are either preserved specimens or material sample.

NatureServe (available [here](#)) was searched and all occurrences appeared in the general area as the other public datasets and FWS datasets.

Appendix 2. GIS Data Review and Method to Develop Core Map (Step 3)

This core map was created based on biological information, including range, known location, and species habitat (vernal pool). EPA used FWS known location and range data and the CA FWS vernal pools (habitat type) data. The initial PULA consists of vernal pools that intersects with/is near species range or those that intersect with/is near the known locations given by FWS.

1. Datasets Used in Core Map Development

- FWS Species Range – last updated on Oct. 21, 2015, in the FWS [ECOS](#) database
- FWS known locations (available [here](#))-last updated Dec. 16, 2024.
 - Does **not** include all known locations found in the FWS Five-Year Review (2023) due to data agreements between FWS and various organizations responsible for most of the data. California Natural Diversity Database (CNDDB) is one of those organizations. The FWS known locations were visually confirmed to roughly match with Figure 1 in the FWS Five-Year Review (2023), however.
- CA FWS vernal pools habitats (available [here](#))-last updated July 29, 2024.
 - Vernal Pools, Areas of Conservation Emphasis (ACE), version 3.0, last updated on July 29, 2024..
- USA SSURGO Soil Hydrologic Group dataset linked [here](#), last updated on April 11, 2025.

2. Datasets Referenced and Software

Additional reference details for the datasets are described in EPA’s process document. Software Used: ArcGIS Pro Version 3.5.

3. Core Map Development

- EPA started by importing the California Orcutt grass range data from FWS ECOS.
- FWS known location data was imported as a layer and filtered using “Select by Attributes” for California Orcutt Grass. The expression that was applied was “Where CNAME is equal to California Orcutt grass.” All these known locations are found inside of the current range. Data Export Features was used to save this information.
- The CA FWS habitat data was imported as a layer and filtered using “Select by Attributes” for vernal pools (habitat type) in Southern California. The expressions that were applied were “Where Eco_Name is equal to Southern California Mountains and Valleys or Eco_Name is equal to Southern California Coast” and “Where VernalPool is equal to Y.” Data Export Features was used to save this information.
- A “Select Layer by Location” geoprocessing step was applied to isolate all vernal pools (in eco-regions southern CA coast and southern CA mountains & valleys) that correspond to the FWS known location data. Data Export Features was used to save this information, and this extent was determined to be as refined as the core map could get and was saved as the interim core map featured in Figure 1 of the main document.
- A final check that the vernal pools only include clay soils suitable for the species was run by importing the USA SSURGO Soil Hydrologic Group dataset linked [here](#), raster clipping it to the vernal pools that correspond to the FWS known locations, converting raster to vector, and completing a “Select by Attributes” query to isolate the Group D soils, which are defined as clay soils. This did not end up shrinking the extent of the core map, as all vernal pools that correspond to the FWS location data coincide with clay soils.