Interim Core Map Documentation for Sacramento Orcutt Grass

Version 1

Review Completed: April 2026

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

Species Summary

The Sacramento Orcutt grass (*Orcuttia viscida,* Entity ID 787) is an endangered terrestrial plant (monocot). This species is typically found in the deepest parts of vernal pools within a narrow zone of remanent depositional stream terraces in the Southeastern Sacramento Valley Vernal Pool Region. The U.S. Fish and Wildlife Service (FWS) designated a critical habitat for the Sacramento Orcutt grass on February 10, 2006. Sacramento Orcutt grass is adapted for wind pollination. Additional information on the species is provided in **Appendix 1**.

Description of Core Map

The core map for the Sacramento Orcutt grass is based on biological information. The core map is defined by the designated critical habitat identified by FWS and includes the boundaries of conservation easements managed by the Sacramento Valley Conservancy (SVC), where FWS has identified existing occurrences.

Figure 1 depicts the resulting interim core map for the Sacramento Orcutt grass. The size of this core map is approximately 32,664 acres. Landcover categories within the core map area are included in **Table 1**. Landcover is predominantly grassland/herbaceous.

The core map developed for the Sacramento Orcutt grass is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the Sacramento Orcutt grass. 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 or as other new information becomes available. This interim core map has a “limited” best professional judgment classification because it consists of the species’ critical habitat with limited additions or subtractions.

This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

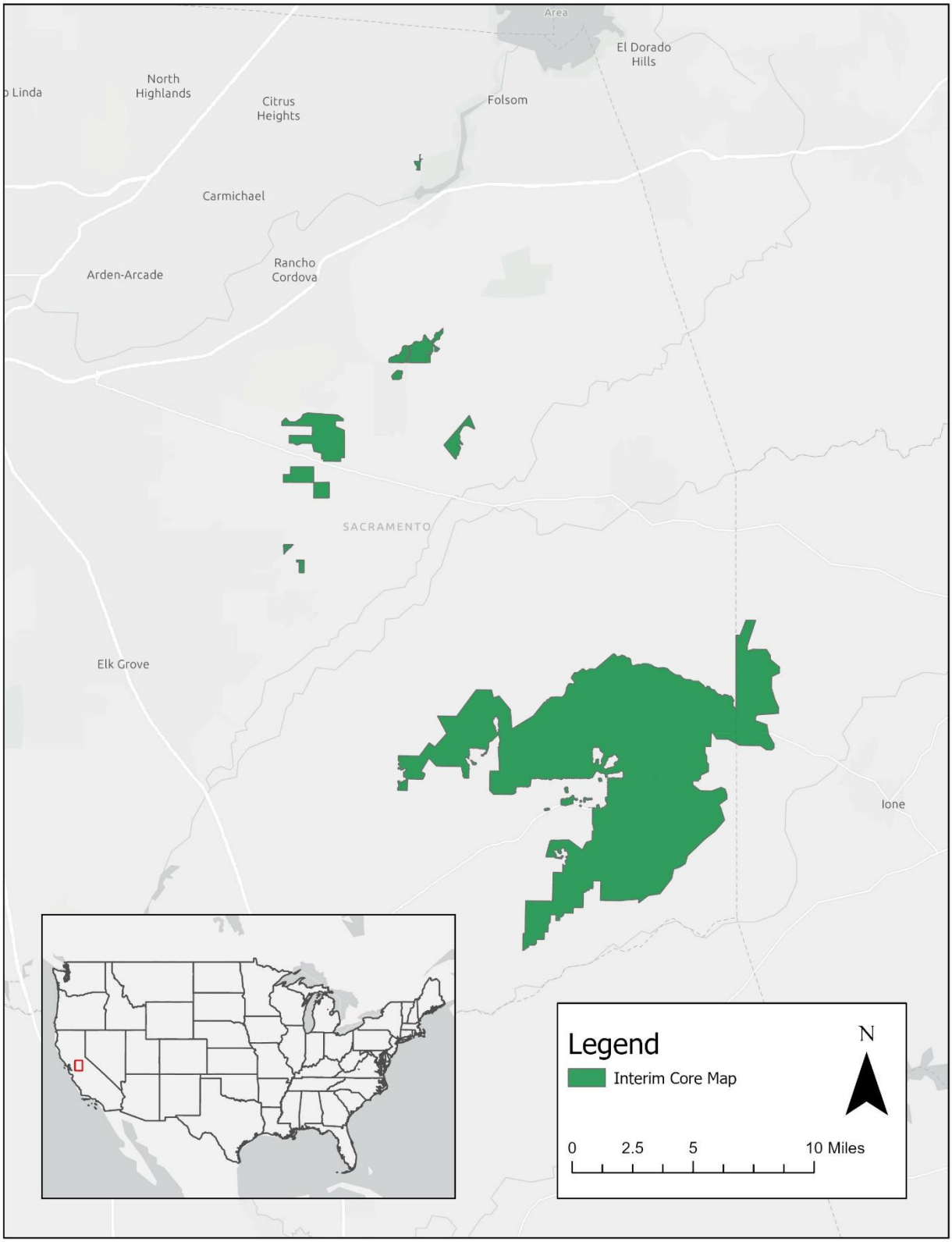

Figure 1. Interim core map for the Sacramento Orcutt grass. The total acreage is approximately 32,664 acres.

Table 1. Percentage of Interim Core Map Represented by National Land Cover Database (NLCD)[1] Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Landcover (Value)	% of core map represented by landcover
Forestry	Deciduous Forest (41)	0
Forestry	Evergreen Forest (42)	0
Forestry	Mixed Forest (43)	0
Agriculture	Pasture/Hay (81)	0
Agriculture	Cultivated Crops (82)	0
Mosquito adulticide, residential	Open space, developed (21)	1
Mosquito adulticide, residential	Developed, Low intensity (22)	0
Mosquito adulticide, residential	Developed, Medium intensity (23)	0
Mosquito adulticide, residential	Developed, High intensity (24)	0
Invasive species control	Woody Wetlands (90)	0
Invasive species control	Emergent Herbaceous Wetlands (95)	0
Invasive species control	Open water (11)	1
Invasive species control	Grassland/herbaceous (71)	93
Invasive species control	Scrub/shrub (52)	5
Invasive species control	Barren land (rock/sand/clay; 31)	0
Total Acres	**Interim Core Map Acres**	**~ 32,664**

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 NatureServe
- Occurrence locations in the Global Biodiversity Information Facility (GBIF)

EPA evaluated these four sets of data before selecting the type of and developing the core map. FWS appeared to have the finest description of extant occurrences. Occurrences in iNaturalist, GBIF, and NatureServe did not support expanding the core map outside of the interim core map. **Appendix 1** includes more information on the available known location information.

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

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 U.S. Fish & Wildlife Service (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
4. Document the core map

For step 1, EPA compiled available information for the Sacramento Orcutt grass from FWS, as well as observation information available from various publicly available sources (including iNaturalist, NatureServe, and GBIF). The information compiled for the Sacramento Orcutt grass is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- FWS' Designated Critical Habitat for Sacramento Orcutt grass
- FWS' description of extant occurrences of Sacramento Orcutt grass
- SVC's managed lands dataset
- This species relies on vernal pools

For step 2, EPA used the compiled information to identify the core map type including the designated critical habitat, extant occurrence information, and SVC's managed lands dataset. Extant occurrences were described by FWS in their 2022 5-Year Review for Sacramento Orcutt grass. FWS' designated critical habitat (2006) did not include all extant occurrences identified by FWS. For this reason, EPA also included conservation easements managed by SVC where extant occurrences were identified by FWS. Therefore, EPA based the interim core map on the designated critical habitat and the conservation easements identified by FWS. Cultivated lands were removed from the core map because this species is unlikely to occur on cultivated lands.

For step 3, EPA used the best available data sources to generate the core map. Data sources are discussed in the process document. For this core map, EPA used the designated critical habitat for Sacramento Orcutt grass, and SVC's managed lands dataset. **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

EPA explored using the NLCD Land Cover dataset to remove areas of medium- to high-intensity development to further refine the interim core map. However, this approach was not used because these areas represented less than 1% of the land cover area, and the NLCD Land Cover data resolution was not fine enough to precisely remove these areas from the interim core map.

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

Appendix 1. Information Compiled for the Sacramento Orcutt Grass

1. **Recent FWS documents/links and other data sources**
   - 5-Year Review Sacramento Orcutt grass (*Orcuttia Viscidia*) (September 19, 2024)
   - Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants 71 Fed. Reg. 7118 (February 10, 2006)
   - Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (December 15, 2005)

2. **Background information**
   - **Status**: Federally listed as endangered in 1997
   - **Resiliency, redundancy, and representation** (the 3Rs)
     - No information regarding resiliency, redundancy, and representation are available at this time.
   - **Habitat**
     - "Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and nonnative upland plant species in all but the driest years. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands." (71 Fed. Reg. 7118 (February 10, 2006))
   - **Pollinator/reproduction**
     - Flowering occurs in May and June and seeds set in June and July, where seed dispersal is relatively limited (within 10 feet of the source). (2005 Recovery Plan)
     - While pollinators have been observed gathering pollen from this species, the importance of insect pollination is poorly understood. It is also important to note that the Sacramento Orcutt grass is adapted for wind pollination. (2024 5-Year Review)
     - Pollinator is not identified or described in FWS documentation.
   - **Taxonomy** (2005 Recovery Plan)
     - Terrestrial monocot plant
     - In the Poaceae grass family
   - **Threats**
     - The 5-Year Review identified development as the primary threat to this species, and occurrences have already been extirpated due to development (2024).
   - **Relevant Pesticide Use Sites**
     - Relevant pesticide use sites were not described in the literature EPA reviewed from FWS.

   - **Recovery Criteria/Objectives** (2024 5-Year Review)
     - "1A. 95% of suitable vernal pool habitat within each prioritized core area for the species is protected (Cosumnes/Rancho Seco, Mather, and Phoenix Field and Park core areas)."

- "1B. 100% of species occurrences distributed across the species geographic range and genetic range are protected. Protection of extreme edges of populations protects the genetic differences that occur there."
- "1C. Reintroductions must be carried out and meet success criteria established in the Recovery Plan."
    - "Outplantings of Sacramento Orcutt grass have occurred at four sites: the Montelena Wetland Preserve, Mather Wetland Preserve, Kassis site, and Sylva site (Witham 2022, entire). The Kiefer Landfill Wetland Preserve population has also been enhanced through additional plantings. Reintroductions have not occurred in the Rancho Seco or Orangevale areas, both of which are specified in the Recovery Plan (Service 2005). No habitat remains in Orangevale, so no reintroductions will be occurring in this area."
- 1D. Identify additional occurrences.
- "1E. Habitat protection results in protection of hydrology essential to vernal pool ecosystem function, and monitoring indicates that hydrology that contributes to population viability has been maintained through at least one multi-year period that includes above average, average, and below average local rainfall, a multi-year drought, and a minimum of 5 years of post-drought monitoring."
- "2A. Habitat management and monitoring plans that facilitate maintenance of vernal pool ecosystem function and population viability have been developed and implemented for all habitat protected […]."
- "2B. Mechanisms are in place to provide for management in perpetuity and long-term monitoring […]."
- "2C. Monitoring indicates that ecosystem function has been maintained […] for at least one multi-year period that includes above average, average, and below average local rainfall, a multi-year drought, and a minimum of 5 years of post-drought monitoring."
- 2D. Seed banking for reintroductions/introductions and/or protection against stochastic extirpations.
- 3A. Surveys, reviews, and population monitoring that show a stable or increasing population with evidence of reproduction and recruitment for at least one multi-year period.
- 3B. Surveys, reviews, and habitat monitoring that show that identified threats have been ameliorated or eliminated.
- "4A. Research actions necessary for recovery and conservation of the covered species have been identified […]."
- "4B. Research on genetic structure has been completed and results incorporated into habitat protection plans to ensure that within and among population genetic variation is fully representative by populations protected […]."
- "4C. Research necessary to determine appropriate parameters to measure population viability has been completed."
- "5A. Recovery Implementation Team is established and functioning to oversee rangewide recovery efforts."
- "5B. Vernal pool regional working groups are established and functioning to oversee regional recovery efforts."
- "5C. Participation plans for each vernal pool region have been completed and implemented."

        - "5D. Vernal pool region working groups have developed and implemented outreach and incentive programs that develop partnerships […]."
    - **Recovery Actions** (2024 5-Year Review)
        - Conduct a Species Status Assessment
        - "Conduct a study to identify methods to control the dispersal of the invasive waxy mannagrass in vernal pool habitat."
        - "Develop and implement a management plan for control of invasive plants […]."
        - "Implement appropriate levels of grazing at the Rancho Seco site to benefit Sacramento Orcutt grass."
        - "Work with partners and private landowners to secure protection of the remaining [two] unprotected occurrences of the species."
3. **Description of Species Range**
    - Figure A1-1 depicts the FWS range. The range was last updated on May 27, 2015. The total acreage of the range is around 187,029 acres.

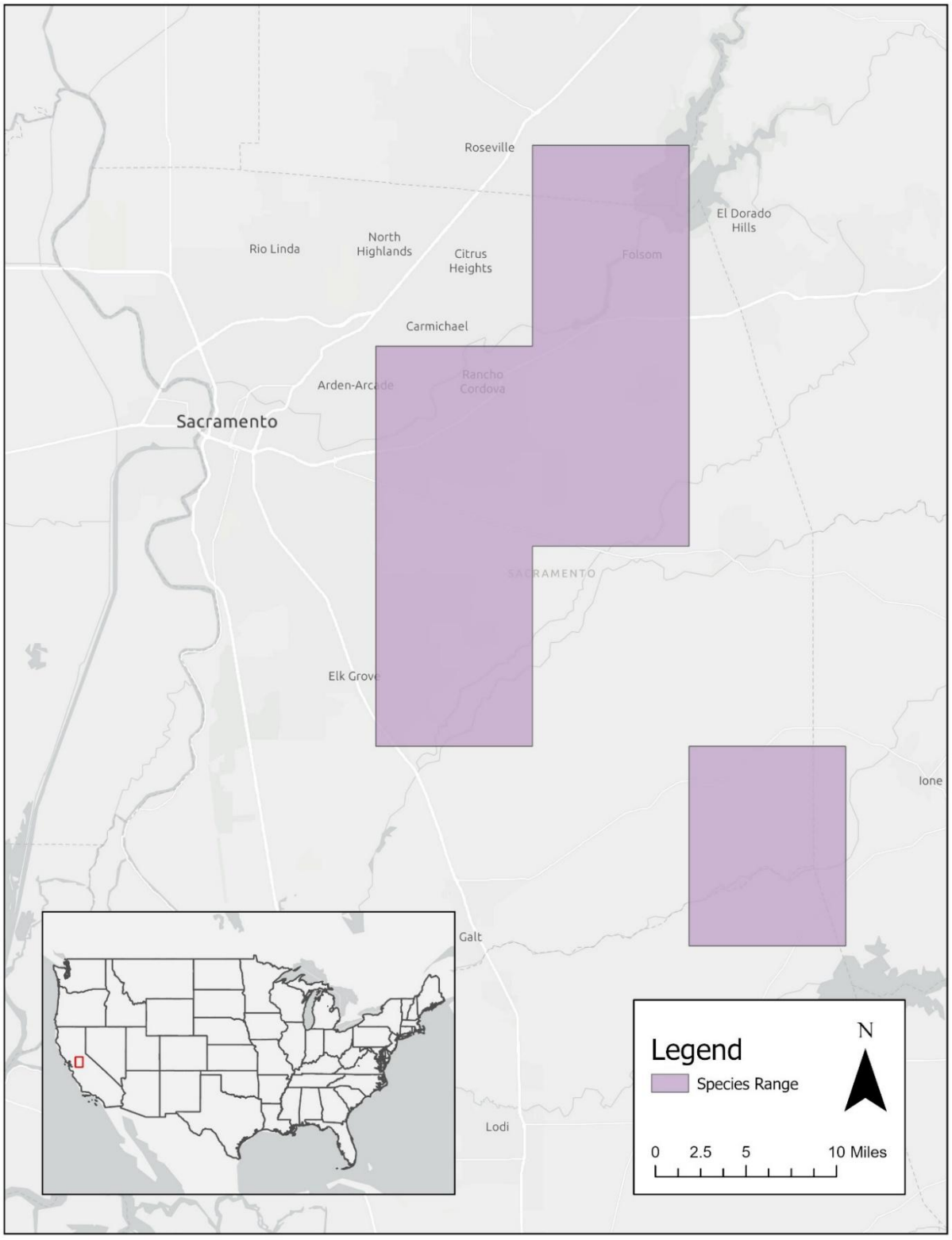

Figure A1-1. FWS' range for the Sacramento Orcutt grass. The total acreage of the range is approximately 187,029 acres.

4. **Critical Habitat**
    - FWS designated a critical habitat for this species on February 10, 2006 (https://www.govinfo.gov/link/fr/71/7118?link-type=pdf)
    - Figure A1-2 depicts the FWS designated critical habitat. The total acreage of the range is around 33,276 acres.

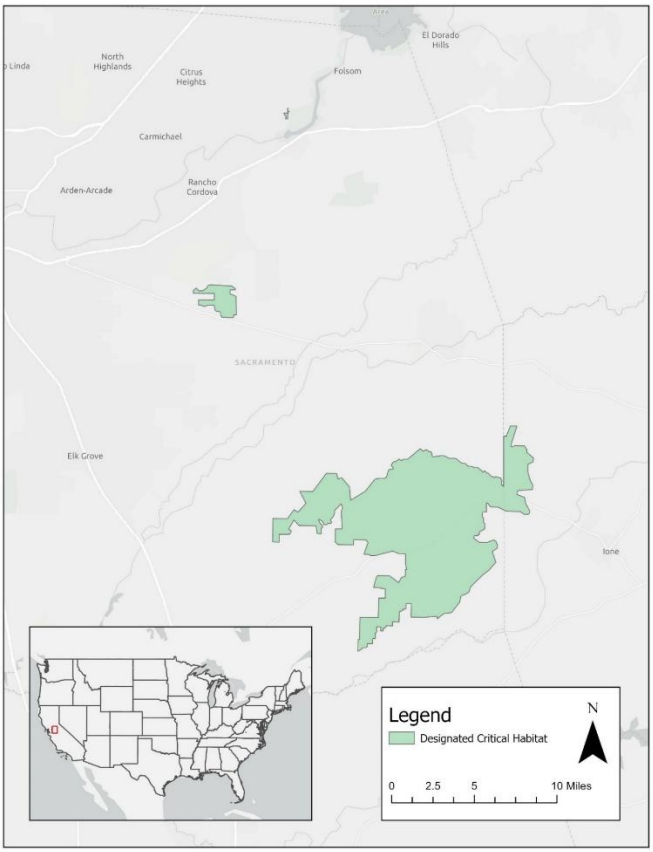

Figure A1-2. FWS' Designated Critical Habitat for the Sacramento Orcutt grass. The total acreage of the range is approximately 33,276 acres.

5. **Known Locations** (2024 5-Year Review)

Table 1. Sacramento Orcutt grass locations, occurrence type, and status. (Adapted from FWS' 2024 5-Year Review)

Vernal Pool Core Area	Location	Diversity Database Occurrence Number	Occurrence Type/Presumed Status	Protection Status
Cosumnes/ Rancho Seco Lake	Rancho Seco Lake	16	Natural/Extant	Conservation easement for the Sacramento Municipal Utility District (SMUD) Nature Preserve Mitigation Bank, established 2014
Mather	Kiefer Landfill Wetland Preserve	1, 6	Natural (enhanced)/ Extant	Conservation easement

Vernal Pool Core Area	Location	Diversity Database Occurrence Number	Occurrence Type/Presumed Status	Protection Status
Mather	Anatolia Preserve (a.k.a., Sunrise-Douglas Conservation Bank)	17, 18	Natural/Extant	Conservation easement
Mather	South of Glory Lane	19	Natural/Extant	Conservation easement for the Cordova Hills Onsite Preserve
Mather	Arroyo Seco Conservation Bank	20	Natural/Extirpated	Conservation easement, but no longer contains suitable habitat
Mather	North of Glory Lane	21	Natural/Extant	None
Mather	Rio del Oro, West of Grant Line Road	22	Natural/Extant	None, but is within a proposed preserve associated with the South Sacramento Habitat Conservation Plan
Mather	Sylva site	N/A	Introduced/Extant	Conservation easement for the Werre-Laguna Preserve with the Sacramento Valley Conservancy
Mather	Kassis site	N/A	Introduced/Extant	Conservation easement for the Werre-Laguna Preserve with the Sacramento Valley Conservancy
Mather	Mather Wetland Preserve	N/A	Introduced/Extant	Conservation easement for the Illa M. Collin Conservation Preserve (Mather)
Mather	Montelena Wetland Preserve	N/A	Introduced/Extant	Conservation easement for the Montelena Wetland Preserve
Phoenix Field and Park	Phoenix Field	5	Natural/Extant	Department Ecological Reserve
Phoenix Field and Park	Phoenix Park	15	Introduced/Extant	City of Fair Oaks Park
N/A	Orangevale	4	Natural/Extirpated	None, the area has been developed

- **Occurrences Included in Public Databases**
  EPA queried iNaturalist, GBIF, and NatureServe. Collectively, the occurrence data are generally consistent with the interim core map.

  iNaturalist (available here) had ten research grade observations for this species, where

only three appeared to fall within the species range. The positional accuracy of the points does not allow EPA to determine if these locations were in or out of the extant occurrences identified by FWS.

GBIF (available here) included six human observed occurrences (from 2000-2025). All observations are also included in iNaturalist or NatureServe.

Occurrences in NatureServe were consistent with other occurrence data (linked here).

Appendix 2. GIS Data Review and Method to Develop Core Map

This core map was created based on biological information, including occurrence information and species habitat. EPA used the designated critical habitat provided by FWS as the starting point for developing this core map. EPA then added in the conservation easements (provided by SVC) where FWS identified extant occurrences of Sacramento Orcutt grass.

1. **Dataset References and Software**

- Software used: ArcGIS Pro 3.2
- FWS' Species Range – last updated on May 27, 2015
- FWS' Designated Critical Habitat – Designated on February 10, 2006
- SVC's conservation easements' boundary data
- EPA's Modified Cultivated Layer – lasted updated on December 16, 2024

2. **Datasets Used in Core Map Development**

All datasets used in core map development are described in EPA's process document.

3. **Core Map Development**

- EPA started with the designated critical habitat provided by FWS.
- EPA then added in the conservation easements' boundary data provided by SVC, which were all areas where FWS identified extant occurrences of Sacramento Orcutt grass.
- Lastly, EPA performed a pairwise erase of the above areas using EPA's Modified Cultivated Layer to remove developed areas, which were identified by FWS as a primary threat to this species.
- The resulting interim core map includes all areas where FWS identified presumed extant occurrences in their 2024 5-Year Review. This area is generally representative of other occurrence data sources including iNaturalist, GBIF and NatureServe.