Interim Core Map Documentation for the Gaviota Tarplant

Version 1
Review Completed: April 2026
Core Map Developer: U.S. Environmental Protection Agency (EPA), Office of Pesticide Programs

Species Summary

The Gaviota tarplant (*Deinandra increscens ssp. Villosa,* Entity ID 1119) is an endangered terrestrial plant (dicot) – it is an annual herb in the Asteraceae family. The U.S. Fish and Wildlife Service (FWS) has designated a critical habitat for the Gaviota tarplant in 2002. This species requires grassland habitats but is now regarded as both a coastal and upland species with locations interior from the coast at higher elevations. Areas that are occupied by the Gaviota tarplant often intergrade with coastal sage scrub communities and are dominated by nonnative, Mediterranean annual grasses and nonnative forbs. This species likely requires insect pollinators. Currently, the Gaviota tarplant is found only in a few areas around the Santa Ynez Mountains in California. Additional information on the species is in **Appendix 1**.

Description of Core Map

The core map for the Gaviota tarplant is based on biological information. The outer extent of this core map is defined by the spatial union between designated critical habitat and Areas of Conservation Emphasis (ACE) Hexagons that contain occurrence areas identified in the California Natural Diversity Database (CNDDB). The ACE hexagons are further refined by filtering for relevant Existing Vegetation Types (EVT) using the LandFire data. For more details, see **Appendix 2**.

Figure 1 depicts the resulting interim core map for the Gaviota tarplant. The size of this core map is approximately 27,051 acres. Landcover categories within the core map area are included in **Table 1**. Landcover is predominantly shrub/scrub and grassland/herbaceous. Since this species occurs in grassland areas, many of these areas potentially represent habitat.

The core map developed for the Gaviota tarplant is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the Gaviota tarplant. 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. In addition to the FWS designated critical habitat, the map is also based on potential habitats that occur within ACE hexagons containing occurrence areas described by CNDDB. This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

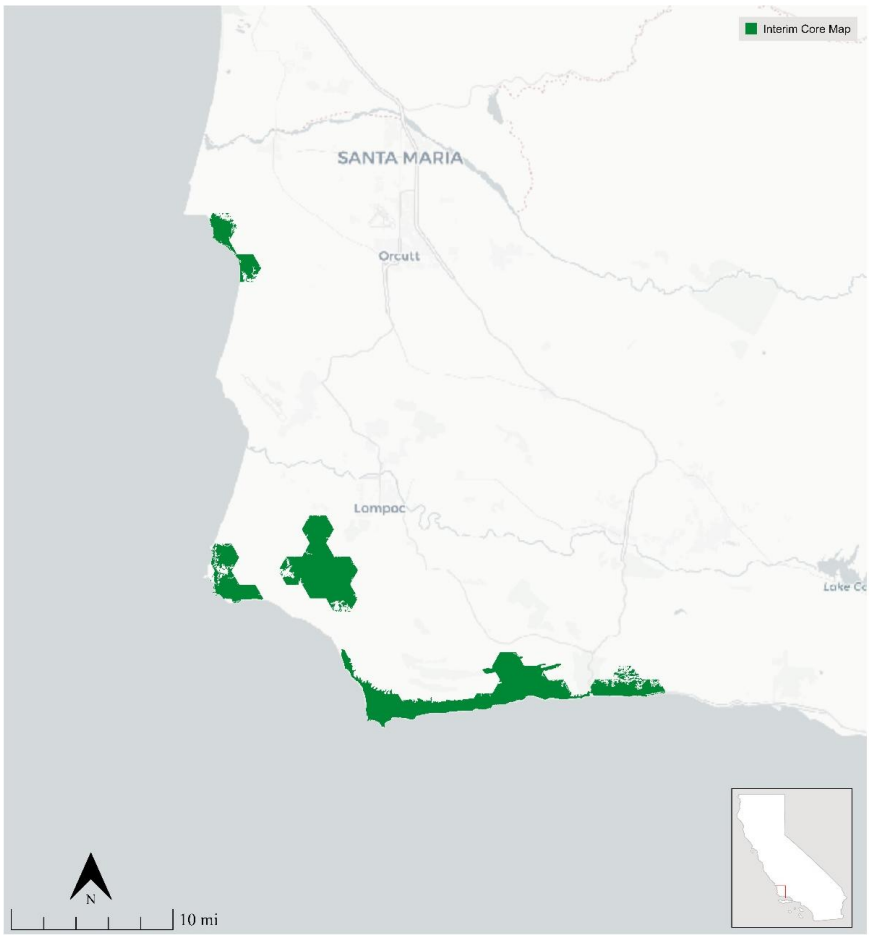

Figure 1. Interim core map for the Gaviota tarplant.

Table 1. Percentage of Interim Core Map Represented by National Land Cover Database (NLCD)[1] Landcovers 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)	3
Forestry	Mixed Forest (43)	5
Agriculture	Pasture/Hay (81)	0
Agriculture	Cultivated Crops (82)	<1
Mosquito adulticide, residential	Open space, developed (21)	2
Mosquito adulticide, residential	Developed, Low intensity (22)	1
Mosquito adulticide, residential	Developed, Medium intensity (23)	<1
Mosquito adulticide, residential	Developed, High intensity (24)	<1
Invasive species control	Woody Wetlands (90)	<1
Invasive species control	Emergent Herbaceous Wetlands (95)	1
Invasive species control	Open water (11)	<1
Invasive species control	Grassland/herbaceous (71)	21
Invasive species control	Scrub/shrub (52)	65
Invasive species control	Barren land (rock/sand/clay; 31)	<1
Total Acres	**Interim Core Map Acres**	**~ 27,051**

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 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 resolution and most comprehensive set of the location information, providing a map that depicted the current known locations (**Figure A1-2 in Appendix 1**). Many such locations were provided to FWS by CNDDB and this is the only FWS occurrence data that EPA was able to acquire. Henceforth, "FWS occurrence data" and "CNDDB occurrence data" will be used interchangeably to refer to the same data.

- EPA queried iNaturalist, GBIF, and NatureServe. Collectively, the occurrence data are consistent with the FWS location data used to identify the core map.
- iNaturalist (available here) had 263 research grade observations for this species since 2010.

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

Location data for these observations are consistent with the core map given the positional accuracy of the information.

- GBIF (available here) included no additional occurrences nor human observations that are unique from iNaturalist.
- NatureServe (available here) included no additional occurrence data.

Occurrences in iNaturalist, GBIF, and NatureServe did not support expanding the core map outside of current interim core map. **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 U.S. Fish & Wildlife Service (FWS) and their Designated Critical Habitats"[2] (referred to as "the process"). EPA developed the core map using the four 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 Gaviota tarplant from FWS, as well as observation information available from various publicly available sources (including iNaturalist, NatureServe, and GBIF). The information compiled for the Gaviota tarplant is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- Critical habitat designated by FWS
- Occurrences and known locations of the Gaviota tarplant identified by CNDDB (**Figure A1-2 of Appendix 1**)

For step 2, EPA used the compiled information to identify the core map type including designated critical habitat and known location information. The extant populations are in areas identified by various sources (CNDDB, Consortium of California Herbaria, and a Gaviota tarplant survey conducted by the Vandenberg Space Force Base) and compiled together by FWS (**Figure A1-2 of Appendix 1**) which many fell within the designated critical habitat. Therefore, EPA partly based the core map on the critical habitat designated by FWS. EPA further refined the core map by adding identifying the ACE hexagons that contained species occurrences identified by CNDDB. These hexagons are then further refined using landcover data from the LandFire dataset which was filtered to keep only a select number of Existing Vegetation Type names that represent potential habitat. The entire range of the species was not used as the core map because the range contains large areas where the species does not occur.

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 only the species occurrence data from CNDDB to append to the critical habitat areas. **Appendix 2** provides more details on the Geographic Information System (GIS) analysis and data used to generate the core map.

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

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

EPA had considered using the critical habitat alone. However, more recent population surveys from various sources (compiled together in the Five-Year Review, 2022) indicated that there are species occurrences both within and outside of the critical habitat. Therefore, EPA chose to simply append such sites to the critical habitat designation.

Appendix 1. Information Compiled for the Gaviota tarplant

1. **Recent FWS documents/links and other data sources**
   - Five Year Review (2022) (https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3961.pdf)
   - Five Year Review (2011) (https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1822.pdf)
   - Critical Habitat Designation (2002) (https://www.govinfo.gov/link/fr/67/67968?link-type=pdf)
   - 2015-2016 Threatened and Endangered Plant Surveys on Vandenberg Air Force Base, California) (https://downloads.regulations.gov/FWS-R8-ES-2018-0042-0004/attachment_21.pdf)

2. **Background information**
   - **Status**: Federally listed as endangered in 2000
   - **Resiliency, redundancy, and representation** (the 3Rs)

     Resiliency: There are about 27 extant occurrences for this species. Species' recovery priority number is 12 (moderate to low degree of threat, low recovery potential). The Gaviota tarplant exhibits significant annual fluctuations in population which suggests the presence of a seed bank. This seed bank is crucial for maintaining populations through periods of environmental variability. The species likely relies on insect pollinators due to its self-incompatibility. Various conservation seed banking efforts have increased the number of seeds banked for the species which supports its long-term viability. (Five Year Review 2024)

     Redundancy: The Gaviota tarplant is distributed across several populations in southwestern Santa Barbara County. The largest population is at Sudden Peak/Tranquillon Mountain, followed by Point Sal/Lions Head, Jalama Beach, and Point Arguello. The species is found in both coastal and upland areas, with occurrences documented at various locations, including Vandenberg Space Force Base. (Five Year Review 2024)

     Representation: The Gaviota tarplant exhibits dimorphism in its fruits, which affects its dispersal mechanisms. Ray achenes are larger and heavier, facilitating animal dispersal or retention near the parent plant, while disk achenes are smaller and lighter, allowing for wind dispersal. The species is considered both a coastal and

upland species, with occurrences in varied ecological settings. (Five Year Review 2024)

- **Habitat**
  - Primarily grassland, often intergrading with coastal sage scrub communities (Five Year Review 2022)
  - These areas are dominated by nonnative Mediterranean annual grasses such as wild oat (Avena spp.), bromes (Bromus spp.), false brome (Brachypodium distachyon), and nonnative forbs like storksbill (Erodium spp.). Native grasses and forbs can also co-occur with the Gaviota tarplant but are typically less dominant. (Five Year Review 2022)
  - Shrubs are largely absent in stands occupied by the species, although shrubs may occur in intergrade zones and other successional areas, such as saw-tooth goldenbush (Hazardia squarrosa), California buckwheat (Eriogonum fasciculatum), and coyote brush (Baccharis pilularis). Suitable grassland habitats for the species include marine terraces, coastal bluffs, active and inactive cattle ranches, undeveloped plains and prairie areas, and open fields. (Five Year Review 2022)

- **Pollinator/reproduction**
  - Flowering occurs from May to October
  - Self-incompatible, requiring cross-pollination for successful reproduction
  - Relies on insect pollinators
  - Produces dimorphic fruits: ray achenes and disk achenes, which have different dispersal mechanisms. Ray achenes are larger and heavier while disk achenes are smaller, lighter, and have a pappus. Therefore, ray achenes are dispersed by animals while disk achenes are wind dispersed.

- **Taxonomy**
  - Terrestrial Plant
  - FWS Category: Flowering dicot plant belonging to the Asteraceae family.

- **Relevant Pesticide Use Sites**
  - No information specific to pesticides. However, conversion of land to agriculture is attributed to habitat loss and degradation. (Five Year Review 2022)

- **Recovery Criteria/Objectives**
  - No recovery plan has been prepared.

- **Recovery Actions**
  - No recovery plan has been prepared.

3. Description of Species Range

- Figure A1-1 depicts the FWS range. The range was last updated on 3/20/2018. Total acreage of range is around 225,604 acres.

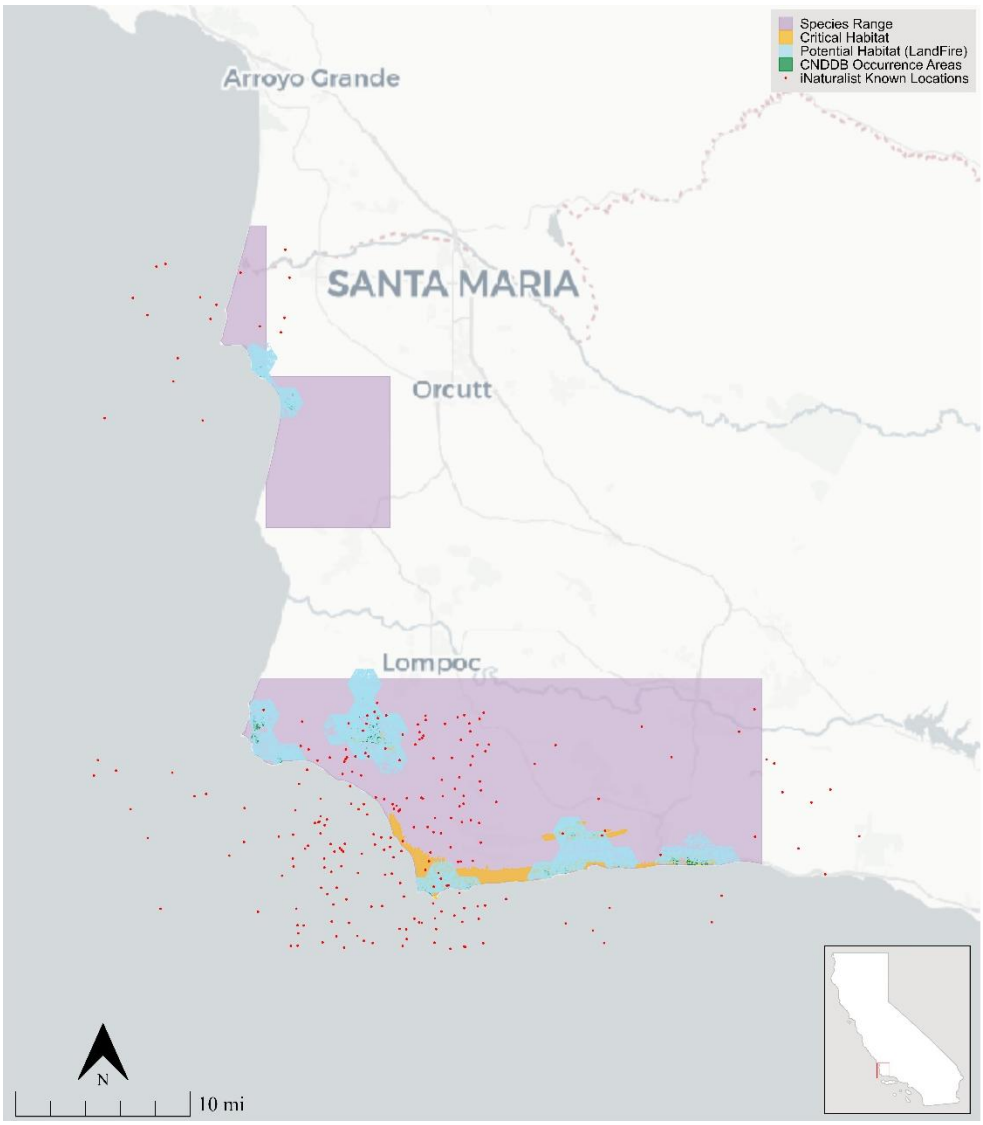

Figure A1-1. FWS range for the Gaviota tarplant. The total acreage of the range is around 225,604 acres.

4. **Critical Habitat**
    - FWS has designated a critical habitat for this species (https://www.govinfo.gov/link/fr/67/67968?link-type=pdf)

5. **Known Locations**
    - Known Locations Described in FWS Recovery Documents
        - Currently found in 27 separate areas (Five Year Review 2024);
        - Figure A1-2 depicts the currently known locations from FWS.

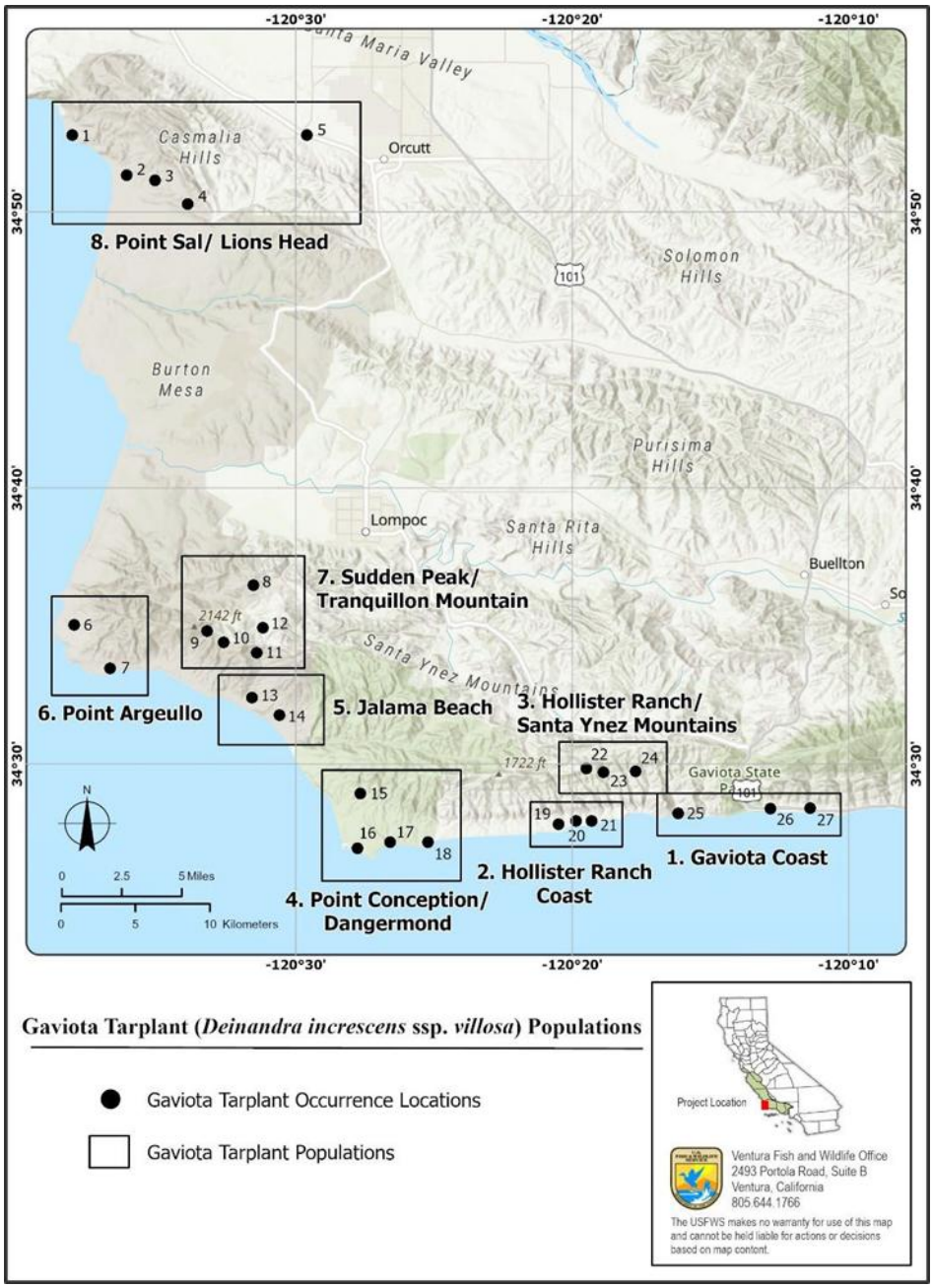

Figure A1-2. Known location information from FWS. Map reproduced from most recent FWS 5-year review (2022).

- **Occurrences Included in Public Databases**
  EPA queried iNaturalist, GBIF, and NatureServe. There were no occurrences in NatureServe or GBIF that unique from iNaturalist. Occurrence data from iNaturalist are consistent with the interim core map.

  iNaturalist (available here) had 263 research grade observations for this species, many of which appear to fall outside of the species range, critical habitat, and areas of

occurrence; however, the positional accuracy of the points do not allow EPA to determine if these occurrences were in or out of the relevant areas.

Collectively, the occurrence data are consistent with the interim core map.

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

This core map was created based on biological information, including ACE hexagons containing CNDDB occupied locations, potential habitat, and critical habitat. EPA used the critical habitat as the starting point for developing this core map. EPA then spatially appended areas of potential habitat which was identified by first selecting ACE hexagons that contained occurrences from CNDDB. These hexagons are then intersected with specific landcover types from the LandFire dataset.

1. **Dataset References and Software**

- Software used: R – version 4.4.2
- CNDDB – accessed November 2025
- FWS Critical Habitat – last updated on 11/7/2002
- LandFire – accessed December 2025

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 critical habitat.
- Of the occurrence data from FWS, EPA was only able to obtain the CNDDB data which was used to identify relevant, overlapping ACE hexagons.
- The remaining hexagons are then filtered down further using landcover data from LandFire dataset. The specific EVT names are:
  - Southern California Coastal Scrub
  - California Central Valley and Southern Coastal Grassland
  - California Mesic Serpentine Grassland
  - California Coastal Live Oak Woodland and Savanna
  - Southern California Oak Woodland and Savanna
  - Mediterranean California Northern Coastal Dune
  - Mediterranean California Southern Coastal Dune
  - California Ruderal Grassland and Meadow
  - California Ruderal Scrub

This produces areas of potential habitat for this species which is then spatially appended to the critical habitat areas to produce the interim core map.