

Interim Core Map Documentation for the Soft Bird's-Beak

Version 1

Review Completed: April 2026

Core Map Developer: EPA's Office of Pesticide Programs (OPP)

Species Summary

The soft bird's-beak (*Chloropyron molle* ssp. *molle*; Entity ID #534) is an endangered annual herb (dicot). This species appears to be restricted to the mean high water tidal datum of coastal salt and brackish marshes in San Pablo and Suisun Bays. Regular inundation or well-saturated sites is essential to this species' persistence. The soft bird's-beak is also hemiparasitic or capable of photosynthesis but reliant on a host plant (other native halophytic species) for survival. Flowering typically peaks in July and August. Seeded fruits are formed, which carry anywhere from 8 to 79 seeds that are thought to disperse via the tide. There is a designated critical habitat for this species. Additional information is provided in **Appendix 1**.

Description of Core Map

The core map for soft bird's-beak is based on designated critical habitat. The U.S. Fish and Wildlife Service (FWS) developed the designated critical habitat in 2007 to include areas that contain the features (native plant communities and tidal hydrology) necessary to conserve extant occurrences. FWS acknowledged that there were additional occurrences identified in diked/managed marshes outside of the designated critical habitat, but these areas were not included because they did not have the features essential to long term persistence. EPA did not find evidence that any key areas for this species exist outside of the designated critical habitat. **Figure 1** depicts the core map for the soft bird's-beak. The core map represents approximately 2,278 acres.

The soft bird's-beak inhabits brackish and coastal salt marshes in areas that are regularly inundated or well-saturated within San Pablo and Suisun Bays. This species appears to be restricted to the mean higher high water tidal datum. While capable of photosynthesis, the soft bird's-beak is also hemiparasitic, and relies on a host-plant relationship for survival. There are several plants associated with occurrences of soft bird's-beak including *Sarcocornia pacifica* (pickleweed), *Distichlis spicata* (salt grass), *Jaumea carnosa* (fleshy jaumea), *Frankenia salina* (alkali heath), and *Troglochin maritima* (arrow-grass). These criteria were captured as necessary features in the species' designated critical habitat, on which this core map is based. Landcover categories within the core map area are included in **Table 1**. Landcover within the core map is almost exclusively emergent herbaceous wetlands, which is consistent with the habitat of this species.

The core map developed for the soft bird's-beak is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include soft bird's-beak. 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 expert feedback from FWS. This interim core map has a "none" (1) best professional judgment classification

because it consists of the species' critical habitat without additions or subtractions. However, EPA did limit the core map only to designated critical habitat based on interpretation of FWS documentation. There is confidence in the core map because the species' critical habitat is highly refined, represents areas important for this species' conservation, and contains all the extant occurrences in habitat critical to the species' persistence. This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

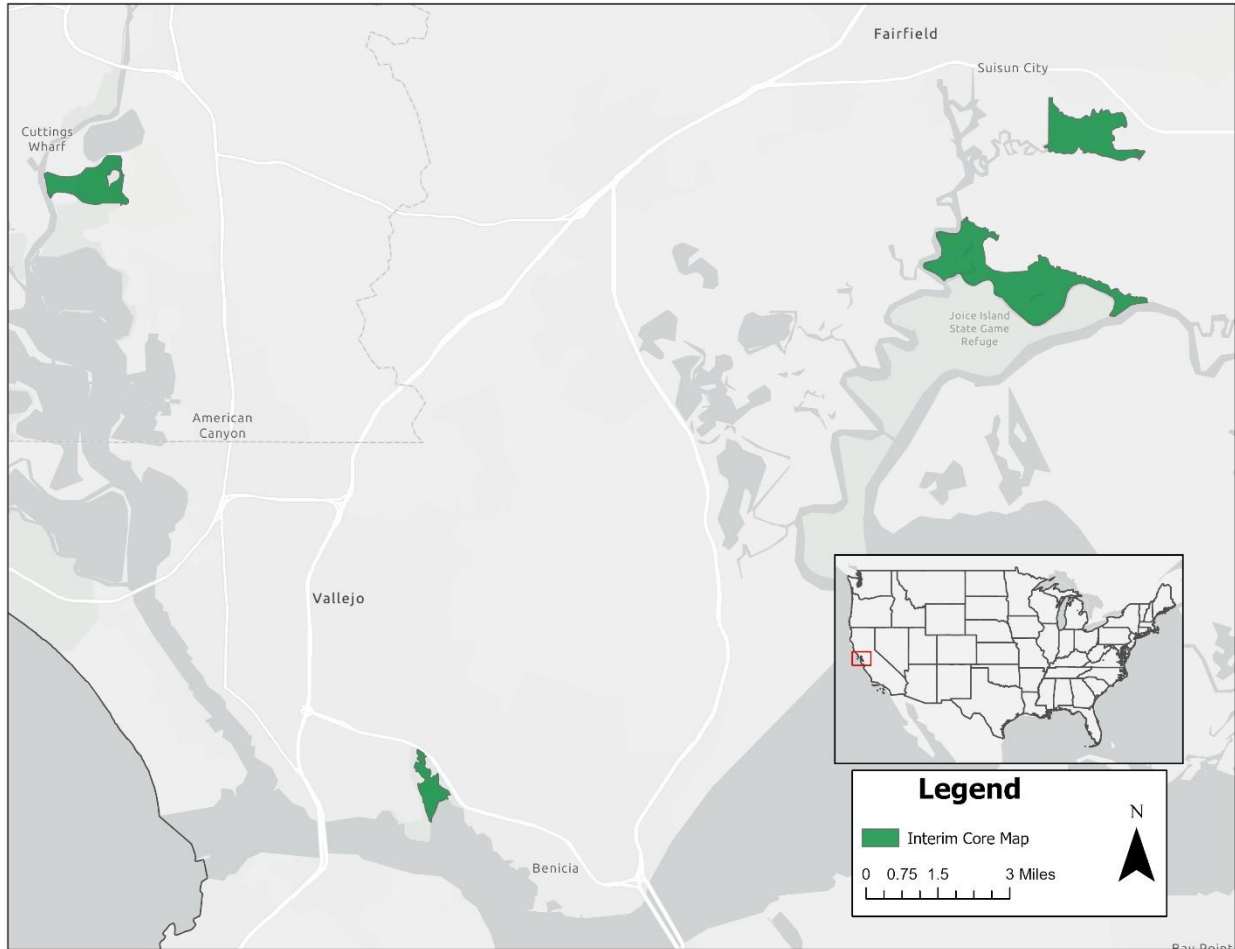


Figure 1. Interim core map for the soft bird's-beak. The total acreage of the core map is approximately 2,278 acres.

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 |
|-----------------------------------|-----------------------------------|--|
| 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) | 0% |
| 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) | 97% |
| Invasive species control | Open water (11) | 1% |
| Invasive species control | Grassland/herbaceous (71) | 1% |
| Invasive species control | Scrub/shrub (52) | 0% |
| Invasive species control | Barren land (rock/sand/clay; 31) | 0% |
| Total Acres | Interim Core Map Acres | ~ 2,278 |

Evaluation of Known Location Information

There are four datasets with known location information for this species:

- 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 four sets of data before selecting the type of and developing the core map. FWS' most recent 5-year review (2023) detailed known locations of this species. FWS mapped the distribution of extant and extirpated occurrences in their most recent 5-year review (2023). The extant occurrences are largely consistent with the designated critical habitat. iNaturalist, NatureServe, and GBIF were reviewed by the Agency on September 2, 2025. iNaturalist had 69 research grade observations. NatureServe reported 24 occurrences with 17 presumed extant, six possibly extirpated, and one extirpated. iNaturalist and NatureServe data had a coarse resolution, and EPA could not determine conclusively if these data fell within the critical habitat; however, they generally appear to be consistent with the locations of the range and critical habitat. GBIF was filtered for human observations for soft bird's-beak with coordinates from 2000-2025. There were 58 records reported; however, these records

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

were all reported in iNaturalist. **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”). This core map was developed by EPA and was developed 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 soft bird’s-beak from FWS as well as observational information available from various publicly available sources (discussed in previous section). The information compiled for the soft bird’s-beak is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- Current existing populations occur in locations consistent with the critical habitat.
- The species’ critical habitat is highly refined.

For step 2, EPA used the compiled information to identify the core map type, including the species range, critical habitat, and known location information. EPA compared known location data to the range and critical habitat and found that the FWS known locations of currently existing (extant) populations are consistent with the location of the designated critical habitat. The species range contains areas that are not regularly inundated or do not support host-plant species. Therefore, the species range is not likely limited to the areas containing habitat to support soft bird’s-beak persistently. Based on this information, EPA used the designated critical habitat as the core map.

For step 3, EPA used the designated critical habitat provided by FWS for the soft bird’s-beak. EPA downloaded the critical habitat from FWS’s ECOS (<https://ecos.fws.gov/ecp/>).

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

EPA did not explore approaches other than those described in this documentation.

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 Species

1. Recent FWS Documents/Links

- [Soft Bird's-Beak \(*Chloropyron molle ssp. molle*\) 5-Year Review: Summary and Evaluation](#) – (August 30, 2023)
- [Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Cirsium hydrophilium* var. *hydrophilium* \(Suisun thistle\) and *Cordylanthus mollis ssp. mollis* \(soft bird's-beak\) 72 Fed. Reg. 18518 \(April 12, 2007\)](#)
- [Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California: Volume I](#) – (August 27, 2013)

2. Background information

- Status: Federally listed as endangered in 1997
- Resiliency, redundancy, and representation (the 3Rs)
 - No information regarding resiliency, redundancy, and representation are currently available.
- **Habitat, Life History, and Ecology**
 - **Habitat:** The soft bird's beak appears to be restricted to the mean higher high water tidal datum of coastal salt and brackish marshes in San Pablo and Suisun Bays. Regularly inundated or well-saturated sites containing other native halophytes to provide host plants is essential to this species' persistence. (2023 5-Year Summary)
 - **Reproduction:**
 - Flowering typically peaks in July and August (2023 5-Year Summary)
 - "Fruits are a capsule form and the number of seeds produced per fruits can vary widely (from approximately 8-79 seeds per fruit), with an estimated average number of seeds produced per plant being 495. Seed maturation can occur as early as July. Seed of *C. molle ssp. molle* have a reticulated seed coat that traps air thereby allowing seeds to float in saline and fresh water for hours to days long periods. The details of how this contributes to seed dispersal are not currently well understood by a reasonable prediction is that it can enable water dispersal by tidal flows. Germination is reported to begin sometime in December and some early seedlings have been observed to overlap with the previous year's plants that were in a late-fruiting state." (2023 5-Year Summary)
 - The soft bird's-beak "is probably dependent on insects for successful pollination and reproduction. [...] Bumble bees (*Bombus californicus*) were the most frequent visitors seen foraging among flowers. The low number of potential pollinators at some locations suggests that the subspecies may rely to some degree on self-pollination to fertilize flowers within larger populations." (72 Fed. Reg. 18518 (April 12, 2007))
- **Taxonomy (Source: 2023 5-Year Summary)**
 - "At the time of listing, the genus *Cordylanthus* was placed in the Scrophulariaceae (figwort family), and the accepted taxonomic nomenclature for the species of interest in this review was *Cordylanthus mollis ssp. mollis*. However, a molecular systematics study [...] provided evidence to move the hemiparasitic group Castillejiinae that includes *Cordylanthus*, to the Orobanchaceae (broomrape family) thereby placing the species

into the genus *Chloropyron*.” The resulting accepted species’ name is now *Chloropyron molle* ssp. *molle*.

- **Essential Primary Constituent Elements (PCEs) for Designated Critical Habitat:**
 - “Persistent emergent, intertidal, estuarine wetland at or above the mean high-water line (as extended directly across any intersecting channels);
 - Rarity or absence of plants that naturally die in late spring (winter annuals); and
 - Partially open spring canopy cover (approximately 790 nMol/m²/s) at ground level, with many small openings to facilitate seedling germination.” (72 Fed. Reg. 18518 (April 12, 2007))
- **Relevant Pesticide Use Sites in FWS Documents**
 - Pesticide threats to the species listed in FWS documents include: “[...] control or removal of nonnative invasive plants, especially *Lepidium latifolium*, which, if not carefully managed, can damage *C. mollis* ssp. *mollis* populations through the injudicious application of herbicides [...]. (72 Fed. Reg. 18518 (April 12, 2007)).
- **Relevant Recovery Criteria and Actions (Source: 2023 Recovery Plan)**
 - “Recovery strategies for *Chloropyron molle* ssp. *molle* include both long- and short-term elements.”
 - “Recovery strategies include:
 - suppression of invasive non-native plant species,
 - protection and management of nearby native bee and wasp habitats,
 - management of grazing and control of feral pigs to reduce trampling and disturbance,
 - management of vehicle access and recreation,
 - management of urban runoff,
 - restoration of normal tidal range and salinity,
 - seed banking of *C. molle* ssp. *molle*,
 - monitoring populations and habitat, and
 - research aspects of life history of *C. molle* ssp. *molle*.”

3. Description of the species range

- “*Chloropyron molle* ssp. *molle* grows in the coastal salt marshes and brackish marshes in the mean higher high water (MHHW) tidal datum of San Pablo and Suisun Bays”
- The current western limit of *C. molle* ssp. *molle* ranges from the northbound I-80 bridge over the Carquinez Strait “to the brackish tidal marshes at the mouth of the Sacramento River in the east.” (2023 5-Year Summary).
- Figure A1-1 depicts the current FWS species range (last updated March 21, 2018).
- The species range is approximately 115,431 acres.

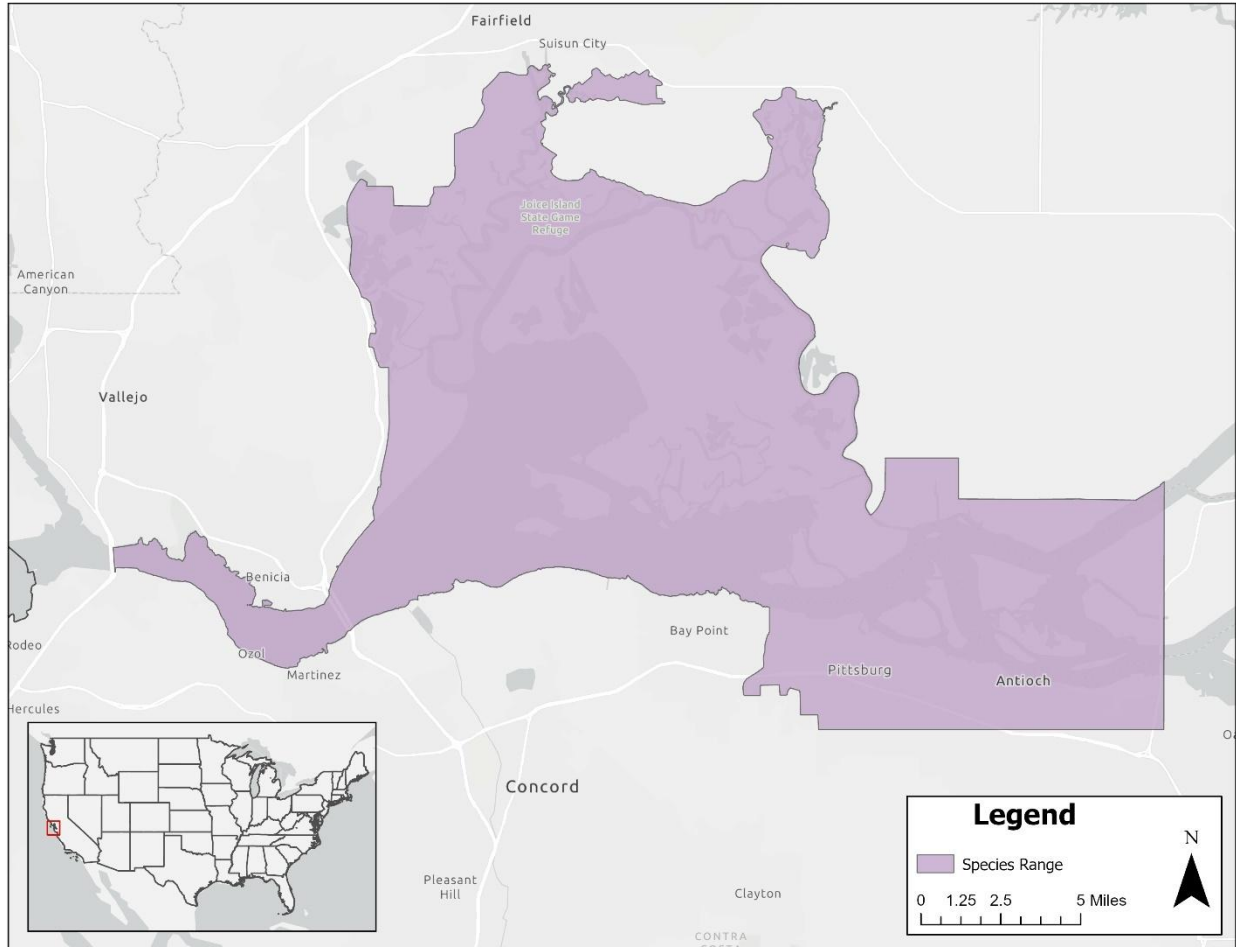


Figure A1-1. FWS' Range of the soft bird's-beak.

4. Critical Habitat (Source: 2023 5-Year Review)

- “On April 12, 2007, the [FWS] published a final rule in the Federal Register to designate critical habitat for [...] *C. molle* ssp. *molle* (72 FR 1851[8]; U.S. Fish and Wildlife Service 2007). The designated sites were Fagan Slough Ecological Reserve; Hill Slough Wildlife Area; Point Pinole Regional Park; Rush Ranch/Grizzly Island Wildlife Area; and Benicia State Recreation Area.”
- **Figure A1-2** depicts the current designated critical habitat.

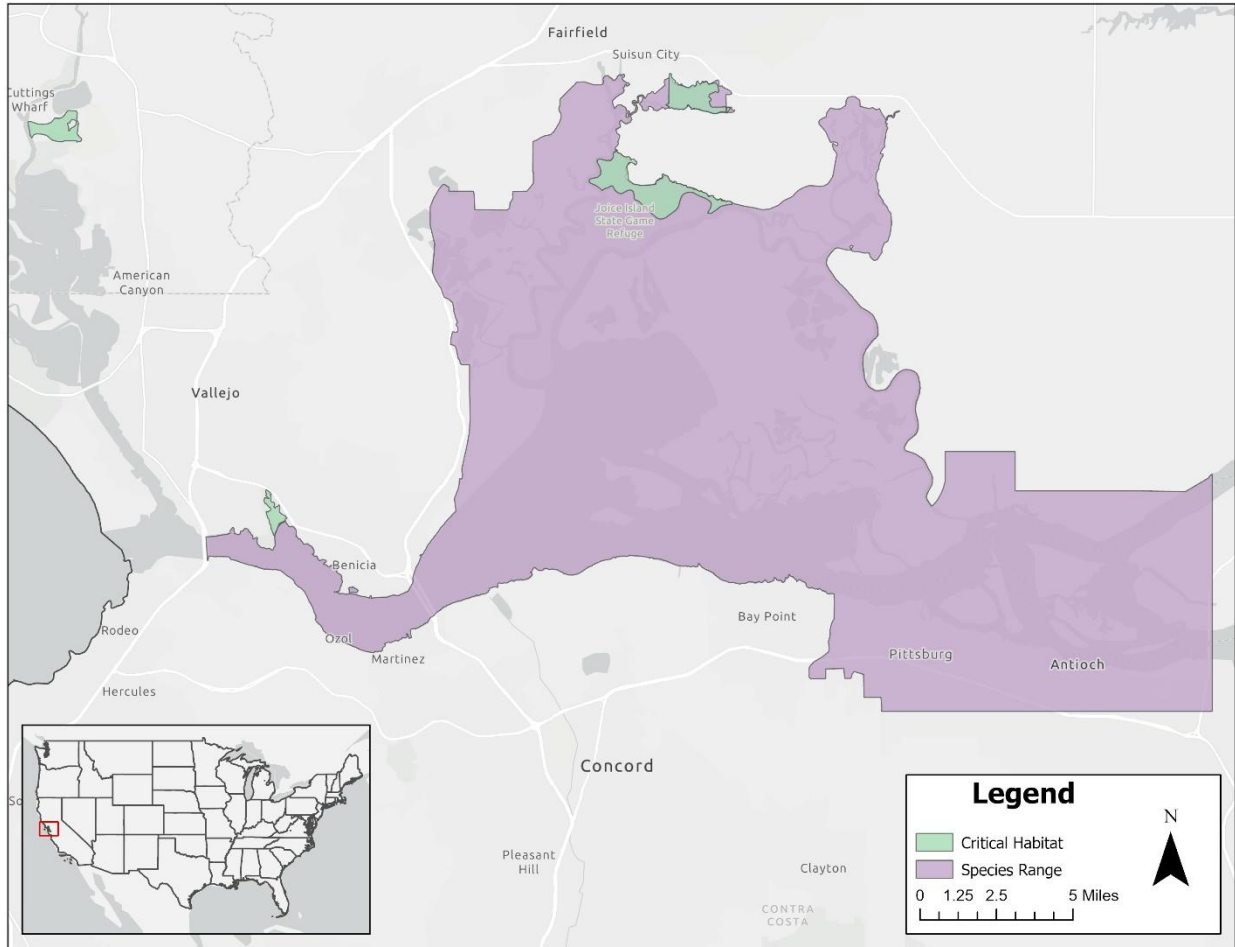


Figure A1-2. FWS' designated critical habitat for the soft bird's-beak. Range is also included for reference.

5. Known Locations

• Known Locations Described in FWS Recovery Documents

- There are currently 11 population with documented occurrences in nine general areas: Rush Ranch, Hill Slough, Joice Island, Bernicia State Recreation Area (BSRA), Point Pinole, Concord Naval Weapons Station, Fagan Slough, McAvoy Boat Har[b]or and Denverton.” (2023 Recovery Plan)
- **Figure A1-3** depicts the known location data in FWS' most recent 5-Year Review.
- When considering the locations of the current extant populations (**Figure A1-3**), they are consistent with the location of the Critical habitat (**Figure A1-2**).

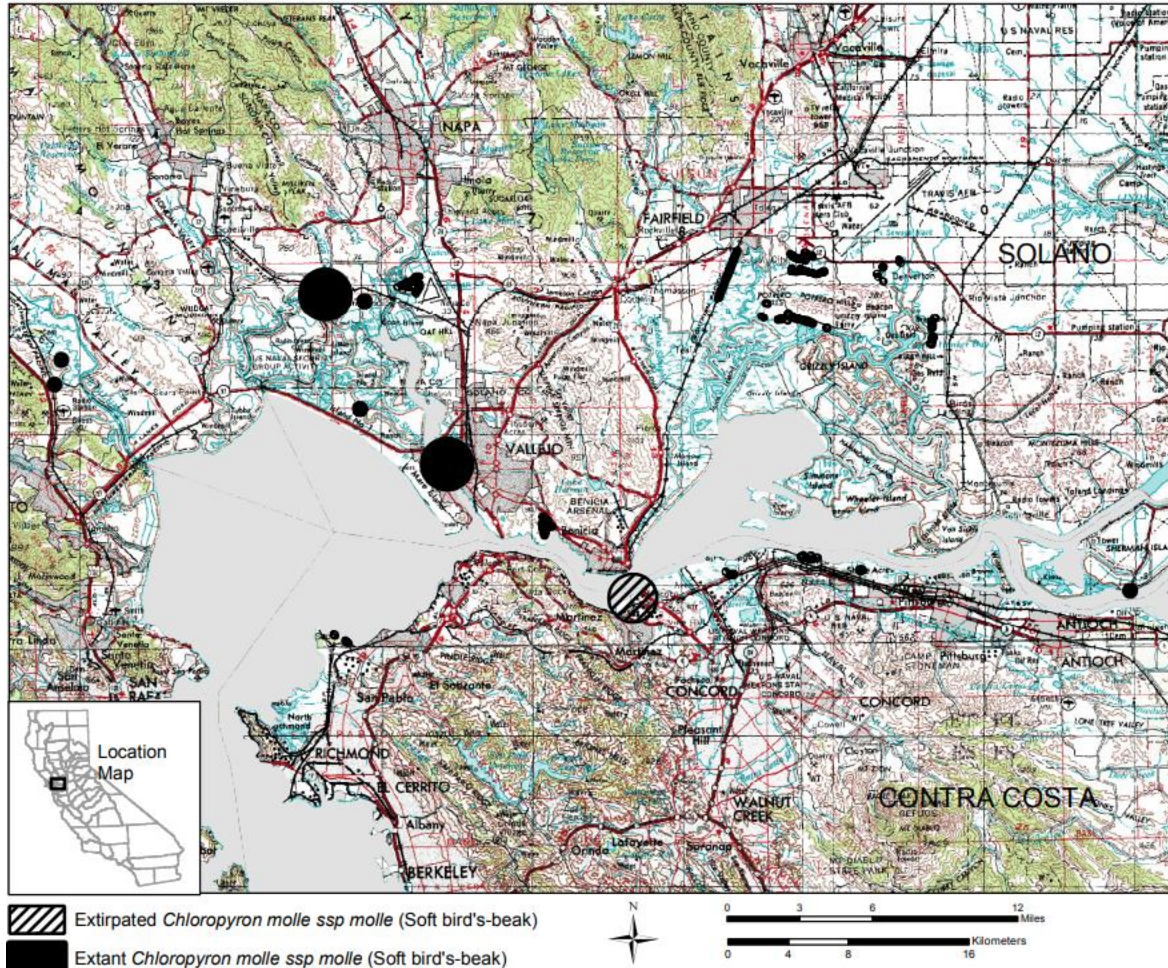


Figure A1-3. Known locations of the soft bird's-beak. Reproduced from FWS' 5-Year Review (2023).

- Occurrences described in iNaturalist
 - Searched for “Soft Salty Bird’s-Beak” on September 2, 2025. Search yielded 69 research grade observations from 2020 to 2025. https://www.inaturalist.org/observations?quality_grade=research&subview=map&taxon_id=79709
 - “Soft Salty Bird’s-Beak” is recognized as *Chloropyron molle molle* by iNaturalist.
 - **Figure A1-4** depicts the locations of these observations.
 - Due to the coarse resolution of these data, many of the observations are mapped in unsuitable, non-marsh habitat. Therefore, it is unclear if these observations are in the core map area or not.

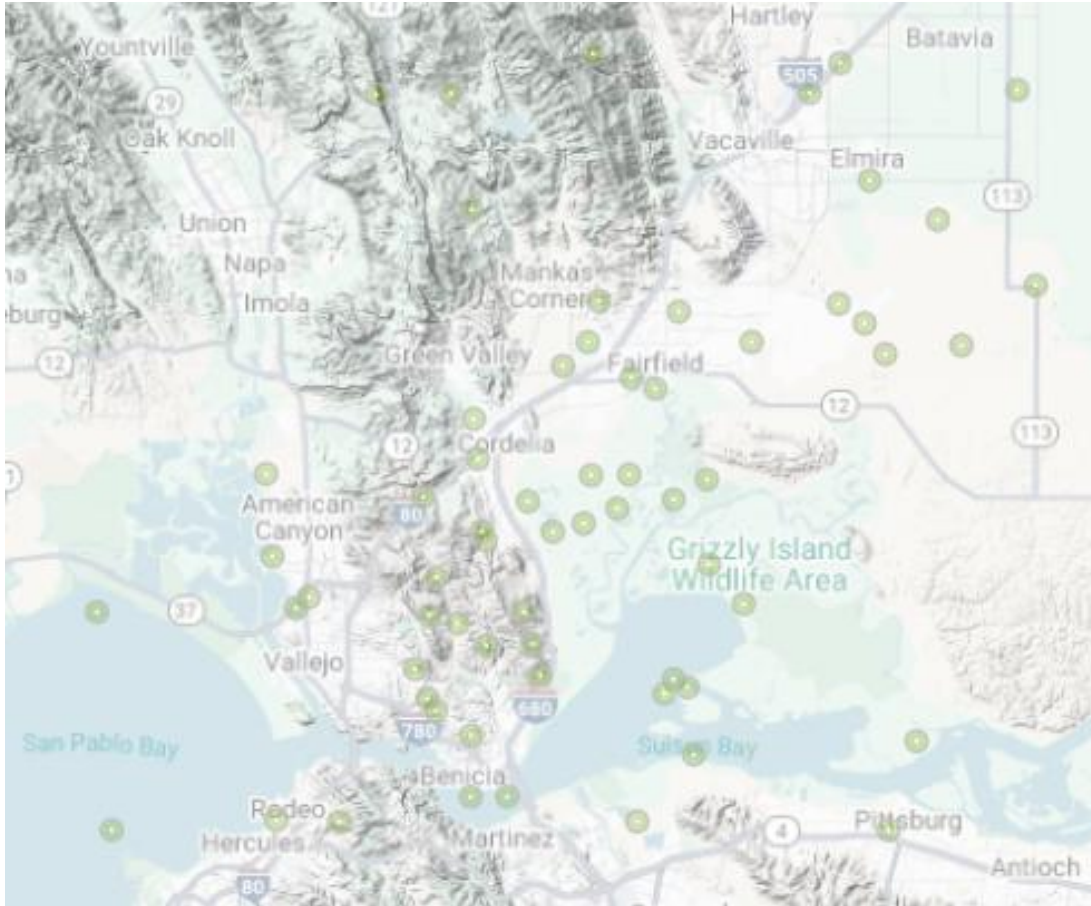


Figure A1-4. Screenshot from iNaturalist’s observations for the soft bird’s-beak.

Occurrences in NatureServe

- Searched for “*Chloropyron molle ssp. molle*” on September 2, 2025. Search yielded 24 occurrences with 17 presumed extant, six possibly extirpated, and one extirpated. [Chloropyron molle ssp. molle | NatureServe Explorer](#)
- These locations are generally consistent with the location of the range and critical habitat given the resolution of the data.

Occurrences in GBIF

- Searched for “*Chloropyron molle ssp. molle*” on September 2, 2025. When filtered for “present” and “Human observation” with coordinates between 2000 through 2025, there were 58 occurrences. [Occurrence search](#)
- All observations were included in either iNaturalist or NatureServe.
- Collectively, the occurrence data from iNaturalist, GBIF, and NatureServe do not support expanding the core map beyond the designated critical habitat.