

1 **A.35 HAIRY ORCUTT GRASS**
 2 **(*ORCUTTIA PILOSA*)**

3 **A.35.1 Legal and Other Status**

4 Hairy Orcutt grass (*Orcuttia pilosa*) is listed as endangered
 5 under the federal Endangered Species Act (ESA)
 6 throughout its range and is listed as endangered under the
 7 California ESA (DFG 2011). The California Native Plant
 8 Society (CNPS) includes Hairy Orcutt grass on List 1B, rare
 9 and endangered in California and elsewhere (CNPS 2006).

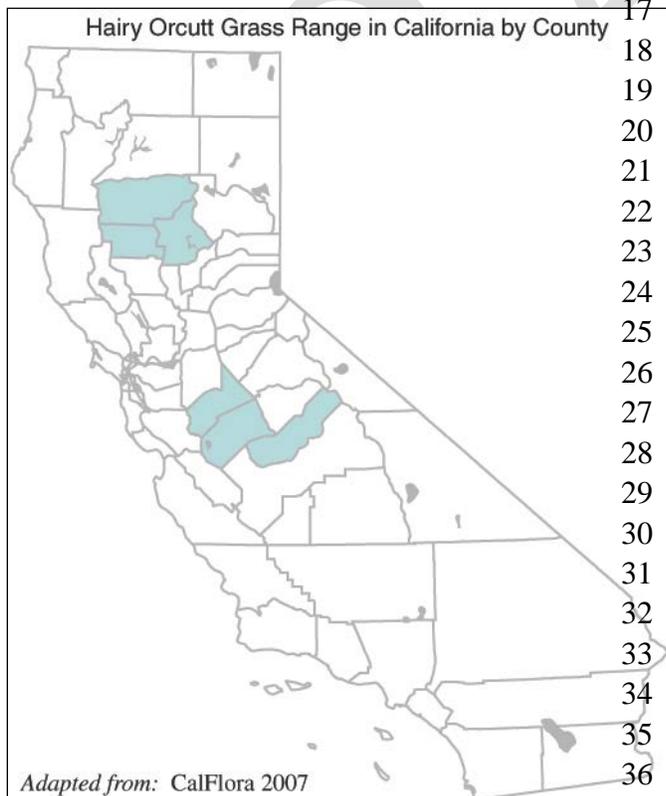


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10 Critical habitat has been designated for Hairy Orcutt grass, including one location in Butte County.
 11 In Butte County, 8 acres (3 hectares [ha]) of critical habitat have been designated for hairy Orcutt
 12 grass (Unit 2) (71 FR 7118). This location is on private property south of Chico along Highway 99
 13 and 0.4 mile (0.64 km) south of the junction with Pentz Road. This location includes the only
 14 reported location for hairy Orcutt grass in Butte County.

15 **A.35.2 Species Distribution and Status**

16 **A.35.2.1 Range and Status**



17 Hairy Orcutt grass inhabits vernal pools in
 18 rolling topography on remnant alluvial
 19 fans and stream terraces in the Central
 20 Valley of California. It is known to occur
 21 over a distance of 223 miles (490
 22 kilometers [km]) along the eastern margin
 23 of the San Joaquin and Sacramento
 24 valleys from Tehama County south to
 25 Stanislaus County and through Merced
 26 and Madera counties (62 FR 14338).
 27 Prior to surveys conducted in the 1980s,
 28 this species had been reported from 25
 29 sites, primarily in the Northeastern
 30 Sacramento Valley and Southern Sierra
 31 Foothills Vernal Pool Regions in Tehama,
 32 Stanislaus, Madera, and Merced counties,
 33 California. There is also a historical
 34 report of a specimen collected in the
 35 Solano-Colusa Vernal Pool Region in
 36 Glenn County, in 1937. During the late

1 1980s, surveys determined that 12 historical occurrences had been extirpated, and three
2 additional populations were reported in Madera, Stanislaus, and Tehama counties. Recently
3 (within the past decade), 10 new natural occurrences of hairy Orcutt grass have been discovered
4 in Madera, Tehama, and Stanislaus counties, and this species has been introduced into a
5 recreated pool in Madera County (USFWS 2005, CNDDDB 2006).

6 Of the 39 Element Occurrences currently included in the California Natural Diversity Database
7 (CNDDDB 2006), 27 natural occurrences and the introduced population are presumed to be extant.
8 Nine of the extant and one of the possibly extirpated populations are in the Vina Plains area in
9 Tehama County, which is in the Northeastern Sacramento Valley Vernal Pool Region. An
10 additional isolated occurrence in this same region is in central Butte County. Eleven extant
11 occurrences are in the Southern Sierra Foothills Vernal Pool Region, including nine in Madera
12 County and two in eastern Stanislaus County. Six extant occurrences are in the Solano-Colusa
13 Vernal Pool Region on the Sacramento National Wildlife Refuge in Glenn County (USFWS
14 2005, CNDDDB 2006).

15 The overall trend for this species is declining due to loss of vernal pool habitat (DFG 2000,
16 USFWS 2005, 2006).

17 **A.35.2.2 Distribution and Status in the Plan Area**

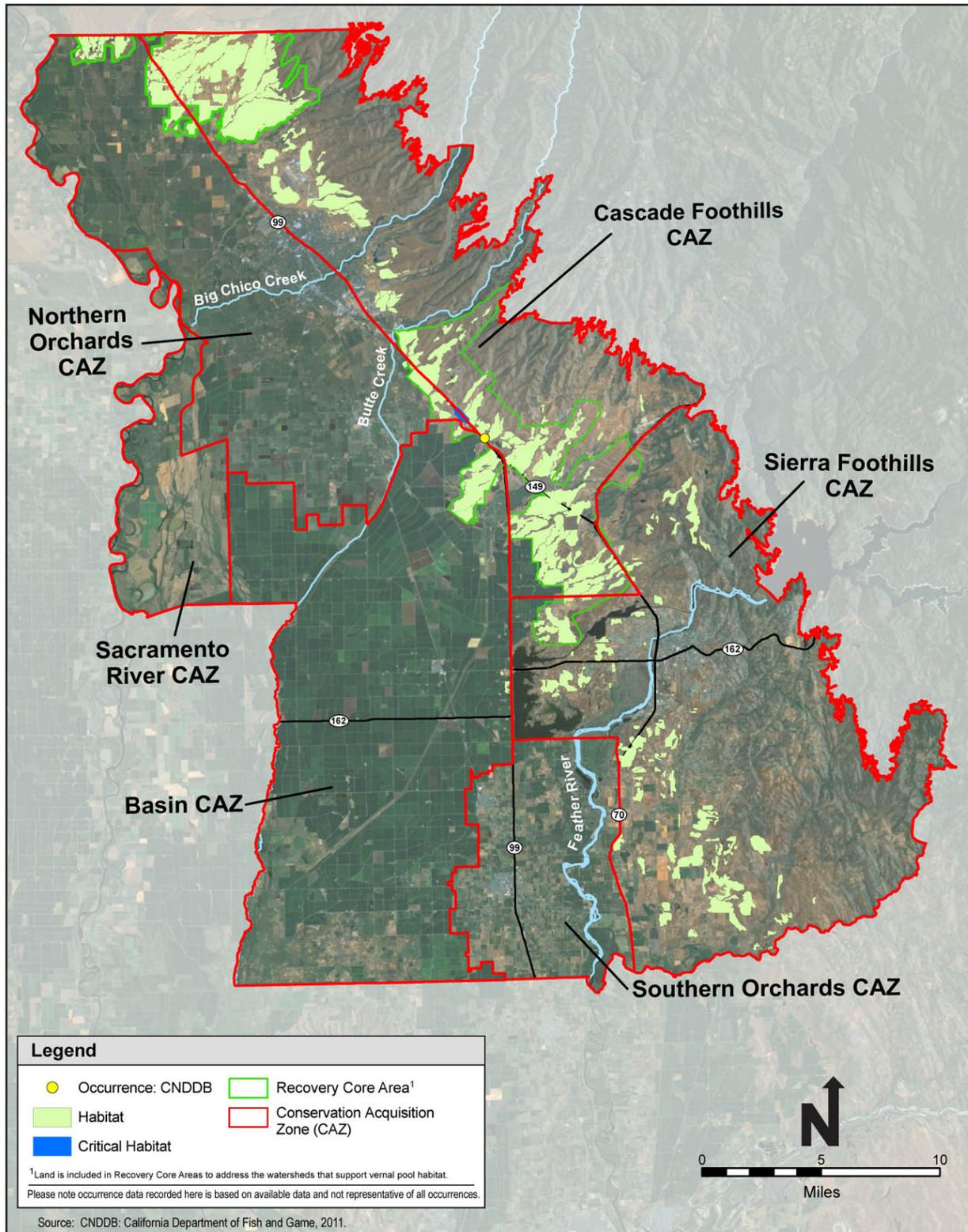
18 There is only one record of occurrence for this species in Butte County (see Figure A-35), on
19 private property south of Chico along Highway 99 and 0.4 mile (0.64 kilometer [km]) south of
20 the junction of Pentz Road; however, the information is from a 1986 recorded observation for
21 Hoover's spurge, and the presence of hairy Orcutt grass has not been confirmed. The number of
22 plants and trend for this location are unknown, although it is presumed to be extant (CNDDDB
23 2006). This species does occur in vernal pools on the Vina Plains in Tehama County, just north
24 of Butte County.

25 **A.35.3 Habitat Requirements and Special Considerations**

26 Hairy Orcutt grass is restricted to vernal pools and, in Butte County, occurs in valley and foothill
27 grasslands on volcanic mudflow or clay substrate at 75 to 375 feet (25 to 125 meters) elevation
28 (CNDDDB 2006). This species is typically found on high or low stream terraces and alluvial fans
29 in Northern Basalt Flow, Northern Claypan, and Northern Hardpan vernal pools within annual
30 grasslands (Sawyer-Keeler Wolf 1995, CNDDDB 2006). Previous studies indicated the median
31 size of occupied pools measured was 4.2 acres (1.7 hectares [ha]), with a range of 0.8 to 617.5
32 acres (0.34 to 250 ha). At the Vina Plains, this species was found growing only in pools that
33 held water until May, June, or July in 1995, and not in those that had dried by April. Hairy
34 Orcutt grass is found on both acidic and saline-alkaline soils, in pools with an iron-silica
35 cemented hardpan or claypan (USFWS 2005).

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Figure A-35. Hairy Orcutt Grass Modeled Habitat and Recorded Occurrences

1 Common associates of hairy Orcutt grass throughout its range include coyote thistle (*Eryngium*
2 spp.) and popcorn flower (*Plagiobothrys stipitatus*), and this species often occurs with other rare
3 vernal pool plant species, including Hoover's spurge and Greene's tuctoria (*Tuctoria greenei*) in
4 the Sacramento Valley (USFWS 2005). In the one location where hairy Orcutt grass was
5 reported in Butte County, it occurred with Hoover's spurge and Greene's tuctoria.

6 Other native plant species found growing with hairy Orcutt grass at the Butte County location
7 included annual hair grass (*Deschamsia danthonioides*), adobe allocarya (*Plagiobothryus*
8 *acanthocarpus*), navarretia (*Navarretia leucocephala*), Tehama navarretia (*Navarretia*
9 *heteranda*), dowingia (*Dowlingia* spp.), and clover (*Trifolium variegatum*). Nonnative plants
10 included prickle grass (*Crypsis* spp.), common unicorn plant (*Proboscidea louisianica*), and
11 Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) (CNDDDB 2006).

12 **A.35.4 Life History**

13 Hairy Orcutt grass blooms from May to September. The life history characteristics of hairy
14 Orcutt grass are common to all members of the species within this group (tribe Orcuttieae).
15 They are all annuals and wind-pollinated, although the pollen probably is not carried long
16 distances between populations. Local seed dispersal is by water, which breaks up the
17 inflorescences. It is speculated that long-distance dispersal is unlikely, but seed may have
18 historically been carried by waterfowl or other animals that visit the vernal pools. The seeds can
19 remain dormant for an undetermined length of time (at least 3 to 4 years) and germinate
20 underwater after they have been immersed for prolonged periods (USFWS 2005).

21 **A.35.5 Threats**

22 The CNPS states this species is seriously threatened by agriculture, urbanization, overgrazing,
23 nonnative species, and trampling (CNPS 2006). The 11 extirpated or presumed extirpated
24 populations in Madera, Merced, Stanislaus, and Tehama counties were lost due to agricultural
25 land conversion, urbanization, and intensive cattle grazing (62 FR 14338). Small population size
26 has been identified as a specific problem for hairy Orcutt grass. Six of the extant populations of
27 this species had fewer than 100 plants when reported (CNDDDB 2006). Small populations are
28 threatened with extirpation from random events, such as extreme weather and lack of genetic
29 diversity. Small, less genetically diverse populations are less likely to adapt and survive
30 environmental changes, even relatively minor events (USFWS 2005). The size of the population
31 in Butte County is unknown (CNDDDB 2006).

32 Threats to vernal pool habitat and species in general, including hairy Orcutt grass, are described in
33 the Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon (Recovery
34 Plan), approved by the USFWS in December 2005 (USFWS 2005). These threats are as follows:

- 35 • Habitat loss and fragmentation generally resulting from urbanization, agricultural
36 conversion, mining, and also occurring as a result of habitat alteration and degradation

1 due to changes to natural hydrology, invasive species, incompatible grazing regimes
2 (including insufficient grazing for prolonged periods), infrastructure projects (such as
3 roads and utility projects), recreational activities (such as off-highway vehicles and
4 hiking), erosion, climatic and environmental change, and contamination.

- 5 • Conversion of land use, such as from grasslands or pastures, to more intensive
6 agricultural uses, such as croplands or from one crop-type to another, has contributed and
7 continues to contribute to the decline of vernal pools in general and is identified as one of
8 the major threats to the remaining populations of hairy Orcutt grass (USFWS 2005). The
9 one occurrence of hairy Orcutt grass in Butte County is located on private property that is
10 used for grazing (CNDDDB 2006). Hairy Orcutt grass can tolerate some grazing, but
11 ecologically appropriate livestock numbers, timing, and intensity are unknown (DFG
12 2000).
- 13 • Competition from invasive species. In addition, native plant species that occupy the
14 same microhabitat can also compete with vernal pool plants such as hairy Orcutt grass.
15 Native competitors include coyote thistle (*Eryngium* spp.), alkali mallow (*Malvella*
16 *leprosa*), lippia (*Phylanodiflora* spp.), hard-stemmed tule (*Scirpus acutus* var.
17 *occidentalis*), alkali bulrush (*Scirpus maritimus*), and cocklebur (*Xanthium strumarium*).
18 Nonnative competitors include bindweed (*Convolvulus arvensis*) and swamp grass
19 (*Crypsis schoenoides*). Competition from invasive plant species is identified as an
20 increasing problem throughout the range of hairy Orcutt grass. Increasing dominance by
21 competitors may also contribute to changes in hydrology and livestock grazing practices
22 (USFWS 2005).
- 23 • Changes in hydrology that result in a change in the timing, frequency, and duration of
24 inundation in vernal pools, creating conditions that render existing vernal pools
25 unsuitable for vernal pool species. Several of the reported occurrences of this species
26 were extirpated due to changes in hydrology from agricultural practices (CNDDDB 2006).
- 27 • Several other threats to vernal pools and their associate species in general were identified
28 in the Recovery Plan. Water contamination can occur from use of herbicides, fertilizers,
29 and other chemicals commonly used in urban and agricultural settings. Fertilizers may
30 also contribute to the growth of invasive plants (USFWS 2005). Increased human
31 presence may lead to overuse, trampling (by walking or off-road vehicles), vandalism,
32 and dumping (62 FR 14338). Habitat alteration may also occur due to large-scale climate
33 and environmental changes, such as global warming, that lead to changes in the
34 precipitation pattern and atmospheric conditions (USFWS 2005).

35 A.35.6 Relevant Conservation Efforts

36 Five extant populations of hairy Orcutt grass are protected at The Nature Conservancy's Vina
37 Plains Preserve in Tehama County and an additional six populations are in the Sacramento
38 National Wildlife Refuge in Glenn County. The introduced population is within a Department of
39 Transportation mitigation site in Madera County on U.S. Bureau of Reclamation property. The

1 remaining extant populations are on private property, or the owner/manager is unknown,
2 including the location in Butte County (CNDDDB 2006).

3 **A.35.7 Species Habitat Suitability Model**

4 **A.35.7.1 Habitat**

5 Hairy Orcutt grass habitat includes the following BRCP mapped land cover types:

- 6 • Vernal pool;
- 7 • Altered vernal pool; and
- 8 • Grassland with vernal swale complex.

9 Vernal pools that may support hairy Orcutt grass habitat may also occur as inclusions in mapped
10 grassland, blue oak savanna, ranchettes—open, and disturbed ground land cover types. These
11 inclusions were not mapped because they did not meet the mapping criteria for vernal pool,
12 altered vernal pool, and grassland with vernal swale complex land cover types.

13 **A.35.7.2 Assumptions**

14 Hairy Orcutt grass is typically found on high or low stream terraces and alluvial fans in Northern
15 Basalt Flow, Northern Claypan, and Northern Hardpan vernal pools within annual grasslands
16 (Sawyer and Keeler Wolf 1995). It occurs in valley and foothill grassland on volcanic mudflow
17 or clay substrate (CNDDDB 2006).

18 Given these habitat preferences, suitable habitat for the Hairy Orcutt grass is defined as any
19 mapped vernal pool or altered vernal pool within the Plan Area. Additionally, the grassland with
20 vernal swale complex land cover type is included in the model. This type may include areas that
21 pool in a given year but that were not captured as individual vernal pools in the GIC/SAIC vernal
22 pool mapping effort. Because vernal elements were identified based on photo interpretation of
23 aerial photography from winter 2002 (an average rainfall year), an above-average rainfall year
24 may result in more areas of ponded water within the Plan Area.

25 **A.35.8 Recovery Plan Goals**

26 A general statement for recovery of hairy Orcutt grass is presented in the Recovery Plan: to
27 ensure protection of the full geographic, genetic and ecological extent of this species and to
28 improve the circumstances that caused it to be listed in the first place. Accomplishment of this
29 goal would be achieved by protecting 90 percent of known occurrences throughout its range,
30 including 95 percent of suitable habitat in the Oroville, Vina Plains, Sacramento NWR, Madera,
31 and Merced Core Areas and 85 percent of suitable habitat in the Turlock Core Area. In addition,
32 seed would be banked from at least one population in each core area. Historical locations would
33 be investigated and the species would be reintroduced where it has been extirpated.

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