

12. *ORCUTTIA VISCIDA* (SACRAMENTO ORCUTT GRASS)

a. Description and Taxonomy

Taxonomy.—Sacramento Orcutt grass is in the tribe Orcuttieae of the grass family Poaceae (Reeder 1965). Hoover (1941) first published the scientific name *Orcuttia californica* var. *viscida* for Sacramento Orcutt grass. He had collected the type specimen from “7 miles south of Folsom” in Sacramento County (Hoover 1941:155). Although Hoover recognized that Sacramento Orcutt grass differed from California Orcutt grass in several respects, he did not consider the former to represent a distinct species. However, Reeder (1980) determined that the differences in morphology, seed size, and chromosome number were sufficient grounds to elevate Sacramento Orcutt grass to the species level as *Orcuttia viscida*. Reeder’s taxonomy has been accepted since that time. Other common names for this species include Sacramento orcuttia (Smith *et al.* 1980) and sticky Orcutt grass (California Department of Fish and Game 1987c).

Description and Identification.—In basic form, *Orcuttia viscida* resembles other members of the tribe and genus. Although all members of the Orcuttieae produce exudate, *O. viscida* is particularly viscid even when young, hence the scientific name. The plants are densely tufted, bluish-green, and covered with hairs. The stems are erect or spreading, 3 to 10 centimeters (1.2 to 3.9 inches) long, and do not branch. Leaf width is 2 to 4 millimeters (0.08 to 0.16 inch). The inflorescence occupies the upper one-third to one-half of the stem and consists of between 5 and 15 spikelets. The spikelets are closely spaced, and although distichous, are oriented towards one side of the stem. Each spikelet contains 6 to 20 florets. The lemmas are 6 to 7 millimeters (0.24 to 0.28 inch) long and divided about halfway into teeth; the central tooth is longer than the others. The teeth are tipped with bristles 1 millimeter (0.04 inch) or more in length. The tips of the lemma teeth bend downward slightly, giving the inflorescence a bristly appearance. Seeds of *O. viscida* are about 2.5 millimeters (0.10 inch) long (Hoover 1941; Griggs 1977a; Reeder 1982, 1993; Stone *et al.* 1988) and weigh about 0.45 milligram (1.6×10^{-5} ounce) (Griggs 1980, Griggs and Jain 1983). The diploid chromosome number is 28 (Reeder 1980).

Orcuttia viscida has unequal lemma teeth, unlike *O. pilosa* and *O. tenuis*. Both *O. californica* and *O. inaequalis* have unequal lemma teeth but can be distinguished from *O. viscida* by the length of the lemma and its teeth and

bristles, the size and density of the inflorescence, and the size of the seeds. Moreover, the chromosome number of *O. viscida* differs from all other *Orcuttia* species (Reeder 1982).

b. Historical and Current Distribution

Historical Distribution.—*Orcuttia viscida* is endemic to the Southeastern Sacramento Valley Vernal Pool Region (Keeler-Wolf *et al.* 1998) and always has been restricted to Sacramento County (**Figure II-16**). The earliest collection was from 1936 near Phoenix Field. Three other occurrences documented in 1941 and 1958 extended the range north to Orangevale and south to near Sloughhouse. *Orcuttia viscida* was introduced to Phoenix Park, in Sacramento County, in 1978. Three additional natural occurrences were discovered in the late 1980s, including one in extreme southeastern Sacramento County near Route 104. Thus, by 1990, this species was known from a total of seven natural occurrences and one introduction (Stone *et al.* 1988, California Natural Diversity Data Base 2003).

Current Distribution.—Within the past two decades, *Orcuttia viscida* has been discovered at one new site in Sacramento County, within the previously known range. However, one entire occurrence and a portion of another have been extirpated. Thus, eight of the nine occurrences are extant. Five occurrences, comprising more than 70 percent of the occupied habitat, are concentrated into a single area of about 6 square kilometers (2.3 square miles) in the Rancho Cordova area east of Mather Field. Two other occurrences are adjacent to each other: Phoenix Field Ecological Reserve and the introduced population at Phoenix Park. The eighth extant occurrence is near Rancho Seco Lake (Stone *et al.* 1988, S. Cochrane *in litt.* 1995a, S. Morey *in litt.* 1996, California Natural Diversity Data Base 2003). All occurrences are in the Southeastern Sacramento Valley Vernal Pool Region (Keeler-Wolf *et al.* 1998).

c. Life History and Habitat

Basic life history and habitat requirements of this plant are likely similar to those described above in the species accounts for *Orcuttia inaequalis* and *Neostapfia colusana*.

Reproduction and Demography.—*Orcuttia viscida* flowers in May and June (Griggs 1977a, Skinner and Pavlik 1994, S. Cochrane *in litt.* 1995a) and sets seed in June and July (Holland 1987). The plants are adapted for wind pollination, but do provide a source of pollen for native bees (Griggs 1974 as

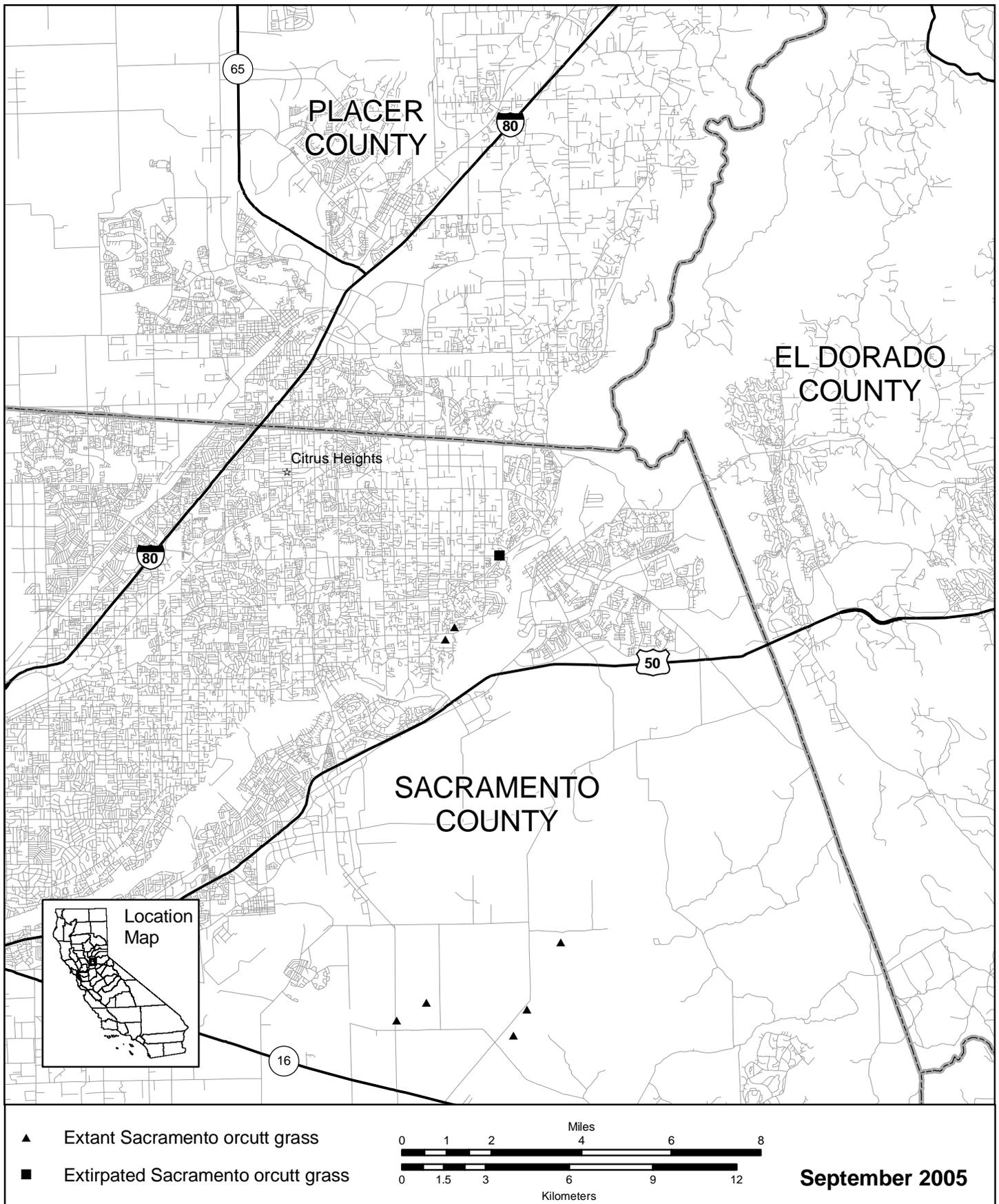


Figure II-16. Distribution of *Orcuttia viscida* (Sacramento Orcutt grass).

cited in Stone *et al.* 1988). Seeds likely do not disperse far under natural conditions. In a 6-year period, an experimental population spread at most 3 meters (10 feet) from the seed source, and 95 percent of plants were within 30 centimeters (11.8 inches) of the source (R. Holland *in litt.* 1986). A demographic study conducted from 1974 to 1978 (Griggs 1980, Griggs and Jain 1983) indicated that *O. viscida* produced an average of 500 seeds per plant. At one site in 1978, 88 percent of plants survived to maturity. The size of the seed bank stored in the soil was about 44 times as great as the population of growing plants (Griggs 1980, Griggs and Jain 1983). The number of plants varies with rainfall. Large numbers of plants grow only in years when seasonal rainfall exceeds 40 centimeters (15.7 inches), particularly when heavy rains begin in November and continue through the end of April (Holland 1987). This species is apparently less likely to germinate in years of below-normal precipitation than are other members of the tribe (Griggs 1980, Griggs and Jain 1983). In studies of enzyme systems, genetic diversity between populations of *O. viscida* was low. However, plants from the primary area of concentration had alleles that did not occur in other areas. The amount of genetic variation occurring among related individuals was about equal to that within populations (Griggs 1980, Griggs and Jain 1983).

Habitat and Community Associations.—*Orcuttia viscida* has been found in Northern Hardpan and Northern Volcanic Mudflow vernal pools (Sawyer and Keeler-Wolf 1995). It occurs on high-terrace sites (Stone *et al.* 1988) at elevations of 46 to 82 meters (150 to 270 feet) (California Natural Diversity Data Base 2005). Occupied pools occur in *Quercus douglasii* woodland and annual grassland (Crampton 1959, Griggs 1977a, California Natural Diversity Data Base 2005). Among occupied pools discovered prior to 1988, the median area was 0.28 hectare (0.69 acre) and ranged from 0.1 hectare (0.25 acre) to 0.82 hectare (2.03 acres). Soils underlying pools where *O. viscida* grows are acidic with an iron-silica hardpan (Stone *et al.* 1988), and the pools contain numerous cobbles (Crampton 1959, Stone *et al.* 1988). Four of the known occurrences are on soils in the Redding series, two are on Red Bluff-Redding complex soils, two are (or were) on Xerarents-urban land-San Joaquin complex, and one is on Corning complex soils. The most common associates of *Orcuttia viscida* are *Plagiobothrys stipitatus*, *Eryngium* spp., *Eleocharis macrostachya*, and *Psilocarphus brevissimus* (Stone *et al.* 1988). *Gratiola heterosepala* co-occurs with *O. viscida* in one pool (Stone *et al.* 1988, California Natural Diversity Data Base 2005). One population of *O. tenuis* grows in the same vicinity as *O. viscida*, but the two species have not been found together (Cochrane *in litt.* 1995a).

d. Reasons for Decline and Threats to Survival

Most species addressed in this recovery plan are threatened by similar factors because they occupy the same vernal pool ecosystems. These general threats, faced by all the covered species, are discussed in greater detail in the Introduction section of this recovery plan. Additional, specific threats to *Orcuttia viscida* are described below.

Urbanization is a continuing threat, particularly in the Rancho Cordova area (S. Cochrane *in litt.* 1995a). Expansion of the Kiefer Landfill in Sacramento County may adversely affect the occurrences adjacent to the new landfill footprint (S. Cochrane *in litt.* 1995a, U.S. Fish and Wildlife Service 2005). At present, trash from the landfill frequently blows into the pools (S. Cochrane *in litt.* 1995b). An industrial park and road widening are other urban-related factors that threaten *Orcuttia viscida* (Stone *et al.* 1988, S. Cochrane *in litt.* 1995a). The Phoenix Field Ecological Reserve and Phoenix Park occurrences are in an urban landscape. The Ecological Reserve is completely surrounded by housing and the vernal pools are buffered by as little as 3 feet (1 meter) from adjacent residential backyards (D. Burmester, pers. comm. 2005). They are affected by excess runoff from lawns, ball fields, and roads; by herbicide and fertilizer applied in adjacent areas (Griggs and Jain 1983, R. Holland *in litt.* 1986, Stone *et al.* 1988, S. Cochrane *in litt.* 1995a, S. Morey *in litt.* 1996, Clark *et al.* 1998); and by dumping of landscape waste (Clark *et al.* 1998). The California Department of Fish and Game installed a drain to prevent urban and landscape runoff from entering the vernal pools (M. Showers, *in litt.* 2005). Another threat at the Phoenix Field Ecological Reserve is invasion of garden plants (Clark *et al.* 1998, California Natural Diversity Data Base 2003). Recreational activities such as rollerblading (C. Witham *in litt.* 2000a), biking, and horseback riding (S. Cochrane *in litt.* 1995a,b; Clark *et al.* 1998) also pose continuing threats of damage to the Phoenix Park occurrence of this plant. In addition, competition from other native plants, such as *Eleocharis macrostachya* and nonnative plants such as *Glyceria* spp. (mannagrass) could displace *O. viscida* (Stone *et al.* 1988, S. Cochrane *in litt.* 1995a,b; Clark *et al.* 1998). Mining, off-road vehicle use, and vandalism also threaten one or more specific occurrences (U.S. Fish and Wildlife Service 1997a). Although the individual populations of *O. viscida* are sufficiently large that they are not subject to random fluctuations such as genetic drift, the very restricted range of the species as a whole puts it in continued danger of extinction from random, catastrophic events.

e. Conservation Efforts

Orcuttia viscida was federally listed as an endangered species on March 26, 1997 (U.S. Fish and Wildlife Service 1997a) and had been previously State-listed as endangered in 1979 (California Department of Fish and Game 1991). The California Native Plant Society has included it on lists of very rare and endangered plants for over two decades (Powell 1974); *O. viscida* is currently on List 1B, with the highest endangerment rating possible (California Native Plant Society 2001). In 2005, critical habitat was designated for *O. viscida* and several other vernal pool species in *Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Evaluation of Economic Exclusions From August 2003 Final Designation; Final Rule* (U.S. Fish and Wildlife Service 2005).

Two reserves have been set aside to protect *Orcuttia viscida*. The Phoenix Field Ecological Reserve encompasses 3.2 hectares (8 acres) and is managed by the California Department of Fish and Game. The site has been fenced, and only authorized persons have access. The California Department of Fish and Game plans to install a drain to prevent urban and landscape runoff from entering the pools. Volunteers and agency personnel monitor the *O. viscida* population periodically (S. Morey *in litt.* 1996, Clark *et al.* 1998). The nearby Phoenix Park Vernal Pool Preserve encompasses 5.7 hectares (14 acres) and is managed by the Fair Oaks Recreation and Park District. A low fence excludes motorized vehicles, but allows foot traffic. Interpretive signs and a footbridge also have been installed (Clark *et al.* 1998).

Griggs (1980) studied the ecology, demography, and genetics of several species in the Orcuttieae tribe, including *Orcuttia viscida*. In the course of his research, he introduced local seeds into an unoccupied, natural pool in Phoenix Park. The introduction apparently was successful because the population has persisted and remained stable since 1978 (S. Cochrane *in litt.* 1995a, California Natural Diversity Data Base 2003).

We funded a status survey for members of the Orcuttieae in the 1980s, which led to the discovery of several new populations (Stone *et al.* 1988). The California Department of Fish and Game sponsored a native plant recovery workshop in 1995 to develop recovery strategies for *Orcuttia viscida* (S. Cochrane *in litt.* 1995a). Workshop participants have since conducted several tasks contributing to the species' recovery, including monitoring populations, assessing threats, and providing public education (S. Cochrane *in litt.* 1995b, S. Morey *in litt.* 1996).