

*Orcuttia viscida*

Sacramento Orcutt grass is found in naturally occurring scattered vernal pool complexes in Sacramento County, California, and is the most geographically restricted *Orcuttia* species. The specific vernal pool characteristics that determine the suitability for Sacramento Orcutt grass germination, growth and reproduction are not well understood. Sacramento Orcutt grass occurrences are known from only in eastern Sacramento County in the Sacramento Valley with a predominant elevational variation of 45 m (150 ft) to 114 m (375 ft). Conserving a broad distribution of Sacramento Orcutt grass across its rather relatively narrow geographical and elevational distribution protects the natural environmental processes for the species and provides the best chance for retaining the species across the full extent of the species range.

The vernal pool types and soils associated with the three areas of concentration of Sacramento Orcutt grass differ across the geographic range of the species and leads to different species compositions and environmental conditions between Sacramento Orcutt grass occurrences. Providing for a mosaic of habitat types both between and among vernal pool species occurrences is essential to the species conservation because it would include the full extent of the physical and environmental conditions for the species (Fugate 1992, Fugate 1998, Gonzales *et al.* 1996, Ikeda and Schlising 1990, Noss *et al.* 2002a, Platenkamp 1998, Zedler *et al.* 1979). The distribution of Sacramento Orcutt grass reflects a relatively smaller diversity of vernal pool habitat types that provide habitat for the species on the old stream terraces of the Sierra Nevada foothills. Vernal pool complexes that provide suitable habitat for this species include one physiographic and edaphic settings-remnant depositional stream terraces at the base of the Sierran foothills. The Sacramento County occurrences of Sacramento Orcutt grass are associated with Redding soils that are strongly acidic underlain by an iron-silica cemented hardpan and with soils mapped in the Pentz-Pardee-Red Bluff association. Not all areas of Sacramento Orcutt grass have been identified as to the specific soil series or soil mapping units where they occur. Many of the occupied vernal pools vary in size from 1,000 sq m (0.3 ac) to 8,260 sq m (2 ac). The parent material of vernal pools greatly influences species composition and hydrologic functioning of the vernal pool (Hanes and Stromberg 1998,

Holland and Jain 1981, 1988). Soils beneath vernal pools are extremely variable and are not the same as soils mapped by soil surveys, but are usually undescribed hydric inclusions that vary upon location (Holland and Dain 1990). The primary constituent elements of critical habitat for *Orcuttia viscida* are the habitat components that provide:

(i) Vernal pools, swales, and other ephemeral wetlands and depressions of appropriate sizes and depths and the adjacent upland margins of these depressions that sustain *Orcuttia viscida* germination, growth and reproduction, including but not limited to vernal pools on high terrace landforms on acidic soils such as Red Bluff, Redding, and Corning soil series. These habitats typically become inundated during winter rains, but are dry during the summer and do not necessarily fill with water every year; and

(ii) The associated watershed(s) and hydrologic features, including the pool basin, swales, and surrounding uplands (which may vary in extent depending on pool size and depth, soil type and depth, hardpan or claypan type and extent, topography, and climate) that contribute to the filling and drying of the vernal pool or ephemeral wetland, and that maintain suitable periods of pool inundation, water quality, and soil moisture for *Orcuttia viscida* germination, growth and reproduction, and dispersal, but not necessarily every year.

*Unit 3, Rancho Seco Unit, Sacramento and Amador Counties (35,078 ac (14,196 ha))*

This unit marks the southern extent of the range of *Orcuttia viscida*, and is one of only three areas where the species remains extant (criterion 1). It supports occurrences of the species within relatively undisturbed high terrace vernal pool complexes on Corning and Redding soil mapping units. Corning soils are not common to the other two units (criterion 2).

This unit occupies the area south of Laguna Creek and north of the Sacramento and San Joaquin County line along Dry Creek. The eastern boundary is the low elevation foothills of western Amador County. The western limit is bounded by urban and agricultural areas near the cities of Galt and Elk Grove, and along the foothill region of the southeastern Sacramento Valley. The western boundary also marks a change from high terrace soils in the region, including Corning and Redding soil mapping units that comprise the extent of *Orcuttia viscida* habitat. The northern and southern boundaries of this unit exclude urban

and agricultural areas. The majority of land within this unit is privately owned, but some includes additional protection which will help the species occurrences to persist over time (criterion 4). TNC owns 7,736 ac (3,094 ha) and an additional 11 ac (5 ha) of private land is protected by WRP easements or agreements.

*Orcuttia inaequalis*

San Joaquin Valley Orcutt grass is found in naturally occurring widely scattered vernal pool complexes in Fresno, Madera, Merced, Stanislaus, and Tulare counties in the northeastern San Joaquin Valleys. San Joaquin Valley is the only species found just in the San Joaquin Valley. The specific vernal pool characteristics that determine the suitability for San Joaquin Valley Orcutt grass germination, growth, and successful reproduction are unknown. However, San Joaquin Valley is a strict endemic to usually larger vernal pools that range in area from 140 sq m (1,500 sq ft) to 4.9 ha (12.1 ac) in size and 30.5 cm (12 in) to 55.9 cm (22 in) deep but can be found in both smaller and larger and shallower and deeper vernal pools (Stone *et al.* 1988, Volmar 2002). San Joaquin Valley is found in vernal pool complexes on a variety of geological surfaces including Lone, Laguna, Merthen, Modesto, North Merced Gravels, Riverbank, Turlock Lake, and Valley Springs in the northeastern San Joaquin Valley.

San Joaquin Valley Orcutt grass occurrences are known from central Merced County to northern Tulare County in the northeastern San Joaquin Valley with a predominate elevational variation of near 47 m (155 ft) to near 570 m (1,870 ft). Conserving a broad distribution San Joaquin Valley Orcutt grass across its geographical and elevational distribution protects the natural environmental processes for the species and provides the best chance for retaining the species across the full extent of the species range.

The vernal pool types and soils associated with the six areas of concentration of San Joaquin Valley Orcutt grass differ greatly across the geographic range of the species and leads to different species compositions and environmental conditions between San Joaquin Valley Orcutt grass occurrences. Providing for a mosaic of habitat types both between and among vernal pool species occurrences is essential to the species conservation because it would include the full extent of the physical and environmental conditions for the species (Fugate 1992, Fugate 1998, Gonzales *et al.* 1996, Ikeda and Schlising 1990, Noss *et al.* 2002a,