

not limited to, hardpan vernal pools on alluvial terraces and San Joaquin, Redding, Corning, Keyes, and Pentz soils series, among others, and northern basalt flow vernal pools on Hideaway soils series, which 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 *Castilleja campestris* ssp. *succulenta* germination, growth and reproduction, and dispersal, but not necessarily every year.

*Unit 1, Southeast Sacramento Valley Unit, Sacramento and San Joaquin Counties (2,422 ac (980 ha))*

This unit contains occurrences of the species in vernal pools occurring on San Joaquin soils (Holland 1998; Sacramento County 1999; CNDDDB 2002). The unit is geographically important because it represents the northernmost extent of the species' range, and because it is the only unit designated for this species within the Sacramento Valley. The unit is isolated from other *Orthocarpus campestris* var. *succulentus* occurrences to the south in the San Joaquin Valley by a distance of over 50 mi (80 km). This unit occupies the area east of Galt in southeastern Sacramento and northeastern San Joaquin Counties. All of the lands included within this unit are privately owned.

*Unit 2, Waterford Unit, Stanislaus and Tuolumne Counties (33,705 ac (13,640 ha))*

This unit supports *Orthocarpus campestris* var. *succulentus* occurrences within hardpan vernal pools on alluvial terraces on Amador and Redding soils (CNDDDB 2002). These soil types are not otherwise well represented (criterion 2). The unit represents the northernmost extent of *O. c.* var. *succulentus* range within the San Joaquin Valley, and is over 50 mi (80 km) from the isolated occurrence to the north (criterion 1). It contains a variety of pools and ephemeral habitats in which the plants are known to occur, including shallow and deep pools and pools with both long and short inundation periods (criterion 2). The Waterford Unit is important for the survival of *O. c.* var.

*succulentus* because it represents large areas of contiguous habitat with relatively intact hydrology. Vernal pools in the Waterford Unit are located mainly in eastern Stanislaus County, but overlap into western Tuolumne County, extending into the low elevation foothills of the Sierra Nevada. All the lands within this unit are privately owned.

*Unit 5, Fresno Unit, Fresno County (26,406 ac (10,686 ha))*

This unit contains occurrences of the species growing within vernal pools formed on Fallbrook, Ramona, San Joaquin, Vista, and Pollasky soil series (CNDDDB 2002). Essential habitat in this unit consists of typical "bowl-like" pools, whereas other areas are more similar to swales. The diversity of vernal pool types found within the Fresno Unit contributes to the range of ecological conditions in which *Orthocarpus campestris* var. *succulentus* occurs (criterion 2). This area is also noteworthy because it represents the southern extent of the species' range (criterion 1). The Fresno Unit is located south of Millerton Lake. Property ownership and protection within this unit includes CDFG (1 ac (0.4 ha) and CDFG-administered land (1 ac (0.4 ha)). The remainder of the property within this unit is privately owned.

*Unit 6A, Table Mountain Unit, Fresno County (4,258 ac (1,723 ha))*

This area supports occurrences of the species within Northern Basalt Flow vernal pools (CNDDDB 2002). This is the only area where *Orthocarpus campestris* var. *succulentus* is found on this vernal pool type (criterion 2). Northern Basalt Flow pool complexes, such as Table Mountain, are extremely rare, occurring only on ancient terraces and hilltops. Basalt tables are perched on narrow, sinuous basalt mesas above the surrounding low-lying terrain. They typically contain small, irregularly clustered pools with "flashy hydrology" (Keeler-Wolf *et al.* 1998). They are less common than hardpan and claypan pools that are typically found in this region, and occur in complexes that are less dense than habitat in units further north.

Three occurrences of *Orthocarpus campestris* var. *succulentus* within this unit are wholly or partly in designated reserves, which are on two mountains near Millerton Lake. The Sierra Foothill Conservancy's Big Table Mountain Preserve includes one of these occurrences, and a portion of another, which is shared with BLM. The other is in CDFG's Big Table Mountain

Ecological Reserve. A fourth nearby occurrence is partially under the control of BLM and partly in private ownership. BLM owns approximately 350 ac (142 ha) and CDFG owns approximately 419 ac (170 ha) of land within this unit. TNC has 650 ac (256 ha) of conservation easements within this unit. These preserved areas increase the likelihood that the species will persist in the unit over time (criterion 4).

The Table Mountain Unit is comprised of two subunits. Both subunits are located east of Millerton Lake on basalt mesas above the San Joaquin River. Subunit 6B is located on Kennedy Table in Madera County, and Subunit 6A is directly south of this unit across the San Joaquin River on Table Mountain in Fresno County.

*Neostapfia colusana*

Colusa grass occurrences are known from eight areas of concentration with an elevational variation of near 5 m (16 ft) to near 100 m (350 ft). Conserving a broad distribution of Colusa 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 eight areas of concentration of Colusa grass differ greatly across the geographic range of the species; these differences lead to different species compositions and environmental conditions between Colusa 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 Colusa grass reflects a diversity of vernal pool habitat types and sizes that provide habitat for the species. Vernal pool complexes that provide suitable habitat for this species include two different physiographic and edaphic settings: claypan soils of saline-alkali basins and remnant alluvial fans and old stream terrace areas with strongly acidic, gravelly, and cobbly soils having an iron-silica cemented hardpan, and shallow, slightly acidic residual soils of the Pentz series underlain by cemented tuffaceous alluvium. Additional settings for Colusa grass are found in vernal pool complexes where resistant beds of tuffaceous deposits are exposed along intermittent drainages and, in Stanislaus