

County, neutral to slightly alkaline claypan soils on dissected alluvial fans. Not all areas of Colusa grass have been identified as to the specific soil series or soil mapping units where they occur. However, in Merced County, Colusa grass occurs on clay soils on Mehrten Formation and also on Riverbank, North Merced Gravels, and Laguna Formations. Of the Orcuttiaeae grasses, Colusa grass inhabits the widest range of vernal pool sizes, with the smallest being 100 sq m (1,075 sq ft) and the largest at 250 ha (618 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 by location (Holland and Dain 1990). The primary constituent elements of critical habitat for *Neostapfia colusana* 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 *Neostapfia colusana* germination, growth, and reproduction, and that typically become inundated during winter rains, including but not limited to vernal pools formed on the rim of alkaline basins in the Sacramento and San Joaquin valleys, as well as on acidic soils of alluvial fans and stream terraces along the eastern margin of the San Joaquin Valley and into the adjacent foothills. All of these pool types 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 *Neostapfia colusana* germination, growth and reproduction, and dispersal, but not necessarily every year.

*Unit 1, Davis Communications Annex and Grasslands Area Unit, Yolo County (440 ac (178 ha))*

This unit is geographically important (criterion 1) because it contains one of only six areas where *Neostapfia colusana* is known to occur (EIP

Associates 2001; Yolo County Parks 2001; CNDDDB 2002). Species occurrences within the unit grow in large vernal playa pools of the Pescadero soil series (Yolo County 1995; Holland 1998; USDA 2001).

This unit is located southeast of the City of Davis and south of the South Fork of Putah Creek. This unit's western boundary coincides with the Solano and Yolo County line. The unit contains land owned by Yolo County. Approximately 322 ac (128 ha) is owned by the DoD.

*Unit 3, Farmington Unit, Stanislaus County (38,408 ac (15,544 ha))*

This unit supports *Neostapfia colusana* within vernal pools on ecologically noteworthy high terrace landforms and Redding-Pentz-Peters soil mapping unit complexes (criterion 2) (USDA 2001; CNDDDB 2002). The impermeable layers underlying these occupied vernal pools are generally iron-silica cemented hardpan. Habitat in this unit includes deeper pools that provide the long inundation period required for germination of *N. colusana* (EIP Associates 1999). This unit is geographically isolated from the other *N. colusana* units to the north by over 50 mi (80 km) (criterion 1).

The Farmington unit is located in northeast Stanislaus County. It is hydrologically separated from other *Neostapfia colusana* units to the south by the Stanislaus River. The eastern boundary generally parallels the Calaveras County Line. Woodward Reservoir and the town of Oakdale are all located outside and to the west of the unit. The unit is generally south of State Highway 4 and north of State Highway 108. The unit boundary is drawn to include these species' occurrences and the vernal pool complexes that Holland (1998) mapped and are visible on SPOT imagery. Lands within this unit are privately owned.

*Unit 4, Waterford Unit, Stanislaus and Tuolumne Counties (70,810 ac (28,657 ha))*

The Waterford Unit is important for the conservation of the geographic diversity of the species (criterion 1) because it contains 20 percent of all extant *Neostapfia colusana* occurrences (CNDDDB 2002). These occurrences are found within vernal pool complexes formed on alluvial terraces and associated Whitney soils, among others. This unit contains vernal pools, swales, and other ephemeral wetlands formed on acidic soils of alluvial fans and stream terraces along the eastern margin of the San Joaquin Valley and into the adjacent foothills. These varied vernal

pool habitats are essential for the conservation of the species because they provide a diversity of habitat for the species (criterion 2).

The Waterford Unit is bordered by the Stanislaus River to the north and the Tuolumne River to the south. The City of La Grange is located southeast of this unit. Stanislaus County Road J9 runs west of the unit, and the City of Oakdale is located outside of the northwest corner. The eastern boundary extends into the low-elevation foothills of the Sierra Nevada. Vernal pool complexes in the Waterford Unit are mainly located in eastern Stanislaus County, but overlap into southwestern Tuolumne County. Lands within this unit are mostly privately owned. Approximately 2 ac (0.8 ha) of this unit are lands administered by the CDFG.

*Unit 5, Turlock Unit, Stanislaus and Merced Counties (35,508 ac (14,370 ha))*

This unit encompasses large, playa vernal pools where the species is found, including the Hickman vernal pool complex in Stanislaus County (Holland 1998; CNDDDB 2002). This unusual vernal pool complex provides a unique habitat for *Neostapfia colusana* (criterion 2), as well as a number of other vernal pool species. Not only does the Hickman pool complex contain one of the largest vernal lakes in California, occupying more than 300 ac (121 ha), but it also exhibits tremendous biodiversity (Medeiros 2000).

The Turlock Unit is bordered by the Tuolumne River to the north and the Merced River to the south. The unit lies between the towns of La Grange and Snelling. Stanislaus County Road J9 runs west of the unit and the eastern edge is located in the low elevation foothills of the Sierra Nevada. Vernal pool complexes in the Turlock Unit are located in Stanislaus and Merced Counties. Approximately 41 ac (17 ha) of lands within this unit are owned by the California State Parks.

*Unit 6, Merced Unit, Merced and Mariposa Counties (93,125 ac (36,688 ha))*

This unit is geographically important (criterion 1) because it contains over 40 percent of all known *Neostapfia colusana* occurrences (CNDDDB 2002). The unit also contains a diversity of vernal pool habitats for *N. colusana*, including the only locations where this species is known to occur on Keyes'—Pentz, Redding, and Keyes soils (criterion 2) (USDA 2001). Although many occurrences of *N. colusana* have been extirpated in the past two decades, the occurrences in the Merced Unit are among the most robust remaining