

Unit 31, Lake Cachuma Area Unit, Santa Barbara County (20,754 ac (8,399 ha))

The Lake Cachuma critical habitat unit is located within a 10 mi (16 km) radius of the northwestern portion of Lake Cachuma in central Santa Barbara County. Land ownership includes the U.S. Forest Service (USFS) (5,434 ac (2,199 ha)) and BLM (92 ac (37 ha)). All other land within the unit is privately owned. The unit boundary contains four vernal pool complexes that are at least 10 ac (4 ha) in size (Holland 2003); these complexes vary in size from 40 to 199 ac (16 to 81 ha). The unit also contains one documented occurrence of vernal pool fairy shrimp. Limited survey data for fairy shrimp exist for this unit. We believe listed fairy shrimp probably occur at several additional locations with suitable ephemeral aquatic habitat. A portion of the critical habitat unit overlaps the Santa Barbara vernal pool region delineated by the CDFG (Keeler-Wolf *et al.* 1998). The Lake Cachuma unit is essential for the conservation of vernal pool fairy shrimp because it contains seasonally flooded aquatic habitats that are located at least 36 mi (60 km) from other wetlands that are known to possess the species. Compared to most counties mentioned in this rule, Santa Barbara County contains a relatively small acreage of remaining vernal pool habitat, thereby highlighting the need to proactively manage the ephemeral aquatic habitats that still remain (criterion 1).

Unit 32, Ventura County Unit, Ventura County (46,531 ac (18,830 ha))

The Ventura County Unit is located in the north-central portion of Ventura County. With the exception of 1,951 ac (790 ha) that are privately owned, all other land within this unit occurs within the Los Padres National Forest. Vernal pool fairy shrimp and Conservancy fairy shrimp co-occur at relatively high-elevation (5,500 ft (1,700 m)) forested sites within this unit. This combination of attributes is unique because these species normally occur at much lower elevations in grassland habitat. The critical habitat perimeter encompasses an area that is known to contain vernal pool and Conservancy fairy shrimp and isolated pools that provide habitat for both species. Few fairy shrimp surveys exist for this unit. However, listed fairy shrimp probably occur at several additional locations with suitable ephemeral aquatic habitat. The Ventura County Unit is essential for the conservation of vernal pool fairy shrimp because it contains ephemeral aquatic environments that are rarely

associated with fairy shrimp, and the occupied sites are disjunct from others, in that they are located at least 36 mi (60 km) from the closest known site (criteria 1 and 2).

Vernal Pool Tadpole Shrimp

Vernal pool tadpole shrimp occurrences are known from Shasta County to Tulare County, California, with an elevational variation of near 3 m (10 ft) to near 150 m (500 ft). The vernal pool types and soils associated with areas of concentration of vernal pool tadpole shrimp differ greatly across the geographic range of the species; these differences lead to different species compositions and environmental conditions between vernal pool tadpole shrimp occurrences. Providing for a mosaic of habitat types and conditions both between and among vernal pool species is essential because it would include the full extent of the physical and environmental conditions for the species (Barclay and Knight 1984; Bauder and McMillan 1998; Fugate 1992 and 1998; Gonzales *et al.* 1996, Noss *et al.* 2002a, Noss *et al.* 2002b; Platenkamp 1998; Zedler *et al.* 1979). The soils that contain occurrences of vernal pool tadpole shrimp in the delineated units vary significantly throughout the species' range. In the north, the rare Northern Mudflow formation underlies vernal pools in Shasta and Tehama Counties. Tehama and Butte Counties contain Northern Basalt Flow vernal pools that are limited to ancient terraces and hilltops that comprise some of the oldest geologic formations in California. Northern Volcanic Mudflow vernal pools are delineated in Butte and Yuba Counties. Throughout the Central Valley, the habitat ranges from high terrace landforms to claypan and hardpan pool types. Northern Basalt Flow vernal pools are found in Fresno County in the low elevation foothills. In the Suisun Marsh area, vernal pool tadpole shrimp are found in the saline-alkaline transition zone. 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 which vary upon location (Holland and Dain 1990). The primary constituent elements of critical habitat for vernal pool tadpole shrimp are the habitat components that provide:

(i) Vernal pools, swales, and other ephemeral wetlands and depressions of

appropriate sizes and depths that typically become inundated during winter rains and hold water for sufficient lengths of time necessary for vernal pool tadpole shrimp incubation, reproduction, dispersal, feeding, and sheltering, but which are dry during the summer and do not necessarily fill with water every year, including but not limited to, vernal pools on Redding and Corning soils on high terrace landforms, and

(ii) The geographic, topographic, and edaphic features that support aggregations or systems of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions within a matrix of surrounding uplands that together form hydrologically and ecologically functional units called vernal pool complexes. These features contribute to the filling and drying of the vernal pool and maintain suitable periods of pool inundation, water quality, and soil moisture for vernal pool crustacean hatching, growth and reproduction, and dispersal, but not necessarily every year.

Unit 1, Stillwater Plains Unit, Shasta County (3,538 ac (1,432 ha))

This unit contains the species (CNDDB 2002) within vernal pools mapped by Holland (1998) that are found on old alluvial terraces above the Sacramento River, often on Redding and Corning soil complexes (Shasta County 2001). Generally, these pools range in size from small (30 ft² (10 m²)) to several acres (hectares) in size at the Stillwater Plains area. This unit is geographically important because it comprises the northern extent of the species range in California (criterion 1). The vernal pool tadpole shrimp within this unit were found to be genetically different from other populations, particularly those in the foothills of the Sierra Nevada (King 1996).

This unit is located in the area east of the Redding Municipal Airport between Airport Road to the west and Deschutes Road to the east. The unit is north of Dersch Road and south of Lassen Park Highway. This unit comprises a portion of the Stillwater Plains. This unit includes the Stillwater Plains Conservation Bank. Most of the land included within this unit is privately owned, but 130 ac (52 ha) of that is protected by WRP easements or agreements. The BLM owns 42 ac (17 ha).

Unit 2, Dales Unit, Shasta and Tehama Counties (33,975 ac (13,750 ha))

This unit is ecologically important because it is one of the few areas where vernal pool tadpole shrimp are known