

final rule on or before May 15, 2004. On July 22, 2002, the Sonoma County DPS was listed as an endangered species under an emergency basis and proposed for listing as endangered (67 FR 47726; 67 FR 47758). The final rule listing the Sonoma County DPS as endangered was published in the **Federal Register** on March 19, 2003 (68 FR 13498). This proposed rule to list the Central California tiger salamander complies with the June 6, 2002, settlement agreement.

### Background

The California tiger salamander was first described as *Ambystoma californiense* by Gray in 1853 based on specimens that had been collected in Monterey, California (Grinnell and Camp 1917). Storer (1925) and Bishop (1943) also considered the California tiger salamander to be a distinct species. Dunn (1940), Gehlbach (1967), and Frost (1985) stated the California tiger salamander was a subspecies of the more widespread tiger salamander (*A. tigrinum*). However, based on recent studies of the genetics, geographic distribution, and ecological differences among the members of the *A. tigrinum* complex, the California tiger salamander is now considered to be a distinct species (Shaffer and Stanley 1991; Jones 1993; Shaffer *et al.* 1993; Shaffer and McKnight 1996; Irschick and Shaffer 1997; Petranka 1998). The range of this animal does not naturally overlap with any other species of tiger salamander (Stebbins 1985; Petranka 1998).

The California tiger salamander is a large and stocky terrestrial salamander with small eyes and a broad, rounded snout. Adults may reach a total length of 208 millimeters (mm) (8.2 inches (in)), with males generally averaging about 203 mm (8 in) in total length, and females averaging about 173 mm (6.8 in) in total length. For both sexes, the average snout-vent length is approximately 91 mm (3.6 in). The small eyes have black irises and protrude from the head. Coloration consists of white or pale yellow spots or bars on a black background on the back and sides. The belly varies from almost uniform white or pale yellow to a variegated pattern of white or pale yellow and black. Males can be distinguished from females, especially during the breeding season, by their swollen cloacae (a common chamber into which the intestinal, urinary, and reproductive canals discharge), more-developed tail fins, and larger overall size (Stebbins 1962; Lored and Van Vuren 1996).

California tiger salamanders are restricted to vernal pools and seasonal

ponds in grassland and oak savannah plant communities from sea level to about 460 meters (m) (1,500 feet (ft)) (Stebbins 1989; Shaffer *et al.* 1993; Jennings and Hayes 1994; Petranka 1998; California Natural Diversity Data Base (CNDDDB) 2002). Along the coast ranges, the species occurs in the Santa Rosa area of Sonoma County, southern San Mateo County south to central San Luis Obispo County, and the vicinity of northwestern Santa Barbara County. In the Central Valley and surrounding Sierra Nevada foothills, the species occurs from northern Yolo County (Dunnigan) southward to northwestern Kern County and northern Tulare County. A population of salamanders at Grass Lake in Siskiyou County (Mullen and Stebbins 1978) has been identified as the northwestern tiger salamander (*A. t. melanostictum*) (H. Shaffer, University of California, Davis, pers. comm. 1998).

Several gaps exist in the distribution of the California tiger salamander. In the northeastern Sacramento Valley, the species was known from only one site, in southern Butte County on the Gray Lodge Waterfowl Management Area, where it has not been located since 1965 despite subsequent surveys (Stebbins 1989; Shaffer *et al.* 1993). Although the area between Sacramento and the Cosumnes River contains suitable vernal pools, and has been surveyed extensively, the species has only been recorded along the southern edge of Sacramento County (CNDDDB 2002). In a survey transect that extended along the west side of the Sacramento Valley from Shasta County to Solano County, and contained 35 kilometers (km) (22 miles (mi)) of vernal pool habitat and over 200 pools, California tiger salamanders were recorded only at the Jepson Prairie in Solano County (Simovich *et al.* 1993). The animal has not been found west of Interstate Highway 680 and north of Interstate Highway 580 in Contra Costa or Alameda Counties (LSA Associates, Inc. 2001; CNDDDB 2002). It is likely that the species is uncommon or absent in much of the southernmost San Joaquin Valley from approximately Los Banos in Merced County south, and the foothills of the Sierra Nevada south of Visalia in Tulare County, because of unsuitable habitat (Shaffer *et al.* 1993). The factors that may restrict the California tiger salamander in the northern and southern extent of its range are speculative (H. Shaffer, pers. comm. 2002), but may include low rainfall in the southern San Joaquin Valley and the greater abundance of nonnative predatory fish in the northern Sacramento Valley (Hayes 1977). Jones (1989) suggests that the present pattern

of disjunct and widely dispersed populations was caused by the extreme anthropogenic changes in and around the Central Valley, and by the restrictive breeding requirements of the species.

Studies of mitochondrial DNA (mtDNA) indicate that there are six populations of *A. californiense*, which are found in Sonoma County, Santa Barbara County, the Bay Area (central and southern Alameda, Santa Clara, western Stanislaus, western Merced, and the majority of San Benito Counties), Central Valley (Yolo, Sacramento, Solano, eastern Contra Costa, northeast Alameda, San Joaquin, Stanislaus, Merced, and northwestern Madera Counties), southern San Joaquin Valley (portions of Madera, central Fresno, and northern Tulare and Kings Counties), and the Central Coast Range (southern Santa Cruz, Monterey, northern San Luis Obispo, and portions of western San Benito, Fresno, and Kern Counties) (Shaffer and Trenham 2002). Except for the Sonoma County and Santa Barbara County populations, the geographic barriers between some of these populations are not entirely clear. The Central California DPS of the California tiger salamander (Central California tiger salamander) occupies the Bay Area, Central Valley, southern San Joaquin Valley, and the Central Coast Range.

Subadult and adult California tiger salamanders spend the dry summer and fall months of the year estivating (existing in a state of dormancy or inactivity in response to hot, dry weather) in the burrows of small mammals, such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Lored and Van Vuren 1996; Petranka 1998; Trenham 1998a). During estivation, California tiger salamanders eat very little (Shaffer *et al.* 1993). Once fall or winter rains begin, they emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993).

California tiger salamanders spend the vast majority of their lives in upland habitats, and cannot persist without it. The upland component of California tiger salamander habitat typically consists of grassland savannah with scattered oak trees. However, in Santa Barbara County, some California tiger salamander breeding ponds exist within mixed grassland and woodland habitats, and a few ponds are found in woodlands, scrub, or chaparral habitats. Salamanders settle most commonly in burrows in open grassland or under isolated oaks, and less commonly in oak woodlands.