



California tiger salamander from Alameda County
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The California tiger salamander is both an *endangered species* and a *threatened species*.

Endangered species are plants and animals that are in immediate danger of becoming extinct.

Threatened species are plants and animals whose population numbers are so low that they may become endangered in the future.

The U.S. Environmental Protection Agency's (EPA) Endangered Species Protection Program (ESPP) will help ensure that pesticide use does not jeopardize the survival of listed species.

Ambystoma californiense

California Tiger Salamander

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Description and Ecology

Status Santa Barbara Distinct Population Segment (DPS), Threatened, listed January 19, 2000. Sonoma DPS, Endangered, listed July 22, 2002. Central California DPS, Threatened, listed August 4, 2004.

Critical Habitat Designated for Santa Barbara DPS 2004, Sonoma DPS 2005, and Central California DPS 2005.

Appearance The California tiger salamander is now considered to be a distinct species within the more widespread *Ambystoma tigrinum* complex. Like other members of the complex it is a fairly large and stocky salamander. Adult males are about 8.0 inches in length, females are about 6.8 inches in length, and snout-vent length for both is about 3.6 inches. The salamander's head is large and rounded and its wide mouth appears to smile. Small eyes protrude from the head; its dark irises appear large. All California tiger salamanders have some amount of dots or bars in pale yellow or white against the black background of its back, sides, legs and tail. Their bellies may be white, pale yellow, or a variegated pattern of white, pale yellow and black.

Range The range of the California tiger salamander is limited to the grasslands and foothills (to elevations of 1,500 feet) of central California and does not overlap the range of any other species of tiger salamander. Along the coast ranges, it occurs in southern San Mateo County south to central San Luis Obispo, and also in the vicinity of northwestern Santa Barbara County. The Santa Barbara population is considered a separate DPS and is "endangered." The population in Sonoma County is also considered a separate DPS and is "endangered." That these two populations have been classified as separate DPSs means that there has been little genetic exchange with the Central California DPS for some time. In the Central Valley and the surrounding Sierra Nevada foothills the California tiger salamander occurs from northern Yolo County southward to northwestern Kern County and northern Tulare County.

Critical habitat has been designated in Yolo, Solano,

Sacramento, San Joaquin, Amador, Calaveras, Stanislaus, Merced, Madera, Alameda, Fresno, Tulare, Santa Clara, San Benito, Monterey, Kern and San Luis Obispo counties.

Habitat Salamanders of the genus *Ambystoma* are referred to as mole salamanders because of their use of burrows for hibernation and shelter or, as in the case of the California tiger salamander, aestivation and shelter during the warm, dry months of summer and autumn. Because California tiger salamanders dig poorly, the burrows of small mammals are essential. Their dependence upon the upland burrows of California ground squirrels and Bota's pocket gopher is called a commensal relationship; it neither helps nor harms the burrowing mammals, but is of great benefit to the salamanders. Because the ground squirrel and pocket gopher tunnels collapse within 18 months of abandonment, the ongoing co-location with these animals is critical for the survival of California tiger salamanders that spend the majority of their life in upland habitat. This habitat is usually grassland or oak savannah, and sometimes oak woodland.

California tiger salamanders exhibit a biphasic life cycle and as a result require two distinct habitats. At the onset of the winter rains, these salamanders will emerge from their burrows to feed and migrate as far as one mile to their wetland breeding ponds. These are vernal pools or seasonal ponds within the grasslands or oak savannah, or even stock ponds that mimic seasonal ponds. In years of "normal" amounts of rainfall these ponds will retain water long enough for salamanders to complete their larval stage and metamorphose, but not long enough, as in the case of permanent ponds, to be habitable by major predators such as fish and bullfrogs. Within that range of water retention, larvae develop faster in smaller, more rapidly drying ponds. However, the longer larvae remain in the pond, the larger they will be and the more likely they are to survive and reproduce. It is estimated that during the life of an average female California tiger salamander, just 11 of her offspring will reach metamorphosis. Other estimates further suggest that

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only 5 percent of juveniles survive to become breeding adults.

Adult California tiger salamanders have been found as far as 1.3 miles from their breeding pond; most remain closer. One study located 95 percent of the salamanders within 2,100 feet of their breeding pond in Solano County.

Biology and Behavior Following metamorphosis in late spring or early summer, juvenile salamanders migrate into the uplands and settle into animal burrows. Like adults they will leave their burrows to feed on insects and worms during nights of high humidity, and return to the burrow before morning. Eventually, they will aestivate there until the onset of the next rainy season.

It will take two or more (as much as 4 to 6) years for California tiger salamander larvae to reach maturity. Like other adults, they will then leave their burrows as the rainy season begins and migrate to the breeding pond, most often their natal pond. Males will go first and stay longest. Females will leave the pond shortly after laying their eggs. They attach the eggs singly, or in groups of two or four, to twigs, grass and plant stems, boards, rocks and debris. In 10 to 14 days the eggs hatch.

Salamander larvae look very little like the adults. They are yellowish-gray with a broad dorsal fin extending well onto the back. The head is large and broad with feathery gills on each side. They are among the top predators of the seasonal pond system. During the first six weeks they eat zooplankton, small crustaceans and aquatic insects and then switch to larger prey such as the small tadpoles of Pacific treefrogs and California red-legged frogs. They will remain in the pond for 3-6 months depending on the season. In seasons of drought many of the ponds may not be able to retain larvae fully to a critical body size that would enable metamorphosis. In extreme droughts, a seasonal pond that fails to fill means there will be no breeding season.

California Tiger Salamander Information Sources

Listing Notice Santa Barbara DPS - US Fish and Wildlife Service, 2000. Federal Register 65, No. 12, pp. 3096-3109, January 19, 2000. http://ecos.fws.gov/docs/federal_register/fr3498.pdf

Sonoma DPS – US Fish and Wildlife Service, 2002. Federal Register 67 No. 140, pp. 47726-47740, July 22, 2002. http://ecos.fws.gov/docs/federal_register/fr3498.pdf

Central DPS - US Fish and Wildlife Service, 2004. Federal Register 69, No. 149, pp. 47212-47248, August 4, 2004. http://ecos.fws.gov/docs/federal_register/fr4278.pdf

Critical Habitat Designation Santa Barbara DPS - US Fish and Wildlife Service, 2004. Federal Register 69, No. 226, pp. 68568-68609, November 24, 2004. http://ecos.fws.gov/docs/federal_register/fr4355.pdf

Sonoma DPS – US Fish and Wildlife Service, 2005. Federal Register 70 No. 239, pp. 74137-74163, December 14, 2005. http://ecos.fws.gov/docs/federal_register/fr4495.pdf

Central California DPS - US Fish and Wildlife Service, 2005. Federal Register 70, No. 162, pp. 49379-49458, August 23, 2005. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2005_register&docid=fr23au05-22

Species Account U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, 2009. http://www.fws.gov/sacramento/es/animal_spp_acct/california_tiger_salamander.pdf



*California tiger salamander breeding pond, Merced County
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California tiger salamander larva, Sonoma County/ © 2006 Jeffrey Mitchell



*California tiger salamander, Santa Barbara County
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