



# Sensitive Species of the Santa Ana Watershed



Photo by Talula Wiater

## Western Spadefoot Toad (*Spea hammondi*)

The western spadefoot toad (*Spea hammondi*) is a moderate sized toad measuring 1 1/2 to 2 1/2 inches (37-62 mm). It varies in color from greenish, grayish to brownish with light colored, irregular stripes on the back, and a cream colored belly. Each hind foot has a wedge-shaped, cornified spade used for digging. This toad has gold eyes with a vertical pupil when constricted. *S. hammondi* lives most of its life underground, except when breeding in quiet streams or seasonal pools. Spadefoot toads are of great interest to scientists because of their ability to accelerate metamorphosis when subject to food and water volume reduction (Boorse and Denver 2004). When a pond begins to dry-up, the tadpoles develop faster. However, at

least 30 days are required for successful metamorphosis (Morey 1996). With increased farming and development of areas that contain seasonal pools, this species has lost over 80 percent of its known habitat in southern California (Stebbins 2003; Jennings and Hayes 1994).

### Habitat

This spadefoot toad prefers lowlands with areas of open, or low vegetation in sandy or gravelly soil. They are often found in valley and foothill grasslands, open chaparral, pine-oak woodlands, floodplains and washes with adjacent upland, where they spend over 80% of the year under ground (Stebbins 2003). For successful reproduction, *S. hammondi* requires temporary rain pools void of exotic predators, such as bullfrogs (*Rana catesbeiana*), mosquito fish and crayfish (Jennings and Hayes 1994).

### Status and Distribution

*S. hammondi* is considered a Federal species of concern, as well as a California species of special concern. Historically, this species occurred from as far north as Redding California, and south to Baja California, however it has been extirpated (locally extinct) from many areas (FWS 2004; DFG 2004; Jennings and Hayes 1994). Currently, this toad is only known to occur in the Great Valley and its bordering foothills, and the Coast Ranges south of Monterey Bay, CA to northwest Baja, California (Stebbins 2003).

Within the Santa Ana watershed, this toad occurs in the vicinity of Lake Matthews/Estelle Mountain, Lake Perris, San Jacinto Wildlife Area, and the San Jacinto River (Dudek 2000). Additionally, SAWA biologists have encountered spadefoot toads adjacent to Temescal Wash near Lee Lake Pond (Bradley 2004) and on the El Toro Reserve.

### Threats

It appears that *S. hammondi* has become extirpated from most of southern California's lowlands, and there have been extensive losses in northern California. Loss of habitat, such as seasonal pools necessary for reproduction, and the invasion of exotic predators, such as predatory fishes and bullfrogs, and perhaps mosquito fish are primary factors in native amphibian declines. Fragmentation and degradation of habitat, caused by roads and farming practices such as disking and livestock trampling, are also major factors (FWS 2004; Jennings and Hayes 1994; Stebbins 2003). When populations eventually become isolated by habitat fragmentation, dispersal ceases. This eliminates gene flow between populations and exposes them to the problems associated with small populations, such as inbreeding depression which over time will render the animals less fit. Additionally, small populations are less able to recover from periodic catastrophic events such as fire and floods. This renders them highly susceptible to local extinction

events. With no naturally occurring dispersal, small patches of suitable but disconnected habitat are unlikely to be re-occupied without management efforts by people on behalf of the toads.

### **Research and Management Needs**

It is apparent that the future of this species of concern is quite uncertain. Further management and conservation efforts are necessary or the western spadefoot toad will likely warrant listing as threatened or endangered in the near future. Much of this toad's life-history is not well understood and studies of soil composition requirements, as well as upland habitat usage are necessary (Jennings and Hayes 1994). Complete protection of any remaining habitat that is suitable for the spadefoot is key to their conservation. Responsible parties must conduct proper management of current preserves and core areas, and these areas should be re-connected, where possible, to avoid further isolation and to allow dispersal. Agricultural activities, fragmentation and development in spadefoot occupied habitat should be avoided. As a "neighbor" and responsible citizens, we should avoid further human disturbance (i.e. trampling, off-road use, filling pools, and development) to the habitat where the spadefoot toad lives.

### **SAWA Contact**

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### **References**

- Boorse, G. C. and R. J. Denver. 2004. Endocrine Mechanisms Underlying Plasticity in Metamorphic Timing in Spadefoot Toads.
- Bradley, J. Draft Final Report, March 15, 2004. Prepared for Riverside Corona Resource Conservation District.
- California Department of Fish and Game (DFG); Habitat Conservation Planning Branch. California's Wildlife, Amphibians and Reptiles, Western Spadefoot. 1988. <<http://www.dfg.ca.gov/whdab/html/A028.html>>
- Dudek and Associates, Inc. March 7, 2002. Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP)-Draft. Encinitas, California. Vol. 1, Sec. 2.
- Jennings, M. P. and Hayes, M. P. 1994. Amphibian and Reptile Species of Special Concern in California. Inland Fisheries Division, California Department of Fish and Game. pp. 94-7.
- Morey, S. R. 1998. Pool Duration Influences Age and Body Mass at Metamorphosis in the Western Spadefoot Toad: Implications for Vernal Pool Conservation. *In* C. W. Witham, E. T. Bauder, D. Belk, W. R. Ferren Jr., and R. Ornduff (Editors). Ecology, Conservation, and Management of Vernal Pool Ecosystems – Proceedings from a 1996 Conference. California Native Plant Society, Sacramento, CA.
- Stebbins, R. C. 2003. A Field Guide to Western Reptiles and Amphibians 3rd Ed. Houghton Mifflin Company. New York, New York. pp. 205-6.
- United States Fish and Wildlife Service (FWS). Sacramento Fish and Wildlife Office Species Account: Western Spadefoot (*Spea hammondi*). Retrieved from <[http://sacramento.fws.gov/es/animal\\_spp\\_acct/w\\_spadefoot\\_toad.htm](http://sacramento.fws.gov/es/animal_spp_acct/w_spadefoot_toad.htm)> on December 1 2004.

### **Photo Credit**

Photo taken in Temescal Wash, Western Riverside County, CA. 2004.