

**California Wildlife Habitat Relationships System**  
**California Department of Fish and Game**  
**California Interagency Wildlife Task Group**

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LONG-TOED SALAMANDER

*Ambystoma macrodactylum*

Family: AMBYSTOMATIDAE  
A003

Order: CAUDATA

Class: AMPHIBIA

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#### DISTRIBUTION, ABUNDANCE, AND SEASONALITY

The long-toed salamander is uncommon to common in preferred habitats in the Sierra from Tuolumne Co. in the vicinity of the Stanislaus River, north through the mountains of the state, and east of the Cascades in Modoc and Lassen cos. Preferred habitats include ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, red fir and wet meadows. Found from near sea level to 2800 m (9180 ft). An isolated, endangered subspecies (*A. m. croceum*) occurs in a small number of restricted localities in Santa Cruz and Monterey cos.

#### SPECIFIC HABITAT REQUIREMENTS

**Feeding:** During dry periods adults feed primarily on arthropods, especially spiders, insects and isopods. During wetter months, when breeding occurs, aquatic dipterans and terrestrial insects are taken. The aquatic larvae of this species feed mostly on small aquatic crustaceans (cladocerans, copepods and ostracods), aquatic dipterans, and tadpoles (Anderson 1968).

**Cover:** Adults of this species are subterranean during most of the year, utilizing mammal burrows, rock fissures, and occasionally human-made structures. During breeding migrations they may be found under surface objects such as rocks or logs near the breeding pond. Terrestrial juveniles (especially *A. m. croceum*) may spend the entire first summer of life in mammal burrows or under surface objects in the immediate vicinity of the breeding pond (Anderson 1967). Aquatic larvae prefer shallow water, less than 30 cm (12 in) in depth, and utilize clumps of vegetation or other bottom debris as cover.

**Reproduction:** Breeds primarily in temporary ponds formed by winter and spring rains and snowmelt. Some populations, especially those occurring at high elevations, require permanent ponds because of slow developmental rates of larvae (Anderson 1967).

**Water:** Rainfall and snowmelt are important in the formation and maintenance of breeding ponds. Most surface movements such as migration to and from breeding ponds, and the dispersal of juveniles away from ponds, are associated with sustained rainfall, especially at night.

**Pattern:** Wide variety of habitats. Found primarily in yellow pine, mixed conifer, and red fir forests associated with mountain meadows. *A. m. croceum* is found in oak woodlands and riparian habitats.

#### SPECIES LIFE HISTORY

**Activity Patterns:** Adults are subterranean most of the year. Nocturnal surface activity in the periods preceding and following breeding.

**Seasonal Movements/Migration:** In montane situations, salamanders emerge and migrate to breeding ponds as soon as springtime temperatures are warm enough to reduce snow cover and open ponds. *A. m. croceum* begins breeding migrations with the first heavy rains of fall. Return migrations may occur immediately after breeding, or may not take place until several weeks after the cessation of breeding activities.

**Home Range:** Little movement during most of the year. Breeding migrations probably less than 1000 m (3280 ft) in most localities.

**Territory:** Not known to be territorial.

**Reproduction:** Period of breeding variable, depending on snowpack, but usually occurs in late May or June in the Sierra (Anderson 1967), but as late as mid-July in Lassen National Park. Eggs usually are laid in loose clusters, 8 to 10 eggs per cluster (Stebbins 1954), on the underside of logs and slabs of bark in water between 27 and 75 cm (11 and 30 in) in depth. *A. m. croceum* breeds from mid-January to mid-February and lays eggs singly or in loose clusters on pond vegetation in shallow water 5-8 cm (2-3.2 in) below the surface (Anderson 1967). Larvae metamorphose prior to the drying of breeding ponds, but at high elevations larvae may overwinter in permanent ponds.

**Niche:** Larvae may compete with other larval amphibians where they are sympatric, and are probably preyed upon by aquatic invertebrates, garter snakes, and possibly by other vertebrates. Adults appear to be protected by noxious skin secretions (Anderson 1963).

**General Comments:** The few existing populations are very restricted, and exist in ecologically fragile locations. Any human activity in the vicinity of these populations may affect significant numbers of the existing population (Bury and Ruth 1972).

## REFERENCES

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