

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

WESTERN TOAD

Anaxyrus boreas

Family: BUFONIDAE
A032

Order: ANURA

Class: AMPHIBIA

Written by: S. Morey

Reviewed by: T. Papenfuss

Edited by: R. Duke, E. C. Beedy

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Widely distributed in California, the western toad is present everywhere except the deserts and highest mountains. Elevations of occurrence extend from sea level to 3050 m (10,000 ft) (Stebbins 1985). Throughout its range the western toad can be scarce or common, depending on habitat quality. The western toad occurs in most California habitats except the deserts. It is uncommon in the high Sierra and in densely forested areas.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Adults take a variety of terrestrial insects and other small arthropods (Stebbins 1972). Less commonly eaten are earthworms, snails, and slugs. Tadpoles filter suspended plant materials and tiny planktonic organisms from water, or feed on bottom detritus (Nussbaum et al. 1983).

Cover: During periods of inactivity, this toad seeks cover inside or under surface objects such as boards, tree bark, rotting logs, large rocks and boulders. Toads will also use rodent burrows and rock fissures, or temporarily bury themselves in loose soil (Nussbaum et al. 1983).

Reproduction: Breeding and egg-laying normally occur in quiet waters less than 30 cm (12 in) deep (Stebbins 1954). Almost any source of standing water can be used for reproduction, including lakes, ponds, vernal pools, roadside ditches, irrigation canals, permanent and intermittent streams, and rivers. The presence of predatory fishes may reduce tadpole survival.

Water: Standing water is essential for reproductive success. Adults and transformed juveniles of this species, however, are highly terrestrial and often live far from water. During summer, they are most active on humid nights. The highly sculptured, warty skin of this species may aid in water uptake and reduce water loss across its surface (Lillywhite and Licht 1974).

SPECIES LIFE HISTORY

Activity Patterns: Terrestrial individuals are primarily nocturnal over much of their range, but are also active diurnally during spring. Toads from high Sierra populations are diurnal during their entire activity period. They become inactive when the weather is especially hot, dry or cold.

Seasonal Movements/Migration: Pronounced movements to hibernacula occur in some areas, especially where winters are severe. This species travelled 900 m (2790 ft) to hibernacula in Colorado (Campbell 1970). In mild climates, seasonal movements (except to and from breeding sites) are not extensive.

Home Range: There is much individual variation in home range size. At low elevation, individuals are occasionally encountered up to 1000 m (3100 ft) from potential breeding sites.

Territory: Males defend small areas around themselves during the breeding period. Such territorial individuals emit short "bird-like twittering" calls (Nussbaum et al. 1983) when other males approach, or vigorously chase them away.

Reproduction: In California, the breeding season extends from January to July depending on local conditions. Breeding at any specific locality is usually synchronous. Females lay up to 16,500 eggs (Stebbins 1954) in large stringy masses. They are deposited in double rows and become entangled with each other, submerged vegetation and bottom debris as the female moves about while laying. Tadpoles metamorphose during the summer or fall, when they may emerge and disperse from the breeding sites by the hundreds or thousands.

Niche: Tadpoles may be very numerous, and often form dense aggregations. Nussbaum et al. (1983) reported a school of tadpoles one meter wide and 300 m (930 ft) in length. Tadpoles of this species may compete for food or space with other amphibian larvae. Tadpoles are fed upon by predatory aquatic invertebrates (Brockelman 1969), birds (Karlstrom 1954, Beiswenger 1981) and garter snakes. Post-metamorphic individuals are somewhat protected from predators by noxious skin secretions. This species' range overlaps with the Yosemite toad in the central Sierra, where they apparently hybridize.

REFERENCES

- Beiswenger, R. E. 1981. Predation by gray jays on aggregating tadpoles of the boreal toad *Bufo boreas*. *Copeia* 1981:459-460.
- Brockelman, W. Y. 1969. An analysis of density effects and predation in *Bufo americanus* tadpoles. *Ecology* 50:632-644.
- Campbell, J. B. 1970. Hibernacula of a population of *Bufo boreas boreas* in the Colorado Front Range. *Herpetologica* 26:278-282.
- Karlstrom, E. L. 1954. On robins and tadpoles. *Yosemite Nat. Notes* 33:185-188.
- Lillywhite, H. B., and P. Licht. 1974. Movement of water over toad skin: functional role of epidermal sculpturing. *Copeia* 1974:165-171.
- Nussbaum, R. A., E. D. Brodie, Jr., and R. M. Storm. 1983. *Amphibians and reptiles of the Pacific Northwest*. Univ. Press of Idaho. 332pp.
- Stebbins, R. C. 1954. *Amphibians and reptiles of western North America*. McGraw-Hill, New York. 536pp.
- Stebbins, R. C. 1972. *California amphibians and reptiles*. Univ. California Press, Berkeley. 152 pp.
- Stebbins, R. C. 1985. *A field guide to western reptiles and amphibians*. 2nd ed., revised. Houghton Mifflin, Boston. 336pp. Press, Berkeley. 538 pp.