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

AMERICAN BULLFROG *Lithobates catesbeianus*
Family: RANIDAE Order: ANURA Class: AMPHIBIA
A046

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DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Native to the eastern United States, the bullfrog was introduced to California several times early this century (Storer 1922). It is now widespread and common in the state (Bury and Luckenbach 1976). Bullfrogs are absent from the high Sierra, with few populations above 1220 m (4026 ft). In desert regions, they occur along the Mojave and Colorado rivers and in areas where irrigation creates suitable habitat. Elevation ranges from sea level to 1830 m (6000 ft).

SPECIFIC HABITAT REQUIREMENTS

Feeding: Adults are opportunistic feeders taking both aquatic and terrestrial prey items. Invertebrates are the primary food of bullfrogs (Frost 1935, Korschgen and Moyle 1955, Cohen and Howard 1958, Taylor and Michael 1971). Vertebrate prey such as fish, salamanders, frogs (including bullfrogs) and tadpoles, spadefoot toads, snakes, turtles, birds, and mice are also taken. Tadpoles feed primarily on algae and diatoms, but may also consume plant material (Dickerson 1906, Treanor and Nicola 1972) and some animal food (Stebbins 1951, Brown 1972, Treanor and Nicola 1972).

Cover: Highly aquatic, bullfrogs are found in quiet waters of ponds, lakes, reservoirs, irrigation ditches, streams, marshes, and other permanent water (Stebbins 1954). Wright and Wright (1949) listed shoreline cover, and shallow water as important habitats for adults and tadpoles, respectively. Dickerson (1906) suggested that bullfrogs prefer deep water with shallow margins and a cover of submerged and emergent vegetation. The survival of larval and adult bullfrogs was reduced in ponds where vegetation cover and debris were lacking (Brown 1972). At colder localities in California, adults may hibernate underwater beneath submeraed debris or mud (Willis et al. 1956).

Reproduction: Males may use emergent vegetation and floating debris as "croaking posts." Eggs are depositied among aquatic plants or brush growing on the bottom (Stebbins 1954). Tadpoles use shallow waters near shore for at least six months while completing development.

Water: A highly aquatic species. Permanent water is often required for the completion of larval development. Adults often travel considerable distances from water on rainy nights. Dispersal of juveniles away from breeding sites may occur without rain.

Pattern: This species occurs near permanent or semi-permanent water in a variety of California habitats. It is absent from high mountain and arid deserts.

SPECIES LIFE HISTORY

Activity Patterns: Terrestrial individuals may be active at all times of the day. In areas with

mild winters, bullfrogs are active all year, but they undergo periods of inactivity or hibernate in cold climates.

Seasonal Movements/Migration: Pronounced movements by adults are commonly observed during warm fall, winter, or spring rains. Their purpose is unknown, but they may be lengthy foraging excursions, or dispersals to new breeding localities. No significant migration by adults from breeding sites has been recorded. In August and September, newly transformed juveniles are often seen over 50 m (155 ft) from water in the Central Valley. They are presumably dispersing from rapidly drying ponds where their development took place.

Home Range: At a pond in Ontario, Currie and Bellis (1969) reported that average bullfrog activity areas had radii of about 3.2 m (10 ft). The longest intrapond movement observed was 12 m (37 ft). Males had larger areas of activity than females, and large frogs moved more than small ones.

Territory: Males defend areas around themselves for sexual display during the breeding season. Females lay eggs within the territories of chosen males. Territories are defended against other bullfrogs by stereotyped postures, vocalizations, and physical combat (Wiewandt 1969, Ryan 1980).

Reproduction: In California, breeding and egg-laying occur from March to July (Stebbins 1972). Females deposit 10,000 to 20,000 eggs in disk-shaped masses about 1 egg thick and 1 to 5 ft in diameter (Stebbins 1972). In some localities they may produce more than one clutch per season (Emlen 1977). Tadpoles may reach 14 cm (5.5 in) in length and require at least six months to transform. Individuals in many populations overwinter as tadpoles and transform during their second year (Treanor and Nicola 1972).

Niche: The bullfrog is the largest frog in California, and it may prey on, or compete for food and space with, native amphibians with which it coexists. Moyle (1973) suggested that bullfrogs are responsible for the elimination of the red-legged frog from the floor of the Central Valley and adjacent Sierra foothills, and for reduction in the range of the yellow-legged frogs. Supporting evidence is sparse. Bullfrog tadpoles are preyed upon by aquatic insects, fish, garter snakes, wading birds, and probably a few nocturnal mammals (Nussbaum et al. 1983). Juvenile and adult bullfrogs are taken by a wide variety of vertebrate predators.

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