

Western Ecological Research Center

Publication Brief for Resource Managers

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California Red-Legged Frog Movement and Habitat Use

Once an abundant frog throughout much of central and southern California, the California red-legged frog (*Rana draytonii*) is now rare in the Sierra Nevada foothills and the southern portion of its range. In parts of the central Coast Range, however, large, vigorous populations do remain. Most protection efforts for this threatened species have focused on breeding sites. A scarcity of information on habitat use beyond the breeding site has made it difficult to evaluate requirements for nonbreeding habitat and connecting migration corridors. Nonbreeding habitats are critically important for California red-legged frogs, especially for individuals that breed in temporary bodies of water, according to a recent USGS study published in the *Journal of Herpetology*. The study provides insights into movement and habitat use of this species in a coastal environment and establishes a basis for making decisions about habitat protection.

California red-legged frogs use ponds or pools for breeding during the wet season (December through



Breeding habitat for California red-legged frog with nonbreeding riparian habitat in the background. Photo: G. M. Fellers, USGS.

Management Implications:

- Maintaining populations of pond-breeding amphibians requires that all essential habitat components be protected: breeding habitat, nonbreeding habitat, and migration corridors.
- A buffer is needed around all three habitat components to ensure that outside activities do not degrade any of the three. Such a buffer cannot be defined as a standard fixed distance but rather as an area sufficient to maintain the essential features of the amphibian habitat.
- It is often not obvious from casual inspection what areas frogs are relying upon, hence delineating each habitat component and determining the size of a suitable buffer requires either an expert opinion from a field biologist with extensive experience with the species of interest, or a field study to monitor radiotagged frogs.
- For California red-legged frogs, nonbreeding habitats must have sufficient moisture to allow amphibians to survive throughout the nonbreeding season, sufficient cover to moderate temperatures during the warmest and coldest times of the year, and protection from predators.
- Long-distance dispersers are the individuals most likely to reach distant breeding sites, thus providing genetic diversity, and colonizing sites where frogs have been lost because of random events that periodically extirpate local populations.

March) and ponds, riparian areas, or other aquatic habitats during the rest of the year. In Marin County, stock ponds were the most commonly used breeding sites in this study. USGS scientists Dr. Gary Fellers and Patrick Kleeman radiotracked a total of 123 frogs between November 1997 and May 2003 to evaluate seasonal

habitat use. Individual frogs were continuously tracked for up to 16 months. Some individuals remained at breeding ponds all year, but 66% of female and 25% of male frogs moved to nonbreeding areas, even when the breeding site retained water.

In general, frogs moved toward breeding ponds with the onset of heavy winter rains. Frogs departed from breeding ponds at varying times throughout the rainy season, with some frogs remaining at permanent ponds all year. Some frogs made large-scale movements during the dry season (May through October), as seasonal breeding sites dried. Frogs at the main study site moved a median distance of 150 m, roughly the distance to the nearest suitable nonbreeding area. The greatest straight-line distance traveled was 1.4 km, although the presumed distance traveled by that frog was 2.8 km. Most frogs that dispersed from breeding ponds crossed a grazed pasture to a riparian area where they stayed through the nonbreeding season; only a few individuals moved primarily along a creek.

Females were more likely than males to move from permanent ponds (38% of females, 16% of males), but among dispersing frogs, males and females did not differ in distance moved. Some frogs left breeding sites shortly after egg laying, but many individuals remained until the site was nearly dry. Fog provided moisture for dispersal or migration throughout the summer.



California red-legged frog in a typical breeding pond. Photo: G. M. Fellers, USGS.

The study found that most frogs move away from breeding sites, but only a few move farther than the nearest suitable nonbreeding habitat. The distance moved is highly site-dependent, as influenced by the local landscape. Thus, average dispersal or migration distances from this or other studies cannot be used to establish habitat requirements; instead each local habitat must be assessed by an expert familiar with the ecology of this species.

Fellers, G. M., and P. M. Kleeman. 2007. California red-legged frog (Rana draytonii) movement and habitat use: Implications for conservation. Journal of Herpetology 41:276–286.