

Western Ecological Research Center

Publication Brief for Resource Managers

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Diurnal Versus Nocturnal Surveys for California Red-Legged Frogs

The California red-legged frog (*Rana draytonii*) is a federally listed threatened species. The U.S. Fish and Wildlife Service (USFWS) has provided detailed requirements for both the qualifications of biologists conducting surveys and the techniques for carrying out both diurnal and nocturnal surveys of this species. Surveys are required prior to any federally permitted habitat modifications or any activity on federal lands that has the potential to affect this species. In a recent issue of the *Journal of Wildlife Management*, USGS scientists Dr. Gary Fellers and Patrick Kleeman conducted paired diurnal and nocturnal surveys of California red-legged frogs to determine whether there was a difference in detections.

The authors conducted 29 paired diurnal and nocturnal surveys from October 1999 to September 2004. Their study area included a total of 17 survey sites located in 5 counties and 8 habitat types; 2 sites were located in the Sierra Nevada foothills, while the rest were near San Francisco Bay. They were careful to reduce variation caused by weather, season, or observer. At each site, the same observer conducted both the diurnal and nocturnal surveys on the same day. Except for one site surveyed by boat, the authors conducted diurnal and nocturnal surveys by slowly walking the perimeter of each site while searching the bank and open water for frogs with 8 or 10X binoculars. For nocturnal surveys, a 30-W sealed beam light enabled them to look for eye shine.

The authors detected significantly more California red-legged frogs during nocturnal surveys than diurnal surveys, and 89.4% of all frogs detected were found at night. They detected California red-legged frogs during 52% of the diurnal surveys, compared with 100% of nocturnal surveys. Furthermore, there was not a site at

Management Implications:

- Nocturnal surveys are the most efficacious method to determine the presence of adult and subadult California red-legged frogs.
- Biologists doing surveys of this frog must be skilled at finding and identifying amphibians, and they must use appropriate survey techniques and equipment.
- It is important that the protocol results in a high likelihood of detecting California red-legged frogs if they are present.
- This study supports the recent improvements in the USFWS protocol that require both diurnal and nocturnal surveys to evaluate the presence of California red-legged frogs.

which they detected frogs during the day but not during that same night. The results remained significant for adult and subadult frogs, when analyzed separately.

Their results indicate that nocturnal surveys were more likely to detect California red-legged frogs and that significantly more frogs were found at night. Nocturnal surveys not only resulted in higher detection of California red-legged frogs but it was easier to identify frogs reliably. Diurnal surveys remain an important part of the survey protocol, because they enable the biologist to evaluate how to conduct the nocturnal survey effectively, assess habitat quality, and conduct surveys for eggs, tadpoles, and recent metamorphs.

Fellers, G. M., and P. M. Kleeman. 2006. Diurnal versus nocturnal surveys for California red-legged frogs. Journal of Wildlife Management 70:1805-1808.