Transponder (PIT) tags were inserted into the toads, which were found in their respective holes five days later at 1220 h. Later that day at 2120 h, the toads were found foraging just outside of their holes under the cover of darkness. The hole openings were 2.5 cm wide × 2.0 cm tall and 3.4 cm wide × 3.0 cm tall and were 1.82 m and 1.52 m above the ground, respectively.

These observations were made while conducting research with permission of the USFWS, PRDNER, and private landowners. We thank them for their continued support.

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***PHYLLOMEDUSA CAMBA*. DEFENSIVE BEHAVIOR.** *Phyllomedusa camba* is a species in the *P. tarsius* group distributed in Bolivia, Peru, and Brazil in the states of Amazonas, Acre, Mato Grosso, and Rondonia (Frost 2011. Amph. Species of the World; Rodrigues et al. 2011. Checklist [2]:397–399). On 03 November 2011, we observed the defensive behavior of an adult male *P. camba* at the Terra Indígena do Zoró, Mato Grosso, Brazil (10.31780°S, 60.51561°W, SAD69; elev. 179 m). When disturbed, the individual began secreating a milky venom from the doral glands (Fig. 1A), raised the body (Fig. 1B), and began making lateral movements as if to attack the intruder (Fig. 1C).

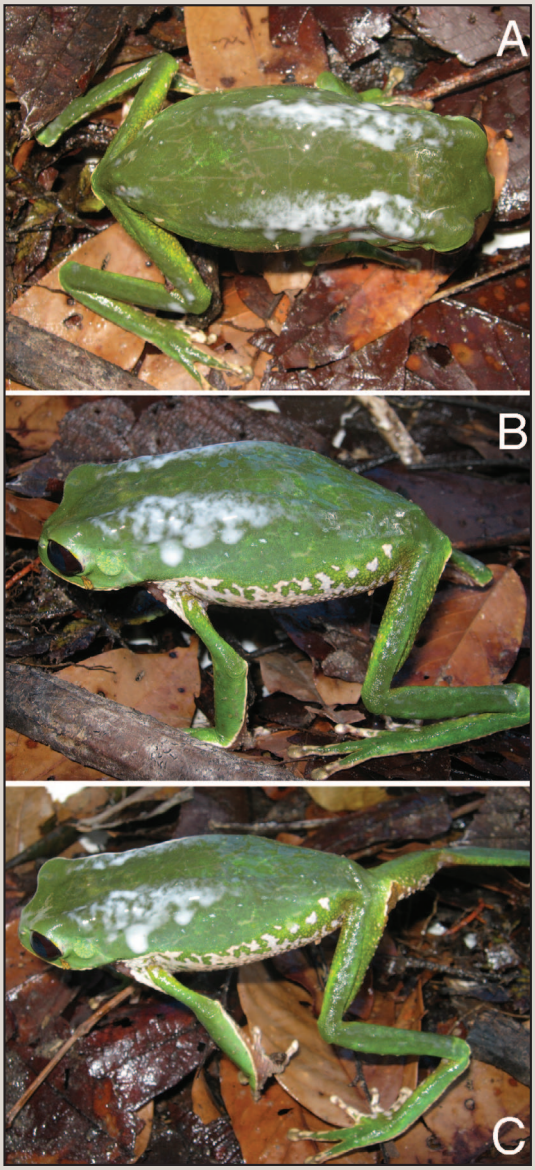

FIG. 1. *Phyllomedusa camba* from Terra Indígena do Zoró, Mato Grosso, Brazil showing defensive behavior. A) Secreting milky toxins from the dorsal glands; B) raising the body; C) defensive movements towards the attacker.

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***RANA DRAYTONII* (California Red-legged Frog). CANNIBALISM.** *Rana draytonii* has been the subject of numerous research reports and notes documenting predation. Specifically, several predators have been reported for *R. draytonii*, including Great Blue Heron (*Ardea herodias*) (Fellers and Wood 2004. Herpetol. Rev 35:163), Loggerhead Shrike (*Lanius ludovicianus*) (Alvarez 2005. Ecol. Restor. 23:66–67), American Bullfrog (*Liothobates catesbeianus*) (Jennings and Cook 2001. Herpetol. Rev. 33:182–183), and several others (US Fish and Wildlife Service 2002. Recovery Plan for the California red-legged frog [*Rana aurora draytonii*]. Portland, Oregon). Herein I report on mortality from the cannibalistic behavior of two life stages of this federally threatened species.

While monitoring a stock pond in eastern Contra Costa Co., California, USA (37.81708°N, 121.78768°W; elev. 601 m), I observed a larval *R. draytonii* appearing to feed on an object floating at the surface. Larvae of *R. draytonii* are typically observed feeding within vegetation, likely filter-feeding on algae, protozoans, and phytoplankton from the surfaces and substrate within the pond (Stebbins and Cohen 1995. A Natural History of Amphibians. Princeton Univ. Press, Princeton, New Jersey. 316 pp.). In this instance, upon close inspection with binoculars, I was able to determine that the larva engaged in feeding was *R. draytonii* and that the object on which it fed was a second *R. draytonii* larva. It appeared that the larva being consumed was still alive, although it moved very little. I observed that the predating larva appeared to feed by scraping the surface of its *R. draytonii* prey. This behavior continued for 12 minutes during my observations.

During the same day, and at the same site, I observed approximately 245 post-metamorphic *R. draytonii*. While conducting individual counts I noted two distinct size cohorts. This is a typical observation at stock ponds in this general area, and likely reflects the metamorphosis of current-year larvae and larger *R. draytonii* metamorphosing after overwintering as larvae (Fellers et al. 2001. Herpetol. Rev. 32:156–157). On 26 occasions I observed the larger-size cohort (approx. 50.8 mm), attempting to feed upon the smaller size cohort (approx. 25.4 mm) (Fig. 2). Feeding attempts typically started with the larger animal orienting toward the smaller. The larger frog remained motionless until the small frog moved, at which time the larger frog leapt directly at and onto the smaller with mouth agape. In 25 of the 26 observations of this activity, the smaller frog escaped. On one attempt, the larger frog was able to grasp and ultimately consume the smaller.

These observations suggest that *R. draytonii* of two life stages number among the seasonally abundant resources utilized by

FIG. 1. A larval *Rana draytonii* cannibalizing a conspecific at the surface of a stock pond.

FIG. 2. Two size cohorts (frog on right is approx. 25 mm; frog on left is approx. 50 mm) of *Rana draytonii*, with the larger cannibalizing the smaller shortly after the photo was taken.

both pre- and post-metamorphic *R. draytonii* and are taken by cannibalistic feeding. This cannibalism likely is opportunistic and provides a seasonally abundant source of protein for larvae and post-metamorphic frogs.

These observations contribute to the greater understanding of the natural history and population dynamics within occupied breeding habitat for *R. draytonii*. Cannibalism witnessed in this species is likely common among many anurans, but may confound attempts to increase populations of this rare species.

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***RANA DRAYTONII* (California Red-legged Frog). ASSOCIATION WITH BEAVER.** A number of new observations are being reported on microhabitat use by California Red-legged Frogs. Among these, Cook (1997. MS thesis, Sonoma State Univ., Rohnert Park, California. 23 pp.) reported on the use of microhabitat in a freshwater marsh by this species; Alvarez (2004. Herpetol. Rev. 35:85–86) documented the use of desiccation cracks in the bottoms of dry ponds by *R. draytonii* seeking shelter from extreme climatic conditions, and Alvarez et al. (*in press*. Amphibian Conservation and Biology) detailed the microhabitat use by ovipositing *R. draytonii* at several aquatic breeding habitats. Nonetheless, many natural history details related to this species remain unknown or unreported, and land managers continue to use scant information to make management decisions in habitat occupied by *R. draytonii*. This potentially creates conditions under which this federally listed species may be harmed or killed during land management activities. Here we report the use of dams and burrows (bank-lodges) constructed by beaver (*Castor canadensis*) as refugia for the *R. draytonii*.

In Spring 2000, it was discovered that beaver naturally colonized the upper portion of Kellogg Creek, downstream from Los Vaqueros Reservoir in Contra Costa Co., California, USA. This colonization was considered potentially damaging to mitigation developed for the construction of the reservoir, and catalyzed the design and implementation of a program to indirectly control the beavers through the removal of at least 24 beaver dams.

Two monitoring biologists were posted on-site during each dam removal to document any "take" of *R. draytonii*. Dams were removed with the aid of a backhoe equipped with a thumb. Twigs, branches, logs, and mud were grasped and pulled from the creek bed, and material was placed on the upper bank. Biologists maintained positions downstream of the dam and collected *R. draytonii* that were in harm's way from debris or inundation (Fig. 1). Collected frogs were released unharmed within the creek channel after each dam was removed.

During removal of the 24 beaver dams, 60 adult and subadult *R. draytonii* were collected and subsequently returned to the creek. Four *R. draytonii* larvae were also detected when a large portion of one beaver dam was removed and stranded the tadpoles in the previously inundated areas.

Over subsequent months, post-removal surveys were conducted along Kellogg Creek at various times to determine if beavers had restored their dams and if *R. draytonii* and other species were present. On one occasion, *R. draytonii* were observed utilizing a previously inundated burrow of a bank-lodge dug into the bank of Kellogg Creek. This burrow afforded refuge not only to the beavers and the *R. draytonii*, but also to Western Pond Tturtles (*Actinemys marmorata*), as observed during previous management actions (Alvarez 2006. Herpetol. Rev. 37:339).

It is clear that the infrastructure—both dams and burrows associated with bank-lodges—resulting from beaver activity provides refuge microhabitat for *R. draytonii*. Beaver-dammed water bodies also provide breeding habitat for *R. draytonii* adults and rearing habitat for tadpoles. These sites should be treated as critical to the survival of local populations of this species;

FIG. 1. Two adult *Rana draytonii* well-hidden within a beaver dam that was being removed along Kellogg Creek, Contra Costa Co., California.