

PEER EDITED

NOTES

PREDATION EVENTS ON THE ENDANGERED BLUNT-NOSED LEOPARD LIZARD (*GAMBELIA SILA*) INCLUDING ANOTHER BY THE LONG-NOSED SNAKE (*RHINOCHAILUS LECONTEI*)

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Abstract.—In our initial report of predation of a Blunt-nosed Leopard lizard (*Gambelia sila*) by a Long-nosed Snake (*Rhinocheilus lecontei*), we speculated that the snake was not an important source of predation on this endangered lizard. Here we report a second instance of predation by the Long-nosed Snake and reassess its impact on Blunt-nosed Leopard Lizards. We also report other suspected predation events on Blunt-nosed Leopard Lizards by other predators that we found during radio-telemetry studies on the Lokern Natural Area, Semitropic Natural Area, and at Pixley National Wildlife Refuge in the San Joaquin Desert of California in 2015.

Key Words.—birds; California; lizards; predators; Red-tailed Hawk; San Joaquin Desert; snakes

Snakes are known predators of Blunt-nosed Leopard lizards (*Gambelia sila*) and recently we reported on an act of predation by a Long-nosed Snake (*Rhinocheilus lecontei*) at the Lokern Natural Area in Kern County, California (Germano and Saslaw 2015). Because of the small size of Long-nosed Snakes compared to leopard lizard adults and the relative scarcity of the snake in the San Joaquin Desert, we speculated that this snake likely was not an important source of predation on the endangered leopard lizard (Germano and Saslaw 2015). However, we reassess this view based on a second predation event. We also report other confirmed acts of predation on radio-collared Blunt-nosed Leopard Lizards by other species that we found in 2015 while we were conducting home range studies on the lizards.

In the Semitropic Natural Area of the San Joaquin Desert, we found the signal from a radio transmitter of a male Blunt-nosed Leopard Lizard 14 July 2015 coming from a kangaroo rat (*Dipodomys* sp.) burrow system (35°21'04"N, 119°32'58"W), the location of which had not changed in about 7 d. Because we were close to the end of the active season of adult Blunt-nosed Leopard Lizards in mid-July, we wanted to remove radio collars from all lizards. We suspected that the male had gone down for the year, as can happen in July for adults of this species (Germano and Williams 2005; Germano 2009). The male was an adult that was 101 mm snout-vent length (SVL) and 30.0 g when we collared him 29 May 2015. As with our previous report, we found a live Long-nosed Snake in a tunnel of the burrow system of the kangaroo rat (Fig. 1). We released the snake about



FIGURE 1. Top) Long-nosed Snake (*Rhinocheilus lecontei*) dug out of a kangaroo rat (*Dipodomys* sp.) burrow and (Bottom) the Holohil BD2 radio transmitter found moist in the same tunnel as the snake. The transmitter was originally attached to a male Blunt-nosed Leopard Lizard (*Gambelia sila*) that was being radio-tracked on the Semitropic Natural Area in Kern County, California. (Top: Photographed by Erin N. Tennant; Bottom: Photographed by David J. Germano).

50 m from the burrow system after we photographed it. At the point where we found the snake in the tunnel, we found a still moist shed skin and the radio transmitter of the lizard. The transmitter was caked in moist dirt and appeared to have passed through the digestive system of an animal (Fig. 1). We suspect that this Long-nosed Snake was the predator of the radio-collared Blunt-nosed Leopard Lizard.

This second find of likely predation of a Blunt-nosed Leopard Lizard by a Long-nosed Snake in the same year at two sites indicates to us that this snake may be a more significant predator of Blunt-nosed Leopard Lizards than we previously considered. This second snake was smaller than the first (although we did not measure it) and the head seemed to us much too small to be able to consume the large head of an adult leopard lizard, especially one carrying a radio transmitter around its neck. Although natural predation is not something we think requires conservation action for this endangered lizard, we do think it would be useful to conduct studies of snake assemblages in the range of Blunt-nosed Leopard Lizards to determine what suite of species are potential predators of the lizard and in what abundance.

During the course our radio telemetry study at four sites in the southern San Joaquin Desert, we found other acts of suspected predation. At the Semitropic Natural Area, we found the radio signal of an adult male (111 mm SVL, 45.2 g) coming from the body of a Northern Pacific Rattlesnake (*Crotalus o. oreganus*) when we were digging up the burrow system of a kangaroo rat 17 July 2015 looking for the lizard. This male had been tracked for almost two months before the signal did not move for several days before we dug up the burrow system. We also found three radio-collared Blunt-nosed Leopard Lizards that seem to have been eaten by Red-tailed Hawks (*Buteo jamaicensis*). The transmitters of two adult males (both 114 mm SVL and 45.5 g) were heard coming from a hawk nest on a transmission line of a double pole H-structure in the Lokern area 2 and 4 June 2015. The transmitters were recovered from between the base of the poles 3 July and 8 June 2015, respectively. At Pixley National Wildlife Refuge, the radio signal of an adult female (110 mm SVL, 33.9 g) was found at the base of a Red-tailed Hawk nest in a Cottonwood (*Populus fremontii*) snag on 29 June 2015. Both the Northern Pacific Rattlesnake and Red-tailed Hawks are known predators of Blunt-nosed Leopard Lizards (Germano and Brown 2003). We also found the remains of an adult male (116 mm SVL, 44.3 g) spread across the ground at the Semitropic Reserve 18 June 2015 (Fig. 2), but we do not know what animal tore it apart. We suspect the predator was a bird. In addition, at the Lokern Natural Area, we found four broken collars on the ground and two transmitters and collars in tunnels of kangaroo rats. The transmitters from the tunnels appeared to have passed through the digestive system of an animal (Fig. 3), but we do not know what species may have preyed on the lizards that wore these transmitters, although snakes are likely.



FIGURE 2. The remaining body parts found on the ground of a male Blunt-nosed Leopard Lizard (*Gambelia sila*) that was being radio-tracked on the Semitropic Natural Area in Kern County, California. (Photographed by David J. Germano).



FIGURE 3. Holohil BD2 radio transmitters originally attached to Blunt-nosed Leopard Lizards (*Gambelia sila*) at study sites in Kern County, California. The transmitter on the left was removed from a living lizard and the transmitter on the right was found in the tunnel of a kangaroo rat (*Dipodomys* sp.). Note the dulled surface of the beaded chain collar and the discoloration of the transmitter on the right. This transmitter likely passed through the digestive system of an animal, probably a snake. (Photographed by David J. Germano).

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