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A REPORT ON A COLLECTION OF AMPHIBIANS AND REPTILES
FROM THE RIPARIAN REGION OF THE GRAND CANYON, ARIZONA

C. Kenneth Dodd, Jr.
Office of Endangered Species
U.S. Fish and Wildlife Service
Washington, D.C. 20240

and

Division of Reptiles and Amphibians-USNM
Smithsonian Institution
Washington, D.C. 20560

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While the first scientific investigations of the Grand Canyon began with the explorations of John Wesley Powell in 1869, relatively little is known today of the vertebrate fauna of the riparian region of the inner canyon, especially with regard to community structure. Beginnings have been made in connection with mammals (Suttkus et al., 1978) and fishes (Suttkus and Clemmer, 1977) although much remains to be done. To date, no studies have been published on the distribution of amphibians and reptiles in the riparian region or the species composition at various sites. Miller et al. (1982) summarized what is known of the canyon's amphibians and reptiles and provided a thorough literature review.

In June 1982, I was invited to participate in one of a series of collecting trips sponsored by the Denver Wildlife Research Center, U.S. Fish and Wildlife Service, in a survey of the herpetofauna of the canyon. Previous collecting trips have been made by Dr. Norm Scott (DWRC) and Dr. C. R. Shoop (Univ. of Rhode Island) and these authors will present the results of their studies in later publications. All specimens were collected under a Grand Canyon National Park scientific research permit to David Heins (Millsaps College, Jackson, MS) and Arizona State scientific collecting permit (No. 179) to me. Specimens will be deposited in the Smithsonian Institution (USNM), Washington, D.C.

Methods

The collecting party consisted of personnel from the Denver Wildlife Research Center and Dr. David Heins and students from Millsaps College in Jackson, Mississippi. Collections were made between June 19 (Lee's Ferry, River Mile 0) and June 24 (Overhang, River Mile 137) at campsites on the Colorado River (Table 1). Lizards were captured either by hand or by banding with a rubber band; frogs and snakes were captured by hand. Collecting was

generally done in late afternoon and early morning hours. Species totals are provided in Table 2.

Species

Bufo punctatus--The red-spotted toad was collected at night in the campground at Lee's Ferry (1) and from along the bank at the mouth of the Paria River at Lee's Ferry (3). Additional individuals were collected at night at Buck Farm Canyon in the sandy area used for camping and during daylight in a seine in the Little Colorado River just above its junction with the Colorado. No choruses were heard at any location. Recently metamorphosed toadlets and tadpoles were collected in the creek at Buck Farm Canyon.

Bufo woodhousei--The Rocky Mountain toad was the most common amphibian collected; a total of 15 individuals were obtained. Loud breeding choruses were heard at the Paria River at Lee's Ferry and at a backwater pool at Cardenas Creek. No chorus was heard at Buck Farm Canyon. Additional toads were seen but not collected in reeds bordering the Little Colorado River above its junction with the Colorado and at Overhang, River Mile 137.

Hyla arenicolor--The canyon treefrog was only collected along the small stream in Buck Farm Canyon. Individuals were seen sitting on the banks or canyon walls within close distance to water. One individual was heard calling. Tadpoles of this species were quite numerous in the creek and a collection of tadpoles was made.

Cnemidophorus tigris--The northern whiptail was generally abundant, particularly at Cardenas Creek and Lower Bass Camp. This lizard was found in sandy habitats which had vegetation scattered throughout to which it could retreat. The lack of whiptails at River Miles 41 and 137 is an indication that we arrived

at these camps after the sun had disappeared behind a canyon wall, not that whiptails were absent. Indeed, numerous tracks were observed at both localities.

Cnemidophorus seemed particularly fond of the small green leafhoppers that abound everywhere in the sandy riparian habitats. Indeed, at times they seemed oblivious to people as they darted constantly between plants flicking their tongues and catching insects. Their pointed snouts, long tongue, and darting movements seemed particularly well adapted to catch the small leafhoppers.

Crotaphytus insularis--The black collared lizard was seen in the high rocks at River Mile 19 (left bank) and the arroyo east of camp at River Mile 71, Cardenas Creek (left bank). No specimens were collected.

Sauromalus obesus--Two chuckwallas, including one juvenile, were collected from the canyon wall overlooking Shinumo Creek just downstream from Lower Bass Camp. One individual was seen but not collected in the arroyo east of Cardenas Creek.

Sceloporus magister--The desert spiny lizard was the only Sceloporus collected. It was abundant among rock boulders, ledges, and in sandy areas. Both breeding adults (males-bright blue bellies, distinct collar; females-slightly smaller size, orange heads) and juveniles were collected. Desert spiny lizards were also observed but not collected at Lee's Ferry and Overhang.

Urosaurus ornatus--The tree lizard was collected at three of the camp-sites and not observed at the others. It was found among rocks and on ledges; two individuals were collected as they basked on the sand in late afternoon sun at Lower Bass Camp. A number of individuals had a pale pink chin and turquoise markings on the belly giving a very pretty appearance.

Uta stansburiana--The side-blotched lizard was abundant at all localities although not collected at Buck Farm Canyon. It occurred in a variety of ground habitats including sandy and rocky substrates and on rocks and ledges. Some utas were strikingly marked dorsally.

Crotalus viridis abyssus--The endemic Grand Canyon rattlesnake was collected at two localities. One adult (76.4 cm. SVL; 85.0 cm. TL) was found at dusk coiled on a trail in dense tamarisk at Cardenas Creek. The other (59.2 cm. SVL; 64.0 cm. TL) was found at night on rocky substrate on a cliff slope overlooking Lower Bass Camp as mammal traps were being checked.

The behavior of the smaller snake is noteworthy. When encountered, the snake was quiet. However, when the collectors attempted to pin the snake with a stick, it rattled vigorously and attempted escape. The collectors were able to block retreat but unable to pin the snake. Repeated attempts to collect the snake failed whereupon the rattlesnake crawled into and up an Ephedra bush and continued to rattle vigorously; as the collectors departed to return to camp for the snake stick, the rattle could be heard many meters away. In about 30 minutes, I returned and found the snake 85.0 cm. from the ground in the top of the bush where it had remained. It made no attempt to escape but rattled when captured. This is the first instance of which I am aware in which a rattlesnake became arboreal when faced with danger. Two other rattlesnakes, presumably of this species, were seen but not collected at night in heavy vegetation and rocky slopes on the left bank at River Mile 183.

Masticophis taeniatus--A single juvenile desert striped whipsnake was collected in late afternoon in the top of tamarisk trees at River Mile 19.

Tadpoles--In addition to the collection of tadpoles at Buck Farm Canyon, tadpoles were observed in the Little Colorado River just above its junction with the Colorado (River Mile 61.5); the identity of these tadpoles is unknown. Tadpoles, presumably Bufo sp., were observed in Elves Chasm (River Mile 116.5) and in Kanab Creek (River Mile 143.5).

Summary

Between 19-25 June 1982, herpetofaunal observations were recorded for eight localities between River Miles 0-183 in the riparian region of the Grand Canyon. A total of 98 specimens covering 10 species were taken. In addition, one collection of tadpoles was preserved. One additional species, Crotaphytus insularis, was seen but not collected. Brief notes on the species and habitats are provided.

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Table 1. Collecting localities. River miles based on Belknap (1969). All localities in Coconino Co., Arizona.

0	Lee's Ferry, right bank
19	left bank
41	Buck Farm Canyon, right bank
61.5	junction with Little Colorado River, left bank
71	Cardenas Creek, left bank
108.5	Lower Bass Camp, right bank; junction with Shinumo Creek, right bank
137	Overhang (Back Eddy), left bank

Table 2. Species collected by river mile number.

<u>Species</u>	<u>River Mile No.</u>							<u>Total</u>
	0	19	41	61.5	71	108.5*	137	
<u>Bufo punctatus</u>	4		2	1				7
<u>Bufo woodhousei</u>	7		3		5			15
<u>Hyla arenicolor</u>			5					5
<u>Cnemidophorus tigris</u>	3	1			5	6		15
<u>Sauromalus obesus</u>						2		2
<u>Sceloporus magister</u>		7	1			9		17
<u>Urosaurus ornatus</u>		8				4	1	13
<u>Uta stansburiana</u>	5	3			8	4	1	21
<u>Crotalus viridis abyssus</u>					1	1		2
<u>Masticophis taeniatus</u>		1						1

98

* Includes combined collection at Lower Bass Camp and Shinumo Creek

Table 3. USNM herpetological field numbers.

Lee's Ferry (0)	061321-4	<u>U. stansburiana</u>
	061325	<u>C. tigris</u>
	061326	<u>U. stansburiana</u>
	061327-8	<u>C. tigris</u>
	061329-35	<u>B. woodhousei</u>
	061336-9	<u>B. punctatus</u>
River Mile 19	061340	<u>C. tigris</u>
	061341	<u>M. taeniatus</u>
	061342-8	<u>S. magister</u>
	061349-51	<u>U. stansburiana</u>
	061352-9	<u>U. ornatus</u>
Buck Farm Canyon (41)	061360-1	<u>B. punctatus</u>
	061362-4	<u>B. woodhousei</u>
	061365-9	<u>H. arenicolor</u>
	061370	<u>S. magister</u>
Cardenas Creek (71)	061371-3	<u>C. tigris</u>
	061374-81	<u>U. stansburiana</u>
	061382-6	<u>B. woodhousei</u>
	061387	<u>C. v. abyssus</u>
	061388-9	<u>C. tigris</u>
Lower Bass Camp (108.5)	061390-7	<u>S. magister</u>
	061398	<u>C. tigris</u>
	061399-400	<u>U. ornatus</u>
	061401	<u>U. stansburiana</u>
	061402	<u>C. v. abyssus</u>
Little Colorado River (61.5)	061403	<u>B. punctatus</u>
Lower Bass Camp (108.5)	061404	<u>U. ornatus</u>
	061405-9	<u>C. tigris</u>
	061410	<u>S. magister</u>
	061411	<u>U. ornatus</u>
	061412-4	<u>U. stansburiana</u>
Shinumo Creek	061415-6	<u>S. obesus</u>
Overhang (137)	061417	<u>U. ornatus</u>
	061418	<u>U. stansburiana</u>