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**STATUS OF THE MOHAVE RATTLESNAKE AND
CERTAIN LIZARDS AND ANURANS IN THE
FORT BOWIE NATIONAL HISTORIC SITE AREA**

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STATUS OF THE MOHAVE RATTLESNAKE (CROTALUS SCUTULUS) AND
CERTAIN LIZARDS AND ANURANS
IN THE
FORT BOWIE NATIONAL AREA

Terry B. Johnson and Charles H. Lowe

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**Status of the Mohave Rattlesnake (Crotalus scutulatus) and Certain
Lizards and Anurans**

in the Fort Bowie National Historical Site Area

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INTRODUCTION

During our previous investigation of the herpetofauna of the Fort Bowie National Historic Site (Lowe and Johnson 1976), questions concerning the distributions of several species were not fully answered due to limitations in field work.. The Mohave rattlesnake (Crotalus scutulatus) and the zebra-tailed lizard (Callisaurus draconoides) had previously been reported from the Site by unknown observers but were not encountered during our 10 days of intensive field work during September 1975 through August 1976. We also were unable to substantiate at that time an early sight record for the desert spiny lizard. This report, based on our subsequent field work during July-September 1977, clarifies the status of these reptiles.

In addition, we verify and further clarify the status of the species of whiptail lizards (Chamodophorus) including the all-female species, and species of spadefoot toads occurring or expected on the Historic Site.

METHODS

Mohave Rattlesnake.--To enable us to compare the relative abundances of Mohave rattlesnakes in two contiguous arena (i.e., on the Site and in adjacent but off-site grasslands) we established a two segment transect (see Figure 1). The On-Site Segment (4.6 km), sampled rocky soils with vegetation typical of the Site (see Lowe and Johnson 1976). The Off-Site Segment (9.9 km) sampled sandier soils and grasslands W of the Site. The presence of Mohaves in those grasslands had been previously established (Lowe and Johnson 1976, Jacob 1977).

We periodically censused the transect (N - 62) by vehicle (i.e., road hunting) from July through September 1977. Each day of coverage was divided into four census periods: 2300-0400 h, light to moderate (rattlesnake) activity expected: 0400-0940 h, moderate to heavy activity expected: 0900-1800 h, light to no activity expected: 1800-2300 h, moderate to heavy activity expected. The transect was censused more frequently during the two periods of greater expected activity (n - 40) than during the two periods of lighter expected activity (n - 22).

Zebra-tailed Lizard and Desert Spiny Lizard.--Extensive habitat search on foot was carried out in the lower Siphon Canyon area: in washes and along hillsides on the Site from the Butterfield Stage Station down Siphon Canyon and into the off-site Emigrant Canyon Flatlands. This search area was selected because of: (1) the existence of a sight-record of a zebra-tail in the area (M. Hoy, fide) and (2) penetration into the area by the creosotebush dominated community of the Flatlands most likely to support the zebra-tail and desert spiny lizard. Fine soils and open vegetation (as are found in the Flatlands) are more typical of areas inhabited by zebra-tails than are rocky soils and denser vegetation, as occur throughout the rest of the Historic Site.

All-female Whiptail Lizards.--It was anticipated that extensive habitat search in Siphon Canyon during the summer monsoon might determine the presence of the Chihuahua whiptail lizard on the Historic Site. Habitat searches for all species were carried out from July through September.

Spadefoot Toads.-- The spadefoot toads in the area have distinctive calls that can be clearly distinguished at distance. Only the western spadefoot has been observed on site. Additional species of spadefoots were sought by searching habitats, road-hunting during rains and listening for calls during peak nocturnal activity periods on wet summer nights.

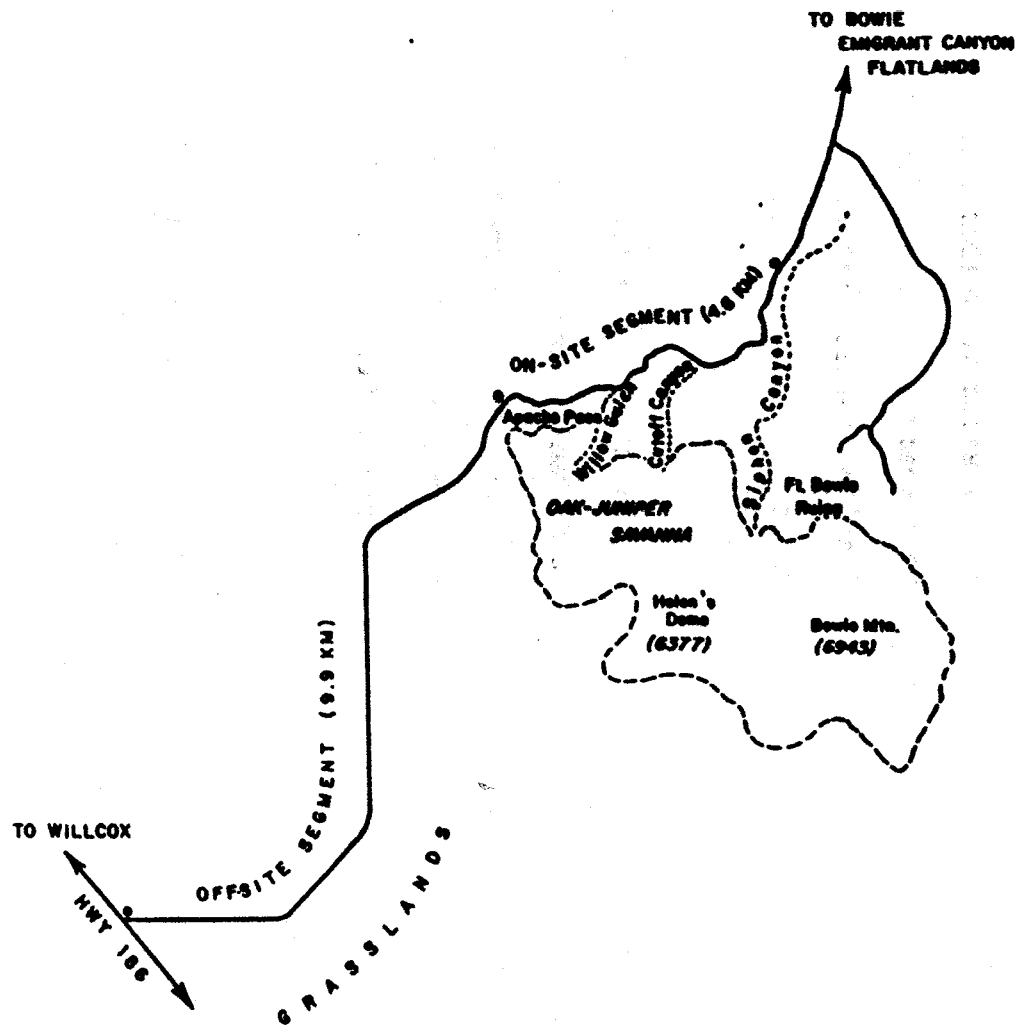


Figure 1. Transect Segments used to census rattlesnakes (Crotalus) in the Fort Bowie National Historic Site area, July-September 1977.

RESULTS AND DISCUSSION

Mohave Rattlesnake.--No Mohave rattlesnakes were found on the Site during our 1977 field work. However, they were moderately common in the offsite grasslands W of Apache Pass. We found one individual within .4 km of the Apache Pass Site boundary along the Apache Pass Road. The habitat at that point is transitional between the oak-juniper savanna of the western edges of the Site and the open grasslands of the west. Given this proximity to the Site of a population of Mohave rattlesnakes, individuals may be expected to occur on the Site occasionally.

For comparative purposes, numbers of western diamondback rattlesnakes (Crotalus atrox) encountered on transact runs were recorded (see Table 1). It was the most common species of rattlesnake on the Site. Diamondbacks were found in the transitional area of the western edge of the Site (see above), accounting for their low numbers on the Off-Site Segment of the transact (see Table 1). Blacktailed rattlesnakes, Crotalus molossus, also occur on the Site but in very low numbers (see Lowe and Johnson 1976) ; now were encountered on transact runs.

Unverified visual records of on-site Mohave rattlesnakes were probably the result of misidentification of western diamondbacked rattlesnakes. Field marks used to distinguish one species from the other are quite easily confused by persons who are either unfamiliar with them or unwilling to study them closely (see Jacob 1977).

Zebra-tailed Lizard.--No zebra-tailed lizards were found within the Site boundaries during our 1977 field work. Small to moderate populations were found as close as 1.2 km N of the (lower Siphon Canyon) Site boundary. The habitat where they were found was quite different from any existing on the Site; soils were fine-grained and vegetation was open creosote and palmilla. Fine soils and open vegetation are favored by zebra-tails (Lowe 1964).

Table 1. Numbers (individuals per km) of *Crotalus atrox* and *C. scutulatus* observed in the area of the Fort Bowie National Historic Site, July - September 1977. For map of transect segments see Fig. 1.

Census Period (time of day).	<i>C. atrox</i>		<i>C. scutulatus</i>	
	On-Site ¹ <u>Segment</u>	Off-Site ² <u>Segment</u>	On-Site <u>Segment</u>	Off-Site <u>Segment</u>
2300-0400	0.03	0.01	0.0	0.05
n = 8	(1)	(1)	(0)	(4)
0400-0900	0.02	0.01	0.0	0.10
n = 20	(2)	(2)	(0)	(19)
0900-1800	0.0	0.0	0.0	0.01
n = 14	(0)	(0)	(0)	(1)
1800-2300	0.04	0.01	0.0	0.07
n = 20	(4) **	(2)	(0)	(13) **

¹On-Site Segment 4.6 km in length

²Off-Site Segment 9.9 km in length

n = number of transect runs during Census Period

() = number of snakes observed

*number of snakes includes 3 DOR

**number of snakes includes 1 DOR

Greater earless lizards (Holbrookia texana) were numerous on the Site and in the immediately adjacent Emigrant Canyon Flatlands in 1977, as they were during our previous field work. The field marks of this species are quite similar to those of the zebra-tail, and the two species sight easily be confused by a casual observer unfamiliar with either species. It is likely that the sight-record of a zebra-tail on the Site was the result of a misidentification of a greater earless lizard. There is, however, the possibility of movement up the sandy Siphon Canyon wash by zebra-tails in years of abundance or at other times.

Desert Spiny Lizard. --The on-site habitat with highest probability for supporting a population of Sceloporus magister is the creosotebush habitat area described above for the zebra-tailed lizard. During our fieldwork in 1977 we were again unable to locate any individuals of the desert spiny lizard on-site or directly off site. We conclude that; it appears beyond reasonable doubt, this relatively large and conspicuous lizard species does not occur on the Historic Site.

We assign the earlier on-site sight record of Sceloporus magister (M. Hoy, June 25, 1971) to the similarly large sceloparine lizard, Sceloporus clarki, which is a common species on the Historic Site.

Whiptail Lizards.—Systematics (taxonomy) of the genus Cnemidophorus is more than usually difficult. For several reasons field identification without collecting can vary from doubtful to worthless. This is particularly true for all-female species in the sexlineatus species group (see Lowe and Johnson 1976). We have verified (with specimen vouchers) three species on-site: the desert-grassland whiptail (Cnemidophorus uniparens), the Sonora whiptail (C. sonorae), and the western whiptail (C. tigris). The first two are all-female species, the third (tigris) is bisexual. .

The Chihuahua whiptail (C. exsanguis), another all-female species, occur elsewhere in the Chiricahua Mountains. It was anticipated that a population may be located in Siphon Canyon. However, we did not observe the species on-site or off-site during our subsequent field work during July-September 1977.

Spadefoot Toads.--We reported earlier that the western spadefoot (Scaphiopus hammondi) occurs on the Historic Site. Two other species of spadefoots, commonly in association with S. hammondi in the Southwest are commonly encountered off-site in the Emigrant Canyon flatland: plains spadefoot toad (S. bombifrons) and desert spadefoot (S. couchi). No individuals of either were encountered on-site during our subsequent field work in 1977. It seems likely that one, or both of these species may be located on-site in the future.

CONCLUSIONS

Mohave Rattlesnake.-- There are no populations of Mohave rattlesnakes established on the Site. Presence of moderate numbers as close as .4 km W of the Site provides a potential source of immigrants. However, the on-site habitat is more typical of that inhabited by western diamondback rattlesnakes than it is of that which is inhabited by Mohaves. Western diamondbacks are moderately common on the Site. The unverified sight records of Mohaves on the Site were probably resulted from misidentification of diamondbacks. The markings of the two species are similar and overlapping.

The occurrence of diamondbacks in rocky and relatively heavily vegetated areas on the Site and the presence of Mohaves in grassland areas are consonant with the general distributional patterns known for the two species, as is the area of overlap (Lowe 1964, Stebbins 1966, Conant 1975, Jacob 1977). Without significant change in the habitat on the Site, this situation is not likely to change. The Mohave rattlesnake should be listed as: Hypothetical -- no verified on-site record.

Zebra-tailed Lizard.--At present there are no on-site populations of zebra-tailed lizards, though some are established within 1.2 km of the Site. Habitat conditions (especially soils) on the Site are marginal at best for this species, and then only at the extreme northern edge of the Site in lower Siphon, Canyon. In exceptional years individuals may be found on the site, accessing it via the lower Siphon Canyon wash. This is neither to be expected nor anticipated.

The greater earless lizard is abundant on the Site. Field marks distinguishing this species from the zebra-tail are very similar to those of the zebra-tail. The unverified record of an on-site zebra-tail was probably made by an observer who was unfamiliar with either species. The zebra-tailed lizard should be listed as: Hypothetical -- no verified on-site record.

Desert Spiny Lizard.--Similar to the case of zebra-tail lizard - earless lizard confusion, the desert spiny lizard is frequently confused with the similarly large Sonora spiny lizard. Such is apparently the case for the Historic Site. At present there is no population of the desert spiny Lizard on-site, or, insofar as we now know, nearby off-site. The desert spiny lizard should be listed as: Hypothetical -- no verified on-site record.

Chihuahua Whiptail Lizard. --Further field work has not deterred the occurrence of the all-female Chihuahua whiptail on-site. Two other all female species (desert-grassland whiptail, Sonora whiptail) and the bisexual western whiptail occur on the Historic Site.

Spadefoot Toads.--Only the western spadefoot has been found on-site. One or both of the two other species common in the Emigrant Canyon flatlands to the east (plains spadefoot, desert spadefoot) may be found on site in the future.

In brief, we have determined that three of the six problem species have been at some earlier time confused in each case with a closely similar species that does, in fact, occur

on-site: western diamondback rattlesnakes occur on the Historic Site, Mohave rattlesnakes do not; Sonora spiny lizards do, desert spinys do not; greater earless lizards do, zebra-tails do not. The other three problem species all have marginal habitats on the Historic Site and may be found there in the future: the all-female Chihuahua whiptail, the desert spadefoot toad, and the plains spadefoot.

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