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Final Report
to
The National Park Service

Herpetofaunal Survey of
Bandelier National Monument
(P.O. PX7000-3-0530)

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INTRODUCTION

A comprehensive survey of the Bandelier National Monument herpetofauna was conducted between May 1973 and October 1975 by Dr. William G. Degenhardt, Richard B. Halley, James S. Jacob, and Steven R. Williams. Species distributions were determined and evaluated in terms of geographic and elevational ranges, characteristic habitat, and relative species abundance.

Physical Description of the Monument

Bandelier National Monument is located twelve miles south of Los Alamos, New Mexico on the Pajarito Plateau. The monument is bounded on the northeast by New Mexico State Highway 4; on the southeast by the Rio Grande; on the south by the Canada de Jochiti Grant (owned by the University of New Mexico); and on the west by Santa Fe National Forest. The plateau on which the monument is situated ~~is~~ dissected by three major canyons running from northwest to southeast. These are, from north to south: Frijoles, Alamo, and Capulin. Frijoles Canyon contains a permanent stream, El Rito de los Frijoles. Capulin Creek flows year round only in the upper third of the canyon and Alamo Creek carries permanent water only in the northern part of its canyon.

Elevations within the monument range from 5300 feet in White Rock Canyon in the southeast corner to 8600 feet in the recently annexed northwest section. Climatic regimes vary proportionately and this is reflected in a variety of vegetation types ranging from Juniper and Sagebrush in the lower elevations to forests of Douglas Fir, White Fir, and Aspen at high elevations.

Specimens were collected from May 1973 to September 1975. All

specimens are deposited in the Division of Herpetology of, The Museum of Southwestern Biology on the campus of the University of New Mexico in Albuquerque.

Techniques used for collecting lizards included noosing, can traps buried with the tops level with the ground surface, stunning with heavy rubber bands, hand catching, and occasionally shooting with dust shot. Snakes and amphibians were collected by hand.

ANNOTATED LIST OF RECORDED SPECIES

Class Amphibia

Order Salientia

Family Plethodontidae

Ilethodon neomexicanus, Jemez Mountains Salamander.

One specimen was observed on the north slope of the Apache Spring gulley about one quarter mile west of the spring at an elevation of approximately 8200 feet. The area was characterized by moist slopes of moss covered rocks. The individual observed, a juvenile, was found under a flat moss covered rock. Enough favorable habitat is present to make it seem highly probable that a larger population exists. The principal vegetation consists of Douglas Fir (Pseudotsuga menziesii), White Fir (Abies concolor), Ponderosa Pine (Pinus ponderosa), and Quaking Aspen (Populus tremuloides).

Order Anura

Family Bufonidae

Bufo punctatus, Red-spotted Toad.

Larvae were collected in September in a temporary pool on the

mesa between Lummis and Alamo canyons at an elevation of approximately 6500 feet. The principal vegetation consists of Ponderosa Pine (Pinus ponderosa) with an understory of Little Bluestem (Andropogon scoparius), Mountain Muhly (Muhlenbergia montana), Arizona Fescue (Festuca arizonica), and Bottlebrush Squirreltail (Sitanion hystrix). Bufo punctatus probably breeds in temporary pools scattered throughout the southern half of the monument. Bufo woodhousii, Woodhouse's Toad.

Individuals were observed during July and August at elevations near 5300 feet in White Rock Canyon along the west bank of the Rio Grande. The principal vegetation in these areas consists of Juniper (Juniperus spp.) with a sagebrush (Artemisia tridentata) understory. Western Wheatgrass (Agropyron smithii) characterizes the more level sandy areas, while saltgrass (Distichlis stricta) dominates the river's edge. Bufo woodhousii seems to be confined to areas along the Rio Grande with the possibility that it may invade the lower parts of Frijoles Canyon.

Family Hylidae

Hyla arenicolor, Canyon Treefrog.

A gravid female was collected in May at 5700 feet in Alamo Canyon. Larvae were collected in September at an elevation of approximately 6600 feet in Lummis Canyon just northwest of Corral Hill. The principal vegetation in these areas includes Ponderosa Pine (Pinus ponderosa), Pinyon (Pinus edulis), and Juniper (Juniperus spp.) with the addition of Gambel's Oak (Quercus gambelii) and Box Elder (Acer negundo) in Alamo Canyon. H. arenicolor probably breeds locally in semi-permanent ponds throughout the

monument.

Family Ranidae

Rana catesbeiana, Bullfrog.

Individuals of this species were observed during July and August at elevations near 5300 feet in White Rock Canyon along the edge of the Rio Grande. The principal vegetation includes Juniper (Juniperus spp.), Sagebrush (Artemisia tridentata), and Saltgrass (Distichlis stricta). Bullfrogs are an introduced species in New Mexico, need deeper permanent water for breeding, and appear to be confined to river edges within the monument.

Class Reptilia

Order Squamata

Family Teiidae

Cnemidophorus exsanguis, Chihuahua Whiptail.

Individuals were observed from May through August in Alamo, Capulin, Hondo, Lummis, Media, and White Rock Canyons. C. exsanguis has the widest distribution of any whiptail in the monument and was found at elevations ranging from 5300 to 6000 ft in grassy and semi-open areas within canyons. Juniper (Juniperus spp.) forms the characteristic overstory with New Mexico Olive (Forestiera neo-mexicana), Snakeweed (Xanthocephalum spp.), Apache Plume (Fallugia paradoxa), Blue Grama (Bouteloua gracilis) and Arizona Fescue (Festuca arizonica) as understory components. Along river flat habitats Russian Olive (Elaeagnus angustifolia) is often present. Cnemidophorus tesselatus, Checkered Whiptail.

One specimen was collected during June at the mesa edge above White Rock Canyon at an elevation of approximately 5800 feet.

Other individuals were observed along the river in White Rock Canyon at an elevation of approximately 5300 feet. Characteristic vegetation includes Juniper (Juniperus spp.), Apache Plume (Fallugia paradoxa), Snakeweed (Xanthocephalum spp.) and Blue Grama (Bouteloua gracilis).

Cnemidophorus velox, Plateau Whiptail.

Individuals were observed in June and August at elevations from 5900 to 6300 feet in Frijoles, and Lummis canyons. Dominant vegetation in these areas includes Ponderosa Pine (Pinus ponderosa), Pinyon (Pinus edulis), Juniper (Juniperus spp.), Apache Plume (Fallugia paradoxa), Blue Grama (Bouteloua gracilis), and Mountain Muhly (Muhlenbergia montana). The distribution of C. velox appears to be somewhat spotty but it seems likely that populations are present in other canyons in the southern half of the monument.

Family Iguanidae.

Crotaphytus collaris, Collared Lizard.

One adult male was collected in White Rock Canyon at an elevation of approximately 5350 feet about 1.5 miles south of the mouth of Frijoles Canyon. The dominant vegetation in this area consists of Juniper (Juniperus spp.), Sagebrush (Artemisia tridentata), Snakeweed (Xanthocephalum), Blue Grama (Bouteloua gracilis), and Sand Dropseed (Sporobolus cryptandrus). Crotaphytus collaris is probably distributed throughout White Rock Canyon and its range may extend into the lower parts of Medio, Capulin, Alamo, and Lummis canyons as well.

Sceloporus undulatus, Eastern Fence Lizard.

This lizard was observed from April through September in all

sections of the monument and at elevations from 5400 to 8200. S. undulatus is the most abundant and widely distributed herptile in the monument and can be found in all the principle vegetation zones. It is the only reptile that occurs in high elevation areas characterized by Mixed Conifer vegetation. (cf. horned lizard on) Phrynosoma douglasi, Short Horned Lizard. *Quemazon Mt.*

One specimen was collected on Frijoles Mesa near the campground at an elevation of 6600 feet. The principal vegetation in this area is Ponderosa Pine (Pinus ponderosa), various oaks (Quercus spp.), Bottlebrush Squirreltail (Sitanion hystrix), Mountain Muhly (Muhlenbergia montana), Arizona Fescue (Festuca arizonica), and Little Bluestem (Andropogon scoparius). P. douglasi probably occurs on other mesas in the monument where similar vegetation occurs.

Urosaurus ornatus, Tree Lizard.

Individuals were observed from May through September at elevations of 5300 to 6900 feet in White Rock, Sanchez, Medio, Capulin, Alamo, Lummis, and Frijoles canyons. Urosaurus ornatus is usually found on rocky slopes but may occur in a variety of vegetation types ranging from Ponderosa Pine (Pinus ponderosa) and Douglas Fir (Pseudotsuga menziesii) in Frijoles Canyon to mixed Ponderosa Pine, Pinyon (Pinus edulis), and Juniper (Juniperus spp) in Capulin Canyon. Some individuals were noted in close proximity to various oaks (Quercus spp.).

U. ornatus, along with Sceloporus undulatus and Cnemidophorus exsanguis, is one of the most abundant and widely distributed lizards in the monument.

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Phrynosoma douglasi, Short Horned Lizard.

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U. ornatus, along with Sceloporus undulatus and Cnemidophorus exsanguis, is one of the most abundant and widely distributed lizards in the monument.

Family Scincidae

Eumeces multivirgatus, Many-Lined Skink.

Individuals of this species were observed from May through August in Frijoles and Lummis canyons and on the mesa near Corral Hill at elevations between 6200 and 6700 feet. This skink is found in a variety of vegetation types but seems to prefer areas with rocks and relatively high soil moisture. It is often found under rocks or other surface debris. Dominant vegetation components include Ponderosa Pine (Pinus ponderosa), Douglas Fir (Pseudotsuga menziesii), Gambel's Oak (Quercus gambelii), Box Elder (Acer negundo), Bottlebrush squirreltail (Sitanion hystrix), Mountain Muhly (Muhlenbergia montana), Arizona Fescue (Festuca arizonica), and Little Bluestem (Andropogon scoparius).

Eumeces obsoletus, Great Plains Skink.

Two individuals of this species were seen in Frijoles Canyon at elevations between 5900 and 6100 feet in June. Both sightings were in rocky areas near Frijoles Creek. The dominant vegetation in these areas includes Douglas Fir (Pseudotsuga menziesii), Ponderosa Pine (Pinus ponderosa), and Box Elder (Acer negundo). Eumeces obsoletus probably also occurs in the lower reaches of Frijoles Canyon and along the Rio Grande in White Rock Canyon.

Family Colubridae

Diadophis punctatus, Ringneck Snake.

One individual was collected during May in White Rock Canyon about one mile south of the Frijoles Canyon mouth at an elevation of 5350 feet. The principal vegetation in the area consists of Juniper (Juniperus spp.), Sagebrush (Artemisia tridentata), Sand

Dropseed (Sporobolus cryptandrus), Blue Grama (Bouteloua gracilis), and Western Wheatgrass (Agropyron smithii). Diadophis punctatus is probably confined to areas along the Rio Grande in White Rock Canyon. These snakes are secretive and are most commonly found under objects.

Masticophis taeniatus, Striped Whipsnake.

Individuals were observed during June and July in White Rock Canyon at an elevation of approximately 5350 feet. The principal vegetation in these areas is as above for D. punctatus. M. taeniatus is especially attracted to rocky areas and frequents this type of habitat in White Rock Canyon. This species seems to be quite abundant within its limited distribution in the monument. 4.5' under
seen by
T. Young on 4/6/88
Pituophis melanoleucus, Gopher Snake.

One specimen was collected in June at an elevation of 6600 feet on the road near the monument entrance gate. Another was observed at an elevation of 5350 feet in White Rock Canyon during July. In both areas, Juniper (Juniperus spp.) and Blue Grama (Bouteloua gracilis) were important components of the vegetation. Pituophis melanoleucus frequents a wide variety of habitats and probably occurs in most areas in the monument below the Mixed Conifer Zone. Thamnophis elegans, Western Terrestrial Gartersnake.

Individuals were observed from April through September at elevations between 5900 and 6300 feet in Frijoles Canyon. The principal vegetation consists of Douglas Fir (Pseudotsuga menziesii), Ponderosa Pine (Pinus ponderosa), Oaks (Quercus spp.), Box Elder (Acer negundo), and Alder (Alnus spp.), with an understory of Mutton Bluegrass (Poa fendleriana), Nodding Brome (Bromus anomalus), and

Sedge (Carex spp.). T. elegans is usually restricted to habitats near permanent water. It may also occur in upper Alamo, upper Capulin, and White Rock canyons.

Family Viperidae

Crotalus atrox, Western Diamondback Rattlesnake.

Individuals were observed in June at elevations between 6300 and 6600 feet in Lummis and Capulin canyons at the Pueblo of the Stone Lions, and on Frijoles Mesa. The dominant vegetation in these areas is Ponderosa Pine (Pinus ponderosa) or Ponderosa Pine mixed with Pinyon (Pinus edulis) and Juniper (Juniperus spp.). C. atrox probably occurs throughout the southern half of the monument in association with any of the vegetation types found therein.

UNRECORDED PROBABLE SPECIES

Class Reptilia

Order Testudinata

Family Trionychidae

Trionyx spiniferus, Spiny Softshell.

Tracks of T. spiniferus were found on a sand bank of the Rio Grande just south of the monument boundary. At present, because of the relatively swift current of the Rio Grande, turtle trapping is impractical within the monument. In the future, as the water level rises in Cochiti Lake, it should be easier to determine with certainty whether T. spiniferus is indeed present within the monument. In addition, flooding should increase the amount of favorable habitat available to this species.

Order Squamata

Family Teiidae

Cnemidophorus neomexicanus, New Mexico Whiptail.

Specimens have been collected in White Rock Canyon just south of the monument boundary in habitat similar to that existing within the monument. It seems likely, therefore, that this species occurs in small numbers within the monument.

Family Colubridae

Thamnophis cyrtopsis, Black-Necked Garter Snake.

This species has been collected in White Rock Canyon just south of the monument boundary. Since similar habitat exists within the monument it is probable that T. cyrtopsis occurs there as well.

Family Viperidae

Crotalus viridis, Prairie Rattlesnake.

One specimen was found on New Mexico Highway 4 approximately two miles north of the monument boundary in Pinyon-Juniper habitat. It seems likely that this species may range into the monument on mesas with similar vegetation.

Relative Distribution of Species

The herpetofauna of Bandelier National Monument is most diverse and abundant at lower elevations, particularly in the canyon bottoms. A total of four species occur in mixed conifer areas, twelve species in areas dominated by Ponderosa Pine, twelve species in Pinyon-Juniper areas, and fourteen species in areas dominated by Juniper. Thus, species diversity is inversely correlated with elevation within the monument.

Summary

Nine families, fifteen genera, and nineteen species comprise the known herpetofauna of Bandelier National Monument. Four species are probable but unverified and fifteen species known to occur in the general area include some good possibilities for future addition to the list. The most diverse and abundant herpetofaunal assemblage occurs at lower elevations and particularly in canyons in the southern half of the monument.

Possible Herpetofauna

TABLE 1

The species listed below occur in the general vicinity of Bandelier National Monument, either in the Jemez Mountains or the Rio Grande Valley. Some of these species may range into the monument proper.

Species	Potential Habitat Within Bandelier Nat. Mon.
Order Annura:	
<u>Pseudacris triseriata</u>	pools in grassy areas; all elevations
<u>Rana pipiens</u>	
<u>Scaphiopus bombifrons</u>	White Rock Canyon
<u>Scaphiopus hammondi</u>	White Rock Canyon
Order Squamata	
Sub-Order Lacertilia	
<u>Holbrookia maculata</u>	White Rock Canyon
<u>Phrynosoma modestum</u>	White Rock Canyon
Sub-Order Serpentes	
<u>Arizona elegans</u>	White Rock Canyon
<u>Heterodon nasicus</u>	White Rock Canyon
<u>Hypsiglena torquata</u>	White Rock Canyon
<u>Masticophis flagellum</u>	White Rock Canyon
<u>Opheodrys vernalis</u>	grassy areas; all elevations
<u>Rhinocheilus lecontei</u>	White Rock Canyon
<u>Salvadora grahamiae</u>	southern half of monument
<u>Thamnophis sirtalis</u>	White Rock Canyon
<u>Crotalus molossus</u>	White Rock Canyon

TABLE 2

RELATIVE ABUNDANCE OF HERPETOFAUNA

	Mixed Conifer	Ponderosa Pine	Ponderosa Pine Canyons	Pinyon- Juniper	Pinyon-Juniper Canyons	Juniper	Juniper Canyons
<u>Plethodon neomexicanus</u>	U	--	--	--	--	--	--
<u>Bufo punctatus</u>	--	U	U*	U*	U*	U*	U*
<u>Bufo woodhousei</u>	--	--	--	--	--	--	C
<u>Hyla arenicolor</u>	--	--	MC	--	MC	--	MC*
<u>Rana catesbeiana</u>	--	--	--	--	--	--	MC
<u>Crotaphytus collaris</u>	--	--	--	--	--	--	MC
<u>Phrynosoma douglassi</u>	--	U	--	U*	--	--	--
<u>Sceloporus undulatus</u>	U	C	C	C	C	C	C
<u>Urosaurus ornatus</u>	--	--	MC	--	MC	--	MC
<u>Eumeces multivirgatus</u>	U*	MC	MC	--	--	--	--
<u>Eumeces obsoletus</u>	--	--	U	--	U*	--	U*
<u>Cnemidophorus exsanguis</u>	--	--	U	--	MC	--	MC
<u>Cnemidophorus tessellatus</u>	--	--	--	--	--	U	MC
<u>Cnemidophorus velox</u>	--	--	MC	--	MC	--	--
<u>Diadophis punctatus</u>	--	--	--	--	--	--	U
<u>Masticophis taeniatus</u>	--	--	--	--	MC*	MC*	C
<u>Pituophis melanoleucus</u>	--	MC	MC*	MC	MC*	MC*	MC
<u>Thamnophis elegans</u>	MC	--	C	--	U	--	--
<u>Crotalus atrox</u>	--	U	MC	MC	MC	MC*	MC*

C = common

MC = moderately common

U = uncommon

* = probable occurrence