

BASELINE INVENTORY OF MAMMALS, REPTILES, AND
AMPHIBIANS OF DEVILS TOWER NATIONAL MONUMENT, WYOMING

David M. Armstrong
Natural Science Program and University Museum
University of Colorado
Boulder

Objectives

Despite its small size, Devils Tower National Monument encompasses a remarkable array of ecological situations. The area is of particular interest to the ecologist and biogeographer because Devil's Tower and environs rise as an "island" of montane and saxicoline habitat out of a "sea" of shortgrass prairie.

The objective of this study is to provide an inventory of terrestrial mammals, reptiles, and amphibians in the National Monument: (1) to aid in the interpretive program of the National Monument; (2) to aid in the resource management mission of the National Monument; and (3) to provide natural history baseline data upon which further ecological or evolutionary studies of the fauna of Devils Tower National Monument may be based.

Methods

Methods are those employed successfully in previous studies in other units of the National Park Service (Armstrong, 1979, 1984). All methods are as non-manipulative as possible. The only animals that need to be captured for identification and documentation are nocturnal small mammals (< ca. 50 gr.). At each field site, a pair of transects (each with 25 stations, the stations set 5 m. apart and the transects spaced 10 m. apart) was established, each station set with a Sherman livetrapp provided with cotton bedding and baited with rolled oats. The transects were run for four days and nights without pre-baiting. Interval of inspection depended on weather conditions, and was established to eliminate trap mortality. Small mammals captured were identified to species, sexed, weighed, aged, their reproductive condition and microhabitat noted. They were then individually marked (by toe-clipping) and released.

In addition to the livetrapping program, one to six mistnets were set in habitat appropriate to bats on all but windy and/or rainy nights.

Reptiles, amphibians, and larger mammals (deer, lagomorphs, carnivores) were observed on plotless cruises through all major habitat-types, making note of all terrestrial vertebrates (individuals or certain sign) seen.

Transects were located in all major habitat-types in the National Monument: riparian grassland, ponderosa pine woodland, oak woodland, upland meadow, prairie dog town, and cliff/talus shrub complex. (Transects were marked

temporarily with plastic surveyor's tape on 1x2 stakes. Transects will be permanently marked for future study and/or reference if judged desirable by Park Service personnel.)

All work was coordinated with appropriate Park Service personnel, and was conducted as unobtrusively as possible. Because any field work attracts the attention of at least some visitors, a handout describing the survey was prepared and made available to interested persons.

A survey of literature was conducted in the spring of 1986. Field work began in June 1986. I was in the Monument for intensive field work from 5 through 8 June, and I also reviewed pertinent literature in the Monument archives at that time. Results of the initial livetrapping suggested that numbers of small mammals were very low. Therefore, additional livetrapping was postponed until August.

From 4 to 29 August from one to four persons were in the field on the Monument. Livetrapping was continued with greatly increased success. A total of 40 pairs of transects aggregating some 8000 trap-nights, were run.

Results

Table 1 lists species of amphibians, reptiles, and mammals observed directly or indirectly during the 1986 field season. This is a first approximation of alpha diversity in the Monument. A total of 33 species were observed, about one-third of the potential natural fauna (as listed in our First Quarterly Report, dated 1 September). Species documented include two of a potential six amphibians (33 percent), six of 15 reptiles (40 percent) and 25 of 66 mammals (38 percent). These results are encouraging, especially considering the fact that livetraps (rather than pitfalls or snaptraps) are biased against shrews and mistnetting is less effective than shooting in capturing bats. Furthermore, the observed fauna is compared with a checklist of potential natural fauna that was deliberately liberal, drafted to include not only species sure to occur but those suspected to occur even occasionally, now or in the past.

Table 2 shows the average number of different individual small mammals captured on transects in each habitat type. Thus, this is an average minimum number of small mammals (by species) known to be alive on an average transect within a particular habitat type.

The number of species captured is roughly as expected, but numbers of individuals taken is very low. In a short-term study of the sort being conducted we are not in a position to monitor long-term trends (and thereby isolate and interpret short-term anomalies), but we do expect to be able to contrast our data with data from earlier studies in comparable areas to demonstrate that numbers really were quite low. We also have data on biomass, sex, and age distribution of the captures to describe generally the structure of local populations.

From the standpoint of trapping success, there is some reason for

Table 1. Amphibians, reptiles, and mammals observed in Devils Tower National Monument, Crook County, Wyoming, Summer 1986.

CLASS AMPHIBIA- -AMPHIBIANS	
FAMILY BUFONIDAE- -TOADS	
Great Plains Toad-	<u>-Bufo cognatus</u>
FAMILY RANIDAE- -TRUE FROGS	
Leopard Frog-	<u>-Rana pipiens</u>
CLASS REPTILIA- -REPTILES	
FAMILY COLUBRIDAE- -COLUBRID SNAKES	
Yellow-bellied Racer-	<u>-Coluber constrictor</u>
Hognosed Snake-	<u>-Heterodon nasicus</u>
Smooth Green Snake-	<u>-Opheodrys vernalis</u>
bullsnake-	<u>-Pituophis melanoleucus</u>
Plains Garter Snake-	<u>-Thamnophis radix</u>
FAMILY VIPERIDAE- -PIT VIPERS	
Prairie Rattlesnake-	<u>-Crotalus viridis</u>
CLASS MAMMALIA- -MAMMALS	
FAMILY VESPERTILIONIDAE- -COMMON BATS	
Little Brown Bat-	<u>-Myotis lucifugus</u>
Big Brown Bat-	<u>-Eptesicus fuscus</u>
FAMILY LEPORIDAE- -RABBITS AND HARES	
Cottontail-	<u>-Sylvilagus cf. audubonii*</u>
FAMILY SCIURIDAE- -SQUIRRELS	
Least Chipmunk-	<u>-Tamias minimus</u>
Yellow-bellied Marmot-	<u>-Marmota flaviventris</u>
13-lined Ground Squirrel-	<u>-Spermophilus tridecemlineatus</u>
Black-tailed Prairie Dog-	<u>-Cynomys ludovicianus</u>
Fox Squirrel-	<u>-Sciurus niger</u>
Pine Squirrel-	<u>-Tamiasciurus hudsonicus</u>
FAMILY GEOMYIDAE- -POCKET GOPHERS	
Northern Pocket Gopher-	<u>-Thomomys talpoides</u>
FAMILY CASTORIDAE- -BEAVER	
Beaver-	<u>-Castor canadensis</u>
FAMILY CRIDETIDAE- -NATIVE RATS AND MICE	
Western Harvest Mouse-	<u>-Reithrodonotomys megalotis</u>
White-footed Mouse-	<u>-Peromyscus leucopus</u>
Deer Mouse-	<u>-Peromyscus maniculatus</u>

Bushy-tailed Woodrat- Neotoma cinerea
Prairie Vole- Microtus ochrogaster

FAMILY ERETHIZONTIDAE- -PORCUPINES

Porcupine- Erethizon dorsatum

FAMILY CANIDAE- -DOGS AND ALLIES

Coyote- Canis latrans
Red Fox- Vulpes vulpes

FAMILY PROCYONIDAE- -RACCOONS AND ALLIES

Raccoon- Procyon lotor

FAMILY MUSTELIDAE- -WEASELS AND ALLIES

Badger- Taxidea taxus
Striped Skunk- Mephitis mephitis

FAMILY FELIDAE- -CATS

Bobcat- Felis rufus

FAMILY CERVIDAE- -DEER

Mule Deer- Odocoileus hemionus
White-tailed Deer- Odocoileus virginianus

* Identification tentative; field observation not confirmed by specimen.

Table 2. Mean number of individual small mammals taken on transects in each of six habitat-types (number in parentheses is number of replicate transects).

SPECIES	HABITAT-TYPE					
	PONDEROSA PINE (10)	UPLAND MEADOW (8)	OAK WOODLAND (8)	RIPARIAN GRASSLAND (6)	PRAIRIE DOG TOWN (3)	CLIFFS/TALUS (4)
<u>Tamias minimus</u>	0.10		0.25			
<u>Spermophilus 13-lineatus</u>					0.33	
<u>paromyscus leucopus</u>	0.40	0.12	0.50			1.50
<u>P. maniculatus</u>	0.80	0.75	0.88	0.17		3.00
<u>Microtus ochrogaster</u>		0.25		0.33		

disappointment. However, it is the nature of livetrapping studies of small mammals to reflect field conditions. Therefore a paucity of captures may be as meaningful as an abundance of captures. Thorough survey of the relevant literature should allow us to speculate on the causes behind the patterns observed.

Based on preliminary observations we have begun to draft a dichotomous key to the fauna of the Monument. We soon will be in contact with Monument personnel for guidance as to what other products will be most useful to them.

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Conclusions

Studies of terrestrial vertebrates of Devils Tower National Monument document a rich fauna of complex ecological distribution. In contrast with rather high alpha diversity are the generally populations of small mammals. Comparison of field data with published studies should allow insight into factors underlying the scarcity of small mammals.

Literature Cited

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