

CRATERS OF THE MOON NATIONAL MONUMENT BIOLOGICAL SURVEY

PROGRESS REPORT (1949-1951) - by Earl J. Larrison

The original interest in the fauna of the Monument was the obtaining of short series of several rodents for edaphic color studies. Subsequent investigation of the area, however, indicated its extreme interest as a unique faunal and floral unit, such that I have decided to offer the research which should give us a much better understanding of the biota of the Monument. This report summarizes very briefly the results of field work to date and proposed future work. I shall render a more detailed report in the fall of this year.

WORK IN 1949

Two days were spent in the Monument and were devoted entirely to an investigation of the vegetation and biotic habitats. No specimens were taken. A few photographs were made.

WORK IN 1950

Seven days (August 1-7) were spent in the Monument. A general survey of the habitats of the Monument were made with trips as far south as the craters to the south of the Yellowjacket Waterhole. A reconnaissance map was made of the various vertebrate habitats which were entered on a topographic map with as much detail as possible. A copy of this map will accompany the report to be submitted in the fall. It is planned to revise and correct this map in future field work.

As time allowed, a program of mammal trapping was begun and several habitats in various parts of the Monument were sampled. A standard trapping procedure was adopted which, it is planned, will be followed in the future. The results may be briefly summarized as follows:

(habitats sampled with transect lines of mouse traps placed in a straight line 10 feet apart and baited with rolled oats; these lines to be run for three consecutive nights).

<u>limber pine woods</u>	deer mouse	little chipmunk	
Aug. 2	1	1	
Aug. 3	1	0	
Aug. 4	0	0	
<u>rabbit-antelope brush</u>			
#1 Aug. 2	2	1	
Aug. 3	2	0	
Aug. 4	0	0	
#2 Aug. 5	1	1	
Aug. 6	1	0	
#2 Aug. 2	0	0	
Aug. 3	2	0	
Aug. 4	0	0	
Aug. 5	2	0	pocket mouse
Aug. 6	0	0	1
<u>pahoehoe lava flow</u>			
Aug. 2	1	0	0
Aug. 3	1	0	0
Aug. 4	0	0	

<u>antelope brush-bunchgrass</u>	deer mouse	pocket mouse	meadow mouse
Aug. 2	2		
Aug. 3	2 (2)		1
Aug. 4	0	1 (light)	
Aug. 5			1
Aug. 6	0	0	0
<u>cinder field (Echo Cr.)</u>			
Aug. 4	0		
Aug. 5	0		
Aug. 6	0		
<u>Echo crater rocks</u>			
#1			
Aug. 3	3	1	
Aug. 4	2		
Aug. 5	3		
Aug. 6	0		
#2			
Aug. 3	3	1	
Aug. 4	6		1 little chip.
Aug. 5	2		
Aug. 6	2		
<u>old bahoehoe flow</u>			
Aug. 3	0		
Aug. 4	0		
Aug. 5	0		
Aug. 6	0		
<u>rabbit-antelope brush</u>			
#1 (Echo Cr.)			
Aug. 4	1		
Aug. 5	1		1 little chip.
Aug. 6	1		
#2 (Broken Top)			
Aug. 4		1 (black)	
Aug. 5	1		
Aug. 6	1		

Notes were made on such birds as were seen. Sixty specimens were made up into mammal study skins.

Preliminary study of the specimen material the following winter revealed the validity of those subspecies previously described as endemic to the area. The deer mice, because of their variability, presented various problems in analysis. It was decided to wait for additional specimens and the acquisition of an electronic colorimeter. The latter instrument was received during the winter.

The pocket mice presented an interesting problem. Those specimens obtained in the central portion of the Monument near Broken Top and Echo Crater, conformed closely to the endemic black-colored race (Perognathus parvus idahoensis). Those obtained on the brushy hill just east of the headquarters seemed intermediate in nature. More specimens were thus desired to solve this problem.

Examination of the other specimens was delayed pending gathering of comparative material from southern Idaho.

Notes were made on the occurrence of the various birds and mammals observed. These will be summarized in the forthcoming report.

A tentative outline of a proposed biological study of the Monument was made and presented to the Superintendent upon my leaving the area.

WORK IN 1951

Eight days, September 1-8, were spent in the Monument continuing studies begun the previous year.

General survey and observational work was continued, the prime object being to familiarize myself with the geology and topography of the Monument.

Some forty color pictures were obtained to show the various features and vegetational types of the area.

Observation was made on the distribution and habits of the birds and mammals.

A mammal trapping program was initiated and the results are as follows (the standard trapping procedure of the previous year was followed):

<u>Rabbit-antelope brush (Broken Top)</u>		deer mice	pocket mice	
#1	Sept. 3	9	3	
	Sept. 4	9	4	
	Sept. 5	4	3	
#2	Sept. 3	15		
	Sept. 4	9	1	
	Sept. 5	6	1	
#3	Sept. 3	6	1	
	Sept. 4	7	1	
	Sept. 5	7	3	
<u>brush-bunchgrass (near Hdgs.)</u>				
#1	Sept. 3	8	9	meadow mouse
	Sept. 4	6	6	3
	Sept. 5	2	8	2
#2	Sept. 3	4	3	1
	Sept. 4	4	6	
	Sept. 5	2	1	1
<u>pahoehoe lava flow</u>				
#1	Sept. 3	5		
	Sept. 4	3		
	Sept. 5	4		little chip. - 2
# 2	Sept. 3	5		
	Sept. 4	4		
	Sept. 6	6		

Lower Little Cottonwood Cr.
Bunchgrass Meadow

		deer mice	pocket mice	Microtus
#1	Sept. 6	5	4	
	Sept. 7	4	1	
#2	Sept. 6	5		1
	Sept. 7	3	2	1
#3	Sept. 6	5	1	
	Sept. 7	3	2	

Rodents were found, both in trapping and in general observation, to be much more numerous in 1951 than in 1950. In fact, in a summer devoted to trapping mice in southern Idaho, I found the rodents to be most numerous in the Monument of any place examined. The low of 1950 can probably be attributed to the long cold winter preceding. The much larger population of 1951 is probably the result of the preceding relatively mild winter and good seed crop of the following floral season. Should the winter of 1951-1952 be also mild with and early spring, the rodent population could be even greater, unless some other biotic check, such as disease or competition, should act to control the numbers. I plan to spend a week or two in the Monument in 1952 with one of the prime object being to check the population levels.

Evidence was discovered in 1950 of the presence of pocket gophers in certain of the cinder fields, but I was unable to obtain any specimens. A detailed examination in 1951 revealed the gopher work in the cinder areas to be more widespread but no fresh excavations were seen. A number of sets were made but no specimens obtained. The prolonged dry spell has, no doubt, greatly slowed down gopher activity in the cinder areas. Trapping after a wet spell would produce results, I feel. This is an important matter, as there is possibility that the cinder gopher may represent an undescribed endemic subspecies. In 1951, numerous gopher hills were observed in the area around Little Cottonwood Creek. One specimen obtained here proved to be an intergrade between Thomomys talpoides fuscus and T. t. idahoensis. It will be interesting to compare this population with those of the cinder fields.

On rough analysis, the deer mice of the central part of the Monument seem slightly darker on top with a more strongly bicolored tail, comparing them with specimens from other parts of southern Idaho. Individual and age variation greatly complicate the matter, however. Specimens from the perimeter of the volcanic area, such as from Little Cottonwood Creek, are about evenly divided between specimens similar to those of the central part of the volcanic area and of the normal Snake River Plain type (that is, with tails less strongly bicolored). A detailed series of spot samplings radiating out from the central volcanic area should be made.

The many additional specimens of pocket mice gotten in 1951 solved the pocket mouse problem, at least tentatively. As regards color (and therefore subspecific status), the populations are as follows:

- 1) central part of volcanic area (as around Broken Top); specimens are 100% P. n. idahoensis with typical very dark colorations and large size
- 2) intermediate area, as hill just east of headquarters population 50% black P. n. idahoensis (typical) and 50% intergrades with P. n. clarus, the race of the Snake River Plain. The intergrades are slightly smaller and lighter than the black ones, but darker on top than typical clarus. The chief character showing relation to clarus is the totally white hairs of the belly.
- 3) peripheral intermediate area such as the meadow on lower Little Cottonwood Creek. The population here was 50% young dispersing idahoensis, 25%

intergrades (closer to clarus), and 25% typical clarus.

From these results and other considerations, I deduce the following:

- 1) the pocket mouse of the surrounding normal edaphic areas is clarus, in population sufficiently large to press into the volcanic area
- 2) Selection pressure in the volcanic area, especially in its center, is sufficiently (actually it is abnormally high) strong and the evolved adaptation sufficiently successful to produce a very dark-colored race called Idahoensis. Living conditions and the adaptation in color must be so successful that the population of these mice is very high per unit area
- 3) the high pressure of idahoensis results in centrifugal dispersal of young which meet the inward dispersing clarus. Intergrades are thus produced in number which are intermediate in character, and interesting enough, occupy intermediate areas.
- 4) the dispersal pressures are probably equal, such that the black race, those occupying a relatively small area, is not swamped by the normal group through over-balanced gene flow, if nothing else.
- 5) the centrifugal force of idahoensis in 1951, at least, was so great that young dispersants were found in areas away from the volcanic center in conditions distinctly unfavorable for their existence. It is probable that most of those animals dispersing from the black soil areas suffer from high selective mortality.

Other data and conclusions from observations will be presented in the forthcoming more detailed progress report.

The writer will be occupied in the summer of 1952 in completing a study of the ecology and mammals of Owyhee County, Idaho. However, I intend to spend a week or two in the Monument working on various problems.

I plan to spend the entire summer of 1953 in the Monument, bringing to study to as much of a conclusion as possible. This project would have, among others, the following goals:

- 1) determination of the vertebrate fauna of the Monument
- 2) analysis of certain edaphic color problems among the mammals.
- 3) study of the peculiar ecology of the area
- 4) analysis of color variation in the insects, particularly grasshoppers and beetles.
- 5) additional collecting of botanical specimens to add to the proposed floral study to be made in 1952 by Dr. William Baker of the U. of Idaho, with the purpose of preparing for publication a preliminary flora of the area
- 6) preparation for publication of a paper on the ecology of the vertebrates of the Monument.

September 7, 1951