

On October 28, 1966 a special trip was made to the Research Station to get a measure of the detrimental effects caused by a rapid decline in the volume-flow in the Snake River. Foot-square samples were taken from the newly exposed stream channel and it appears that all the insects were left stranded. Three yard-square quadrats of stream channel were examined to determine the number of sculpins that were stranded on the exposed stream channel. An average of 18 sculpins were left stranded per square yard. This information shows that the unnatural fluctuating water levels are extremely detrimental to the river's ecology, and the depletion of the food organisms must surely have a detrimental effect on the higher trophic levels in the food chain.

This study of the Snake River has the following objectives: (1) to make a complete species list of all the invertebrates found in the river, (2) to determine the life histories of as many of the species as possible, and (3) to determine the effects on the aquatic organisms when the volume-flow is decreased rapidly. Much of this information has already been learned and more will be discovered when all the samples have been quantitatively analyzed.

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Stress and Parasitism  
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Project Number 103

Studies on stress and parasitism during the summer of 1966 were confined to rechecking some of the results of 1965 and to adding information on the volume of cecal contents as indicated by their weight. The main purpose was to try to eliminate some of the variables which are inherent in a project of this sort. Practically all of the laboratory work was done during July.

Twenty ground squirrels (*Citellus armatus*) were collected and examined immediately for protozoa, following the hemacytometer counting technique of last summer. These field controls contained, on the average, 2866 amebas per ml of cecal contents. Last year 40 field controls yielded 3417 amebas/ml. Twenty animals were cold-stressed by the absence of bedding and the addition of ice to their cages each night for three consecutive nights. The average ameba count rose to 5387. Last year the figure for 50 cold-stressed squirrels was 5348, a remarkably similar number. Twenty animals kept in cages with bedding and heated at night (caged controls) had about the same number of amebas as did the stressed animals. This result was comparable to that of last year with 10 caged controls and clearly indicates that caging alone is a highly significant stress factor.

Since the volume of cecal contents might influence the numbers of amebas, all ceca were weighed when removed from an animal and weighed again when the contents were washed out. The weights of the cecal contents were considered to be a reliable indication of their volume. There was found to be no correlation between the weight of cecal contents and the numbers of amebas per ml. An examination of the records of all 170 animals captured during 1965 and 1966 showed no correlation between the weight of a squirrel and the average number of amebas per ml of cecal contents in any of the three groups--field controls, caged controls or cold-stressed.



Cortisone injection experiments were repeated using larger doses of the drug. Last year 1.5 mg per day for 3 days were used with little result. This year 16 mg per day were used. Results were as follows:

1965	20 squirrels	cortisone	4,638	amebas/ml	cecal fluid
1965	20 "	saline	3,405	" "	" "
1966	5 "	Cortisone	20,755	" "	" "

Only 5 animals were used this year because the supply of cortisone was exhausted and no more could be obtained when needed.

ACTH was injected into 10 animals using a dose of 0.05 ml of the commercial product each day for three days. The average ameba count was 10,077.

Average adrenal weights were as follows:

20 field controls	25 mg
20 stressed and caged controls	30 mg
5 cortisone-injected animals	17 mg
10 ACTH-injected animals	19 mg

The difference between the adrenal weights of field animals and caged squirrels was slight. The low weight of those in cortisone-injected animals was expected because the adrenals were "bypassed". In the ACTH-injected squirrels there probably was insufficient time for the adrenals to enlarge.

The results supported the conclusions reached last year and showed that variation in body weight and cecal weights were not significant.

Assisted by Jeanne H. Williams, Student Conservation Program.

Biotic Succession in Lodgepole Pine Forests of Fire Origin  
in Yellowstone National Park  
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Project Number 133

Six areas selected in 1965 were intensively studied in an attempt to determine the pattern of succession in the development and establishment of lodgepole pine (*Pinus contorta latifolia* Engelm.) forests. The six forests are from 5 to 260 or 280 years old.

Hygrothermograph, maximum-minimum temperature, and rainfall records were collected from June 11 to August 26. Atmometers were in the field from July 26 to August 26. Data on soil temperatures were collected on two areas during June, July, and August, and on four areas during part of July and through August.

Forty-five soil samples were collected, making a total of 60 samples (10 from each area). Chemical analysis is almost completed on these samples.

Each area was snap-trapped (120 traps for 3 nights) in late June and again in late August. A total of 4,220 trap nights yielded 235 rodents. Eight species were collected. A tentative summary of rodent trapping data is presented in Table 1.