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AN ECOLOGICAL COMPARISON OF TWO STREAM  
SECTIONS WITH AND WITHOUT NATIVE FISH  
POPULATIONS, IN YELLOWSTONE NATIONAL PARK

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This is a brief report of a reconnaissance survey of the benthic macroinvertebrate community above and below a natural barrier to fish movement on Raven Creek, a tributary of Pelican Creek in the Lake Yellowstone watershed. This project is part of a U.S. Fish and Wildlife Service program to evaluate differences in stream ecology with and without native fish populations. The Final Report is due June 30, 1978.

#### Study Objectives

- A. The purpose of this investigation is to identify the components of the benthic macroinvertebrate community in fish and fishless sections of Raven Creek, and
- B. To determine if there are differences between these communities in relation to species composition, distribution, abundance, and drift activity.

#### Methods

On July 15 and 16, 1977, benthic macroinvertebrate samples were collected quantitatively (0.06m<sup>2</sup> circular bottom sampler) from rubble and gravel substrates 100m and 400m upstream and 400m and 2000m downstream from 5m high Raven Creek Falls.

Drift samples of benthic macroinvertebrates, using two 0.1m<sup>2</sup> vertical frame nets, were collected simultaneously 100m upstream and 400m downstream from the falls. Nets were exposed for 20 minutes at the following times: 12:00, 16:30, 20:30, 22:00, 00:30, 05:20, 07:00, and 09:00.

Personnel from the U.S. Fish and Wildlife Service electrofished the stream above the falls to confirm the lack of fish in this section. A 200m long section, below the 400m downstream benthic station, was shocked for obtaining an estimation (De Lury Method) of the fish population (Salmo clarki lewisi). Stomach samples were taken from 48 fish; content analysis should give an indication of predation by trout on the invertebrate community.

### Results

This past Fall all 20 of the benthic samples and 25 of the 32 drift samples were sorted (this was rather time consuming due to large amounts of algae and debris plus high numbers of organisms present in the samples). I have just started to analyze the samples; therefore, no results are available.

### Recommendations and/or conclusions

The original proposal had two visits scheduled to this area; because of time limitations only one visit took place. Perhaps sampling at a later date in a different season would be possible. I suggest that other fishless areas (30 have been identified so far) be investigated to see if similarities exist. The significance of differences or similarities between fish and fishless portions of streams is important in the management of endangered habitats. Therefore, sampling should be extended to other areas as suggested by the U. S. Fish and Wildlife Service.

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