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SOUTH-CENTRAL FISHERY STUDY

JOB II

ROCK CREEK FLOODPLAIN STUDY

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The maintenance of a population of any organism is dependent on the presence of suitable habitat. Nearly all fish habitat in Montana is under ownership of private individuals or government agencies other than the Montana State Fish and Game Department. This habitat, particularly that which is in private ownership, is subject to the influences of various land-use practices, some obviously detrimental to the welfare of fish. Rock Creek, one of the better trout streams in south-central Montana, is located in a heavily farmed valley near Billings, one of Montana's largest cities. Recently, as a result of the threat of heavy erosion, a channel clearance and realignment program was undertaken on this stream by the U.S.D.A. This program was financed in part with federal funds under the Agricultural Conservation Program, and the SCS furnished technical supervision. By removing snags and pools, piling rubble against undercut banks, and by making the stream shorter, wider, and shallower, this program seriously reduced the amount of fish habitat and, indirectly, the numbers of fish in the stream.

Observations made by Montana Fish and Game Department personnel indicate that this program destroyed fish habitat and ignored the major cause of excessive erosion on Rock Creek. Personnel of this department feel that excessive erosion by Rock Creek has resulted largely from use by livestock. The well-defined floodplain is vegetated by trees, shrubs, and grasses, which would normally minimize bank cutting and channel migration. On those ranches where heavy use by livestock has resulted in reduction and/or change of floodplain vegetation, the erosion problem has been severe. On other ranches, where flood plain grazing is not practiced, cottonwood, willows, and other shrubs are abundant in all age groups, and little erosion occurs. In the latter areas, the river channel is typically deeper and narrower, with good trout pools and undercut banks.

This project will investigate the effect of floodplain grazing on the fishery of Rock Creek. It will provide information for the department as well as ranchers and government agencies, which enable the formulation of land use practices for the protection of the fishery of Rock Creek and similar streams.

Specific objectives of the study are:

1. To determine the relationship between intensity of livestock use and the density and composition (by species and size class) of floodplain and bank vegetation.
2. To determine the effect of floodplain and streambank vegetation on stream channel stability and other channel characteristics (depths, widths,

bottom types, pool-riffle relationships, etc.) and on the fish populations of the stream.

Procedure:

1. Experimental stations on the floodplain, subject tovarious intensities of livestock grazing, will be established. Stations of moderate to severe grazing intensities can be chosen on ranches where the owners are willing to cooperate to the extent of allowing access by department personnel and by reporting numbers of animals using the area. Stations with no grazing will be established by purchase of land by the department and fencing this land to exclude livestock. It is desirable to include in the latter class sections in which vegetation had been abused as well as sections in which present vegetation is relatively undisturbed.

2. These stations will be mapped, showing vegetation of the flood plain as well as location, average depths, widths, velocities, bottom types and pool-riffle relationships of the stream. Vegetation will be measured quantitively as to species composition, age class composition, and density at regular intervals during the study. Mapping will be supplemented by photographing and the establishment of bench marks so that the amount of cutting and changes in channel location and cross-section can be measured. The stream channel will be surveyed periodically in order to evaluate changes in location and morphology of the bed.

3. Fish populations of the stream within the sample areas will be sampled periodically with electric stream census methods in order to determine the size of the standing crop and the age and species composition under various land use practices.