



The fishery of Hyalite Reservoir during 1974 and 1975  
by Jerry Darwin Wells

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE  
in Fish and Wildlife Management  
Montana State University  
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**Abstract:**

A partial creel census was conducted to estimate the fishing pressure, catch rates, and harvest of fish at Hyalite Reservoir from June to September 1974 and 1975. Fishing pressure was estimated to be 9663 hours in 1974 and 8384 hours in 1975. Estimated catch rates were 0.20 fish/hour in 1974 and 0.12 fish/hour in 1975. The estimated harvest was nearly 2500 fish in 1974 and 1000 fish in 1975. The lower catch rate and harvest in 1975 were due to the absence of hatchery cutthroat trout entering the fishery. Cutthroat trout, Arctic grayling and brook trout, respectively, made up 96, 3 and 1 percent of the harvest in 1974 and 76, 18 and 4 percent in 1975. Hatchery cutthroat trout made up 72 percent of the total estimated harvest in 1974 but only 25 percent in 1975. The use of the East and West Forks of Hyalite Creek by cutthroat trout and grayling in spawning condition was investigated during 1975. Over 98 percent of the presumed spawners were captured in the West Fork. Twenty-two ripe cutthroat (ages III-V) and 134 ripe grayling (ages III-VI) were captured in this stream. Sexually mature cutthroat trout first entered the stream when flow was increasing from spring runoff and mean daily stream temperature was near 3 C. No distinct peak in their numbers was observed. All were wild appearing fish. Spawning grayling entered the stream after peak flows when mean daily stream temperature was near 6 C. A distinct peak was observed in the seventh day of their run. No cutthroat trout fry and nearly 2,000 grayling fry were captured migrating into the reservoir.

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Approved:

William R. Gould  
Chairman, Examining Committee

James M. Pickett  
Head, Major Department

Henry L. Parsons  
Graduate Dean

MONTANA STATE UNIVERSITY  
Bozeman, Montana

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## ABSTRACT

A partial creel census was conducted to estimate the fishing pressure, catch rates, and harvest of fish at Hyalite Reservoir from June to September 1974 and 1975. Fishing pressure was estimated to be 9663 hours in 1974 and 8384 hours in 1975. Estimated catch rates were 0.20 fish/hour in 1974 and 0.12 fish/hour in 1975. The estimated harvest was nearly 2500 fish in 1974 and 1000 fish in 1975. The lower catch rate and harvest in 1975 were due to the absence of hatchery cutthroat trout entering the fishery. Cutthroat trout, Arctic grayling and brook trout, respectively, made up 96, 3 and 1 percent of the harvest in 1974 and 76, 18 and 4 percent in 1975. Hatchery cutthroat trout made up 72 percent of the total estimated harvest in 1974 but only 25 percent in 1975. The use of the East and West Forks of Hyalite Creek by cutthroat trout and grayling in spawning condition was investigated during 1975. Over 98 percent of the presumed spawners were captured in the West Fork. Twenty-two ripe cutthroat (ages III-V) and 134 ripe grayling (ages III-VI) were captured in this stream. Sexually mature cutthroat trout first entered the stream when flow was increasing from spring runoff and mean daily stream temperature was near 3 C. No distinct peak in their numbers was observed. All were wild appearing fish. Spawning grayling entered the stream after peak flows when mean daily stream temperature was near 6 C. A distinct peak was observed in the seventh day of their run. No cutthroat trout fry and nearly 2,000 grayling fry were captured migrating into the reservoir.

## INTRODUCTION

Hyalite Reservoir was created by the construction of an earth filled dam across Hyalite (Middle) Creek. Construction was begun in 1939 by the Montana State Water Board under a permit granted by the United States Forest Service. Work was interrupted during World War II with the dam being completed in February, 1951. The reservoir was created to supply water to the Gallatin Valley for irrigation. Presently, it also provides water to the City of Bozeman for municipal use and receives substantial fisherman use because of its accessibility, scenic setting, adjacent camping facilities and proximity to a population center.

The reservoir presently contains cutthroat trout (*Salmo clarki*), Arctic grayling (*Thymallus arcticus*), brook trout (*Salvelinus fontinalis*) and cutthroat-rainbow trout hybrids. The species resident in the drainage above the dam at its completion are unknown. However, records show the Montana Department of Fish and Game began planting hatchery Yellowstone cutthroat trout in Hyalite Reservoir in 1953 and released approximately 10,000 fish of 4" length into the reservoir annually from 1968 through 1972. The approximately 10,000 cutthroat planted as 4" fish in September were marked with a right pectoral fin clip. In June 1973 an additional 5,000 cutthroat of 9" length were marked with an adipose fin clip and released into the reservoir. Both

groups of marked fish were clearly identifiable during 1974 and 1975.

Plants were discontinued in 1974.

Intensive field work was conducted on the fishery of Hyalite Reservoir from June through September, 1974 and 1975. The primary purpose of the study was to determine the fisherman use, harvest and contribution of hatchery fish to the harvest during 1974 and 1975. The natural reproduction of cutthroat trout and Arctic grayling in the inlets to the reservoir was also investigated during 1975.

## DESCRIPTION OF STUDY AREA

Hyalite Reservoir is located in southwestern Montana in Gallatin County approximately 17.5 air kilometers south of Bozeman. The reservoir is situated in an elongate basin in the Gallatin Range at an altitude of 2012 meters. It drains 2332 hectares (5760 acres) of steep slopes belonging to the Gallatin National Forest and the Burlington Northern Railway. An unsurfaced road provides easy access to Hyalite Reservoir and its campgrounds during the snow-free months. The road is not maintained during the winter months but snowmobile traffic is allowed.

At maximum capacity Hyalite Reservoir contains 991 hectare-meters (8,027 acre-feet) of water, has a surface area of 84.2 hectares (208 acres) and a maximum depth of 27 meters (88.6 feet). However, it is subject to extreme fluctuations in water level with an annual draw-down of up to 8 vertical meters. Typically, the reservoir is filled to capacity in early summer and then drawn down through the fall with water maintained at low levels from October until the onset of spring runoff. Most of the runoff enters by way of the East and West Forks of Hyalite Creek (Fig. 1). High water in the West Fork occurred in mid-June, 1974 and early July, 1975 (Fig. 2). Peak flow in the East Fork also occurred in early July, 1975. Water levels of the reservoir during 1974 and 1975 are shown in Figure 3.

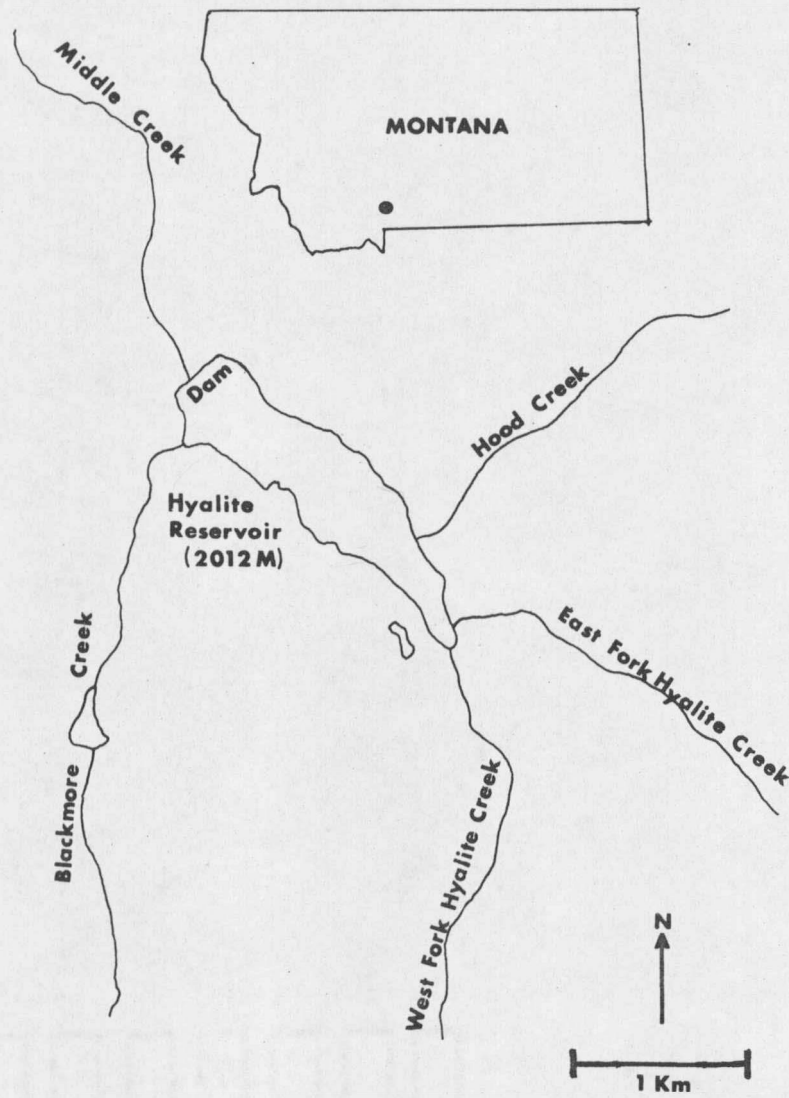


Figure 1. Map of the study area showing major inlet streams and outflow (Middle Creek).

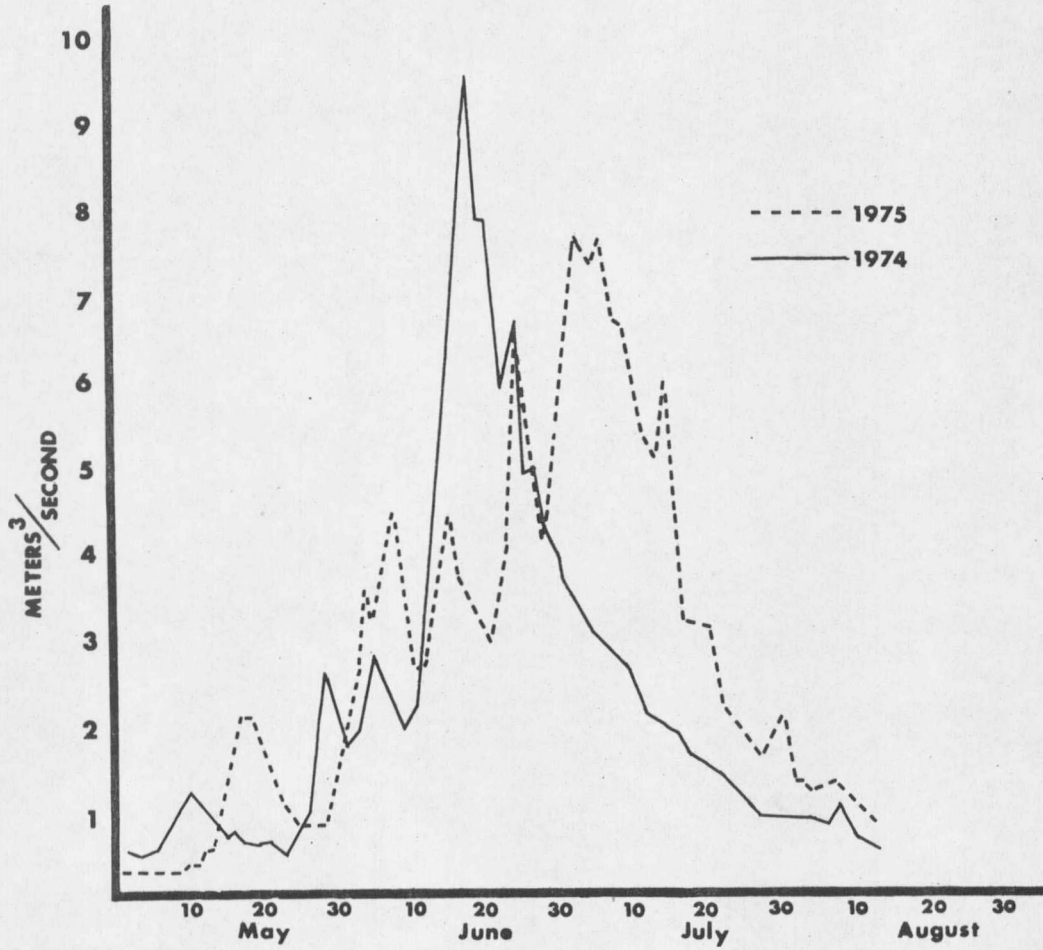


Figure 2. Stream flow in the West Fork of Hyalite Creek from May through August 1974 and 1975. (Data from Montana Dept. of Nat. Resources)

































































































