



Fisherman use and fish harvest on the West Gallatin River, Montana  
by Richard Seth Lyden

A thesis submitted to the Graduate Faculty 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:

Estimates of fishing intensity and yield of game fish were made on the canyon portion of the West Gallatin River, Montana during the summer fishing seasons, of 1971 and 1972» Two sections each about 11 miles long were selected for intensive study» These sections were the most accessible and most heavily fished portions of the river.

An estimated 57 percent in 1971 and 36 percent in 1972 of all fisherman were interviewed. During 1971, total fisherman days per stream mile were estimated to be 181 and 224 for the upper and lower sections, respectively while during 1972 these values were 196 and 274, respectively. An increase in fishing pressure of 35 percent in the lower section was attributed to a shorter high and turbid water period in 1972. The catch varied from 5,318 fish caught in 3,305 fisherman days in section B during 1972 to 3,618 fish caught in 2,616 fisherman days in section B during 1971. The average number of fish caught per fisherman' day ranged from 1.38 to 2.02. Catch rates for wild rainbow trout ranged from 0.15 to 0.35 and for hatchery trout ranged from 0.05 to 0.30. Wild and hatchery rainbow trout combined, contributed 67.2 to 93.4 percent of the total game fish catch for both sections both years. An increase in the take of hatchery trout from 1971 to 1972 appeared to be due to more selective planting in 1972, The upper section, late summer, and weekdays were characterized as tourist fisheries while the lower section, early summer, and weekends-holidays were characterized as local fisheries. Tourists caught more, trout than did locals but a greater percentage of the tourist catch was comprised of hatchery fish.

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A thesis submitted to the Graduate Faculty in partial  
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## ABSTRACT

Estimates of fishing intensity and yield of game fish were made on the canyon portion of the West Gallatin River, Montana during the summer fishing seasons of 1971 and 1972. Two sections each about 11 miles long were selected for intensive study. These sections were the most accessible and most heavily fished portions of the river. An estimated 57 percent in 1971 and 36 percent in 1972 of all fisherman were interviewed. During 1971, total fisherman days per stream mile were estimated to be 181 and 224 for the upper and lower sections, respectively while during 1972 these values were 196 and 274, respectively. An increase in fishing pressure of 35 percent in the lower section was attributed to a shorter high and turbid water period in 1972. The catch varied from 5,318 fish caught in 3,305 fisherman days in section B during 1972 to 3,618 fish caught in 2,616 fisherman days in section B during 1971. The average number of fish caught per fisherman day ranged from 1.38 to 2.02. Catch rates for wild rainbow trout ranged from 0.15 to 0.35 and for hatchery trout ranged from 0.05 to 0.30. Wild and hatchery rainbow trout combined, contributed 67.2 to 93.4 percent of the total game fish catch for both sections both years. An increase in the take of hatchery trout from 1971 to 1972 appeared to be due to more selective planting in 1972. The upper section, late summer, and weekdays were characterized as tourist fisheries while the lower section, early summer, and weekends-holidays were characterized as local fisheries. Tourists caught more trout than did locals but a greater percentage of the tourist catch was comprised of hatchery fish.



## INTRODUCTION

The upper 41 miles of the West Gallatin River in Montana is one of eight streams in the state that is classified as having national as well as statewide fishery value. It represents 10 percent of the top quality stream miles in the state (Brown *et al.*, 1959). In the past several years this part of the river and the surrounding canyon area have been increasingly used for recreation.

In the late 1800's and early 1900's the Gallatin Canyon was used primarily for ranching and lumbering operations. During the period 1905 to 1914 the area was placed in the Gallatin National Forest, a road was built to West Yellowstone, and dude ranching began. This period signified the real opening of the canyon area and since then tourism has steadily risen in importance. With the growth of recreational activities, the rise in federal regulatory powers, and the increased activities of large corporations like Burlington Northern and Chrysler Realty, increased development of the Gallatin Canyon is occurring.

Construction of a large recreational development, the Big Sky of Montana complex, was initiated in the spring of 1971. This complex is located on the West Fork drainage of the Gallatin River and is expected to have a considerable impact on the area. In light of these expectations a study was made to evaluate the environmental, economic, and recreational features of the area prior to full development of the

complex. As a part of this larger study a fishing survey was conducted on the upper West Gallatin River in the canyon during the summer fishing seasons of 1971 and 1972. The primary objective of the study was to obtain baseline information on fisherman use and fish harvest.

## DESCRIPTION OF THE STUDY AREA

The West Gallatin River originates on the east slope of the continental divide in Yellowstone National Park. It flows approximately 100 miles north to near Manhattan, Montana where it joins the East Gallatin River to form the Gallatin River.

From its origin the West Gallatin River flows through high mountainous valleys until it reaches the Yellowstone National Park boundary. From the Park boundary the river flows through the Gallatin Canyon for a distance of about 41 miles after which it crosses the broad Gallatin Valley to its confluence with the East Gallatin River. The West Gallatin River drains an area of 1,100 square miles all above 4,000 feet elevation. Of this drainage area 825 square miles are located above the mouth of the Gallatin Canyon.

The primary study area was the Gallatin Canyon and included the river from the Yellowstone National Park boundary downstream 41 miles. Fishing access sites are numerous along this portion of the river as the river flows through a preponderance of publicly owned land and is closely paralleled by a highway (Fig. 1).

In the canyon the West Gallatin River has a gradient of approximately 38 feet per mile and average width of about 60 feet. Pools and riffles occur in close succession and vary in length from a few to over 200 feet. A few of the pools are over 12 feet in depth. The

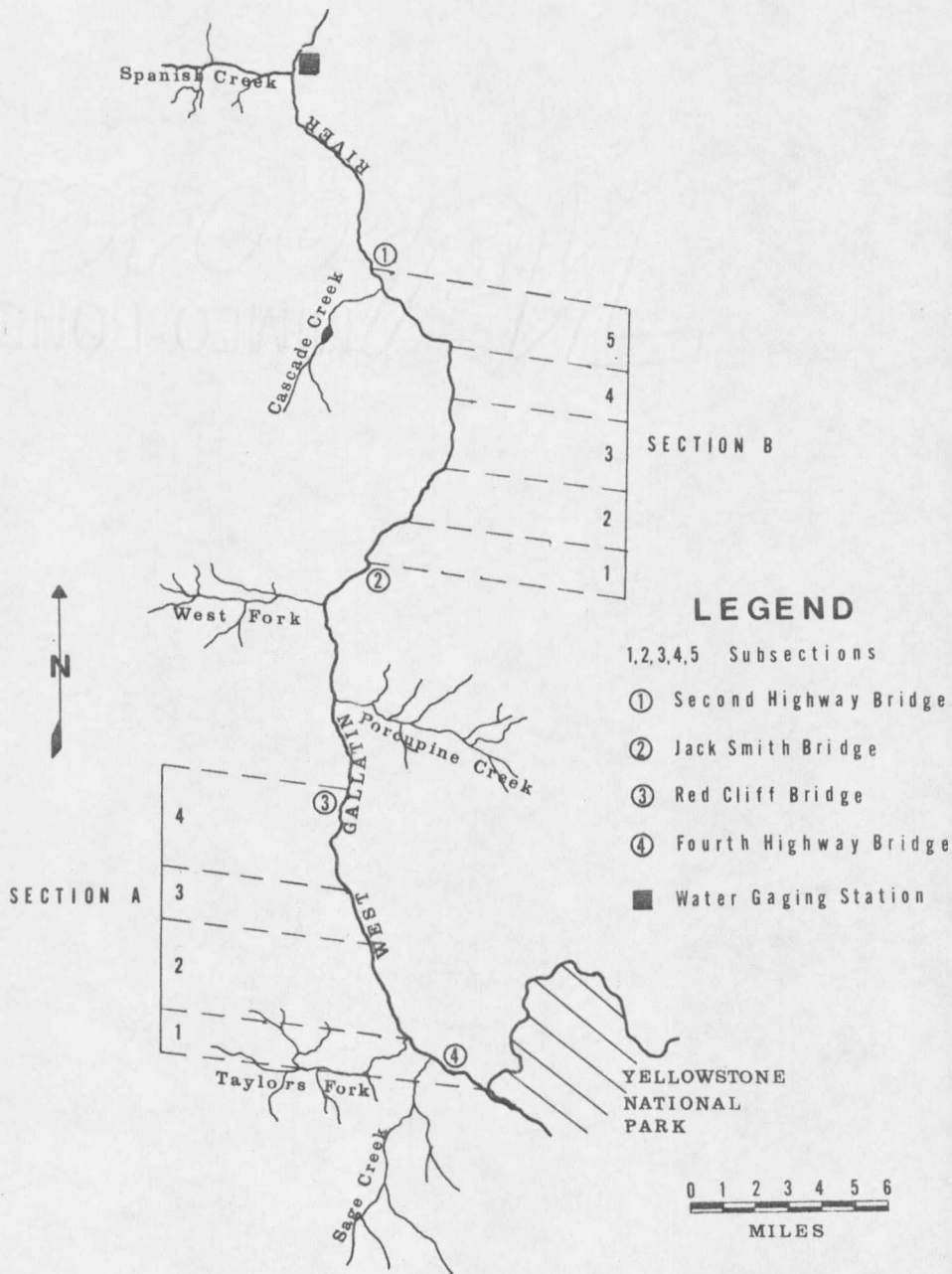


Figure 1. Study area, showing location of study sections A and B on the West Gallatin River.

stream bed is composed largely of loose boulders, rubble, gravel, and sand (Missouri River Basin Studies, 1951).

Surface discharge data for the period 1930 to 1969, and 1972, obtained from a U.S. Geological Survey gage station located on the river near Spanish Creek, show that the high water period normally occurs from late May to late June with peak flows occurring in early June and ranging up to 6,500 cfs. In 1972 high water extended from late May until late June with a peak flow of 5,540 cfs occurring on June 7. Discharge data taken from the Gallatin River near Logan, Montana suggested flow trends for the West Gallatin River (Fig. 2). These data showed that the high water period of 1971 lasted two weeks longer and that discharges were higher than those of 1972.

Rainbow trout (*Salmo gairdneri*) were the most important game fish in the canyon. Other game fish present include brown trout (*Salmo trutta*), cutthroat trout (*Salmo clarki*), rainbow-cutthroat hybrid trout, brook trout (*Salvelinus fontinalis*), and mountain whitefish (*Prosopium williamsoni*). Non-game fish present include mottled sculpin (*Cottus bairdi*), longnose sucker (*Catostomus catostomus*), white sucker (*Catostomus commersoni*), and longnose dace (*Rhinichthys cataractae*).

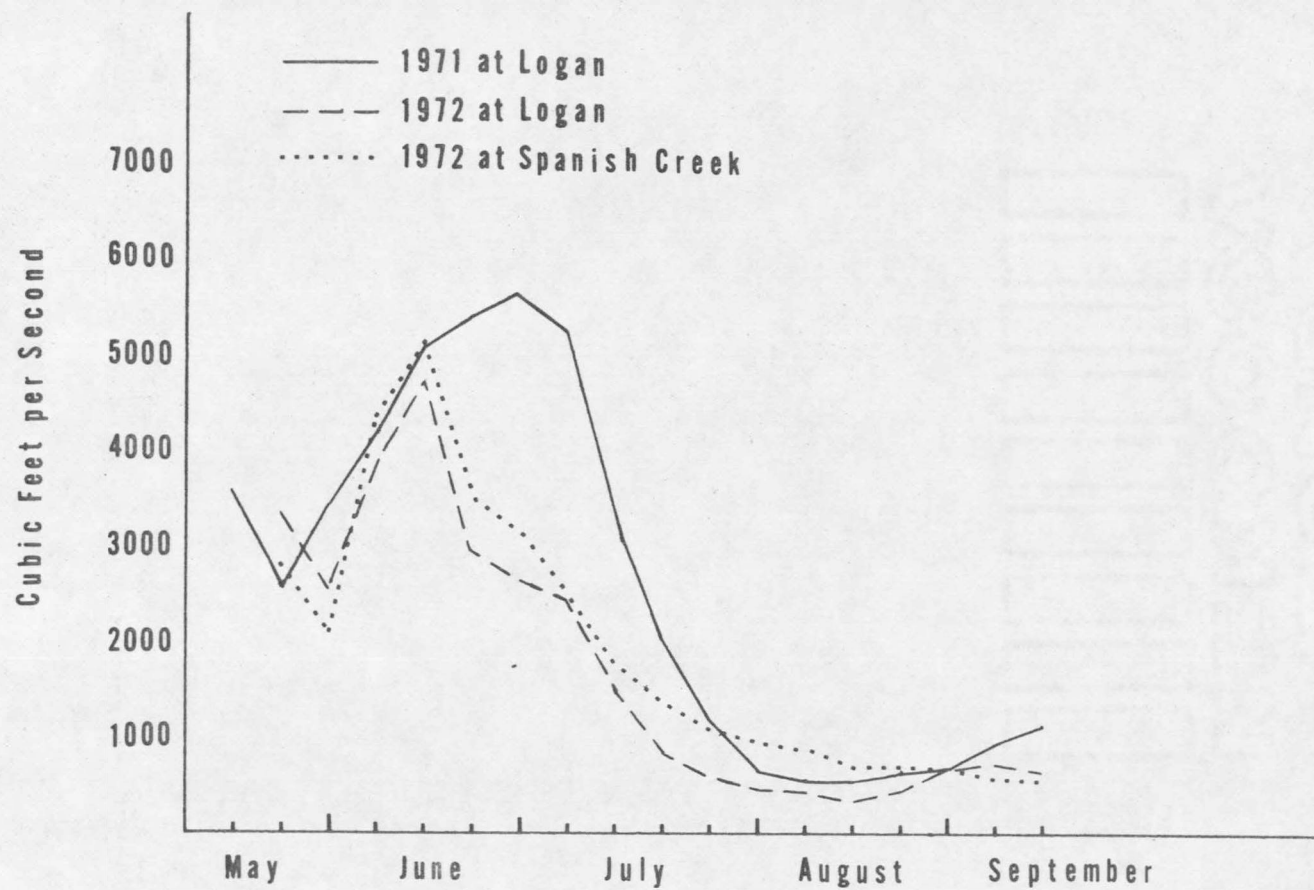


Figure 2. Discharge for the Gallatin River at Logan and for the West Gallatin River at Spanish Creek.

## METHODS

Two sections of the West Gallatin River in the canyon were selected for intensive study. These sections contained the most accessible and observable portions of the river. A preliminary study conducted during 1970 along the entire 41 miles of the river in the canyon showed that 75 percent of the fisherman counted were in these two sections (Graham, personal correspondence). Study section A began at the Yellowstone National Park boundary and continued downstream 11.1 highway miles to a point 0.7 of a mile below the Red Cliff bridge (Fig.1). This section was further divided into four subsections ranging in length from 2.2 to 3.6 miles. Study section B began at the Jack Smith bridge located two miles below the West Fork tributary and continued downstream 11.8 miles to the second highway bridge located just below Cascade Creek. This section was further divided into five subsections ranging in length from 1.8 to 3.6 miles.

Beginning on the opening day of fishing season in each census year (May 16, 1971 and May 21, 1972) and continuing for four weeks in 1971 and three weeks in 1972, fisherman were censused on weekends and holidays. For the remainder of the summer up until September 12, 1971 and September 10, 1972, fisherman were censused a minimum of four days a week with the stipulation that all weekends and holidays be included. The weekdays censused were chosen at random with the































































