

MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

The Madison River Sport Fishery - 1951 - 1963

The Madison River in southwestern Montana has long been recognized as one of the nation's top ranking trout streams. This river supports a good population of brown trout, rainbow trout and mountain whitefish. Large fish, especially brown trout are common in the river. The popularity of this stream has been largely due to these big fish.

During the period 1950 - 1952, a creel census and fisherman-expenditure study was conducted on the Madison by the Fish and Wildlife Service. This study was designed to obtain information on fishing pressure, angler success, total harvest and fishermen-expenditures. Development for irrigation and power were being considered at that time. Fish and Game personnel have collected creel census data on the Madison as part of the statewide creel census since 1951.

The fish population of the Madison has been sampled with electric shockers in recent years. Shockers are most effective on small streams where a stream section can be blocked off and nearly all fish can be collected. However, an adequate sample can be obtained from a large river with modifications in gear and techniques.

The Madison River below Ennis Lake has been open to winter fishing since 1959. Winter fishing was permitted on the river between Ennis Lake and Quake Lake in 1962 - 63. This season was requested by the Madison Valley Rod and Gun Club. Prior to 1959, winter whitefish seasons were in effect on the entire river.

During the past summer, the Fish and Game Department received letters or copies of letters from several individuals objecting to the winter fishing season upstream from Ennis Lake. Most of these letters were from non-resident fishermen who fish the river during the regular season. These people expressed concern that winter fishing has or will deplete the number of large wild brown trout and rainbow trout. Most of these letters indicate the parties concerned come to Montana to catch large wild fish and that they have little interest in catching hatchery-reared fish.

This report is a summary of the creel census and shocking data available from the Madison River since 1950, and will deal primarily with that portion of the river between Ennis Lake and Quake Lake since this is the area in question. The creel census conducted by the U. S. Fish and Wildlife Service in 1950-52 differs from our statewide creel census in several ways. The 1950-52 census was conducted by five 7-man crews working on approximately 1/3 of the river during each of the 3 years of study. With this extensive coverage, estimates of total pressure and harvest could be made in addition to catch per hour, species composition of the catch and average size of fish. Our statewide census gives less extensive coverage over the entire river each year. This data cannot be used for estimates of total pressure nor harvest, but it does provide annual trend data on catch per hour, species composition and size of fish. These factors will be discussed in this report since they would change if overfishing has occurred.

The Madison River is divided into 4 sections for the statewide creel census. Section 2 extends from Ennis Lake to Sheep Creek, which is about 1 mile from the outlet of Quake Lake. Part of this area was censused by the Fish and Wildlife Service in 1951 and the remainder was part of the 1952 census. The area now inundated by Quake Lake (Madison Canyon) was recorded separately in 1952 and will be excluded for comparisons to be made in this report. Only trout and grayling are included in calculations.

The catch per hour recorded in 1951 and 1952 was .55 and .57 fish per hour of angling. The data available from the statewide census of 1953 and 1954 was based on very few contacts so it was not used for this report. The catch per hour from 1955 through 1962 ranged from .55 to .97 fish per hour of effort. The rate of catch has fluctuated between those values without any trend upward or downward. The 1963 data is not complete but data available at this time shows an average catch of .65 fish per hour during December through February, and .72 fish per hour during March 1 through May 19, 1963. The catch rate from May 20 through mid-August, 1963 was .76 fish per hour. Fishing success drops off during late summer so the final 1963 rate of success will be slightly lower than .76 but will probably be comparable to that of past years. Although the catch rate was high during the winter season, there is no evidence that success during 1963 was adversely affected.

Another statistic that can indicate effects of angling is the average size of fish. If overfishing occurs, smaller and younger fish will be more abundant in the creel and the average size will be reduced. In 1951 and 1952 the brown trout harvested from this section of river averaged 14.2 and 14.4 inches respectively. During the regular seasons of 1955 through 1962, the browns averaged from 12.3 to 13.7 inches in length. Average lengths have been over 13.0 inches since 1959. Brown trout taken during December through February of last winter averaged 16.9 inches in length and average size from March 1 through May 19 was 15.3 inches. Browns checked prior to July 1, 1963 averaged 14.5 inches. This average length compares favorably with that of other years, indicating that the winter fishing has not adversely affected the size of browns available to summer anglers on the Madison River.

Analysis of the average size of rainbow trout is complicated by introduction of hatchery fish. These fish may vary in size from year to year and fin erosion also introduces an error in length data. The rainbows averaged 11.8 inches in 1951, 11.3 inches in 1952 and ranged from 10.5 to 12.9 during the 1955-1962 period, with no definite trend upward or downward. Rainbows averaged 12.5 inches during the winter season of 1962-63 and 11.7 inches during the current season. Again there is no evidence of over fishing unless the presence of hatchery fish tends to mask a change in the average size of wild rainbows.

The species composition of the creel is difficult to evaluate because of the number of hatchery fish and whitefish recorded. The effect of other species, such as grayling, cutthroat and brook trout, would be negligible. Brown trout have made up 20 to 30% of the observed catch since 1951. About one-quarter of the fish checked during the current season were browns. Fifty-five percent of the observed catch during the 1962-63 winter season were brown trout. This increase in relative harvest of brown trout during the winter is largely due to two factors; 1. no hatchery rainbows are planted during the winter, 2. brown trout are usually more vulnerable to hook-and-line fishing during the winter. However, this does not indicate over-exploitation of this species. This will be discussed further under a section dealing with shocker samples.

In summarizing the creel census data, catch per hour, size of fish and species composition have been fairly constant during the regular seasons of 1951, 1952 and 1955 through 1962. During the winter season of 1962-63, brown trout made up a greater percentage of the creel and were of a larger average size. Catch per hour may also have been higher during the winter. However, it must be remembered that fishing pressure is very light during the winter and total harvest is small. It has been estimated that the harvest on one weekend during the "salmon-fly season" exceeds the total winter harvest on this section of the river. This winter harvest is allowing anglers to take some of the fish that would normally be lost through winter mortality. The larger average size indicates that winter anglers harvested large brown trout that are not taken by a large majority of anglers during the regular season.

Flows in the Madison River were greatly reduced following the earthquake in 1959. This afforded fishery personnel an opportunity to sample the fish population with an electric shocker. The unit used was quite heavy and could only be used near bridges or other accessible areas. A total of 265 rainbow trout, 159 brown trout, and 1 brook trout were taken as well as whitefish, suckers and other non-game species. Seventy-nine of the brown trout and 57 of the rainbow trout were nine inches or longer; 16 browns and 9 rainbows were in the 16- to 22-inch size group. Thirty-three of the 6- to 14-inch rainbows were identified as hatchery fish. This sampling indicated an excellent trout population with a considerable number of large fish and ample reproduction.

During 1963 portable shockers were used to sample the fish population of the Madison. These units were placed in boats and floated downstream, usually along one shoreline. Float distances ranged from 2 to 7 miles and a total of 5 float trips were made on portions of the river between McAtee Bridge and Ennis Lake. Areas used by small fish were not sampled extensively and many small fish passed through the mesh of the dip nets. Therefore, yearling and young-of-the year fish were not taken in relation to their true abundance.

A total of 1199 trout were collected in this sampling. Sixty-three percent of these fish were brown trout. Wild rainbows made up 31% of the catch and the remaining 6% were hatchery-reared rainbows. Although browns make up considerably less than one-half of the anglers' catch, they made up nearly two-thirds of the standing population of trout in 1963 and nearly 60 percent of the 9-inch and longer trout taken in the 1959 sampling. This indicates that brown trout are not being harvested in proportion to their abundance in the stream. A light harvest during the winter season will allow fishermen to take some of these fish without jeopardizing the summer fishery. This principal was well illustrated on a heavily fished section of O'Dell Creek near Ennis that was shocked in May and August, 1963. On May 10, prior to opening of the fishing season but after the period of highest natural mortality, the 500-foot section of stream contained 48 catchable sized browns and 13 catchable sized rainbows. On August 12, which is after the period of heaviest fisherman use, the same stream section contained 73 browns and 13 rainbows over 7 inches in length. Natural recruitment from smaller size classes of brown trout far exceed angler harvest plus natural summer mortality of this stream section.

The largest brown trout taken during shocking operations on the Madison was over 23 inches long and weighed 5.2 pounds. Sixteen percent of the browns were in 16 through 23 inch groups which are mostly fish of 2 to 5 pounds. This indicates that large browns are common in the river although the harvest of these fish is

relatively small. The following quotations from the U.S. Fish and Wildlife Service report of the creel census indicates that there has been little change in abundance of 5 pound fish since 1952:

"The largest recorded trout was a rainbow 32 inches long, weighing 5 pounds (dressed). The largest recorded brown trout was 24 inches long and weighed 5 pounds. Trout over 24 inches in length were uncommon and less than 25 fish of 24 or more inches in length were recorded in any one year. . . ."

Concern has been expressed over the harvest of trout from the Madison River during spawning seasons. It has been demonstrated that the number of spawners is not a limiting factor in trout production of Montana streams such as the Madison River. The Madison has extensive gravel areas which provide adequate spawning facilities. The success of natural reproduction by both brown trout and rainbow trout was evidenced by observation of large numbers of young-of-the year and yearling trout during the 1963 shocking operations.

These data indicate that the brown trout are underharvested at the present time and that there is no justification, from a biological standpoint, for curtailing the winter fishing season.

Sampling with electric shockers will be carried out each year to determine changes that may occur in the fish population. The Bureau of Sport Fisheries and Wildlife have indicated an interest in a creel census comparable to the study of 1950 through 1952. They should be encouraged to initiate a study of this type at the earliest possible date.

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