JOB COMPLETION REPORT

INVESTIGATIONS PROJECTS

State of Montana Name Central Montana Fishery Study

Project No. F-5-R-7 Title Inventory of Waters of the Project Area

Job No. I

Period Covered May 1, 1957 - April 30, 1958

Abstract:

Five lakes were surveyed for fish populations present. Physical characteristics were also checked in the lakes surveyed.

Water samples from Belt Creek have been taken and other data collected in an effort to establish water quality standards.

Aerial photographs were taken of ten lakes.

Survey data was collected in connection with forest spraying operations.

Data collected has been recorded and is on file in the district headquarters in Great Falls.

Objectives:

The purpose of this project is to determine the physical, chemical and biological characteristics of the waters of highest importance to the total recreational fisheries picture of the project area, and where practicable potential fisherman use.

Techniques Used:

Samples of fish were collected in lakes and ponds by use of experimental gill nets.

A 110-220 volt motor generator shocker was used to sample three hundred foot sections of streams.

Aerial photographs were taken and used as maps in the survey work.

Findings:

Tunnel Lake in Teton County was treated with toxicant during September 1956. Two 125-foot experimental gill nets were set in the lake on June 10, 1957 and lifted two days later on June 12. No perch were caught but five white suckers (Catostomus commersonni) were taken indicating that a complete kill of that species had not been attained. The lake was stocked with approximately 40,000 cutthroat trout fingerlings on August 27, 1957.

Work started in 1956 on Willow Creek Reservoir in Lewis and Clark County was followed through June 1957. Two 125-foot experimental gill nets were set in the reservoir on June 6 and June 13, 1957. In the four nets set, each for two and one-half hours the catch of white suckers was 22 per hour per net.

Ackley Lake in Judith Basin County was sampled with two 125-foot experimental gill nets on August 2, 1957. An average of 26 longnose (Catostomus catostomus) and white suckers (Catostomus commersonnii) per hour per net were caught. In addition to the suckers, two whitefish (Prosopium williamsoni) and one rainbow (Salmo gairdnerii) were caught.

Kolar Reservoir No. 1, near Geyser, in Judith Basin County, was sampled with two 125-foot experimental gill nets on August 5, 1957. Twenty white suckers per net per hour were taken. In addition 5 rainbow trout were caught. The reservoir was rehabilitated and is reported in the Completion Report for F-24-D-10.

Lebo Lake near Two Dot in Wheatland County, was sampled with two 125-foot experimental gill nets on January 8th and 9th, 1958. The nets were set under ice approximately eight inches thick. An average of twenty-two white suckers were caught per net per hour.

During the report period 240 samples of water from Belt Creek in Cascade County, were collected and read in a turbidimeter. Regular bi-monthly samples were taken from ten sampling stations. Samples of bottom fauna have been collected and identified in the laboratory at Montana State College in Bozeman.

The information and data collected from Belt Creek has been gathered in an effort to establish standards of existing water quality. The presence of mine mills in the drainage, though not now operating, presents a constant threat to the fishery of this important trout stream.

Aerial photographs were taken of ten lakes in the project area. The photographs were taken from such elevation as to provide as nearly vertical shots as possible. Scale is obtained by measuring recognizable features on the ground. Usable maps have been made from the photographs.

Survey data was collected from streams affected by forest spraying operations. This information was summarized and incorporated on stream survey cards.

On may 16, 1957, several of the headwaters of the Judith drainage were checked for cutthroat trout. Weatherwax Creek, one of the tributary streams of the Middle Fork of the Judith was found to contain cutthroat trout. The U. S. Forest Service cooperated with the Montana Fish and Game Department by adjusting the boundary in the forest spraying operation so as to prevent the airplanes from spraying in the Weatherwax drainage.

During the period of spraying operations in the Judith River drainage, water samples were taken twice daily at the lower end of the Middle Fork. An analysis for DDT was made at Montana State College in Bozeman. Information concerning the findings will be included in the Completion Report for F-21-R-2, Job I. Samples of bottom fauna were also collected in the Judith drainage and evaluated at the college in Bozeman.

Recommendations:

In order to formulate future fishery management plans and improvements, compilation of a complete file of information regarding all Montana waters should be continued.

Summary:

This report briefly includes an outline of work done in the project area in connection with the statewide water inventory work. It does not include all the data collected, such data are filed on special file cards to be used in future management and restoration work.

Data and Reports:

The original data and reports are filed in the fisheries office of the District Headquarters in Great Falls.

Prepared by Nels A. Thoreson

Approved by George D. Holton

Date May 5, 1958

MONTANA STATE DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION
HELENA, MONTANA

Job Completion Report
Investigations Projects

State of Montana

Name Central Montana Fishery Study

Project No. F-5-R-7

Title The Distribution and Limiting Factors in the Cutthroat Trout in Montana.

Job No. II

Period Covered May 16, 1957 to April 30, 1958

Abstract:

To establish the present distribution and limiting factors of the cutthroat trout, a preliminary survey was conducted during the summer of 1957. Forty streams were investigated east of the Continental Divide in the Missouri, Marias, Musselshell, Milk, St. Mary's, Sun and Yellowstone River drainages. Cutthroat trout were found in 27 of these streams in association with populations of rainbow, eastern brook, and brown trout; whitefish; longnose, common white and jordan sucker; and cottus. Sixty-seven percent of the isolated cutthroat populations were separated from exotic species of trout by either natural or artificial barriers.

Objectives:

Cutthroat trout in Montana once sustained a major portion of the fishery in the State. Today, preliminary surveys show that exotic fishes are maintaining the fishery and that there is a decrease in the cutthroat trout distribution and abundance. It is the objective of this study to define and discuss the present distribution and the limiting factors involving the decrease of the cutthroat population.

Techniques Used:

A survey of cutthroat waters was made on streams east of the Continental Divide during the summer of 1957. The survey methods used supplied information on the physical, chemical and biological data concerning the cutthroat streams.

Population data was obtained by the use of an electric shocker, cresol treatment, dynamite and angling.

Three hundred foot sections were shocked on predetermined areas to estimate the abundance of the species present. The use of the electric shocker during the summer was limited to one stream (Little Belt Creek). The weight of the equipment and the inaccessibility of the streams was the major deterrent in its use.

The use of cresol was experimented in five streams. Dilution of the concentrate was obtained from L. P. Wilkins (1955. Observations on the field use of Cresol as a stream-survey method. Prog. Fish Cult. 17 (2) : 85-86). This was

at one gallon per 300 feet of a stream flowing 4 cubic feet per second. A sampling dilution for 40 feet (one to two holes) was one pint. This method was very desirable in inaccessible streams.

The use of dynamite was very limited because of its damage to the stream cover and the poor recovery success in the small streams. One-fourth of a stick (40% dynamite) sufficed in streams less than 10 feet wide and averaging less than two to three feet deep.

Angling proved to be the best way for determining the species present and their extent of range within a stream in the small inaccessible mountain streams. This method failed to give quantitative data of population densities. The streams were then rated as to "poor", "medium", and "good" on the fish caught and seen in the stream. Baits and flies were used, but the flies yielded a greater success.

Stream flows were calculated by the "floating chip method". Temperatures and elevations were recorded along with the stream cover, bottom type, surrounding country, and other physical characteristics pertaining to a stream.

Samples of fish collected were preserved in 10 percent formalin and later transferred to seventy percent alcohol.

Creel census data was obtained from the Montana Fish and Game Department files in Helena. All streams containing cutthroat were recorded from 1953 through 1957. Planting records were also obtained in a similar manner. These records included cutthroat waters on both sides of the Continental Divide.

Findings:

In the 40 streams surveyed on the east side of the Continental Divide, 27 contained cutthroat trout. Eighteen (67%) of the streams had isolated strains of cutthroat separated either by natural or artificial barriers from other species of exotic trout. Nine (33%) of these barriers were natural falls (average 4 feet). They were located in confined areas which forced the water over the falls making them impassable to the fish present. In six instances (22%) the barrier was old beaver dams (average 5 feet). Other barriers encountered were reservoirs and dams built on a creek bend or an irrigation diversion which limited the upward movement of fish. The stream above these barriers contained no exotic species of trout unless previously planted there.

Identification of the rainbow and cutthroat trout inhabiting the same stream were very difficult due to the cross breeding of the two species. At the present time work is being done to establish characteristics separating the two species. The characteristics are being studied on specimens collected during the summer and from specimens in the State Collection at Montana State College.

At this time no conclusive information can be formulated from the data taken in the field on habitat requirements or limiting factors. No suitable study stream has been located to determine specific influences affecting the abundance and distribution of the cutthroat trout. A desirable study stream would be one having a pure strain of cutthroat occurring above a population of exotic species which descend into a mixture of cutthroat and some other specie or species of trout. These would preferably be eastern brook, rainbow, or brown trout. This stream should also be in an area not affected by logging, insect spraying, or road building.

Analysis of the creel census records on both sides of the Continental Divide from 1953 through 1957 show there are 685 streams and lakes which have recorded cutthroat trout catches in them. Of these waters 494 (73%) are streams. Two hundred sixty-two (53%) and 91 (48%) of the lakes are on the west side of the Continental Divide.

A distribution map of the cutthroat trout in Montana is being prepared from the creel census data and field information collected in the survey work. Additional records of cutthroat have been obtained from three fisheries districts. These being District #1 (Missoula), District #2 (Kalispell) and District #4 (Great Falls). As yet this data is incomplete and will require another summer of collecting data.

Recommendations:

Another summer of work is required before any conclusive recommendations can be made.

Prepared by Delano A. Hanzel

Date April 15, 1958

Approved by George D. Holton

F-5-R-7

Job No. III

Investigation of
Effectiveness of
Marias River
Rehabilitation

MONTANA STATE DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION
HELENA, MONTANA

Job Completion Report
Investigations Projects

State of Montana

Name Central Montana Fishery Study

Project No. F-15-D-4

Title Marias River Fishery Restoration

Job No. I

Period Covered May 1, 1957 - April 30, 1958

Abstract:

Creel census checks on the Tiber impoundment during 1957 indicated an average catch per hour of 1.1 fish. The average weight of fish caught at the beginning of the 1957 fishing season was approximately 0.5 of a pound and the average total length was approximately eleven inches.

Checks of the rehabilitated streams above Tiber dam indicated that rainbow trout were well distributed throughout the drainage. Whitefish reproduction has resulted in establishing that species throughout several streams of the drainage. Long-nosed suckers, white suckers and several species of minnows are also established in the rehabilitated waters.

A total of 3,655,996 rainbow trout were planted in the rehabilitated waters during 1957.

Objectives:

Rehabilitation of the Marias River drainage above Tiber Dam was accomplished during 1954 and 1955. The major objectives of this rehabilitation work was the removal of carp and goldeye, the decimation of other undesirable species, and their replacement by trout.

To establish a trout population in the Tiber impoundment and the upstream waters was the objective of this project.

Techniques Used:

Fish planted in the streams of the drainage were transported into the area on regular distribution trucks. The fish tanks were then transferred by use of power equipment to four-wheel drive vehicles which were capable of traversing the rough terrain along the streams of the upper Marias drainage.

Fish planted in the Tiber impoundment were transported and planted by use of a specially built tank mounted in a Cessna 180 airplane. Oxygen was supplied to the water enroute from small oxygen bottles carried in the airplane.

Creel census was conducted on the Tiber impoundment throughout the 1957 fishing season, May 26, 1957 through November 30, 1957.

On the opening day of the 1957 fishing season approximately seven hundred automobiles and approximately three hundred boats were counted by use of an airplane. On the last day, November 30, 68 automobiles and 24 boats were counted. The fisherman use of Tiber reservoir during 1957 was high considering the remoteness of the area in relation to Montana's population centers.

Information collected in creel census and from logs kept by fishermen indicated an average catch of 1.1 fish per hour. The sample included in this means was from 1,114 fishermen who fished a total of 3,277 hours and caught 3,480 fish.

Fishing on the Tiber impoundment during the first weeks of the 1957 fishing season was better in the downstream portions near the dam probably due to the extreme turbidity in the upper portions.

Fishermen using attracting lures caught fish at a rate of 1.32 fish per hour on opening day of fishing season compared to 0.66 fish per hour caught by those using worms for bait.

Rainbow trout weighed during May 1957 averaged approximately 0.5 of a pound and were approximately eleven inches long (total length).

During the period October 28 through October 31, 1957 the Marias River and tributary streams were checked for fish present by means of an electric shocker.

Cut Bank, Two Medicine, Birch, Big Badger and the Marias were all found to contain rainbow trout. From one section of Cut Bank Creek sampled measurements were made on thirty-two rainbow trout, twenty whitefish and nine long-nosed suckers. The mean total length of the rainbow trout was 5.9 inches, the whitefish 5.6 inches and the suckers 5.4 inches.

Numerous whitefish (Prosopium williamsoni) were found in Cut Bank, Two Medicine, and Big Badger Creeks. Two definite sizes were found indicating successful reproduction in early winter of 1955 and 1956. Since no adults were present in much of Cut Bank Creek it appears that there had been considerable drift, at least thirty-five miles, down stream from where the rehabilitation was started. No whitefish were found in Cut Bank Creek below the town of Cut Bank during 1953 and 1954.

Reproduction of other fishes and their dispersion downstream was also noted. They included white suckers (Catostomus commersonni), long-nosed suckers (Catostomus catostomus), mountain suckers (Pantostens sp.), fathead minnows (Pimephales promelas), creek northern chub (Couesius plumbeus) and shiners (Notropis sp.).

Fish planted in the Marias drainage in 1957 included in Table 1.

Table 1. Rainbow trout planted in the rehabilitated water of the Marias River Drainage.

| Body of Water | Number | Pounds |
|---|---|---|
| Cut Bank Creek | 241,440 | 600 |
| Two Medicine River | 261,000 | 620 |
| Tiber Dam | 2,632,752 | 7,662 |
| Rideout's Pond | 1,450 | 5 |
| Wilson's Pond | 10,250 | 35 |
| Marias River Below Tiber Dam | 10,142 | 220 |
| Kipp Lake | 498,962 | 1,810 |
| Total | 3,655,996 | 10,952 |

Recommendations:

It is recommended that a follow-up investigational study be made on the Tiber impoundment and the rehabilitated waters of the Marias drainage upstream from Tiber Dam.

Data and Reports:

The original data and reports are in the fisheries office of the District Headquarters in Great Falls, Montana.

Prepared by Nels A. Thoreson

Approved by George D. Holton

Date May 8, 1958

MONTANA STATE DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION

HELENA, MONTANA

Job Completion Report
Development Project

State of Montana

Project No. F-24-D-10 Name Central Montana Fishery Study

Job No. I Title Statewide Lake and Stream Rehabilitation Kolar Reservoirs

Period Covered: August 1957 to April 1958

Abstract: Six hundred pounds of a fish toxicant commercially known as Fish Tox and fifty-five gallons of Pro-Noxfish was applied to Kolar Reservoir No. 1, several miles of McCarthy Creek and associated ponds and sloughs. White suckers were the predominant species of fish killed. Checks were made following treatment. No fish have as yet been found. Rainbow trout fry will be planted in May, 1958.

Objectives: To remove the existing fish population from Kolar Reservoirs and associated waters located near Geyser in Judith Basin County so it can be restocked with rainbow trout.

Techniques Used: Experimental gill nets were used to sample the reservoirs. Limited use of toxicants were used in the associated waters.

Treatment of the stream was accomplished by dragging sacks of the commercial product Fish Tox downstream. The main reservoir and several associated ponds and sloughs were treated with a liquid toxicant known commercially as Pro-Noxfish. It was applied by use of a spray boom mounted on the boat and by a hose submerged in the deeper portions of the reservoir.

In the flowing waters streams, spring holes, etc. and ponds with springs arising from the bottom 600 pounds of Fish Tox was used. In the impounded water fifty-five gallons of Pro-Noxfish was used at a rate of one part per million.

Findings: The original plans included fish removal from two reservoirs, Kolar Reservoir No. 1 and Kolar Reservoir No. 2. Because a reservoir washed out in the Arrow Creek drainage downstream from Kolar's Reservoir No. 2 removing an effective fish barrier the plans for rehabilitation of the No. 2 reservoir were discontinued.

The reservoir treated (Kolar Reservoir No. 1) covers approximately 11 acres and contains approximately 100-acre feet. A reservoir owned by the Great Northern Railway Co. upstream from the main reservoir containing approximately 7-acre feet and several other ponds and sloughs were also treated. The fish were killed out from approximately three miles of McCarthy Creek associated with the reservoirs and sloughs.

White suckers (Catostomus commersonnii) were the predominant fish killed in the reservoir. Less than fifty trout were observed in all of the rehabilitation most of which were killed in the reservoir. White suckers were also found in the stream and associated ponds and sloughs. Other fish killed were dace (Rhinichthys sp.), mountain suckers (Pantosteus sp.) and several species of minnows common to the area.

The application of toxicant was started on August 26, 1957 and completed on September 17, 1957.

Checks made in the stream sections following toxicant application and in the spring of 1958 have disclosed no fish present.

One gill net was set through the ice in Kolar Reservoir on December 4, 1957 and lifted January 9, 1958. Nothing was caught. A second net set on December 4, 1957 and lifted April 23, 1958 caught only crayfish.

Rainbow trout fry will be planted in the reservoir and stream during May 1958 at state expense.

Recommendations: It is recommended that a follow-up investigational study be made on the rehabilitated waters in order to determine the success of establishing a fishable population by planting rainbow fry.

Data and Reports: The original data and reports are in the fisheries office of the district headquarters in Great Falls.

Prepared by Nels A. Thoreson

Approved by George D. Holton

Date May 9, 1958