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MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT

State Montana

Name Reservoir Investigations

Cooperators None

Title Libby Reservoir

Project No. F-34-R-3

Job No. 3

Period Covered July 1, 1968 through June 30, 1969

Abstract

An attempt was made to trap the spawning run of mountain whitefish (Prosopium williamsoni) moving into Fisher River from Kootenai River. High flows during the period of trap operation made trapping very difficult and resulted in unreliable counts of fish moving into Fisher River. The trapping efforts did show that Fisher River could be effectively trapped during years with near-normal flows during the whitefish spawning run. Assistance was given the Corps of Engineers in site selection and design of a fish barrier suitable for Young Creek; this creek is a small tributary of Libby Reservoir. Montana's standard electrofishing gear was tested in the lower Fisher River and found to be inadequate for collection of fish from this area.

Background

Libby Reservoir will be formed by a multi-purpose hydroelectric dam being built by the Corps of Engineers on the Kootenai River near Libby, Montana. This impoundment will have detrimental effects upon the fishery in waters affected due to construction activities in impoundment of water, and due to operation of the dam. Since 1966 a substantial portion of the Reservoir Investigations Project effort has been in the Libby area and has involved collecting basic fishery information on which requests for mitigative measures are based. Also, developing and testing specialized gear to be used in the Corps of Engineers funded projects has been undertaken. The Corps of Engineers has funded the Department in research and management activities on Fisher River, Wolf Creek, Fortine Creek and Young Creek; this funding became effective July 1, 1969.

Objectives

The objectives of this job are: (1) make field inspections of construction activities as needed and advise the construction agency of means to minimize construction-related fishery damages; (2) continue survey of streams tributary to Libby Reservoir with respect to potential development as spawning streams; and (3) develop gear and methods suitable for sampling resident and migratory fish in Fisher River and Young Creek.

Procedures

Several meetings were held with Corps of Engineers design personnel on construction of a fish barrier for Young Creek. This installation is to serve as a fish barrier and an upstream-downstream fish trap. Corps of Engineers personnel were shown the Hungry Horse Creek upstream-downstream trap from which the Young Creek barrier design will be patterned. Project personnel also assisted Corps of Engineers surveyors in selecting a site for the Young Creek barrier.

A series of three upstream traps were placed in the Fisher River drainage to monitor spawning whitefish movements into and within the drainage. The first trap was located near the junction of Fisher River with Kootenai River; the second trap was in Wolf Creek near the junction with Fisher River, about 12 miles upstream from the first trap; and the third trap was located in Fisher River, 14 miles upstream from the mouth of Fisher River. These traps were operated daily for the period of October 2, 1969 through November 4, 1969. Fish captured by these traps were identified by species, total length measured and then released upstream.

Findings

Young Creek Barrier Dam: The project leader attended several meetings and held several telephone conference calls with Corps of Engineers design personnel on construction of the Young Creek barrier dam. He also submitted a rough design of a barrier dam considered adequate for Young Creek. Corps of Engineers design personnel visited the Hungry Horse Creek upstream-downstream fish trap from which Young Creek barrier dam will be patterned.

The design submitted to the Corps of Engineers by Fish and Game personnel included a velocity barrier 30 feet wide with a total drop of 42 inches. The controlled-flow bypass channel was proposed to be 10 feet wide. The initial Corps design included a velocity barrier width of 60 feet with a drop of 42 inches and bypass channel 20 feet wide. The design was changed to a velocity barrier 40 feet wide with 42 inches drop and a controlled-flow bypass channel 14 feet wide on recommendation by Fish and Game project leader. The bypass channel re-enters the velocity barrier channel immediately below the riprap at the base of the velocity barrier apron. The velocity barrier is being constructed so that a Wolf type downstream trap can easily be installed. Upstream trap facilities consisting of a portable trap box with leads will be installed in the bypass channel as needed.

The operation of the barrier will be flexible enough to allow three types of trapping; total fish passage through the bypass channel at all time, complete blockage of all upstream moving fish, or selective upstream and downstream fish passage by operation of the upstream or downstream trap facilities. Montana Fish and Game Department will assume operation of this trap and velocity barrier and construction and installation of the upstream and downstream trap facilities.

Project personnel assisted Corps of Engineers surveyors in the selection of the site for the Young Creek barrier. The barrier and the small impoundment created by the barrier had to be located on land owned or controlled by the Federal Government. The site selected fitted the land ownership requirements and utilized natural terrain that reduced construction costs.

Stream Survey: Several small streams that will be tributary to the reservoir were examined for potential spawning for salmonids. Each of these streams had summer flows less than 2 cfs. and all were blocked to reservoir fish by one or more natural barriers. Barriers included high falls, and average gradients of 15 percent or more.

Effectiveness of Electrofishing Equipment: Relocation of the Great Northern Railroad and road construction has resulted in several thousand feet of stream being lost and other thousands of feet of the Fisher River being forced into man-made channel changes or into damaged natural channel.

The Fisher River channel changes are characterized by extensive areas more than five feet deep with one bank heavily riprapped. Widths vary from 50 to 125 feet and large rock groins have been built that extend across the channel. Sampling of the fish populations in the man-made channels was tested using a portable generator, a variable voltage pulsator, and hand-held electrodes. This type of gear was found to be ineffective for collection of fish from the channel changes in two aspects: (1) in deep water many fish were able to elude the electrical field; and (2) netting of narcotized fish in deep water was extremely difficult.

Fisher River Trapping: Three fish traps were installed in the Fisher River to monitor the movement of spawning whitefish in this river from the Kootenai River. The first trap was located near the mouth of Fisher River (lower trap), a second trap was placed in Wolf Creek near its junction with Fisher River (Wolf Creek trap), and a third trap (upper trap) was placed in Fisher River 14 miles upstream from its junction with Kootenai River. The Wolf Creek trap was designed to capture fish moving from Fisher River into Wolf Creek and the upper Fisher trap was above the mouth of Wolf Creek and above the Fisher River channel changes.

Very little is known about stream conditions that start a whitefish spawning run. It was expected that this movement might start when the Kootenai River water temperatures cooled to about 50° F.. Past years' water temperature records showed this level to occur about September 15th, on the average. Trap installation was scheduled to be done about this date. Heavy fall rains in the Kootenai River area cooled both Fisher River and Kootenai River much earlier than normal. The heavy rains also increased the flow of Fisher River above normal, to the point that the traps could not be installed at the anticipated date.

Fisher River flows had stabilized near the end of September although they were still above normal. Three traps were installed October 2, 1969 and were fished continuously as possible through November 4, 1969. Much trouble was experienced keeping the traps operable due to the heavier than normal flows and the large amounts of trash carried by these flows. There were several days and nights when trap leads could not be held in place.

Due to the poor operating conditions the catch estimates of whitefish moving into Fisher River from Kootenai River are thought to be unreliable. Total catch at the lower trap was 347 spawning whitefish. Total catch at the upper Fisher River trap was 11 spawning whitefish, and catch at Wolf Creek trap was 2 spawning whitefish. A few rainbow trout and one Dolly Varden were also taken

in the upper Fisher River trap while several longnose suckers were taken in the Wolf Creek trap.

Although the trapping of Fisher River was unsuccessful in enumerating the 1969 whitefish spawning run, the experience was invaluable for background for future trapping efforts. It was determined that installation of traps should be completed by at least September 15th in a normal temperature year. Instead of one trap taking in the entire Fisher River near its junction with Kootenai River the trap site should be moved downstream and two traps installed. The two traps could either be constructed in a double V across the entire channel or separate traps be used in each of the channels of the Fisher River where it splits before entering Kootenai River. Higher than normal flows during time of trap operations will always create maintenance problems but Fisher River should be easily trapped at normal flows with little maintenance of traps.

Recommendations

Corps of Engineers have funded Montana Fish and Game Department for fishery projects on Fisher River, Wolf Creek and Fortine Creek to determine the effects of road and railroad relocation upon these streams. Further work to be done on these streams will be handled by this new project. Funding has also been provided for development work on Young Creek and will become the responsibility of another project.

It is recommended that the Libby Reservoir job of the Reservoir Investigations Project be limited to two phases of work associated with Libby Reservoir. (1) Additional work needs to be done on tributary streams with emphasis on their spawning potentials for salmonids from the reservoir. Data should be collected to assist formulation of an action plan which will be submitted to the Corps of Engineers. (2) The populations of fishes in Kootenai River should be determined. Further development of gear adequate to sample the Kootenai River will have to be continued. Gear in the development stage includes boat-mounted electrofishing equipment for either day-time or night-time use.

Prepared by: Joe E. Huston

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Waters referred to:

11-3500-1
11-2320-1
11-7680-1
11-2460-1
11-7780-1