MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

In Cooperation with
Montana Department of Natural Resources and Conservation
Contract No. ED-MDFWP- 167

FISHERIES DIVISION

JOB PROGRESS REPORT

September 19, 1979 - November 1, 1979

KOOTENAI FALLS AQUATIC ENVIRONMENT STUDY

By
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PURPOSE

Montana Department of Fish, Wildlife and Parks entered into an agreement with Montana Department of Natural Resources and Conservation to perform long-term sampling within and below the pondage area of the proposed Kootenai Falls hydroelectric project. This hydroelectric project has been advanced by Northern Lights Inc., and is located in the immediate vicinity of Kootenai Falls, Kootenai River, Lincoln County, Montana. Sampling is limited to annual fish population estimations within the proposed pondage area and biennial aquatic insect sampling above and below the proposed dam centerline. Aquatic insect sampling is to be done in April every-other year while fish population estimations are to be done in late summer-early fall each year.

This report details work accomplished in fall 1979 fish population estimations.

WORK ACCOMPLISHED

Graham (1979) proposed that fish population estimates be obtained from the Kootenai Falls-China Rapids section of Kootenai River in late August and early September. This time schedule could not be met in 1979 since the contract was not finalized until September 19, 1979. The earliest possible dates on which fish sampling could be accomplished was October 1 through 12, 1979.

Reliable in-river population estimates of mountain whitefish (Prosopium williamsoni) are generally unobtainable in Kootenai River after mid-September. Spawning movements of adult fish in the river and into tributary streams generally start in mid-September and continue through mid-November. Reliable in-river population estimates of rainbow trout (Salmo gairdneri) should be feasible from early summer through mid-winter since most movements occur in late winter and spring. It was decided by the project leader to attempt obtaining fish population estimates in October realizing that whitefish estimates would likely be unreliable.

Corps of Engineers was requested to provide a steady flow of 10,000 cfs from Libby Dam throughout these sampling periods. This request could not be granted and river flows varied from lows of 4,000 cfs during the day to maximums of 15,000 cfs during the night.

Fish capturing equipment used included jet boat-mounted electrofishing gear similar to that used by Graham (1979). Methods advocated by Vincent (1971) were to be followed on fish marking and recapture runs and analysis of data collected.

Fish marking runs were made on the nights of October 2,3, and 4, 1979. Total catch for these three nights of effort was only 81 mountain whitefish, 71 rainbow trout and 1 Dolly Varden. These numbers of fish were insufficient to make a population estimate by the mark and recapture method. It was decided that additional marking runs would be made the following weekend and, if sufficient fish were captured, then recapture runs would be made the week of October 15. Capture of fish the nights of October 9 and 11 totalled only 19 mountain whitefish, 10 rainbow trout, 1 Dolly Varden and 1 cutthroat trout. It was then decided to cancel all further electrofishing operations for 1979.

Efficiency of electrofishing equipment can be ruled out as a reason for not capturing adequate numbers of fish. Large numbers of fingerling-sized (3-6 inch) mountain whitefish were attracted to the positive electrodes, clearly indicating sufficient electrical current since small fish are harder to capture than larger fish. Voltage and amperage could be regulated to maximums of near 400 volts at 4 amperes. Ideal for best electrofishing efficiency in Kootenai River is about 200 volts at 2 amperes.

Catch-per-boat-night of electrofishing effort is presented in Table 1 for sampling done in Kootenai Falls - China Rapids Section in 1978 and 1979 and in Flower-Pipe Section in 1978 and 1979. The Flower-Pipe Section of Kootenai River is located about four miles upstream from the Kootenai Falls - China Rapids Section. A boat-night of electrofishing effort is defined as one boat electrofishing for one night. Usual length of this effort by one boat and crew (three people) is about three to four hours of actual electrofishing.

Table 1. Average catch-per-boat-night of rainbow trout and mountain whitefish, Kootenai Falls - China Rapids and Flower-Pipe Sections of Kootenai River in 1978 and 1979.

Section and Time	Average catch-per-boat-night	
	Rainbow trout	Mountain whitefish
China Rapids, fall 1979	16	20
China Rapids, fall 1978	68	201
Flower - Pipe, spring 1979	85	459
Flower - Pipe, spring 1978	107	504

These data indicate a general decline in numbers of both rainbow trout and mountain whitefish. Since analysis of fish scales for age and growth patterns of fish collected from Kootenai Falls-China Rapids Section in 1979 has not been done, no comparisons between age-classes can be made. If the catch-per-boat-night is a valid comparison then a decline of the suggested magnitude would likely be throughout the entire population and not limited to a particular age-class.

Sampling done in 1978 and 1979 by Corps of Engineers funded studies on spawning populations and in-river populations of rainbow trout and mountain whitefish indicate some change occuring. Population estimates of rainbow trout in the Flower-Pipe Section declined from 115 rainbow trout per 1000 feet of river in 1978 to 85 rainbow trout per 1,000 feet of river in 1979. This change was not significant at the 80 percent level. At the same time rainbow trout spawning runs into Bobtail Creek increased from 131 fish in 1977 to 378 fish in 1979 (May and Huston, 1979). Bobtail Creek is the nearest tributary to the Kootenai Falls-China Rapids Section used by rainbow trout for spawning.

Population estimates of mountain whitefish in the Flower-Pipe Section in 1978 were 711 whitefish per 1,000 feet of stream compared to 546 per 1,000 feet of stream in 1979. This decline was significant at the 80 percent level (May and Huston, Ibid). Numbers of whitefish entering Quartz Creek in 1978 and 1979 for spawning were estimated at about 2,500 fish each year (May, 1979). Quartz Creek is the nearest Kootenai River tributary to the Kootenai Falls-China Rapids Section used by whitefish for spawning.

The data from Bobtail and Quartz Creeks show strong populations of adult fish but data from the Flower-Pipe Section seem to indicate declining total populations. Thus, the decline appears to be limited to sub-adult fish. If this trend is true for the Flower-Pipe Section it is likely true also for the Kootenai Falls-China Rapids Section since they are within a short distance of each other.

The Department of Fish, Wildlife and Parks will continue Corps of Engineers-funded Kootenai River Investigations through 1980. This work will measure both rainbow trout and mountain whitefish populations in the Flower-Pipe Section and spawning runs of rainbow trout into Bobtail Creek in spring 1980. These investigations should help in determining true status of river population work attempted in October 1979 for this study. Preliminary analysis of the spring 1980 investigations should be available in early summer 1980.

LITERATURE CITED

Graham, Patrick J. 1979. Kootenai Falls aquatic environment study. Montana Dept. Fish and Game, 84 pp.

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