MONTANA DEPARTMENT OF FISH AND GAME

In Cooperation with U. S. Army Corps of Engineers

Contract No. DACW 67-73-C-0004

FISHERIES DIVISION

Final Job Report

July 1, 1972 - June 30, 1975

LAKE KOOCANUSA TRIBUTARY DEVELOPMENT

Lake Koocanusa, Montana

By

Joe E. Huston and Bruce May

Reservoir Investigations Project

October 1975

MONTANA DEPARTMENT OF FISH AND GAME

FISHERIES DIVISION

Final Job Report
Project No. 2275

Project Title: Development of Lake Koocanusa Tributaries

Period Covered: July 1, 1972 through June 30, 1975

INTRODUCTION

Libby Dam impounding the Kootenai River near Libby, Montana created a 90-mile-long, 48,000 surface-acre multipurpose reservoir. This fluctuating reservoir (Lake Koocanusa) inundated 48 miles of mainstem Kootenai River and about 14 miles of tributary streams in the State of Montana. The remainder of the reservoir is in British Columbia, Canada. Libby Project was authorized for flood control, power production and recreation benefits but not for fish and wildlife.

Prior to impoundment, Kootenai River sustained an excellent sport fishery of regional importance. Populations of sport fish included trainbow trout (Salmo gairdneri), cutthroat trout (Salmo clarki), Dolly Varden (Salvelinus malma), mountain whitefish (Prosopium williamsoni), and burbot (ling) (Lota lota). Fisheries management by the State of Montana was minimal since these game fish populations were self-sustaining

Montana Department of Fish and Game realized that impoundment of the Kootenai River by Libby Dam would drastically change the fisheries management needs of the area. Intensive programs would have to be undertaken to maintain a fishery in the new multipurpose impoundment to replace that of the free-flowing Kootenai River. Two principle programs were formulated - (1) the development of tributary streams of the impoundment as spawning and rearing areas for reservoir-living game fish and (2) the release of large numbers of suitable species of hatchery fish into the reservoir. This report gives a summary and analysis of tributary stream development work done from 1966 through 1975.

DISCUSSION

Montana Department of Fish and Game conducted an intensive survey of all Montana tributaries of the Kootenai River within the Montana portion of Lake Koocanusa from 1966 through 1975 to determine streams with potential for development as spawning and rearing areas for reservoir-living game fish. We also determined the best methods of development and the most suitable species of fish for each stream that had spawning and rearing potentials. Types of development were:

A. Removal of barriers inhibiting upstream-downstream movement of fish.

B. Making imprint plants of suitable fish species.

C. Removal of barriers and making imprint plants.

D. Removal of barriers, suppression of resident fish populations and making imprint plants of suitable fish species.

Species of fish for which streams were to be developed included all stream-spawning salmonids within the Kootenai River which might survive in the reservoir. Species of fish to be imprint planted into a stream were limited to mountain whitefish and the adfluvial strain of westslope cutthroat trout (Salmo clarki subsp.).

It was originally planned that streams with treatment type D would be planted with westslope cutthroat trout for at least three years and that other streams to be stocked with cutthroat would be planted as fish were available, but for not more than three years. This plan was made with the assumption that the reservoir would not be operated in a manner that would encourage downstream losses of reservoir fish. However, severe drafting of Lake Koocanusa in winter 1972-73 and spillway release of water in summer-fall 1974 caused numerous cutthroat trout and mountain whitefish to move out of the reservoir. These downstream losses will delay reaching spawning run capacities in tributaries for several years; thus, additional imprint plantings will be required to maintain maximum in-stream adfluvial cutthroat trout populations.

Creeks to be stocked with mountain whitefish were scheduled for three plantings. Sufficient numbers of fish were not available to fill the 1974 planting schedule. Montana Department of Fish and Game will collect the necessary eggs and plant the needed fish in winter 1976.

Conversion of a stream containing a resident fish population to one used for spawning and rearing by a migratory fish is a new fisheries management technique for Montana. This method was tested on Young Creek, a Lake Koocanusa tributary, starting in 1969. Stream development included barrier removal, suppression of the resident fish population and replacement of the resident population with adfluvial westslope cutthroat trout. An upstream-downstream fish trap constructed by the Corps of Engineers was operated by Montana Department of Fish and Game under Contract No. DACW 67-73-C-0004 to determine the success of these developments.

By summer 1972, results of the Young Creek experiment indicated a successful conversion to adfluvial cutthroat from a resident brook trout (Salvelinus fontinalis)-resident cutthroat trout population. It was decided to continue development of other reservoir tributary streams.

A list of the streams developed, type of treatment, species planted and spawning runs developed is given in Table 1. Figure 1 shows the location of these streams. Procedures, methods used and treatment details for each stream were discussed by Bruce May 1974*.

*May, Bruce. 1974. Lake Koocanusa Tributary Development. Job Progress Report, 1972-1974, Contract No. DACW 67-73-C-0004, Montana Department of Fish and Game, pp 13.

Table 1. Summary of development of Lake Koocanusa tributary streams

Stream	Type of treatment 1/	Imprint Plantings 2/		Spawning Runs 3/	
		Wct	Mwf	Wct	Mwf
Murray Creek	C	yes (1)			
Therriault Creek	A				
Deep Creek	C	yes (1)			
Clarence Creek	D	yes (3)			
Grave Creek	C	yes (1)		yes 4/	yes 4/
Fortine Creek	B	yes (2)		yes	yes
Pinkham Creek	D	yes (3)			
Sutton Creek	C		yes (2)		yes
Five Mile Creek	D	yes (4)	yes (2)	yes	yes
Cripple Horse Creek	C		yes (2)	yes	yes
Canyon Creek	A			yes	
Jackson Creek	A				
Barron Creek	A				yes
Bristow Creek	C		yes (2)	yes	yes
Big Creek	D	yes (3)	yes (2)		
Sullivan Creek	D	yes (3)			

1/ Types of treatment are: A-barrier removal only, B-imprint plants only, C-barrier removal and imprint plants and D-barrier removal; suppression of resident fish populations and imprint plants.

2/ Wct is abbreviation for westslope cutthroat trout and Mwf is for mountain whitefish, yes indicates fish planted and number in parenthesis is number of years planted.

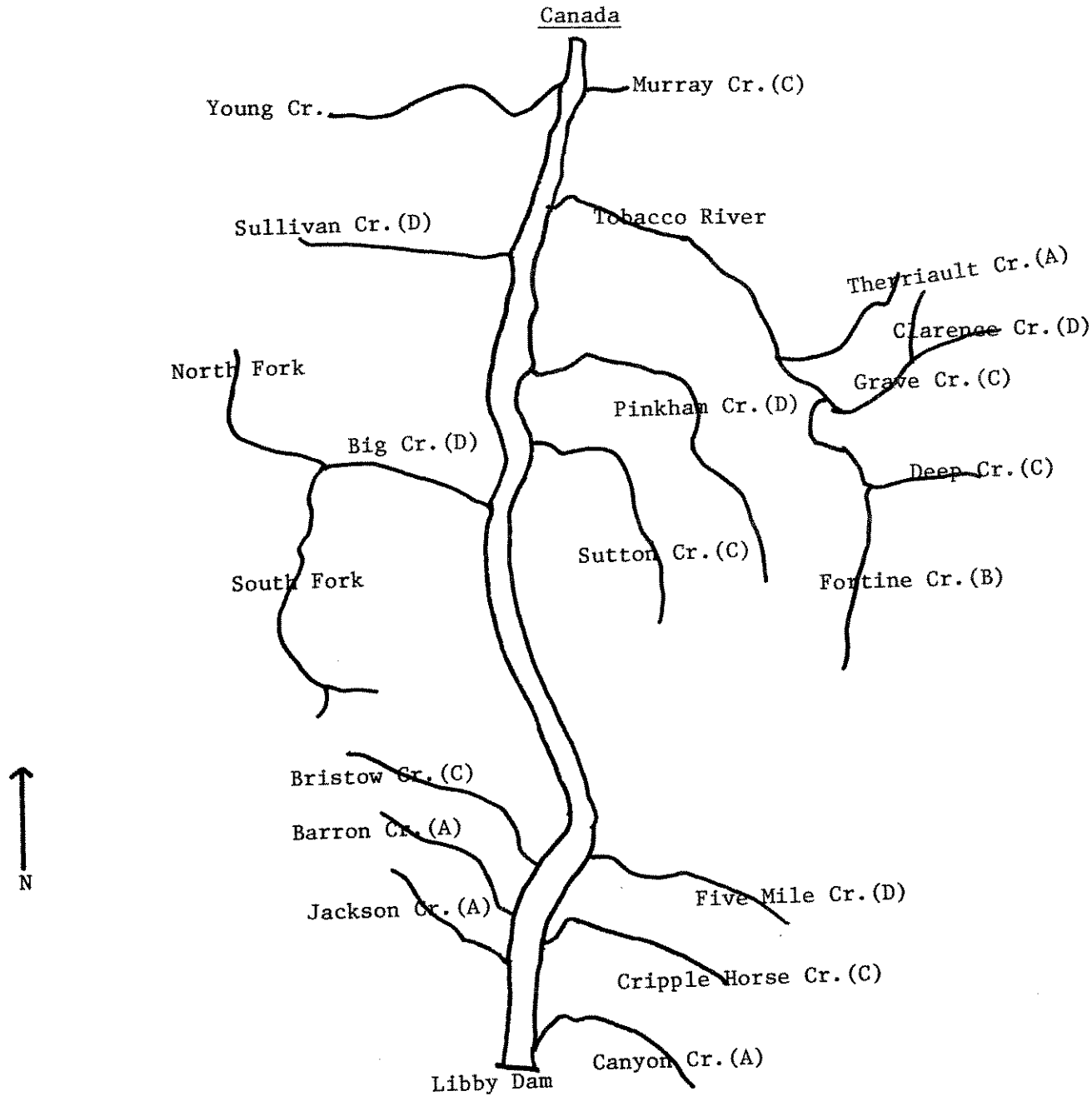
3/ Yes indicates spawning fish observed while no remark indicates no information.

4/ Spawning fish traveled as far upstream as Glen Lake Irrigation Company's diversion dam.

Grave Creek and Five Mile Creek were planted with westslope cutthroat trout in 1972 and the remainder of the creeks were first planted in 1973. Mountain whitefish were stocked in 1973 and 1975. Spawning runs from these imprint plants should start to develop within three or four years following the initial stocking.

Table 1 shows that spawning cutthroat trout and whitefish have been observed in six creeks. These spawning runs are probably the result of both the tributary development program and continuation of some prior runs. It is suspected that cutthroat and whitefish runs in Five Mile Creek are a direct result of stream development. Grave and Fortine Creeks, tributary to Tobacco River, contained whitefish, cutthroat trout, rainbow trout and Dolly Varden spawning runs from Kootenai River prior to impoundment. Likely spawning runs observed in the Tobacco River drainage were a combination of continuing existing runs, fish from imprint plants and fish from general plantings made in Lake Koocanusa.

Cutthroat spawning runs into Cripple Horse, Canyon and Bristow Creeks are likely from fish planted directly into the reservoir. Whether or not these spawning runs will continue in these short creeks with little rearing capacity is unknown at this



LEGEND
5mm = 1 mile

A. Barrier removal only
B. Imprint plants only
C. Barrier removal and imprint plants
D. Barrier removal, suppression of resident fish populations and imprint plants

Figure 1. Map of Libby Reservoir flowage and management plan for each tributary developed

time. They will likely disappear unless heavy plantings of cutthroat into the reservoir are continued.

Mountain whitefish which spawned in Sutton, Cripple Horse, Barron and Bristow Creeks probably are not related to the imprint plantings but to pre-impoundment whitefish straying into the available areas. It is suspected that even if river-born whitefish eventually are able to adjust to a lake environment and survive, it will take some time. Continued good spawning runs of whitefish in these streams indicate that the imprint plantings were successful. Whitefish planted into Lake Koocanusa tributaries are from Hungry Horse Reservoir stocks which either adjusted to a lake environment in the 20 years since impoundment or are the descendants of Flathead Lake runs cut off by Hungry Horse Dam.

Development of Lake Koocanusa tributaries has been a long-term project which started in 1966. Evaluation of the development cannot be completed until at least 1980. Total cost to the Corps of Engineers for their part of the stream development program (July 1, 1972 through June 30, 1975) was $19,100.00. Cost to Montana Department of Fish and Game has been $7,175.00 for initial survey work from 1966 through 1969, $1,210.00 for additional follow-up survey work done in summer 1975, $400.00 for an overrun during the three-year Corps of Engineers funded contract and $4,910.00 for the cost of planting cutthroat trout from 1972 through 1975.

Additionally, Montana will spend an estimated $1,850.00 to collect whitefish and make imprint plants in winter 1976, plus an additional minimum of $3,000.00 for future imprint plants of cutthroat required because of reservoir operations in 1972-73 and in 1974. Montana's total costs will probably exceed $18,500.00 for work which would have been unnecessary if Libby Dam had not been built.

There is no doubt these tributary developments have resulted in somewhat larger numbers of game fish in Lake Koocanusa than would be present had the work not been done. Because the second development program (hatchery construction) has remained unfunded this tributary development program is of much greater importance to the present reservoir fishery than it was originally expected to be. Thus, it is quite important to the immediate future of the Lake Koocanusa fishery that the evaluation of this development program be intensified in 1976 and continued through spring 1980. Corps of Engineers will be requested to provide funds for this work. Detailed cost estimates for the work have not been made.