MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION

Interim Progress Report

PROJECT TITLE: Lake Koocanusa Post-Impoundment Fisheries Study

PERIOD COVERED: October 1, 1981 through March 31, 1982

ABSTRACT

The results of the 1981 fall net series are presented along with an analysis of the contact creel survey run in 1981. Of particular interest is the appearance of large numbers of kokanee in the angler catch in the fall of 1981. The possible origin of these kokanee is explained.

The contribution of the 1981 plant of westslope cutthroat trout to the creel and to the overall cutthroat population is noted.

Activities concerned with the protection and improvement of water quality, fish habitat and fish passage in important spawning and nursery tributaries of Lake Koocanusa are reviewed.

BACKGROUND

Lake Koocanusa, a multipurpose reservoir, was created in 1972 by Libby Dam impounding the Kootenai River, approximately 17 miles upstream from Libby, Montana. The full pool elevation of 2459 MSL was first achieved in 1974. At full pool, the surface area of the reservoir is 46,500 acres with a total capacity of 5,809,000 acre-feet. The annual drawdown for flood control and power production has ranged from 94-172 feet with the average being 127 feet which reduces the pool volume by about 70 percent.

Fish populations present in the Kootenai River prior to impoundment expanded rapidly in the new reservoir. Approximately 3.1 million westslope cutthroat trout were planted in the reservoir from 1972-1976 by the Montana Department of Fish, Wildlife and Parks to take advantage of the initial productivity and establish a sport fishery. An intensive spawning enhancement program for salmonids was conducted from 1970-1975 in tributary streams having potential spawning and nursery habitat. The program involved removing potential barriers to fish movement and reducing resident fish stocks in some streams followed by imprint plantings of young-of-the-year westslope cutthroat trout. This program was quite successful.

Lake Koocanusa has provided an excellent sport fishery. The fishery was based primarily on rainbow and cutthroat trout until 1981 when kokanee became important. A localized fishery for burbot also developed in the Rexford area during the winter and spring. Bull trout are occasionally

taken in the spring and early summer. Most gamefish species in the reservoir peaked in abundance in 1978 and have since gradually declined.

A fish hatchery on the Bull River in British Columbia at the upstream end of Lake Koocanusa is thought to have been the source of unknown numbers of rainbow trout, lake trout and kokanee which have appeared in the reservoir. These unplanned introductions have compounded the problem of management of Lake Koocanusa for westslope cutthroat trout.

OBJECTIVES

The specific objectives for the period covered by this interim report were to 1) monitor fish population trends in Lake Koocanusa with fall net series; 2) begin summarizing data on growth rates of gamefish species; 3) determine catch rates and species composition of the fisherman harvest; and 4) determine contribution of hatchery fish to the cutthroat trout population.

PROCEDURES

A detailed review of the methodology used to collect and analyze fisheries data is given by May and Huston (1981).

FINDINGS

Fish Population Trends - Fall Netting

The fall gill net series using surface nets was conducted in the Cripple Horse and Rexford areas from October 6 to October 14. The water surface elevation of 2455-56 msl was similar to previous years as were the secchi disc readings of 19-22 feet. However, the surface water temperatures at Cripple Horse (56°F) and Rexford (54°F) were 3° and 6° cooler than temperatures recorded during previous fall net series. These lower temperatures probably were the cause of markedly reduced catches of northern squawfish, peamouth chubs and redside shiners during 1981 (Table 1). The lower temperatures should not have materially affected the catch of cutthroat and rainbow trout.

Table 1. The average catch of rainbow trout, cutthroat trout, peamouth chubs, northern squawfish and redside shiners in floating gill nets set in Lake Koocanusa, 1975-1981.

	Average catch per net					
Species	1975	1976	1978	1979	1980	1981
Rainbow	2.8	3.1	5.2	4.6	4.2	3.0
Cutthroat	2.0	2.2	1.9	1.4	1.0	1.1
Peamouth	1.9	4.1	2.8	4.6	6.6	2.4
Northern squawfish	4.2	5.1	3.9	2.3	2.3	1.0
Redside shiners	3.3	6.3	5.3	1.8	0.4	0.1

The catch of peamouth, northern squawfish and redside shiners declined in the Rexford and Cripple Horse area in 1981 from the previous year. Catch of cutthroat trout varied little from 1980 to 1981. The average catch in 1980 was 1.0 fish per net compared to 1.1 fish per net in 1981. Catch of rainbow trout also declined from 1980 to 1981.

Creel Survey

The results of contact creel survey conducted on Lake Koocanusa from April 10, 1981 to October 11, 1981 are summarized in Tables 2 and 3. A total of 1,713 anglers contacted during the survey caught 2,323 trout and salmon for an average catch of 1.4 fish per angler and an average catch rate of .30 fish per hour of effort. Rainbow trout comprised 51 percent of the catch, followed by cutthroat trout with 26 percent and kokanee 14 percent of the catch. The remainder consisted of cutthroat x rainbow hybrids (6 percent) and bull trout (3 percent).

There was a considerable amount of variation from month to month in fishing pressure, catch per man hour and species composition of the catch (Table 2). The catch rate varied from 0.18 fish per hour of effort in August to 0.59 fish per hour in October. The higher catch rates recorded in September and October were in part due to the recruitment of higher numbers of kokanee into the fishery.

Non-resident anglers comprised 44 percent of the angling population, with local residents making up 31 percent and other state residents comprising the remaining 28 percent (Table 3). About 85 percent of the anglers contacted fished from boats as compared to only 15 percent from shore. The survey technique was biased towards anglers fishing from boats as the three primary survey points were at boat ramps. The comparatively high number of shore fisherman contacted in April was a result of poor boat access due to the drawdown.

Table 3. Angler origin and fishing method used on Lake Koocanusa from April 10, 1981 through October 11, 1981.

Month	Percent of anglers			Percent of anglers fished from	
	Local Resident 1/	State Resident 2/	Out-of-state Non-resident 3/	Shore	Boat
April	51	32	17	40	60
May	29	40	31	11	89
June	30	12	58	4	96
July	18	29	53	9	91
August	34	28	38	4	96
September	22	18	60	2	98
October	48	22	30	4	96
TOTAL	31	28	41	15	85

1/ Anglers from Lincoln County
2/ Anglers from Montana counties other than Lincoln
3/ Anglers from states other than Montana

Table 2. Summary of creel survey conducted on Lake Koocanusa from April 10, 1981 through October 11, 1981.

Month	Number angler	CPH 1/	Number caught and average total length in inches									
			Rainbow		Cutthroat		CTXRB hybrids		Bull trout		Kokanee	
			Number	Length	Number	Length	Number	Length	Number	Length	Number	Length
April	337	0.28	346(74)	13.8	115(24)	14.0	----	----	7(1)	14.9	2(1)	----
May	362	0.22	221(54)	13.9	113(28)	13.2	34(8)	13.2	38(9)	14.4	2(1)	----
June	231	0.27	150(58)	13.7	62(24)	13.4	27(11)	14.5	14(6)	15.1	1(1)	----
July	389	0.27	201(46)	14.2	124(29)	13.8	50(11)	14.1	3(1)	14.8	57(13)	10.6
August	151	0.18	64(48)	13.9	34(26)	11.7	5(4)	15.9	----	----	29(22)	11.0
September	197	0.44	180(36)	11.9	115(23)	12.1	10(2)	11.6	----	----	195(39)	11.3
October	46	0.59	24(19)	13.6	48(39)	13.5	1(1)	----	1(1)	----	50(40)	11.3
TOTAL	1713	0.30	1186(51)	13.8	611(26)	13.2	127(6)	13.7	63(3)	14.7	336(14)	11.1

1/ CPH is abbreviation for catch per hour of fishing effort.

Most of the bull trout were caught in April through June. Mature bull trout begin ascending tributary streams on their annual spawning movements in June and July and are thus removed from the reservoir fishery.

Recruitment of Hatchery Cutthroat into the Population

Lake Koocanusa was planted in May, 1981 with approximately 200,000 four to six inch westslope cutthroat trout from Murray Springs Fish Hatchery. These fish were marked externally with fluorescent dye and internally with tetracycline. Several hundred of these marked fish were moved to the Libby Field Station and held in a raceway as a control. Testing done in January, 1982 on 12 of the control fish showed that 11 of the 12 had maintained external fluorescent dye marks and 10 of the 12 had good internal tetracycline marks. Tetracycline marks were most prominent on the anterior vertebrae and ribs between the third and seventh rib.

Four to six inch cutthroat trout planted in the reservoir in May should have ranged from 9-12 inches in length in October. Of 46 cutthroat in this size range caught by netting in October 1981, 12 were found to have external fluorescent dye. Examination of the heads and first anterior vertebrae from the 46 cutthroat showed only two with tetracycline marks.

The preliminary results based on fluorescent dye marks indicate that hatchery cutthroat comprised approximately 25 percent of the cutthroat in the 9-12 inch length group in October, 1981. A further indication of the recruitment of these hatchery fish into the population is apparent in the species composition of the angler catch in October. Cutthroat trout comprised 39 percent of the catch in October, a much larger percentage than in the previous months. The 1980, 1981, 1982 and 1983 hatchery plants, representing four year classes, will have to be followed through the fishery until 1986 before the contribution of hatchery cutthroat to the total cutthroat population in Lake Koocanusa can be adequately determined.

Age and Growth

A considerable amount of time was spent nomographing rainbow, cutthroat and bull trout and mountain whitefish scales collected from 1970-1981. The data will be entered on the computer for processing by a new age and growth program developed by the Montana Department of Fish, Wildlife and Parks. This standardization of the age and growth data will allow for a detailed analysis of changes in growth in pre- and post-impoundment fish populations.

Miscellaneous Activities

The maintenance and improvement of water quality, fish habitat and fish passage in tributaries to Lake Koocanusa has been a management priority. The Montana Department of Fish, Wildlife and Parks has used the data collected during the Corp funded projects in conjunction with data from an instream flow study funded by the Kootenai National Forest to prepare and file instream flow reservations for Young Creek, Fortine Creek and the Tobacco

River. Adjudication of water rights in these streams will be a major factor in preserving their value as spawning and nursery areas for rainbow and cutthroat trout from Lake Koocanusa.

Sinclair Creek, a tributary of the Tobacco River, supports spawning cutthroat and rainbow trout from Lake Koocanusa. An abandoned water supply dam located about four miles upstream from the mouth stopped further upstream movement. Construction of a fish ladder over this dam was completed in October, 1981 by the Tobacco Valley Rod and Gun Club and Department of Fish, Wildlife and Parks, with some material supplied by Lincoln County. The ladder should begin passing spawning fish in spring 1982 into five miles previously inaccessible spawning and nursery habitat.

LITERATURE CITED

May, Bruce and Joe Huston. 1981. Lake Koocanusa Post-Impoundment Fishery Study, Annual Progress Report. October 1, 1980 to September 30, 1981. Montana Department Fish, Wildlife and Parks, Helena, MT 19pp.