MONTANA DEPARTMENT OF FISH AND GAME

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FISHERIES DIVISION
Job Progress Report

July 1, 1976 - June 30, 1977

LAKE KOOCANUSA POST-IMPOUNDMENT FISHERIES STUDY
Lake Koocanusa, Montana

By

Bruce May and Joe E. Huston

Reservoir Investigations Project

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Project No. 2274

Project Title: Lake Koocanusa Post-Impoundment Fisheries Study

Period Covered: July 1, 1976 through June 30, 1977

ABSTRACT

Trend sampling indicated that rainbow and cutthroat trout in the Cripple Horse area were more numerous in the fall of 1976 than in 1975. Trout populations in the Rexford area did not change significantly between the two years. Northern squawfish and peamouth population also remained comparatively stable.

Numbers of cutthroat trout spawning in both Canadian and U.S. tributaries were quite high. Over 700 fish ascended Young Creek and redd counts in other Montana tributaries indicated excellent runs of adult cutthroat. About 900 adults entered Gold Creek, a British Columbia tributary.

Fishing success continued to be good to excellent with rainbow and cutthroat comprising about 95 percent of the catch. A majority of the anglers was local residents and fishing pressure remained light for a reservoir the size of Lake Koocanusa.

Initial analysis of the food habits data showed that cutthroat and rainbow trout of all sizes fed almost exclusively on Daphnia during the winter and early spring. Surface insects became increasingly important in the diet of fish of both species in May and continuing through the summer. Large rainbow over 18 inches in length also fed heavily on redside shiners during this period.

Cutthroat and rainbow were concentrated in the upper 20 feet of the water column throughout the reservoir during the report year. Surface water temperatures during the summer of 1976 did not get sufficiently high to initiate fish movement to cooler water temperature strata in the reservoir.

Cutthroat trout densities were highest during most of the year in surface waters within 500 feet of the shoreline. A similar pattern was noted for rainbow trout except they were also numerous on the bottom within 125 feet of the shoreline.

BACKGROUND

Lake Koocanusa was created by Libby Dam impounding the Kootenai River approximately 17 miles upstream from the town of Libby, Montana. The reservoir at full pool elevation of 2459 feet MSL is 90 miles long, (48 miles in Montana and 42 miles in British Columbia), has a surface area of 46,500 acres and a gross storage capacity of 5,809,000 acre feet (Figure 1). The predicted average annual drawdown of 120 feet reduces the reservoir volume 69 percent and the maximum drawdown of 172 feet reduces the volume 85 percent. The drawdowns from 1973 to 1977 were 230, 153, 172, 150, and 101 feet respectively. These water level fluctuations have a profound influence on the ecology of the reservoir fish populations inhabiting the reservoir.

A selective withdrawal system has been constructed for each of the eight penstocks which will allow water to be drafted from the penstock openings at elevation 2222 feet MSL to the reservoir surface. This system can allow water releases through the turbines to approximate the natural temperature regime in the Kootenai River prior to impoundment.

Game fish species present in the reservoir include: rainbow trout (Salmo gairdneri), westslope cutthroat trout (Salmo clarki sub-sp.), Dolly Varden (Salvelinus malma), kokanee (Oncorhynchus nerka), brook trout (Salvelinus fontinalis), burbot (Lota lota), mountain whitefish (Prosopium williamsoni), and white sturgeon (Acipenser transmontanus). Non-game species include largescale suckers (Catostomus macrocheilus), longnose sucker (C. catostomus), redside shiner (Richardsonius balteatus), northern squawfish (Ptychocheilus oregonensis), and peamouth (Mylocheilus caurinus).

The initial management plan for the reservoir was to establish spawning runs of westslope cutthroat and other game fish in suitable tributary streams. Westslope cutthroat trout inhabiting Hungry Horse Reservoir was selected as the strain of cutthroat most suitable for the fluctuating reservoir environment of Lake Koocanusa. This cutthroat has adapted well to a similar environment in Hungry Horse Reservoir and has provided a good fishery without stocking for over 20 years. Approximately 500,000 young-of-the-year cutthroat have been planted in tributary streams of Lake Koocanusa (developed as spawning and nursery areas) and about 3,000,000 fingerling cutthroat have been planted directly into the reservoir since 1970. The reservoir population of cutthroat was adversely affected by the escapement of fish out of the reservoir when it was drafted 230 feet below full pool for construction in the winter of 1972-73 and when spillways released water from near the surface in 1974 from July through December.

New reservoirs generally provide excellent sport fishing for the first few years because there is minimal competition plus an abundance of food and space resulting in excellent growth and survival of fish. As the reservoir ages, the maintenance of a satisfactory sports fishery becomes increasingly difficult. Some of the factors affecting reservoir game fish populations are: 1) inadequate annual recruitment of game fish from natural reproduction, 2) increased numbers of rough fish and increased competition for food and space between all species, 3) increased predation, 4) decline in fish food production

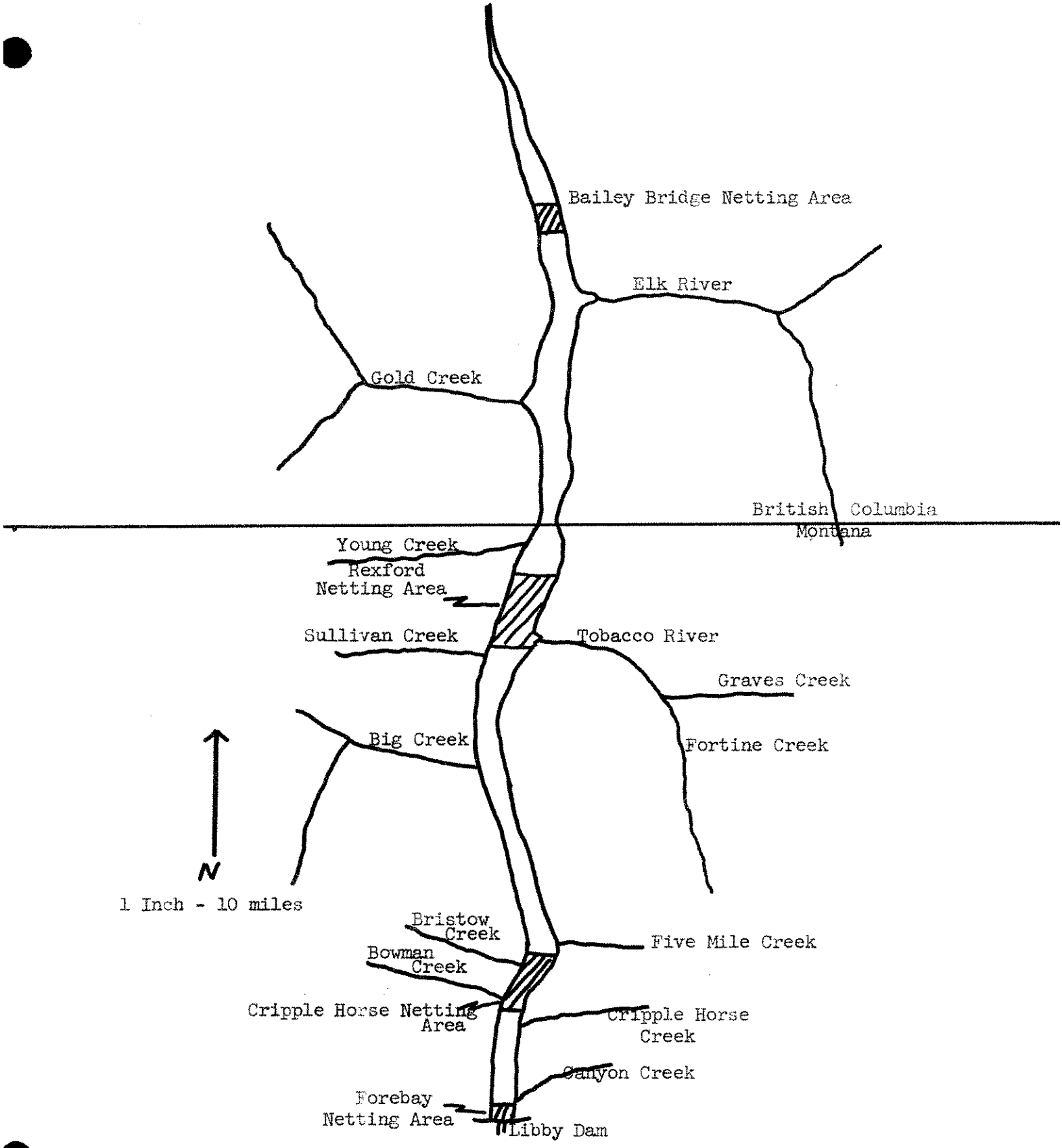

Figure 1. Map of Lake Koocanusa Showing Major Tributaries and Netting Areas

and 5) downstream escapement of game fish. Reservoir operations can vary the impact of any one of the above variables on game fish populations. The annual stocking of large numbers of hatchery fish can help maintain a sports fishery if the reservoir provides a suitable environment for their survival and growth. Thus, reservoir operation is critical to the maintenance of an environment which provides a satisfactory habitat for game fish.

Lake Koocanusa is in the first stage of its evolution and is providing a good sport fishery for cutthroat trout, rainbow trout and Dolly Varden. The rainbow and Dolly Varden trout populations are from natural reproduction, whereas the cutthroat population is being maintained by large plants of hatchery fish and natural reproduction.

OBJECTIVES

The objectives of this project are to: 1) determine the year-round vertical and horizontal distribution of major fish species in the forebay area, 2) monitor population trends of major fish species, 3) collect data on angler harvest and movement of game fish, 4) determine growth rates and condition factors of major game species, and 5) determine food habits of rainbow and cutthroat trout.

PROCEDURES

Fish Population Trend Sampling

Standard experimental floating and sinking gill nets were used to determine fish population trends. Catch by species was analyzed using the Kruskal-Wallis non-parametric ranking test advocated by Gooch 1/. Montana's standard gill net is 125 feet long and comprised of equal sections of 3/4 inch, 1 inch, 1 1/2-inch and 2-inch bar mesh. May and Huston (1976)2/ described the methods used to collect data during the spring and fall trend sampling.

Trend sampling during this report period included sampling in September, 1976 at the Rexford, Cripple Horse and Bailey Bridge (British Columbia) areas using floating nets. The spring sampling with sinking nets was cancelled because water elevations and temperature did not fall within the prescribed range.

Trend data on adult cutthroat were collected by trapping and counting the spawning adults entering Young Creek and by making redd counts in selected tributaries to the reservoir. Adult cutthroat entering Young Creek were tagged to determine migration patterns and angler harvest. Standard fisheries techniques were used to determine growth rates and condition factors.

1/ Gooch, Burwell, 1975. The Statistical Analyses of Gill Net Catches, Montana Dept. Fish and Game, Unpublished Mimeo, 40pp.

2/ May, Bruce and Joe E. Huston, 1976. Lake Koocanusa Post-Impoundment Fisheries Study. Job Progress Report. Contract No. DACW 67-75-C-0004. Montana Dept. Fish and Game. 13pp.

Determination of Vertical and Horizontal Fish Distribution

Sampling to determine vertical and horizontal fish distribution has been limited to the forebay and Cripple Horse Areas. Sampling frequency was monthly or when noticeable water temperature changes occurred. Acoustical gear was used to determine overall vertical and horizontal fish distribution throughout the day whereas gill nets were used to determine species distributions in overnight sets. Gill net catches during daylight hours were too low to provide meaningful data.

Angler Success and Pressure

Creel data obtained in 1974 by contacting anglers on the reservoir included both completed and non-completed trips. Beginning in 1975, creel data were based on complete trips obtained at a compulsory checking station located at Canoe Gulch Ranger Station. Creel data were analyzed through the use of a computer program developed by Dr. Tiahrt at Montana State University. Total fishing pressure estimated for the reservoir was obtained from a state-wide postal census.

Food Habits

Fish were collected at monthly intervals in the Cripple Horse and Rexford areas and quarterly in the Big Creek area. Standard procedure was to set three gangs of two floating nets, two single sinking nets and a gang set of six floating nets.

Nets were usually set at dusk and lifted at dawn. Based on information from Windell, et.al. (1976)3/ nets were checked during the middle of the night and trout removed when surface temperatures exceeded 54°F. Trout removed at night were killed immediately, an identification number placed in the mouth and placed on ice. Stomachs were removed the following morning.

Stomachs were placed individually in cheesecloth bags with the identification number and preserved in a mixture of methyl alcohol, formaldehyde, and acetic acid. Information obtained on each fish at the time of stomach removal included: total length, weight, sex, state of sexual maturity, location of capture, and time of capture. Following each sampling trip, the stomachs were removed from the cheesecloth and the contents of each emptied into a plastic vial with preservative.

Analysis of stomach contents will be done using three methods -- numerical, volumetric, and frequency of occurrence. All results will be expressed in percentages.

3/ Windell, J.T., J.F. Kitchell, D.O. Norris, and J.W. Foltz. 1976. Temperature and rate of gastric evacuation by rainbow trout, (Salmo gairdneri) Trans. Am. Fish Soc. 105(6):712-717

Plankton

Monthly plankton samples were taken to evaluate the nocturnal distribution of zooplankton in the Cripple Horse and Rexford areas. Ten plankton tows were taken at each site with a standard Wisconsin net.

For analysis, each sample was diluted depending on the density of zooplankton. Originally, 10 one ml aliquots were removed from each diluted sample with a Hensen-Stempel pipette and counted in a Sedgewick-Rafter cell. Chi-square analysis on the March and April samples showed no difference between the results of counting five aliquots and counting ten aliquots, Therefore, only five aliquots were counted for all samples after April.

Benthos

Four benthos samples were taken at each site monthly. Samples were taken at various depths including one taken near the point of maximum drawdown. The February-April samples were taken near the poirt of maximum drawdown. The February-April samples were taken with one-half square foot Eckman dredge. Subsequent samples were obtained with a 0.75 square foot Petersen dredge.

FINDINGS

Population Trends

Data from floating gill net catches from the 1975 and 1976 fall set series are compared in Tables 1 and 2. Surface water temperatures ranged between 59° - 63° during the netting operation and secchi disc readings ranged between 19-23 feet except for the Bailey Bridge area where a reading of 29 feet was recorded in 1976. The maximum reservoir elevation was within five feet of full pool both years.

Catch rates were not significantly different for rainbow trout, cutthroat trout, peamouth and northern squawfish in the Rexford area between 1975 to 1976. The catch rates of rainbow trout and cutthroat trout were significantly higher in 1976 than in 1975 in the Cripple Horse area. Numbers of cutthroat trout and peamouth were significantly higher in the Cripple Horse area than in the Rexford area in 1976, but no significant difference was found for rainbow and squawfish catches between the two areas. Catch rates for peamouth chubs and northern squawfish for the Bailey Bridge area were significantly higher than for the Rexford section. The catch of rainbow trout at Rexford was much higher than at the Bailey Bridge area.

Floating gill net data indicate cutthroat trout are more abundant in the Cripple Horse area in the fall than the other two areas. Rainbow trout were least abundant and squawfish were most abundant in the Bailey Bridge area. Data collected monthly in 1977 indicate that fish abundance varies for an area on a seasonal basis.

Table 1. Kruskal-Wallis Ranking Tests of gill net catches from Cripple Horse and Rexford areas, September, 1975 - 1976. Number of nets in parentheses

Species	Mean Catch 1975	Mean Catch 1976	Mean Rank 1975	Mean Rank 1976	P 1/
Cripple Horse Area 1975 (61) Versus 1976 (47)					
RB	2.46	3.74	47.26	63.89	< 0.01**
CT	2.46	3.19	49.28	61.28	< 0.05*
CRC	4.03	5.32	52.79	65.02	> 0.30
SQ	5.79	4.45	60.82	46.03	< 0.02*
Rexford Area 1975 (68) Versus 1976 (44)					
RB	3.03	3.45	54.26	59.95	> 0.30
CT	1.63	1.77	56.09	57.13	> 0.90
CRC	1.26	2.14	54.90	58.98	> 0.50
SQ	2.74	3.70	52.75	62.30	> 0.15

1/ * 95 percent confidence level
** 99 percent confidence level

Table 2. Kruskal-Wallis Ranking Tests of gill net catches from Cripple Horse, Rexford, and Bailey Bridge areas, September, 1976. Number of nets in parentheses

Species	Mean Catch Cripple Horse	Mean Catch Rexford	Mean Rank Cripple Horse	Mean Rank Rexford	P 1/
Cripple Horse Area (47) Versus Rexford (44)					
RB	3.74	3.45	47.55	44.34	.50
CT	3.19	1.77	55.51	35.84	.001**
CRC	5.32	2.14	53.45	38.05	.01 **
SQ	4.45	3.70	48.40	43.43	.30
Rexford Area (44) Versus Bailey Bridge Area (47)					
	Rexford	Bailey Bridge	Rexford	Bailey Bridge	
RB	3.45	2.00	53.19	38.57	.01**
CT	1.77	1.51	46.11	45.89	.05
CRC	2.14	3.96	38.66	52.87	.02 *
SQ	3.70	6.94	38.32	53.19	.02 *

1/ * 95 percent confidence level
** 99 percent confidence level

The year to year change in catch rates in the three areas will become more meaningful after several more years of trend data have been recorded. It appears now that rainbow and cutthroat populations have remained stable in the Rexford area while increasing significantly in the Cripple Horse area. Squawfish and peamouth populations have remained comparatively stable in both areas.

The spawning run of cutthroat trout ascending Young Creek was monitored (Table 3) and redd counts were made on nine tributaries to the reservoir (Table 4) to establish trend data on reservoir cutthroat populations based on spawning densities. The number of cutthroat entering Young Creek to spawn in 1977 was almost identical to that recorded in 1976. Estimation for the run was over 700 fish in both years as some fish ascended Young Creek before and after the trap was in operation. The average size of the fish in 1977 was almost one inch longer than in 1975.

Redd counts indicated that considerable numbers of trout were ascending other tributaries to spawn. The spawning density was heaviest in Young Creek, Pinkham Creek, Five Mile and Bristow Creek. Most areas containing suitable gravel in these streams exhibited evidence of redd preparation. Trout migrated over 40 miles from the reservoir to spawn in Fortine Creek and 30 miles in Big Creek.

The spawning activity of cutthroat trout in the British Columbia part of the reservoir was also quite intensive in 1977. Approximately 900 mature cutthroat were captured on their spawning run up Gold Creek (personal communication, Norman Ringstad). The data collected from the United States and Canadian parts of the reservoir indicates that an excellent population of mature westslope cutthroat trout has developed which is utilizing much of the available spawning habitat in reservoir tributaries. Continued monitoring of these runs will provide valuable trend data on the numbers of adult cutthroat inhabiting the reservoir.

Angler Harvest and Migration Patterns

A total of 391 reservoir anglers were contacted in 1976 at the Canoe Gulch checking station (Table 5). Sixty-eight percent of the anglers caught fish. The catch rate for all anglers was .42 fish per-man-hour of effort. Cutthroat trout comprised 64 percent of the catch followed by rainbow trout (30 percent) and Dolly Varden (6 percent). Cutthroat trout and rainbow trout averaged 14.8 and 14.6 inches in total length, respectively. The quality of the fishery has remained high as indicated by the catch rates and size of the trout.

Factors limiting use of the reservoir by the angling public include: 1) access problems created by the drawdown and lack of suitable boat ramps, 2) an abundance of natural lakes and streams in the area which provide quality angling in esthetically pleasing environments and, 3) the relative isolation of the reservoir from major population centers.

The 1975-76 statewide angler pressure survey gave an angler use estimate of 18,567 man-days for the U.S. portion of Lake Koocanusa. Sixty-nine percent of this pressure occurred during spring-summer and 31 percent during fall-winter.

Table 3. Summary of data from cutthroat trout spawning run from Lake Koocanusa into Young Creek, 1975-1977

	Year		
	1975	1976	1977
Number of spawners	303	692	679
Sex ratio (male:female	1.0:2.7	1.0:4.8	1.0:3.3
Average length (male in inches)	14.7	15.4	15.6
Average length (female in inches)	14.7	15.3	15.6
Estimated fecundity	220,000	600,000	600,000

Table 4. Summary of cutthroat trout redd survey in Lake Koocanusa tributaries, June, 1977

Stream	Location	Number Redds
Pinkham Creek	Mouth up 6 miles	231
Young Creek	Mouth up 7 miles	441
Canyon Creek	Mouth up 1 mile	1 1/
Five Mile Creek	Mouth up 2 miles	166
Bristow Creek	Mouth up 2 miles	108
Cripple Horse	Mouth up 3 miles	33
Big Creek	Drop Crk to West Fork	38
Fortine	Davis Crk to Sec.29	10

1/ Flows insufficient for fish passage

Table 5. Angler harvest of game fish from lower 30 miles of Lake Koocanusa, 1976

Period	Number Anglers	Successful Anglers	CPMH [1]	Catch [2] RB	Wct	DV
Spring	264	185	0.43	158	319	40
Summer	77	45	0.39	24	100	2
Fall	50	35	0.40	41	50	5
Combined	391	265	0.42	223	469	47
		Average size in inches		14.6"	14.8"	14.1"

[1] Catch-per-man-hour of angling effort

[2] Rb - rainbow trout; WCT - cutthroat trout; DV - Dolly Varden

Return of tags by anglers from cutthroat trout tagged at Young Creek (Table 6) has provided information on cutthroat movements in the system. Tagged fish caught in the United States part of the reservoir were 86 percent of the number of tagged fish caught. The remaining 14 percent were caught in the Kootenai River downstream from Libby Dam. A similar pattern was obtained in 1977 except returns from the Canadian part of the reservoir were six percent. Except for the trout creeled during the spawning season in or near Young Creek, most tagged fish in 1976 and 1977 were caught in the lower part of the reservoir at distances of between 30-47 miles from Young Creek.

Gill net data from the Food Habit Studies indicated that cutthroat trout are more numerous in the Rexford area in the spring than in the Cripple Horse area. During this period, plankton densities in the upper end averaged about two to three times higher than in the lower end.

Spawning movements in April and May tended to concentrate cutthroat in the upper end of the reservoir. After spawning was completed in early summer, fish tended to move downstream to the lower part of the reservoir where water temperatures were more desirable and plankton as abundant as in the Rexford area. Drafting of the reservoir in the late fall and winter tended to concentrate the cutthroat in the lower 20 miles of the reservoir. A better understanding of these seasonal movements will be obtained when data from the Food Habits and Limnological Studies are integrated with tag return and gill net catch rate information.

Table 6. Angler harvest and movement patterns of westslope cutthroat trout tagged as spawning adults, Young Creek fish trap, 1973-1977

Year Tagged	No. Tagged	Angler Harvest Number of Tags Returned Each Year 1973	1974	1975	1976	1977	Total
1973	237	2	10	--	--	1	13
1974	313	--	6	16	12	2	36
1975	578	--	--	12	12	21	45
1977	663	--	--	--	--	50	50

Food Habits

Final analysis of stomach contents will not be completed until June, 1979. Results presented here are based on gross analysis performed while removing the stomach contents.

Cutthroat trout of all sizes fed almost exclusively on Daphnia during the winter and early spring months. Feeding must have involved the expenditure of large amounts of energy, as Daphnia populations were low at that time. A shift from Daphnia to surface insects was evident in the late spring and summer. Daphnia were still present in many cutthroat stomachs, especially those of smaller fish (330 mm), but aquatic Dipteran adults, grasshoppers (Orthoptera), and bettles (Coleoptera) comprised the major portion of the volume. Cutthroat stomachs taken in the fall typically showed a mix of insects and Daphnia.

Rainbow trout also fed mostly on Daphnia in the winter and spring months. Small rainbows continued to feed on Daphnia but consumed some terrestrial insects in the summer. Rainbow trout larger than 330 mm shifted to feeding largely on insects and redside shiners (Richardsonius balteatus) in the summer months. All rainbows fed on Daphnia and insects in approximately equal proportions in the fall.

There appeared to be little difference in the food habits of trout caught at Cripple Horse from those caught at Rexford.

Plankton

Winter and early spring populations of Daphnia were very low (0.3 per liter at Rexford) and less than 0.1 organism per liter at Cripple Horse. Densities increased in May and peaked in June at approximately 5 Daphnia per liter at Cripple Horse and 15 per liter at Rexford. Plankton populations were consistently higher in the Rexford area. Densities were highest near the surface.

(Leptodora kindtii) began to appear in the samples in June and increased in abundance in July, the last month for which sampling was complete. (Leptodora kindtii) may become an important item in the trout diet at certain times of the year.

Table 6 A Movement patterns as determined by capture of tagged westslope cutthroat trout, 1973-1977

Year Returned	No. caught at these distances from Young Creek in Miles						Percent tagged fish caught		
	0-5	6-9	10-19	20-30	30-47	Below Libby Dam	Below Libby Dam	In Canada	In U.S.A.
1973	1	-	-	1	-	-	0	50	50
1974	5	1	-	3	1	6	38	18	44
1975	3	2	4	3	3	13	46	32	22
1976	5	3	-	3	7	3	14	-	86
1977	34	7	10	-	15	6	8	6	86

Benthos

No benthos samples have been analyzed at this time. Benthos is however, quite sparse, probably due to the large winter drawdown. One sample which did contain large numbers of Chrionomid pupae and Oligochaetes was taken over the old submerged river channel near Rexford.

Vertical and Horizontal Fish Distribution

An overview of the data from vertical gill nets fished in the forebay area of Lake Koocanusa is presented in Table 7. Cutthroat and rainbow trout were concentrated in the upper 10 to 20 feet of the water column throughout the year except during the summer months when surface water temperatures were sufficiently high to cause them to seek depths with cooler temperatures. Approximately 75 and 61 percent of the total catch of rainbow and cutthroat respectively were caught within 20 feet of the water surface. Less than three percent of the catch was recorded from depths of greater than seventy feet.

The depth distribution of the catch in relationship to temperature patterns in the reservoir is presented in Figures 2 and 3. There is a marked difference in the depth distribution of the fish between July, August, and September in 1975 versus 1976. In 1975, surface water temperatures reached 68°F. and stayed warm through mid-September. During this period cutthroat and rainbow trout appeared to seek the depths where water temperatures were between 59-62°F. The surface temperatures in the summer of 1976 were above 62°F for only a brief period and consequently the fish remained near the surface throughout the summer.

Data collected using acoustical gear indicated that vertical distribution of fish was different at night than in the daytime. Generally during the daylight hours fish were deeper and slightly more concentrated along the shore than at night. The movement toward the surface at night for cutthroat and rainbow appears to be related to the feeding rhythm.

Initial inspection of rainbow and cutthroat trout food habits data collected in summer 1977 showed these species most numerous at the 40 to 70-foot depth strata during the day. They did move into surface waters at night to feed on surface insects.

Some differences were noted between the off-shore and on-shore distribution of cutthroat and rainbow trout. Surface gill nets sampling to six feet of depth fished from the shoreline out 750 feet usually caught more cutthroat trout than rainbow trout. Sinking nets sampled from the bottom up six feet and extending from the shoreline out 150 feet always caught many more rainbow trout than cutthroat trout. These two types of nets fished at night indicate that rainbow trout are more bottom-oriented than cutthroat trout.

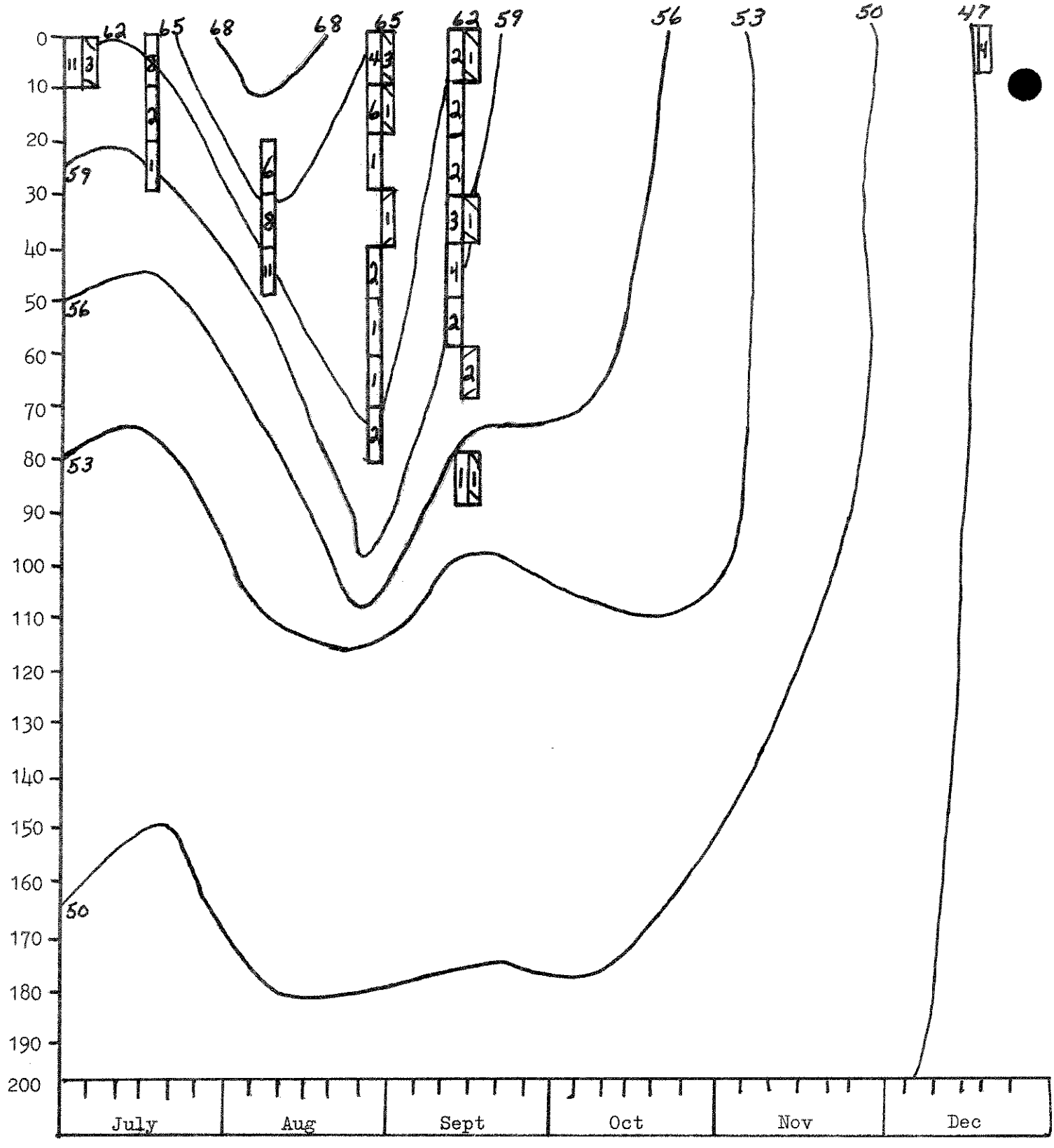

Figure 2. Temperature isotherms and depth distribution of rainbow and cutthroat trout in forebay area of Lake Koocanusa, 1975. Number of fish in each ten-foot depth strata is given.

cutthroat - ▯ ▯ - rainbow

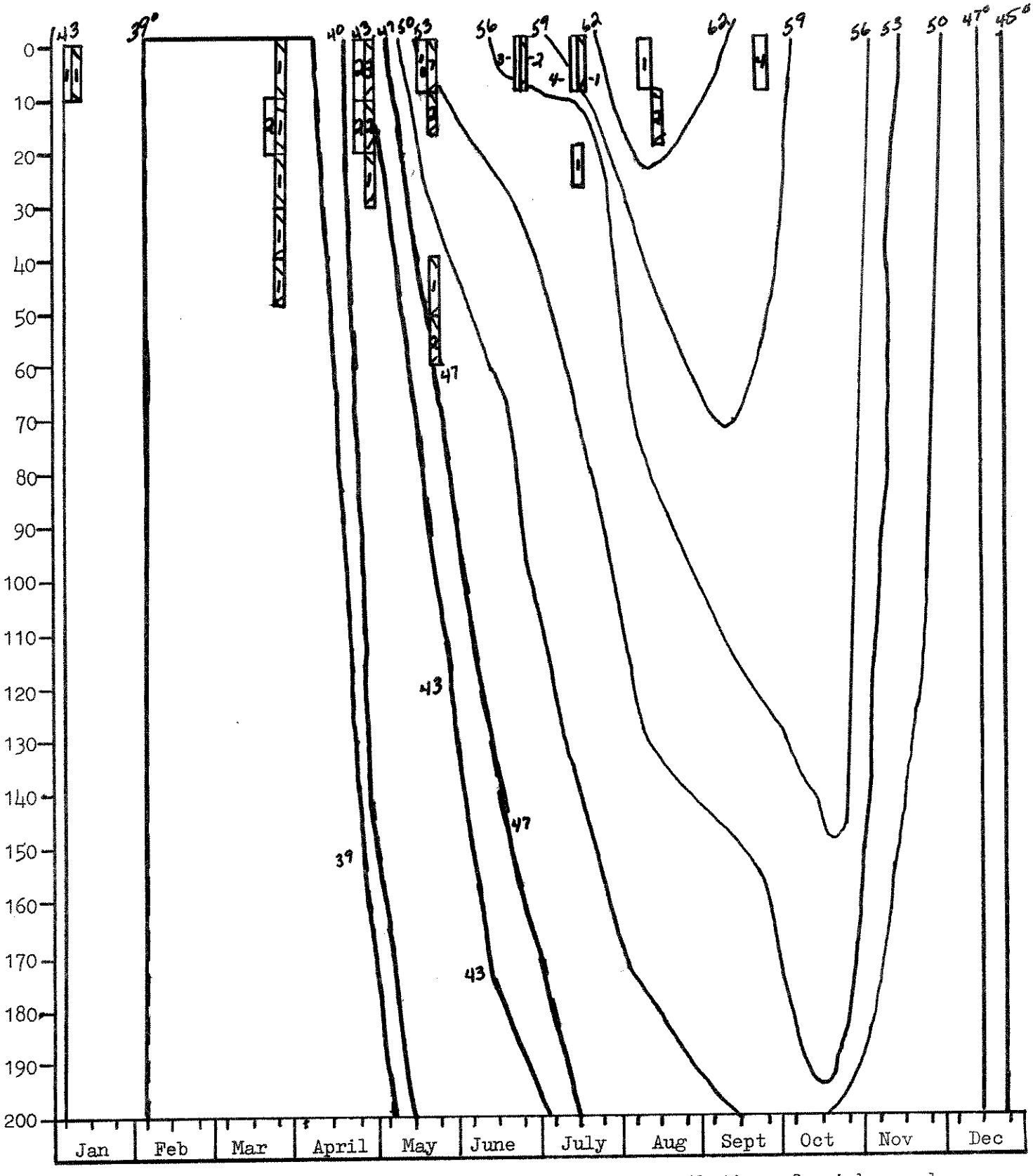

Figure 3. Monthly temperature isotherms and depth distribution of rainbow and cutthroat trout in forebay area of Lake Koocanusa, 1976. Number of fish in each ten-foot interval is indicated.

cutthroat - ▯ ▯ - rainbow

Table 7. Seasonal depth distribution of rainbow and cutthroat trout [1] in Lake Koocanusa from 1974 to April, 1977. Values are total captured for the period from vertical nets

Water Depth	Months												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
0/ 9	1/1	2/1	6/0	4/2	7/10	2/3	5/28	3/6	1/6	1/0	1/0	1/0	34/57
10/ 19			2/2	2/2	2/0		0/2	3/5	0/2				9/13
20/ 29			1/0	1/0			0/2	0/7	0/2				2/11
30/ 39			1/0				0/1	1/8	1/3				3/12
40/ 49			1/0		1/0			2/12	0/4				4/16
50/ 59					2/0			0/1					2/1
60/ 69								0/1	2/0				2/1
70/ 79								0/2					0/2
80/ 89									1/1				1/1
90/ 99													
100/109													
110/119													
120/129													
130/139													
140/149													

[1] Number of rainbow/number of cutthroat

Growth and Condition Factors

Scales were aged and condition factors calculated for major game species during the report period. This data will be summarized and presented in a future report. Initial analysis indicates that the growth and condition factors continue to be excellent in the reservoir. Cutthroat and rainbow trout averaged, respectively, 14.7 and 15.6 inches in total length after two growing seasons in the reservoir.

RECOMMENDATIONS

1. Continue sampling programs as outlined in current contract documents.

2. Continue to monitor cutthroat spawning runs in selected tributaries using fish traps and redd counts.

3. Determine streams which support significant runs of rainbow trout.

4. Determine migration patterns of rainbow trout through a tagging program.

5. Determine depth distribution and/or location of trout in the Rexford area during the summer when water temperatures are sufficiently high to force fish to seek water depths in their preferred temperature range.

6. Determine fish distribution in pelagic area of the reservoir.

7. British Columbia Fish and Wildlife Branch has been conducting surveys on the fishery in their portion of Lake Koocanusa. Their data will be included in the next annual report.