MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT

State Montana

Project No. F-34-R-4 Title Reservoir Investigations

Job No. II-a Title Hungry Horse Reservoir Study

Period Covered July 1, 1969 through June 30, 1970

ABSTRACT

Thirty overnight gill net sets were made at four netting stations in Hungry Horse Reservoir in May 1970. These efforts, when combined with similar efforts to be made in the fall 1970, will complete the fish population trends sampling in the reservoir. Information on angler harvest collected by big-game check station personnel during October and November 1961, 1962, 1965 through 1969 is presented. Catch rates for cutthroat trout (Salmo clarki subsp.) and mountain whitefish (Prosopium williamsoni) appear to be related to reservoir drawdown.

BACKGROUND

Hungry Horse Reservoir is a hydroelectrical impoundment on the South Fork of the Flathead River near the town of Hungry Horse, Montana. When full, this reservoir has a surface area of 22,500 acres and impounds about 3.5 million acre-feet of water. Annual flucuation varies with power demand and flood control. Average annual maximum drawdown for the last five years has been about 85 feet.

Prior to July 1, 1969 all fishery research and management activities on this reservoir were carried out under a State of Montana funded project or under a single job of Federal Aid Project F-34-R-4. Starting July 1, 1969 this job was divided into two jobs; one job dealing with general reservoir activities and the other specific work dealing with life history of cutthroat trout and mountain whitefish in Hungry Horse Creek, a tributary of Hungry Horse Reservoir.

OBJECTIVES

The objectives of this job were to collect trend information about the fish inhabiting the reservoir and to assess the reliability of passage of spawning fish through road culverts.

PROCEDURES

Trends in the reservoir fish population are determined by gill net sampling in the spring and fall every other year. Generally, each of five netting stations are sampled with 6 to 8 overnight gill net sets. Drawdown of the reservoir during the spring may cause elimination of the uppermost sampling stations. Sampling was conducted at only four stations in May, 1970.

Cutthroat trout and Dolly Varden (Salvelinus malma) were recorded separately from each net, measured (total length), weighed individually and had scale samples taken. Individual fish of other species were weighed and measured separately from about one-half of the nets. Catches from the other nets were counted and recorded by species.

Records were made on movement of spawning fish through road culverts by project personnel or from reports of capture by anglers at creel census stations. Creel census information was collected by big-game check station personnel during parts of October and November, 1969 and by project personnel in June 1969. The primary objective of the June creel census was to determine catch of spawning cutthroat trout from Hungry Horse Creek and was a part of the "Life Cycle Studies of Westslope Cutthroat Trout and Mountain Whitefish" of Federal Aid Project F-34-R-4.

FINDINGS

In May 1970 a total of 30 overnight gill net sets were made at four sampling stations in the reservoir. Average catch-per-net-night was 0.8 cutthroat trout, 5.8 Dolly Varden, 12.0 mountain whitefish, 9.4 northern squawfish (Ptychochelius oregonensis), 5.8 largescale suckers (Catastomus macrocheilus), and 5.2 longnose suckers (Catastomus catastomus). Further sampling will be done in November, 1970 and analysis of the complete year's sampling presented in F-34-R-5 report. The spring netting data seems to indicate that numbers of the other species have changed little. 1/

Angler harvest information has been collected by big-game check station personnel during big-game hunting season from about October, 1970 through November, 1970 for the years of 1961, 1962, 1965, 1966, 1967, 1968 and 1969. This information can be divided into two catagories: 1) reservoir anglers fishing for cutthroat trout, and 2) anglers fishing reservoir tributary streams specificially for mountain whitefish. Catch of cutthroat trout by whitefish anglers and of whitefish by reservoir anglers is accidental. The harvest information for each group of fishermen is presented in Table 1.

1/ Huston, Joe E., Reservoir Investigations. Job Progress Report, Federal Aid of Fish Restoration Project F-34-R-3, Job 2, Montana Fish and Game Dept., pp11 mimeo.

Table 1. Sample of fish harvested by reservoir and stream anglers during big-game hunting season for the years of 1961, 1962 and 1965 through 1969

	1961	1962	1965	1966	1967	1968	1969
Catch by Reservoir Anglers							
Number of anglers	25	85	29	17	42	51	35
Fish caught							
Cutthroat Trout	64	176	50	64	127	74	152
Mountain Whitefish	-	4	1	-	4	7	10
Dolly Varden	2	3	1	-	-	-	-
Arctic Grayling	-	2	-	-	-	-	-
Catch-per-man-hour	0.5	0.5	0.5	0.8	0.7	0.4	1.6
Catch-per-angler	2.6	2.2	1.8	3.8	3.1	1.6	4.6
Catch by Tributary Anglers							
Number of anglers	74	244	57	85	176	132	133
Fish caught							
Cutthroat Trout	9	58	-	-	-	3	40
Mountain Whitefish	432	2,033	402	1,025	1,531	832	1,743
Dolly Varden	4	5	-	-	-	-	-
Arctic Grayling	-	7	-	-	-	-	-
Catch-per-man-hour	1.8	2.0	2.6	2.8	2.4	1.8	4.1
Catch-per-angler	6.0	8.2	7.1	12.1	8.7	6.3	13.4
Reservoir Draw-down							
Feet below full pool October and November	3'-20'	0'	1'-7'	13'-58'	12'-28'	0-1'	32'-42'

Angling catch rate for reservoir cutthroat trout appears to vary in relation to reservoir drawdown. Seven years of data gathered from anglers in October and November indicates highest catch rates for years when the reservoir level is lowest and vica versa. This seems reasonable when consideration is given to the concentrating effect that results from less water volume. Reservoir volumes decline approximately 16 percent at levels of 15 feet less than full pool heighth, 28 percent at 45 feet, 38 percent at 65 feet and 48 percent when pool heighth is 85 feet less than full pool. The poorest catch rate occurred in 1968 with the reservoir at full pool and the highest in 1969 with the reservoir level 32 to 42 feet less than full pool. No influence should be drawn that there is any increased productivity, for the contrary probably exists. The trout are likely more readily caught because of the entire cutthroat population being confined to less water and equally likely, due to the decreased are in the reservoir bottom being less able to supply natural insect fauna for food.

Mountain whitefish caught by anglers in tributary streams appear to also be concentrated into stream areas and thus providing higher catch rate. Catch rates were highest for 1966 and 1969 the two years of greatest drawdown during the October-November census period. Mountain whitefish move into streams in pre-spawning movement during this period and reduced insect fauna food levels in the reservoir could likely cause increased catch rates. Concentration of mountain whitefish in the reservoir also varies the same as for trout, with drawdown, the catch per gill net was also lowest in 1968 and highest in 1970.

Spawning cutthroat trout and mountain whitefish were observed to move through all road culverts with gabion fishways. Stream-bed erosion below the outfall of the lowest gabion check dam continues to be a problem at the Murray and Emery Creek fishways. It is anticipated that additional check dams and erosion control structures will be needed within a few years.

RECOMMENDATIONS

Gill net sampling to complete the 1970 fish population trend data should be done in November 1970. Observations should be continued on fish passage through road culverts and needs for additional construction or repair work determined. Intensive stream sampling should be done in South Fork Logan Creek in spring 1971 to determine whether adfluvial cutthroat trout utilize this creek for spawning. Yearling cutthroat trout planted in this stream in fall of 1968 should return to spawn for the first time in 1971.

Prepared by Joe E. Huston

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Waters referred to:

1-08886005
1-08358001
1-08498001
1-08426001
1-08256001
1-11232001