MONTANA DEPARTMENT OF FISH AND GAME
FISHERIES DIVISION

JOB PROGRESS REPORT
Research Project Segment

State Montana Title Reservoir Investigations

Project No. F-34-R-8 Title Hungry Horse Reservoir Study

Job No. II-a

Period Covered July 1, 1973 through June 30, 1974

ABSTRACT

Twenty-eight overnight gill net sets were made in Hungry Horse Reservoir at four netting stations. The average catch per net night totalled 35.5 fish of which 28.0 were game fish and 7.5 nongame fish. These catch data combined with similar netting to be done in fall, 1974, will comprise the 1974 biennial population trend sampling.

Three creeks tributary to Hungry Horse Reservoir were sampled. One creek was barren of fish life, one contained a fair population of yellowstone cutthroat trout and in the third stream adfluvial westslope cutthroat trout and Dolly Varden were found.

Analysis was completed of scales collected from game fish during the 1972 biennial gill net sampling.

BACKGROUND

Hungry Horse Reservoir located on the South Fork Flathead River near Hungry Horse, Montana, is operated by the U.S. Bureau of Reclamation. Full pool elevation is 3,560 feet msl with a surface area of about 23,700 acres storing about 3.5 million acre-feet of water. The stated purpose for the reservoir is flood control, production of electrical energy and irrigation. Fish and wildlife are not benefits of this federal water development project.

Montana Department of Fish and Game has been conducting research and management activities on the reservoir and its tributary streams since 1958. The overall purpose of the work has been to maintain the native sports fishery within the South Fork drainage. Native game species include the westslope cutthroat trout, (Salmo clarki, subsp.), Dolly Varden (Salvelinus malma), and mountain whitefish (Prosopium williamsoni) while exotic game species include Arctic grayling (Thymallus arcticus), rainbow trout (Salmo gairdneri) and yellowstone cutthroat trout (Salmo clarki). Nongame species found in the drainage are all native and include largescale suckers (Catostomus macrocheilus), longnose suckers (C. catostomus) and northern squawfish (Ptychocheilus oregonensis).

OBJECTIVES

The objectives of this job were the collection of data on fish population trends in the reservoir and determination of spawning habitat of reservoir-dwelling fishes in the South Fork Flathead River drainage upstream from the reservoir.

PROCEDURES

Trends in the reservoir fish population are determined by gill net sampling with standard nets in the spring and fall every even numbered year. Sampling done in May, 1974, combined with data to be collected in October or November, 1974, will comprise the 1974 biennial population trend data. During May, 1974, a total of 28 overnight bottom gill net sets were made at four sampling stations. Cutthroat trout and Dolly Varden were recorded separately for each net, weighed and measured (total length). All individual fish or other species were counted, weighed and measured for about one-half the nets. Scales were collected from a representative sample of all game fish.

Sampling was cancelled in the South Fork Flathead River drainage above the reservoir due to low flows. The areas of the South Fork and its tributaries scheduled to be sampled are most accessible by jet boat. River volumes during the time set aside for this sampling were less than what was needed for safe boat operation.

Three reservoir tributaries (Wheeler, Wildcat and Doris Creeks) were sampled using electrofishing equipment. Fish caught were identified by species, weighed measured (total length), and then released. The areas of Wheeler and Wildcat Creeks sampled were above falls which stops movement of reservoir-dwelling fishes. Doris Creek was sampled within an area known to serve as a spawning and rearing area for reservoir-dwelling fish.

The Bureau of Reclamation was requested to supply the project with a recap of daily dam operations including inflow, forebay elevations and outflow divided into spill and plant discharges. Contour maps of the reservoir basin were also requested.

Aging of and determination of growth rates were finished for scales collected from game fish during the 1972 biennial population trend sampling. Scales were analyzed using a micro-beam projector assuming a straight line relationship between scale length and fish body length.

FINDINGS

A total of 28 overnight bottom gill net sets was made at standard netting stations in May, 1974. A total of 566 mountain whitefish, 195 Dolly Varden, 22 cutthroat trout, 150 northern squawfish, 19 longnose and 40 largescale suckers were caught. The average catch per net night was 35.5 fish of which 28.0 were game fish and 7.5 nongame fish. The reservoir was at elevation 3,475 feet during the netting compared to an elevation of 3,560 at full pool.

Hungry Horse Reservoir has been gill net sampled periodically since 1958. Comparison of catch data between netting times is difficult since sampling has

been done at different drawdown levels. Sampling periods were scheduled relative to predicted start of cutthroat and mountain whitefish spawning runs. Spring sampling is done about three to five weeks before start of cutthroat spawning runs and fall sampling is done about 2 to 4 weeks before whitefish spawning runs.

Investigations are continuing on methods to correlate sampling data collected at different drawdown levels. Factors being considered at this time are physical and include changes in volume, surface area and bottom area. U.S. Bureau of Reclamation has supplied the project with required storage and surface area tables and small-scale contour maps of the reservoir basin.

Three streams tributary to the reservoir were sampled in summer, 1973. Areas sampled in two of these creeks (Wheeler and Wildcat) were above natural barriers eliminating movement of spawning fish from the reservoir. Wheeler Creek was found to contain a fair population of yellowstone cutthroat trout. Wildcat Creek was found to contain no fish.

The area of Doris Creek sampled is known to be used for spawning by reservoir-dwelling cutthroat. Sampling yielded juvenile cutthroat trout and immature Dolly Varden. The immature Dolly Varden were probably offspring from a spawning run from the reservoir. Doris Creek had been sampled in the early 1960's and at that time contained only cutthroat trout.

Fish scales collected from cutthroat trout, Dolly Varden and mountain whitefish caught during the 1972 population sampling were read and age and growth rates determined. These data are presented in Table 1 and compared to data from fish collected in 1958. Reservoir sampling was started in 1958.

Table 1. Age and growth rates of Dolly Varden, mountain whitefish and cutthroat trout collected from Hungry Horse Reservoir in 1958 and 1972

Species	Year	Length in Inches at Annulus							
		I	II	III	IV	V	VI	VII	VIII
Dolly Varden	1958	2.6 (152)*	5.4 (152)	8.7 (138)	12.7 (98)	17.1 (40)	20.6 (19)	23.3 (1)	
	1972	3.4 (60)	6.3 (60)	9.4 (47)	13.0 (32)	16.5 (20)	19.4 (9)	23.4 (4)	26.4 (3)
Cutthroat	1958	2.8 (70)	5.8 (66)	9.5 (45)	12.1 (23)	13.7 (6)			
	1972	2.7 (32)	5.4 (32)	9.5 (24)	13.2 (5)				
Whitefish	1958	3.3 (103)	7.0 (99)	9.3 (77)	10.8 (48)	11.3 (14)	12.5 (3)	13.7 (2)	14.6 (2)
	1972	3.1 (108)	7.6 (94)	10.7 (72)	12.5 (31)	13.6 (5)	14.4 (2)		

*Number in parenthesis is size of sample

Hungry Horse Reservoir is open to year-around fishing but tributary streams are open to fishing from mid-June through November each year. The late opening

was designed to protect spawning runs of cutthroat trout from over-utilization. Past year's creel census information and return of tagged fish indicated that anglers might have caught 10-15 percent of a spawning run from Hungry Horse Creek, a heavily fished stream. The catch of unspawned fish was a small portion of the total catch.

Creel census stations were operated on the two roads leading out of the reservoir the first two weekends of the 1974 fishing season, June 16-17 and June 22-23. Tributary creeks were at or near peak spring run-off during the two weekends resulting in poor angling conditions. A total of 326 fishermen were checked who had fished 890 hours and caught 272 mature cutthroat trout. Most of the fish caught were unspawned fish but the low number should not have any effect upon the abundance of the 1974 year-class.

RECOMMENDATIONS

The 1974 population trend sampling should be completed by gill net sampling standardized netting stations. If acceptable river flows occur in the South Fork Flathead River in summer, 1974, electrofishing surveys should be conducted to determine spawning habitat used by reservoir fishes. Physical surveys of streams tributary to the reservoir should be started. The 1974 spring run-off included near-record peak flows which may have resulted in build-up of debris barriers and deterioriation of fish passage facilities at several road culverts. Operation of the reservoir should be related to fish population trend information.

Prepared by Joe E. Huston

Date July 2, 1974

Waters referred to:	Hungry Horse Reservoir	08-8860-05
	South Fork Flathead River	08-6660-01
	Doris Creek	08-7230-01
	Wheeler Creek	08-7720-01
	Wildcat Creek	08-7560-10