Ref ID: 71152

MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT

State of Montana

Project No. F-34-R-2 Name: Reservoir Investigations

Job No. 1 Title: Noxon Rapids-Cabinet Gorge Reservoirs

Period Covered: July 1, 1967 - June 30, 1968

ABSTRACT:

Prospect Creek incubation channel was operated to hatch and release an estimated 40,000 Montana westslope cutthroat trout fry (Salmo clarki subsp.) and 91,308 brown trout fry (Salmo trutta) into Noxon Rapids Reservoir. Trapping of the brown trout spawning run into Prospect Creek in fall 1967 yielded three fish. Sampling of Noxon Rapids Reservoir by gill netting in summer 1967 did not indicate any significant change in brown trout or cutthroat trout compared to previous years sampling.

RECOMMENDATIONS:

Gill net sampling of both reservoirs should be intensified. Brown trout fry released from the incubation channel in 1966 should reach netting size by mid-summer 1968.

OBJECTIVES:

Objectives of the Noxon Rapids - Cabinet Gorge Reservoirs investigations are: (1) establishment of larger populations of reservoir and spawning brown trout and Montana westslope cutthroat trout through use of Propsect Creek incubation channel; (2) investigation of other sites for potential channel development or spawning improvement; and (3) write-up of data on rainbow trout movement in the reservoir system.

TECHNIQUES:

Eyed-eggs of brown trout and cutthroat trout were planted, hatched, and released from an incubation channel into Prospect Creek, tributary of Noxon Rapids Reservoir. Brown trout eggs were supplied by California Fish and Game Department and cutthroat trout eggs by a State of Montana hatchery. Daily operation of a downstream fry trap was used to enumerate brown trout fry leaving the channel. Total escapement of cutthroat trout fry was derived from estimates of egg hatching rate, fry survival, and periodic operation of the downstream fry trap.

An upstream trap to capture and enumerate brown trout moving into Prospect Creek to spawn has been operated each fall since 1965. Fish captured were sexed, measured (total length), scale samples taken, and released upstream. Two trapping sites have been used. Destruction of equipment by vandals in 1966

caused project personnel to move the trap to a less suitable site in 1967. Greater stream velocities and depths at this second site have been as serious as the problem at the first site.

Gill net sampling of fish populations of Noxon Rapids and Cabinet Gorge Reservoirs has been in progress since 1955. Sampling in 1967 used gear, techniques, and sites similar to past years work. A description of pre-1967 sampling is presented by Huston (1965) and Gaffney[1/].

FINDINGS:

Incubation Channel Operations: The State Fish Hatchery at Libby, Montana supplied the project with 240,000 eyed eggs of cutthroat trout. These were planted in the channel June 28, 1967 and hatched within 15 days. Mortalities of eggs and sac fry were estimated to be at least 75 percent. Eggs held at the Libby hatchery from the same group of fish suffered more than 60 percent mortality through hatching. It is therefore assumed that the heavy mortality was due to poor quality of eggs and not a channel malfunction as determined by a combination of survival rates, periodic operation of the fry trap and intensive electrofishing. An estimated 40,000 fry moved out of the channel into Prospect Creek by September 1967.

California Fish and Game Department supplied the project with 770,000 eyed eggs of brown trout. These eggs were planted in the channel December 23, 1967, and hatched by January 22, 1968. Downstream movement of fry started February 22nd and essentially stopped April 3rd when catches at the trap dropped to less than 50 fish per day. Total escapement was estimated at 91,308 fry. Fry leaving the channel in February and first ten days of March averaged 200 per ounce, and those in April 180 fish per ounce. Observations of fry activity and downstream movement showed that 95 percent of all fish moved out of the channel between the hours of 4-6 A. M. and that remaining fish were most active during the same hours.

Brown trout eggs arrived at a time when both the project leader and Washington Water Power Company biologist were unavailable. Planting of the eggs was done by personnel unfamiliar with the physical channel characteristics, and not all of the available gravel beds were utilized. Egg density per square foot of gravel was estimated at 1,600 eggs. Egg mortality was estimated to be at least 60 percent primarily from fungus accelerated by crowded conditions.

The channel was intensively electrofished in September 1967 to remove hold-over fish from eggs planted in 1966 and 1967. About 1,000 brown trout from 3-7 inches in length and several hundred 2-3 inch cutthroat trout fry were captured and released into Prospect Creek.

Upstream Trap Operations: A fish trap has been fished in Prospect Creek to catch upstream migrants each fall since 1965. The trap consists of a 4'x4'x2' collecting box and 1" mesh poultry net leads four foot high extending to both stream banks. Fish captured were identified by species, sex, had total lengths recorded, scale samples taken from brown trout, and then released upstream. In addition to brown trout other species of fish

1/. Gaffney, John J., 1956. A Survey of the Fishery Resource in a Section of the Clark Fork River in Western Montana, Progress report, Project 29-E-1, Montana Fish and Game Department, 12 pp. mimeo.

taken each year include mountain whitefish (Prosopium williamsoni), rainbow trout (Salmo gairdneri), brook trout (Salvelinus fontinalis), and Dolly Varden (Salvelinus malma). The trap was installed the first week of October and fished through late November each year. Table 1 gives the brown trout catch for each year of operation.

Table 1. Number of spawning brown trout, average length and size, range, sex and age, Prospect Creek, 1965, 1966, 1967

	Year of Collection		
	1965	1966	1967
Number caught	24	8	3
Average size	22.3"	20.9"	14.9"
Size range	17.0-26.0"	13.7-25.5"	10.2-23.9"
Number females	12	5	2
Number males	12	3	1
Ages*	7(13) 6(10) 5(1)	7(2) 6(3) 5(2) 4(1)	7(1) 3(2)

*Numbers in parenthesis are numbers of fish of that age

A spawning run of brown trout first appeared in tributaries of Noxon Rapids Reservoir in 1960 and peaked in Prospect Creek in 1962 at an estimated 300 fish. Numbers of fish using Prospect Creek have declined steadily since 1962 and the 1967 data indicate this run has virtually disappeared. Brown trout fry released from the incubation channel in 1966 should spawn for the first time in either 1969 or 1970.

Noxon Rapids Reservoir Sampling: Eleven overnight gill net sets were made at three sampling stations in summer 1967. Total catch included 242 non-game fish and 38 game fish. Northern squawfish (Ptychocheilus oregonensis) and largescale suckers (Catastomus macrocheilus) were the most abundant non-game species and lake whitefish (Coregonus clupeaformis) and Dolly Varden the most abundant game species. Two small brown trout were taken, the first caught since 1962. Non-game fish (86.4 percent) and game fish (13.6 percent) taken in 1967 compare favorably with the 1962 ratio of 89.4 percent non-game fish and 10.6 percent of game fish. Both the 1962 and 1967 ratios are different than the 1960 ratio of 42.8 percent non-game fish and 57.2 percent game fish. Brown trout netted in 1967 made up 5.3 percent of total game fish compared to 11.4 percent in 1962 and 0.8 percent in 1960.

Spawning Site Development Investigations: Future spawning area or channel development will depend upon Prospect Creek incubation channel's influence on reservoir or spawning populations of brown trout. If brown trout populations can be enhanced by the incubation channel then other sites around Noxon Rapids or Cabinet Gorge Reservoirs will be developed. Preliminary negotiations have been started with landowners along a Cabinet Gorge Reservoir tributary to gain access to and control of a suitable length of stream. Development work would probably consist of in-channel improvements since rugged terrain almost precludes development of an off-channel controlled-flow structure.

Report Write-up: Compilation and analysis of fish movements and reservoir operation patterns for the years 1962-1965 have been completed. Written report of these data for publication and presentation at the Western Division, American Fisheries Society meeting in Reno, Nevada has been completed.

Bibliography

Huston, Joe E., 1965. Investigation of Two Clark Fork River Hydroelectric Impoundments. Proc. Mont. Acad. Sci., 25:20-40,1965.

Prepared by Joe E. Huston

Approved George D. Holton

Date May 15, 1968