MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT

State Montana

Cooperators Washington Water Power Company

Project No. F-34-R-3 Title Reservoir Investigations

Job No. 1 Title Noxon Rapids - Cabinet Gorge Reservoirs

Period Covered July 1, 1968 - June 30, 1969

Summary

Eyed eggs of cutthroat trout (Salmo clarki) and brown trout (Salmo trutta) were incubated in the Prospect Creek incubation channel. Escapement of the fry into Prospect Creek was not measured because of a failure of the downstream fry trap. Hatching success and escapement were thought to be good for both species. No brown trout were taken from Prospect Creek during the 1968 spawning run. Gill net sampling of Noxon Rapids and Cabinet Gorge Reservoirs was done in May 1969 to determine fish population trends. This sampling and a similar pattern to be done in October 1969 will comprise a complete series.

Background

Noxon Rapids and Cabinet Gorge Reservoirs are "run-of-the-river" hydroelectric impoundments owned and operated by Washington Water Power Company. The Company and Montana Fish and Game Department have cooperated in fishery studies in the two impoundments since 1956. Both reservoir fisheries have rapidly progressed through the typical impoundment pattern; i.e., good sport fishing immediately following impoundment which rapidly declined as age of the reservoir increased. Both reservoirs have received large plants of hatchery reared rainbow trout (Salmo gairdnerii) varying in size from fingerling to catchable-size fish.

It has been determined that mass movement of rainbow trout downstream and out of the reservoirs does occur. These fish movements have been correlated with reservoir inflow and outflow patterns. Rainbow trout have an inherited urge to migrate toward the sea. Apparently this plus the right combination of reservoir inflow and outflow characteristics, brought about a mass exodus of rainbow trout about every three or four years. Brown trout and the native cutthroat trout are not as prone to move out of the reservoirs as the rainbow trout.

Management and research activities since 1965 have centered around attempting to increase both brown and cutthroat trout populations in Noxon Rapids Reservoir. Primary efforts were releasing large numbers of fry of both species from an incubation channel into Prospect Creek, tributary to Noxon Rapids Reservoir. If the brown and cutthroat trout populations can be increased through incubation channel operations then similar activities will be inaugurated on Cabinet Gorge Reservoir.

Objectives

The objectives of this job were: (1) to plant, hatch, and release large numbers of cutthroat and brown trout fry from an incubation channel into Prospect Creek, a tributary of Noxon Rapids Reservoir; (2) to trap and enumerate brown trout entering Prospect Creek for spawning; (3) to sample Noxon Rapids and Cabinet Gorge Reservoir by gill nets and determine trends in brown trout and cutthroat trout populations; (4) to perform necessary maintenance needed on the incubation channel, and; (5) to finish the write-up of data collected from the two reservoirs from 1962 through 1965 under state project 2262.

Procedures

California Fish and Game Department supplied the project with 720,000 eyed brown trout eggs December 18, 1968, and Montana's Libby Hatchery furnished 450,000 eyed cutthroat eggs June 12, 1969. These eggs were buried in trenches 4 inches deep in gravel of the incubation channel. The fry trap was operated to enumerate escapement of brown trout fry from February 22, 1969 through April 15, 1969.

A trap designed to collect spawning brown trout entering the Prospect Creek drainage was installed October 11, 1968 and operated through November 15, 1968. The catch was identified by species and data on length and sex were taken from all brown trout. Scale samples were also taken. All fish were released upstream from the trap.

Fish populations of Noxon Rapids and Cabinet Gorge Reservoirs were sampled by gill nets to determine trends in brown and cutthroat trout populations. Three or four nets were fished overnight at each of three stations in each reservoir. The sampling stations are the same as those used since 1960.

Findings

Upstream trap operations - The trap designed to collect fall spawning fish species entering Prospect Creek was fished from October 11 through November 15, 1968. No fish of any species was taken during this time. It may be that the trap was installed too late in the year to sample spawning brown trout. It is thought that the 1968 trap catch is indicative of the strength of the run. Data collected from 1965 through 1967 shows a declining run of brown trout that very easily could have ceased to exist after 1967. Catch of spawning brown trout for

years 1965-68 was: 1965 - 24 fish; 1966 - 8 fish; 1967 - 3 fish; 1968 - 0 fish.

Brown trout fry were first released from the incubation channel in spring, 1966. It is not anticipated that these fish will return to spawn until an age of four years, in the fall of 1970.

Incubation channel operations - On December 19, 1968 the 720,000 eyed brown trout eggs supplied by California Fish and Game Department were planted in the incubation channel. Hatching was completed in about five weeks and fry had emerged from the gravel in another three weeks. Periodic checks were made of hatching success and fry emergence. It was estimated that about 90 percent of the eggs hatched and that fry emergence was excellent. Visual observations indicated that fry were more abundant than any other year of channel operation.

The downstream trap was operated to enumerate fry escapement from February 22, 1969 through April 15, 1969. The trap's catches were very low in spite of the large numbers of fry observed in the channel. The trap was operated by temporary personnel. Careful examination of the trap by the project leader March 26th led to the discovery of a leak which may have been responsible for the small catch. A false bottom of the headgate leading into the fry trap had separated from the true bottom about 3/8 inch. Brown trout fry moving out of the channel would have likely gone downstream between the false and true headgate bottom, missing the trap entirely.

The trap records indicate that the peak out-migration of the brown trout fry occurred between February 28th and March 10th. A total catch of 91,308 fry was made and 69,540 were taken during these 12 days. A crude estimate of total escapement from the incomplete trap data and from hatching and emergence observations would lead to a 60 to 70 percent escapement from the 720,000 eggs planted.

On June 12, 1969, the 450,000 eyed cutthroat eggs from Montana's Libby Hatchery were planted in the incubation channel. Hatching and emergence were completed within three weeks. No downstream enumeration was made.

Fish population sampling - Ten gill net sets were made overnight in each of Noxon Rapids and Cabinet Gorge Reservoirs. This sampling was done in May, 1969 and will be repeated in October, 1969 completing a sampling series. The analysis of these data will be presented in F-34-R-4 report including comparisons to prior netting data.

Miscellaneous work - Maintenance work on the incubation channel consisted of flushing silt and debris out of gravel using high pressure water pumps.

Write-up of data collected during 1963 through 1965 was completed. A paper entitled "Temporal Movement of Rainbow Trout in Reservoirs" was presented at the Western Division, American Fisheries Society meeting held in Reno, Nevada, July 9 - 11, 1969. Mr. Tim Vaughon, Wildlife Biologist, Washington Water Power Company, was co-author.

Recommendations

It is recommended that the same program carried out from July, 1965 through June, 1968 be continued July 1, 1969 through June 30, 1970. This entails operation of the incubation channel to rear brown trout and cutthroat fry for release into Prospect Creek, operation of a trap in Prospect Creek during the fall to enumerate the brown trout spawning run, and gill net sampling of both Noxon Rapids and Cabinet Gorge Reservoirs to determine trends in brown and cutthroat trout populations.

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Waters referred to:

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