

## MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS.

## FISHERIES DIVISION

JOB PROGRESS REPORT  
Research Project Segment

State: Montana Title: Reservoir Investigations  
Project No.: F-34-R-14 Title: Noxon Rapids-Cabinet Gorge  
Job No.: I-a Reservoir Study  
Period Covered: 1 July 1979 through 30 June 1980

## OBJECTIVE

The primary objective was to evaluate the planting of cutthroat trout in Noxon Rapids Reservoir and its tributary streams. Incidentally, information was also collected on brown trout living in Cabinet Gorge Reservoir and spawning in Bull River.

## WORK ACCOMPLISHED

Number of young-of-the-year westslope cutthroat trout planted into Noxon Rapids Reservoir and four of its tributary streams was 407,800 fish in 1977, 294,900 in 1978 and 255,400 in 1979. The fish planted in the reservoir and tributary streams in 1977 and those planted in the reservoir in 1978 should have grown enough to be catchable by gill net by fall 1979.

A total of 6 surface and bottom gill nets were fished overnight in Noxon Rapids and Cabinet Gorge Reservoirs in October 1979, while 20 floating and sinking nets were fished overnight in Noxon Rapids and 6 in Cabinet Gorge Reservoir in June 1980. Average catch-per-net-night by fish species, sampling time and reservoir is listed in Table 1. These data show that no cutthroat trout were caught in Noxon Rapids and that catch from Cabinet Gorge was only one fish in the May 1980 sampling. The near absence of cutthroat in the catch would indicate that planting cutthroat trout in Noxon Rapids Reservoir has not had a beneficial effect upon the sport fishery potential of this reservoir or Cabinet Gorge Reservoir which is immediately downstream of Noxon Rapids Reservoir.

Sampling of Noxon Rapids Reservoir for October 1979 and June 1980 was in Trout Creek area. Catch of game fish was low compared to nongame fish during both sampling periods. Greater numbers of nongame fish were caught in June. These higher catch rates were

Table 1. Average catch-per-net-night, Noxon Rapids and Cabinet Gorge Reservoirs, October, 1979 and June, 1980

Area and Date	Rb*	CT	DV	LL	MWf	LWF	CSu	FSU	Sq	CRC	Pmk	RsS	YP	BB	Total
<b>Noxon Rapids</b>															
Oct. 1979	0.4	0	0.6	0	0	0.8	4.6	0	1.4	38.2	0	0.2	10.4	0	56.6
June 1980	0.1	0	0.1	0.1	0	1.0	10.6	1.0	4.9	31.6	0.1	0.2	53.2	0.1	103.0
<b>Cabinet Gorge</b>															
Oct. 1979	0.2	0	0	3.2	0.4	0.4	0.4	0	4.0	2.8	0	0.4	0.4	0	12.2
June 1980	3.0	0.2	0.2	0.2	2.3	1.5	7.7	3.3	6.3	25.7	0.5	0.8	33.8	0	85.5

\* Fish abbreviations are: Rb = rainbow trout, CT = cutthroat trout, DV = bull trout (Dolly Varden)  
 LL = brown trout, MWf = mountain whitefish, LWF = lake whitefish, CSu = largescale sucker, FSu = longnose sucker, Sq = northern squawfish, CRC = peamouth, Pmk = pumpkinseed, RsS = reidside shiner, YP = yellow perch and BB = black bullhead.

likely caused by these species being concentrated for spawning activities near the shoreline and very susceptible to being caught by gill nets by increased mobility.

The area of Cabinet Gorge sampled in October 1979 and June 1980 was Bull River Bay. The proportion of the total catch made up of game fish was much higher than Noxon Rapids Reservoir and catch showed species variation from October to May. The catch of rainbow trout was higher in June than October due to hatchery rainbow being planted in the bay a week before net sampling was done. Catch of brown trout in October was much higher than in June. Bull River enters Cabinet Gorge Reservoir at Bull River Bay and the October catch in the bay was fish that would have entered Bull River for spawning. Lower catch of whitefish in October may be related to these species spawning in Bull River in October, whereas they were in the reservoir in June. Higher catch rates of most nongame fish in June were likely a function of these fish spawning in the bay at this time of year.

American Smelting and Refining Company and previously Bear Creek (a Kennecott subsidiary) has been doing extensive hard rock mining exploration in the Bull River drainage since 1969. Any mining development in the drainage has potential for damaging the fishery resource including spawning runs from Cabinet Gorge Reservoir. An unknown number of brown trout from the reservoir spawn in Bull River each fall. Preliminary inventory work was done in Bull River Bay and Bull River in fall 1979 upon which to develop a more extensive survey in following years.

One sinking gill net was set across the old Bull River channel in Bull River Bay about 400 yards downstream from full pool elevation. This one net was set overnight on October 23, 1979, November 16, 1979 and December 10, 1979. Catch of spawning brown trout for October 23 was four males and four females, for November 16, one male and four females and for December 10 was no males but one female. These limited data would indicate that spawning brown trout may be going into Bull River as early as mid-October and as late as mid-December.

Brown trout are thought to start spawning when decreasing water temperatures range between the lower 50°'sF or upper 40°'sF. Maximum daily temperatures as measured by a 30-day thermograph in Bull River dropped to 49°F October 20 and continued dropping to 34°F December 1. After December 1, maximum temperatures rose and averaged about 38°F the remainder of December.

Average total length and ranges of spawning brown trout captured by gill nets in Bull River Bay are shown in Table 2. These data indicate that the average size is quite large and that size range is extensive.

Table 2. Average size and range (total length) of male and female adult brown trout captured in Bull River Bay, fall 1979.

	Males	Females
Number	10	12
Average size	19.6 inches	19.1 inches
Range	16.0 to 24.5 inches	13.0 to 24.7 inches

It was not possible to collect scales for age-growth analysis from male brown trout and scales from only five females could be accurately read. Age and growth data from these five female fish are listed in Table 3.

Table 3. Growth rates and age of five female adult brown trout caught in Bull River Bay, fall 1979. The edge of each scale was considered the last annulus.

Length	Weight	Length in inches of annuluses			
		I	II	III	IV
13.0 inches	0.82 pounds	4.0	10.0	13.0	
18.5 inches	2.48 pounds	4.2	10.1	18.5	
19.3 inches	2.56 pounds	2.8	11.0	16.3	19.3
20.5 inches	3.70 pounds	3.1	9.1	19.0	20.5
21.8 inches	3.73 pounds	3.1	9.3	18.2	21.8

Few conclusions should be drawn from the small number of brown trout aged. The age data extrapolated to the size ranges shown in Table 2 does indicate that the spawning run included several age classes of fish. Growth rates of the fish were excellent during their second and third year of life which were probably spent in Cabinet Gorge Reservoir where an abundance of forage fish are available.

A five mile section of Bull River extending downstream from the mouth of the East Fork Bull River was floated and brown trout redds counted December 10, 1979. Five redds were observed and all were located within the first mile downstream of the East Fork. All redds were located at the tail-end of pools immediately before

breaking into a riffle. Four of the five redds were located in mid-channel; the fifth near the shoreline. Three redds were distinct individuals probably made by one pair of fish. Two redds included 3-5 distinct excavations raising the possibility that more than one female spawned in the same redd area.

#### RECOMMENDATIONS

Extensive surveys should be made of the entire Bull River drainage to locate areas used for spawning by brown trout. Redd counts should be made within each of these spawning areas. Physical measurements including water depths, velocities, distance from shade and cover, and composition of redd gravels should be made at enough redds to describe the range of spawning habitat.

Determination of total spawning population of brown trout entering Bull River would be desirable but the remoteness of this stream from any Department installation makes this goal almost unattainable. Rather, it is proposed that once all potential spawning areas are located, each area be checked at least once every two weeks and new redds marked. These redd surveys should start about mid-October and end in late December. Knowing the total number of redds should be an excellent measure of the total spawning population of brown trout.

Washington Water Power Company has agreed to assist the Department as much as possible during the investigation of brown trout spawning in Bull River.

Prepared by: Joe E. Huston

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Waters referred to:

Noxon Rapids Reservoir - 05-9328-05  
Cabinet Gorge Reservoir - 05-8512-05  
Bull River - 05-0864-01

Key Words:

Reservoir Management  
Brown Trout Spawning