MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-46-R-5 STUDY TITLE: SURVEY AND INVENTORY OF COLDWATER LAKES

JOB NO.: II-a JOB TITLE: NORTHWEST MONTANA COLDWATER LAKES INVESTIGATIONS, NOXON RAPIDS AND CABINET GORGE RESERVOIRS SEGMENT

PROJECT PERIOD: JULY 1, 1991 THROUGH JUNE 30, 1992

ABSTRACT

Maximum drawdown of Noxon Rapids Reservoir was 10 feet in mid-to-late April 1992 even though Bonneville Power Administration requested a 22 foot draft. Two bass tournaments were held on Noxon with good catch rates. Fall and spring gill and trap netting caught no burbot (Lota lota) in either reservoir but two 15-inch burbot were caught in Triangle Pond. Brown trout redd counts were made in selected Noxon Rapids and Cabinet Gorge reservoir tributaries. Counts were not total since unspawned fish were observed on the last trip made January 14-15, 1992. Largemouth bass spawning in 1991 in Noxon Rapids started in June and was essentially finished by mid July. Size of young-of-the-year bass caught in mid October varied from 1.0 inches to 3.6 inches.

BACKGROUND

Cabinet Gorge Reservoir, completed in 1953 and Noxon Rapids Reservoir, completed in 1958, are owned and operated by the Washington Water Power Company (WWP), Spokane, Washington. The reservoirs are heel-to-toe, run-of-the-river hydroelectric impoundments with Noxon Rapids extending 38 miles downstream from Thompson Falls, Montana to near Noxon, Montana. Cabinet Gorge Reservoir is 18 miles long and the dam structure is located about 1/4 mile inside the state of Idaho. Cabinet Gorge has a surface area of 3,400 acres at full pool elevation of 2,175 feet msl while Noxon Rapids' surface area is 8,600 acres at 2,331 feet msl.

A complete description of management activities in Noxon Rapids and Cabinet Gorge reservoirs prior to 1985 is given in a report entitled "Thirty-two Years of Fish Management, Noxon Rapids and Cabinet Gorge Reservoirs," Montana Dept. Fish, Wildlife and Parks, Helena, MT, 1985, by Joe Huston.

Fishery management activities on Cabinet Gorge Reservoir from 1985 through the present have been very limited since fish from the upper reservoir invade the lower reservoir very rapidly. In recent years, Cabinet Gorge has been used as a re-regulating reservoir for Noxon Rapids fluctuating 2 to 4 feet almost daily except when inflow exceeds generating capacity of the Cabinet Gorge powerhouse.

In 1985 WWP entered into a new Noxon Rapids Reservoir operating agreement with the Bonneville Power Administration. Briefly this agreement stated that the maximum annual draft under normal circumstances would be mo more than ten feet, daily fluctuations would not be more than two feet and that during the period of May 15 - September 30 maximum drawdown would be limited to 4 feet. Non-normal circumstances that could result in a drawdown of more than ten feet include that in the second and succeeding years of a critical water year the reservoir may be drafted but on a pro-rata basis with other reservoirs within the region.

Fisheries management emphasis shifted from trout to a combination of brown trout (Salmo trutta), burbot, largemouth bass (Micropterus salmoides) and smallmouth bass (Micropterus dolomieui). Smallmouth bass were planted in Noxon Rapids in 1982 and 1983 and burbot were planted in 1985-87. Brown trout were present in the Clark Fork River prior to impoundment, existed in small numbers prior to 1985 and have increased since 1985 due to limiting reservoir drawdown.

OBJECTIVES AND DEGREE OF ATTACHMENT

Objectives included three from the Northwest Montana Coldwater Lakes investigations (F-46-R-3, II-a) and 5 from the Northwest Montana Warmwater Lake Investigations (F-46-R-3, III-a). These objectives were:

Northwest Montana Coldwater Lakes Investigation

1. Manage lake and reservoir water levels to minimize impacts on fish populations. Objective was attained using state funding. WWP was able to limit drafting of Noxon Rapids Reservoir to ten feet. Bonneville Power Administration did request a 22-foot deep draft but WWP did not honor this request per the agreement described above. The ten foot draft started April 10, 1992, reached the ten foot level April 15th, remained at this level through April 24, when refilling started. The reservoir reached full pool April 29, 1992. WWP and Department personnel checked most of the dewatered shoreline for stranded, dead fish. Very few were found except in one area adjacent to the Trout Creek Community boat ramp. Several thousand pumkinseed (Lepomis gibbosus), bullhead (Ictalurus melas), redside shiner (Richardsonius balteatus) and yellow perch (Perca flavescens) were estimated to have been lost. It was also estimated that at least a thousand young-of-the-year and yearling largemouth bass were killed. Dead largemouth bass were counted in an area estimated to represent about 1/8 of the total area and 129 young-of-the-year and 11 yearlings were found.

2. Provide lake fisheries to sustain an increase of 32,600 angler days by 1992 through natural reproduction and hatchery plants. Provide kokanee fisheries for 12-14" fish at a catch rate of 1 fish/hour. The angler use objective was substantially met. Kokanee portion of this objective is applicable to other lakes covered by Coldwater Lakes Investigations.

3. Attempt to acquire sites and provide facilities on all lakes and reservoirs capable of sustaining more than 300 man days of fishing per year on a priority basis at the rate of one lake per year. This objective was met using state funding. The Department suggested, the U.S. Forest Service agreed, WWP provided funds and boat ramps at Marten Bay and North Shore Campgrounds were extended during the April, 1992 ten foot reservoir drawdown. A new boat ramp was poured at the Department-owned Flatiron Ridge Fishing Access Site in April, 1992. Complete renovation of the site to provide handicapped access, a fishing pier, boat dock, parking and sanitary facilities will be done in FY93.

Northwest Montana Warmwater Lake Investigations

1. Establish and maintain fishable populations (catch rate = 0.25 fish/hour) of smallmouth bass and burbot in Noxon and Cabinet Gorge reservoirs. Objective was partially met. It has not yet been ascertained if burbot are reproducing in Noxon Rapids Reservoirs. Rumors persist of an occasional burbot being caught by anglers. Anglers do catch good numbers of smallmouth bass mostly 6 to 12 inches long indicating good reproduction from the fish planted in 1982 and 1983.

2. Attempt to acquire and develop access sites on all lakes and reservoirs with the potential for more than 500 man days of fishing annually. First priority should be given Lake Blaine and those lakes with adjoining Champion International or Plum Creek Timberlands property. Objective was met using state funding.

3. Enhance fish populations through the placement of artificial habitat. this objective was met. The U.S. Forest Service, WWP, Department and local fishing clubs cooperated in constructing and placing about 500 pieces of commercially made habitat in a 30 acre Noxon Rapids Reservoir bay located between Tuscor and Marten creeks. Bass were observed frequenting the palm tree structures during the April 1992 ten foot drawdown and four smallmouth bass were caught in gill nets fished around the structures in mid-May 1992. Gill nets fished outside the structured area caught no bass.

4. Define the mechanisms of predator/prey relationships in area lakes. Reduce competition with game fish and reduce overabundant populations of nongame fish. This objective was met.

5. Encourage increased public knowledge and participation in resource decisions. This objective was met. Department personnel and the WWP fisheries technician attended meetings of area service and sports clubs.

PROCEDURES

Per recommendations listed by Huston (Huston 1991) sampling of fish populations in Noxon Rapids and Cabinet Gorge reservoirs is being geared to specific species using selective non-lethal methods and gear as much as possible. Methods used in this report period included beach seining, electrofishing and trap netting for bass species, redd counts in tributary streams for brown trout, trap netting for burbot, and limited general gill netting using "Noxon gill nets" for other fish species. Noxon gill nets consist of 50 foot long by 6 feet deep panels of 1 and 1/4 inch, 1 and 1/2 inch and 2 inch mesh bar measure mesh tied together making each net 150 feet long. Both sinking and floating nets are used.

Scales for age and growth analysis of largemouth bass were collected from fish caught during sampling efforts and from angler caught bass during a bass tournament held in August, 1991. Lengths, weights and scale samples were collected from game fish caught during any sampling. Lengths and weights of nongame fish were collected from gill net caught fish.

STATUS OF FISH POPULATIONS

Burbot - From May, 1991 through May 1992 Noxon Rapids Reservoir was netted with a total of 38 overnight trap net sets, 32 overnight sinking gill net sets and 31 overnight floating gill net sets. No burbot were caught. Population status of this species is unknown.

In April 1985, 23 adult burbot ranging in size from 2 to 3 feet in length were released in Triangle Pond located west of Noxon, Montana. Triangle Pond is a gravel pit dug during construction of Cabinet Gorge Reservoir. It is about 8 surface acres with a maximum depth of 35 feet. Water source is underground exchange with Cabinet Gorge Reservoir and the pond fluctuates with Cabinet Gorge Reservoir. In May 1992 one fyke net caught burbot 14.9 inches and 15.2 inches long showing that some natural reproduction has occurred. The burbot population in Triangle Pond is probably food supply limited since the only other fish species are finescale suckers and planted rainbow trout.

Brown Trout - Brown trout redd counts were started December 10, 1991 and terminated the next day when many unspawned fish were observed in Bull River. Redds counted numbered 53 in Bull River, 1 in Prospect Creek, 0 in Clear Creek and 5 in Vermilion River. Prospect Creek and Clear Creek, Noxon Rapids tributaries, were recounted January 14, 1992. In Prospect Creek three very new redds were seen and two pairs of fish were observed on redds. In Clear Creek one very new redd was seen.

An area of Clear Creek about 50 feet upstream and downstream from the single redd found January 14 was checked March 10, 1992 and an additional four redds were found. it is presumed that most of the spawning in the Prospect-Clear Creek drainage occurred within a month after January 14, 1992.

Redds in Bull River tributary to Cabinet Gorge Reservoir were recounted January 15, 1992 and a total of 90 were found. As in Prospect Creek, 3 pairs of brown trout were observed so it is known that the 90 redds don't represent a total count. The 90 redds found for the 1991 spawning population is very comparable to the high of 94 redds found in 1987.

Smallmouth Bass - Only subjective information was collected about the smallmouth bass population in Noxon Rapids Reservoir, mostly from anglers including tournament bass fishermen and Department and WWP personnel. Anglers have reported catching good numbers of smallmouth bass in that portion of the reservoir upstream from Vermilion River bay - Beaver Creek bay. The area of greatest catch was from Finley Flat upstream to the Thompson Falls dam. Many of the fish reported caught were 6 to 12 inches long, likely from the 1987 to 1989 year classes.

During the August 1991 bass tournament anglers weighed in 9 smallmouth bass ranging in size from 12.5 to 18.0 inches long out of the total of 218 bass weighed. Most of these smallmouth were caught downstream from the town of Trout Creek, the area considered to contain the best population of largemouth bass. The downstream area was also the most heavily fished during the tournament. During the May, 1992 net sampling four of the five smallmouth bass caught were taken in the Tuscor Creek-Marten Bay area within or near the area "planted" with bass habitat structure.

Scales from 12 smallmouth bass were collected and age-growth analysis performed. These data are presented in Table 1 below.

Table 1. Age growth of 12 smallmouth bass collected in July-August 1991.

	Length in Inches at Annulus							
Species	I	II	III	IV	V	VI	VII	VIII
Smallmouth Bass	3.0(12)*	5.9(10)	9.4(10)	12.5(9)	13.5(3)	14.3(1)	16.6(1)	17.6(0)

*Number in parenthesis is size of sample.

Largemouth Bass - In the absence of creel census information, data collected from largemouth bass fishing tournaments are the best indication of population characteristics and fishing success. Angler success from tournaments held in June 1992 and August 1991 is shown in Table 2 below.

Table 2. Bass tournament catches, Noxon Rapids Reservoir, August 1991 and June 1992.

	August 1991	June 1992
Number of anglers	50	48
Total hours fished	800	768
Total fish caught	370	[1]
Number greater than 12 inches		
Largemouth Bass	209	232
Smallmouth Bass	9	31
Catch per hour[2]	0.27	0.34

[1]No records kept on fish less than 12 inches.
[2]Based on bass 12 inches long or longer.

Catch rates were rated from good to excellent for both tournaments. In August 1991 the 1985 and 1986 year classes of bass made up 57 percent of the catch of fish 12 inches long or longer. These same two year classes contributed 92 percent of the catch in an August 1989 tournament. Year classes of bass spawned before the 1985 operating agreement contributed seven percent of the catch in the 1989 tournament and six percent of the catch in the 1991 tournament indicating that the drawdown limits have increased annual survival of these older, larger fish.

Scales for age and growth analysis were collected from fish caught during the August 1991 tournament. These data (Table two) are compared to age and growth information collected from fish caught in summer 1982, and from an August 1989 bass tournament.

Table 3. Age and growth rates of largemouth bass, Noxon Rapids Reservoir, 1982, 1989, and 1991.

	Length in Inches at Annulus					
Year	I	III	V	VII	VIII	X
1982	2.3(?)	7.6	10.9	13.8		19.3
1989	3.1(130)*	10.7(129)	14.0(9)	17.4(4)		
1991	3.2(102)	10.0(99)	14.2(63)	17.7(6)	18.9(3)	

?Number of fish aged in 1982 is not known.
*Number in parenthesis is sample size.

The growth data clearly show improved growth rates in 1989 and 1991 when compared to 1982. It also indicates no apparent changes between 1989 and 1991.

Beach seining for large mouth bass young-of-the-year, done in mid-October 1991 in the Marten Creek area is compared to similar efforts in 1989 and 1990. The same shoreline length was seined each year. The 1991 data is not completely comparable to prior years' information since the 1989-1990 seine was 50 feet long by 5 feet deep and the seine used in 1991 was 100 feet long by 10 feet deep.

Data shown in Table 4 includes average catch per seine haul for each year based upon a 50 foot long seine.

Table 4. Average catch per seine haul and size of young-of-the-year largemouth bass, Marten Creek area of Noxon Rapids Reservoir, mid October 1989, 1990 and 1991.

Parameter	1989	1990	1991
Number per haul	25	5	20
Average size (inches)	2.1	2.6	2.7
Range of size	1.2 - 3.4	1.6 - 3.3	1.0 - 3.6
Percent 2 inches long or longer	64	70	93

This data would appear to indicate good year classes of bass in 1989 and 1991 and a poorer year class in 1990. Ageing of fish caught in 1992 through about 1996 will determine the accuracy of these seining catches and sizes of fish.

It is considered that largemouth bass should be at least 2 inches long in the fall to have a reasonable chance of survival until the next spring. Beach seining was done in the Marten Creek area in May and June 1991 with a 50 foot seine and in April 1992 with the 100 foot seine. No young-of-the-year bass were collected in 1991 and only one in 1992. A good number of young-of-the-year bass were collected near the Trout Creek community boat ramp during the April 1992, ten-foot draft of the reservoir. These bass averaged 2.4 inches long and ranged from 1.8 inches to 3.2 inches. Ninety-five percent of the 129 bass measured were 2.0 inches long or longer.

Time of largemouth bass spawning has varied in each of 1990, 1991, and 1992. In 1990 the bulk of the spawning occurred in the last ten days of June, in 1991 in the first 15 days if July and in 1992 the middle 15 days of June. In both 1991 and 1992 a few largemouth were observed over nests three to four weeks after the peak time.

Between July 17, 1991 and August 14, 1991 crews from the Department and Washington Water Power Company spent six nights electrofishing for bass in two small areas of the reservoir. The purpose was to capture and tag good numbers of bass from the habitat planting area and an untreated area before a bass tournament, then during the tournament record number of tagged and untagged bass taken from the two areas.

Unfortunately only seven largemouth and three small mouth were captured by the electrofishing effort. Primary reason for the poor success was considered to be reservoir fluctuation during the evening hours during the week. Reservoir levels would drop as much as two feet prior to midnight-1 a.m. and rise during the remainder of the night. This constantly changing water level apparently caused bass to retreat to deep waters away from the shoreline outside the range of electrofishing. It is calculated that successful electrofishing of bass will have to be done during weekends when reservoir levels do not fluctuate.

During the August 18-19 bass tournament one tagged largemouth and one smallmouth were caught. Both were from the area of habitat plantings and both from the area in which they were initially captured.

Montana fishing regulations include catch and release for bass during the month of June. A bass tournament on Noxon Rapids Reservoir was allowed June 20 and 21, 1992 on the condition that fishermen cooperate with the Department so that bass caught could be tagged and released within a reasonable time and distance from

point of capture. Department and WWP personnel manned four boats with three covering the lower 20 miles of the reservoir and one the upper 18 miles. A total of 30 smallmouth and 224 largemouth over 12 inches long were tagged with numbered Floy tags. Other data recorded for individual fish included area of capture, area of release, and length and weight.

Department and WWP personnel will participate in scoring bass caught during an August 1992 tournament and record tagged bass caught by participants.

Other Species - Yellow perch had started spawning before the April 10, 1992 drawdown. Literally thousands of egg skeins were noted stranded throughout the reservoir. Yellow perch were still spawning May 20, 1992 as ripe males and females were caught during netting operations. One lake trout (Salvelinus namaycush) was caught during the May netting. This fish was probably a downstream migrant from Flathead Lake.

RECOMMENDATIONS

Testing of largemouth bass in Noxon Rapids Reservoir has shown that there is no genetic variation within individuals of this population. The Department will be planting largemouth bass fingerlings into two areas of the reservoir in summer 1992 from a hatchery brood stock with considerable genetic variation. These two areas of the reservoir include flats that can readily be electrofished and seined.

Using genetic markers it should be possible to keep track of the performance of the existing fish spawned in 1992 versus those planted. University of Montana Population Genetics Laboratory personnel have indicated that individuals of the two populations can be differentiated by starch gel electrophoresis of soft fin rays. The fin to be removed for fish less than five inches long is the pectoral fin while for larger fish a portion of the soft dorsal fin could be used. It is planned to expend considerable effort tracking the two populations starting with beach seining in October 1992. Hopefully cross-spawning between the two populations will occur in about 1997 at which time young-of-the-year bass will be tested to determine genetic variation.

Other fishery activities to be continued include counting brown trout redds in appropriate reservoir tributaries, reservoir net sampling spring and fall, beach seining spring and fall and continuing burbot searches in Noxon Rapids Reservoir during the winter. A major new effort will be reservoir tributary survey as part of a Challenge Grant program with the U.S. Forest Service and Washington Water Power. The target drainage for the first years' effort is Bull River, tributary to Cabinet Gorge Reservoir. Major areas of investigation include genetic analysis of all suspected sensitive (FS classification) species of special concern (Montana classification) populations within the drainage, making fish population estimates on main stem Bull River and important tributaries, making redd counts for bull and brown trout within all the drainage, doing sediment sampling in important spawning areas and doing the Hankin Reeves stream survey on Bull River proper and major tributaries. Personnel from WWP with assistance from USFS and FWP will be responsible for compiling all data into a final report.

LITERATURE CITED

Huston, Joe E. 1991. Northwest Montana coldwater lakes investigations: Noxon Rapids and Cabinet Gorge segment, proj. no. F-46-R-4, Job II-a, Montana Department of Fish Wildlife and Parks, Helena, Montana 59620, 10 pp. Reprint.

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Waters Referred to:		
	Noxon Rapids Reservoir	05-9328
	Cabinet Gorge Reservoir	05-8512
	Prospect Creek	05-5648
	Bull River	05-0864