F-78-R-4 IV-E

Region 7

Montana Department of Fish, Wildlife and Parks
Fisheries Division

Job Progress Report

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PROJECT NO. F-78-R-4 STUDY TITLE: Survey and Inventory of Warmwater Lakes

JOB NO: IV-E JOB TITLE: Tongue River Reservoir Investigations

PROJECT PERIOD: July 1, 1997 through June 30, 1998


## ABSTRACT

A size goal for crappie and an abundance goal for walleye at Tongue River Reservoir were met in 1997. The 1991 year class of crappie (six year old fish) were still abundant in 1997. The daily crappie limit instituted in 1996 is at least partially responsible. The 1997 year class of crappie appears to be of moderate size. Catch rate of spotted shiners was the highest measured since this species was first introduced in 1990.


## INTRODUCTION

A size goal for crappie and an abundance index goal for walleye have been in place for a number of years. These goals, in mid-summer gill net catches, are for 20% of crappie to exceed a total length of 250mm and for walleye catch rates to exceed an average of 2.0 fish per gill net set.

A major construction project began at Tongue Reservoir in 1996 and will continue through 1998. This project consists of reconstructing the dam, spillway and low-level outlet works to meet safety standards. It has resulted in a very low reservoir level of about 700 surface acres (approximately 3,200 acres at

spillway level) beginning in the fall 1997 and will continue through spring 1999. This long draw-down will decrease fish abundance. In 1996 fishing regulations were changed to decrease crappie harvest so that good numbers of adult crappie would be present to repopulate the reservoir following the construction low water period and to allow survival of crappie to help meet size goals.

## METHODS

Fish populations were sampled with gill nets and seines. Gill nets were of the sinking,experimental type, 125 feet long. A bag seine of 100 feet length, 8 feet deep and 1/4 inch mesh was set from a boat and hauled to shore.

## RESULTS AND DISCUSSION

Results of gill netting are shown in Table 1. Table 2 compares walleye and crappie statistics for 1997 with previous years.

Gill net catch rate of fish, in general, has been trending upward since 1995. The overall catch rate of 63.9 fish per overnight set in 1997 (Table 1) was almost twice the value for 1995. Rock bass, a species found in Montana only in the Tongue River drainage were sampled in both 1996 and 1997, after a two year absence in gill net samples. Other species were collected in gill nets in numbers and sizes similar to recent past years.

Goals for both crappie and walleye, two important sport species in Tongue Reservoir, have been met for the past three years (1995-97, Table 2). In fact the proportion of crappie in gill net samples exceeding 250mm (size preferred by anglers) in 1997 has not been exceeded since 1981. This goal has been met because of the longevity of the 1991 year class (6 years old in summer 1997). Without the crappie daily limit, this goal probably would not have been met. I believe that the crappie daily limit has decreased fishing pressure as well as individual take of crappie. However, data from the statewide fishing pressure estimates is not yet available to demonstrate this. The walleye goal will probably continue to be met provided walleye stocking at present levels is able to continue and providing effects of low water levels in late 1997, 1998 and early 1999 are not severe.

Catch rate for young-of-the-year fish (YOY) in seine hauls was somewhat less than in 1996, but well within historical levels (Tables 3 and 4). The catch rate for spotted shiner (9.7 per haul) was the highest measured since this species was introduced in 1990. It has never become abundant, but could increase the growth rate for both crappie and walleye if it did. Walleye YOY were not sampled in seine hauls in 1997, but zero catch rates have been observed in past years. Since walleye planting began on an annual basis in the mid 1980's at Tongue Reservoir, walleye yearlings have alsays been observed in gill net samples. For that reason the absence of YOY in seine hauls does not indicate an absence in the reservoir.

Catch rate of crappie YOY in seine hauls in 1997 was lower in 1996, but was still large enough to indicate moderate year class strength. Abundance of crappie YOY in seine hauls is an accurate indicator of year class strength at Tongue River Reservoir.

Waters referred to: Tongue River Reservoir 7-21-9000
Key Words: Crappie, Crappie Reproduction, Walleye
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Table 1. Results of 10 evernight experimental gill net sets at Tongue River Reservoir, August 1997.

| Species | Number Caught | Mean No./ Net Set | Mean Length (mm) | Mean Weight (gm) | Length Range (mm) | Weight Range (gm) | % of catch |
|---|---|---|---|---|---|---|---|
| Walleye | 42 | 4.2 | 384 | 679 | 227-691 | 110-3200 | 6.6 |
| Sauger | 2 | 2.0 | 362 | 380 | 358-365 | 340-420 | 0.3 |
| Yellow perch | 27 | 2.7 | 182 | 75 | 138-220 | 30-120 | 4.2 |
| Smallmouth bass | 25 | 2.5 | 266 | 319 | 145-411 | 30-120 | 3.9 |
| Largemouth bass | 1 | 0.1 | 286 | 430 | --- | --- | 0.2 |
| White crappie | 73 | 7.3 | 213 | 133 | 140-300 | 30-380 | 11.4 |
| Black crappie | 51 | 5.1 | 231 | 196 | 130-311 | 30-460 | 8.0 |
| Pumpkinseed | 2 | 0.2 | 164 | 100 | --- | --- | 0.3 |
| Rock bass | 5 | 0.5 | 156 | 60 | 147-162 | 50-70 | 0.8 |
| Chnl. Catfish | 18 | 1.8 | 382 | 571 | 149-512 | 30-1140 | 2.8 |
| Yellow blhd. | 109 | 10.9 | 230 | 152 | 112-323 | 20-440 | 17.1 |
| Black blhd. | 39 | 3.9 | 196 | 123 | 101-305 | 30-320 | 6.1 |
| Stonecat | 1 | 0.1 | 205 | 90 | --- | --- | 0.2 |
| Shrthd. Redhorse | 150 | 15.0 | 296 | 288 | 220-482 | 100-1200 | 23.5 |
| White sucker | 61 | 6.1 | 348 | 506 | 241-456 | 160-1000 | 9.5 |
| Longnose sucker | 1 | 0.1 | 203 | 80 | --- | --- | 0.2 |
| Carp | 32 | 3.2 | 498 | 1471 | 229-585 | 170-2320 | 5.0 |
| Totals | 639 | 63.9 | | | | | 100.1 |

Table 2. Tongue River Reservoir walleye gill net catch rates[8] and percentage of crappie >250mm total length in experimental gill nets, 1980-1997.

| Year | Walleye Catch Rate[8] | Walleye Mean Total Length (mm) | Percentage of Crappie >250mm Total Length |
|---|---|---|---|
| 1997 | 4.2 | 384 | 24.2 |
| 1996 | 5.0 | 395 | 20.0 |
| 1995 | 2.4 | 335 | 21.2 |
| 1994 | 5.3 | 349 | 2.2 |
| 1993 | 1.1 | 308 | 0.7 |
| 1992 | 8.4 | 325 | 0.8 |
| 1991 | 3.9 | 383 | 19.9 |
| 1990 | 4.1 | 349 | 2.9 |
| 1989 | 15.7 | 343 | 12.8 |
| 1988 | 19.4 | 332 | 18.9 |
| 1987 | 5.6 | 279 | 4.2 |
| 1986 | 1.6 | 273 | 0.0 |
| 1985 | 0.6 | 463 | 2.7 |
| 1984 | 0.4 | 417 | 1.2 |
| 1983 | 0.2 | 427 | 3.4 |
| 1982 | 2.0 | 397 | 1.7 |
| 1981 | 5.6 | 377 | 27.8 |
| 1980 | 4.3 | 319 | 11.4 |

[8]Average number of walleye per overnight experimental gill net.

Table 3. Mean number of young-of-the-year fish in Tongue River Reservoir seine hauls.

| Year | Mean Number | Most Abundant Species | Second Most Abundant Species |
|---|---|---|---|
| 1997 | 104 | Crappie | Spottail shiner |
| 1996 | 159 | Crappie | Yellow perch |
| 1995 | 682 | Crappie | Smallmouth bass |
| 1994 | 54 | Yellow Perch | Crappie |
| 1993 | 3 | Crappie | Spottail Shiner |
| 1992 | 17 | Crappie | Sunfish |
| 1991 | 464 | Crappie | Carp |
| 1990 | 569 | Crappie | Bullhead |
| 1989 | 5 | Yellow Perch | Smallmouth Bass |
| 1988 | 271 | Crappie | Yellow Perch |
| 1987 | 68 | Yellow Perch | Smallmouth Bass |
| 1986 | 127 | Crappie | Carp |
| 1985 | 46 | Crappie | Yellow Perch |
| 1984 | 585 | Carp | Bullhead |
| 1983 | 288 | Crappie | Walleye |

Table 4. Results of 10 seine hauls at Tongue River Reservoir, August 1997.

| Species | Number Caught | Mean No./ Haul | Mean Length (mm) | Mean Weight (gm) | Length Range (mm) | Weight Range (gm) |
|---|---|---|---|---|---|---|
| Smallmouth bass | 53 | 5.3 | 146 | 43 | 96-213 | 10-120 |
| Smlmouth bass YOY | 60 | 6.0 | 58 | -- | 45-84 | -- |
| Lrgmouth bass YOY | 5 | 0.5 | 68 | -- | 63-71 | -- |
| Walleye | 1 | 0.1 | 237 | 100 | -- | -- |
| Yellow perch | 2 | 0.2 | 126 | 20 | 119-132 | 10-30 |
| Yellow perch YOY | 37 | 3.7 | 58 | -- | 50-67 | -- |
| White crappie | 6 | 6.0 | 208 | 118 | 202-213 | 110-130 |
| Crappie YOY | 759 | 75.9 | 48 | -- | 35-60 | -- |
| Sunfish YOY | 17 | 1.7 | 33 | -- | 27-40 | -- |
| Pumpkinseed | 4 | 0.4 | 117 | 43 | 110-133 | 30-70 |
| Yellow bullhead | 2 | 0.2 | 163 | 55 | 152-173 | 50-60 |
| Ylw blhd YOY | 3 | 0.3 | 44 | -- | 37-49 | -- |
| Shorthead redhorse | 6 | 0.6 | 191 | 80 | 120-236 | 20-110 |
| Shrthead rdhrse YOY | 7 | 0.7 | 82 | -- | 70-93 | -- |
| White sucker | 1 | 0.1 | 257 | 170 | -- | -- |
| Spotted shiner | 97 | 9.7 | 44 | -- | 35-52 | -- |
| Carp | 15 | 1.5 | -- | -- | -- | -- |
| Carp YOY | 53 | 5.3 | 57 | -- | 42-75 | -- |