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 AND WARMWATER ECOSYSTEMS

JOB NO: V-e JOB TITLE: NORTHEAST MONTANA WARMWATER ECOSYSTEM INVESTIGATIONS

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

## ABSTRACT

Gillnet sampling in the Fort Peck Dredge Cuts indicated only moderate numbers of walleye and sauger. Cisco declined from 1990 and 1989 levels and no rainbow smelt were taken. Paddlefish harvest and tagging records were maintained for populations above and below Fort Peck Dam. A paddlefish creel census was conducted on the fishery above Fort Peck Reservoir during the spring of 1991. Total fishing pressure was estimated at 2,938 angler days with a total harvest of 488 paddlefish. Pressure was the highest recorded to date. Catch rates were low and the average size of female paddlefish declined significantly. Fishermen released 15-20% of paddlefish landed over 20 pounds. Anglers from 35 of Montana's 56 counties utilized the fishery, as well as snaggers from 15 states. Gill netting in Fresno Reservoir produced good catches of lake whitefish, walleye, and northern pike. Yellow perch were also present in good numbers after being absent from the catch two consecutive years. The catch-per-unit-effect (CPUE) for walleye was the highest recorded to date. Sampling indicated good recruitment from natural reproduction. Beach seining indicated below average production for walleye, yellow perch, and emerald shiner. Water levels at the time of seining were high, which may have negatively affected the catch. A revised walleye stocking plan was developed and implemented. Beach seining at Nelson Reservoir indicated reproductive success of northern pike and perch was poor. The CPUE for young-of-the-year (YOY) walleye, however, was the highest recorded since 1981. Large fingerling tiger muskies were planted in H.C. Kuhr Reservoir to aid survival and recruitment. Gill and trap netting failed to capture any tiger muskies. Yellow perch and crappie may overpopulate if suitable predation is not maintained. Walleye sampled in Beaver Creek Reservoir provided sufficient recaptures to estimate abundance of three year-classes. During the April-September creel period, fishermen harvested 361 walleye averaging 13.8 inches and 0.84 pounds. Natural reproduction of walleye was unconfirmed for the second consecutive year. Spottail shiners and yellow perch have dramatically increased in numbers. The number of largemouth bass over 5.0 inches increased in Reser

Reservoir, although average size was small. Large numbers of yellow perch YOY were observed for the first time in 1991. Introductions of warm/cool water species into Bailey Reservoir have been successful. Growth rates are exceptional and large catches of perch exceeding 0.5 pounds have been taken. Fishing pressure on large (>10 pounds) northern pike may be excessive during the ice fishing/spearing season. Forty-one walleye, representing two successive fry plants, were collected by gill and trap nets at Little Warm Reservoir. Initial stocking of walleye and crappie in this recently filled reservoir has been successful. However, a number of non-stocked species, including yellow perch, were found. Night electrofishing revealed a poor population of adult largemouth bass in Atlas Reservoir.

## OBJECTIVES AND DEGREE OF ATTAINMENT

Job Objectives: (streams)

1) To ensure within hydrologic constraints that streamflows do not fall below 1975-85 averages. Objective accomplished using state funding.

2) To maintain all the region's streambanks and channels in their present or improved condition. Objective accomplished using state funding.

3) To develop seasonal flow recommendations to improve flows for walleye spawning in the Milk River. Objective partially accomplished through participation in the Milk River Basin Advisory Committee.

4) To ensure that Fort Peck tailwater/dredge cut fish population is adequately protected from development related to hydropower expansion. Objective accomplished and data presented.

5) To acquire maximum spring flows within hydrologic constraints in the East Fork Poplar River through the International Joint Commission agreement. Objective accomplished using state funding.

6) To maintain paddlefish populations and angler catch rates at existing levels. A creel census was conducted in the spring of 1991 in the Missouri River study area above Fort Peck Reservoir. Objective accomplished and data presented.

7) To acquire public fishing access through lease or purchase and develop a fishing access site acquisition and development plan for the region. Objective accomplished using state funding.

Job Objectives: (lakes)

1) To collect 20-30 million walleye eggs for fry and fingerling stocking from the Miles City hatchery. Objective accomplished using state funding.

2) To develop 2 new fishing reservoirs and maintain 10 existing fisheries per year. Objectives accomplished.

3) To acquire public fishing access through lease or purchase and develop a fishing access site acquisition and development plan for the region. Objective accomplished using state funding.

4) To acquire suitable water level and minimum pool for Fresno and Nelson Reservoirs. Objective accomplished and data presented.

5) To maintain a variety of species combinations distributed geographically throughout the region in 45 small reservoirs. Objective accomplished using state funding.

6) To provide 10,000 angler days and catch of 0.25 walleye per hour at Nelson Reservoir. Objective accomplished; data presented. Quantification of fishing pressure will be accomplished by utilizing data from the statewide fishing pressure survey scheduled for 1992-93.

7) To maintain a population balance of predators versus perch and crappie. Objective accomplished and data presented.

8) To maintain or improve forage base for predator species in numerous reservoirs throughout the region. Objective accomplished and data presented.

## PROCEDURES

Floating and sinking standard experimental gill nets 125 feet in length and 6 feet deep, consisting of 25-foot panels of 3/4-, 1-, 1 1/4-, 1 1/2- and 2-inch square mesh, were fished to acquire information on overall fish populations. Beach seining to determine abundance and reproductive success of sport and forage fish was conducted in late summer and early fall utilizing a 100- x 9-foot seine of 1/4-inch square mesh. Monofilament gill nets 100 feet x 6 feet with 1/2-inch square mesh were set horizontally in the dredge cuts to sample smelt and cisco. A boom-rigged electrofishing boat was employed to sample adult and juvenile fish in Reser, Atlas, Nelson, Fresno, and Beaver Creek Reservoirs. A backpack electrofishing unit was used at Reser Reservoir to sample young-of-year (YOY) largemouth bass from shoreline vegetation. Whenever possible, fish were measured for total length and weighed to the nearest 0.01 pound. Scales and/or spines were taken from walleye to determine age composition.

## RESULTS AND DISCUSSION

### Fort Peck Dredge Cuts and Tailwater

Fish population sampling continued in the Fort Peck Dredge Cuts and tailwater complex in 1991, utilizing 10 experimental gill nets set overnight. This netting effort was initiated in 1979 to obtain information on the overall fish population due to potential impacts associated with a Corps of Engineers proposal to construct additional hydropower facilities which included a reregulation dam 8

miles downstream from Fort Peck Dam. An additional objective is to evaluate the abundance of game fish in relation to cisco and rainbow smelt numbers.

Sauger and walleye are the most popular game fish in the study area. The combined catch for sauger and walleye was highest in 1980, which was believed to be associated with rainbow smelt abundance resulting from an upstream migration from Lake Sakakawea, ND. In 1991, the sauger/walleye catch of 20 represents a decline in comparison to 1988 and 1989 and ranks as medium abundant relative to all previous years (Table 1). Efforts were made to correlate sauger/walleye abundance with forage fish numbers (Figure A). The catch of rainbow smelt has been low in recent years; however, the contribution of smelt to the forage supply has been replaced by cisco.

No smelt were taken by experimental gill nets in 1991. Additional sampling with four 100- x 8-foot monofilament gill nets with 1/2-inch square mesh has also been utilized to expand sampling for smelt, and three were taken by this gear in 1991. In previous years, the highest smelt catch in monofilament nets was 41 and 39 in 1988 and 1981, respectively. The mean total catch from these monofilament nets during 1981-88 was 11.7 smelt.

Cisco appeared in the experimental net catch for the first time in 1985 and have become a significant forage source. The presence of cisco correlates with new introductions into Fort Peck Reservoir and is attributed to downstream migration through the dam. Numerous dead or injured cisco have been observed in the Fort Peck tailpool area on several occasions. The 1991 cisco catch was 23 in 10 experimental gill nets, which has been the standard sampling efforts beginning in 1979. An additional five cisco were caught in four 1/2-inch square mesh monofilament gill nets.

Other features of the 1991 experimental gill net catch revealed 66 channel catfish which was the second highest on record. One lake trout and one smallmouth bass were netted, which was the first appearance of these species in the summer netting. The lake trout catch is not considered unusual, however, since this species is common in the deep, cold tailrace pool immediately below the powerhouse. The catch of 114 goldeye was the lowest on record. During 1991, releases from Fort Peck Dam were lower and more stable than usual due to maintenance work underway, and this undoubtedly influenced fish movement and distribution in the study area.

Table 1. A summary of the catch from ten 125-foot experimental gill net sets in the Fort Peck dredge cut/tailwater area, 1979-91.

| | 1979 | | | 1980 | | | 1981 | | | 1982 | | | 1983 | | | 1984 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) |
| Sauger | 7 | 15.3 | 0.96 | 67 | 14.7 | 1.03 | 47 | 15.0 | 0.93 | 9 | 16.1 | 1.06 | 12 | 14.3 | 0.92 | 14 | 12.6 | 0.50 |
| Walleye | 8 | 16.4 | 1.48 | 27 | 16.8 | 1.80 | 9 | 17.4 | 1.86 | 7 | 18.3 | 1.82 | 8 | 17.2 | 1.58 | 8 | 13.6 | 0.92 |
| Sh. sturg.[1] | 137 | 25.1 | 1.94 | 66 | 25.4 | 2.15 | 83 | 25.9 | 2.25 | 52 | 25.6 | 2.19 | 54 | 26.8 | 2.55 | 30 | 26.1 | 2.28 |
| Rb. smelt | --- | ---- | ---- | 29 | 06.9 | 0.08 | 4 | 07.0 | 0.08 | --- | ---- | ---- | 2 | 07.2 | 0.10 | --- | ---- | ---- |
| Wht. suck. | 5 | 13.6 | 1.78 | 7 | 14.6 | 1.57 | 16 | 12.5 | 1.04 | 7 | 15.7 | 1.85 | 8 | 14.6 | 1.65 | 17 | 13.9 | 1.39 |
| R. carpsk. | 32 | 15.2 | 1.62 | 23 | 15.6 | 1.75 | 12 | 15.2 | 1.72 | 17 | 15.0 | 1.58 | 16 | 15.6 | 1.59 | 21 | 15.9 | 1.75 |
| Sht. redh. | --- | ---- | ---- | 6 | 15.0 | 1.45 | 2 | 16.4 | 1.98 | 2 | 13.1 | 0.80 | --- | ---- | ---- | 3 | 14.5 | 1.19 |
| Goldeye[2] | 150 | 12.4 | 0.55 | 255 | 12.5 | 0.55 | 190 | 12.1 | 0.51 | 167 | 12.0 | 0.52 | 159 | 11.6 | 0.54 | 241 | 11.9 | 0.45 |
| Carp | 9 | 17.3 | 2.41 | 9 | 17.6 | 2.66 | 10 | 18.7 | 3.04 | 5 | 17.5 | 2.32 | 11 | 17.4 | 2.35 | 2 | 18.5 | 3.04 |
| Ln. suck. | --- | ---- | ---- | 7 | 13.3 | 1.43 | 4 | 15.2 | 1.67 | 3 | 18.6 | 2.98 | --- | ---- | ---- | 1 | ---- | ---- |
| Ch. cat. | 13 | 17.8 | 1.77 | 5 | 20.6 | 2.68 | 4 | 17.3 | 1.86 | 15 | 18.4 | 2.08 | 5 | 18.4 | 1.98 | 6 | 18.8 | 2.10 |
| Bl. suck. | 5 | 23.2 | 4.05 | 1 | 23.8 | 4.46 | 2 | 24.2 | 4.05 | --- | ---- | ---- | --- | ---- | ---- | 1 | 26.8 | 6.50 |
| No. pike | 3 | 26.8 | 4.33 | 1 | 28.5 | 6.90 | --- | ---- | ---- | 23 | 22.8 | 2.27 | 3 | 31.0 | 8.10 | 4 | 23.8 | 3.46 |
| Sm. buff. | 1 | 27.5 | 12.20 | --- | ---- | ---- | 1 | 24.3 | 6.25 | 2 | 16.7 | 1.98 | 1 | 19.2 | 2.98 | 1 | 20.5 | 4.20 |
| Bm. buff. | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- |
| Burbot | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 1 | 12.8 | 0.43 | --- | ---- | ---- | --- | ---- | ---- |
| Lk. white. | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 1 | 23.0 | 6.58 |
| Yel. perch | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 2 | 05.9 | 1.10 |
| Cisco | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- |
| Ch. sal. | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- |
| Paddlefish | --- | ---- | --- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- |
| Sm. bass | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- |
| Lk. trout | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- |

[1]Length data in 1981 is based on 66 fish.

[2]Length and weight data based on 122 fish in 1984; 127 in 1985 and 1986; 126 in 1987; 62 in 1988; and 127 in 1989.

Table 1. Continued.

| | 1985 | | | 1986 | | | 1987 | | | 1988 | | | 1989 | | | 1990 | | | 1991 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) | No. | Avg. Lgth. (in.) | Avg. Wt. (lbs.) |
| Sauger | 41 | 14.4 | 0.93 | 6 | 16.7 | 1.35 | 12 | 14.3 | 0.89 | 16 | 14.8 | 1.00 | 39 | 15.9 | 1.06 | 36 | 13.9 | 1.39 | 12 | 16.8 | 1.28 |
| Walleye | 6 | 14.1 | 0.82 | 1 | 18.6 | 1.90 | 2 | 15.6 | 1.20 | 3 | 16.3 | 2.00 | 7 | 14.9 | 1.18 | 9 | 17.2 | 1.76 | 8 | 15.2 | 1.19 |
| Sh. sturg.[1] | 53 | 27.4 | 2.70 | 23 | 26.9 | 2.76 | 20 | 26.8 | 2.35 | 40 | 27.5 | 2.40 | 27 | 27.6 | 2.29 | 46 | 27.4 | 2.48 | 37 | 26.7 | 2.12 |
| Rb. smelt | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 5 | 06.4 | NA | 4 | 06.4 | 0.33 | --- | ---- | ---- | --- | ---- | ----- |
| Wht. suck. | 3 | 13.4 | 1.39 | 13 | 13.7 | 1.15 | 10 | 11.3 | 0.93 | 30 | 12.9 | 1.30 | 34 | 12.9 | 0.92 | 49 | 11.2 | 0.78 | 30 | 12.6 | 1.00 |
| R. carpsk. | 25 | 15.7 | 2.11 | 15 | 15.6 | 1.70 | 9 | 15.3 | 1.67 | 10 | 15.7 | 2.00 | 12 | 15.8 | 1.65 | 23 | 15.8 | 1.89 | 23 | 15.8 | 1.77 |
| Sht.redh. | 4 | 14.5 | 1.87 | 1 | 15.6 | 1.80 | 4 | 15.5 | 1.78 | 6 | 15.6 | 1.80 | 11 | 13.7 | 1.22 | 5 | 15.3 | 1.62 | 6 | 13.3 | 0.87 |
| Goldeye[2] | 187 | 11.3 | 0.47 | 224 | 11.5 | 0.54 | 208 | 11.4 | 0.49 | 150 | 11.1 | 0.50 | 158 | 11.2 | 0.38 | 180 | 11.0 | 0.45 | 114 | 10.8 | 0.35 |
| Carp | 5 | 17.3 | 2.64 | 3 | 17.3 | 2.33 | 4 | 17.2 | 2.34 | 2 | 20.2 | 3.50 | 5 | 19.5 | 3.79 | 4 | 17.2 | 2.30 | 3 | 15.9 | 1.53 |
| Ln.suck. | --- | ---- | ---- | 1 | 17.8 | 2.30 | --- | ---- | ---- | 1 | 16.4 | 1.90 | 4 | 07.3 | 0.48 | 3 | 14.9 | 1.53 | --- | ---- | ----- |
| Ch. cat. | 2 | 20.2 | 3.30 | 5 | 17.8 | 1.84 | 11 | 17.3 | 1.88 | 5 | 18.8 | 3.40 | 74 | 17.2 | 1.68 | 29 | 16.9 | 1.53 | 66 | 17.5 | 1.55 |
| Bl. suck. | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 1 | 25.6 | 5.80 | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ----- |
| No. pike | 6 | 26.8 | 4.16 | 3 | 28.9 | 6.88 | --- | ---- | ---- | 3 | 24.2 | 4.56 | 1 | 28.0 | 4.69 | 7 | 21.2 | 2.59 | 6 | 23.4 | 3.65 |
| Sm. buff. | 2 | 18.1 | 3.91 | 2 | 15.7 | 1.90 | 1 | 22.5 | 6.20 | 3 | 17.5 | 2.90 | 2 | 19.8 | 9.13 | 1 | 21.6 | 5.00 | 1 | 27.2 | 11.20 |
| Bm. buff | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 1 | 16.0 | 2.07 | --- | ---- | ---- | --- | ---- | ----- |
| Burbot | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ----- |
| Lk. white. | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 2 | 22.9 | 4.80 | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ----- |
| Yel. perch | 8 | 05.9 | 0.09 | 3 | 06.9 | 0.15 | 1 | 07.1 | 0.22 | 1 | 07.5 | 0.20 | --- | ---- | ---- | 7 | 06.1 | 0.14 | 1 | 5.7 | 0.08 |
| Cisco | 4 | 10.6 | 0.45 | 12 | 13.5 | 0.86 | 17 | 09.9 | 0.34 | 25 | 11.0 | 0.50 | 62 | 09.1 | 0.22 | 40 | 09.4 | 0.33 | 23 | 10.3 | 0.34 |
| Ch. sal. | --- | ---- | ---- | 1 | 07.2 | 0.20 | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ----- |
| Paddlefish | --- | ---- | ---- | --- | ---- | ---- | 1 | 52.0 | 15.40 | --- | ---- | ---- | 1 | 54.0 | 31.94 | --- | ---- | ---- | --- | ---- | ----- |
| Sm. bass | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 1 | 13.6 | 1.20 |
| Lk. trout | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | --- | ---- | ---- | 1 | 27.9 | 8.90 |

[1]Length data in 1981 is based on 66 fish.

[2]Length and weight data based on 122 fish in 1984; 127 in 1985 and 1986; 126 in 1987; 62 in 1988; and 127 in 1989.

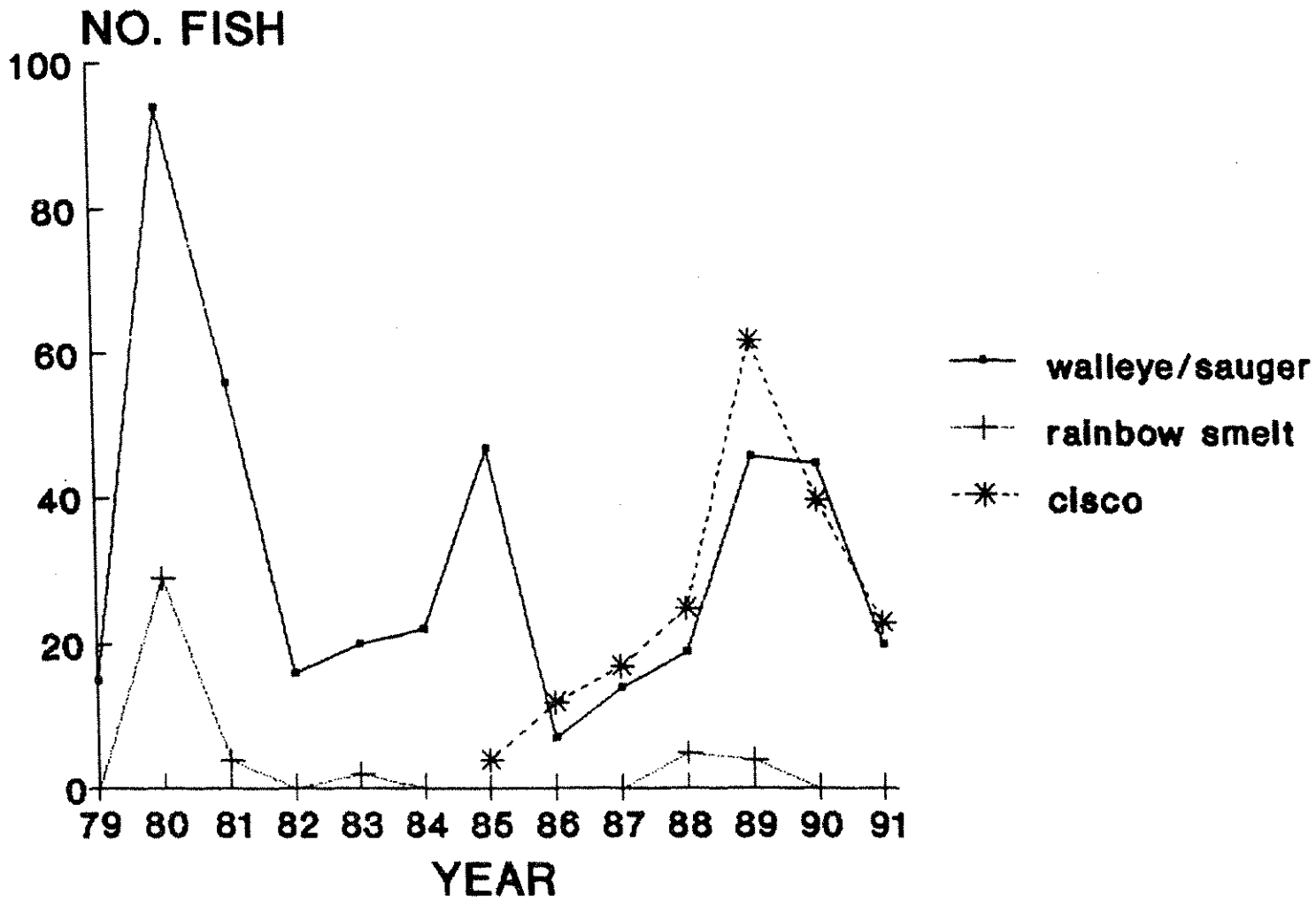


Figure A. Numbers of walleye/sauger in the Fort Peck Dredge Cuts/Tailwater in relation to the catch of rainbow smelt and cisco.

Paddlefish

## Dredge Cut Complex

Harvest and movement records for tagged paddlefish in the Dredge Cut area and Missouri River below Fort Peck Dam were maintained. No additional fish were tagged in the study area in 1991. This report includes tagging data from work conducted by Ken Frazer in 1984, working on a Corps of Engineers funded study, and tagging work by Bill Gardner and Phil Stewart under Dingell-Johnson Project FW-2-R.

Eight tagged paddlefish were harvested by fishermen during 1991, one in Dredge Cuts where tagging occurred and seven by snagging at Intake Dam on the Yellowstone River. To date, 154 paddlefish tagged in the study area have been harvested; 72 (46.8%) in the Dredge Cuts and 82 (53.2%) in the Yellowstone River, primarily at Intake Dam. During the past ten years of 1982-91, however, 78.6% (66 of 84) of the tag returns have been from the Yellowstone River. This is due in part to the higher fishing pressure and harvest at Intake Dam, and also reveals a high rate of paddlefish mobility and interchange between the Missouri and Yellowstone Rivers.

The harvest rate for paddlefish in this area remains low as summarized in Table 2. The average annual percent harvest for 817 fish tagged during 1974-84 varied from 0.6-1.8%. The average annual harvest rate prior to 1974 was 1.0% (Needham, 1985). Paddlefish tagged in the Missouri River outside the Dredge Cuts have experienced a lower rate of exploitation ranging from 0.6-1.2%; whereas fish tagged in the Dredge Cuts had an annual rate of 1.2-1.8%.

The largest groups of paddlefish tagged in a single season are 189 in 1974, 162 in 1978, and 151 in 1979. After 18, 14, and 13 years of fishing pressure and harvest exposure, these groups have exhibited an average annual harvest rate of 1.2-1.8%, and the total harvest rate ranged from 20.0-25.7%.

## Fort Peck Reservoir and Missouri River Upstream

No additional paddlefish were tagged in 1991; however, tagging and harvest records for previously tagged fish were maintained. During 1973-86, a total of 498 paddlefish were tagged in this study area. This total includes 192 fish tagged in the upper portion of Fort Peck Reservoir in 1978.

Six tagged paddlefish were harvested by snagging in 1991. Three of these were tagged in 1978 and one in 1977, 1980, and 1986. Most of the harvest occurs in the spring as fish migrate upstream from Fort Peck Reservoir to spawn, but some fish are also caught in the fall.

Table 2. A summary of paddlefish tagging and harvest from the dredge cut complex and Missouri River, 1974-91. Percent harvest was derived by adjusting for harvest of tagged fish. All fish were tagged in the dredge cuts except 40 fish in 1979 and all fish in 1980-82 which were tagged in the Missouri River.

| Year | No. Tagged | No. Tag Returns 1991 | Total No. Tags Returned | Percent Tags Returned | Avg. Annual % Harvest |
|---|---|---|---|---|---|
| 1968 | 12 | 0 | 1 | 8.3 | * |
| 1969[1] | 94 ( 92) | 0 | 15 | 17.2 | * |
| 1970 | 5 | 0 | 0 | 0 | 0 |
| 1974[2] | 189 (185) | 1 | 34 | 22.3 | 1.2 |
| 1976[3] | 48 ( 47) | 0 | 10 | 23.7 | 1.5 |
| 1977 | 40 | 0 | 9 | 24.8 | 1.7 |
| 1978[4] | 162 (156) | 2 | 36[5] | 25.7 | 1.8 |
| 1979 | 151 | 4 | 29 | 20.0 | 1.6 |
| 1979 | 40 (River) | 0 | 3 | 7.7 | 0.6 |
| 1980 | 29 (River) | 0 | 2 | 7.0 | 0.6 |
| 1981 | 60 (River) | 0 | 6 | 10.4 | 0.9 |
| 1982 | 21 (River) | 0 | 2 | 9.5 | 1.0 |
| 1984 | 77 | 1 | 7 | 9.4 | 1.2 |
| | 928 | 8 | 154 | | |

*Calculation discontinued.

[1]Harvest based on 93 fish in 1978 and 92 in 1984 for dead fish or tag removal.

[2]Harvest based on 188 fish in 1979; 187 in 1983; 186 in 1984; and 185 in 1987 for dead fish or tag removal.

[3]Harvest based on 47 fish in 1978 for one fish found dead.

[4]Harvest based on 161 fish in 1979; 160 in 1980; 158 in 1982; 157 in 1986; and 156 in 1988 due to dead fish.

[5]Total includes one fish possibly tagged in 1977.

Tag return data reveals a low rate of harvest for this paddlefish population as summarized in Table 3. The average annual rate of harvest varies from 1.2-7.1%. However, the highest rate of 7.1% is based on only 13 fish tagged in 1986. Annual harvest rates for most groups of tagged fish vary from 1.2-4.2%.

In 1978, 227 fish were tagged which includes 192 (84.6%) tagged in the upper reservoir near Beauchamp Bay. These fish exhibited a lower tag return rate for several years following tagging compared to fish tagged in the river. This indicated some fish remain in the reservoir and do not make annual spring migrations into the river where they are subject to harvest by snagging. However, beginning in 1986, fish tagged in the reservoir appeared in the harvest at a slightly higher rate and the overall harvest for fish tagged in 1978 now is becoming more comparable to other groups of tagged fish.

Table 3. A summary of paddlefish tagging and harvest data from the Missouri River and Fort Peck Reservoir, 1973-91. Percent harvest was derived by adjusting for previous harvest of tagged fish.

| Year | No. Tagged | No. Returned in 1991 | Total No. Tags Returned | % Harvest | Avg. Annual % Harvest |
|---|---|---|---|---|---|
| 1973 | 45 | 0 | 10 | 24.7 | 1.3 |
| 1974 | 55 | 0 | 12 | 24.3 | 1.3 |
| 1975 | 29 | 0 | 8 | 31.1 | 1.8 |
| 1976 | 23 | 0 | 6 | 29.2 | 1.8 |
| 1977[1] | 60 | 1 | 10 | 17.7 | 1.2 |
| 1978 | 227[2] | 3 | 39 | 18.7 | 1.3 |
| 1979 | 11 | 0 | 5 | 54.3 | 4.2 |
| 1980 | 33 | 1 | 13 | 47.6 | 4.0 |
| 1983 | 2 | 0 | 1 | 50.0 | 5.6 |
| 1986 | 13 | 1 | 4 | 42.7 | 7.1 |
| | 498 | 6 | 108 | | |

[1]Total adjusted for one fish killed by commercial fisherman Aug., 1981.

[2]192 tagged in Fort Peck Reservoir from UL Bend to Beauchamp Bay.

The harvest of paddlefish was determined by creel census in 1991. The study area consisted of approximately 20 miles of river downstream from Fred Robinson Bridge, upstream from Fort Peck Reservoir. The last complete census was conducted in 1986. Harvest occurs by snagging in the spring as paddlefish migrate upstream from the reservoir. Occasionally, paddlefish are also caught in the summer and fall, but due to the low number taken at these seasons only spring harvest has been determined. Almost all fish are taken within the boundaries of the Charles M. Russell National Wildlife Refuge.

A system of sampling the entire day was utilized and no records on the length of trip (hours) were maintained. The absolute number of fishermen and fish taken could be determined on most days. Previous attempts to gather information on hours fished provided unreliable results. Due to the length of fishing trip and erratic fishing activity, information provided by fishermen was not judged to be accurate. It was found that most fishermen greatly over-exaggerated the actual time spent fishing. Estimates of fishermen and fish taken for non-creel days (usually weekdays with light fishing pressure) were made on the basis of known pressure preceding and following non-creel census days or from interviews with snaggers or refuge personnel present throughout the non-census days.

The creel census commenced March 24, 1991, which was nine days after the first paddlefisherman was reported on the river. Based on warden and Charles M. Russell National Wildlife Refuge personnel observations and interviews, 40 man-days of pressure and a harvest of 12 paddlefish was estimated to have occurred during the interim between ice-out and the start of the creel census. These estimates are reflected in the tables. The creel census extended through June 24, at which time fishing effort and success became negligible. An interview card system, which provided completed trip data on anglers leaving the area when the creel clerk was "off duty," assisted in gathering completed trip information.

Total fishing pressure was 2,938 angler-days in 1991 (Figure B). Use continues to increase slightly, but spring weather conditions often dictate the amount of use this area receives. The total paddlefish harvest in 1991 was estimated to be 488 fish. This is slightly below the average number harvested between 1973 and 1986, and below the high of 666 harvested in 1977. Fishermen success expressed as the catch/fishermen/day decreased from the success rate in 1986 and exhibited one of the lowest catch rates recorded in seven harvest surveys since 1973 (Table 4).

Most fishermen were interviewed about paddlefish they released during their trip. Table 5 shows the number of fish actually observed by the creel clerk and the number and size of reported fishermen releases. It appears from the data that larger fish are being released at a rate similar to smaller fish with the exception of paddlefish under 20 pounds.

The period of greatest fishing pressure occurred over the three-day Memorial Day weekend, which produced 603 snaggers and a harvest of only 41 fish. The greatest single-day concentration of snaggers was 243 which occurred on May 25, Saturday of the Memorial Day weekend. This is the largest single-day number of snaggers recorded to date.

# Pressure and Harvest
## Paddlefish

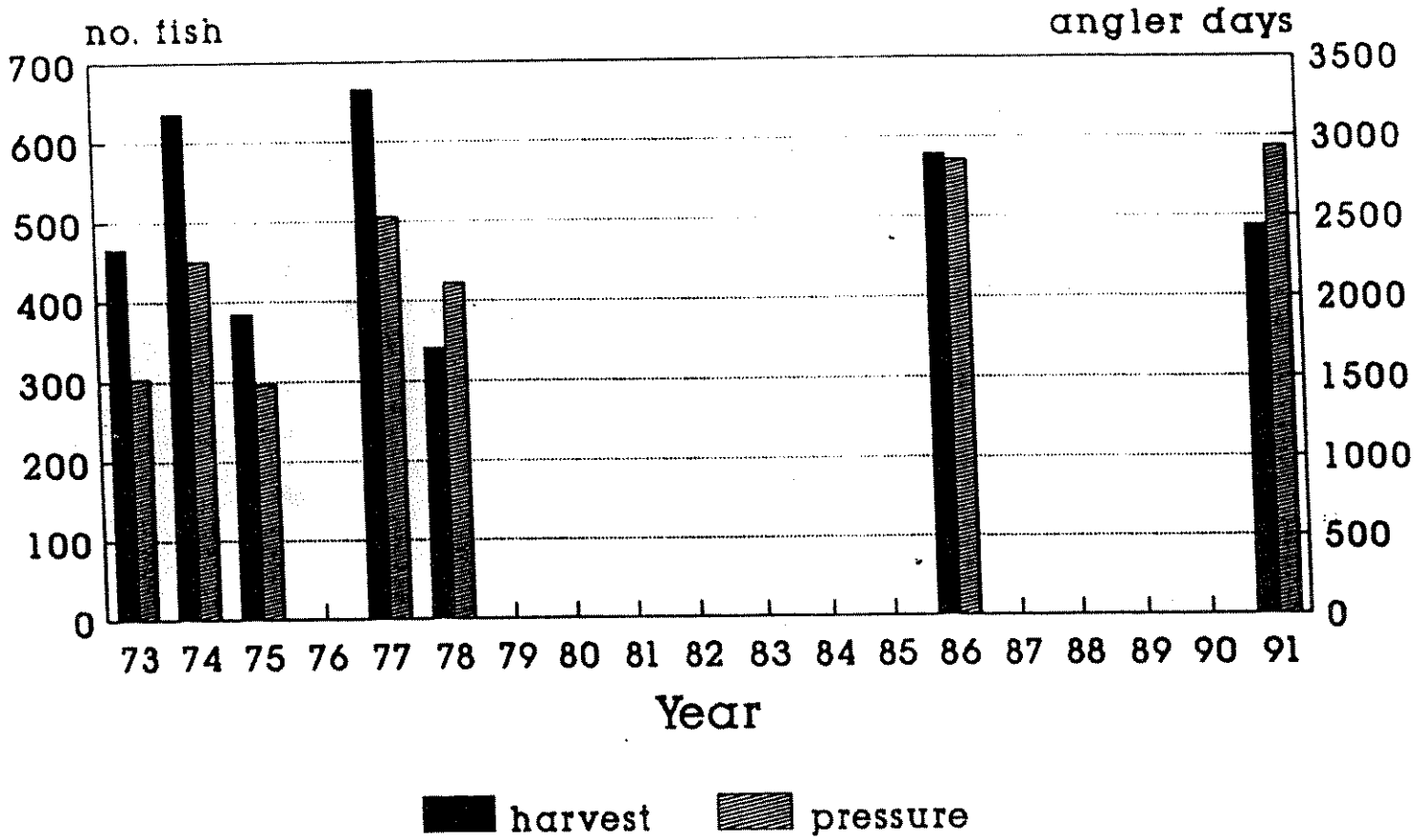


Figure B. Snagging pressure and total harvest as determined by creel census on the Missouri River above Fort Peck Reservoir, 1973-91.

Table 4. A summary of fishing pressure, paddlefish harvest, and catch rates during the spring, 1973-91.

| Year | Total Fishermen Man-days | | | Paddlefish Harvested | | | Catch/Fisherman/Day | | |
|---|---|---|---|---|---|---|---|---|---|
| | Bank | Boat | Total | Bank | Boat | Total | Bank | Boat | Overall |
| 1973 | 984 (64.9%) | 532 (35.1%) | 1,516 | 290 (62.1%) | 177 (37.9%) | 467 | 0.29 | 0.33 | 0.31 |
| 1974 | 1,422 (63.1%) | 831 (36.9%) | 2,253 | 396 (62.2%) | 241 (37.8%) | 637 | 0.28 | 0.29 | 0.28 |
| 1975 | 916 (61.8%) | 566 (38.2%) | 1,482 | 180 (46.7%) | 205 (53.3%) | 385 | 0.20 | 0.36 | 0.26 |
| 1977 | 1,429 (56.5%) | 1,096 (43.4%) | 2,526 | 322 (48.3%) | 344 (51.7%) | 666 | 0.23 | 0.31 | 0.26 |
| 1978 | 699 (33.1%) | 1,413 (66.9%) | 2,112 | 135 (39.6%) | 207 (60.4%) | 342 | 0.19 | 0.15 | 0.16 |
| 1986 | 1,664 (58.2%) | 1,194 (41.8%) | 2,858 | 315 (54.4%) | 264 (45.6%) | 579 | 0.19 | 0.22 | 0.20 |
| 1991 | 1,645 (56.0%) | 1,293 (44.0%) | 2,938 | 260 (53.3%) | 228 (46.7%) | 488 | 0.16 | 0.18 | 0.17 |

Table 5. Number and percent of paddlefish released during the peak snagging period on the Missouri River near Fred Robinson Bridge, April-May, 1991. Percent of total in weight range released is shown in parenthesis.

| Weight Range (lbs.) | # Harvested Fish Weighed by Clerk | # Fish Reported Released | Total Catch |
|---|---|---|---|
| 0 - 19 | 8 | 9 (53%) | 17 |
| 20 - 39 | 172 | 42 (20%) | 124 |
| 40 - 59 | 81 | 21 (21%) | 102 |
| 60 - 79 | 82 | 14 (15%) | 46 |
| 80+ | 17 | 4 (19%) | 21 |

Length and weight data was obtained from 360 paddlefish harvested; 192 males and 168 females (Table 6). Both total length (TL) and body length (BL) measurements were taken. Body length is defined as the distance between the anterior portion of the eye and the caudal fin fork. Paddlefish were selected at random and by availability for measuring. Paddlefish examined during the creel census period produced a sex ratio of 53% males and 47% females.

Male paddlefish averaged 32.2 pounds (range 14-76 pounds) which is below the 1970's average of 37.4 pounds. Female paddlefish averaged 59.7 pounds (range 21-110 pounds) which is well below the average recorded in previous years. Only two (1.2%) of 168 females measured weighed over 100 pounds.

Table 6. A summary of paddlefish size data from the Missouri River above Fort Peck Reservoir, 1965-91.

| | Females | | | | Males | | | |
|---|---|---|---|---|---|---|---|---|
| Year | No. | Avg. TL | Avg. BL | Avg. Weight | No. | Avg. TL | Avg. BL | Avg. Weight |
| 1965 | 13 | 67.0 | ---- | 81.5 | 21 | 55.4 | ---- | 36.4[1] |
| 1966 | 36 | 64.0 | ---- | 74.4 | 30 | 53.3 | ---- | 32.1 |
| 1970 | 7 | 70.2 | ---- | 77.0 | 2 | 58.5 | ---- | 44.0 |
| 1971 | 10 | 66.7 | ---- | 85.7 | 1 | 57.0 | ---- | 44.0 |
| 1973 | 46 | 66.2 | ---- | 76.1 | 50 | 54.9 | ---- | 35.0 |
| 1974 | 58 | 65.3 | ---- | 74.5 | 67 | 55.0 | ---- | 32.8 |
| 1975 | 63 | 65.7 | ---- | 74.8 | 56 | 55.9 | ---- | 34.6 |
| 1977 | 96 | 66.5 | ---- | 78.3 | 135 | 56.9 | ---- | 39.4 |
| 1978 | 58 | 67.7 | ---- | 87.9 | 76 | 55.3 | ---- | 38.2 |
| 1986 | 101 | 65.6 | 47.3 | 76.3 | 167 | 54.1 | 37.5 | 33.5 |
| 1991 | 168 | 59.1 | 45.0 | 59.7 | 192 | 50.8 | 37.8 | 32.2 |

[1]Based on 24 fish.

Angler residence was obtained for 2,817 fishermen comprised of 2,407 (85.4%) residents and 410 (14.6%) nonresidents. Anglers from 35 of Montana's 56 counties utilized the fishery as well as fishermen from 15 states. Angler residence is summarized as follows:

Residents by County

| | | | | | |
|---|---|---|---|---|---|
| 1. | Cascade | 359 | 19. | Phillips | 22 |
| 2. | Yellowstone | 336 | 20. | Stillwater | 22 |
| 3. | Lewis & Clark | 267 | 21. | Teton | 19 |
| 4. | Fergus | 262 | 22. | Powell | 16 |
| 5. | Flathead | 219 | 23. | Garfield | 13 |
| 6. | Gallatin | 168 | 24. | Big Horn | 12 |
| 7. | Hill | 129 | 25. | Valley | 7 |
| 8. | Missoula | 94 | 26. | Sweet Grass | 6 |
| 9. | Silver Bow | 75 | 27. | Wibaux | 5 |
| 10. | Carbon | 60 | 28. | Ravalli | 5 |
| 11. | Musselshell | 54 | 29. | Madison | 5 |
| 12. | Blaine | 51 | 30. | Choteau | 3 |
| 13. | Broadwater | 37 | 31. | Daniels | 2 |
| 14. | Park | 36 | 32. | Judith Basin | 2 |
| 15. | Lincoln | 35 | 33. | Carter | 2 |
| 16. | Jefferson | 32 | 34. | Wheatland | 1 |
| 17. | Lake | 26 | 35. | Liberty | 1 |
| 18. | Glacier | 24 | | | |

Nonresidents

| | | | | | |
|---|---|---|---|---|---|
| 1. | Wyoming | 268 | 9. | Nevada | 8 |
| 2. | Idaho | 28 | 10. | South Dakota | 6 |
| 3. | Washington | 18 | 11. | Wisconsin | 6 |
| 4. | Arkansas | 18 | 12. | Illinois | 4 |
| 5. | California | 17 | 13. | Colorado | 3 |
| 6. | Minnesota | 12 | 14. | Pennsylvania | 3 |
| 7. | Oregon | 10 | 15. | Maine | 1 |
| 8. | Arizona | 8 | | | |

It was interesting to note that with the increase in awareness programs to assist fishermen in identifying pallid sturgeon, a recent addition to the endangered species list, nine pallid sturgeon were reportedly snagged and released by paddlefishermen in the study area. Two of the fish were tagged and one was wearing a recently-attached radio transmitter. Eight of the nine reported fish were snagged in an eddy at James Kipp Park several hundred yards above Fred Robinson Bridge. Not all the sturgeon in question were positively identified, but most fish were weighed prior to release and infer that, indeed, they were pallid sturgeon rather than the more common, smaller shovelnose sturgeon.

Fresno Reservoir

Fresno Reservoir is a highly fluctuating reservoir of 5,757 surface acres located on the Milk River 12 miles northwest of Havre. In most years, the demand for irrigation water results in water level fluctuations of 10-25 feet though maximum depth is only 48 feet. Systematic gill netting at predetermined stations was conducted in the 1960's and 1970's but was discontinued in 1974. Traditional gill-net stations have been sampled since 1987 to determine changes in sport fish abundance and species composition. Samples were collected utilizing six experimental gill nets fished overnight.

Lake whitefish, walleye, perch, and northern pike were well represented in the catch (Table 7). Lake whitefish continue to comprise a significant portion of the gill-net catch, but are rarely caught by fishermen. The large number of YOY whitefish captured may be indicative of the good spawning conditions afforded the previous fall by high reservoir levels. The adult yellow perch population appears to be increasing following two years at very low levels. Four adult longnose suckers and a yearling crappie sp. were the only other species netted. The walleye catch was exceptional. The CPUE was the highest recorded in 14 years of netting. The 1990 year-class was well represented. In recent years a positive correlation has been made between over-winter water levels and recruitment of YOY walleye to the population (Needham and Gilge, 1990). The strong showing of the 1990 year-class in connection with the excellent over-winter storage in 1990-91 reinforces this correlation.

In September of 1990, 6,000 walleye fingerlings averaging 4.7 inches in length were marked by clipping the right opercle and planted in mid-reservoir. Twenty yearling walleye were collected by various sampling gear in summer and fall of 1991. Only one of the walleyes was marked. Though sample size was small and recaptures insufficient to estimate total year-class numbers, the results indicate a strong year-class was produced through natural reproduction. The degree to which stocked fingerlings contributed to year-class strength is still undetermined. Future recaptures of marked fish may provide for estimation of year-class strength. Night electrofishing in the fall was successful in capturing six YOY walleye. Beach seining was unsuccessful in capturing any emerald shiners, but electrofishing revealed large numbers were present in weed cover. Crappie sp. YOY were observed in large numbers in the weedier bays.

Beach seining was conducted at 12 standard sampling sites around the reservoir in a continuing effort to evaluate reproductive success of sport fishes and assess forage abundance. The seining results indicated low numbers of YOY walleye, high numbers of northern pike, and below average reproductive success for YOY yellow perch (Table 8). Spottail shiners and black crappie were relatively abundant while emerald shiners, which are normally abundant, were absent from the catch.

A walleye stocking contingency plan was developed in 1987 to supplement natural reproduction in Fresno Reservoir following extreme drawdown years (Needham and Gilge, 1988). Due to some recent advances in walleye culture and the identification of some limiting factors affecting walleye recruitment in Fresno Reservoir, a revised walleye stocking plan was developed and implemented in 1991 (Attachment A).

Table 7. A summary of the catch in overnight sinking experimental gill net sets in Fresno Reservoir, 1965-91. Number of nets used varied from four to eight.

| Species | Year | No. | Average No. Per Net Set | Average Length (inches) | Average Weight (pounds) | Percent of Total |
|---|---|---|---|---|---|---|
| Lake Whitefish | 1970 | 1 | 0.1 | 19.9 | 3.30 | 0.7 |
| | 1971 | 1 | 0.2 | 18.7 | 2.94 | 1.2 |
| | 1972 | 4 | 0.5 | 17.8 | 2.35 | 6.2 |
| | 1974 | 3 | 0.8 | 19.5 | 3.15 | 8.6 |
| | 1987 | 65 | 10.8 | 12.2 | 0.71 | 36.1 |
| | 1988 | 55 | 9.2 | 17.5 | 2.45 | 28.6 |
| | 1989 | 22 | 3.7 | 14.4 | 1.06 | 30.1 |
| | 1990 | 46 | 7.7 | 10.0 | 0.98 | 48.9 |
| | 1991 | 37 | 6.2 | 12.7 | 1.03 | 24.5 |
| Yellow Perch | 1969 | 7 | 0.9 | 5.4 | 0.07 | 12.3 |
| | 1970 | 20 | 2.5 | 6.9 | 0.16 | 13.8 |
| | 1971 | 6 | 1.5 | 7.6 | 0.23 | 7.4 |
| | 1972 | 2 | 0.3 | 8.7 | 0.40 | 3.1 |
| | 1974 | 2 | 0.5 | 5.7 | 0.09 | 5.7 |
| | 1987 | 43 | 7.2 | 6.2 | 0.13 | 23.9 |
| | 1988 | 24 | 4.0 | 8.7 | 0.32 | 12.5 |
| | 1989 | 0 | ---- | ---- | ---- | 0.0 |
| | 1990 | 0 | ---- | ---- | ---- | 0.0 |
| | 1991 | 16 | 2.7 | 8.2 | 0.40 | 10.6 |
| Walleye | 1965 | 14 | 0.9 | 12.4 | 0.80 | 17.9 |
| | 1966 | 14 | 2.3 | 11.6 | 0.62 | 34.2 |
| | 1967 | 11 | 1.6 | 12.9 | 0.88 | 24.4 |
| | 1968 | 29 | 3.6 | 12.3 | 0.64 | 56.9 |
| | 1969 | 24 | 3.0 | 12.9 | 0.92 | 42.9 |
| | 1970 | 95 | 11.9 | 14.4 | 1.16 | 65.5 |
| | 1971 | 28 | 7.0 | 13.6 | 1.08 | 34.6 |
| | 1972 | 34 | 4.3 | 16.1 | 1.44 | 52.4 |
| | 1974 | 22 | 5.5 | 15.9 | 1.35 | 62.9 |
| | 1987 | 37 | 6.2 | 16.7 | 1.99 | 20.6 |
| | 1988 | 67 | 11.2 | 15.5 | 1.97 | 34.9 |
| | 1989 | 32 | 5.3 | 14.6 | 1.14 | 43.8 |
| | 1990 | 28 | 4.7 | 15.7 | 1.74 | 29.9 |
| | 1991 | 88 | 14.7 | 13.3 | 0.88 | 58.3 |
| Northern Pike | 1965 | 23 | 1.6 | 18.2 | 1.23 | 29.5 |
| | 1966 | 6 | 1.0 | 20.1 | 1.68 | 14.6 |
| | 1967 | 7 | 1.0 | 20.6 | 2.50 | 15.6 |
| | 1968 | 9 | 1.1 | 17.8 | 1.66 | 17.6 |

Table 7. Continued.

| Species | Year | No. | Average No. Per Net Set | Average Length (inches) | Average Weight (pounds) | Percent of Total |
|---|---|---|---|---|---|---|
| Northern pike (continued) | 1969 | 9 | 1.1 | 19.7 | 1.88 | 16.1 |
| | 1970 | 12 | 1.5 | 16.3 | 1.33 | 8.3 |
| | 1971 | 30 | 7.5 | 17.0 | 1.12 | 37.0 |
| | 1972 | 5 | 0.6 | 17.3 | 0.93 | 7.7 |
| | 1974 | 1 | 0.3 | 20.6 | 1.84 | 2.9 |
| | 1987 | 35 | 5.8 | 19.1 | 1.74 | 19.4 |
| | 1988 | 46 | 7.7 | 20.6 | 2.85 | 24.0 |
| | 1989 | 19 | 3.2 | 21.6 | 2.74 | 26.0 |
| | 1990 | 20 | 3.3 | 19.2 | 2.09 | 21.2 |
| | 1991 | 10 | 1.7 | 19.3 | 2.28 | 6.6 |

Table 8. A summary of forage fish and young-of-year game and sport fish taken with a 100- x 9-foot x 1/4-inch square mesh beach seine in Fresno Reservoir, 1965-91.

| Date | No. Seine Hauls | Species and Number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Walleye | No. Pike | Yellow Perch | Emerald Shiner | Crappie sp. | Spottail Shiner | Sucker sp.[1] | Minnow sp.[2] | Other[3] |
| July 1965 | 7 | 0 | 8 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| August 1966 | 6 | 0 | 2 | 0 | 0 | 14 | 0 | 0 | 11 | 0 |
| August 1967 | 10 | 24 | 5 | 0 | 15 | 19 | 0 | 0 | 276 | 0 |
| August 1968 | 12 | 16 | 6 | 2,909 | 147 | 552 | 0 | 0 | 161 | 0 |
| August 1969 | 12 | 4 | 6 | 1,140 | 385 | 67 | 0 | 2 | 380 | 0 |
| August 1970 | 12 | 27 | 45 | 10,151 | 521 | 883 | 0 | 1 | 122 | 0 |
| August 1972 | 12 | 102 | 22 | 1,005 | 205 | 379 | 0 | 0 | 72 | 0 |
| August 1974 | 12 | 13 | 59 | 1,583 | 29 | 1,355 | 0 | 0 | 25 | 0 |
| August 1975 | 11 | 10 | 32 | 4,154 | 155 | 59 | 0 | 0 | 0 | 0 |
| August 1978 | 12 | 22 | 42 | 10,684 | 12 | 3 | 0 | 0 | 0 | 0 |
| August 1979 | 12 | 29 | 45 | 8,516 | 340 | 127 | 0 | 1 | 0 | 1 |
| August 1982 | 12 | 102 | 70 | 8,993 | 121 | 166 | 0 | 0 | 0 | 3 |
| August 1983 | 12 | 23 | 0 | 2,254 | 448 | 9 | 0 | 1 | 7 | 0 |
| August 1984 | 12 | 247 | 0 | 197 | 375 | 0 | 2 | 40 | 55 | 0 |
| August 1985 | 12 | 64 | 0 | 379 | 684 | 3 | 2 | 0 | 9 | 0 |
| August 1986 | 12 | 0 | 23 | 6,077 | 142 | 2 | 20 | 1 | 5 | 1 |
| August 1987 | 12 | 80 | 113 | 6,233 | 1,979 | 7 | 3 | 0 | 3 | 0 |
| August 1988 | 12 | 53 | 4 | 3,122 | 182 | 0 | 20 | 0 | 1 | 0 |
| August 1989 | 12 | 56 | 32 | 24,706 | 22 | 0 | 16 | 2 | 0 | 0 |
| August 1990 | 12 | 8 | 57 | 2,033 | 7 | 165 | 44 | 1 | 2 | 0 |
| August 1991 | 12 | 8 | 36 | 3,425 | 0 | 42 | 53 | 0 | 0 | 0 |

[1]Consists of white and longnose suckers.

[2]Consists of silvery minnows, lake chubs, flathead chubs, and fathead minnows.

[3]Consists of burbot, smallmouth bass, and brook sticklebacks.

Nelson Reservoir

This reservoir is utilized by the Bureau of Reclamation for off-stream storage of irrigation water. At full storage capacity, it covers approximately 4,500 surface acres, but reservoir levels have fluctuated dramatically during the last 10 years. Beach seining is conducted annually to determine reproductive success of sport and forage fishes. Beach seining was conducted in July at seven sites on the reservoir, encompassing 660 feet of shoreline. The sport fish YOY catch consisted of 8 walleye, 1 northern pike, and 77 yellow perch (Table 9). Reproductive success of northern pike and yellow perch was poor. The CPUE for YOY walleye was the highest recorded since 1981. It is unknown whether these fish are of natural or hatchery origin, as 10,000 2.2-inch fingerlings were stocked in 1991. Other forage species sampled in decreasing order of abundance were white sucker, spottail shiner, crappie sp., carp, and buffalo sp.

Night electrofishing in mid-September captured 13 YOY walleye in one hour of sampling, confirming the presence of a relatively strong year-class.

Five experimental gill-net stations were established and sampled in the fall of 1991 for the first time. Sporadic gill netting has been attempted at Nelson Reservoir in the past, but sampling was neither uniform nor consistent enough to develop useful trend data on game fish population size or composition. These stations will be utilized annually in the future.

Table 9. A summary of walleye, yellow perch, and northern pike young-of-year captured by beach seining in Nelson Reservoir, 1974-91.

| | | Walleye | | Yellow Perch | | No. Pike | |
|---|---|---|---|---|---|---|---|
| Year | Shoreline Seined (ft.) | No. | No./ 1,000 (ft.) | No. | No./ 1,000 (ft.) | No. | No./ 1,000 (ft.) |
| 1974 | 1,590 | 36 | 22.6 | 1,365 | 860 | 0 | 0.0 |
| 1975 | 1,845 | 112 | 60.5 | 3,008 | 1,630 | 0 | 0.0 |
| 1976 | 1,590 | 119 | 74.8 | 74 | 50 | 1 | 0.6 |
| 1977 | 1,740 | 1 | 0.6 | 2,939 | 1,690 | 0 | 0.0 |
| 1978 | 870 | 428 | 492.0 | 6,568 | 7,550 | 0 | 0.0 |
| 1979 | 1,530 | 23 | 15.0 | 1,832 | 1,200 | 2 | 1.3 |
| 1980 | ---------- No seining conducted ---------- | | | | | | |
| 1981 | 615 | 31 | 50.6 | 8,859 | 14,400 | 1 | 1.6 |
| 1982 | 660 | 0 | 0.0 | 4,553 | 6,898 | 3 | 5.0 |
| 1983 | 1,420 | 4 | 2.8 | 138 | 100 | 18 | 12.7 |
| 1984 | 1,530 | 0 | 0.0 | 133 | 87 | 0 | 0.0 |
| 1985 | 510 | 3 | 6.0 | 2,272 | 4,455 | 16 | 31.4 |

Table 9. Continued.

| Year | Shoreline Seined (ft.) | Walleye No. | Walleye No./1,000 (ft.) | Yellow Perch No. | Yellow Perch No./1,000 (ft.) | No. Pike No. | No. Pike No./1,000 (ft.) |
|---|---|---|---|---|---|---|---|
| 1986 | 700 | 0 | 0.0 | 3 | 4 | 7 | 10.0 |
| 1987 | 495 | 5 | 10.1 | 1,987 | 4,014 | 0 | 0.0 |
| 1988 | 520 | 0 | 0.0 | 783 | 1,506 | 0 | 0.0 |
| 1989 | 910 | 10 | 11.0 | 736 | 809 | 4 | 4.4 |
| 1990 | 1,320 | 7 | 5.3 | 2,631 | 1,993 | 1 | 0.8 |
| 1991 | 660 | 8 | 12.1 | 77 | 117 | 1 | 1.5 |

H. C. Kuhr Reservoir

This 25-acre reservoir is located 15 miles south of Chinook on private land. For many years the reservoir provided good trout fishing for a private fishing club until white suckers appeared in the early 80's. The sucker population expanded and trout growth and survival became poor. The landowner did not want the reservoir chemically treated but desired to provide some kind of fishing opportunity. The Department of Fish, Wildlife and Parks agreed to develop a perch/crappie fishery in exchange for public use of the reservoir.

The reservoir also contains a variety of forage fish consisting of fathead minnows, brook sticklebacks, silvery minnows, lake chubs, Iowa darter, and northern redbelly dace. Adult yellow perch were stocked in April, 1987, at a rate of 55/acre. Adult crappie were planted simultaneously at a rate of 8/acre. Both species have spawned successfully since 1987. The reservoir contained significant forage, but overpopulation of perch and crappie was anticipated in the absence of predators. Northern pike are usually chosen to control panfish populations, but problems with sporadic or excessive reproduction occur regularly, creating frequent imbalances. A sterile predator, the tiger musky, was selected as a possible management tool. Tiger musky were stocked for panfish control and to reduce some of the variability involved with reproduction of other predators, such as northern pike. The original introduction of tiger musky in 1987 was made from 2-inch fingerlings obtained from Pennsylvania.

Tiger musky were stocked at a rate of 27/acre in 1987 and 22/acre in 1988. The 1987 plant exhibited some survival; however, the 1988 plant was apparently unsuccessful. In 1989, 2-inch fingerlings were stocked at a rate of 48/acre and a rearing pond was stocked at a rate of 140/acre. No muskies from this plant were taken by gill net, traps or seines, and only seven tiger muskies ranging from 10.6-12.8 inches were taken from the rearing pond in the fall. Growth of the 1987 year-class has been good.

The reservoir opened to fishing in May, 1990, for the first time with a tiger musky creel limit of one fish per day over 30 inches. Interest in the trophy fishery was high and at least seven muskies were known to have been caught, three of which were legal size. Only one legal fish was recorded and was subsequently entered as a state record. The fish measured 30.9 inches and 7.70 pounds. However, fishery personnel netted and released a 12-pound musky in 1990.

Due to concern over the high post-stocking mortality of muskies, plans were to intensively rear tiger muskies in the hatchery in 1990 to 8-10 inches and stock in the fall. Water temperature fluctuations in the hatchery and a parasite infestation caused a complete loss of the fingerlings at the hatchery; therefore, no fish were planted in 1990. In 1991, pure strain musky sperm was secured from the Spooner State Fish Hatchery in Wisconsin. The milt was packaged in Erdahl's extender and transferred to Fort Peck Reservoir where eggs from northern pike were fertilized. In May, 1991, 1,500 2-inch fingerlings hatched from these eggs were stocked. This was followed with an August planting of 300 fingerlings averaging 6.4 inches. In late September, 149 8.5-inch muskies were fin-clipped and added to the reservoir.

Seining in July captured a single musky measuring 4.8 inches. This indicated that at least some muskies from the earliest stocking survived. Stomach content examination revealed it had eaten several damselfly naiads and a YOY crappie.

No muskies from any year-class were gill netted in early October. The fingerlings planted in 1991 may have been too small to be effectively sampled by the gill nets, but the absence of other year-classes in the catch is unexplainable at this time.

In light of poor tiger musky survival, fingerling walleye have been stocked to increase predation on juvenile perch and suckers. Walleye ranging from 3.0-5.0 inches were stocked in 1988 at a rate of 28/acre and in 1989 at 14/acre. Walleye fingerling stocking will be initiated on an alternate year basis beginning in 1992.

Reproductive success of perch in 1991 was poor as no YOY were captured by seining. The poor perch reproduction in 1991 may assist in reducing overpopulation and subsequent stunting of panfish in the reservoir. Despite the lack of YOY perch in 1991, several strong year-classes have developed in the absence of adequate predator numbers. Black crappie showed limited reproductive success until 1991 when large numbers of YOY were found (Table 10). Suckers and minnows of forage size have dramatically declined or been eliminated from the reservoir by predation. This indicates in some degree that the soft rayed fishes are perhaps preferred over spiny rayed fishes. Gill netting in 1991 indicated low numbers of tiger muskies and increasing occurrences of walleye, yellow perch and adult white suckers (Table 11).

Table 10. Forage fish abundance determined by beach seining at H. C. Kuhr Reservoir, 1987-91.

| No. Hauls | Date | White Suckers (<10 in.) | Fathead Minnow | Silvery Minnow | Lake Chub | Black Crappie | Yellow Perch YOY | Yellow Perch Age I |
|---|---|---|---|---|---|---|---|---|
| 3 | 7-14-87 | 77 | 1,450 | 58 | 26 | 0 | 332 | 0 |
| 4 | 6-28-88 | 83 | 294 | 34 | 10 | 5 | 20 | 127 |
| 4 | 7-07-89 | 0 | 1 | 0 | 0 | 0 | 8 | 26 |
| 4 | 7-19-90 | 2 | 1 | 0 | 0 | 1 | 1,128 | 58 |
| 4 | 7-22-91 | 0 | 0 | 0 | 0 | 519 | 0 | 33 |

Table 11. Results of fall gill netting at H. C. Kuhr Reservoir, 1987-91.

| | Tiger Musky | | | Yellow Perch | | | Walleye/Sauger | | | Suckers | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | No. | $\bar{X}$ L (in.) | $\bar{X}$ WT (lbs.) | No. | $\bar{X}$ L (in.) | $\bar{X}$ WT (lbs.) | No. | $\bar{X}$ L (in.) | $\bar{X}$ Wt (lbs.) | No. <10 in. | No. >10 in. |
| 1987 | 3 | 14.8 | 0.71 | 14 | 8.8 | 0.41 | 2 | 15.9 | 1.55 | 69 | 314 |
| 1988 | 15 | 24.4 | 3.37 | 1 | 10.8 | 0.59 | 1 | 7.7 | 0.16 | 14 | 186 |
| 1989 | 1 | 26.7 | 4.19 | 17 | 6.6 | 0.15 | 3 | 13.0 | 1.01 | 12 | 187 |
| 1990 | 5 | 29.9 | 6.94 | 24 | 6.3 | 0.12 | 6 | 10.9 | 0.57 | 3 | 27 |
| 1991 | 0 | ---- | ---- | 47 | 7.1 | 0.17 | 8 | 14.5 | 1.41 | 1 | 80 |

## Beaver Creek Reservoir

This 200-acre reservoir has a maximum depth of 90 feet and has provided a rainbow trout fishery of varying success since it's initial filling in 1975. It's proximity to the city of Havre makes this reservoir a valuable local resource and it has been managed intensively in recent years with a variety of species. In the early 1980's, largemouth bass were introduced to help curb excessive sucker numbers and provide an additional game fish. Although bass reproduction has been documented, largemouth bass have not contributed significantly to the fishery. Soon after bass introductions were made, northern pike appeared from an illegal introduction. The northern pike population increased steadily and peaked in 1987. No natural reproduction was documented in 1988 or 1989. Yellow perch were found in the reservoir in 1986. Beach seining indicated good initial reproduction in 1987, but low YOY perch numbers were observed in 1989 and 1990 (Table 12). Large numbers of YOY perch and spottail shiners were captured in 1991. Yellow perch and spottail shiners provide most of the forage base, as

juvenile sucker numbers have declined steadily since 1986. However, due to the abundant alternate forage and a depressed northern pike population, white sucker YOY increased in 1991.

Table 12. A summary of forage fish taken by beach seining from Beaver Creek Reservoir, 1985-91.

| Date | No. Hauls | Species[1] WSU/LSU | YP | LK CH | FTHD MIN | S/P MIN | ID | EM SH | SP SH |
|---|---|---|---|---|---|---|---|---|---|
| 9-04-85 | 5 | 2,535 | 0 | 7 | 0 | 0 | 11 | 0 | 0 |
| 6-16-86 | 4 | 3,110 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| 8-19-87 | 6 | 969 | 2,281 | 2 | 1 | 2 | 72 | 1 | 0 |
| 8-23-88 | 6 | 54 | 4,401 | 0 | 0 | 0 | 4 | 0 | 1 |
| 8-21-89 | 6 | 45 | 29 | 2 | 0 | 0 | 0 | 3 | 602 |
| 8-21-90 | 6 | 1 | 42 | 0 | 0 | 0 | 2 | 1 | 93 |
| 8-13-91 | 6 | 348 | 8,615 | 0 | 0 | 2 | 0 | 2 | 835 |

1 WSU/LSU --- white/longnose sucker
YP -------- yellow perch
LK CH ----- lake chub
FTHD MIN -- fathead minnow
S/P MIN --- silvery/plains minnow
ID ------- Iowa darter
EM SH ---- emerald shiner
SP SH ---- spottail shiner

Walleye were stocked in 1987 due to local demand. The walleye management plan included three consecutive years of stocking followed by two non-stocking years to evaluate natural reproduction. Fish of each year-class were marked for future identification. A creel census conducted during the summer of 1991 was used to gather a recapture sample for estimation of initial cohort size. Creel census data is presented in detail in a companion job progress report (Gilge, 1992). Sufficient recaptures were made in 1991 to estimate all three walleye year-classes (Table 13). The estimates reflect cohort size at the end of their first growing season. It appears that fry plants have been quite successful in establishing a fishable population. During the April-September creel period, fishermen harvested 361 walleye averaging 13.8 inches and 0.84 pounds.

Thirty-four walleye were captured in the fall gill netting. The walleye averaged 14.0 inches (range 11.9-20.2) and 0.97 pounds (range .54-2.86). Growth of walleye to date is consistent with other regional populations. Condition factors of Beaver Creek Reservoir walleye were slightly below those of walleye sampled from nearby Fresno Reservoir in 1991.

No walleye were stocked in 1990 or 1991. Beach seining and electrofishing were utilized to sample YOY walleye in the event limited natural reproduction occurred. No YOY walleye have been captured to date. Efforts to confirm natural reproduction will be ongoing for several years.

Table 13. Walleye stocking records and estimates of three walleye year-classes at end of first growing season in Beaver Creek Reservoir.

| Year | No. Fish Planted | Size (in.) | Estimate of Year Class[1] |
|---|---|---|---|
| 1987 | 50,000<br>322 | fry<br>6.0 | 1,733 ± 757 |
| 1988 | 100,000<br>193 | fry<br>3.7 | 1,358 ± 806 |
| 1989 | 300,000<br>858 | fry<br>4.5 | 9,105 ± 4,535 |

[1]80% confidence interval.

Reser Reservoir

This 25-surface acre reservoir was constructed in 1980 and first filled in 1982. Golden shiners, fathead minnows, and black crappie were introduced to establish a forage base. Largemouth bass fingerlings were stocked at a rate of 300/acre in 1982 and 150/acre in 1983. The bass exhibited good survival and attained catchable size by 1984 when large numbers of 8- to 10-inch fish were harvested under a 10-fish limit. Fishing pressure was light in both 1985 and 1986 due to poor fishing success. Forty-two fishermen were interviewed in 1986 and none had caught a bass. A two-bass limit was imposed in 1986 to assist in rebuilding the population.

Electrofishing after dark has been conducted in most years since 1984 to determine the status of the bass population. The number of bass captured in one complete circuit of the reservoir has been used as an indicator of relative abundance. Largemouth bass reproduction has been monitored since 1985 by electrofishing shoreline vegetation in late summer. Figure C shows relative abundance of YOY and older bass over a 8-year period. Although the number of bass over 5 inches increased significantly in 1991, only 18 of the 170 bass collected were over 7 inches. Because of the small average size, most anglers

# RESER RESERVOIR

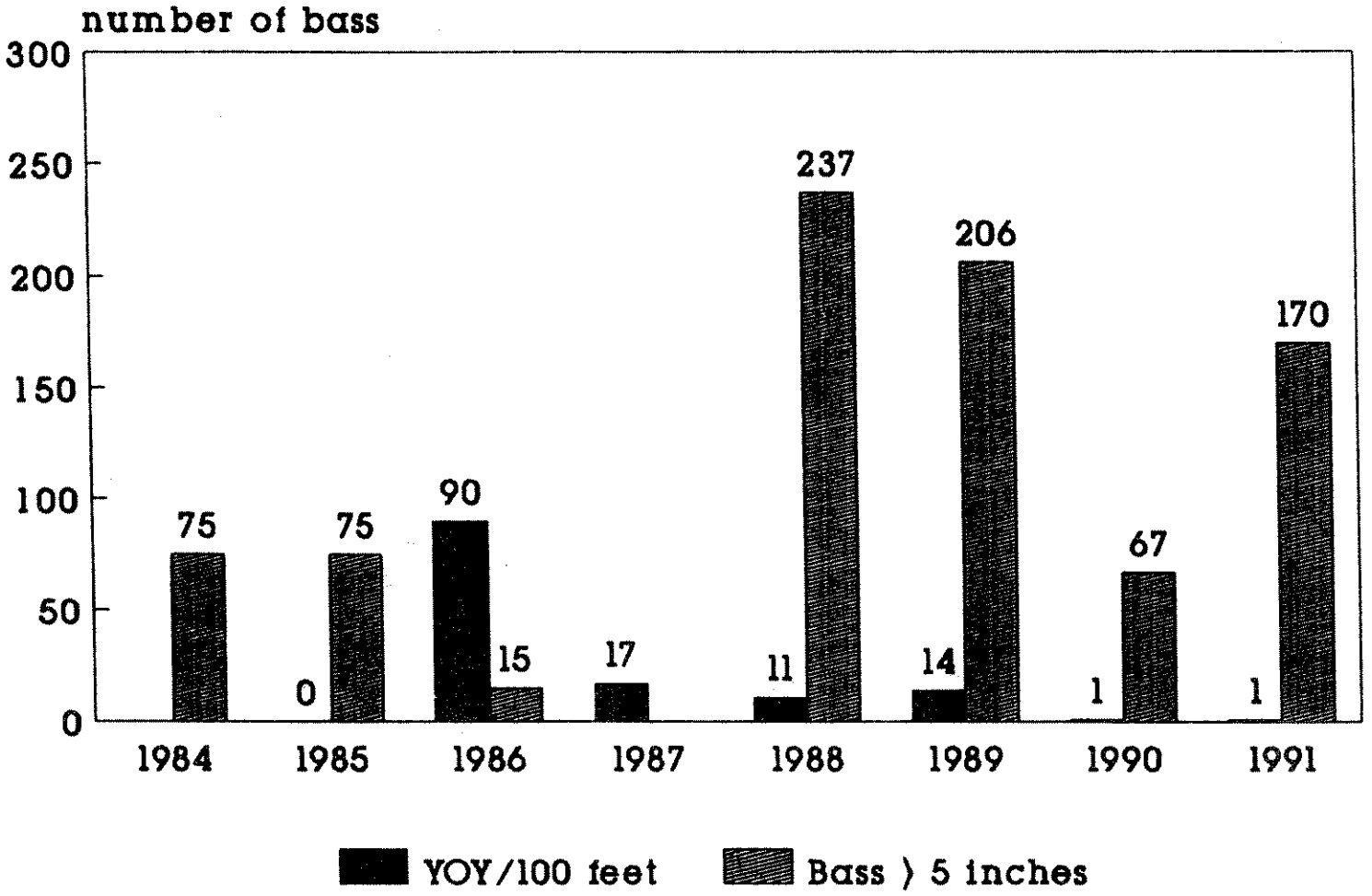


Figure C. Relative abundance of YOY and older bass in Reser Reservoir, 1984-91.

fished the reservoir for trout which are planted annually. Yellow perch, which were illegally introduced into the reservoir in 1988, are being taken in significant numbers by fishermen. Large numbers of YOY perch were observed for the first time in 1991. Forage fish include golden shiners and black crappie, which are present in moderate numbers. Large flocks of cormorants feed regularly at the reservoir and cause significant predation on bass, trout, and crappie.

Bailey Reservoir

This reservoir floods approximately 70 surface acres at full pool and has a maximum depth of 28 feet. It was constructed in the mid-1970's primarily for use as a fishing reservoir. Though privately owned, it has been under the management of the Department of Fish, Wildlife and Parks (DFWP). Initial introductions of rainbow trout provided an excellent fishery. Northern pike were illegally introduced about 1980. No other fish were present in the reservoir and predation on trout soon became excessive. During a severe drought in 1984, the remaining trout winter-killed but the northern pike survived. Larger trout were planted to reduce the level of predation but without success. Chemical rehabilitation was considered, but at the request of the landowner the DFWP began to develop a cool/warm water fishery and trout stocking was discontinued. Yellow perch and black crappie were introduced in 1987, followed by largemouth bass in 1988. An experimental plant of 2,000 walleye fingerlings was made in 1989. Reproductive success of perch, crappie and bass has been good.

Monitoring of adult game fish by gill netting was initiated in 1990. Two overnight experimental sinking gill net sets were utilized in the sampling (Table 14). Yellow perch, black crappie and northern pike have grown exceptionally fast in this productive reservoir. Although significant catches of crappie have not been reported to date, large catches of perch exceeding 0.50 pound were common in 1991. Though no largemouth bass were taken by gill netting, fishermen reported regular catches of yearling bass. No walleye have been sampled to date or reported by fishermen. Large catches of northern pike have been observed for several years. Fishing pressure is occasionally heavy. During the winter of 1989-90, as many as 32 ice/spearing houses were on the reservoir on any given day. Dozens of large pike (>10 pounds) were reportedly harvested that same winter. The catch of large pike since that winter has declined noticeably.

Table 14. Total catch from two experimental gill net sets at Bailey Reservoir, 1990-91.

| | Northern Pike | | | Yellow perch | | | Black Crappie | | |
|---|---|---|---|---|---|---|---|---|---|
| Date | No. | $\bar{X}$ L (in.) | $\bar{X}$ WT (lbs.) | No. | $\bar{X}$ L (in.) | $\bar{X}$ WT (lbs.) | No. | $\bar{X}$ L (in.) | $\bar{X}$ WT (lbs.) |
| 8-08-90 | 24 | 18.1 | 1.23 | 34 | 7.7 | 0.26 | 21 | 5.7 | 0.10 |
| 9-27-91 | 7 | 24.7 | 3.21 | 58 | 10.1 | 0.56 | 4 | 8.5 | 0.35 |

## Little Warm Reservoir

Little Warm Reservoir provided good fishing for northern pike and yellow perch until the dam washed out by flooding in 1986. The reservoir was subsequently drained for repair and refilled in 1988. The reservoir is utilized for stock water and irrigation. The DFWP manages the fishery which is open to the public. The reservoir was stocked with 100,000 walleye fry in both 1989 and 1990. Sixty-eight ripe adult crappie were planted in 1989 also. Three experimental sinking gill nets and three 1/4-inch mesh frame traps were fished overnight in late May to assess survival and growth of stocked fish. Forty-one walleye were sampled representing both year-classes (Table 15). Growth has been exceptional.

Table 15. Walleye stocking records and average size of fish representing two walleye year-classes sampled from Little Warm Reservoir, May 1991.

| Stocking Date | No. Fry Stocked | No. | x L | | x WT | |
|---|---|---|---|---|---|---|
| 5-11-89 | 100,000 | 29 | 13.6 | (12.5-14.4) | 1.01 | (0.84-1.32) |
| 5-15-90 | 100,000 | 12 | 9.3 | ( 8.7-10.1) | 0.28 | (0.24-0.40) |

Eleven crappie were captured ranging in length from 4.0-7.5 inches. Two yellow perch of unknown origin were also netted. Other species found in the reservoir were brook sticklebacks, Iowa darters, white suckers, golden shiners, and fathead minnows. Most of these fish are common to the drainage and probably were introduced from upstream sanctuaries. Management plans include alternate year stocking of walleye fry to maintain the population as natural reproduction is not expected to occur in this reservoir.

## Atlas Reservoir

This reservoir has 10 surface acres and initial filling occurred in 1986. Stocking to develop a sport fishery began in September, 1987, with 592 5-inch largemouth bass. An additional 865 and 600 bass (5-inch) were stocked in May, 1988, and June, 1989, respectively. Approximately 40,000 fathead minnows were stocked in the spring of 1988 to establish a forage base.

A 5-bass daily and possession creel limit was imposed in the spring of 1990 to help prevent over-harvest. Prior to this, angler use and harvest were extremely low since fishermen were unaware of this new fishery. Sampling was conducted in the spring of 1989 and 1990 utilizing a beach seine to secure information on the developing bass population. Sampling efficiency was poor and provided limited information on abundance, but size data was obtained.

Night electrofishing was initiated in the fall of 1990, and repeated in the fall of 1991, as a sampling technique to acquire population data. The sampling effort consisted of one complete circuit of the reservoir shoreline.

This sampling indicated good development of a bass fishery in 1990. Adult bass were in good condition and displayed good growth rates; sub-adults were present and YOY were very abundant. However, in 1991, the overall bass population had changed greatly. Few adults were taken, yearling bass were abundant although growth was poor, and no YOY were observed (Table 16).

Table 16. A summary of bass sampling from Atlas Reservoir. Spring data for 1989 and 1990 were not differentiated by age groups since they appeared to be entirely comprised of stocked fish.

| Date | No. Sampled | | Average Total Length (in.) | Average Total Weight (lbs.) |
|---|---|---|---|---|
| 05/08/89 | 31 | | 8.8 | 0.34 |
| 05/22/90 | 9 | | 11.1 | 0.75 |
| 10/01/90 | Adults 42 | | 13.0 | 1.21 |
| | Yrlg. 10 | | 7.3 | 0.21 |
| | YOY 20 | | 3.0 | ---- |
| 09/30/91 | Adults 4 | | 8.9 | 0.46 |
| | Yrlg. 20 | (300)[1] | 5.4 | 0.09 |

[1]Approximately 300 additional 5.0-inch bass were counted but not netted.

Spring seining in 1991 was conducted to determine the presence of bass and evaluate winterkill and restocking needs. The catch of adult bass was poor, but no dead fish indicating winterkill problems were observed.

Due to the poor catch of adult bass recorded during fall electrofishing in 1991, it appears that a large segment of the adult population was apparently lost to winterkill. Poor catches by anglers confirm the lack of adult bass, and harvest by sport fishermen is not considered to be responsible for the disappearance of large adults. The lack of YOY in 1991 is attributed to the lack of adults. Yearling bass in 1991 were smaller in size compared to 1990, which may be due to low reservoir levels caused by drought. The water level improved significantly in 1991 due to late spring rains and growth rates for the existing population should recover in the immediate future.

## RECOMMENDATIONS

Netting surveys in the Fort Peck Dredge Cuts should continue to maintain data on the overall fish population.

A 2-paddlefish annual limit, utilizing tags similar to those on the Yellowstone River, should be imposed on the Missouri River. The ability to immediately release a paddlefish should be retained. Annual collections of paddlefish jaws should be made to assist in determining the age structure of the Missouri paddlefish population. An annual mail/phone survey should be conducted using names of anglers who purchased tags. This information may be used to estimate total harvest. Records on the harvest of tagged paddlefish should be maintained.

Standardized late summer seining to assess game fish reproduction and forage fish abundance should be continued at Fresno Reservoir. Sampling of adult game fishes should be continued utilizing fall gill netting to gather recruitment information relating to walleye year-class strength and winter reservoir water levels. Attempts should be made to quantify the walleye population and determine the potential for supplying eggs. The revised walleye stocking plan developed in 1991 should be implemented.

Walleye reproduction is still considered to be below optimum at Nelson Reservoir but appears to be improving. Alternate years of walleye fingerling stocking should be continued. Monitoring of reproductive success of sport and forage fish should be continued. Efforts should be made to improve natural reproduction of walleye by construction of rock shoals. A creel census similar to one conducted in 1984 should be initiated.

Beach seining and gill netting should be continued at Beaver Creek Reservoir to monitor growth and survival of stocked walleye. Initiate alternate year walleye fry plants in 1992.

Sampling for tiger muskies should include spring frame trapping as an additional method of assessing survival and growth. Stocking of 8- to 10-inch muskies should continue until survival and recruitment can be fully evaluated. With the apparent lack of tiger musky recruitment, walleye stocking will be necessary to increase predation on the expanding panfish populations.

Annual monitoring of the bass populations at Reser Reservoir and Atlas Reservoir should continue.

Sampling of adult game fish at Baileys Reservoir should continue in order to establish trend data and monitor growth and recruitment. Spring trap netting should indicate if the reservoir has potential as a northern pike egg source.

Alternate year walleye stocking should continue at Little Warm Reservoir. Periodic netting should be conducted to determine stocking success and the degree of expansion of invasive fish species such as yellow perch.

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Waters referred to:

| | |
|---|---|
| 16-5140 | Fort Peck Reservoir |
| 16-2500 | Missouri River Sec. 05 |
| 16-2520 | Missouri River Sec. 06 |
| 15-5240 | Fresno Reservoir |
| 15-6480 | Nelson Reservoir |
| 15-5880 | H. C. Kuhr Reservoir |
| 15-4570 | Beaver Creek Reservoir |
| 15-8860 | Reser Reservoir |
| 15-4532 | Atlas Reservoir |
| 15-4535 | Bailey Reservoir |
| 15-6105 | Little Warm Reservoir |

Key words or fish species:

paddlefish, harvest, cisco, smelt, walleye, water levels, recruitment, tiger musky, stocking, creel census


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Date: June 30, 1992

ATTACHMENT A

WALLEYE STOCKING PLAN FOR FRESNO RESERVOIR

Walleye fingerlings (4- to 6-inch) should be planted at a rate of 10,000 per year on alternate years beginning the fall of 1990. If water levels are expected to remain below 2550 msl into the winter, then the plant should be deferred until the following fall, at which time an alternate year schedule will resume. This strategy is contingent upon the ability of the Miles City Hatchery to produce larger fingerlings in early fall. The hatchery is currently meeting existing needs.

The previous stocking strategy for Fresno Reservoir involved periodic stocking of walleye fry based on walleye reproductive success and severity of reservoir drawdowns. The new strategy has numerous advantages over the old fry stocking plan, including the following:

1. Expected increase in survivability of planted fish.

2. Time to predict over-winter water levels prior to stocking. (Over-winter water levels have recently been shown to be instrumental in determining walleye year-class strength.)

3. Fish are large enough to be fin-clipped for permanent marking. This may allow for assessment of the stocking contribution to the overall fishery and aid in quantifying particular cohorts.

4. It will allow for natural reproduction in non-stocking years to be assessed more definitely.