MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-46-R-3 STUDY TITLE: SURVEY AND INVENTORY OF WARMWATER LAKES

JOB NO.: IV-C JOB TITLE: FORT PECK RESERVOIR STUDY

PROJECT PERIOD: JULY 1, 1989 THROUGH JUNE 30, 1990

ABSTRACT

Spring trapping in the upper Big Dry Arm captured 2,360 walleye. The catch rate of 11.4 fish per trap-day was above the average catch rate of 7.5 for the previous 10 years. The average weight for male and female walleye was 1.78 and 4.88 pounds, respectively. Average weights and condition factors continue to increase for all 1.0-inch length groups in the 14.0- to 25.0-inch range. The catch rate for northern pike trapped in the upper Big Dry Arm was 1.9 fish per trap-day. This was an improvement over the catch rate for the previous six years, but still indicates a small population. Frame traps were also fished in the lower reservoir, producing catch rates of 0.3 for walleye, 1.0 for northerns, and 0 for yellow perch. Sixty-nine experimental gill net sets were made throughout the reservoir during the summer. Walleye gill net catch rates increased at all sampling stations throughout the lake, with the largest concentration in the Big Dry Arm. Walleye in the 14.0- to 24.0-inch range appeared to be in excellent condition, with average weights and condition factors for most 1.0-inch length groups being similar to fish sampled in 1988. Experimental gill nets found cisco dispersed throughout the lake, with the catch rate increasing from 1.6 in 1988, to 3.4. Beach seine hauls totaling 176 were made at various reservoir locations. Smallmouth bass young-of-year were the most abundant game fish captured. Walleye young-of-year were second in abundance and were especially numerous in areas where fingerling plants occurred. The best catch rate for young-of-year walleye however, was in the upper Missouri Arm, where natural reproduction may be augmenting the population. Since 1986, beach seining has shown spottail shiners to be the most abundant forage fish in the littoral zone, this phenomena continued in 1989. Monitoring production of young-of-year cisco with vertical, small mesh, monofilament gill nets, captured 22.9 fish per net set. This was the second poorest catch rate observed since young-of-year cisco monitoring began in 1986. The growth rate of young-of-year cisco appeared to be slightly less than in 1988, with average lengths dropping from 5.2 inches to 5.0 inches. Spring and fall lake trout creel surveys

continued to show fish in excellent condition, with average weights above 7.0 pounds. Catch rates were 0.17 fish per hour in spring, dropping to .09 fish per hour during fall.

OBJECTIVE AND DEGREE OF ATTAINMENT

Job Objectives:

1) To acquire a greater and consistent walleye egg supply for artificial propagation of fry and fingerlings. Accomplished entirely by state funding.

2) To determine success of walleye fry versus fingerling plants to develop future stocking guidelines. This objective was met and results are presented under Findings.

3) To determine abundance of walleye in spring spawning runs in the Missouri River upstream from Fort Peck Reservoir and assess impacts of river spawning attributable to Yellowstone River walleye stocking. This objective was partially met and is presented under Findings. Electrofishing for spring spawners was not conducted in the Missouri River due to lack of personnel. Fall beach seining in the upper Missouri Arm indicated successful natural reproduction may be occurring.

4) To encourage reservoir management practices to benefit the fishery as outlined in the annual and long range water level management plan by coordinating needs with the Corps of Engineers and other states on the Missouri River Natural Resources Committee. Accomplished wholly by state funding.

5) To improve aquatic habitat and spawning substrate by utilizing artificial structures. Work to be done by state funds, but no projects were submitted by sportsman's groups.

6) To determine effects of reservoir water levels on abundance, distribution, and reproduction of key sport and forage fish. This objective was met and results are presented under Findings.

7) To determine abundance and trends of spring spawning populations of walleye and northern pike. This objective was met and results are presented under Findings.

8) To determine the rate of harvest for key species and angler preference for various species management. This objective was partially met. A spring and fall lake trout creel census was conducted as described under Findings. An intensive reservoir-wide creel census was implemented in April, 1990, and the results will be presented in F-46-R-4.

9) To determine status of cisco and spottail shiners as to abundance, distribution, spawning success, and utilization by predators. This objective was met. Results are presented under Findings.

10) To determine which designated access sites will provide the most benefit to fishermen. This objective was met. Work was performed in cooperation with the Parks Division to identify access needs and site development for additional fishing access and boating facilities. Existing use data from various reservoir areas was summarized from Montana Department of Fish, Wildlife and Parks information and Corps of Engineers recreational use data.

11) To obtain greater public involvement by attending 10 public/sportsmen club meetings and providing 5 news releases per year. Accomplished entirely by state funding.

12) To collect and tabulate commercial fish harvest, prepare commercial regulations, and conduct field inspections to determine compliance and catch of non-target species. Accomplished entirely with state funding.

PROCEDURES

Spring trap-net sampling was conducted in the Big Dry Arm and lower Missouri Arm with 4- x 6-foot frame traps of 1-inch square mesh rigged with 50-foot leads. Sinking 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 throughout the reservoir to acquire information on overall fish populations. Beach seining to determine abundance, reproductive rates and walleye stocking success was conducted in late summer and early fall utilizing a 100- x 9-foot beach seine of 1/4-inch square mesh. Monofilament gill nets 100- x 6-foot with 1/2-inch square mesh were fished vertically from the surface to sample young-of-year (YOY) cisco. Experimental gill nets were also utilized to capture adult cisco spawners in late fall. Lake trout creel census information and size data was collected at the Fort Peck Marina during spring and fall peak fishing periods. All fish were measured for total length in inches. Information on commercial harvest was obtained from records submitted by commercial fishermen.

FINDINGS

Trapping

Spring spawning fish populations were sampled in the upper Big Dry Arm with frame traps from April 25 - May 6, 1989. Walleye, northern pike and forage fish populations have been sampled using this technique since 1974.

During the 1989 sample period, a total of 2,360 walleye were captured; 1,656 males, 672 females, 26 unknowns and 6 immatures. The catch rate of 11.4 walleye per trap-day was above the average catch rate of 7.5 fish per trap-day for the previous 10 years. (Table 1)

The sex ratio of walleye trapped in 1989 was approximately 3:1, male:female. The percentage of males making up the population was slightly higher than during a similar sampling period the previous spring. The average weight for female walleye spawners was 4.88 pounds and 1.78 for males. This is the highest average weight recorded for spawning females during the past 10 years (Table 2). The average weight for males is the heaviest since 1981.

The overall weight composition of the trap-netted walleye is shown in Table 3 and Figure 1. The percent of walleye weighing more than 1.0 and 2.0 pounds has remained nearly the same as in 1988. The percent of walleye larger than 3.0 pounds has increased significantly in 1989.

Condition factors and average weights for 1.0-inch length groups of walleye 14.0 - 25.0 inches is shown in Table 4. Average weights and condition factors have increased for every length group on in this size range.

Northern pike were trapped at a rate of 1.9 fish per trap-day in 1989 (Table 1). This catch rate was better than the average rate for the previous 10 years (1.5), but continues to indicate a small population.

Frame traps were also used in the lower portion of the Big Dry Arm from May 12-26, 1989 (Table 5). Walleye catch rates dipped to 0.3 fish per trap-day from 0.9 fish in 1988. Northern pike were caught at a rate of 1.0, which was double the rate of the previous year. No yellow perch were captured.

Gill Netting

Gill nets were set at 24 different locations throughout the reservoir from July 24-August 15, 1989. Sixty-nine net sets provided information on the distribution, composition and relative abundance of sport and forage fish populations (Table 6).

Table 1. Summary of the walleye and northern pike caught by spring trap-netting in the upper Big Dry Arm of Fort Peck Reservoir, 1974-89.

Date	Trap-days	No. Walleye	Walleye/ Trap-day	No. N. Pike	N. Pike/ Trap-day
1974 (4/22-5/03)	71	1,243	17.4	125	1.8
1975 (4/25-5/12)	97	1,114	11.5	102	1.1
1976 (4/07-5/13)	100	2,108	21.1	95	1.0
1977 (4/12-5/24)	323	1,727	5.3	431	1.3
1978 (4/17-5/05)	81	1,896	23.4	399	4.9
1979 (4/28-5/17)	63	326	5.2	268	4.3
1980 (4/14-5/06)	97	535	5.5	301	3.1
1981 (3/31-4/28)	140	371	2.7	93	0.7
1982 (4/21-5/07)	89	655	7.4	221	2.5
1983 (4/06-5/09)	106	725	6.8	87	0.8
1984 (4/10-5/04)	96	579	6.0	21	0.2
1985 (4/08-4/26)	97	1,202	12.4	69	0.7
1986 (4/07-4/24)	102	1,448	14.2	174	1.7
1987 (4/07-4/24)	220	1,512	6.9	78	0.3
1988 (4/06-4/22)	214	1,610	7.5	163	0.8
1989 (4/25-5/06)	207	2,360	11.4	383	1.9

Table 2. Summary of average weights and sex ratios for walleye trap-netted in the upper Big Dry, 1979-89.

Year	Average Weight Males	Sample Size	Average Weight Females	Sample Size	Sex Ratio Male:Female
1989	1.78	192	4.88	129	3:1
1988	1.69	283	3.68	239	2:1
1987	1.22	152	2.94	94	2:1
1986	1.31	851	2.43	216	3:1
1985	1.31	606	2.54	111	5:1
1984	.88	454	2.14	34	13:1
1983	.80	644	3.24	37	18:1
1982	1.07	565	2.95	58	10:1
1981	2.27	209	3.70	96	2:1
1980	1.77	247	3.43	122	2:1
1979	1.50	204	3.40	61	3:1

Table 3. A summary of size composition for walleye taken during spring trap netting in the upper Big Dry Arm of Fort Peck Reservoir, 1974-89. Percent of the population sample is in parenthesis.

Sexes Combined	1974	1976	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
No. >1 lbs.	221	115	243	225	285	296	172	205	594	900	273	482	285
Percent	(98)	(100)	(95)	(77)	(75)	(45)	(24)	(35)	(81)	(79)	(74)	(91)	(89)
No. >2 lbs.	169	100	86	112	145	92	45	23	108	172	129	304	186
Percent	(75)	(87)	(33)	(38)	(38)	(14)	(6)	(4)	(15)	(15)	(35)	(57)	(58)
No. >3 lbs.	70	47	38	37	65	25	20	6	33	50	55	169	140
Percent	(31)	(41)	(15)	(14)	(17)	(4)	(3)	(1)	(4)	(4)	(15)	(32)	(44)
No. >4 lbs.	21	17	21	20	33	11	13	3	15	14	14	80	100
Percent	(9)	(15)	(8)	(7)	(9)	(2)	(2)	(<1)	(2)	(1)	(4)	(15)	(31)
No. >5 lbs.	5	6	5	9	20	3	6	1	8	5	5	28	42
Percent	(2)	(5)	(2)	(3)	(5)	(<1)	(<1)	(<1)	(1)	(<1)	(1)	(5)	(13)

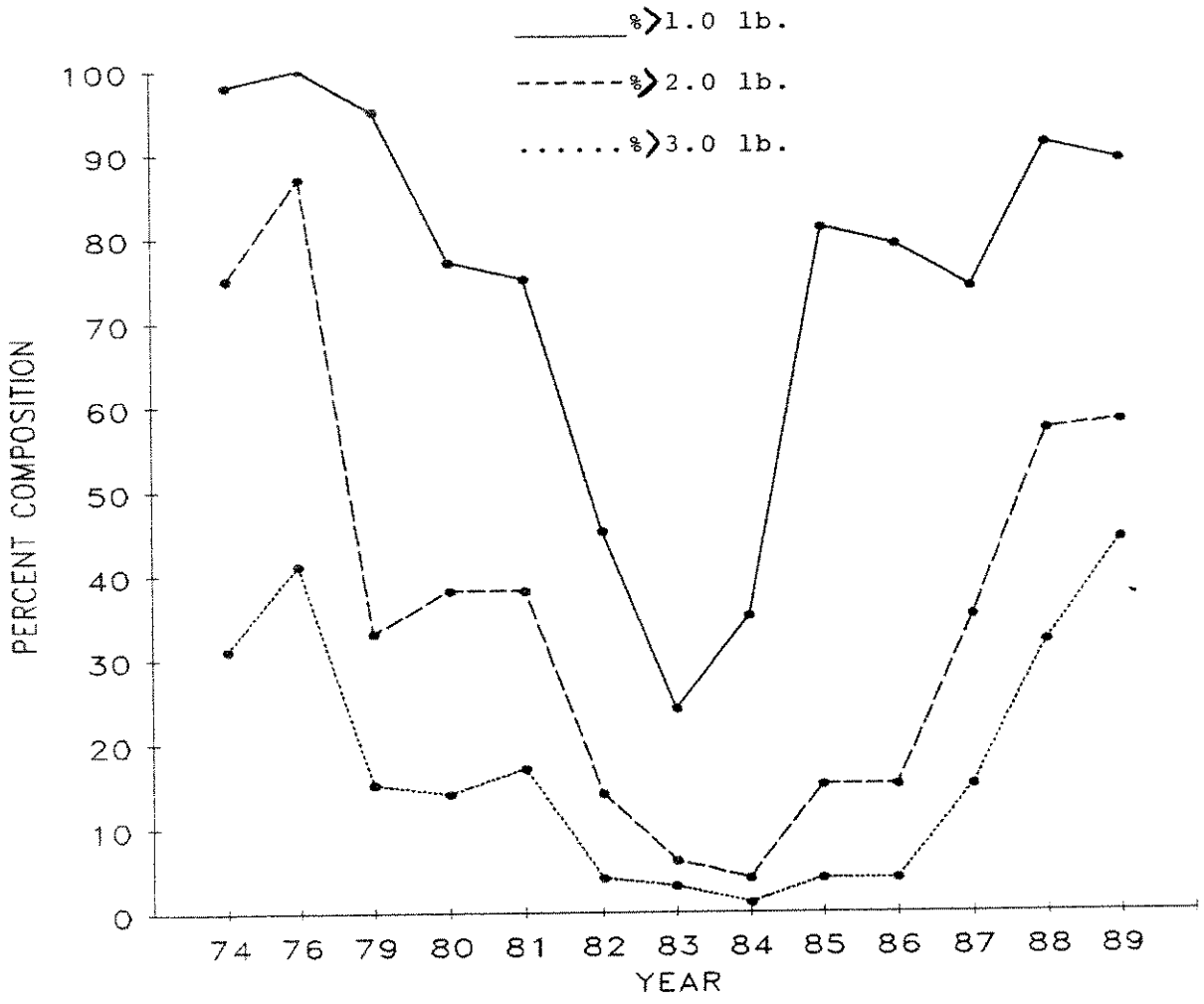

Figure 1. An illustration of changes in the size of walleye taken by spring trap netting in the upper Big Dry Arm of Fort Peck Reservoir, 1974-1989.

Table 4. Average condition factors (C) and average weights for various 1.0-inch length groups of walleye captured in frame traps, Fort Peck Reservoir (Upper Big Dry only).

Length Inches	1986 (C) Factor	1986 Ave. Wt.	1986 Number Sampled	1988 (C) Factor	1988 Ave. Wt.	1988 Number Sampled	1989 (C) Factor	1989 Ave. Wt.	1989 Number Sampled
14.0-14.9	30.1	.92	(155)	30.7	.94	(27)	33.7	1.02	(26)
15.0-15.9	30.6	1.14	(213)	30.6	1.13	(53)	34.5	1.26	(29)
16.0-16.9	30.9	1.37	(258)	31.5	1.42	(53)	33.2	1.48	(30)
17.0-17.9	31.3	1.67	(198)	32.1	1.71	(56)	33.3	1.76	(30)
18.0-18.9	32.5	2.05	(96)	33.3	2.07	(56)	36.0	2.26	(19)
19.0-19.9	31.6	2.29	(35)	32.8	2.41	(60)	36.8	2.69	(11)
20.0-20.9	32.1	2.73	(30)	33.3	2.89	(46)	37.2	3.15	(29)
21.0-21.9	35.0	3.44	(19)	34.3	3.36	(57)	39.7	3.92	(34)
22.0-22.9	32.8	3.68	(12)	34.9	3.92	(45)	40.7	4.57	(30)
23.0-23.9	30.6	3.89	(5)	34.8	4.47	(34)	40.5	5.13	(33)
24.0-24.9	29.2	4.10	(3)	35.4	5.10	(13)	41.1	5.89	(19)
25.0-25.9	27.2	4.53	(2)	35.0	5.73	(10)	42.6	6.95	(4)

Table 5. A summary of the walleye, northern pike, and yellow perch caught by spring trap-netting in the lower portion of Fort Peck Reservoir, 1969-89.

Date		Trap Mesh	Trap-Days	Walleye No.	Walleye Per T.D.	No. Pike No.	No. Pike Per T.D.	Yellow Perch No.	Yellow Perch Per T.D.
1969	(4/21-6/09)	1"	333	0	---	425	1.3	2,002	6.0
1971	(5/04-6/04)	1"	37	1	T*	68	1.8	45	1.2
1972	(4/21-6/29)	1"	82	0	---	104	1.3	299	3.6
	(5/02-5/16)	1/2"	28	0	---	20	0.7	4,816	172.0
1973	(4/05-5/18)	1"	94	0	---	111	1.2	476	5.1
	(4/05-5/18)	1/2"	121	0	---	125	1.0	4,664	38.6
1974			0						
1975		1/2"	71	0	---	6	0.9	4	0.1
1976		1"	89	0	---	146	1.6	3	T
1977			0						
1978			0						
1979			0						
1980			0						
1981	(5/04-5/21)	1"	18	0	---	95	5.3	0	---
1982	(5/11-5/27)	1"	75	25	0.3	259	3.5	1	T
1983	(4/27-5/25)	1"	126	44	0.3	142	1.1	0	---
1984	(5/03-5/18)	1"	72	15	0.2	67	0.9	4	0.1
1985	(5/06-5/22)	1"	52	43	0.8	36	0.7	7	0.1
1986	(4/30-5/15)	1"	58	23	0.4	53	0.9	4	0.1
1987	(4/28-5/13)	1"	52	60	1.3	34	0.7	8	0.2
1988	(4/22-5/11)	1"	152	136	0.9	76	0.5	15	0.1
1989	(5/12-5/26)	1"	101	33	0.3	102	1.0	0	---

*T represents less than 0.1.

Table 6. Fish captured by 125-foot experimental gill nets in Fort Peck Reservoir, 1989

Species[1]	UBD[2] No. Fish	UBD[2] No./ Net Day	LBD[3] No. Fish	LBD[3] No./ Net Day	LMA[4] No. Fish	LMA[4] No./ Net Day	MMA[5] No. Fish	MMA[5] No./ Net Day	UMA[6] No. Fish	UMA[6] No./ Net Day	Total No. Fish	Total No./ Net Day
WE	119	9.9	100	5.6	93	6.2	80	4.4	11	1.8	403	5.8
NP	7	0.6	22	1.2	5	0.3	12	0.7	0		46	0.7
SG	1	<0.1	21	1.2	22	1.5	49	2.7	8	1.3	101	1.5
YP	0		11	0.6	17	1.1	49	2.7	3	0.5	80	1.2
GE	180	15.0	37	2.1	0		0		0		217	3.1
CC	37	3.1	24	1.3	3	0.2	26	1.4	9	1.5	99	1.4
SS	1	<0.1	1	<0.1	1	<0.1	0		0		3	<0.1
CI	125	10.4	20	1.1	23	1.5	61	3.4	4	0.7	233	3.4
TOTALS	470	39.2	236	13.1	164	10.9	277	15.4	35	5.8	1182	17.1
No. Net Days	12		18		15		18		6		69	

[1]WE - walleye
NP - northern pike
SG - sauger
YP - yellow perch
GE - goldeye
CC - channel catfish
SS - shovelnose sturgeon
CI - cisco

[2]Upper Big Dry: Nelson Cr., Short Cr., Lone Tree Cr., McGuire Cr.

[3]Lower Big Dry: Box Cr., S. Fork Rock Cr., N. Fork Rock Cr., Box Elder Cr., Sandy Arroyo, Spring Cr.,

[4]Lower Missouri Arm: Spillway Bay, Bear Cr., N. Fork Duck Cr., S. Fork Duck Cr., Main Duck

[5]Mid Missouri Arm: Pines, Gilbert Cr., Cattle Cr., Hell Cr., Sutherland, Snow Cr.

[6]Upper Missouri Arm: Timber Cr., Devil's Cr.

As in previous years, the largest concentration of walleye was found in the Big Dry Arm (Table 7). Walleye catch rates increased at all sampling stations throughout the reservoir, averaging 5.8 fish per net-day. This was an increase of 2.8 fish per net day over the reservoir-wide catch rate in 1988.

Walleye captured by gill net appear to be in excellent condition (Table 8). Average weights and condition factors for most length groups from 14.0-24.0 inches, indicate that walleye sizes are consistent with fish sampled in 1988.

Scale samples taken from 170 gill-netted walleye were aged (Table 9). Age classes 1-7 were represented. The most dominant age class appears to be 4 year-olds that average nearly 15 inches in length. None of the ages determined from scale samples were verified by spine cross sections.

Numbers of gill-netted northern pike, sauger and yellow perch remained low with catch rates of 0.7, 1.5 and 1.2, respectively (Table 6). The poor catches of northerns and yellow perch is probably due to inadequate natural reproduction relating to unsuitable reservoir levels. Depressed numbers of sauger may have resulted from declining reproductive success due to low river flows during the past three drought years.

The catch rate for goldeye taken by experimental gill net, continues to decline, with only 3.1 fish taken per net-day (Table 6). This is the lowest catch rate recorded since 1981 (Figure 2).

Cisco captured with experimental gill nets have increased slightly from 1988, rising from 1.6 per net-day to 3.4 per net-day. Table 6 shows that this species continues to be well dispersed throughout most of the sampling areas.

Beach Seining

Seining was utilized as a method to determine reproductive success of sport and forage fish throughout the reservoir from August 15-23, 1989. Seine hauls at 176 different reservoir locations, captured 11,699 fish (Table 10).

Smallmouth bass were the most common YOY game fish captured. The average catch rate was 1.7 fish per haul. This is the highest catch rate recorded since smallmouth were introduced in 1982 (Table 11).

YOY walleye were captured at a reservoir-wide rate of 1.0 fish per seine haul, which is the highest rate since 1985 (Table 11). The more abundant YOY walleye catches may be due, in part, to increased stocking efforts.

Table 7. A summary of walleye size and catch rates in 125-foot experimental gill nets for areas of Fort Peck Reservoir.

Area	Year	No. Sampled	Length (in.)		Weight (lbs.)			Net Sets	
			Ave.	Range	Ave.	Range	% >1.0#	Total Sets	No./ Set
Big Dry Arm	1989	219	13.6	6.4-26.5	0.94	0.10-7.03	26.0	30	7.3
Big Dry Arm	1988	86	13.3	6.6-23.4	0.88	0.06-4.26	19.8	24	3.6
Big Dry Arm	1987	106	14.1	6.5-21.4	1.04	0.12-3.33	34.7	33	3.2
Big Dry Arm	1986	109	13.4	7.3-24.6	0.86	0.07-5.40	27.8	24	4.5
Big Dry Arm	1985	219	13.7	7.7-26.5	0.91	0.14-4.56	29.7	30	7.3
Big Dry Arm	1984	147	13.7	7.2-22.4	0.83	0.11-3.84	22.4	33	4.5
Big Dry Arm	1983	111	12.9	7.7-22.4	0.63	0.13-3.06	9.0	33	3.4
Big Dry Arm	1982	69	12.2	7.8-20.4	0.55	0.11-2.33	4.3	12	5.7
Big Dry Arm	1981	96	12.0	7.6-21.4	0.52	0.12-2.51	9.4	18	5.3
Lower Reservoir	1989	93	15.5	7.8-24.1	1.61	0.13-5.60	55.0	15	6.2
Lower Reservoir	1988	57	15.1	8.1-23.9	1.46	0.14-5.30	59.6	18	3.2
Lower Reservoir	1987	48	16.3	10.8-21.5	1.61	0.32-4.08	66.7	15	3.2
Lower Reservoir	1986	---	---	---	---	---	---	--	---
Lower Reservoir	1985	65	13.5	9.9-19.3	0.71	0.24-2.94	12.3	18	3.6
Lower Reservoir	1984	18	13.2	8.8-16.2	0.66	0.18-1.19	11.1	15	1.2
Bear-S.F. Duck Cr.	1983	33	13.0	7.7-22.3	0.68	0.10-2.95	15.2	12	2.7
Bear-S.F. Duck Cr.	1982	42	13.9	7.2-20.3	0.77	0.09-2.45	11.9	12	3.5
Mid Reservoir	1989	80	16.5	10.0-24.2	1.85	0.32-5.90	58.8	18	4.4
Mid Reservoir	1988	49	15.8	8.2-22.8	1.67	0.15-4.70	57.1	21	2.3
Mid Reservoir	1987	88	14.0	8.0-22.0	0.98	0.14-4.35	30.7	21	4.2
Mid Reservoir	1986	56	13.4	8.4-22.3	0.85	0.20-3.00	30.0	21	2.7
Mid Reservoir	1985	102	14.7	7.9-22.1	1.01	0.11-3.60	35.3	21	4.9
Mid Reservoir	1984	60	14.5	8.6-20.6	0.94	0.15-2.33	36.7	21	2.9
Pines-Snow Cr.	1983	54	16.0	7.5-24.8	1.38	0.08-4.52	57.4	21	2.6
Upper Reservoir	1989	11	19.4	9.9-25.8	3.36	0.23-6.20	63.6	6	1.8
Upper Reservoir	1988	15	11.8	7.6-19.3	0.57	0.19-2.57	13.3	12	1.3
Upper Reservoir	1987	32	12.7	8.8-20.4	0.72	0.14-2.96	18.8	12	2.7
Upper Reservoir	1986	3	11.5	9.2-14.4	0.50	0.20-0.97	0.0	6	0.5
Upper Reservoir	1985	31	12.7	8.5-18.2	0.65	0.20-1.72	19.4	18	1.7
Upper Reservoir	1984	10	14.5	9.7-24.5	1.18	0.24-4.72	30.0	18	0.6
Timber Soda Cr.	1983	6	16.2	12.3-21.7	1.02	0.51-3.06	50.0	18	0.3

Table 8. Average weight and condition factors for various length groups of walleye captured by gill netting in Fort Peck Reservoir, 1988-1989.

Length	1988			1989		
Groups (inches)	Condition Factor	Average Weight	Number Sampled	Condition Factor	Average Weight	Number Sampled
14.0-14.9	30.3	0.93	(23)	29.9	0.89	(41)
15.0-15.9	29.9	1.08	(19)	29.7	1.09	(42)
16.0-16.9	30.8	1.35	(08)	30.2	1.33	(26)
17.0-17.9	31.9	1.73	(13)	33.1	1.79	(11)
18.0-18.9	34.0	2.18	(08)	34.7	2.14	(12)
19.0-19.9	34.6	25.2	(09)	34.5	2.49	(17)
20.0-20.9	36.3	3.11	(08)	36.1	3.07	(13)
21.0-21.9	37.2	3.65	(10)	38.2	3.79	(13)
22.0-22.9	37.7	4.30	(05)	37.1	4.23	(14)
23.0-23.9	36.0	4.78	(02)	38.4	5.00	(10)

Table 9. Age analysis and growth increment of 170 walleye taken from Fort Peck Reservoir based on scale samples.

	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7
Ave. L. (in.)	7.5	10.3	12.1	14.7	16.4	18.2	18.9
L. Range (in.)	(5.7-8.8)	(8.8-11.5)	(9.9-13.2)	(12.0-16.2)	(16.1-16.9)	(17.2-19.9)	(17.4-21.2)
Sample Size	24	34	27	49	11	13	12
Growth Increment		2.8	1.8	2.6	1.7	1.8	0.7

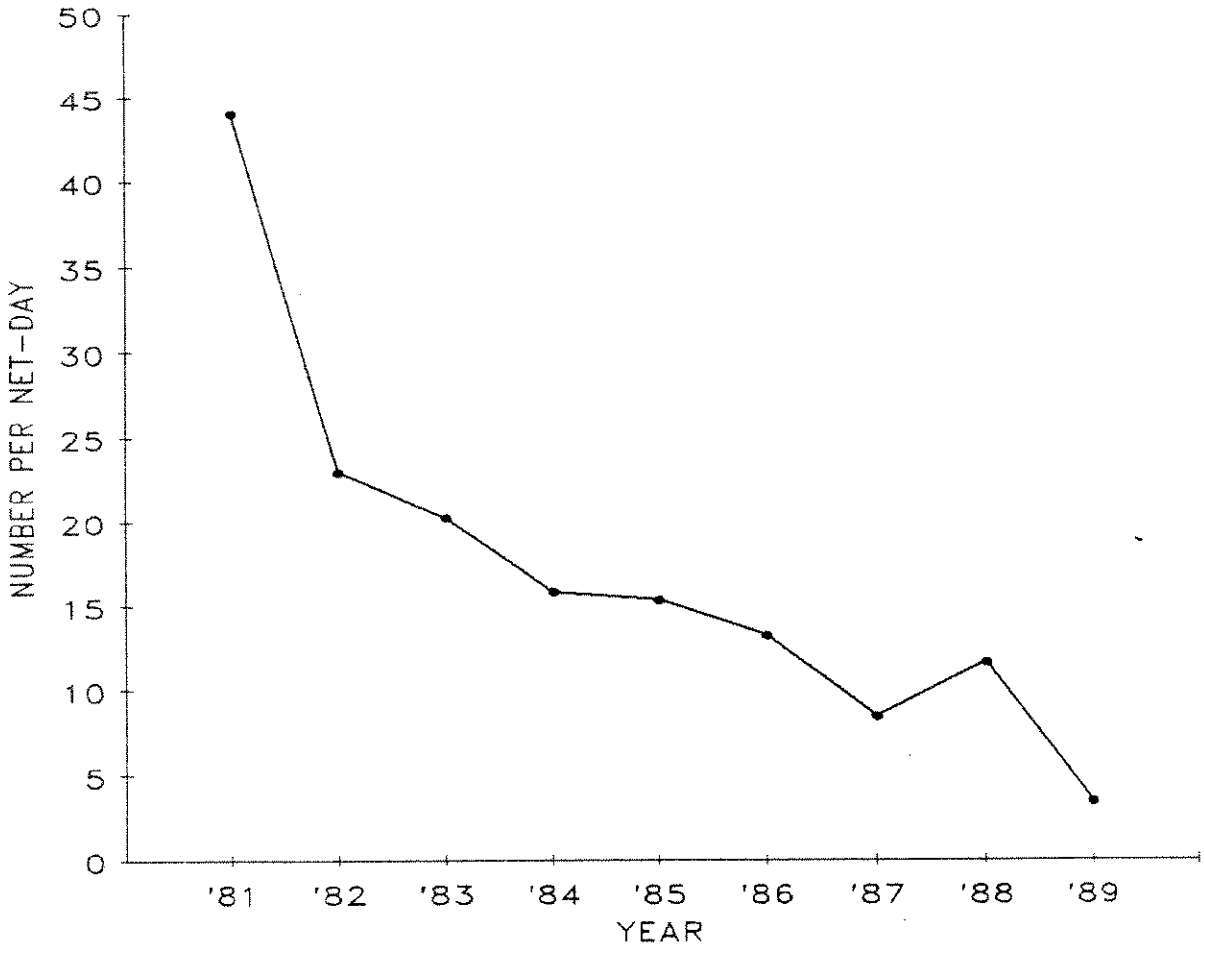

Figure 2. Annual catch rate for goldeye captured by experimental gill nets, Fort Peck Reservoir, 1981-'89.

Table 10. Species and number of forage minnows and young-of-year fish captured by beach seining in Fort Peck Reservoir, 1989.

Species	UBD[2] No. Fish	UBD[2] No./ Haul	LBD[3] No. Fish	LBD[3] No./ Haul	LMA[4] No. Fish	LMA[4] No./ Haul	MMA[5] No. Fish	MMA[5] No./ Haul	UMA[6] No. Fish	UMA[6] No./ Haul	TOTAL No. Fish	TOTAL No./ Haul
WE	16	0.8	7	0.2	44	0.9	17	0.4	94	3.1	178	1.0
NP	0	---	5	0.1	1	0.1	1	0.1	0	---	7	0.1
SG	0	---	0	---	0	---	0	---	2	0.1	2	0.1
YP	121	6.4	433	10.3	62	1.3	228	6.0	51	1.7	895	5.1
GE	3	0.2	0	---	0	---	0	---	158	5.3	161	0.9
WS	1	0.1	54	1.3	94	2.0	49	1.3	2	0.1	200	1.1
RC	0	---	11	0.3	22	0.5	0	---	145	4.8	178	1.0
Bsp	2	0.1	0	---	0	---	41	1.1	64	2.1	107	0.6
LC	0	---	0	---	1	0.1	1	0.1	0	---	2	0.1
CP	0	---	3	0.1	8	0.2	45	1.2	10	0.3	66	0.4
SR	0	---	0	---	0	---	0	---	46	1.5	46	0.3
GS	0	---	0	---	0	---	0	---	1	0.1	1	0.1
FD	28	1.5	0	---	0	---	0	---	742	24.7	770	4.4
SMB	27	1.4	87	2.1	15	0.3	146	3.8	30	1.0	305	1.7
CI	0	---	0	---	0	---	0	---	4	0.1	4	0.1
SM	0	---	0	---	1	<0.1	0	---	11.5	3.8	116	0.7
SS	8	0.4	0	---	6	0.1	0	---	0	---	14	0.1
CR	0	---	2	<0.1	0	---	0	---	19	0.6	21	0.1
FC	0	---	0	---	0	---	7	0.2	42	1.4	49	0.3
FM	0	---	4	0.1	0	---	0	---	0	---	4	<0.1
ES	119	6.3	635	15.1	284	6.0	219	5.8	2193	73.1	3450	19.6
CC	0	---	0	---	0	---	0	---	2	0.1	2	<0.1
ST	664	34.9	2308	55.0	1737	37.0	361	9.5	23	0.8	5093	28.9
BU	1	0.1	0	---	0	---	0	---	0	---	1	<0.1
Totals	990	52.1	3459	84.5	2275	48.4	1115	29.3	3743	124.8	11699	66.5
No. Hauls	19		42		47		38		30		176	

Table 10. Continued

[1]WE - walleye	RC - river carpsucker	SMB - smallmouth bass	FM - fathead minnow
NP - northern pike	Bsp - smallmouth/bigmouth buffalo	CI - cisco	ES - emerald shiner
SG - sauger	LC - lake chub	SM - silvery/plains minnow	CC - channel catfish
YP - yellow perch	CP - carp	SS - sand shiner	ST - spottail shiner
GE - goldeye	SR - shorthead redhorse sucker	CR - black/white crappie	GS - green sunfish
WS - white sucker	FD - freshwater drum	FC - flathead chub	BU - burbot ling

[2]Upper Big Dry: Nelson Cr., Lone Tree, McGuire Cr.
[3]Lower Big Dry: Box Cr., S. & N. Fork Rock Cr., Box Elder Cr., Sandy Arroyo Cr., Spring Cr.
[4]Lower Missouri: Bear Cr., Duck Cr., Catfish Bay, Sturgeon Bay, Spillway Bay
[5]Mid Missouri: Pines, Gilbert Cr., Crooked Cr., Hell Cr., Sutherland Cr.
[6]Upper Missouri: Timber Cr., Blackfoot Cr., Fourchette Cr., Devils Cr., Musselshell,

Table 11. A summary of the total catch and catch rate for selected sport and forage fish taken by seining in Fort Peck Reservoir, 1981-89.

		Species[1]						
		WE	NP	SG	SMB	YP	GE	WSU
1981	No. Hauls--142							
	No. Sampled	33	18	70	19	8,099	1,359	459
	No./Haul	0.2	0.1	0.5	0.1	57.0	9.6	3.2
1982	No. Hauls--195							
	No. Sampled	116	34	113	23	9,604	1,410	1,392
	No./Haul	0.6	0.2	0.6	0.1	49.3	7.2	7.1
1983	No. Hauls--263							
	No. Sampled	52	70	70	77	8,324	0	1,120
	No./Haul	0.2	0.3	0.3	0.3	32.0	0	4.3
1984	No. Hauls--210							
	No. Sampled	115	23	96	27	19,280	1,361	453
	No./Haul	0.5	0.1	0.5	0.1	91.8	6.5	2.2
1985	No. Hauls--197							
	No. Sampled	219	29	36	10	31,695	509	969
	No./Haul	1.1	0.1	0.2	0.1	160.9	2.6	4.9
1986	No. Hauls--176							
	No. Sampled	74	88	61	149	6,597	1,081	861
	No./Haul	0.4	0.5	0.3	0.8	37.5	6.1	4.9
1987	No. Hauls--185							
	No. Sampled	14	10	9	145	2,093	0	48
	No./Haul	0.1	<0.1	<0.1	0.8	11.3	0	0.3
1988	No. Hauls--174							
	No. Sampled	47	74	17	135	1,045	1	258
	No./Haul	0.3	0.4	<0.1	0.8	6.0	<0.1	1.5
1989	No. Hauls--176							
	No. Sampled	178	7	2	305	895	161	200
	No./Haul	1.0	<0.1	<0.1	1.7	5.1	0.9	1.1

Table 11. Continued

		Species[1]					
		BUFF	CARP	FWD	B/WC	ESH	SPSH
1981	No. Hauls--142						
	No. Sampled	1,252	1,047	1,122	3,388	2,488	----
	No./Haul	8.8	7.4	7.9	23.9	17.5	----
1982	No. Hauls--195						
	No. Sampled	4,577	742	658	6,958	2,764	0
	No./Haul	23.5	3.8	3.4	35.7	14.2	0
1983	No. Hauls--263						
	No. Sampled	2,345	1,582	245	9,244	5,859	1,681
	No./Haul	8.9	6.0	0.9	35.1	22.3	6.4
1984	No. Hauls--210						
	No. Sampled	11,414	1,853	584	7,858	10,312	2,120
	No./Haul	54.4	8.8	2.8	37.4	49.1	10.1
1985	No. Hauls--197						
	No. Sampled	363	289	640	1,907	14,109	4,444
	No./Haul	1.8	1.5	3.2	9.7	71.6	22.6
1986	No. Hauls--176						
	No. Sampled	1,378	951	713	3,011	6,443	22,436
	No./Haul	7.8	5.4	4.1	17.1	36.6	127.5
1987	No. Hauls--185						
	No. Sampled	388	509	43	40	3,688	10,027
	No./Haul	2.1	2.7	0.2	0.2	19.9	54.2
1988	No. Hauls--174						
	No. Sampled	24	154	405	12	1,449	10,089
	No./Haul	0.1	0.9	2.3	<0.1	8.3	58.0
1989	No. Hauls--176						
	No. Sampled	107	66	770	21	3,450	5,093
	No./Haul	0.6	0.4	4.4	0.1	19.6	28.9

[1]WE - walleye
NP - northern pike
SG - sauger
SMB - smallmouth bass
YP - yellow perch
GE - goldeye
WSU - white sucker

BUFF - smallmouth & bigmouth buffalo
CARP - carp
FWD - freshwater drum
B/WC - black/white crappie
ESH - emerald shiner
SPSH - spottail shiner

Nearly 32 million walleye fry were stocked throughout the reservoir in 1989 and fingerlings numbered over 600,000. Improved catch rates at Nelson Creek, Spillway Bay, Bear Creek, Ft. Peck Marina, and the Pines are attributed to stocking (Table 12). However, the greater abundance of YOY walleye in the upper Missouri Arm, where no walleye fry or fingerlings were planted in 1989, appears to be the result of natural reproduction (Table 10). These fish may be the consequence of attempts to establish a "river-running" strain of walleye that began in 1983. Some natural reproduction may have occurred in spite of below normal Missouri River flows in recent years. It was hoped that by stocking fry and fingerlings from Yellowstone eggs, a population of walleye could be established in the upper reservoir that would find suitable spawning gravel in the Missouri River.

YOY sauger and northern pike reservoir-wide catch rates were less than 0.1 fish per seine haul. The reason for the poor 1989 northern pike year-class may be due to low lake elevations, and sauger reproduction may have suffered due to low river flows.

Spottail shiners were the most abundant forage fish species captured, with a catch rate of 28.9 reservoir-wide. This was the lowest rate since 1985. The reason for the lower catch rate is unknown. Spottails have been the dominant forage fish in the littoral zone since 1986 (Table 11).

Cisco

Monofilament gill nets, 100- x 6- foot with 1/2- inch mesh, were fished at 11 sites throughout the reservoir in September, 1989 to sample YOY cisco. A catch rate of 22.9, indicates that the 1989 year-class was the second poorest since surveys of YOY cisco began in 1986 (Table 13). Lengths of captured YOY ranged from 4.3 - 5.5 inches, and averaged 5.0 inches. In 1986, 1987 and 1988, YOY cisco lengths (samples taken at approximately the same time of year), averaged 5.8, 4.9, and 5.2 inches, respectively. Cisco yearlings captured in 1989 ranged from 6.7 - 9.4 inches, and averaged 7.5 inches.

Cisco spawners were captured near shoreline at Markle's Point with experimental gill nets. On November 28, a total of 330 cisco were sampled, ranging in length from 7.6 - 15.1 inches. The average weight for females was 0.36 pounds and 0.30 pounds for males. The average total lengths were 10.3 inches for females and 9.8 inches for males. Only 41% of the 17 females captured were ripe.

A comparison of the average lengths for various age classes of cisco from 1985 to 1989, indicates that growth rates have declined dramatically (Table 14). The decline in growth is probably due to intraspecific competition resulting from the cisco population approaching or surpassinng maximum carrying capacity of the reservoir.

Table 12. A summary of walleye stocking and young-of-year abundance (determined by seining) in Fort Peck Reservoir, 1977-89.

Year	Area	No. Walleye Stocked		No. Seine Hauls	No. YOY WE Caught	No. YOY WE/ Haul
		Fingerling	Fry			
1977	Lower Reservoir	62,920	0	25	19	0.76
	Big Dry Arm	0	0	58	13	0.22
1978	Lower Reservoir	85,000	0	10	9	0.90
	Big Dry Arm	175,000	0.25 Mil	24	9	0.40
1979	Lower Reservoir	66,120	0	17	0	0
	Big Dry Arm	194,127	0	27	5	0.20
1980	Lower Reservoir	0	0	27	2	0.07
	Big Dry Arm	0	0.75 Mil	36	1	0.03
1981	Lower Reservoir	125,000	0	36	15	0.42
	Big Dry Arm	279,000	0	56	17	0.29
	Hell Creek	11,000	0	19	1	0.05
1982	Marina	102,000	0	12	7	0.58
	Bear-Duck Creek	0	1.42 Mil	46	83	1.80
	Big Dry Arm	0	0	69	23	0.33
	Hell Creek	17,000	0	13	1	0.08
1983	Bear-Duck Cr.	0	0	69	10	0.14
	S.F. Rock-Box Cr.	0	2.80 Mil	21	4	0.19
	Nelson Creek	0	1.00 Mil	7	1	0.14
	Pines	0	0.60 Mil	10	0	0
	Hell Creek	97,710	0	13	0	0
	Devils Creek	41,160	0	8	16	2.00
	Crooked Creek	7,600	0	10	5	0.50
1984	Marina-Spillway	0	7.00 Mil	21	12	0.57
	Gilbert Creek	0	5.40 Mil	8	9	1.13
	Bay E. of Pines	0	2.30 Mil	10	1	0.10
	Cattle Creek	0	1.00 Mil	7	0	0
	Hell Creek	100,620	0	9	2	0.22
	Duck Creek	43,500	0	8	9	1.13
	Bear Creek	58,820	0	7	9	1.29
	Devils Creek	85,150	0	7	5	0.71
	Crooked Creek	60,000	0	8	15	1.88

Table 12. Continued

Year	Area	No. Walleye Stocked Fingerling	No. Walleye Stocked Fry	No. Seine Hauls	No. YOY WE Caught	No. YOY WE/ Haul
1985	Duck Creek	51,500	0	9	0	0
	Nelson Creek	0	1.80 Mil	8	20	2.50
	S.F. Rock Creek	0	1.50 Mil	6	8	1.33
	Box Creek	0	1.50 Mil	7	1	0.14
	Hell Creek	58,482	1.20 Mil	11	22	2.00
	Timber Creek	0	1.00 Mil	6	6	1.00
	Snow Creek	0	1.20 Mil	0	--	--
	Devils Creek	29,048	3.50 Mil	4	5	1.25
	Squaw Creek	41,040	0	0	--	--
	Crooked Creek	245,437	0	7	28	4.00
1986	Bear Creek	0	2.60 Mil	6	3	0.50
	Spillway Area	0	2.60 Mil	8	14	1.75
	N.F. Duck Creek	15,073	0	5	5	1.00
1987	Nelson Creek	0	2.70 Mil	8	5	0.60
	Rock Creek S.Frk.	0	3.00 Mil	8	0	0
	Hell Creek	0	3.00 Mil	8	0	0
	Gilbert Creek	0	1.20 Mil	10	0	0
	Cattle Creek	0	1.10 Mil	8	0	0
	Crooked Creek	0	1.00 Mil	8	0	0
	Duck Creek	29,935	0	15	4	0.30
	Timber Creek	0	0	7	1	0.10
	Devil's Creek	0	0	7	4	0.60
1988	Hell Creek	0	0.50 Mil	7	0	0
	Spillway Bay	0	3.70 Mil	8	0	0
	Bear Creek	0	6.10 Mil	11	0	0
	N.F. Duck Creek	25,000	1.80 Mil	7	0	0
	S.F. Duck Creek	0	2.30 Mil	8	0	0
	Main Duck Creek	0	5.80 Mil	5	0	0
	Devils Creek	0	3.20 Mil	6	18	3.00
	Ghost Coulee	0	1.90 Mil	7	21	3.00
	Fourchette Creek	0	0	7	4	0.57
	Sutherland Creek	0	0	8	1	0.13
	Nelson Creek	0	0	6	3	0.50
1989	Nelson Creek	0	2.65 Mil	6	11	1.83
	McGuire Cr.	0	2.70 Mil	7	1	0.14
	South & North Fork-Rock Cr.	0	2.15 Mil	8	2	0.25
	Spring Creek	0	3.60 Mil	7	1	0.14
	Spillway Bay	148,180	0	8	16	2.00
	Bear Creek	168,017	0	8	5	0.63
	South & North Fork-Duck	38,358	0	15	6	0.40
	Main Duck Creek	0	2.50 Mil	10	4	0.40
	Marina Area	3,835	1.10 Mil	6	13	2.17
	Pines	6,356	3.00 Mil	10	13	1.30
	Hell Creek	159,107	0	7	4	0.57

Table 13. A Summary of young-of-year Cisco taken by vertical monofilament gill nets in Fort Peck Reservoir during August, 1986 and 1987, September 1988 and 1989.

Station	No. Sets				No. Sampled				No./Set			
	1986	1987	1988	1989	1986	1987	1988	1989	1986	1987	1988	1989
Bear Creek	4	4	4	4	154	52	28	93	39	13	7	23
Shaft Houses	2	2	2	2	324	20	11	11	162	10	6	6
Dam	2	2	2	2	642	11	17	5	321	6	9	3
Bear Creek	2	2	-	2	439	20	-	16	220	10	-	8
Marina	2	2	2	2	153	2	91	33	77	1	46	17
S.F. Duck Creek	2	1	2	2	893	24	302	172	447	12	151	86
Pines-Gilbert Creek	4	4	4	4	1,864	42	1,244	94	466	11	311	26
Hell-Sutherland Cr.	2	2	2	2	596	13	299	145	298	6	150	73
Timber Creek	1	-	1	1	5	-	178	6	5	-	178	6
Devils Creek	1	-	1	1	1	-	46	2	1	-	46	2
N.F. Rock Creek	1	2	2	2	46	47	328	17	46	24	164	9
Bug Creek	1	2	2	2	15	31	22	1	15	16	11	1
TOTALS	24	23	24	26	5,132	262	2,566	595	213.8	11.4	107	22.9

YEAR	AGE 1	AGE 2	AGE 3	AGE 4
'85				
Ave. Lgth.	12.1			
Lgth. Range	(10.0-13.8)			
Sample Size	58			
'86				
Ave. Lgth.	11.0	15.7		
Lgth. Range	(10.3-12.1)	(13.5-15.9)		
Sample Size	14	13		
'87				
Ave. Lgth.		15.8		
Lgth. Range	---	(14.5-15.9)	---	
Sample Size		30		
'88				
Ave. Lgth.	9.4	14.4	15.0	
Lgth. Range	(8.7-10.5)	(9.4-15.9)	(15.0-15.0)	
Sample Size	61	46	1	
'89				
Ave. Lgth.	7.9	10.7	11.8	15.0
Lgth. Range	(6.9 - 9.3)	(8.8-14.8)	(9.8-15.1)	(10.8-15.6)
Sampe Size	27	38	20	11

Table 14. Comparison of average lengths and length ranges for various age classes of cisco, 1985-1989.

Table 15. A summary of lake trout creel census and size data collected at the Fort Peck Marina, Fort Peck Reservoir.

	No. Anglers Creeled	No. LT Creeled	LT Per Trip	Avg. No.Hrs. Fished	LT Per Hr.	Males Avg. Lgth. (in.)	Males Avg. Wt. (lbs.)	Females Avg. Lgth. (in.)	Females Avg. Wt. (lbs.)
1985									
Spring	72	77	1.1	3.8	0.28	20.2	3.05	20.9	3.26
Fall	97	176	1.8	3.8	0.48	21.4	3.20	22.0	3.66
1986									
Spring	56	56	1.0	3.8	0.26	21.2	2.98	20.9	2.95
Fall	206	299	1.5	4.9	0.30	21.4	3.49	23.0	4.26
1987									
Spring	58	48	0.8	4.9	0.17	22.0	3.73	22.2	4.40
Fall	240	239	1.0	4.7	0.21	23.8	5.50	23.8	5.84
1988									
Spring	153	105	0.7	4.5	0.15	24.1	5.63	24.1	5.56
Fall	164	194	1.2	4.6	0.26	25.8	7.16	24.8	6.33
1989									
Spring	207	197	1.0	5.6	0.17	25.0	6.85	26.4	8.28
Fall	142	194	0.5	4.8	0.09	26.5	7.44	25.4	7.12

Lake Trout

A spring and fall creel survey is conducted annually in the vicinity of the dam to collect information on lake trout harvest, size and angler catch rates (Table 15). In 1989, 207 anglers were interviewed in spring and 142 in the fall. Catch rates were 0.17 and 0.09 fish per hour, respectively.

The average weight for lake trout (sexes combined) in the spring was 7.67 pounds and 7.21 pounds in the fall. Figure 3 compares condition factors and average weights of lake trout creeled from fall surveys from 1985 - 1989. Average weight is steadily increasing, while condition factors appear similar for the last 3 years. Figures 4 and 5 compare average weights and condition factors for various 1.0-inch length groups ranging from 19.0 - 3.0 inches. Average weights and condition factors appear to be improving for lake trout 19.0- to 24.0 inches and were basically unchanged for most length groups greater than 24.0 inches.

Examination of lake trout stomachs during the spring creel indicated that cisco were utilized as forage. Of the 197 lake trout inspected, over 20% contained at least one cisco.

Otoliths were removed at random from 19 lake trout during the fall creel survey to determine ages. The ages ranged from 5-14 years with an average age of 10 years (Table 16). Ages were not verified by any other aging method.

Commercial Fishing

Two commercial fishing permits were issued in 1989. Only one change was made on commercial fishing regulations for 1989. Fourchette Bay was added to the Restricted Gear Areas to prevent conflicts with the fishing public. It was anticipated that a new boat ramp and improved access road to the area would result in greater fishing pressure.

Commercial fishermen harvest a total of only 6,289 pounds (round weight) of goldeye in 1989. This is the smallest harvest on record since the commercial harvest of goldeye began in earnest in 1966 (Table 17). Catch rates for commercial harvest of goldeye remained nearly the same in 1989 as in 1988, with a netting efficiency of .006 (Figure 6).

Table 16. Age analysis of 19 lake trout selected randomly from anglers during fall creel survey, 1989.

LENGTH(inches)	SEX	AGE
24.3	Male	5
26.3	Male	8
26.6	Male	11
26.9	Male	9
27.0	Male	10
27.2	Male	11
27.3	Male	9
28.4	Male	8
28.5	Male	7
28.6	Male	13
28.9	Male	10
29.3	Female	10
29.6	Male	10
29.7	Male	12
30.0	Male	14
30.3	Male	9
30.8	Male	11
32.9	Female	12
34.0	Male	10

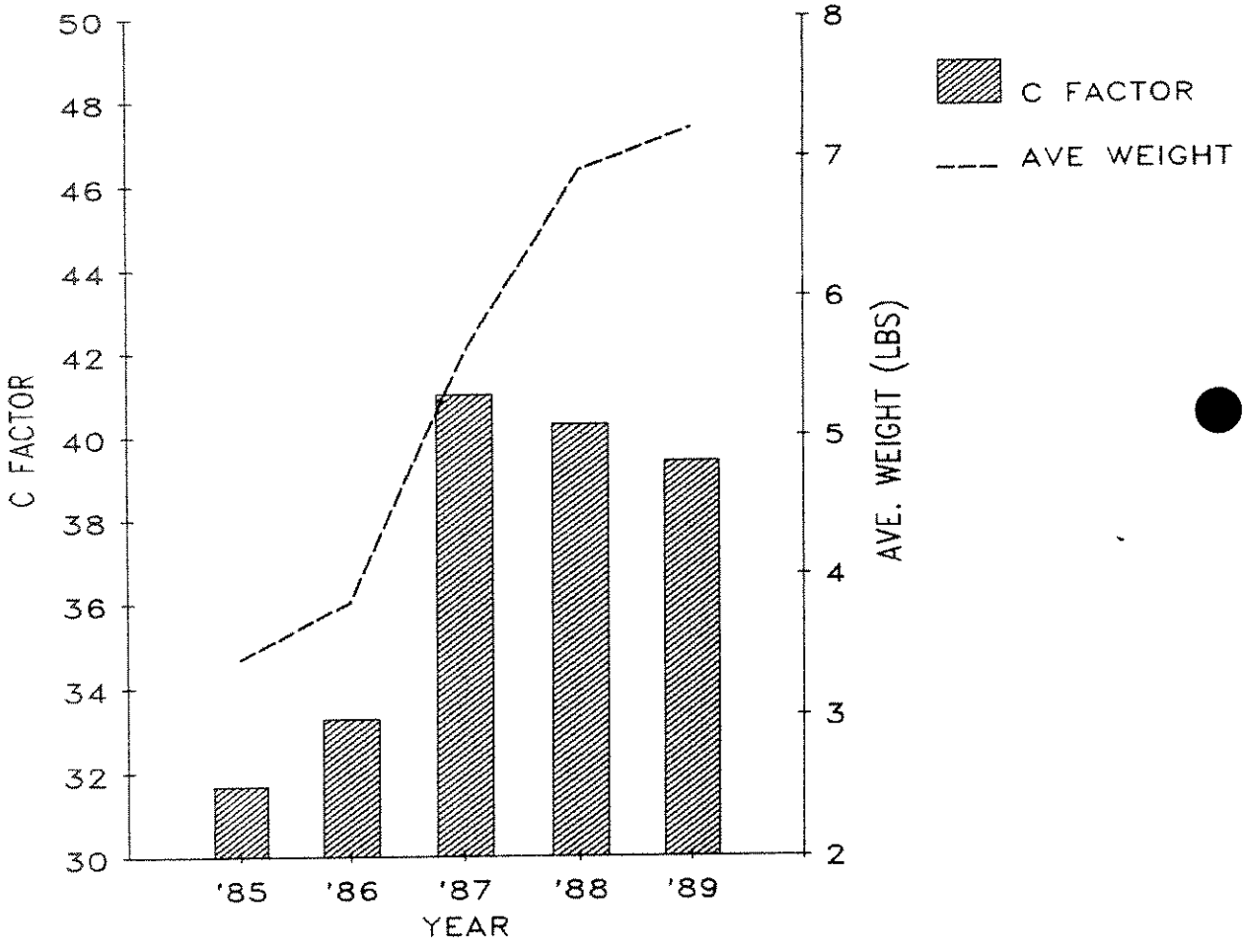

Figure 3. Condition factors and average weights of lake trout from fall creel survey, Fort Peck Reservoir, 1985-1989.

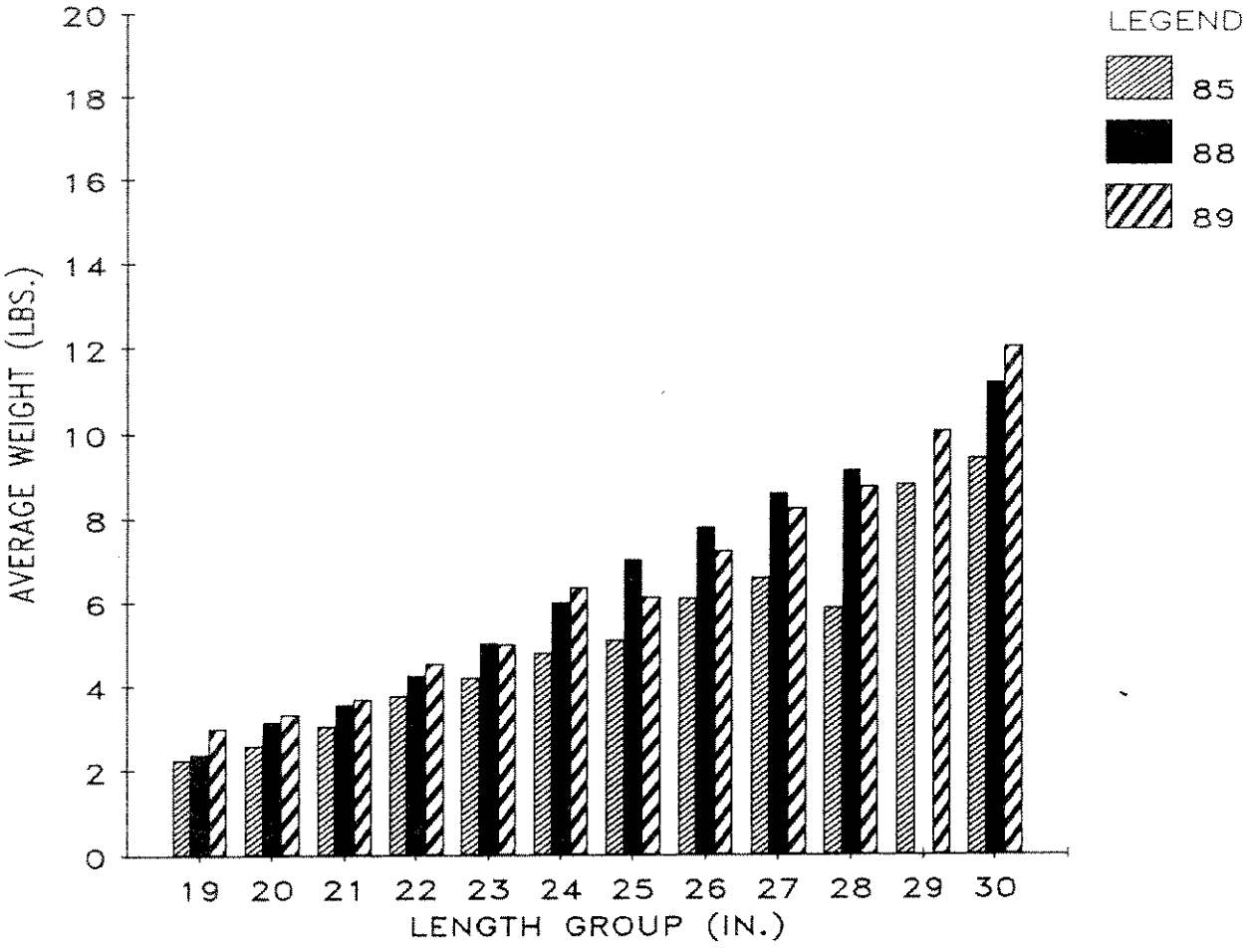

Figure 4. Comparison of average weights from various length groups of lake trout obtained from fall creel surveys, Fort Peck Reservoir, 1985, '88 and '89.

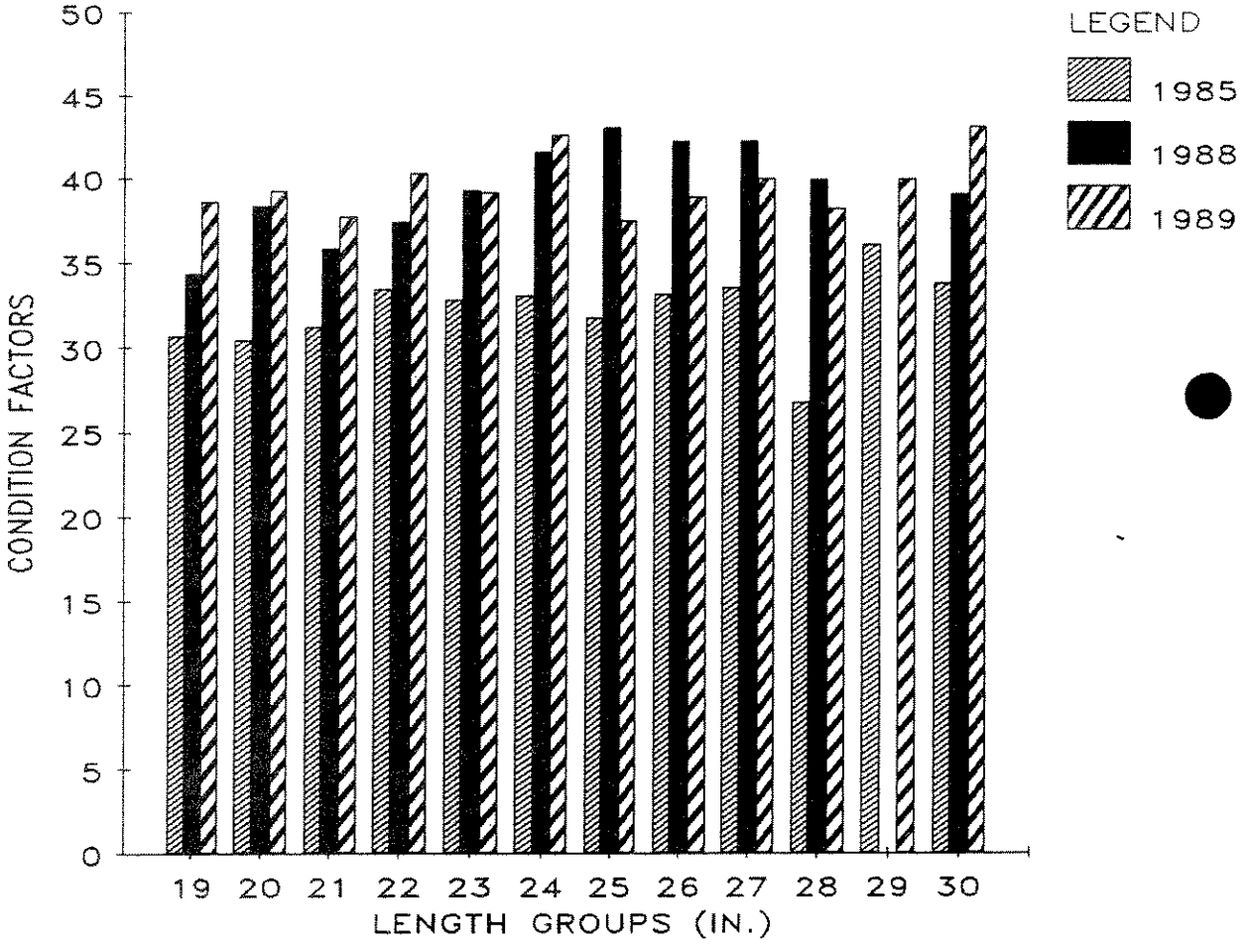

Figure 5. Comparison of condition factors from various length groups of lake trout from fall creel surveys, Fort Peck Reservoir, 1985, '88 & '89.

Table 17. Total pounds (round weight) of commercial species harvested from Fort Peck Reservoir by commercial fishermen, 1957-1989.

Year	Buffalo sp.	River Carpsucker	Carp	Carp & R.[1] Carpsucker	Channel[2] Catfish	Goldeye	Freshwater Drum	Sucker sp.	Total
1957	15,308	7,200	1,500	---	---	---	---	---	24,008
1958	176,091	---	---	25,837	100	17	107	---	202,152
1959	154,770	2,687	13,850	---	462	---	1,875	62	173,706
1960	26,435	11,500	50	---	585	---	---	---	38,570
1961	15,950	950	610	---	790	---	---	---	18,300
1962	130,842	---	---	---	22,215	---	---	---	153,057
1963	263,696	3,440	5,707	---	15,576	49	688	---	289,156
1964	145,706	3,775	1,012	---	7,492	---	1,350	---	159,335
1965	184,003	---	1,400	---	11,666	---	550	---	197,619
1966	266,142	---	---	22,935	16,879	42	2,581	---	308,579
1967	389,083	---	---	35,775	10,066	56,050	4,012	---	494,986
1968	452,230	---	---	100,774	7,749	53,318	5,445	1,625	621,141
1969	323,648	64,718	13,719	---	4,503	199,279	11,759	186	617,812
1970	437,308	49,731	8,944	---	10,619	68,384	19,287	56	594,329
1971	279,831	31,658	1,403	---	13,746	186,310	8,019	1,429	522,396
1972	474,025	40,327	10,992	---	8,060	61,830	9,228	141	604,603
1973	546,657	13,045	3,975	---	2,704	130,061	8,018	---	704,460
1974	376,850	16,719	---	---	1,011	93,825	94	---	488,499
1975	274,091	6,512	---	---	688	129,299	---	---	410,590
1976	402,543	8,456	---	---	---	91,358	---	---	502,357
1977	343,930	8,500	---	---	---	121,868	---	---	474,298
1978	243,166	6,075	---	---	---	105,919	---	---	355,160
1979	224,200	12,862	4,475	---	---	258,780	---	---	500,317
1980	178,777	8,454	5,662	---	---	356,755	509	---	550,157
1981	260,389	6,473	20,788	---	---	244,322	301	---	532,273
1982	123,100	4,357	---	---	---	208,736	---	---	336,193
1983	111,464	1,876	5,060	---	---	403,628	91	---	522,119
1984	64,113	636	---	---	---	362,313	11	---	427,073
1985	---	---	---	---	---	295,120	---	---	295,120
1986	12,115	47	103	---	---	222,163	---	---	234,428
1987	4,526	500	---	---	---	129,990	---	---	135,016
1988	38,342	610	2,276	---	---	36,792	---	---	78,020
1989	---	---	---	---	---	6,289	---	---	6,289
Total	6,939,331	311,108	101,526	185,321	134,911	3,822,497	73,925	3,499	11,572,118

[1]Not differentiated by commerical fishermen when reported.

[2]Not allowed as commerical species after June 30, 1975.

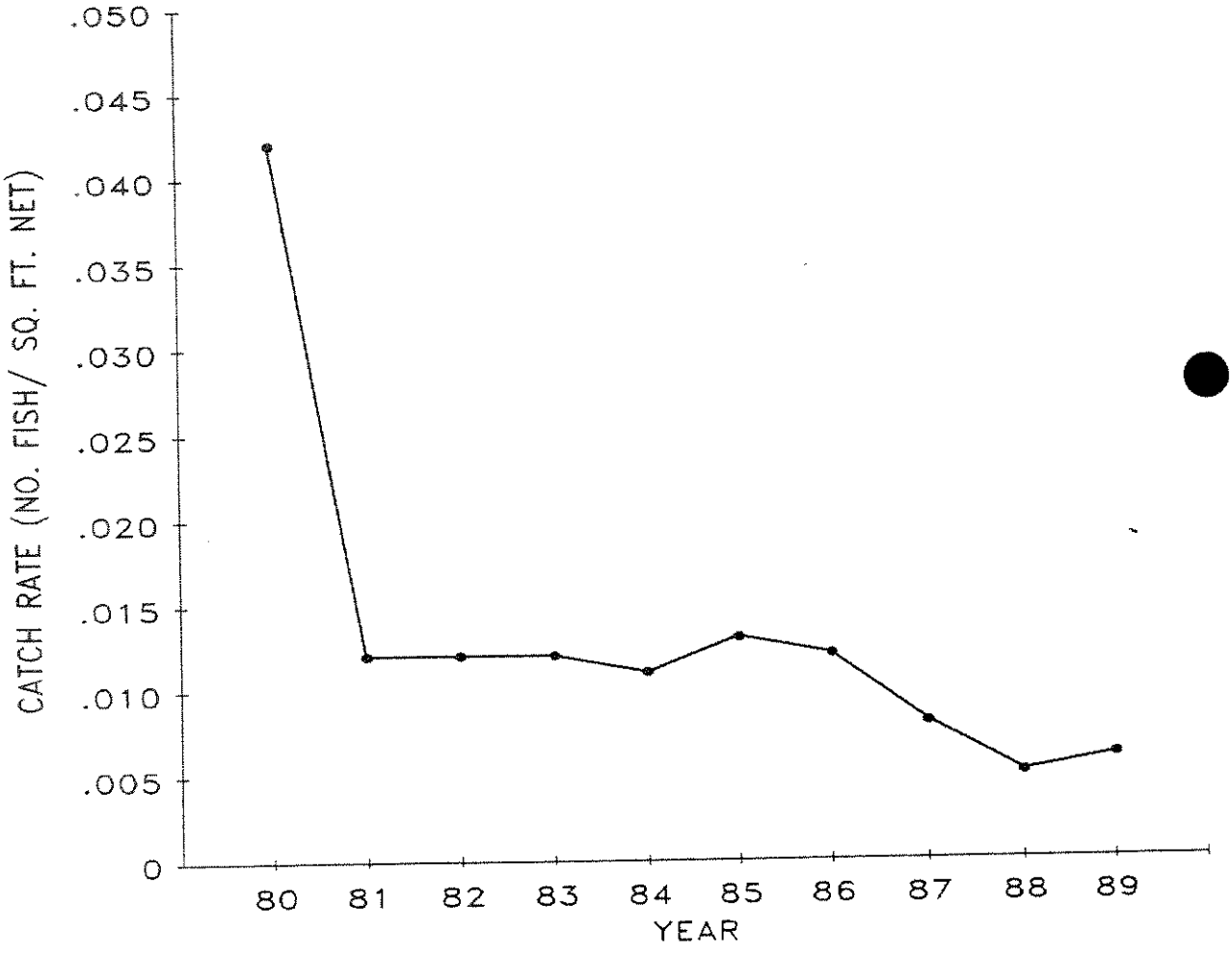

Figure 6. Netting efficiency for commerical gill nets used to catch goldeye in Fort Peck Reservoir, 1980-89.

DISCUSSION AND RECOMMENDATIONS

Cisco appear to be the main forage for walleye, sauger and northern pike, as indicated by examination of stomachs from gill-netted fish. Although contents of stomachs is usually difficult to identify in fish which remain in gill nets overnight, approximately 8% of the game fish stomachs examined contained cisco. Inspection of stomachs from lake trout captured by anglers, showed that cisco were utilized by at least 20% of the fish examined. Excellent condition factors and average weights for most game fish species is attributed to the abundant cisco population. Further evaluation of cisco utilization by game fish will be documented during the 1990 creel survey.

Evaluation of walleye fry versus fingerling plants continues to be inconclusive. In past years, fry plants have shown some benefit to the fishery. In 1989, with one exception, fall beach seining demonstrated that walleye fingerling plants survived better than walleye fry (Table 11). It is recommended that future stocking of walleye should continue, but the ratio of fry to fingerling remains uncertain.

With the apparent natural reproduction of walleye occurring in the upper Missouri Arm, as indicated by fall beach seining, it is recommended that stocking continue to be suspended in this area during 1990 to allow further verification.

A large number of chinook salmon were captured by snag fishermen in late October and November, 1989. Chinook were concentrated near the shaft houses on the east side of the dam in late October and early November, and also congregated in Ft. Peck Marina Bay during late November. Over 90% of the fish captured by snaggers were males, with average weight of approximately 7.35 pounds and length of 25.6 inches. It is believed that the majority of these fish were 3 year-old "jacks" from the 1986 year-class. Over 214,000 4-inch fingerlings were stocked in the Marina area in the spring of 1987. It is assumed that in the fall of 1990, females from the 1986 year-class will make up a much larger percentage of the creel as they reach sexual maturity. With the apparent popularity of this fishery, it is recommended that stocking of salmon fingerlings continue if a disease-free source of eggs can be maintained.

Smallmouth bass reproduction continues to be successful, as indicated by a catch rate of 1.7 fish per haul during fall beach seining. This is the strongest year-class observed since this species was introduced, and no stocking is recommended at this time.

Fall beach seining shows that natural reproduction of northern pike and yellow perch populations is very poor. These populations will continue to decline unless suitable water levels are provided to inundate shoreline vegetation. A massive stocking effort would be the only alternative to maintain this fishery, but would be costly and far less successful than natural reproduction.

Water level recommendations to improve and maintain the reservoir fishery continue to be submitted annually to the Corps of Engineers through the Missouri River Natural Resources Committee. Recommendations are coordinated with other Missouri River states to provide a unified plan for regulating main stem reservoir pool levels and discharges.

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