

Region 6

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATION
PROJECT NO.: F-78-R-1 STUDY TITLE: SURVEY AND INVENTORY OF WARMWATER LAKES
JOB NO.: IV-C JOB TITLE: FORT PECK RESERVOIR STUDY
PROJECT PERIOD: JULY 1, 1994 THROUGH JUNE 30, 1995

ABSTRACT

Nearly 1,900 walleye spawners were taken by spring trap netting in the upper Big Dry Arm. Approximately 49 million walleye eggs were obtained from 386 females, which resulted in the stocking of 23.4 million fry and over 2.1 million fingerling into Fort Peck Reservoir. Condition factors and average weights of most walleye length groups appeared good. The average weight of female walleye spawners was 7.4 pounds, with male spawners averaging 4.2 pounds. Walleyes captured during summer gill net sampling also appeared to be in good condition. The average weight for both sexes of walleye combined was 2.10 pounds. Catch rates for gill-netted walleye reservoir-wide were down from 1993. Fall beach seining showed an increase in the production of forage fish. Greater production is attributed to increasing reservoir water elevations during the summer of 1993 and spring of 1994. Fall cisco gill netting revealed that a record year of natural reproduction occurred which could be the result of good ice cover during the winter of 1993, warm spring temperatures in the spring of 1994 causing a huge plankton bloom, or increasing water levels. Lake trout creel surveys during spring and fall indicated that catch rates remained stable and condition of angler-caught fish was good. Average weight of lake trout during spring and fall creel was 9.81 and 8.96 pounds, respectively. Approximately 100,000 3-7 inch pen reared chinook salmon were released into Fort Peck Reservoir. An attempt to spawn chinook salmon was made in October using a portable fish ladder. Due to the poor showing of spawners, no eggs were taken.

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- x 1-, 1 1/4-, 1 1/2-, and 2-inch square mesh were fished during late summer to monitor condition, distribution and relative abundance of game fish species. Experimental gill nets were also used in the fall to acquire information on cisco spawners. Beach seining, to determine abundance and reproductive success of game and forage fish and to determine stocking success of walleye, 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 water's surface to sample young-of-year (YOY) cisco.

RESULTS AND DISCUSSION

Trapping

Spring spawning fish populations were sampled in the upper Big Dry Arm with frame traps from April 12 - 25, 1994. Walleye, northern pike and forage fish populations have been sampled using this technique since 1979.

An effort of 168 trap-days resulted in the capture of 1,882 walleye, of which 1,361 were weighed and measured. The catch rate for 1994 was 11.2 per trap-day, which was similar to last year's catch rate of 11.3 (Table 1).

The ratio of males to females was approximately 2:1 which was similar to years past. The average weight for female walleye spawners was 7.43 pounds and 4.15 for males. The average weight for both sexes of walleye is the largest observed since trapping began in 1979 (Table 2).

Weight composition of trap-netted walleye is shown in Figure 1. The percent of walleye weighing more than three, four and five pounds has increased from 1994. This is probably due to the increase in forage base on Fort Peck Reservoir.

Condition factors and average weights for 1-inch length groups of walleye from 14-25 inches is shown in Figures 2 and 3, respectively. Since 1990, condition factors and average weight for these length groups appears to have remained the same, or improved slightly.

Scale and spine samples were taken from 221 trap-netted walleye and were aged through the use of a microscope and microfiche machine (Table 3). Age classes from 1-15 were represented. The average weights of walleye in all age classes in 1994 was higher than those of 1990 and lower than those of 1993, as shown in Figure 4. The most abundant age classes were three and six year olds, each comprised 16% of all fish caught and averaged 12.1 and 20.4 inches in length. However, four and five year olds were also abundant comprising 11% and 14% of the total fish sampled.

The catch rate for northern pike in frame traps in the upper Big Dry Arm was 1.0 fish per trap-day. This was the worst catch since 1988 (Table 1). However, a substantial number of adult northern pike must have been present because a record number of young-of-year were sampled during shoreline seining. Of the 160 northern pike weighed and measured, lengths ranged from 12.8 - 40.1 inches, and weights from .70 - 16.10 pounds. The average length of northerns was 30.8 inches and average weight was 7.89 pounds.

Fish were also sampled with frame traps in the lower Missouri Arm from May 2-May 26, 1994 (Table 3). The walleye catch rate increased from 0.3 fish per trap-day in 1992 to 1.5 fish in 1994. The Northern pike catch rate in 1994 was similar to the catch rate in 1992 with 1.2 fish caught per trap-day. Northern pike lengths ranged from 10.2-42.0 inches and weights from .20-18.5 pounds. The average weight was 8.09 pounds and length was 30.6 inches. The number of yellow perch sampled remained extremely low as in past surveys.

Table 1. Summary of the walleye and northern pike caught during spring trap-netting in the upper Big Dry Arm of Fort Peck Reservoir, 1974-94.

Date	Trap-days	No. Walleye	Walleye/Trap-day	No. No. Pike	No. 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
1990 (4/05-5/04)	292	1,863	6.4	513	1.8
1991 (4/09-5/10)	375	793	2.1	491	1.3
1992 (4/07-4/29)	278	1,585	5.7	684	2.5
1993 (4/15-4/30)	172	1,945	11.3	201	1.2
1994 (4/12-4/26)	168	1,882	11.2	160	1.0

Table 2. Summary of average weights and sex ratios for walleye trap-netted in the upper Big Dry, 1979-94.

Year	Average Weight Males	Sample Size	Average Weight Females	Sample Size	Sex Ratio ¹ Male:Female
1994	4.15	1024	7.43	319	2:1
1993	2.50	446	6.47	351	1:1
1992	2.32	229	6.13	522	1:1
1991	1.82	234	5.31	106	2:1
1990	2.08	362	5.77	142	2:1
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

¹Sample size larger than fish sample used to determine average weights and lengths.

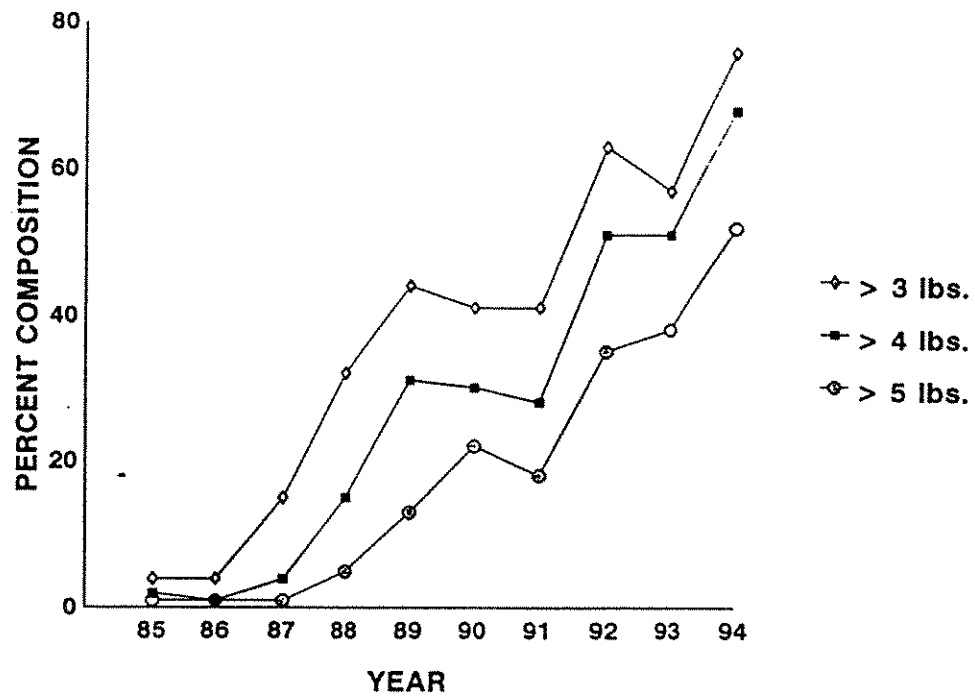


Figure 1. An illustration of the change in size of walleye captured during spring trapping in the upper Big Dry Arm of Fort Peck Reservoir, 1985-94.

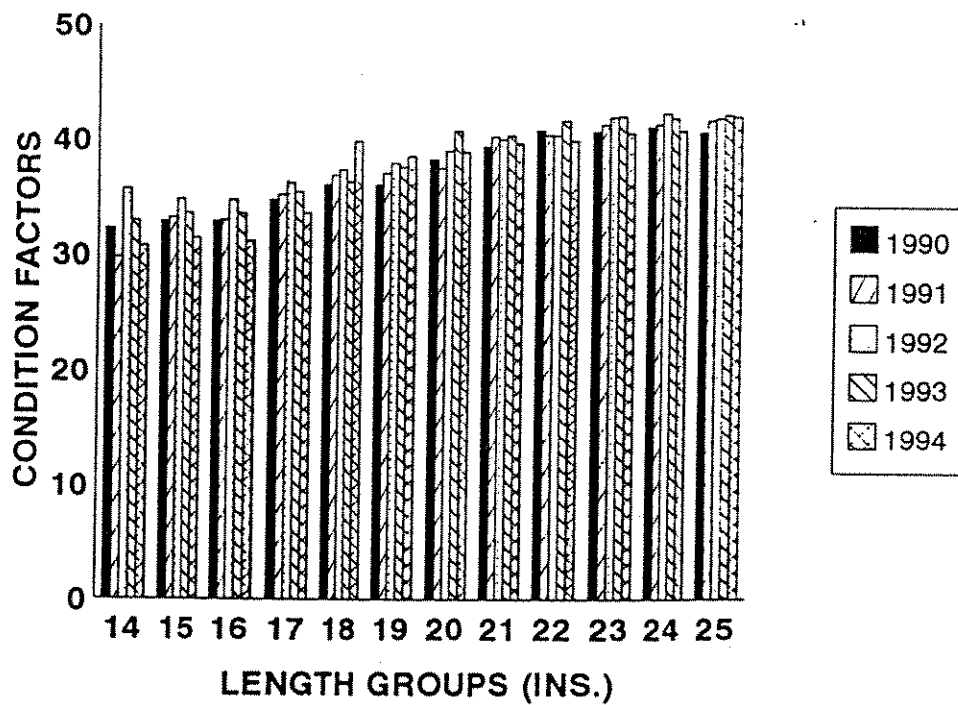


Figure 2. Average condition factors for various 1-inch length groups of walleye trap netted in the upper Big Dry Arm of Fort Peck Reservoir, 1990-94.

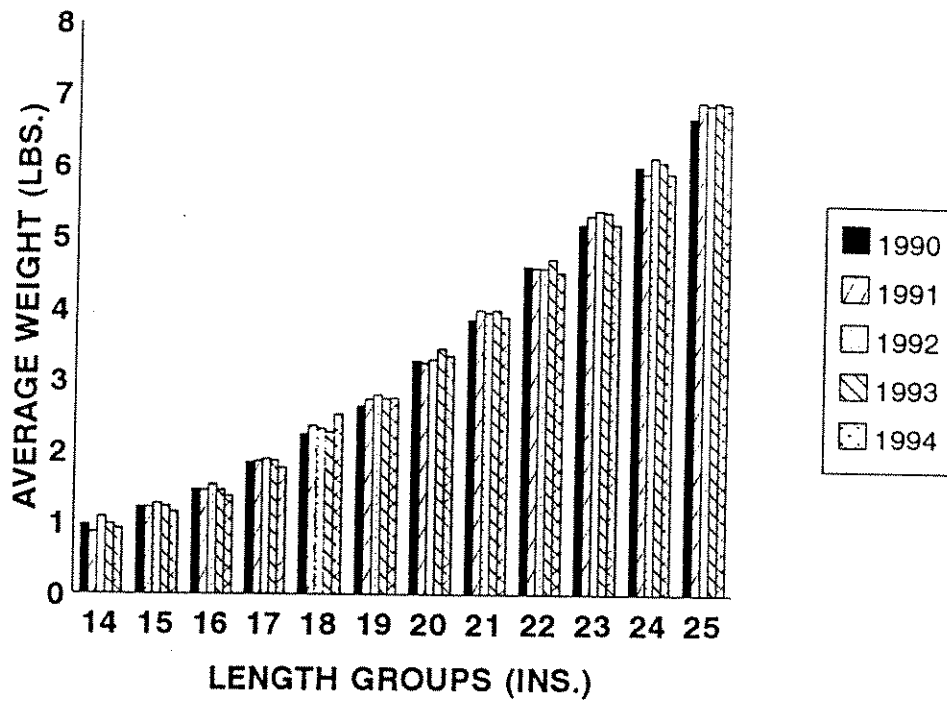


Figure 3. Average weights for various 1-inch length groups of walleye trap netted in the upper Big Dry Arm, Fort Peck Reservoir, 1990-94.

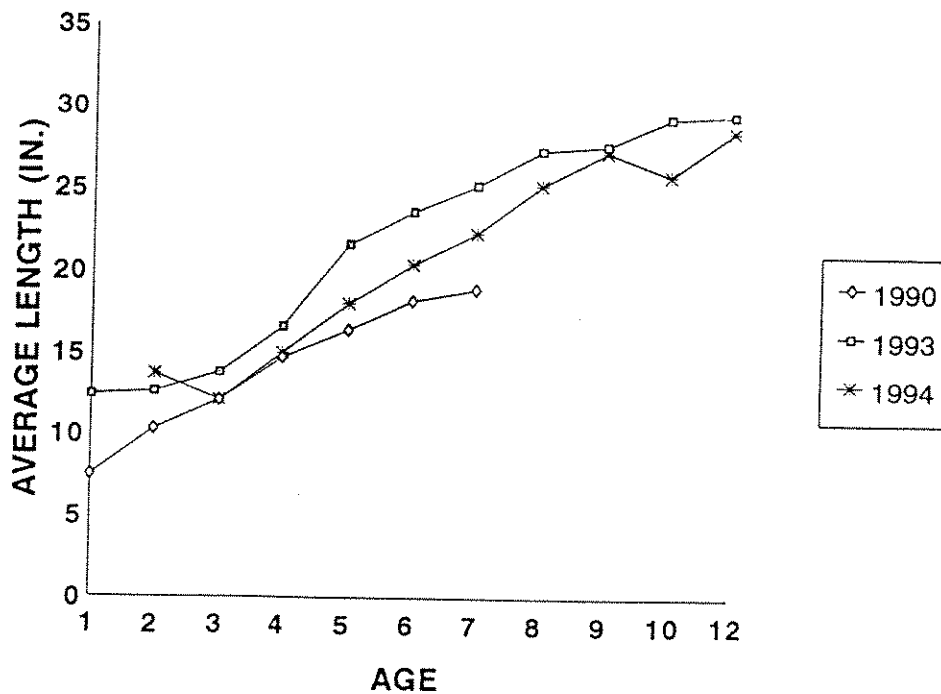


Figure 4. Average lengths for aged walleye trap-netted in the Upper Big Dry Arm of Fort Peck Reservoir, 1990 and 1994.

Table 3. Age analysis and growth increment of 221 walleye taken from Fort Peck Reservoir during 1994 spring trap-netting operations. (age based on scale and spine samples)

Age	2	3	4	5	6	7	8	9
Ave. L. (in.)	13.7	12.1	15.0	18.0	20.4	22.3	25.2	27.2
Lower L. Range	13.7	9.1	11.0	14.1	14.7	16.0	21.5	22.0
Upper L. Range	13.7	16.3	20.6	25.1	25.7	26.9	29.5	31.3
Sample Size	1	36	25	30	35	21	20	25
Growth Increment	-1.6	2.9	3.0	2.4	1.9	2.9	2.0	

Table 10. Continued

Age	10	11	12	13	14	15	16	17	18
Ave. L. (in.)	25.8	28.5	28.0	23.6	30.1	31.0	-----	-----	-----
Lower L. Range	21.6	26.1	28.0	23.6	28.4	31.0	-----	-----	-----
Upper L. Range	29.4	30.2	28.0	23.6	31.6	31.0	-----	-----	-----
Sample Size	14	6	1	1	5	1	-----	-----	-----
Growth Increment	-1.4	2.7	-0.5	-4.4	6.5	0.9	-----	-----	-----

Gill Netting

Gill nets were set at 26 different locations throughout the reservoir from July 20-August 18, 1994. Information on the distribution, composition and relative abundance of sport and forage fish populations was provided by 104 net sets (Table 4).

The largest concentration of walleye was located in the Big Dry Arm, which is consistent with previous annual sampling (Table 5). The overall catch rate for walleye reservoir-wide decreased from 2.7 fish per net-day in 1993, to 1.4 fish per net-day in 1994. The catch rates for walleye in different sampling areas decreased or remained the same in various areas of the reservoir.

The average size of gill-netted walleye has increased over 1993 walleye samples in all areas of the Reservoir with the exception of the Upper Missouri Arm which decreased. The percentage of fish gill-netted that were greater than 1 pound, increased in the Middle Reservoir and Big Dry Arm, and decreased in the lower and Upper Reservoir (Table 5). Figures 5 and 6 show that weights and condition factors remain similar compared to previous years.

Catch rates for gill-netted northern pike and yellow perch have increased from 0.5 and 1.2 in 1993, to 1.5 and 3.2 in 1994 (Table 4). These increases can be attributed to the increase in natural reproduction of these two species. Young-of-the-year comprised 33% of the northern pike collected. Sauger decreased from 1.2 per net in 1993 to .83 per net in 1994. Catch rates for goldeye and cisco have both slightly decreased from the catch rates in 1993. Gill-net sampling continues to show cisco to be well dispersed throughout the reservoir. Figure 7 shows the annual catch rates for goldeye taken with experimental gill nets since 1981.

Beach Seining

Seining was used to determine reproductive success of sport and forage fish throughout the reservoir from August 15-September 12, 1994. Seine hauls at 173 different reservoir locations captured 49,629 fish (Table 6). Total numbers and the overall catch rate for 1994 was much greater than 1993, when only 15,663 fish were sampled. The reservoir-wide catch rate increased from 89.4 fish per seine haul, to 286.9 fish per seine haul. The apparent increase in production resulted from a rising reservoir pool which inundated vegetation providing spawning, rearing habitat and cover for most fish species.

Northern pike, unlike the past surveys, was the most common game fish captured by seining (Table 7). The most northern pike collected per seine haul in previous years was 0.5 per haul in 1986. In 1994, 4.3 northern pike were collected per seine haul, which may indicate successful natural reproduction. Smallmouth bass were the second most abundant game fish collected in seine hauls during the 1994 seining season. The number of bass collected per seine haul increased from 0.3 in 1993 to 0.6 in 1994. The highest catch rate for YOY smallmouth bass occurred in the Middle and Upper Missouri Arm (Table 6).

Table 4. Fish captured by 125-foot experimental gill nets in Fort Peck Reservoir, 1994.

Species ¹	UBD ²			LBD ³			LMA ⁴			MMA ⁵			UMA ⁶			Total	
	No. Fish	No. Net	No./Day	No. Fish	No. Net	No./Day	No. Fish	No. Net	No./Day	No. Fish	No. Net	No./Day	No. Fish	No. Net	No./Day	No. Fish	No. Net
WE	37	2.6	1.1	36	1.1	1.3	25	1.3	1.6	38	1.6	1.6	10	0.8	0.8	146	1.4
NP	13	0.9	1.8	59	1.8	1.2	24	1.2	1.5	36	1.5	1.5	24	2.0	2.0	156	1.5
SG	0	---	0.1	4	0.1	0.4	8	0.4	0.9	22	0.9	0.9	47	3.9	3.9	81	0.8
YP	42	3.0	3.3	107	3.3	0.6	12	0.6	2.0	49	2.0	2.0	118	9.8	9.8	328	3.2
GE	190	13.6	8.3	166	8.3	8.1	162	8.1	4.5	107	4.5	4.5	189	15.8	15.8	814	7.8
CC	15	1.1	0.2	5	0.2	---	0	---	0.1	2	0.1	0.1	98	8.1	8.1	120	1.2
SS	0	---	---	0	---	---	0	---	---	0	---	---	0	---	---	0	---
CI	35	2.5	1.1	34	1.1	0.2	4	0.2	1.3	31	1.3	1.3	16	1.3	1.3	120	1.2
CH	0	---	---	0	---	---	0	---	---	0	---	---	0	---	---	0	---
ST	0	---	0.3	9	0.3	0.3	6	0.3	0.2	4	0.2	0.2	0	---	---	19	0.2
Totals	332	23.7	420	16.2	241	12.1	289	12.1	502	41.7	1,784	17.3					
No. Net Days	14		32		20		246		12		104						

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

²Upper Big Dry: Nelson Cr., Short Cr., Lone Tree Cr., McGuire Cr.
³Lower Big Dry: Box Cr., S. Fork Rock Cr., N. Fork Rock Cr., Box Elder Cr., Sandy Arroyo, Spring Cr.
⁴Lower Missouri Arm: Spillway Bay, Bear Cr., N. Fork Duck Cr., S. Fork Duck Cr., Main Duck
⁵Mid Missouri Arm: Pines, Gilbert Cr., Cattle Cr., Hell Cr., Sutherland, Snow Cr.
⁶Upper Missouri Arm: Timber Cr., Devil's Cr.

Table 5. 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 No./ Sets
Big Dry Arm	1994	73	15.8	4.6-29.9	2.33	0.05-10.5	40.0	46
	1993	162	14.7	5.0-31.2	1.79	0.04-11.8	34.6	44
	1992	144	14.5	5.6-29.8	1.58	0.03-9.80	40.0	31
	1989	219	13.6	6.4-26.5	0.94	0.10-7.03	26.0	30
	1988	86	13.3	6.6-23.4	0.88	0.06-4.26	19.8	24
	1987	106	14.1	6.5-21.4	1.04	0.12-3.33	34.7	33
	1986	109	13.4	7.3-24.6	0.86	0.07-5.40	27.8	24
								4.5
Lower Reservoir	1994	25	16.3	8.7-27.8	2.60	0.30-8.90	36.2	20
	1993	45	16.7	6.9-28.5	2.53	0.10-9.80	50.6	20
	1992	70	15.9	7.2-27.0	2.02	0.10-8.30	46.4	20
	1989	93	15.5	7.8-24.1	1.61	0.13-5.60	55.0	15
	1988	57	15.1	8.1-23.9	1.46	0.14-5.30	59.6	18
	1987	48	16.3	10.8-21.5	1.61	0.32-4.08	66.7	15
	1986	---	---	---	---	---	---	---
								1.3
Mid Reservoir	1994	38	16.6	7.8-29.7	2.84	0.10-11.4	42.1	24
	1993	50	15.3	6.8-28.8	2.17	0.10-10.7	38.4	24
	1992	81	16.9	7.9-29.9	2.66	0.15-11.0	50.0	24
	1989	80	16.5	10.0-24.2	1.85	0.32-5.90	58.8	18
	1988	49	15.8	8.2-22.8	1.67	0.15-4.70	57.1	21
	1987	88	14.0	8.0-22.0	0.98	0.14-4.35	30.7	21
	1986	56	13.4	8.4-22.3	0.85	0.20-3.00	30.0	21
								2.7
Upper Reservoir	1994	10	11.9	7.9-15.2	0.60	0.10-1.20	22.3	12
	1993	6	16.7	10.6-25.6	2.34	0.30-6.50	33.2	8
	1992	15	16.3	7.8-29.3	2.54	0.10-10.0	35.7	8
	1989	11	19.4	9.9-25.8	3.36	0.23-6.20	63.6	6
	1988	15	11.8	7.6-19.3	0.57	0.19-2.57	13.3	12
	1987	32	12.7	8.8-20.4	0.72	0.14-2.96	18.8	12
	1986	3	11.5	9.2-14.4	0.50	0.20-0.97	0.0	6
								0.5

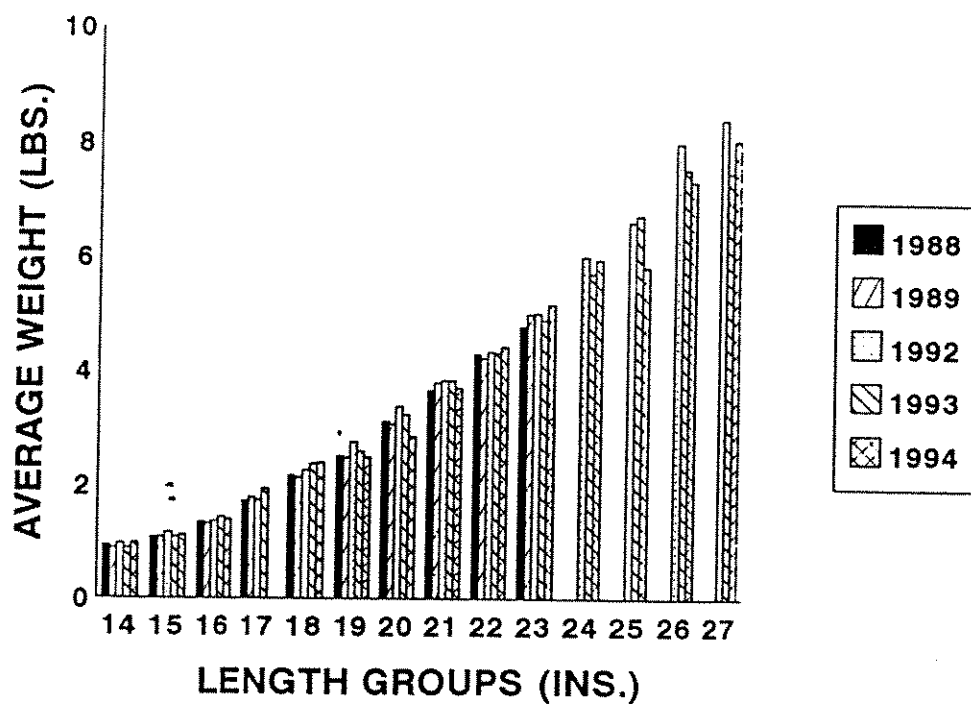


Figure 5. Average weight of various 1-inch length groups of walleye captured with experimental gill nets in Fort Peck Reservoir, 1988-94.

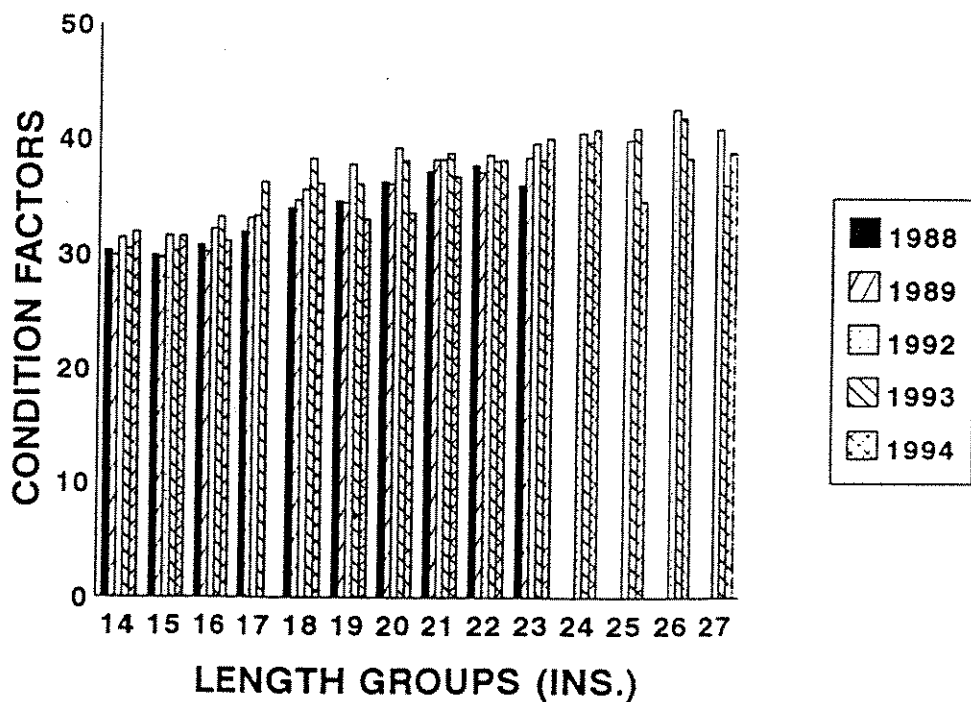


Figure 6. Average condition factors for various 1-inch length groups of walleye captured with experimental gill nets in Fort Peck Reservoir, 1988-94.

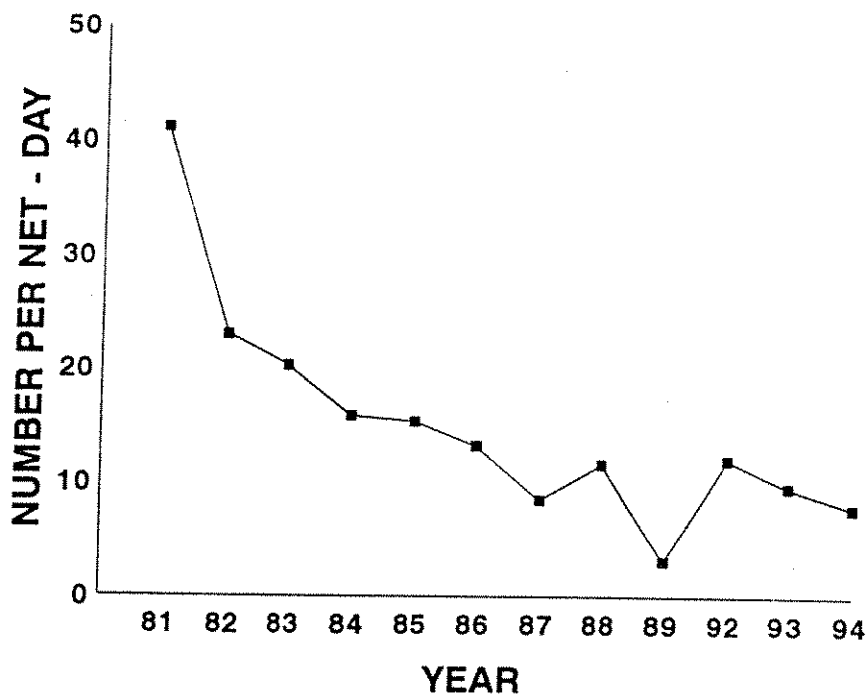


Figure 7. Annual catch rate of goldeye captured by experimental gill nets, Fort Peck Reservoir, 1981-94.

The catch rate for walleye seined reservoir-wide in 1994 was <0.1 fish per haul. This was less than 1993, which had a rate of 0.2 fish per haul (Table 7). The largest concentration of YOY walleye occurred in the Upper Missouri Arm, where 0.2 YOY were captured per haul. All other areas of the reservoir yielded approximately 0.1, or less fish per seine haul. Table 8 shows a summary of seining results which are used to evaluate stocking of walleye fry and fingerling. A total of 23.4 million walleye fry and 2.1 million fingerling were stocked in 1994. The average catch rate for regions where walleye fry were stocked was .06 fish per seine haul and locations where fingerling were stocked was .09.

Sauger production was the same as in 1993, with <0.1 fish captured per haul.

Table 6. Species and number of forage minnows and young-of-year fish captured by seining in Fort Peck Reservoir, August 15 - September 12, 1994.

Species ¹	Upper Big Dry			Lower Big Dry			Lower Missouri			Mid-Missouri			Upper Missouri			Totals		
	No.	No./	Haul	No.	No./	Haul	No.	No./	Haul	No.	No./	Haul	No.	No./	Haul	No.	No.	No.
	Fish			Fish			Fish			Fish			Fish			Fish	Fish	Haul
WE	-----	-----	-----	-----	-----	-----	5	0.1	0.1	5	0.1	0.1	4	0.2	0.2	14	<0.1	<0.1
NP	202	4.8	200	200	5.9	5.9	177	4.3	4.3	142	4.0	4.0	20	1.0	1.0	741	4.3	4.3
SG	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	14	0.6	0.6	14	<0.1	<0.1
YP	1,657	39.5	1,270	1,270	37.4	37.4	593	14.5	14.5	3,814	109.0	109.0	954	45.4	45.4	8,288	47.9	47.9
GE	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	18	0.9	0.9	18	0.1	0.1
WS	1	<0.1	3	3	<0.1	<0.1	40	1.0	1.0	26	0.7	0.7	20	1.0	1.0	90	0.5	0.5
RC	2	<0.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6	0.3	0.3	8	<0.1	<0.1
Bsp	5	0.1	-----	-----	-----	-----	57	1.4	1.4	16	0.5	0.5	83	4.0	4.0	161	0.9	0.9
LC	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	<0.1	<0.1	427	20.3	20.3	428	2.5	2.5
CP	90	2.1	2	2	<0.1	<0.1	54	1.3	1.3	107	3.1	3.1	82	3.9	3.9	335	1.9	1.9
SR	-----	-----	-----	-----	-----	-----	1	<0.1	<0.1	2	<0.1	<0.1	-----	-----	-----	3	<0.1	<0.1
SB	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BA	2	<0.1	3	3	<0.1	<0.1	10	0.2	0.2	41	1.2	1.2	50	2.4	2.4	106	0.6	0.6
SM	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	<0.1	<0.1	11	0.5	0.5	13	<0.1	<0.1
CR	36	0.8	35	35	1.0	1.0	792	19.3	19.3	2,491	71.2	71.2	7,481	356.2	356.2	10,835	62.6	62.6
FC	-----	-----	-----	-----	-----	-----	1	<0.1	<0.1	-----	-----	-----	10	0.5	0.5	11	<0.1	<0.1
BU	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	4	0.2	0.2	4	<0.1	<0.1
FM	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ES	471	11.2	1,297	1,297	38.1	38.1	1,772	43.2	43.2	2,463	70.4	70.4	2,363	112.5	112.5	8,366	48.4	48.4
ST	329	7.8	7,393	7,393	217.4	217.4	3,698	90.2	90.2	7,681	219.5	219.5	652	31.0	31.0	19,753	114.2	114.2
SSH	316	7.5	-----	-----	-----	-----	-----	-----	-----	5	0.1	0.1	100	4.8	4.8	421	2.4	2.4
Totals	3,111	74.1	10,203	10,203	300.1	300.1	7,201	175.6	175.6	16,796	479.9	479.9	12,318	586.6	586.6	49,629	286.9	286.9
No. Hauls	42		34	34			41			35			21			173		
WE - walleye			RC - river carpsucker				BU - burbot						ES - emerald shiner					
NP - northern pike			Bsp - buffalo				BA - smallmouth bass					SG - sauger						
YP - yellow perch			GE - goldeye				WS - white sucker					LC - lake chub						
ST - spottail shiner			SR - shorthead redhorse				SB - brook stickleback					CR - crappie						
FC - flathead chub			SM - plains/silvery minnow				FM - fathead minnow					CP - carp						

Table 7. A summary of the total catch and catch rate for selected sport and forage fish taken by seining in Fort Peck Reservoir, 1983-94.

		Species ¹						
		WE	NP	SG	BA	YP	GE	WSU
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--21							
	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
1990	No. Hauls--165							
	No. Sampled	59	1	34	163	308	73	85
	No./Haul	0.4	<0.1	0.2	1.0	1.9	0.4	0.5
1991	No. Hauls--149							
	No. Sampled	0	19	10	170	1,630	13	259
	No./Haul	0.1	0.1	0.1	1.1	10.9	0.1	1.7
1992	No. Hauls--133							
	No. Sampled	18	7	22	207	1,324	1	45
	No./Haul	0.1	<0.1	0.2	1.6	10.0	<0.1	0.3
1993	No. Hauls--176							
	No. Sampled	32	12	2	45	225	37	56
	No./Haul	0.2	0.1	<0.1	0.3	1.3	0.2	0.3
1994	No. Hauls--176							
	No. Sampled	14	741	14	106	8,288	18	90
	No./Haul	<0.1	4.3	<0.1	0.6	47.9	0.1	0.5

Table 7. Continued.

		Species ¹					
		BUFF	CARP	FWD	B/WC	ES	ST
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
1990	No. Hauls--165						
	No. Sampled	4	87	202	120	1,413	3,624
	No./Haul	<0.1	0.5	1.2	0.7	8.6	22.0
1991	No. Hauls--149						
	No. Sampled	101	214	112	616	5,762	5,849
	No./Haul	0.7	1.4	0.8	4.1	38.7	39.2
1992	No. Hauls--133						
	No. Samples	-----	8	26	57	3,974	2,849
	No./Haul	-----	<0.1	0.2	0.4	29.9	21.4
1993	No. Hauls--176						
	No. Samples	161	85	-----	1,331	2,960	10,679
	No./Haul	0.9	0.5	-----	7.6	16.8	60.7
1994	No. Hauls--173						
	No. Samples	161	335	19	10,835	8,366	19,753
	No./Haul	0.9	1.9	0.1	62.6	48.4	114.2

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

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

Table 8. Summary of walleye stocking and young-of-year abundance determined by beach seining in Fort Peck Reservoir, 1994.

Area	Fingerling	Fry	Number Seine Hauls	Number YOY WE Caught	No. WE/Haul
Bear Creek	377,992	-----	6	2	0.3
Big Dry Creek	-----	2.8 mil	6	0	0
Box Creek	237,160	-----	6	0	0
Box Elder Creek	-----	1.5 mil	6	0	0
Bug Creek	-----	1.5 mil	6	0	0
Cattle/Crooked Creek	-----	2.6 mil	5	0	0
Duck Creek	113,878	2.5 mil	18	1	.06
Gilbert Creek	80,000	-----	6	0	0
Hell Creek	147,791	-----	6	0	0
Lost Creek	-----	0.9 mil	6	0	0
McGuire Creek	204,929	-----	6	0	0
Nelson Creek	-----	4.2 mil	6	0	0
Rock Creek	370,666	-----	10	0	0
Pines	82,954	2.6 mil	6	1	0.2
Sandy Arroyo	273,160	-----	6	0	0
Snow Creek	109,800	-----	6	0	0
Spillway Bay	-----	3.4 mil	6	2	0.3
Spring Creek	-----	1.5 mil	6	0	0
Sutherland Creek	87,840	-----	6	4	0.7
Fourchette Bay	-----	-----	6	1	0.2
Lone Tree Creek	-----	-----	6	0	0
Short Creek	-----	-----	6	0	0
Timber Creek	-----	-----	6	2	0.3
Totals	2,086,170	23.4 mil			

Catch rate for areas where fry were stocked = 0.06

Catch rates for areas where fingerling were stocked = 0.09

Beach seining to evaluate production of key forage fish species indicated a significant increase from 1993 (Tables 6 and 7). The spottail shiner catch rate increased significantly, with 114.2 fish collected per haul. This was the most fish collected since 1993. Crappie showed a large increase, with 62.6 collected per haul, which also was the most collected since 1993. Yellow perch and emerald shiner production also increased with 47.9 and 48.4 fish collected per haul in 1994, compared to 1.3 and 16.8 in 1993. Production of sand shiners and buffalo species apparently increased also.

Lake Trout

Creel surveys at boat ramps near Fort Peck Dam were conducted in the spring and fall, 1994. During the spring creel from May 8-May 31, 299 fishermen were interviewed. The angler catch rate was 0.05 fish per hour, which was slightly lower than the spring creel in 1993 and 1992 (Table 9). Fall creel was conducted from October 18-November 7, with 81 anglers interviewed. The catch rate was the same as 1992, with 0.20 lake trout captured per hour.

During the spring creel, male lake trout averaged 29.6 inches and 10.4 pounds, while females averaged 28.5 inches and 9.24 pounds. The average length and weight for lake trout, sexes combined, was 29.0 inches and 9.81 pounds. This data indicates a substantial increase in the average size and weight of lake trout caught since 1989 (Table 9).

The average length and weight for lake trout during fall creel, sexes combined, was 28.0 inches and 8.96 pounds. Males averaged 27.7 inches and 8.47 pounds, while females averaged 28.4 inches and 9.48 pounds. A summary of condition factors and average weights sampled during the fall creels from 1985-93 is shown in Figure 8. The average condition of lake trout over this time period appears to be relatively stable. This also appears to be the case for various 1-inch length groups of lake trout sampled over the last four years (Figures 9 and 10).

During the spring and fall lake trout creel surveys, stomach contents of lake trout were examined to determine utilization of cisco. At the spring creel, approximately 53.0% of the angler-caught lake trout contained cisco. During the fall creel only .002% of the lakers contained cisco. A reduction in the number of cisco observed in lake trout stomachs is typical during the fall creel due to spawning.

During spring and fall creel surveys, otoliths from lake trout are extracted for aging. Scales are not used to age larger lake trout because annuli become difficult to distinguish. A total of 73 lake trout were aged and ranged from 6 to 29 years old (Table 10). Seven and eight year olds were the dominant age classes caught, with 12 collected for each year class. The average lengths of Fort Peck lake trout for each age class appear to be good. Lake trout sampled from six lakes in Canada were aged, and their average lengths were well below those of Fort Peck Reservoir (Scott and Crossman 1973).

Due to rising water levels which increased lake trout spawning habitat no eggs were taken artificially during 1994. Man power was also redirected to the Chinook salmon egg taking project.

Table 9. A summary of lake trout creel census of boat fishermen and size data collected near the dam, Fort Peck Reservoir, 1985-94 (spring creel: April-May and fall creel: October-November).

	No. Anglers Creeled	No. LT Caught	LT Per Trip	Avg. No.Hrs. Fished	Catch Rate/ Hour	Males		Females	
						Avg. Lgth. (in.)	Avg. Wt. (lbs.)	Avg. Lgth. (in.)	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
1990									
Spring	451	356	0.8	5.4	0.15	26.6	8.06	27.2	9.07
Fall	551	201	0.4	3.8	0.10	26.5	7.52	27.6	8.56
1991									
Spring	550	267	0.5	6.1	0.07	27.0	8.47	26.4	8.21
Fall	215	83	0.4	3.8	0.10	26.7	7.97	27.4	8.60
1992									
Spring	437	150	0.3	4.8	0.07	26.2	7.58	26.7	7.85
Fall	129	88	0.7	3.6	0.19	27.0	7.87	26.9	7.59
1993									
Spring	380	147	0.4	6.0	0.07	27.3	8.70	27.6	9.02
Fall	168	141	0.8	4.2	0.20	26.7	7.11	27.2	8.04
1994									
Spring	299	71	0.2	5.3	0.05	29.6	10.40	28.5	9.24
Fall	81	48	0.6	3.7	0.20	27.7	8.47	28.4	9.48

Table 10. Age analysis and growth increment of 73 lake trout taken during the 1994 spring and fall creel survey on Fort Peck Reservoir. (Age based on otolith samples).

Age	6	7	8	9	10	11	12	13
Ave. L. (in.)	24.9	26.3	26.5	28.7	30.5	31.2	31.1	31.0
Lower L. Range	22.9	24.3	22.4	26.1	26.9	29.0	28.5	29.0
Upper L. Range	26.3	28.1	29.3	31.6	32.8	33.7	32.4	32.5
Sample Size	6	12	12	9	7	5	5	3

Growth Increment	1.4	0.2	2.2	1.8	0.7	-0.1	-0.1
------------------	-----	-----	-----	-----	-----	------	------

Table 10. Continued

Age	14	15	16	17	18	19	20	29
Ave. L. (in.)	32.2	31.4	33.4	27.4	30.2	27.0	31.5	30.5
Lower L. Range	30.6	30.2	30.3	27.4	30.2	27.0	31.5	30.5
Upper L. Range	34.1	33.1	36.5	27.4	30.2	27.0	31.5	30.5
Sample Size	4	3	2	1	1	1	1	1

Growth Increment	1.2	-0.8	2.0	-6.0	2.8	-3.2	4.5	-1.0
------------------	-----	------	-----	------	-----	------	-----	------

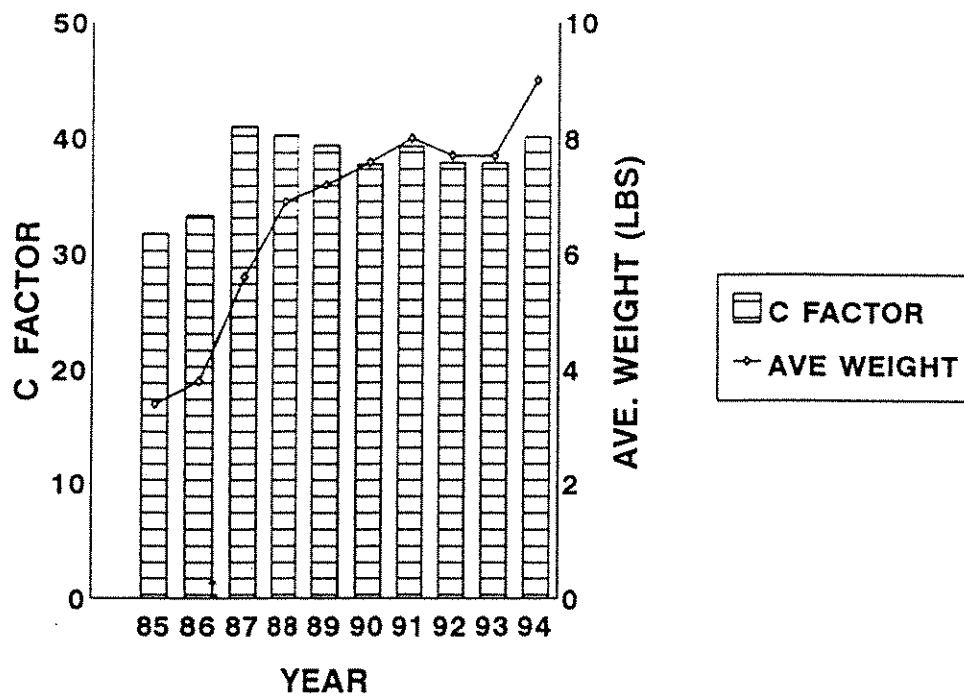


Figure 8. Condition factors and average weight of lake trout sampled during fall creel, Fort Peck Reservoir, 1985-94.

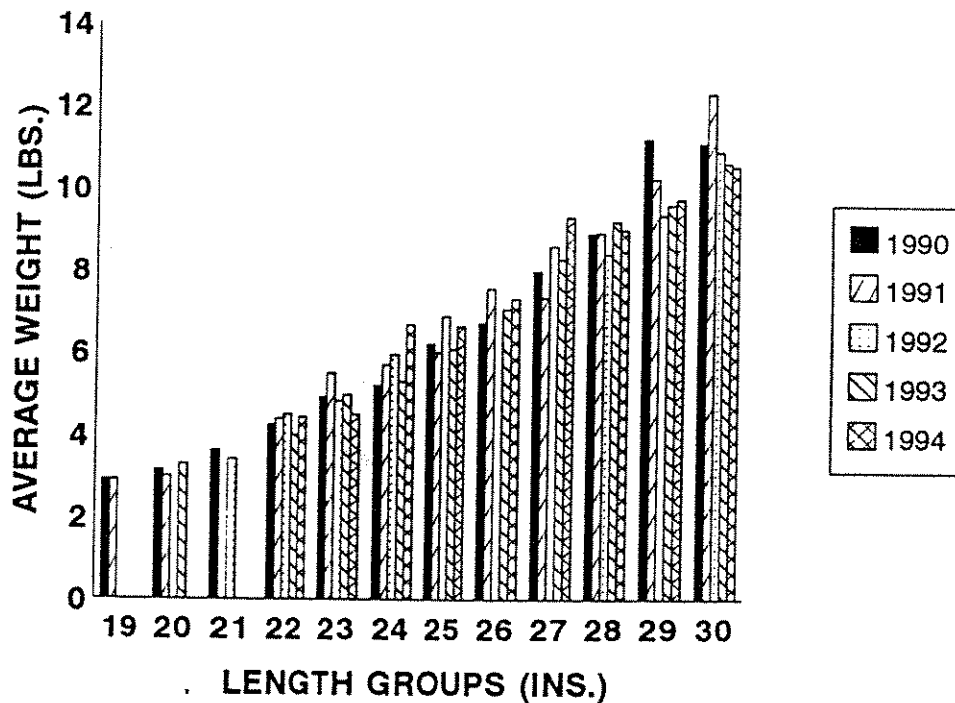


Figure 9. Average weight of various 1-inch length groups of lake trout sampled during fall creel, Fort Peck Reservoir, 1990-94.

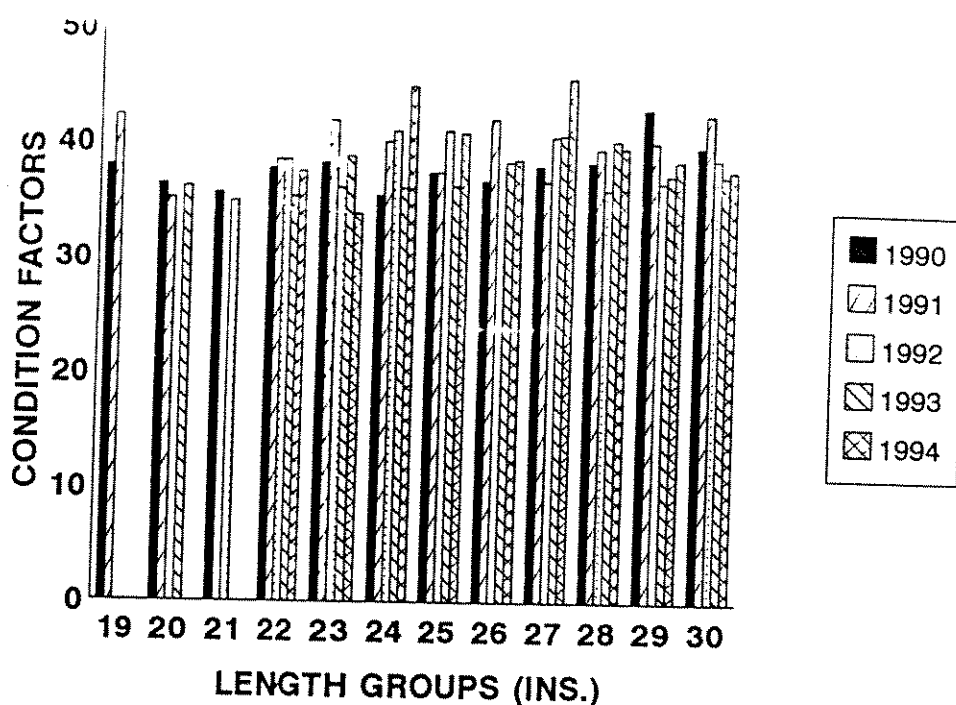


Figure 10. Condition factors of various 1-inch length groups of lake trout sampled during fall creel, Fort Peck Reservoir, 1990-94

Chinook Salmon

A floating cage with the dimensions of 24' X 40' X 10' deep was anchored in Marina Bay. Netting for the cage was composed of 3/16" nylon mesh which had to be cleaned periodically with a broom to prevent algae accumulation. Large mesh nets were draped over the cage to prevent avian predation on caged salmon. The cage was separated in the middle by a net so two compartments could hold different batches of fish. Two automatic feeders were mounted on the cage.

Salmon eggs and fingerlings were obtained from North and South Dakota and were hatched and reared at the Miles City Fish Hatchery. A total of 109,625 fingerling salmon were stocked into the cage on May 5 at an average of 95/lb totaling 1150 pounds (Table 11). The fish were fed a total of 860 pounds of Silver Cup feed. Approximately 100,000 fingerling were released on June 3 at an average of 54 fish/lb.

An attempt was made to artificially spawn Chinook salmon during October and November. Through the cooperation of the Corps of Engineers an artificial fish ladder was built to simulate a flowing stream which attracts salmon. The ladder consisted of a 5 foot by 60 foot culvert with a flare at the end. Wood baffles 2 feet high were placed inside the culvert every 8 foot to create a waterfall effect inside the culvert. A six inch crissafoli pump powered by a 50 horse tractor supplied a steady flow of water to the ladder.

Only 5 females averaging 32.2 in. and 13.1 lbs. and 14 males averaging 18.9 in. and 2.9 lbs were collected while using the artificial ladder. No eggs were taken due to this poor showing. Eight of the males collected had their adipose fin removed which indicates that they were two years old. Almost all the fish released two years ago had their adipose fin clipped off by fisheries personnel.

No attempt will be made to take eggs in 1995 because we anticipate that there will be few mature females in the population.

Table 11. A summary of cage reared salmon in Marina Bay.

	1993	1994
# stocked into cage	64,000	109,625
Date stocked into cage	April 19	May 5
# emptied from cage	55,000	-----
Date released into Marina Bay	June 10	June 3
net loss	9,000	-----
% loss	14.1	-----
escapement	-----	-----
% escapement	-----	-----
mortality loss	9,000	-----
% mortality loss	14.1	-----
Pounds stocked	588	1,150
Pounds thinned	-----	-----
Pounds released	1,594	-----
net gain	1,006	-----
Size at stocking	104.5 fish/lb	95 fish/lb
Size at release	34.5 fish/lb	54 fish/lb
Total lbs. food used	2,200	388
Pounds food utilized	1,540	-----
Total conversion rate	2.3	-----
Utilized conversion rate	1.6	-----
# fish fin-clipped at release	54,500	0
% fin-clipped	99%	0
Average water temperature	51°	49°

Cisco

Small mesh, vertical gill nets were used to sample YOY cisco throughout the reservoir from September 15-October 12 (Table 12). The overall catch rate was 259.4 YOY per net set, which was the most YOY cisco ever sampled since their introduction into Fort Peck Reservoir.

It is unclear why 1994 yielded such an excellent year-class of YOY cisco. Rising water levels along with a warm spring may have increased plankton production which could have supplied hatching cisco fry with abundant of forage.

A total of 7,005 YOY cisco were captured in vertical gill nets in 1994. The average size was 4.8 inches, with lengths ranging from 4.1-5.5 inches.

Figure 11 compares lake elevations and annual cisco production from 1986-94. Although water levels have dropped since 1986, it is not believed that low water has significantly impacted cisco. Cold water habitat is believed to have been sufficient during this period, as no major fish kills during summer months were observed, or reported. During the summer of 1993 and spring of 1994 the Reservoir rose more than 20 feet, which may also be a factor in the excellent 1994 year class.

Two horizontal experimental gill nets were set off of Markles Point on November 29 to sample cisco spawners. A total of 297 cisco spawners were collected averaging 10.7 inches. Forty seven were females and 250 were males with the majority being in spawning condition.

Commercial Fishing

In 1994, no commercial fishing permits were issued on Fort Peck Reservoir.

Table 12. Summary of young-of-year cisco taken by vertical monofilament gill nets in Fort Peck Reservoir during August 1987, and during September 1988-94.

Station	Number Net Sets								Young-of-Year Per Set							
	'87	'88	'89	'90	'91	'92	'93	'94	'87	'88	'89	'90	'91	'92	'93	'94
Bear Cr.	4	4	4	4	-	4	4	2	13	7	23	41	--	8	3	45
Shaft Houses	2	2	2	2	-	2	2	2	10	6	6	20	--	2	2	76
Dam	2	2	2	2	-	2	2	2	6	9	3	1	--	--	--	543
Bear Cr. West	2	--	2	2	1	2	2	1	10	---	8	3	12	2	--	52
Marina	2	2	2	2	-	2	2	2	1	46	17	72	--	5	4	50
So. Fork Duck Cr.	1	2	2	2	-	2	2	2	12	151	86	50	--	15	3	293
Pines-Gilbert Cr.	4	4	4	4	1	4	4	4	11	311	26	48	50	15	6	370
Hell-Sutherland Cr.	2	2	2	2	1	2	4	4	6	150	73	56	49	53	13	518
Timber Cr.	--	1	1	1	1	1	1	2	----	178	6	7	25	6	8	267
Devils Cr.	--	1	1	--	-	1	1	2	----	46	2	--	--	--	--	166
No. Fork Rock Cr.	2	2	2	2	-	2	2	2	24	164	9	1	--	6	1	232
Bug Cr.	2	2	2	2	-	2	2	2	16	11	1	1	--	--	--	26
Totals	23	24	26	25	4	26	28	27	11	107	23	31	34	10	4	259

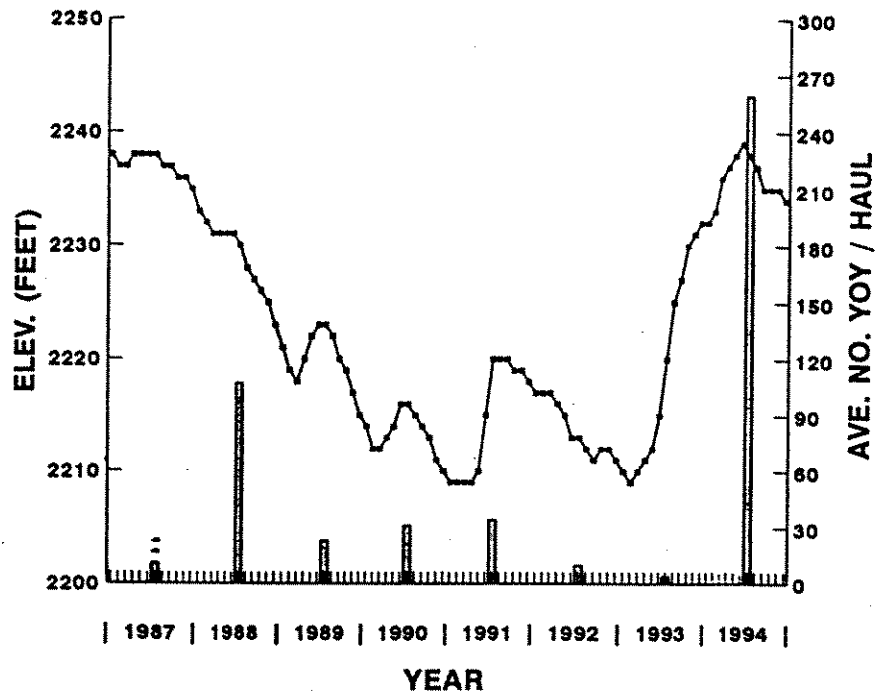


Figure 11. Mean monthly reservoir elevations and annual cisco production as determined by vertical gill netting, Fort Peck Reservoir, 1987-94.

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Prepared by: Michael H. Brunsing

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