MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-113-R-6 STUDY TITLE: SURVEY AND INVENTORY OF WARMWATER LAKES

JOB NO.: 3640 JOB TITLE: FORT PECK RESERVOIR STUDY

PROJECT PERIOD: JULY 1, 2006 THROUGH JUNE 30, 2007
REPORT PERIOD: MARCH 1, 2006 THROUGH FEBRUARY 28, 2007.

ABSTRACT

The reservoir reached peak elevation in 2006 on June 13th at 2206.34 feet and a minimum elevation on February 25th, 2006 at 2200.28 feet, a gain of 6.06 feet. However, the reservoir reached a low of 2199.4 feet on December 31, 2006 resulting in a loss of 6.91 feet. Spring spawning fish populations were sampled in the upper Big Dry Arm with frame traps from April 12th to May 1st, 2006. Both walleye and northern pike were spawned and the fertilized eggs were sent to Fort Peck and Miles City Fish Hatcheries. Trap netting captured 2,345 walleye, of which 681 were weighed and measured. The catch rate in 2006 was 5.5 per-trap night. Higher than the 2005 but lower than 2004 with catch rates of 3.8 and 7.2 per-trap night, respectively. It was the 3rd lowest catch rate since 1975, only 1977 and 1981 were lower. Over 125 million eggs were taken in 2006 with a small portion used in a triploid experiment. Merwin traps collected an additional 285 walleye with a catch rate of 7.5 per-net night. The Fort Peck rearing ponds were used in 2006 to raise northern pike fingerlings. Walleye stocked were not marked with OTC in 2006. Walleye collected in gill nets were examined for OTC marks to determine contribution of fry and fingerling stocks recruiting to the gill net. Gill net collections of potentially marked walleye typically show 50% or more and 20% or more walleye captured originated from fry and fingerling stocked fish, respectively. A total of 4.1 million walleye fingerling and 35.5 million walleye fry were stocked in various locations throughout the reservoir. Northern pike, 42,286 fingerlings, were also stocked in 2006. Eighty-five gill nets were set in various locations throughout the reservoir from July 11th to August 16th, 2006. Twenty-one species were captured for a total of 2,463 fish. Goldeye, channel catfish, and walleye were the most abundant species captured overall, with catch rates of 14.2, 2.5, and 2.4 per-net night, respectively. Gill net catch rates of walleye were below the average of 3.9 per-net for the period from 1985 to 2006 by 1.5 walleye per-net. Gill-netted walleye averaged a size of 16.2 inches and 2.6 pounds. Recruitment of smaller fish still remains low with walleye of preferred size or larger being abundant. The catch rates of Quality size fish and smaller moderately declined in 2006 compared to 2005. Relative weights of walleye from 10 to 14 inches increased from values of 79 in 2005 to 84 in 2006 while relative weights for 14 to 18 inch fish were constant at 83. It is expected the relative weights of walleye greater than 18 inches will be maintained over 90 next year even though they decreased from 93 in 2005 to 91in 2006. Pike catch rates increased slightly to 1.3 per-net with an average size of 26.1 inches and 5.2 pounds. Alternating nets were used to capture walleye less than 15 inches. This gear is used to target smaller walleye to measure return of OTC marked fish to the fishery. Beach seining showed a decrease in number of forage fish, the bulk of the decrease consisted of spottail shiner. The greatest decrease in spottails was from 98 to 14.3 per seine in the lower Missouri Arm from 2005 to 2006. Emerald shiners decreased in abundance in the upper Missouri Arm but increased in middle Missouri Arm. Young-of year perch increased from 5.2 to 8.4 per haul while young-of-year crappie still remain relatively low. One hundred seventy-five thousand salmon were stocked in June of 2006. An additional 4,988 larger, adipose fin clipped fall stock salmon were released in October. Artificial lake trout spawns did not occur in 2006. Cisco young-of-year recruitment strongly improved in 2006, with 137 per-net collected.

OBJECTIVES AND DEGREE OF ATTAINMENT

Activity 1 - Survey and Inventory

Objective: To survey and monitor the characteristics and trends of fish populations, angler harvest and preferences, and to assess habitat conditions in selected waters. This objective was met and is presented in Results and Discussion sections of the report.

Activity 2 - Fish Population Management

Objective: To implement fish stocking programs and/or fish eradication actions to maintain fish populations at levels consistent with habitat conditions and other limiting factors. This objective was met and results are presented in Results and Discussion of the report.

Activity 3 - Technical Guidance

Objective: To review projects by government agencies and private parties that have the potential to affect fisheries resources, provide technical advice or decisions to mitigate effects on these resources, and provide landowners and other private parties with technical advice and information to sustain and enhance fisheries resources. This objective was met by evaluating impact of reservoir water levels on the fishery and providing Corps of Engineers with recommendations for Annual Operating Plan by working with the Missouri River Natural Resource Committee, and working with South and North Dakota during annual meetings. Staff also attended the Great Plains Fisheries Workers Association meeting.

Activity 4 - Aquatic Education

Objective: To enhance the public's understanding, awareness and support of the state's fishery and aquatic resources and to assist young people to develop angling skills and to appreciate the aquatic environment. Nearly 100 volunteers helped take walleye eggs at Little Bug Creek. Objective accomplished. Staff assisted with the Home Run Pond kids ice fishing clinic. Staff also assisted regional information and education officer with other classroom presentations. Staff attended Walleye Unlimited meetings in Billings and Pike Masters in Billings to provide information. Public presentations were given at the MORE show in Billings and once for the annual update meeting in Glasgow. Staff has been instrumental in providing information for the "Ask the Biologist" web page on the Walleye's Forever web site. Professional presentations were given the fisheries division meeting in Billings. Numerous tours have been given of the new hatchery by staff.

BACKGROUND

Fort Peck Reservoir is located in northeastern Montana; it is a large earth-filled dam on the Missouri River. Figure 1 depicts major roads around Fort Peck, select locations and 5 sampling regions the reservoir is divided into: upper Dry Arm, lower Dry Arm, lower Missouri Arm, middle Missouri Arm, and upper Missouri Arm. The dam was closed in 1937 and is the largest water body in the state of Montana, with 240,000 surface acres at full multiple use pool. Full flood pool is reached at 2250 and multiple use pool is reached at 2,246 feet above sea level. At full multiple use pool 1,500 miles of shoreline exists in 130 linear miles of the reservoir with a maximum depth of 220 feet. The bottom of the multiple use pool is 2234 feet above msl and the bottom of the multipurpose carryover zone is 2160 feet msl. The reservoir reached peak elevation in 2006 on June 25th at 2206.34 feet and a minimum elevation on February 25th, 2006 at 2200.28 feet a gain of 6.06 feet (Figure 2), the first significant increase in elevation since 1998. However, the reservoir reached a low of 2199.43st on December 31, 2006 resulting in a loss of 6.91 feet. Reservoir elevations are predicted to rise by approximately 5 feet from May through June and fall in August in 2007 based on the March 2007 basic Forecast.

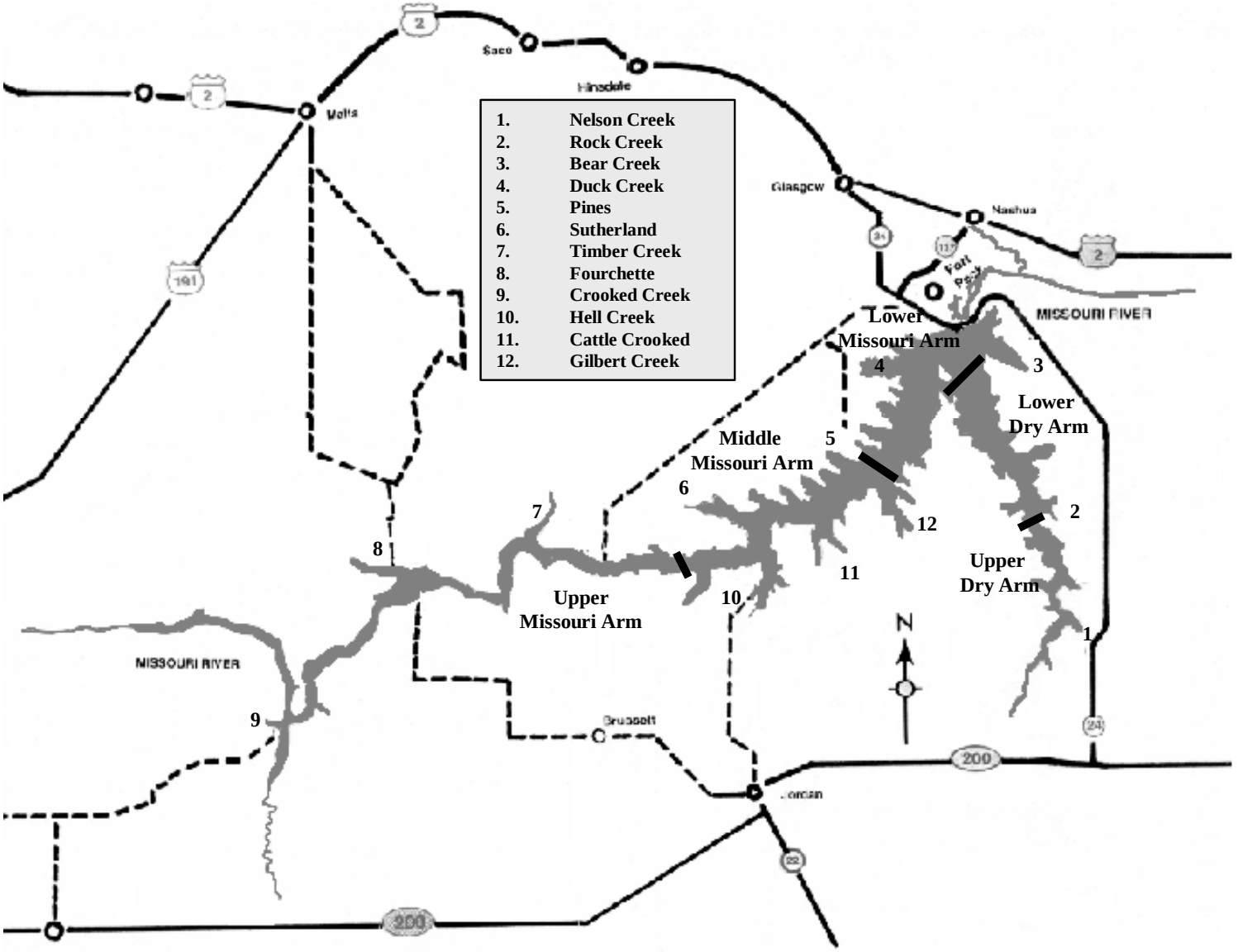


Figure 1. Fort Peck study area describing major zones and select specific locations.

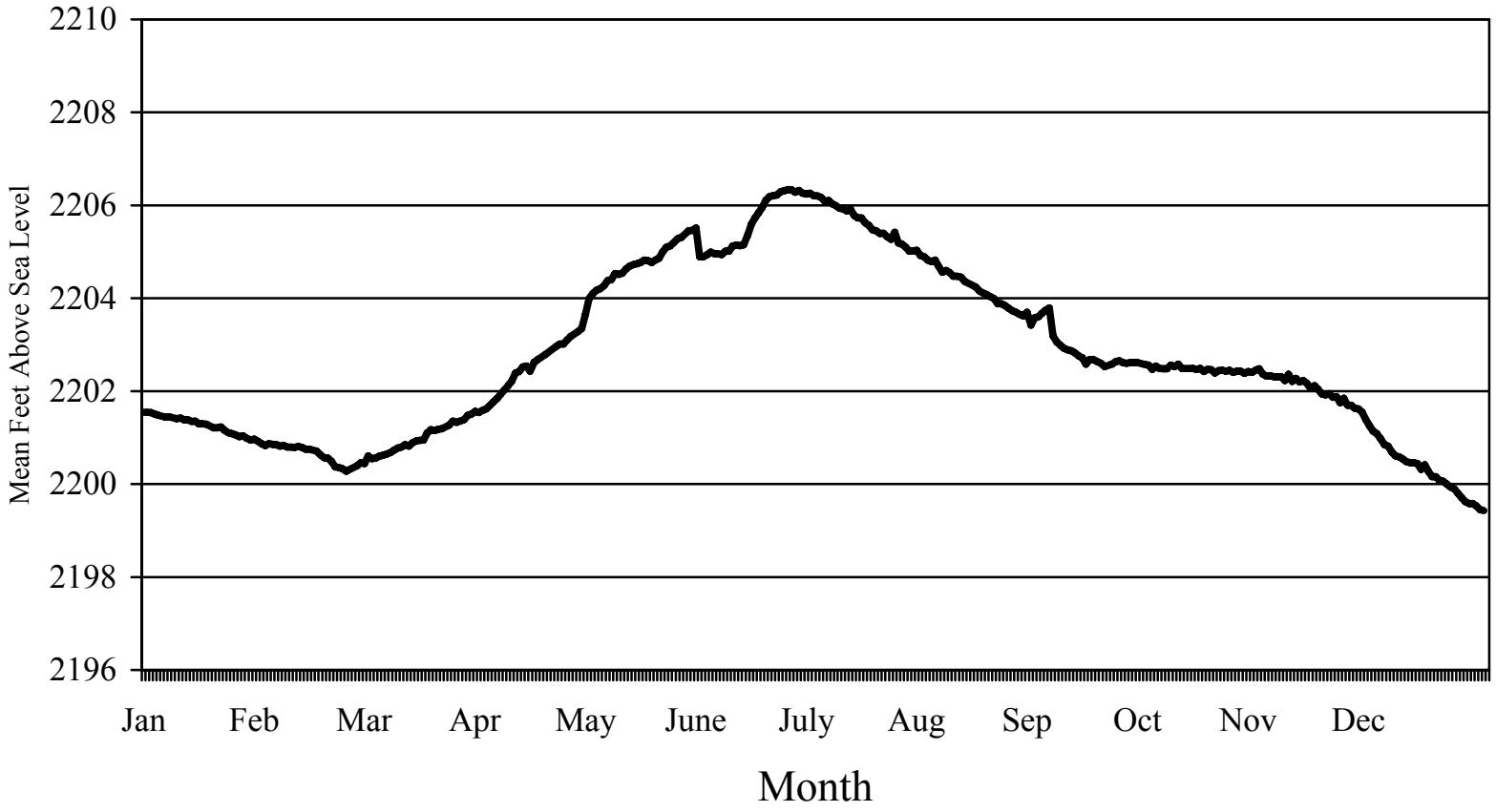


Figure 2. Daily average elevation from Jan 1, 2006 to December 31, 2006.

PROCEDURES

Data Collection

Spring trap-net sampling was conducted in the Big Dry Arm with 4' x 6' frame traps of 1-inch square mesh rigged with 30 to 50-foot leads. Merwin traps with 8' x 8' frames and 300' leads were also used to collect walleye spawners.
Sinking experimental multifilament gill nets 125 feet in length and 6 feet deep consisting of 25-foot panels of ¾" -, 1"-, 1 ¼" -, 1 ½"-, and 2"square mesh were fished during summer to monitor condition, distribution and relative abundance of game and native species. Alternating multifilament nets 125 feet long and 6 feed deep consisting of 25-foot panels of ¾"- 1" - ¾"- 1"- and ¾" square mesh were used to collect age 4 and less walleye to evaluate OTC marks and recruitment of fry/fingerling to fishery concurrently with experimental nets.
Beach seining was conducted in late summer and early fall utilizing a 100- x 9-foot beach seine of 3/16-inch square mesh, to determine abundance and reproductive success of game and forage fish.
Monofilament gill nets 100- x 6-foot with ½-inch square mesh were fished vertically from the water's surface to sample YOY cisco.
Electrofishing was used during the fall to locate, sample, and collect chinook salmon as part of the annual egg-take effort.
Lake trout were sampled with 300 feet long, 6 feet deep multifilament nets consisting of 100-foot panels of 3, 4, and 5-inch square mesh and the 125 feet long gill nets described above.

Data Analysis

Relative abundance of fish species was expressed as mean catch per unit effort (CPUE) for standard trap net, gill net (fish/net night), seine catches (fish/haul).

Walleye scales, spines, and otoliths were collected. In addition, otoliths were collected from salmon and lake trout. Otoliths were cut on an Isomat saw at Fort Peck with sections mounted on glass slides. Comprehensive age results will be provided in a following report. Proportional stock density (PSD) and relative stock density (RSD) values were calculated for walleye (Anderson and Weithman 1978; Gablehouse 1984). Relative weights (W_r) (Wege and Anderson 1978) were calculated using the standard weight (Ws) equations developed for walleye (Murphy et al. 1990), and northern pike (Willis 1989).

Walleye otoliths were collected for Oxytetracyline (OTC) mark evaluation. OTC evaluation has been conducted at the Fort Peck office using techniques described by Lucchessi (2001). A microscope with the appropriate UV light source is currently being used at the Fort Peck Hatchery.

An ongoing effort to enter historical data was begun in the winter of 2002 and continues in 2007. An attempt to finalize those data sets will be a goal for 2007-2008. All the data is being cross-referenced with reports for quality. The final data set will be in EXCEL and will be distributed to the regional office. Once the files have all been cleaned and entered into EXCEL attempts may be made to put them in FA+.

Species Present in Report

Species, which have been documented in Fort Peck Reservoir, are listed in Table 1. Species found in 2006, and therefore found in this report are denoted with an "X" in Table 1. Species codes are also listed in Table 1, these codes are found in tables throughout the report. The University of Idaho continued paddlefish research in the Upper Missouri Arm in 2006.

Table 1. List of species found in Fort Peck, abbreviations used in the report and notation if found in 2006.

Species	Scientific name	Abbreviation	Noted as present in 2006
Pallid Sturgeon	*Scaphirhynchus albus*	PAS	x
Shovelnose Sturgeon	*Scaphiryhynchus platorynchus*	SHS	
Paddlefish	*Polyodon spathula*	PAH	x
Goldeye	*Hiodon alosoides*	GOE	x
Cisco	*Coregonus artedii*	CIS	x
Mountain whitefish	*Prosopium williamsoni*	MOW	
Chinook salmon	*Oncorhynchus tshawytscha*	CHS	x
Rainbow trout	*Oncorhynchus mykiss*	RBT	
Brown trout	*Salmo trutta*	BNT	x
Brook trout	*Salvelinus fontinalis*	BKT	
Lake trout	*Salvelinus namaycush*	LAT	x
Northern Pike	*Esox lucious*	NOP	x
Carp	*Cyprinus carpio*	COC	x
Northern redbelly dace	*Phoxinus eos*	NRD	
Longnose dace	*Rhinichthys cataractae*	LOD	
Pearl dace	*Semotilus margarita*	PED	
Emerald shiner	*Notropis atherionoides*	EMS	x
Sand shiner	*Notropis husonius*	SAS	
Spottail shiner	*Notropis hudsonius*	SPS	x
Fathead minnow	*Pimephales promelas*	FHM	
Plains minnow	*Hybognathus placitus*	PLM	
Silvery minnow	*Hybognathus argyritis*	SIM	
Silvery & Plains minnow	*Hybognathus spp.*	HBO	x
Brassy minnow	*Hybognathus hankinsoni*	BRM	
Lake chub	*Couesius plumbeus*	LAC	
Creek chub	*Semotilus atromaculatus*	CRC	
Flathead chub	*Hybopsis gracilis*	FLC	x
Sturgeon Chub	Macrh*ybopsis gelida*	SNC	
River carpsucker	*Carpoides carpio*	RIC	x
Blue sucker	*Cycleptus elongatus*	BSR	
Smallmouth buffalo	*Ictiobus bubalus*	SAB	x
Bigmouth buffalo	*Ictiobus cyprinellus*	BIB	x
Shorthead redhorse	*Moxostoma macrolepidotum*	SHR	x
Longnose sucker	*Catostomus catostomus*	LOS	x
White sucker	*Catostomus commersoni*	WHS	x
Black bullhead	*Ictalurus melas*	BLB	x
Channel catfish	*Ictalurus punctatus*	CCF	x
Stonecat	*Noturus flavus*	STC	
Burbot	*Lota lota*	BUR	x
Plains killifish	*Fundulus zebrinus*	PLK	
Brook stickleback	*Culaea inconstans*	BRS	
Smallmouth bass	*Micropterus dolemieu*	SMB	x
Largemouth bass	*Micropterus salmoides*	LMB	
White crappie	*Pomoxis annularis*	WHC	x
Black crappie	*Pomoxis nigromaculatus*	BLC	x
Crappie	*Pomoxis spp.*	CRA	x
Bluegill	*Lepomis macrochirus*	BLG	
Green sunfish	*Lepomis cyanellus*	GSF	
Yellow perch	*Perca flavescens*	YEP	x
Sauger	*Sander canadense*	SAR	x
Walleye	*Sander vitreum*	WAE	x
Iowa darter	*Etheostoma exile*	IOD	
Freshwater drum	*Aplodinotous grunniens*	FRD	x

RESULTS AND DISCUSSION

Spring Trap Netting

Spring spawning fish populations were sampled in the upper Big Dry Arm with frame traps from April 12th to May 1st, 2006. Both walleye and northern pike were successfully spawned and the fertilized eggs were sent to the Fort Peck and Miles City Fish Hatcheries. This trapping is consistent and has been conducted since 1979, providing a good tool to document trends in many fish species populations. An effort of 430-trap days was committed to walleye spawning efforts; 5,050 fish were captured for a total catch rate of 11.7 fish per-trap night (Table 2). Twenty-one species were captured; walleye were the most abundant with an average catch-rate of 5.5 fish per trap-night.

Due to low water conditions, the walleye spawn was conducted on the pontoon barge on the bank in a small bay of Little Bug Creek. The North Fork Boat ramp of Rock Creek was used as the only boat launch for the operation. During windy weather increased risk of swamping boats in open water was noted, as the reservoir is more open near Rock Creek. The pontoon barge was set up with the holding pens in 8 to 10 feet of water. Three 10' by 20' holding pens were set up to hold green females (day 1 to day 3) in about 10 feet of water. By keeping the holding pens and spawning barge in shallow water, warmer water temperatures were maintained. The goal of 80 million eggs was exceeded resulting in 125 million eggs. Water temperatures rarely exceeded 54 degrees the entire spawn as in 2004 and was another unusually cool spawn. The typical spawn ends with water temperatures nearing 60 degrees. The boat ramp at McGuire Creek will likely be unusable in 2007 and the Rock Creek boat ramp will have to be used. If Little Bug is unable to be used during the 2007 spawn due to lower water level, then an alternate site at Lost Creek should be considered.

Attempts to produce sterile walleye on an experimental basis were attempted in 2004, 2005, and 2006. In 2005, three treatments were given; 8,000 psi for 30 minutes, 8,000 psi for 20 minutes, and 9,500 psi for 10 minutes. The eye-up of treated samples and control samples were 51% and 6%, 18% and 64%, and 46% and 54% for each treatment and control, respectively. Forty fingerlings from each treatment were tested for triploidy, the 30-minute treatment, 20-minute treatment and 10-minute treatment produced 97.5%, 90% and 95% triploid fish. The 2004, tests were 8,000 psi for 30 minutes, 9,000 psi for 12 minutes, and 9,500 psi for 5 minutes. Less than 1% survived to eye-up in the 8,000-psi test for either the control or treated lots, 1% of the treatment fish at 9,000 psi survived to eye-up while 17% of the control fish survived to eye-up. In the 9,500 psi test 32% of treated fish survived to eye-up and 43% of the control fish survived to eye-up. Induction rate was best for the 9,000-psi fish at 93% and the 9,500-psi tested fish had a 47% induction rate (Kozfkay 2005).

Walleye

Trap netting captured 2,345 walleye, of which 681 were measured. The number of walleye handled was average for the time period from 1975 to 2006 (Figure 3). The catch rate in 2006 was 5.5 per-trap night, well below the long-term average of 8.6 per-trap night during the time period of 1975 to 2006 (Figure 4). It was one of the lower catch rates documented since 1975 (Table 3). Male to female ratio improved to 2:1 compared to the low in the previous years of 1992, 1993, 2000, 2003, and 2005. The average weight for spawners in 2005 was 7.5 pounds and 2.5 pounds for females and males, respectively (Table 4). Inch groups of male and female walleye length were plotted as a percentage of the number measured during spring trap netting from years 2001 to 2006 (Figure 5). Relatively more small males between 12 and 15 inches were measured in 2002 with approximately 25% of the walleye less then 13 inches. In 2003, the percent of walleye less than 15 inches had dropped with less than 6% being smaller than 13 inches. In 2004, male and female ratio improved with a relative increase in the number of small walleye mostly males between 12 and 14 inches reaching nearly 35% of the fish captured. In 2005, the abundance of smaller walleye documented in 2004 continued. Length frequency of smaller walleye shifted in 2006 to 14 inches. Walleye numbers also appear to be satisfactory from 23 inches and greater in 2006 as in past years. This indicates large fish are continuing to grow and survive satisfactorily.

Table 2. Numbers, catch rate, average length and weight of fish captured by trap nets in the Upper Big Dry Arm during the walleye spawn in 2006.

Species	Number	CPUE	n	Average Length Inches	Average Weight Pounds
Bigmouth Buffalo	3	0.0	0	0.0	0.0
Black Bullhead	5	0.0	2	8.2	0.5
Black Crappie	9	0.0	3	10.8	0.9
Burbot	16	0.0	1	36.0	10.0
Channel Catfish	148	0.3	46	11.9	1.0
Cisco	163	0.4	16	11.6	0.6
Common Carp	176	0.4	62	17.9	2.5
Freshwater Drum	2	0.0	1	16.2	2.2
Goldeye	186	0.4	82	12.9	0.9
♀	66	0.2	48	13.1	0.9
♂	36	0.1	21	12.6	0.8
Lake Trout	1	0.0	1	13.8	0.8
Longnose Sucker	1	0.0	0	0.0	0.0
Northern Pike	503	1.2	138	32.1	6.7
♀	49	0.1	11	34.2	10.1
♂	270	0.6	93	32.6	6.3
nonproductive	106	0.2	34	30.2	6.8
River Carpsucker	381	0.9	134	18.3	4.1
Smallmouth Buffalo	121	0.3	35	25.9	9.6
Sauger	6	0.0	3	19.1	2.3
Shorthead Redhorse	579	1.3	156	17.6	2.2
Smallmouth Bass	19	0.0	6	17.2	3.2
Walleye	2,345	5.5	681	19.1	3.2
♀	793	1.8	108	25.5	7.5
♂*	1,408	3.3	533	18.1	2.5
nonproductive	106	0.2	32	14.5	0.9
White Crappie	1	0.0	0	0.0	0.0
White Sucker	164	0.4	42	16.0	2.2
Yellow Perch	165	0.4	57	8.5	0.4
TOTAL	5,050	11.7			

* Weight sub-sample is not the same as length sub-sample size.

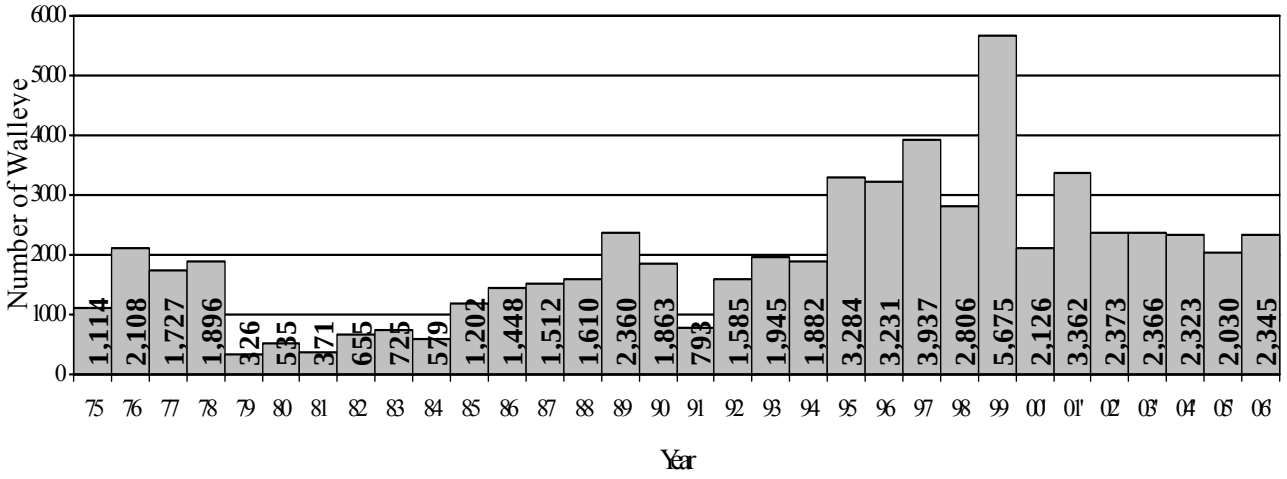


Figure 3. Actual number of walleye captured during spring trapping in upper Dry Arm from 1975 to 2006.

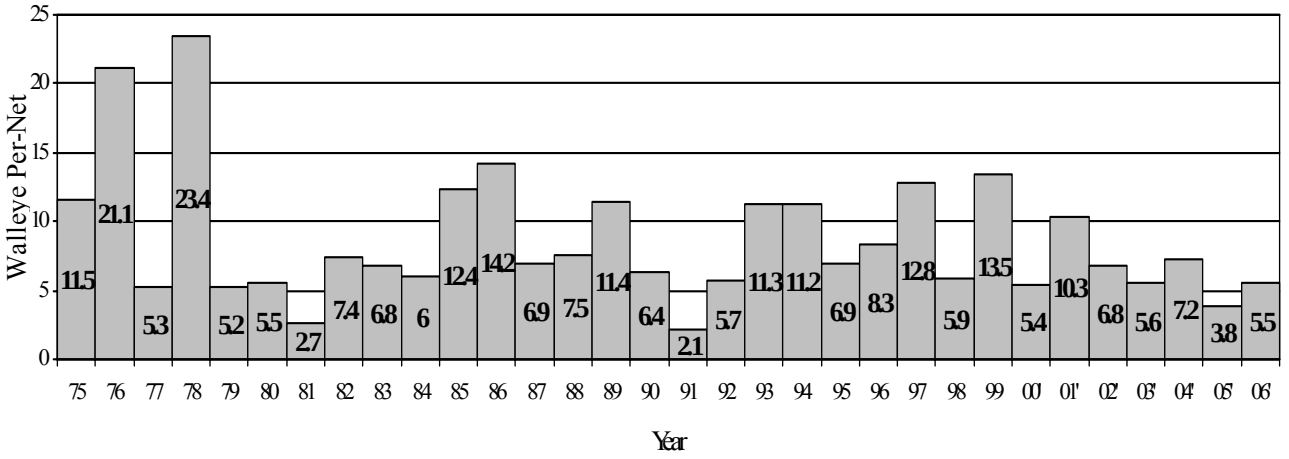


Figure 4. Number of walleye per trap-night during spring trapping in upper Dry Arm from 1975 to 2006.

Table 3. Summary of walleye and northern pike captured during spring trap-netting in the upper Big Dry Arm of Fort Peck Reservoir, 1975-2006.

Date		Trap-days	No. Walleye	Walleye/ Trap-day	Northern Pike	Pike/ Trap-day
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
1995	(4/11-4/28)	473	3,284	6.9	648	1.4
1996	(4/15-5/02)	391	3,231	8.3	2,307	5.9
1997	(4/15-4/29)	307	3,937	12.8	2,652	8.6
1998	(4/04-4/29)	477	2,806	5.9	1,354	2.8
1999	(3/27-4/26)	434	5,673	13.1	2,573	5.9
2000	(4/04-4/28)	392	2,126	5.4	603	1.5
2001	(4/06-4/27)	328	3,362	10.3	1,922	5.9
2002	(4/17-5/09)	349	2,377	6.8	1,713	4.9
2003	(4/11-5/01)	426	2,366	5.6	1,579	3.7
2004	(4/09-4/26)	324	2,323	7.2	2,174	6.7
2005	(4/06-4/27)	537	2,030	3.8	1,327	2.5
2006	(4/12-5/01)	430	2,345	5.5	503	1.2

Table 4. Summary of average weights and sex ratios for walleye trap-netted in the upper Big Dry of Fort Peck Reservoir, 1979-2006.

Year	Average Weight Males	Sample Size	Average Weight Females	Sample Size	Sex Ratio[1] Male: Female
1979	1.5	204	3.4	61	3:1
1980	1.8	247	3.4	122	2:1
1981	2.3	209	3.7	96	2:1
1982	1.1	565	3.0	58	10:1
1983	0.8	644	3.2	37	18:1
1984	0.9	454	2.1	34	13:1
1985	1.3	606	2.5	111	5:1
1986	1.3	851	2.4	216	3:1
1987	1.2	152	2.9	94	2:1
1988	1.7	283	3.7	239	3:1
1989	1.8	192	4.9	129	3:1
1990	2.1	362	5.8	142	2:1
1991	1.8	234	5.3	106	2:1
1992	2.3	229	6.1	522	1:1
1993	2.5	446	6.5	351	1:1
1994	4.2	1,024	7.4	319	2:1
1995	2.5	942	7.9	244	2:1
1996	3.3	690	8.5	280	2:1
1997	2.9	844	7.2	1,157	2:1
1998	2.3	558	4.8	264	2:1
1999	2.0	525	6.0	213	2:1
2000	2.4	457	6.3	346	1:1
2001	2.2	491	5.8	85	4:1
2002	1.5	229	7.5	64	2:1
2003	2.8	284	7.1	210	1:1
2004	2.7	639	7.2	96	2:1
2005	1.7	199	7.4	64	1:1
2006	2.5	533	7.5	108	2:1

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

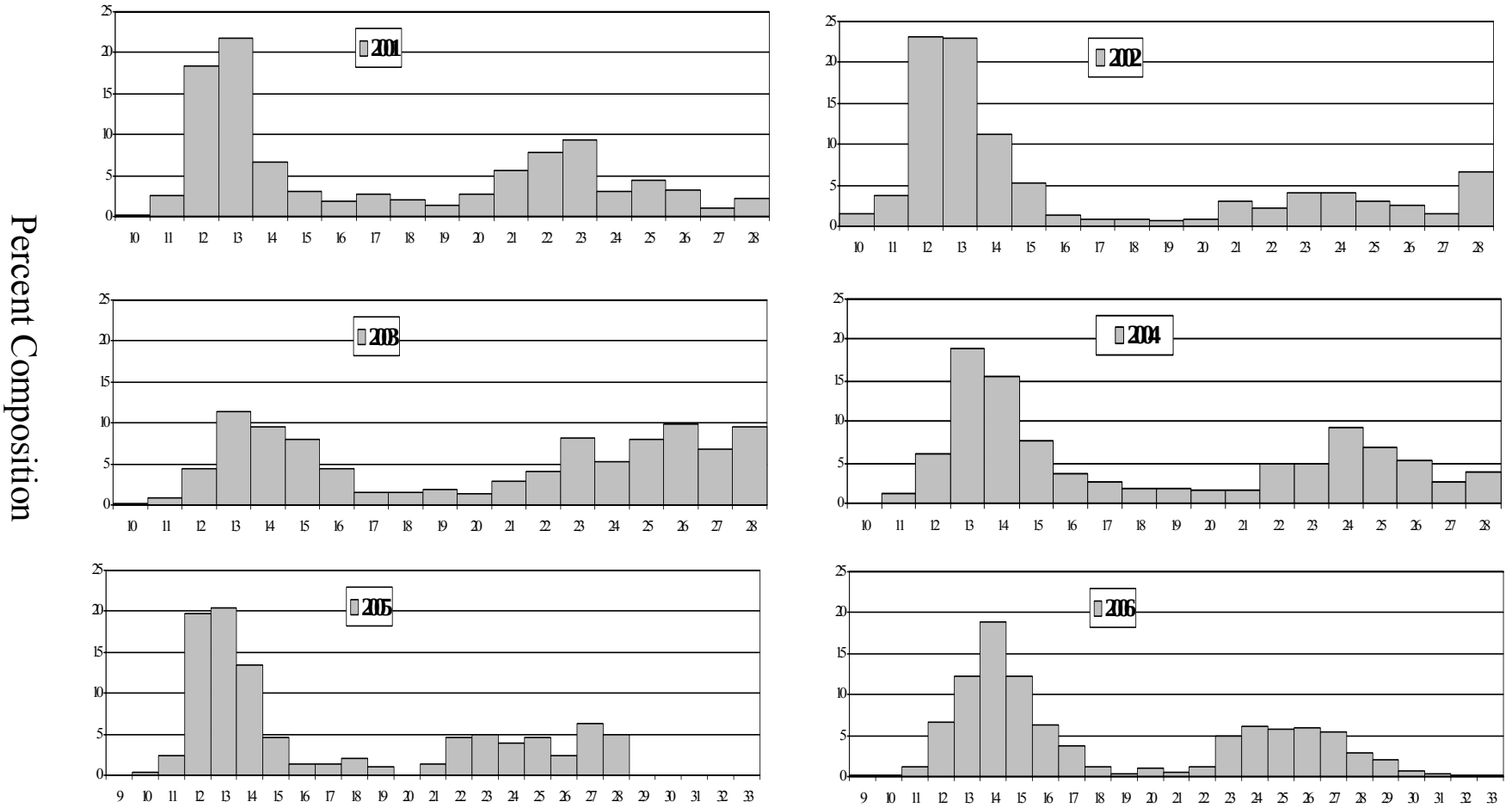


Figure 5. Length frequency of walleye (both sexes) trap netted on Fort Peck Reservoir in the upper Big Dry Arm 2001-2006.

Big Dry Creek did have a short strong pulse that peaked on April 8th, 2006 at 186 CFS (Figure 6). High flows during this time may attract more walleye into the trapping area than in years with low or no flow. Since 1987 walleye catch rate averaged 7.8 walleye per-net night, however for years with over 200 CFS coming out of Big Dry Creek the average catch rate increased to 9.8 walleye per-net net night.

In 2005, as in 2001 to 2004 a lack of holding facilities occurred because water elevation was low and the spawning building couldn't be used. Due to the lack of holding facilities all fish were clipped on the lower caudal fin to indicate a current year mark. Green females captured were fin clipped and sent to holding pens to be held on the capture date (day 1), the next full day (day 2), and up to the second morning (day 3). Each morning the day 3 fish were examined for ripe eggs, ripe fish were sent to the pontoon boat and green or spent females were released. This procedure continued back into the day 2 pen and day 1 pen advancing fish to the pontoon if ripe, the next pen if green, and released, if spent. If a female was recaptured in a trap, as noted by the fin clip, and was green or spent it was released. If a female was recaptured and ripe, it was sent to the pontoon boat for spawning and released. The only remaining holding pens were on the pontoon itself; they provide limited space for daily operations and holding of some males. As limited space was available for holding males and spawning staff during the spawn, it was again determined to use 100% sperm extender procedures. Males were not fin clipped unless milked for semen. Between 20 and 100 males as needed were brought to the pontoon for spawning separately to create sperm extender. Extender was maintained on the pontoon rather than transporting daily. It appeared reduced handling of extended semen improved survival time of sperm. If a fin clipped male was recaptured it was released. Recaptured males were not used in 2006 and should not be unless absolutely necessary to finish the spawn.

Two thousand walleye were tagged with wire tags in 1997. An attempt was again made in 2006 to document recaptured tagged fish. Again, many fish were identified with scar marks near the dorsal fin with no tag or just the wire remaining and the identifying tag plate missing. Five walleye had tags documented from traps and merwins. Four were males averaging 25.7 inches and 6.0 pounds. The other was a female that measured 31.0 inches and weighed 12.3 pounds. Individual recapture information by year and size at each capture can be found in table 5. One fish had been recaptured in 8 out of 10 years.

Northern Pike

Northern pike were spawned in 2006. Quality gravid females were again difficult to capture. Eggs from the pike produced very few fingerlings due to poor eye-up. Those that did hatch were used to meet statewide stocking requests. Total numbers of northern pike captured declined from 1,327 captured in 2005 to 503 in 2006 (Table 3). In 2005, the catch rate of 2.5 was over twice the catch rate of 1.2 per-net night in 2006. One hundred thirty-eight northern pike were measured. Average length and weight was 32.1 inches and 6.7 pounds, which was higher than the previous 28.9 inches and 6.4 pounds. Length frequency shows a continued trend towards larger fish with 97% percent of the fish greater than 26 inches (Figure 7). The lack of smaller fish, with no pike less than 25 inches, indicated continued poor reproduction due to loss of spawning habitat as the reservoir elevation declined. This could possibly be the first time that no pike under 25 inches have been sampled. Forty-nine female pike and 270 male pike were sampled, the remaining fish were not in reproductive condition and sex couldn't be identified. Females averaged 34.2 inches and 10.1 pounds while males averaged 32.6 inches and 6.3 pounds (Table 2).

Other Species Trapped

Nineteen other species were captured in 2006. The number captured and associated catch rates along with average length and weight are reported in Table 2. Shorthead redhorse and river carpsucker were the next most abundant species captured after walleye and northern pike. A separate report discussing these other species should be produced after all the historical data is put together in the future.

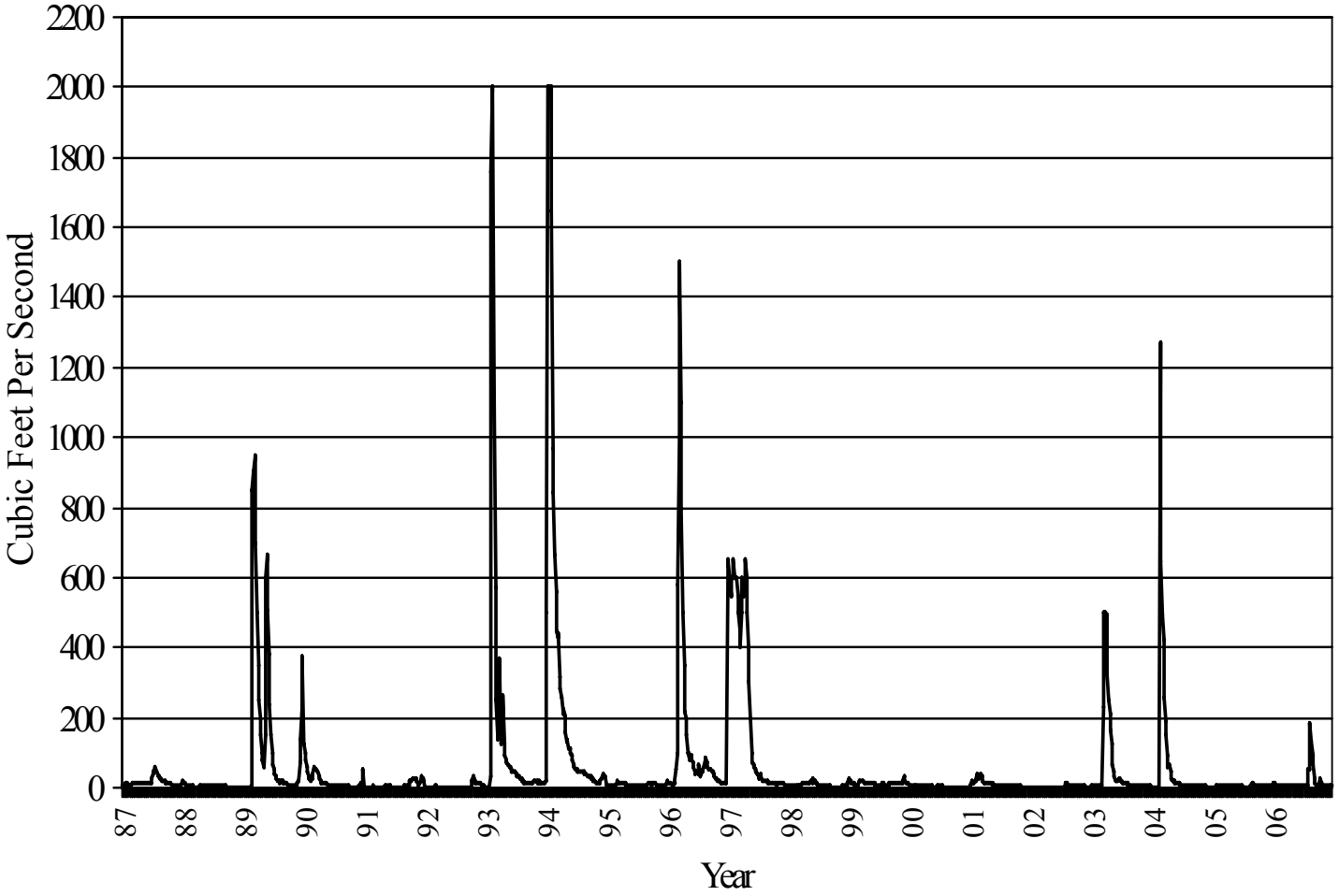


Figure 6. Annual March and April Big Dry Creek flow (CFS) from USGS gage 06131000 from 1987-2006, provisional data from USGS.

Table 5. Walleye captured using trap nets and merwin traps and tagged in 1997; recaptured in 2006 with previous recapture information.

	Year	1997		1998		1999		2000		2001		2002		2003		2004		2005		2006	
Tag#	Sex	Length	Weight	Length	Weight	Length	Weight	Length	Weight	Length	Weight	Length	Weight	Length	Weight	Length	Weight	Length	Weight	Length	Weight
339	♀			25.1	5.5			recap		recap								29.8	-.-		
393	♂	20.4	3.1															26.8	6.5		
405	♂																			26.0	8.3
419	♂	19.2	2.5	20.4	3.2	20.6	2.9	recap		21.4	2.9							23.1	4.3		
420	♂																			24.0	5.1
488	♀	20	3.3			23.8	6.2			recap		26	8.4	recap		recap		26.5	8		
499	♀	28.4	8.8															28.8	9.5		
537	♀	27.5	7.6									28.9	9.7					30	8.5		
587	♀	25.5	5.9					27.2	8	27.2	7.4							28.2	8.9		
617	♀	19.8	2.4															25.2	6.9		
642	♀	26.6	6.4															30.7	10.2		
712	♂	25.1	5.8	25.2	6.2	25.2	6.2	25.4	6	25.5	6.4			recap				25.1	6.2	26.5	5.5
1086	♀	21.5	4.1					recap										29	9		
1286	♀																			31.0	12.3
1394	♀	24.9	5.2															recap			
1558	♀	28.7	9.3	recap														28.6	8		
1589	♂	18	2			20.2	3.2					21.6	38	22.2	3.9			23	4.4		
1671	♂																			26.2	5

Recap indicates the fish was recaptured but was not weighed or measured at that time.

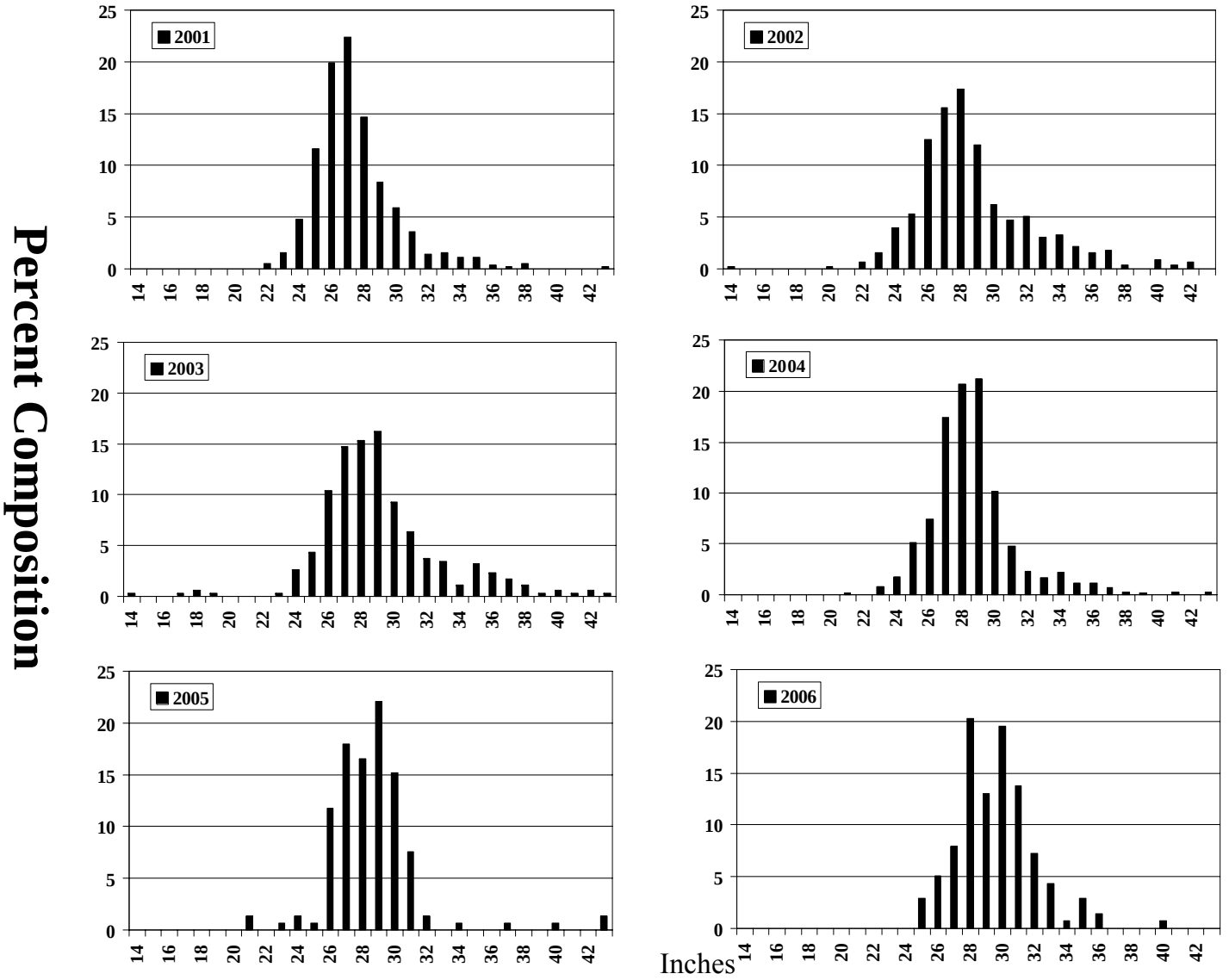


Figure 7. Length frequencies of northern pike trap-netted in the upper Big Dry 2001-2006.

MERWIN SPRING TRAPPING

Two merwins were used in 2006 for a total of 38 days of trapping. Merwin netting captured 17 species with walleye, pike, and channel catfish being the most abundant (Table 6). The overall catch rate was 14.7 fish per trap-day. The merwin traps compliment trap net catches. Trap nets provide the bulk of walleye and are needed in shallow water areas, such as the upper reaches of the bay and on shallow points. Merwin traps are much easier to collect fish from than traps, but require more initial set-up time, however they typically have higher catch rates of fish. It may not be necessary to put out as many merwins in 2006 as catch rates are similar to trap nets and suitable trapping locations are limited at lake elevations around 2200 feet.

Walleye

In 2006, 285 walleye were captured in merwins compared to 643 walleye captured in 2005 and 800 walleye captured in 2004. Sex was determined, resulting in 175 females and 95 males. The remaining walleye were immature or not categorized. Walleye catch rate was 7.5 per trap day compared to 5.1, 12.1, 5.3, 8.6, and 17.0 per trap day in 2005, 2004, 2003, 2002, and 2001 respectively (Figure 8). Walleye average length and weight was 23.0 inches and 6.4 pounds. Females and males averaged 26.8 inches and 9.4 pounds, and 20.2 inches and 3.8 pounds, respectively. More small fish were captured in 2005 and 2004 compared to 2006 and 2003. Length frequencies of walleye show decrease size structure of fish stocks compared to 2005 with a much stronger group of walleye between 22 and 30 inches. In contrast, catch rates of large walleye between 22 and 28-inch fish were nearly non-existent in 2005 (Figure 9). Several factors could lead to this increase of larger fish in 2006, such as increased flows from Big Dry Creek and better locations available for setting the traps.

Northern Pike

Forty-six northern pike were captured with 22 being measured. The catch rate was 1.2 in 2006 compared to 2.9, 8.8, and 1.0 per trap-day in 2005, 2004, and 2003, respectively. A similar trend was noted in the trap net catch as well, with the second largest catch rate of pike being recorded in 2004 followed by a decline in 2005 and 2006. Average length and weight of northern pike was 33.1 inches and 10.2 pounds. Female and male averages were 38.7 inches and 15.8 pounds, and 29.8 inches and 6.7 pounds, respectively.

Other Species

Other species captured included: bigmouth buffalo, black crappie, burbot, channel catfish, chinook salmon, cisco, carp, goldeye, river carpsucker, smallmouth buffalo, sauger, shorthead redhorse, smallmouth bass, white sucker, and yellow perch. Spottail and emerald shiners were not counted but were captured. Table 6 reports catch rates and average lengths and weights for each species captured.

LAKE-WIDE TRAP NETTING

Lake-wide trap netting was discontinued in 2000. If reinstated at the proper time, this gear could potentially locate other spawning areas to supplement the current walleye egg-take operation. Trap nets are also effective in monitoring ling; no other gear captures ling regularly during annual surveys.

FORT PECK REARING PONDS

Ponds S1, S2, S3, N1, N2, N3, and N4 near the COE Upstream Camp Ground and the two perimeter ponds P1 and P2 were not used to rear walleye fingerlings in 2006 (Figure 10). However, ponds S1, S2, S3, N1, N3, and N4 were used rear northern pike fingerlings. Approximately 180,000 fry were planted into the ponds yielding 28,556 fingerlings. A large portion of the loss was due to cannibalism. The ponds should be used in 2007 to rear northern pike fingerlings if the COE is able fill them.

Table 6. Numbers, catch rate, average length and weight of fish captured by merwin traps in the upper Big Dry Arm during the walleye spawn in 2006.

Species	Number	CPUE	n	Average Length Inches	Average Weight Pounds
Bigmouth Buffalo	2	0.0	2	30.5	17.0
Black Crappie	1	0.0			
Burbot	1	0.0			
Channel Catfish	57	1.5	30	11.6	0.8
Cisco	14	0.4			
Common Carp	2	0.1			
Freshwater Drum	1	0.0			
Goldeye	24	0.6	13	12.6	0.7
♀	*11*	*0.3*	*8*	*13.1*	*0.8*
♂	*6*	*0.2*	*5*	*11.8*	*0.6*
Northern Pike	47	1.2	22	33.1	10.2
♀	*11*	*0.3*	*8*	*38.7*	*15.8*
♂	*22*	*0.6*	*14*	*29.8*	*6.9*
River Carpsucker	9	0.2	5	17.2	4.3
Smallmouth Buffalo	9	0.2	1	30.7	15.5
Sauger	2	0.1	1	15.0	1.7
Shorthead Redhorse	39	1.0	10	17.7	2.2
Smallmouth Bass	1	0.0			
Walleye	285	7.5	98	23.0	6.4
♀	*175*	*4.6*	*50*	*26.8*	*9.4*
♂	*95*	*2.5*	*41*	*20.2*	*3.8*
White Sucker	29	0.8	4	15.8	2.0
Yellow Perch	40	1.1	15	7.2	0.3
Total	563	14.8			

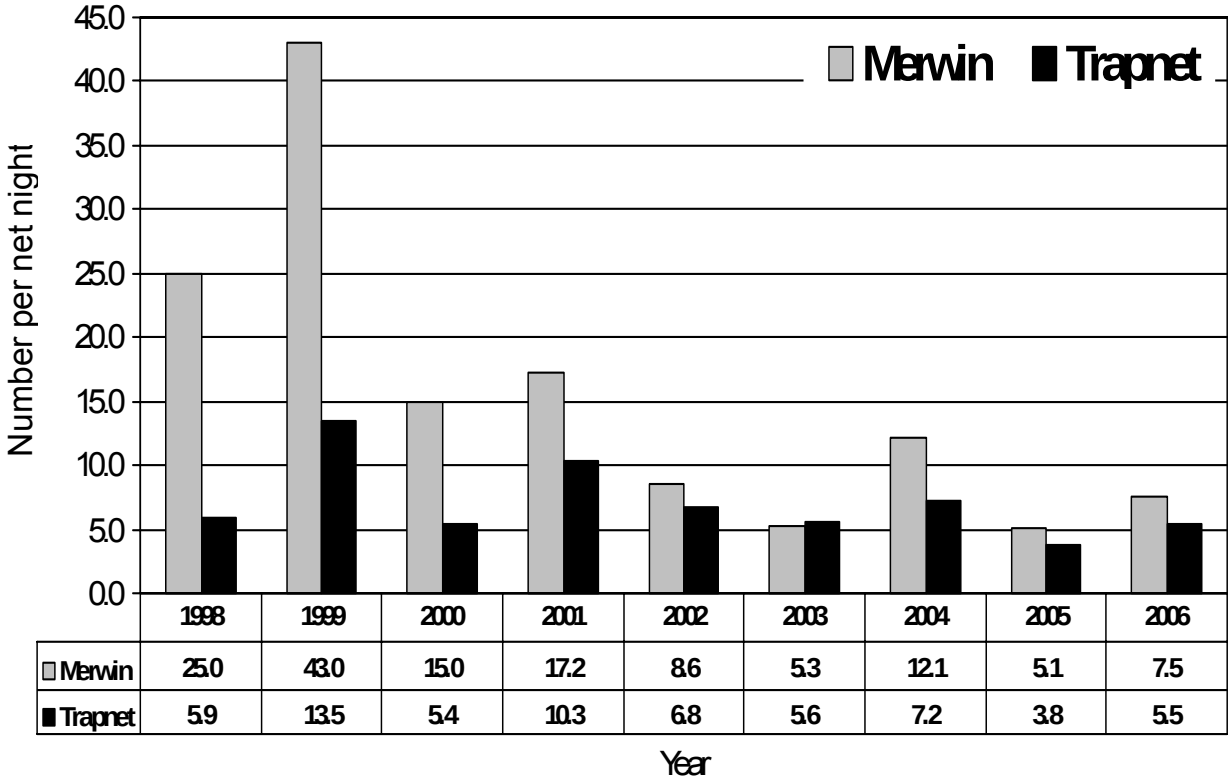


Figure 8. Comparison of Merwin and trap-net catch rates of walleye during spawning operation in the upper Big Dry Arm of Fort Peck Reservoir 1998-2006.

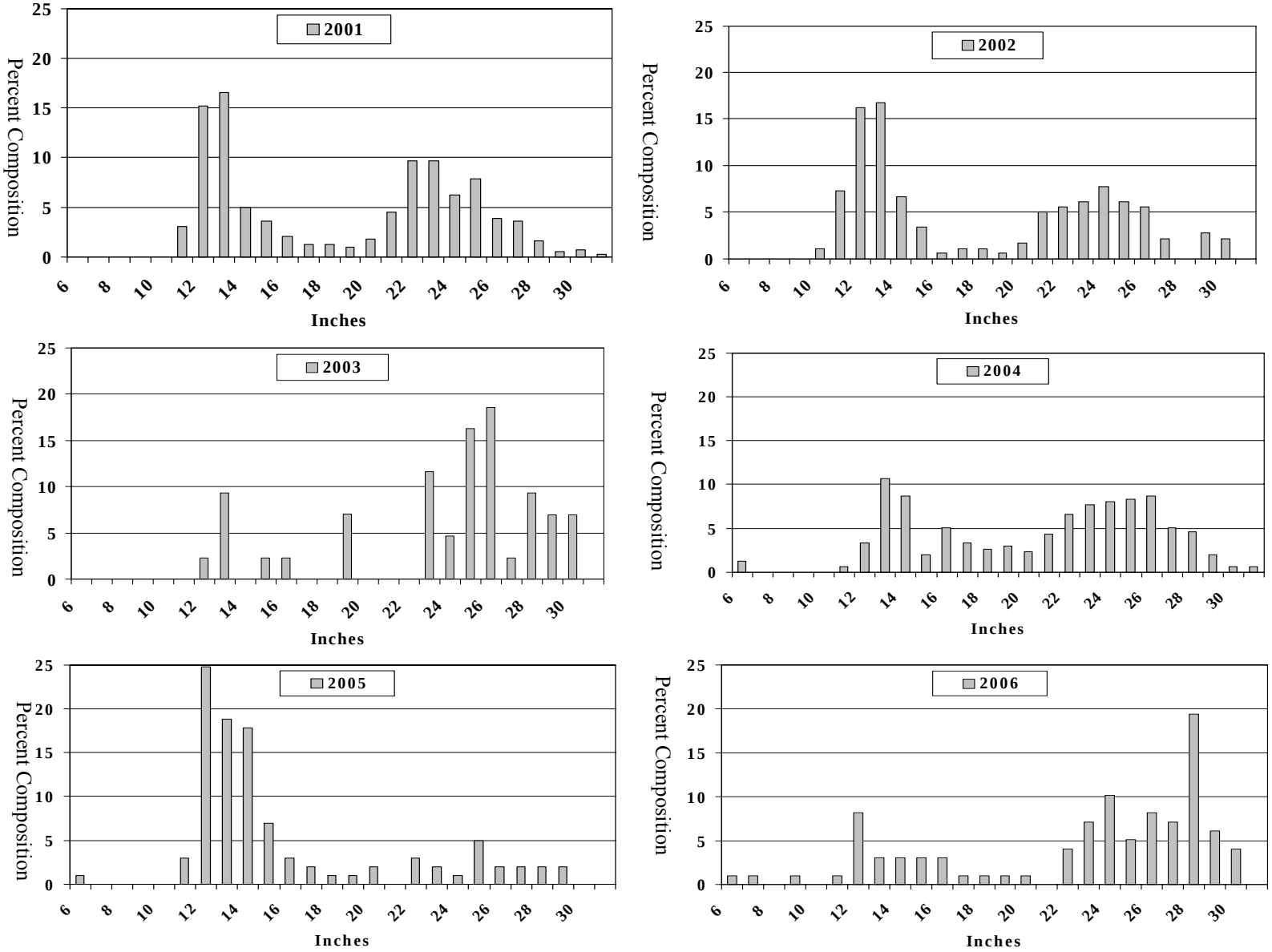


Figure 9. Length frequency of walleye captured by merwin trap from 2001-2006 during the spawning operation in the upper Big Dry Arm of Fort Peck Reservoir.

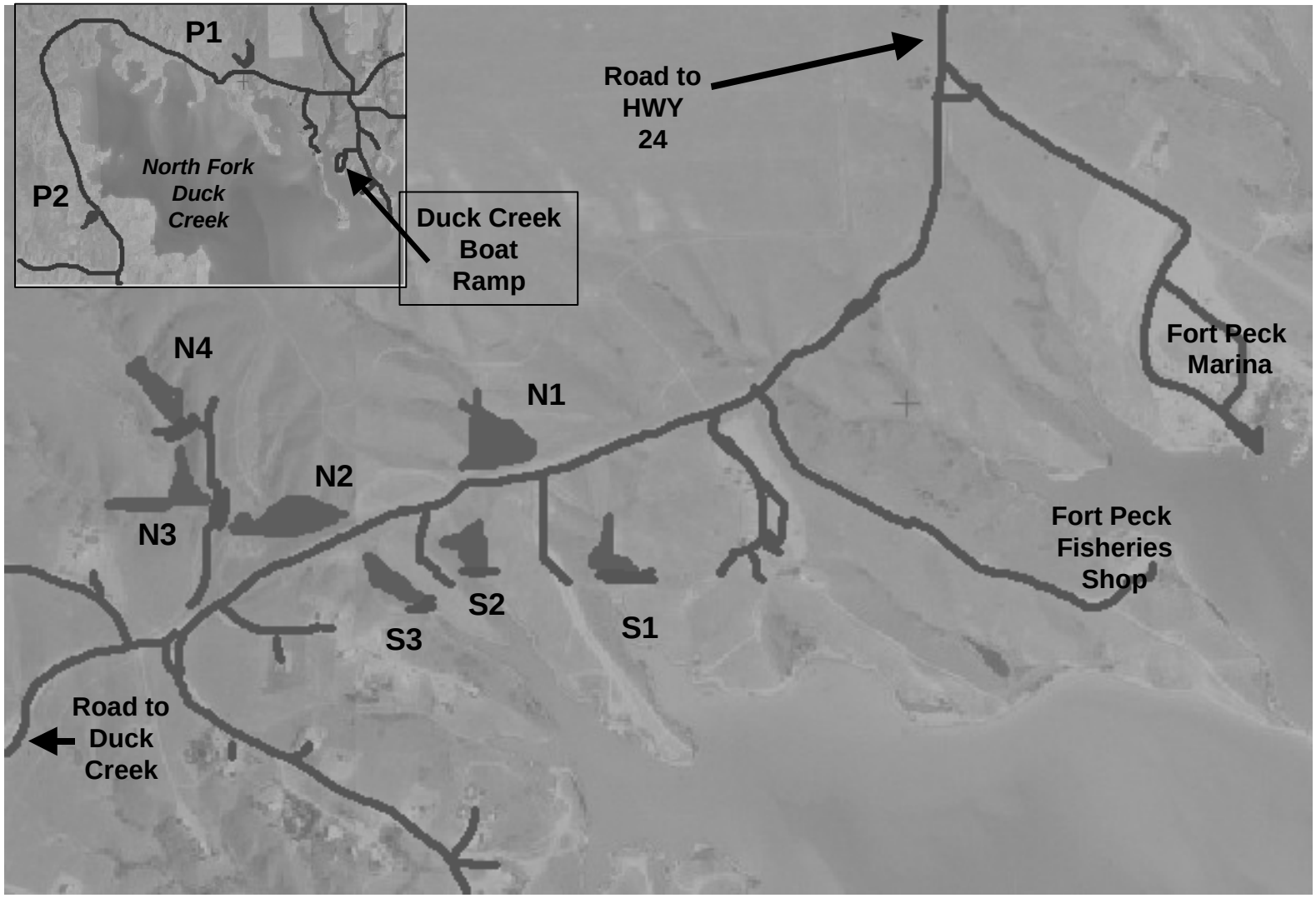


Figure 10. Location of Fort Peck Rearing Ponds.

WALLEYE STOCKING

A request to maintain stocking of walleye fingerling at 2 million or the base stock, was made in 2005. The survival of stocks will likely be diminished if drought persists, however the rise in 2006 may aid in survival of stocks in 2007. The reservoir would need to fill an additional 4 feet or more to flood vegetation in 2007. A total of 4.1 million fingerlings and 35.5 million fry were stocked in 2006 (Figures 11 and 12, respectively). Stocking of fry and fingerling occurred throughout the reservoir in areas downstream of Snow Creek and in the Dry Arm (Table 7 and Figure 13). Miles City State Fish Hatchery and Fort Peck Hatchery produced all the walleye stocked in Fort Peck in 2006. The stocking request for Fort Peck was fully met in 2006. The Fort Peck Hatchery was also able to supplement statewide stocking of walleye in 2006. The 2007 request is for 20 million fry and 3 million fingerlings.

STOCKING OF OTHER WARM WATER SPECIES

Smallmouth bass were not stocked in Fort Peck in 2006. A request for 100,000 northern pike fingerlings was placed in 2006; however, only 42,286 fingerlings could be stocked. Eggs should be collected during the 2007 spring spawning operation at Fort Peck to improve culture methods. Eggs for future stocks should come from another source until the problem of poor eye-up is resolved with the Fort Peck pike. The request for 2007 is 100,000 pike fingerling and any unallocated smallmouth bass.

OXYTETRACYCLINE MARKING OF WALLEYE

Walleye fry or fingerlings were not marked in 2006, but plans to single mark fry and double mark fingerlings should be made for 2007 or 2008. Walleye fry used for fingerling production were marked with OTC in 2002, 2003, and 2004. All fingerling stocked in 2004 were marked. Future calculations of marked walleye will have to incorporate 102.9% as a correction factor for the 2003 stocks as not all fingerling were marked. Fry not used for fingerling production in 1999, 2000, and 2001 were marked; therefore fry stocked into the reservoir in those years had a mark. In 1999, 25% were marked and in 2000 and 2001, 100% were marked.

Otoliths were analyzed for OTC marks from walleye collected in the 2001, 2002, 2003, 2004, 2005, and 2006-gill nets. Walleye otoliths from walleye smaller than 20 inches should be collected and examined in 2006 and 2007 for OTC marks. South Dakota again loaned FWP the appropriate scope and UV light source. It was determined by studies in South Dakota (Dave Lucchesi, Per Comm.) marking of fry with a 500-ppm solution provided a poor mark with a 50% non-marking rate. Marking of fry in a 750 ppm solution provided 100% marking based on experimentation in rearing ponds in South Dakota. Results in 1999, 2001 and 2002 could be doubled based on the findings of Luccesi's study. However the only correction in numbers was done for the 1999-year class. In 1999, 25% of the fry stocked were marked; therefore a multiplication factor of 4 is required to assume equal representation of the mark. Fry stocked out from fingerling production in 2002, 2003, and 2004 were marked at 750 ppm. In 2002, the study changed focus from contribution of fry stocks to contribution of fingerling stocks, hence the fry put in rearing ponds were marked and marking of reservoir stocked fry was discontinued.

In 2001, 213 otoliths were examined. All three-year classes present were collected with an average of 27% of all fish examined showing a mark, without any corrections for lost marks or correcting for the 25% marking in 1999. In 2002, 286 otoliths were examined. Four year classes marked were collected with an average of 20% of all fish examined showing a mark, without any corrections for lost marks or 25% marking in 1999. In 2003, 288 otoliths were examined. The 1999 to 2002 year classes were sampled in 2003 however no young of year were examined. In 2003, 39 fish had a mark for an overall 13.5% occurrence. Percent of each marked year class show 1999 has the strongest capture rate of fish marked in the population with 96% in the 2001 sample (Figure 14), 65% in the 2002 sample (Figure 15), 60% in the 2003 samples (Figure 16) when correct for the 25% marked but not for the potential 50% mark retention. If a correction of 50% for mark retention were applied, the walleye in Fort Peck would have nearly a 50% chance of being a fish originally stocked as a fry. The first fingerling returns from 2002 show 12% of that year class are from fingerling stocks.

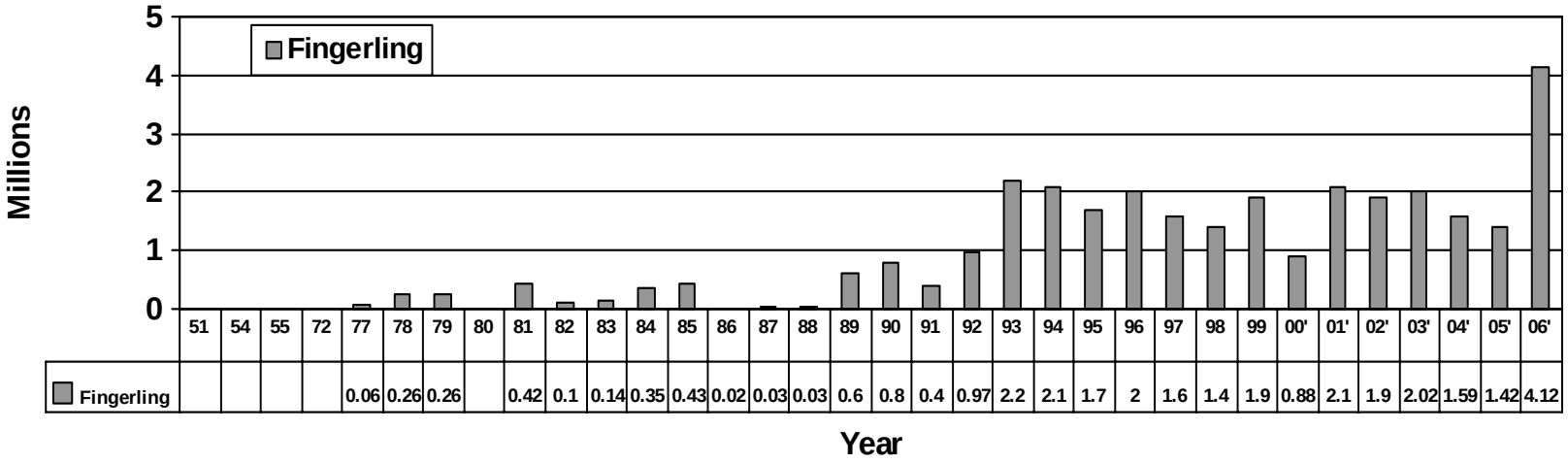


Figure 11. Number of walleye fingerling stocked in Fort Peck annually from 1951 to 2006.

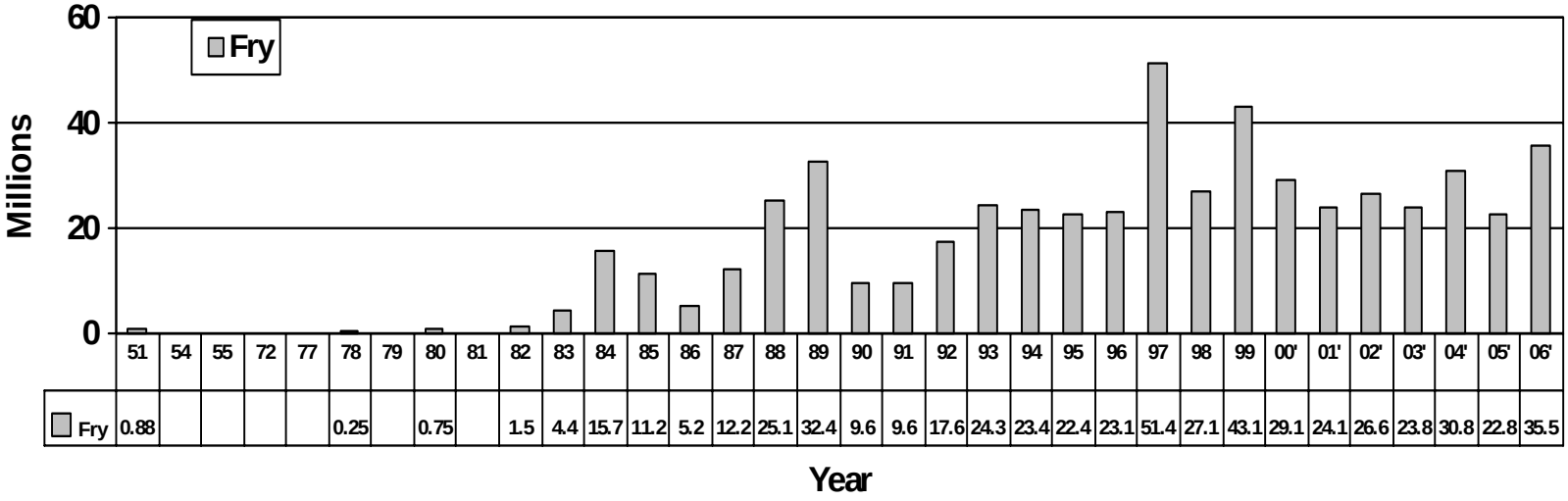


Figure 12. Number of walleye fry stocked in Fort Peck annually from 1951 to 2006.

Table 7. Number of walleye stocked n Fort Peck during 2006 by region, location, and date

Date	Location	Region	Fry	Fingerling	Hatchery
4/26/2006	McGuire Creek	UBD	1,100,000		Miles City
4/28/2006	Lost Creek	UBD	4,000,000		Fort Peck
4/28/2006	Big Bug Creek	UBD	1,500,000		Miles City
5/9/2006	Little Bug Creek	UBD	5,600,000		Fort Peck
6/12/2006	Lost Creek	UBD		85,520	Fort Peck
6/12/2006	Little Bug Creek	UBD		62,199	Fort Peck
6/14/2006	McGuire Creek	UBD		72,796	Fort Peck
6/14/2006	Box Creek	UBD		93,025	Fort Peck
6/14/2006	Boxelder Creek	UBD		93,025	Fort Peck
6/14/2006	Big Bug Creek	UBD		93,024	Fort Peck
5/4/2006	Box Creek	LBD	2,000,000		Fort Peck
5/4/2006	Boxelder Creek	LBD	2,000,000		Miles City
5/11/2006	Sand Arroyo	LBD	1,200,000		Miles City
6/7/2006	Rock Creek Bay	LBD		161,042	Miles City
6/8/2006	Rock Creek Bay	LBD		149,893	Fort Peck
6/9/2006	Bobcat Bay	LBD		72,102	Fort Peck
6/12/2006	Spring Creek	LBD		51,530	Fort Peck
6/12/2006	Sand Arroyo	LBD		60,909	Fort Peck
5/2/2006	Duck Creek	LMA	2,100,000		Fort Peck
5/2/2006	Spillway Bay	LMA	2,100,000		Fort Peck
5/3/2006	Marina Bay	LMA	900,000		Fort Peck
5/12/2006	Duck Creek	LMA	1,400,000		Fort Peck
6/8/2006	N.F. Duck Creek	LMA		168,258	Fort Peck
6/9/2006	Skunk Coulee	LMA		81,364	Fort Peck
6/9/2006	Main Duck Creek	LMA		74,702	Fort Peck
6/9/2006	Bear Creek	LMA		102,651	Fort Peck
6/9/2006	Milk Coulee	LMA		22,518	Fort Peck
6/9/2006	Marina Bay	LMA		72,152	Fort Peck
6/13/2006	N.F. Duck Creek	LMA		73,283	Fort Peck
6/13/2006	Marina Bay	LMA		71,556	Fort Peck
6/13/2006	Sillway Ramp	LMA		77,010	Fort Peck
6/15/2006	Youth Camp Bay	LMA		79,799	Fort Peck
6/15/2006	S.F. Duck Creek	LMA		112,808	Miles City
6/15/2006	Catfish Bay	LMA		83,799	Fort Peck
6/15/2006	Sturgeon Bay	LMA		112,809	Miles City
6/15/2006	Sage Creek	LMA		107,422	Fort Peck
6/15/2006	Haxby Point	LMA		76,878	Fort Peck
6/16/2006	Face of Dam	LMA		93,683	Fort Peck
6/16/2006	Bear Creek	LMA		93,084	Fort Peck
6/16/2006	Spillway Ramp	LMA		65,106	Fort Peck
6/16/2006	Spillway Ramp	LMA		131,250	Fort Peck
6/29/2006	Main Duck Creek	LMA		45,132	Fort Peck
4/29/2006	Pines Bay	MMA	2,850,000		Fort Peck
5/3/2006	Hell Creek Bay	MMA	2,200,000		Miles City
5/8/2006	6th-7th-8th	MMA	6,050,000		Fort Peck
5/16/2006	Hell Creek Bay	MMA	500,000		Miles City
6/6/2006	Cabin Creek	MMA		71,431	Miles City
6/6/2006	Sutherland	MMA		71,431	Miles City
6/6/2006	Snow Creek	MMA		142,862	Miles City
6/8/2006	Hell Creek Bay	MMA		134,673	Miles City
6/13/2006	Pines Bay	MMA		317,765	Fort Peck
6/13/2006	Hell Creek Bay	MMA		207,328	Miles City
6/22/2006	Hell Creek Bay	MMA		141,066	Miles City
6/26/2006	Crooked/Cattle	MMA		97,416	Fort Peck
6/27/2006	Gilbert Creek	MMA		109,770	Fort Peck
6/28/2006	Railroad Bay	MMA		87,468	Fort Peck
	Totals		35,500,000	4,121,539	

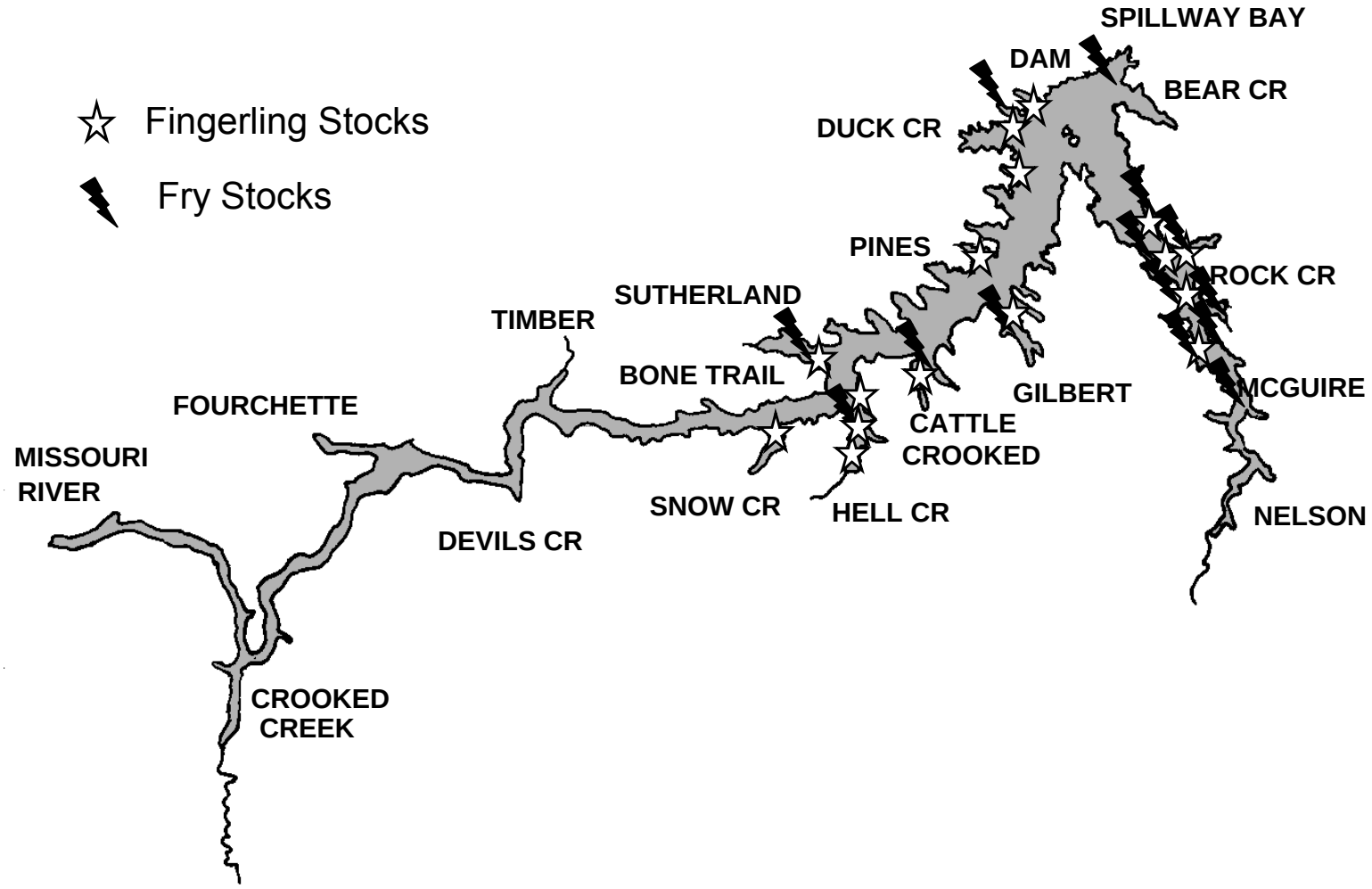


Figure 13. 2006 walleye stocking locations.

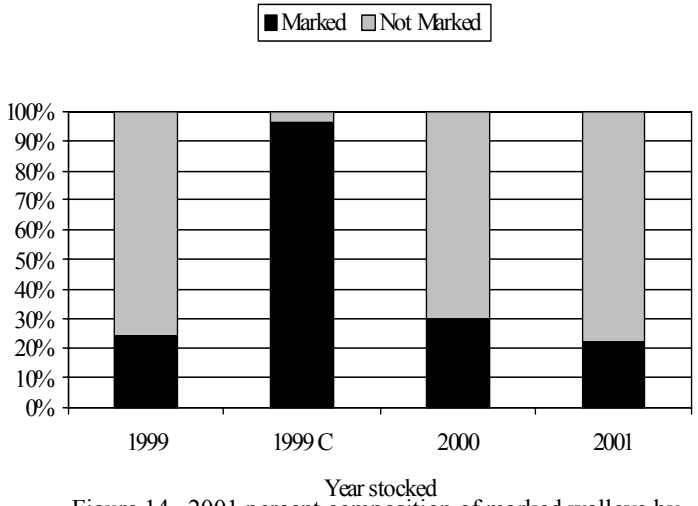


Figure 14. 2001 percent composition of marked walleye by year stocked from fry marking with OTC.

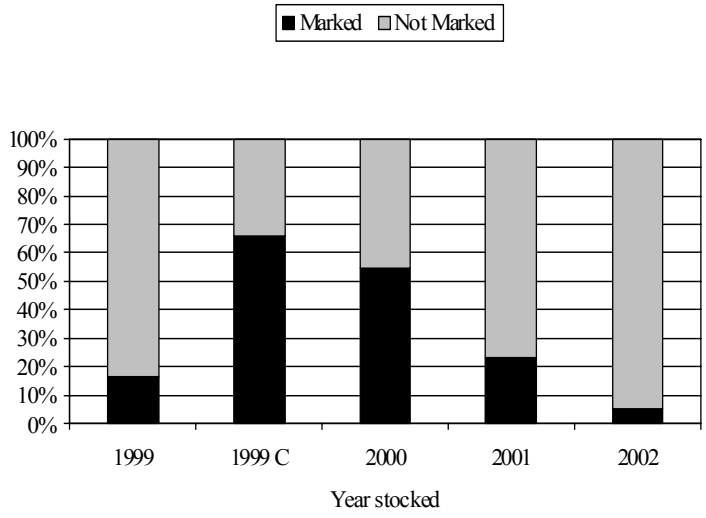


Figure 15. 2002 percent composition of marked walleye by year stocked from fry marking with OTC.

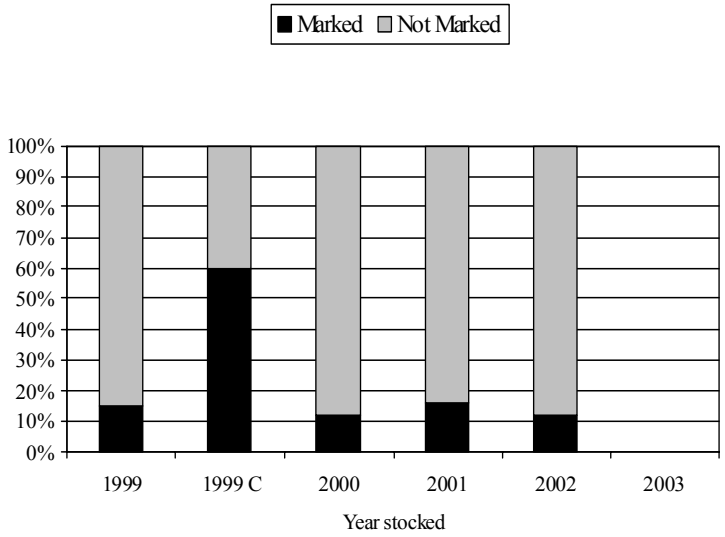


Figure 16. 2003 percent composition of marked walleye by year stocked from fry marking with OTC.

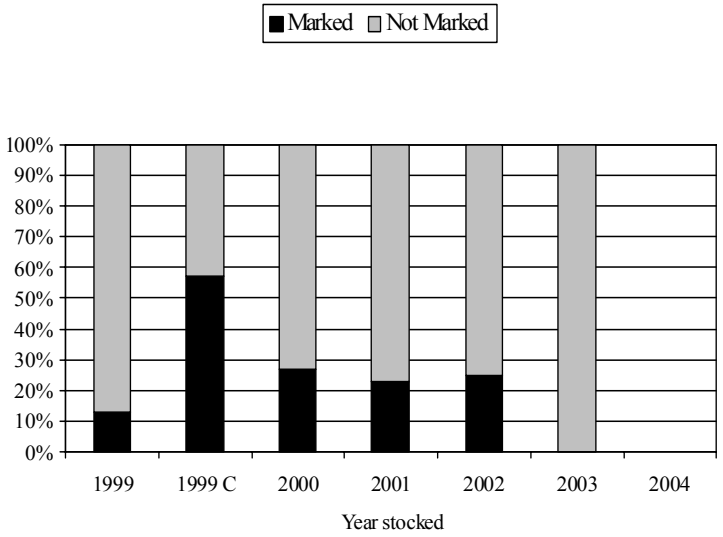


Figure 17. 2004 percent composition of marked walleye by year stocked from fry marking with OTC.

In 2004, 256 otoliths were examined for OTC marks. Six samples were from fish older than 5. All were negative for the mark and should have been, as only fish stocked from 1999 to 2004 should exhibit marks. Of the 250 age appropriate samples, 192 were negative and 58 were positive for OTC marking.

Three-year classes 1999, 2000, and 2001 of marked fry were sampled in 2004 (Figure 17). The 1999-year class had 32 samples with 28 negative and 4 positive for 13% marked. If corrections for 25% initially marked were made the percent would increase to 57% positive. The 2000-year class had 85 samples, with 62 negative and 23 positive for 27% marked. The 2001-year class had 88 samples, with 68 negative and 20 positive for 23% marked. If corrections were made on the assumption that the 500 ppm solution only effectively marked 50% of the fish based on previous studies, the positive percent of fish for 1999, 2000, and 2001 could be as high as 100%, 54%, and 45%, respectively.

Two-year classes of walleye marked as fingerling were sampled, 2002 and 2003. Walleye young-of-year had not been evaluated at the time of this report. One fish from the 2003-year class was sampled, it was negative for OTC. The 2002-year class had 44 samples, with 33 negative and11 positive for 25% positive.

The 2002-year class has recruited more fully into the gill nets in 2004 and based on growth rates should be fully recruited in 2005. Conclusions from 2000 and 2001 fry stocks and the 2002 fingerling stocks indicate potential for the walleye fishery to be composed of 25% fingerling stocks, 50% fry stocks with the remaining 25% resulting from lost marks and/or from natural reproduction. It should also be noted overall recruitment of either stocking type is being conducted in a drought. The effects of the drought each year likely reduces survival of all stocked and natural walleye and may not be similar to contributions of each group under normal or upper decile water management.

In 2005, 250 otoliths were examined for OTC Marks from fish 5 years old and younger; all ages marked are fully recruited to the gear. OTC marks appear to fade around age 4 or 5. All age 0 fish were negative and should have been as none were marked in 2005. Fingerling stocks were marked in 2002, 2003, and 2004, representing age 1 to 3 year old fish. Of the 28 otoliths examined from 1-year-old fish 6 were positive representing 19% of the samples. Of the 89 otoliths examined from 2-year-old fish 17 were positive representing 19% of the samples. Of the 66 otoliths examined from 3-year-old fish 6 were positive representing 9% of the samples. The combined return to gill nets of fingerling marked walleye was 16% of the sampled fish in the appropriate ages. Two-year classes of fish with marks as fry were also examined, the 4 and 5 year old fish. Of the 27 otoliths examined from 4-year-old fish 6 were positive representing 22% of the samples. Of the 8 otoliths examined from 5-year-old fish 7 were positive representing 88% of the samples. The variability of fry stock survivals is understandable as they are likely more susceptible to short and long term environmental fluctuations. Those fluctuations resulting in poor zooplankton abundance would lead to high mortality of fry.

This study has shown fry and fingerlings stocks are an important component of the stocking strategy in Fort Peck with a typical return exceeding 50% of the catchable fish resulting from fry stocks and 25% resulting from fingerling stocks. Natural recruitment is also an important component particularly in the upper Missouri Arm and occasionally from the upper Dry Arm.

Its anticipated the study will be reinitiated in 2007 or 2008 using both the Miles City and Fort Peck Hatcheries to single mark fry and double mark fingerling. Marking was ceased in 2005. The walleye ponds near the COE Campgrounds and Duck Creek ponds should not be used to rear fish for stocking in Fort Peck during the next study phase. The fish from the Fort Peck ponds are more stressed than hatchery fish upon collection. Fresh water cannot be effectively applied to the ponds to maintain preferred temperatures and removal of backstriders is more difficult than in a hatchery. The stress of collection and then holding for 6 hours to immerse the fingerling in OTC solution would likely result in near 100% mortality. Initial plans would include two years of marking followed by 4 years of mark evaluations. This next study will determine relative annual simultaneous contributions of fry and fingerling stocks in combination with natural recruitment. Otoliths will be taken and examined on all deceased gill netted fish greater than 12 inches and less than 20 inches for the duration of the OTC study until 2008. A microscope with the appropriate UV light source is currently being purchases and will be stationed at the Fort Peck Hatchery. The South Dakota scope was used in 2005 and 2006.

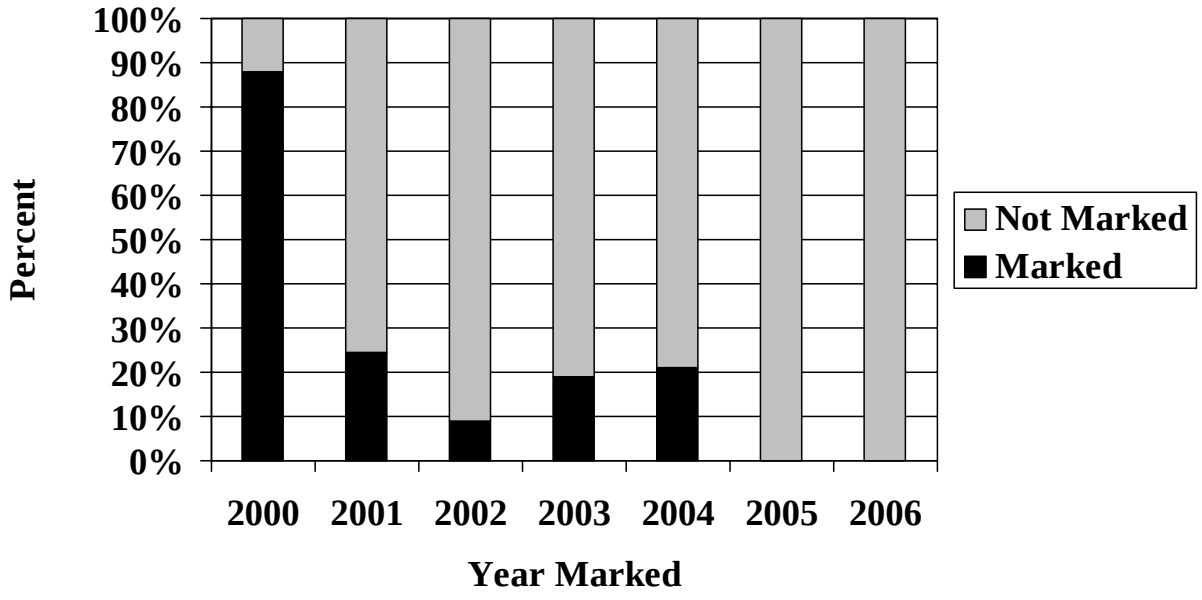


Figure 18. 2006 percent composition of marked walleye in gill nets by year stocked from fry marking with OTC.

LAKE-WIDE GILL NETTING

Eighty-five gill nets were set in various locations throughout the reservoir from July 11th to August 16th, 2006. Gill netting provides information on species distribution, composition, and abundance, walleye condition, and game species stomach contents. Twenty-one species were captured for a total of 2,066 fish (Table 8 and Table 9). Goldeye, channel catfish and walleye were the most abundant species captured overall, with catch rates of 14.2, 2.5, and 2.4 per-net night, respectively. Fish with catch rates equal to or over 1.0 per-net night include: carp, cisco, freshwater drum, northern pike, river carpsucker, and shorthead redhorse. Other less common species include: bigmouth buffalo, black crappie, longnose sucker, paddlefish, pallid sturgeon, smallmouth buffalo, sauger, smallmouth bass, shovelnose sturgeon, white crappie, white sucker and yellow perch.

Walleye

Two hundred seven walleye were captured, measured and weighed. The lake-wide average catch rate was 2.4 walleye per net, which was lower than the catch rates from 2001 through 2004, all ranged between 3 and 4 walleye per net (Figure 19). Average length and weight was 16.2 inches and 2.6 pounds, in 2006 (Table 8). To more easily determine changes in the population five size groups of walleye were used to document contribution of those groups by catch rate. The five groups used are defined by Nielsen, 1989 in Fisheries Techniques and are substock less than 10 inches, stock 10 to 15 inches, quality 15 to 20 inches, preferred 20 to 25 inches, and memorable 25 inches and greater. Trophy size fish are added into the memorable group. It's likely substock fish are not fully recruited to the nets, meaning not all fish less than 10 inches are equally captured. This group of fish is the first indication of potential year class strength based on 2-year-old fish. The 10-15 inch fish are fully recruited to the nets and indicate relatively how many fish are about to enter the angler fishery. In 1981, 1985, 1989, 1992, 1998 and 1999 strong groups of walleye less than 15 inches were apparent with catch rates near 3 per net (figure 19). The combined stock and sub-stock catch rate dropped to 2.0 or less from 2000 to 2006 indicating a decrease in recruitment. Growth begins to accelerate in the quality group, as walleye convert to a cisco diet. In addition, the quality fish seem to move to deeper water in pursuit of cisco and are sampled in smaller proportion then expected. The proportion of walleye over 20 and 25 inches is typically strong despite low numbers of the 15-20 inch quality group. Memorable and larger size fish have exceeded 0.5 walleye per net since 2001 and remain at their highest abundance in Fort Peck's history as a walleye fishery.

Concentrations of walleye were greatest in the upper Big Dry Arm with a catch rate of 4.1 per net (Table 9, Figure 20). The lowest catch rate of 1.1 walleye per-net was documented in the lower Big Dry Arm. The lower Missouri Arm had a catch rate of 1.5 while the middle and upper Missouri Arms had catch rates of 2.1 and 3.5 walleye per-net, respectively. Capture of walleye less than 10 inches was highest in the upper Missouri Arm where it exceeded 1 per net. This area has generally contained more small fish than the other regions. However, in 2001, the Upper Big Dry had the highest catch rate at nearly 9 walleye per-net with the catch being dominated by the 10 to 15 inch fish (Figure 20).

A more detailed examination of length frequency indicated 8 to 14 inch walleye were the most dominate in the catch (Figure 21) but overall catch of any walleye preferred size or smaller have continued to diminish since 1998 (Figure 19).

Relative weights of walleye, greater than 18 inches, showed modest decline from 2005 from nearly 93 to 91(Figure 22). Relative weights for smaller walleye in the 10"to 14" range increased from 79 in 2005 to 84 in 2006 while relative weights remained unchanged at 83 for the 14" to 18" size fish. These were the lowest calculated relative weights since 2000. It is expected relative weights of walleye greater than 20 inches will be maintained over 90 next year. Relative weights in walleye less than 20 inches will likely be maintained over the next year due to higher than expected reproduction of cisco for the 2006 and 2005 year class that were collected at higher than expected rates (Figure 23). However, the limited shoreline forage production in 2004, 2005, and 2006 (Figure 24) will continue to adversely effect walleye recruitment.

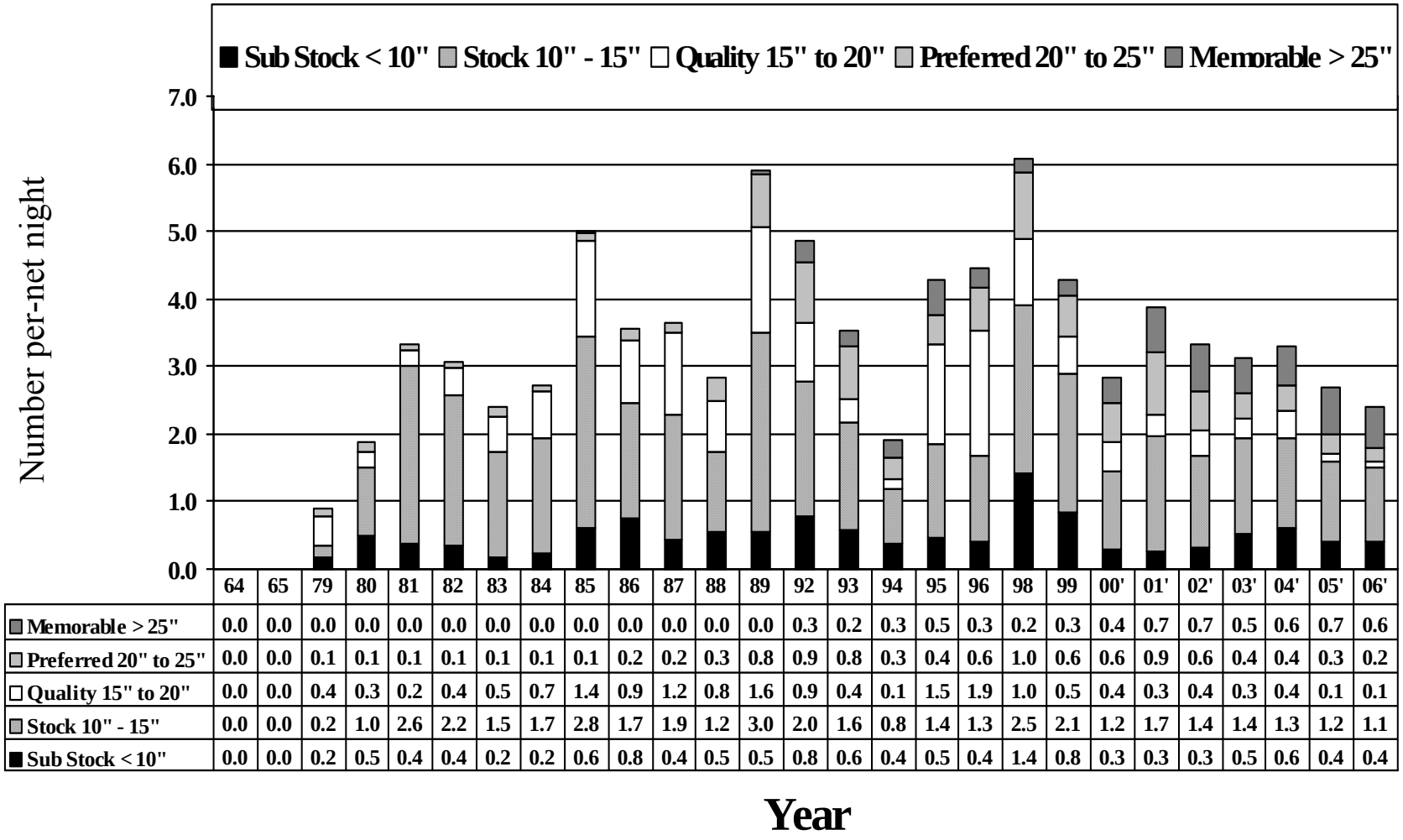
Table 8. Numbers, catch rate, average length and weight of fish captured by gill nets on Fort Peck in 2006 with 85-gill net sets.

Species	Number	CPUE	n	Average Length Inches	Average Weight Pounds
Bigmouth Buffalo	1	0.1	1	28.7	15.0
Black Crappie	5	0.0	5	9.2	0.5
Channel Catfish	215	2.5	215	15.1	1.4
Cisco	83	1.0	83	11.1	0.5
Common Carp	104	1.2	104	18.8	2.8
Freshwater Drum	83	1.0	83	11.1	0.5
Goldeye	1209	14.2	1025	12.0	0.6
♀	*532*	*6.3*	*510*	*12.0*	*0.6*
♂	*327*	*3.8*	*321*	*11.5*	*0.5*
Immature	*220*	*2.6*	*185*	*7.8*	*0.2*
Longnose Sucker	1	0.0	1	15.6	1.7
Northern Pike	108	1.3	108	26.1	5.2
Paddlefish	1	0.0	0	0	0
Pallid Sturgeon	1	0.0	1	12.4	0.2
River Carpsucker	92	1.1	92	19.2	4.2
Smallmouth Buffalo	71	0.8	71	24.1	8.0
Sauger	22	0.3	22	12.3	0.6
Shorthead Redhorse	124	1.5	124	13.3	1.2
Smallmouth Bass	32	0.4	32	11.1	1.1
Walleye	207	2.4	207	16.2	2.6
White Crappie	1	0.0	1	4.8	0.1
White Sucker	43	0.5	43	13.3	1.0
Yellow Perch	61	0.7	61	7.4	0.2
TOTAL	2463	29.0			

Table 9. Fish captured by 125-foot experimental gill nets in Fort Peck Reservoir, 2006.

	UBD[2]		LBD[3]		LMA[4]		MMA[5]		UMA[6]		Total	
Species[1]	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day
BIB									1	0.1	1	0.0
BLC									5	0.3	5	0.1
CCF	40	2.4	12	0.7	1	0.1	20	1.2	142	8.4	215	2.5
CIS	71	4.2	5	0.3	1	0.1	2	0.1	4	0.2	83	1.0
COC	7	0.4	23	1.4	13	0.8	21	1.2	40	2.4	104	1.2
FRD	2	0.1	2	0.1	5	0.3	15	0.9	59	3.5	83	1.0
GOE	178	10.5	87	5.1	134	7.9	145	8.5	665	39.1	1209	14.2
♀	78	4.6	61	3.6	107	6.3	84	4.9	180	10.6	510	6.0
♂	81	4.8	26	1.5	27	1.6	56	3.3	131	7.7	321	3.8
Immature	18	1.1					4	0.2	163	9.6	185	2.2
NOP	27	1.6	18	1.1	30	1.8	17	1.0	16	0.9	108	1.3
PAH	1	0.1									1	0.0
PAS									1	0.1	1	0.0
RIC	40	2.4	16	0.9	5	0.3	8	0.5	23	1.4	92	1.1
SAB	24	1.4	10	0.6	3	0.2	10	0.6	24	1.4	71	0.8
SAR	1	0.1	3	0.2	1	0.1	3	0.2	14	0.8	22	0.3
SHR	5	0.3	25	1.5	10	0.6	25	1.5	59	3.5	124	1.5
SMB	7	0.4	3	0.2	5	0.3	11	0.6	6	0.4	32	0.4
WAE	69	4.1	18	1.1	26	1.5	35	2.1	59	3.5	207	2.4
WHC									1	0.1	1	0.0
WHS	6	0.4	6	0.4	21	1.2	9	0.5	1	0.1	43	0.5
YEP	6	0.4	15	0.9	8	0.5	6	0.4	26	1.5	61	0.7
Total	484	28.5	243	14.3	263	15.5	327	19.2	1146	67.4	2463	29.0
No. Net Days	17		17		17		17		17		85	

[1]See list of fish species for abbreviation definitions.
[2]Upper Big Dry: Nelson Cr., Short Cr., Lone Tree Cr., McGuire Cr., Bug Cr., Lost 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 Crooked Cr., Hell Cr., Sutherland Cr., Snow Cr.
[6]Upper Missouri Arm: Timber Cr., Fourchette Bay, Seven Blackfoot, Crooked Cr.



	64	65	79	80	81	82	83	84	85	86	87	88	89	92	93	94	95	96	98	99	00'	01'	02'	03'	04'	05'	06'
Memorable > 25"	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.5	0.3	0.2	0.3	0.4	0.7	0.7	0.5	0.6	0.7	0.6
Preferred 20" to 25"	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.8	0.9	0.8	0.3	0.4	0.6	1.0	0.6	0.6	0.9	0.6	0.4	0.4	0.3	0.2
Quality 15" to 20"	0.0	0.0	0.4	0.3	0.2	0.4	0.5	0.7	1.4	0.9	1.2	0.8	1.6	0.9	0.4	0.1	1.5	1.9	1.0	0.5	0.4	0.3	0.4	0.3	0.4	0.1	0.1
Stock 10" - 15"	0.0	0.0	0.2	1.0	2.6	2.2	1.5	1.7	2.8	1.7	1.9	1.2	3.0	2.0	1.6	0.8	1.4	1.3	2.5	2.1	1.2	1.7	1.4	1.4	1.3	1.2	1.1
Sub Stock < 10"	0.0	0.0	0.2	0.5	0.4	0.4	0.2	0.2	0.6	0.8	0.4	0.5	0.5	0.8	0.6	0.4	0.5	0.4	1.4	0.8	0.3	0.3	0.3	0.5	0.6	0.4	0.4

Figure 19. Lake-wide contribution of walleye size to gill-net catch by year, 1964 to 2006, walleye were not captured in gill-netting in 1964 or 1965. Gill-nets were not set in 1990, 1991, or 1997.

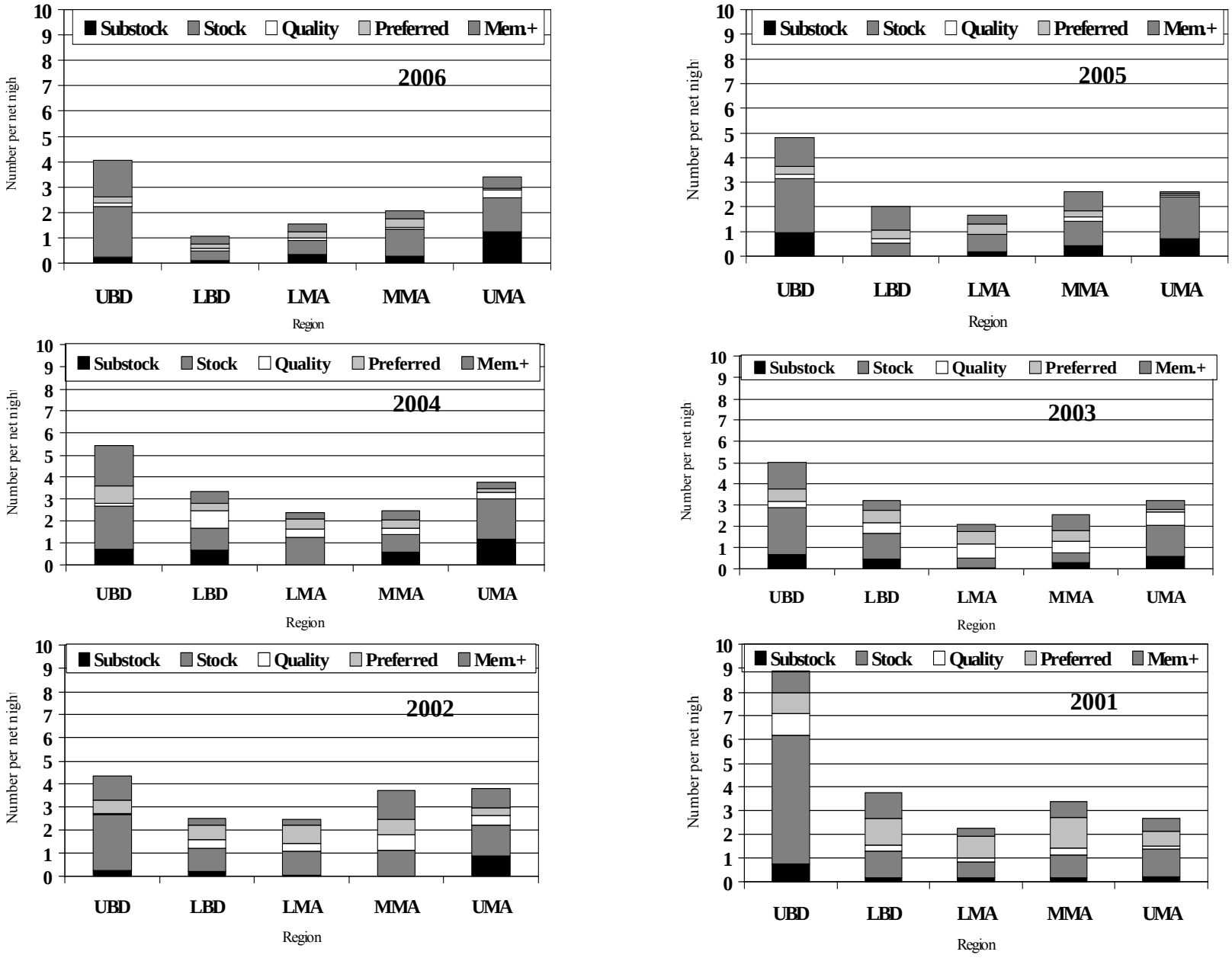


Figure 20. Regional contribution of walleye to gill-net catch from 2001 to 2006 by established length categories.

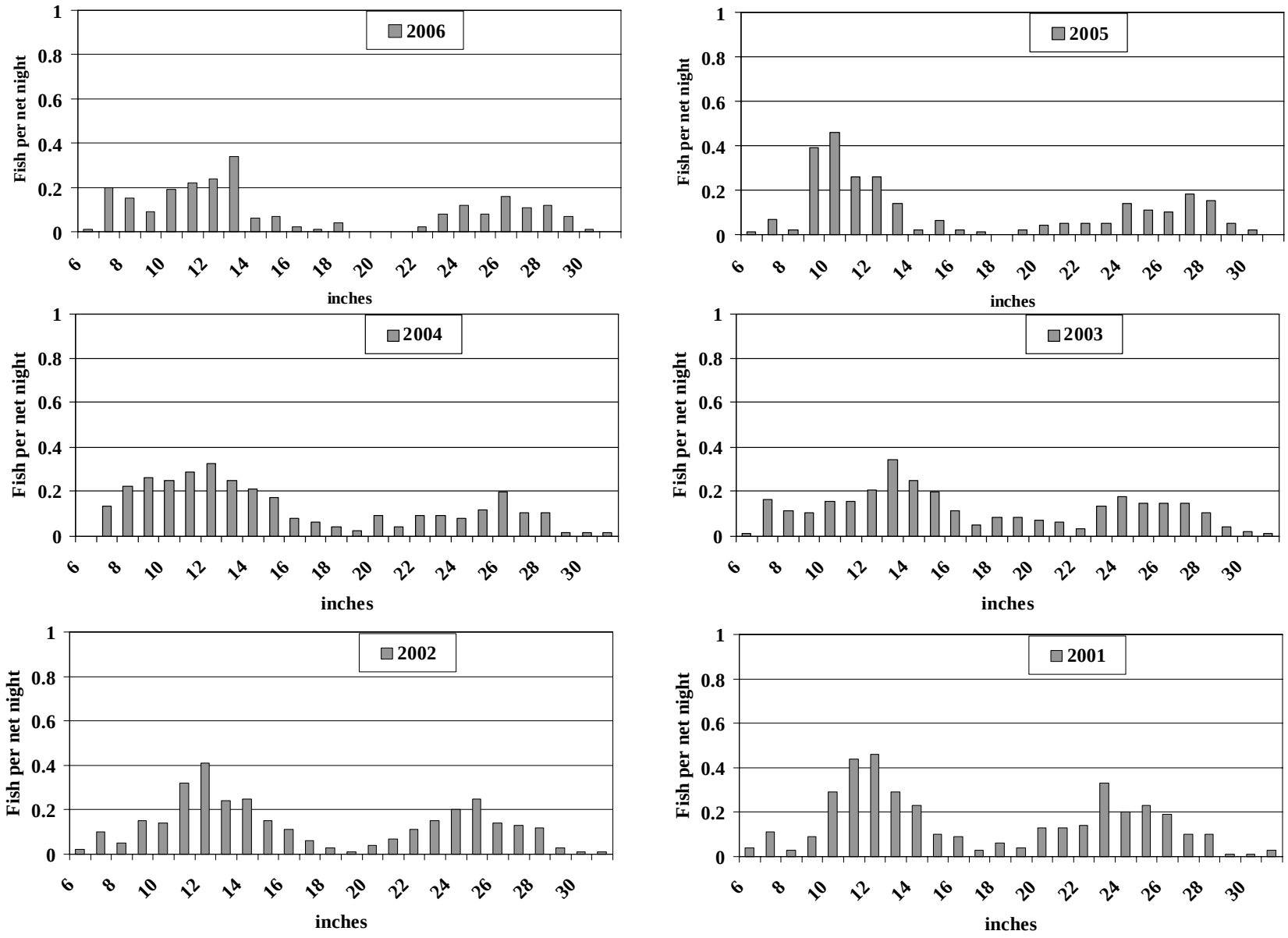
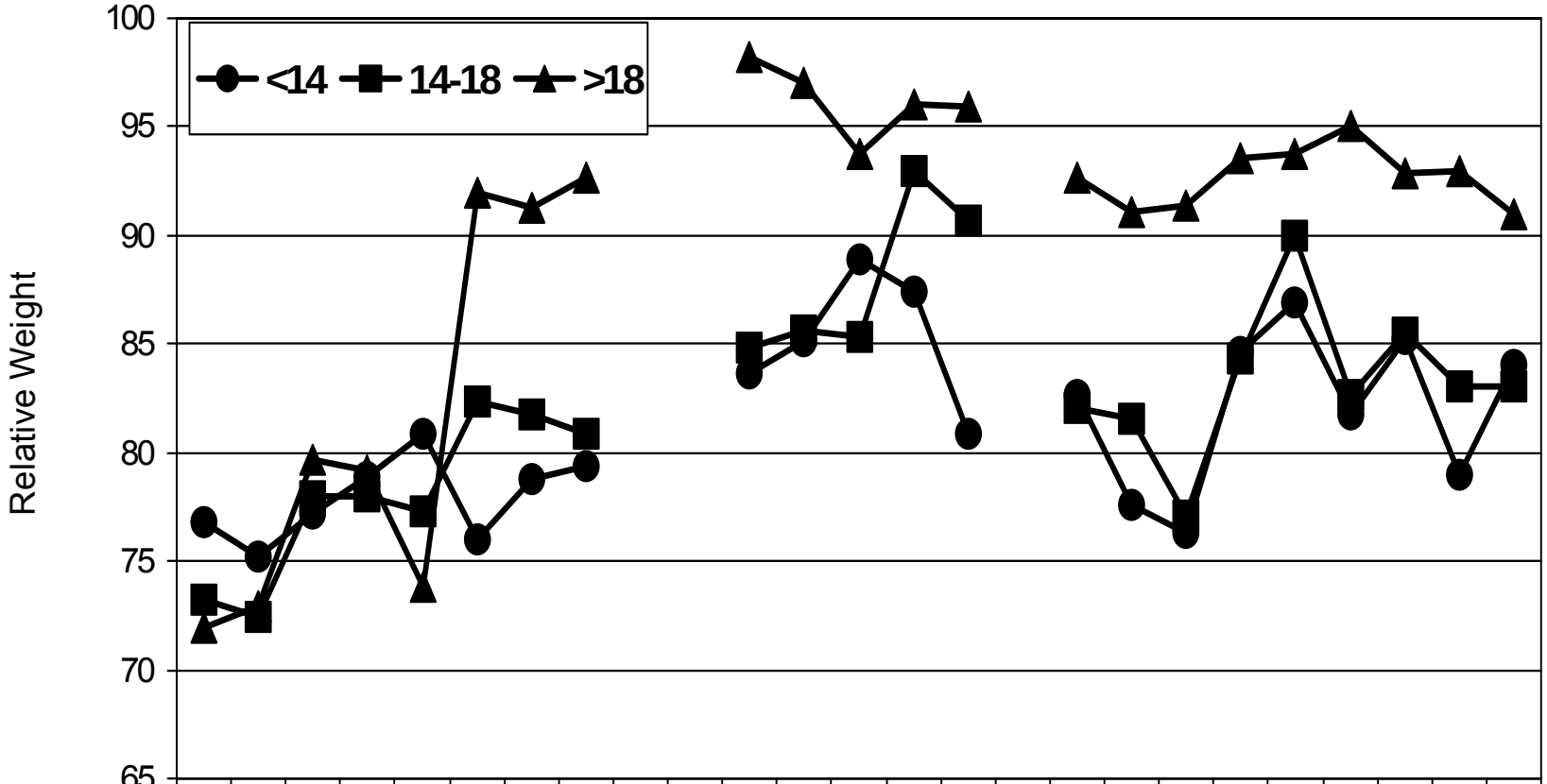
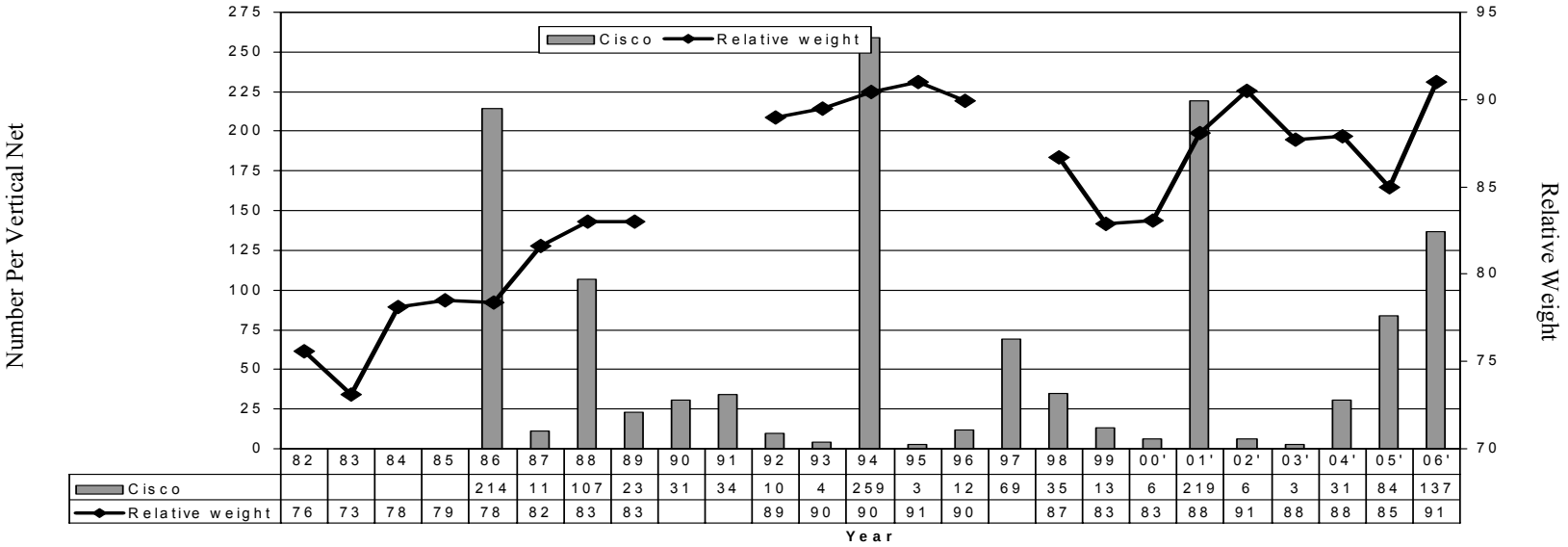


Figure 21. Length Frequencies of walleye gill-netted on Fort Peck Reservoir 2001-2006.



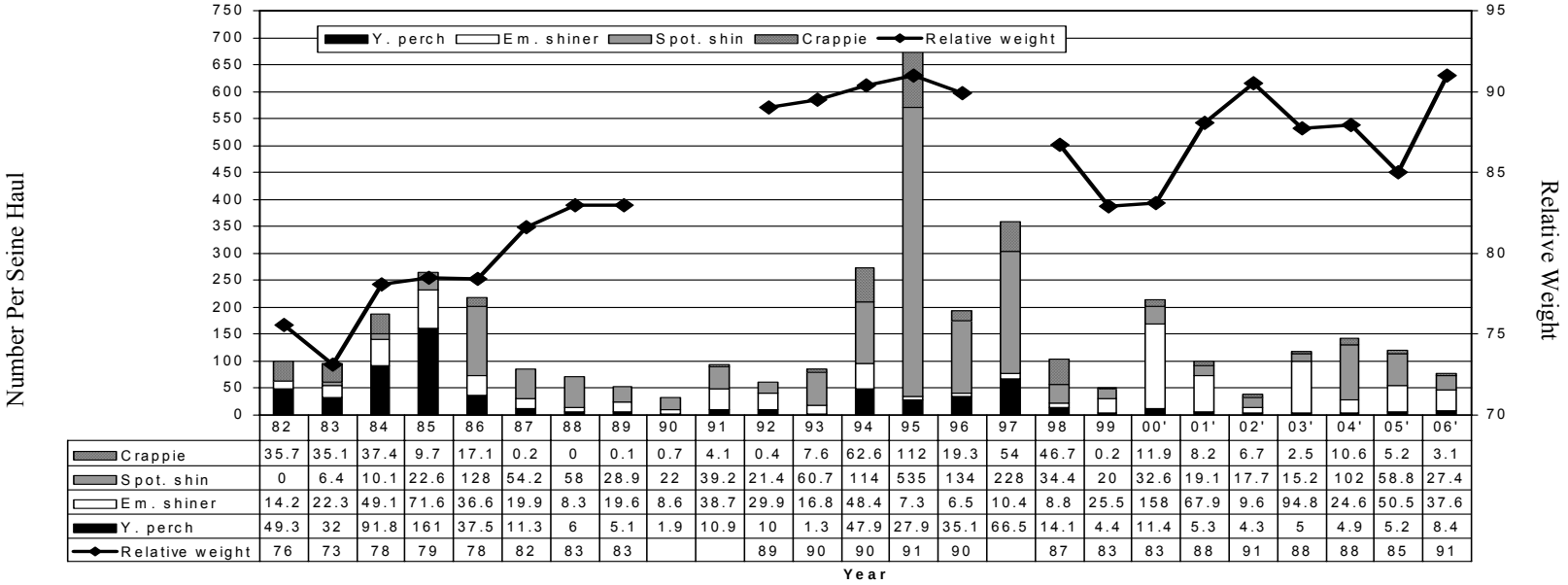
	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
<14	77	75	77	79	81	76	79	79			84	85	89	87	81		83	78	76	85	87	82	85	79	84
14-18	73	72	78	78	77	82	82	81			85	86	85	93	91		82	82	77	84	90	83	86	83	83
>18	72	73	80	79	74	92	91	93			98	97	94	96	96		93	91	91	94	94	95	93	93	91

Figure 22. Relative weights of various length groups of walleye collected with gill-nets on Fort Peck Reservoir, 1982-2006. Gill-nets were not set in 1990, 1991, or 1997.



	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
Cisco					214	11	107	23	31	34	10	4	259	3	12	69	35	13	6	219	6	3	31	84	137
Relative weight	76	73	78	79	78	82	83	83			89	90	90	91	90		87	83	83	88	91	88	88	85	91

Figure 23. Walleye relative weight related to cisco young-of-year production on Fort Peck Reservoir from 1982 to 2006.



	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
Crappie	35.7	35.1	37.4	9.7	17.1	0.2	0	0.1	0.7	4.1	0.4	7.6	62.6	112	19.3	54	46.7	0.2	11.9	8.2	6.7	2.5	10.6	5.2	3.1
Spot. shin	0	6.4	10.1	22.6	128	54.2	58	28.9	22	39.2	21.4	60.7	114	535	134	228	34.4	20	32.6	19.1	17.7	15.2	102	58.8	27.4
Em. shiner	14.2	22.3	49.1	71.6	36.6	19.9	8.3	19.6	8.6	38.7	29.9	16.8	48.4	7.3	6.5	10.4	8.8	25.5	158	67.9	9.6	94.8	24.6	50.5	37.6
Y. perch	49.3	32	91.8	161	37.5	11.3	6	5.1	1.9	10.9	10	1.3	47.9	27.9	35.1	66.5	14.1	4.4	11.4	5.3	4.3	5	4.9	5.2	8.4
Relative weight	76	73	78	79	78	82	83	83			89	90	90	91	90		87	83	83	88	91	88	88	85	91

Figure 24. Walleye relative weight related to major forage fish abundance on Fort Peck Reservoir from 1982 to 2006.

Proportional stock density (PSD) and relative stock density-preferred (RSD-P) are measures of balance for fish populations. The measures are percents of fish captured at substock (<10"), and numbers of fish of each size and larger for stock (> 10"), quality (>15"), and preferred (>20") size fish. Changes in value in each group can be from increases or decreases in recruitment and natural or fishing mortality. In 2004, PSD remained stable, indicating good number of mid-size fish. Anderson and Weithman (1978) models of walleye PSD's suggest a range of 30-60 as favorable values for walleye populations. Since 1984, Fort Peck would have fallen into the favorable category described with a value of 46 in 2006. RSD-P was 39 indicating a greater abundance of stock size walleye, needed for recruitment into the fishery. High values of RSD-P indicate an abundance of larger fish with a small stock size available (Table 10). A ratio between 10 and 20 is considered desirable as a RSD-P for a balanced population. The young to adult ratio (YAR) decreased from 24 in 1999 to 12 in 2000 and to 8 in 2001, with a gradual increase to 23 in 2004 followed by a decrease to 19 in 2005. In 2006, the ratio was 23. A ratio of 20 to 30 would be considered good for YAR. Recruitment appeared to improve in 2005 for the fish less than 10 inches as indicated by the improved number of walleye between 10 and 15 inches in 2006. As anticipated, the YAR remained low in 2001, 2002 and 2003, reservoir levels dropped well below any shoreline vegetation in the spring and summer of 2002 and 2003. It should be expected to see an increase of YAR in 2007 as a result of increased stocking efforts. The improvement may also be a result of slower growing walleye in the past two years, considering the decline in relative weight values from 2000. It may also be a reflection of improved survival in 2004 and 2005 as emerald and spottail shiners and cisco were generally more abundant in 2004 and 2005 than in the previous few years, although they are at minimum acceptable levels. Poor recruitment will likely prevail until shoreline vegetation is covered before fry are stocked, or at minimum, before fingerling are stocked each June, despite the apparent small reprieve from 2004 to 2006.

Northern Pike

A total of 103 northern pike were captured in 2006, by gill netting, for a catch rate of 1.3-per net (Table 11). Overall, the catch rate has continued to drop as a result of limited natural reproduction following several consecutive years of drought conditions (Figure 25). Average length and weight in 2006 was 26.1 inches and 5.2 pounds, which decreased from 2005 as a result of smaller individuals coming into the population. The highest averages were measured in 2002 at 29.5 inches and 7.2 pounds. Less than 19% of the northern pike caught were smaller than 25 inches with the most common inch size being 29 inches containing 10% of the population (Figure 26). Relative weights decreased from in 2006 from100.3 to 98.9, which was the first time they fell below 100 since 1986. The trend of high relative weights should continue, as the population is comprised of large adults feeding on seemingly abundant adult cisco.

Northern pike length categories for stock, quality, preferred, and memorable are 14 inches, 21 inches, 28 inches and 34 inches. Northern pike PSD and RSD-P were 89 and 60, respectively in 2006, a poorly balanced population consisting of large adults and few recruits. In 2005, 2004, 2003, 2002, 2001, 2000, and 1999 PSD was 93, 96, 98, 94, 94, 92, 79, respectively with RSD-P values of 59, 71, 55, 62, 56, 49, and 41, respectively. The YAR remained low at 9% an improvement over the 1% measured in 2002 and 4% in 2005. The low value indicates dismal reproduction. Nine total sub-stock pike were collected in the reservoir in 2006. Seining catch rates for pike YOY were up in 2005 for the Dry Arm that may result in more sub-stock pike recruiting to nets in 2006. If water elevations don't flood vegetation for spawning structure in early spring it is anticipated recruitment will continue to be poor. A stocking 42,286 fingerlings was made in 2006 but did not meet the demand of the requested 200,000 fingerlings. Another request should be placed for 2007 at 100,000 to 200,000 fingerlings.

Channel Catfish

A total of 215 channel catfish were captured in 2006 by gill netting, for a catch rate of 2.5-per net which was a decrease from 3.5 in 2005 (Figure 27, Table 12). Average length and weight increased from 14.3 inches and 1.3 pounds in 2005 to 15.1 inches and 1.4 pounds in 2006 (Table 12). Highest catch rates were in the Upper Missouri Arm at 8.4 and Upper Big Dry at 2.4 per net (Table 9). Catch rates were lower in the other regions ranging from 0.1 to 1.2 per net. Relative weight was 95.1. Catfish PSD, PSD-P, and YAR was 46, 10, and 20 indicating a balanced population with a good number of small fish recruiting at this time.

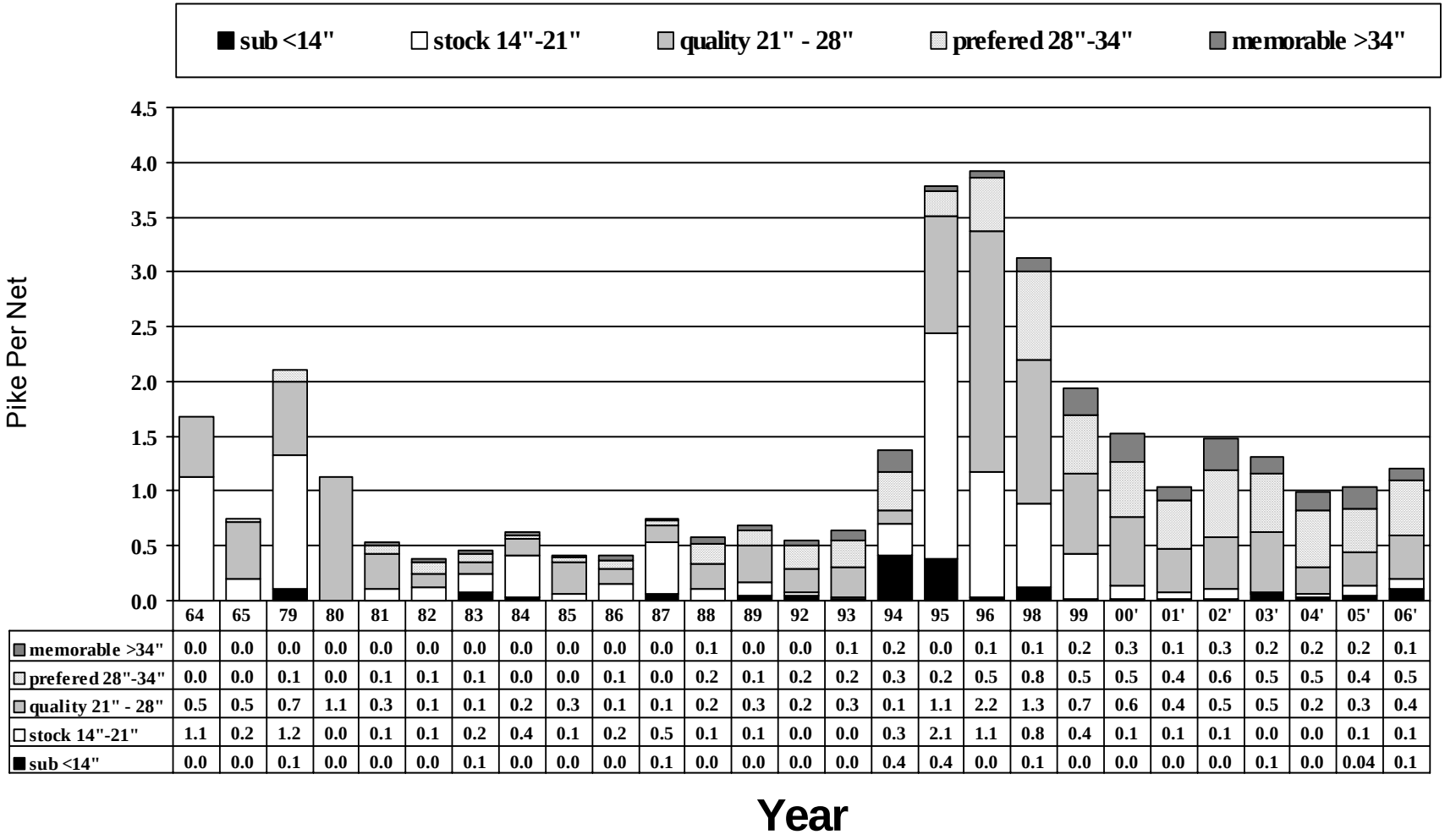
Table 10. Walleye annual lake-wide experimental gill netting statistics of Fort Peck Reservoir, 1984-2006 (no data for 1990-1991 and 1997).

		Net Sets		Average			Sub-						
Year	No.	Total Sets	No./ Net	Length	Weight	rw	Stock	Stock[1]	Quality[2]	Preferred[3]	PSD[4]	RSD-P[5]	YAR[6]
1964	0	23	0.0	-	-	-	-	-	-	-	-	-	-
1965	0	35	0.0	-	-	-	-	-	-	-	-	-	-
1975	43	7	6.1	17.6	1.8	80	0	26	22	6	84	23	0
1976	101	15	6.7	16.8	1.6	82	0	28	19	3	68	11	0
1979	16	18	0.8	14.7	1.1	79	3	13	10	2	77	15	23
1980	15	8	1.9	12.1	0.7	78	4	11	3	1	27	1	36
1981	99	30	3.3	12.0	0.5	74	10	89	10	3	11	3	11
1982	126	42	3.0	13.2	0.7	74	13	113	21	4	20	4	12
1983	202	85	2.4	13.8	0.9	73	16	186	57	12	31	7	9
1984	279	85	3.3	13.9	0.9	78	20	216	68	6	31	3	9
1985	417	87	4.8	13.8	0.9	79	37	380	136	12	36	3	10
1986	176	51	3.5	13.4	0.9	79	37	139	53	9	38	7	27
1987	277	81	3.4	14.3	1.1	81	25	252	110	13	44	5	10
1988	207	75	2.8	14.3	1.2	83	36	171	82	21	48	15	21
1989	404	69	5.9	14.8	1.3	83	36	367	166	58	45	16	10
1992	297	63	4.7	15.8	2.0	88	39	257	132	78	51	30	15
1993	258	74	3.5	15.3	2.0	91	38	219	101	75	46	34	17
1994	139	76	1.8	15.9	2.4	92	23	116	54	43	47	37	20
1995	330	78	4.2	16.6	2.4	91	34	295	189	73	64	25	12
1996	361	82	4.4	16.5	2.1	89	31	327	228	75	70	23	9
1998	418	74	5.6	14.8	1.6	86	79	339	159	89	47	26	23
1999	329	78	4.2	14.4	1.5	90	63	266	108	67	41	25	24
2000	250	88	2.8	16.6	2.3	83	26	224	122	84	54	38	12
2001	272	70	3.9	17.4	2.8	88	19	253	134	112	53	44	8
2002	324	97	3.3	17.4	2.8	90	32	291	159	124	55	43	11
2003	301	96	3.1	17.3	2.8	88	38	263	156	105	59	40	14
2004	250	76	3.3	15.9	2.3	88	47	203	102	73	50	36	23
2005	227	84	2.7	16.3	2.6	85	37	190	88	78	46	41	19
2006	207	85	2.4	16.2	2.6	91	38	168	78	66	46	39	23

[1]Stock is the sum of all walleye greater than 10 inches, [2]Quality is the sum of all walleye greater than 15 inches, [3]Prefered is the sum of all walleye greater than 20 inches, [4]PSD is the proportional stock density (Quality/Stock), [5]RSD-P is the relative stock density, preferred (Preferred/Stock), [6]YAR is the ratio of young to adults (Substock/Stock)

Table 11. A summary of northern pike size, condition and catch rates in 125-foot experimental gill nets of Fort Peck Reservoir from 1983 to 2005.

Year	No. Sampled	Average Length	Average Weight	Average Rel-Wt.	Net Sets Total Sets	Net Sets No./ Set
1983	40	21.2	3.2	95.6	88	0.5
1984	52	20.8	2.4	94.0	84	0.6
1985	36	24.1	3.5	97.8	87	0.4
1986	21	23.7	3.6	94.3	51	0.4
1987	60	19.7	2.3	106.7	81	0.7
1988	43	26.4	5.3	107.0	75	0.6
1989	47	24.4	4.5	110.2	69	0.7
1992	35	26.6	5.5	112.3	63	0.6
1993	47	28.3	6.4	113.9	74	0.6
1994	104	22.6	4.4	107.3	76	1.4
1995	295	20.1	2.5	114.6	78	3.8
1996	321	23.3	3.7	112.8	82	3.9
1998	231	24.7	4.3	104.6	74	3.1
1999	151	26.5	5.1	103.2	78	1.9
2000	134	28.0	6.0	106.5	88	1.5
2001	73	28.6	6.5	110.6	70	1.0
2002	144	29.5	7.2	102.0	97	1.5
2003	126	28.1	6.2	101.1	96	1.3
2004	75	29.1	6.7	100.1	76	1.0
2005	86	28.4	6.5	100.3	84	1.0
2006	103	26.1	5.2	98.9	85	1.3



	64	65	79	80	81	82	83	84	85	86	87	88	89	92	93	94	95	96	98	99	00'	01'	02'	03'	04'	05'	06'
memorable >34"	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.2	0.3	0.1	0.3	0.2	0.2	0.2	0.1
prefered 28"-34"	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.2	0.2	0.3	0.2	0.5	0.8	0.5	0.5	0.4	0.6	0.5	0.5	0.4	0.5
quality 21" - 28"	0.5	0.5	0.7	1.1	0.3	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.3	0.2	0.3	0.1	1.1	2.2	1.3	0.7	0.6	0.4	0.5	0.5	0.2	0.3	0.4
stock 14"-21"	1.1	0.2	1.2	0.0	0.1	0.1	0.2	0.4	0.1	0.2	0.5	0.1	0.1	0.0	0.0	0.3	2.1	1.1	0.8	0.4	0.1	0.1	0.1	0.0	0.0	0.1	0.1
sub <14"	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.04	0.1

Figure 25. Average annual northern pike catch rates in gill-nets from 1964,1965, 1979, and 1980 to 2006. Gill-nets were not set in 1990, 1991, and 1997.

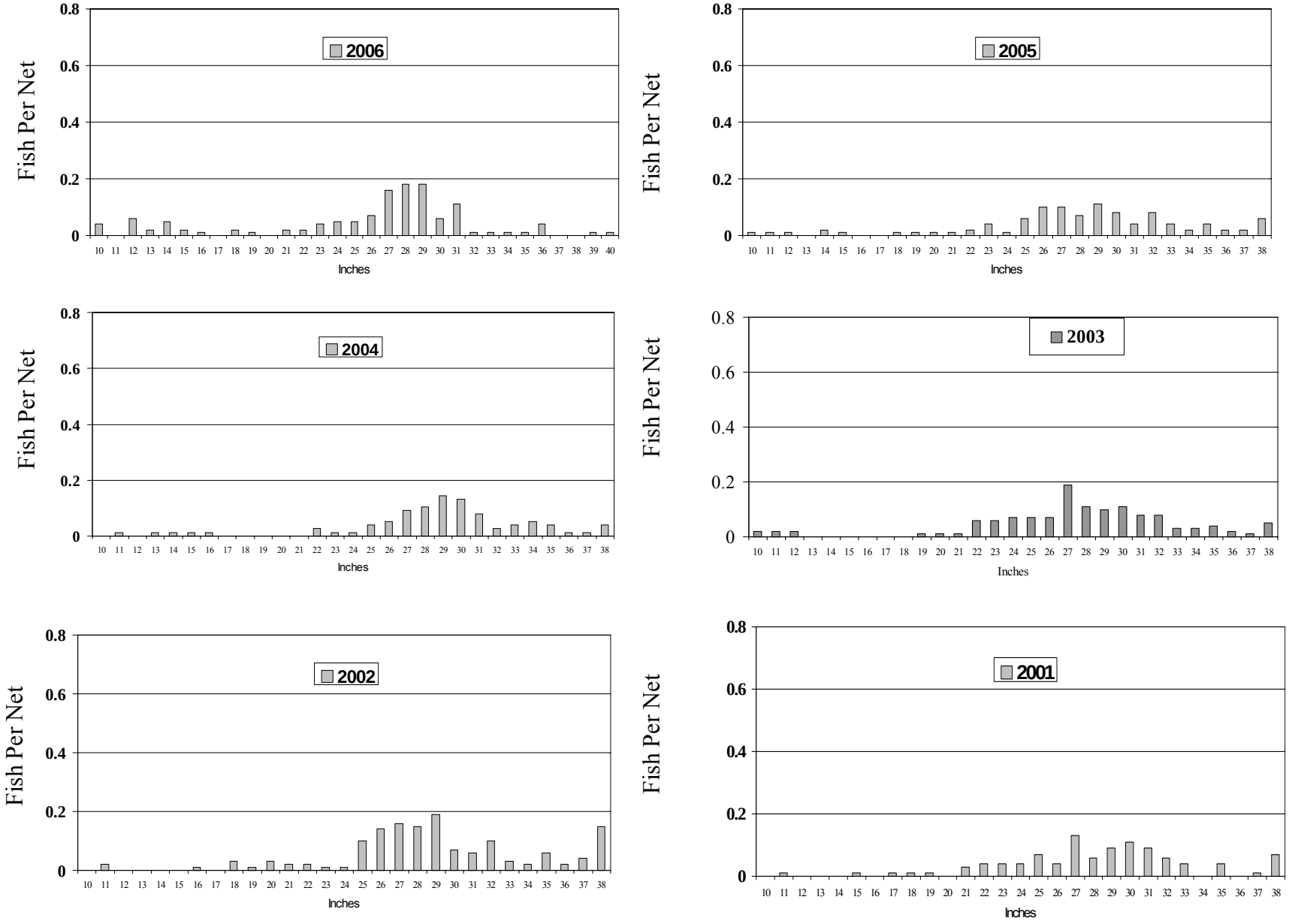
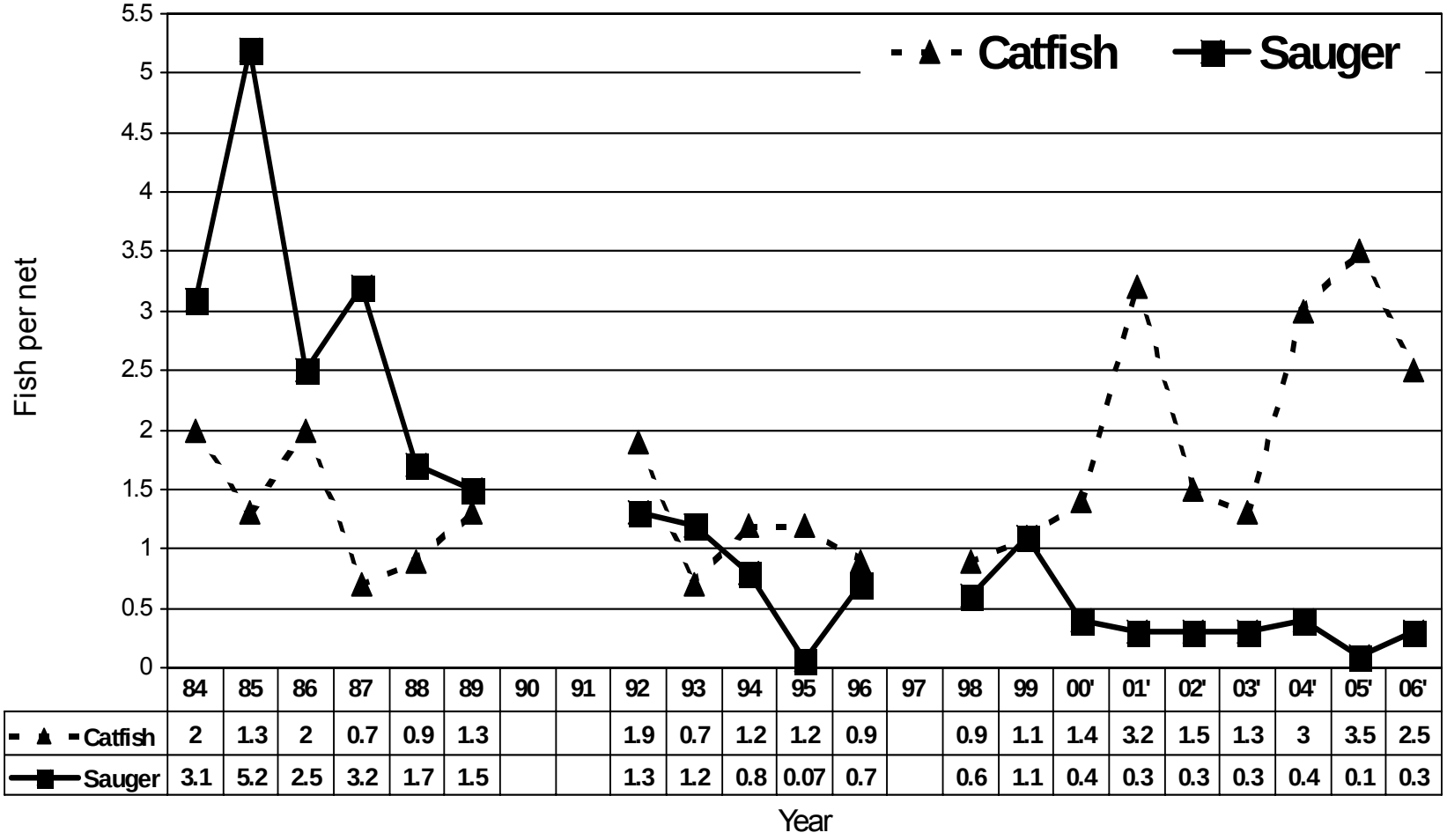


Figure 26. Length frequency of northern pike gill-netted on Fort Peck from 2000 to 2006.



	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
Catfish	2	1.3	2	0.7	0.9	1.3			1.9	0.7	1.2	1.2	0.9		0.9	1.1	1.4	3.2	1.5	1.3	3	3.5	2.5
Sauger	3.1	5.2	2.5	3.2	1.7	1.5			1.3	1.2	0.8	0.07	0.7		0.6	1.1	0.4	0.3	0.3	0.3	0.4	0.1	0.3

Figure 27. Channel catfish and sauger catch rates in lake-wide gill netting from 1984 to 2006. Gill nets were not set in 1990, 1991, and 1997.

Table 12. Summary of the channel catfish caught during summer gill-netting in areas of Fort Peck Reservoir, 1984-2006.

Year	Number	No./Net	Average Length	Average Weight
1984	167	2.0	14.2	0.9
1985	115	1.3	14.5	1.1
1986	105	2.0	14.6	1.1
1987	53	0.7	15.3	1.2
1988	69	0.9	15.9	1.7
1989	99	1.4	16.5	1.5
1992	165	2.6	15.0	1.4
1993	68	0.9	14.9	1.4
1994	119	1.6	14.4	1.1
1995	123	1.6	16.3	1.6
1996	93	1.1	15.6	1.4
1998	91	1.2	18.0	2.3
1999	88	1.1	17.2	2.0
2000	122	1.4	17.5	2.0
2001	222	3.2	17.6	2.1
2002	145	1.5	18.0	2.1
2003	129	1.3	17.6	2.1
2004	227	3.0	15.7	1.8
2005	297	3.5	14.3	1.3
2006	215	2.5	15.1	1.4

Sauger

Sauger numbers have declined in Fort Peck Reservoir in 1986 and remained low since (Figure 27). Gill net data from 1984 to 2006 shows a steady decline since a peak in 1985; with a catch rate over 5 fish per net. The 2006-catch rate was 0.3 fish per net, which was an increase from 0.1 fish per net in 2005. This population relies on natural reproduction from the Missouri River. Average size of 22 sauger in 2006 was 12.3 inches and 0.63 pounds. The highest catch rate for sauger was found in the upper Missouri Arm with 0.8 fish per net (Table 9). Relative weight of sauger in 2006 was 81.1. PSD, PSD-P, and YAR were 62, 23, and 5, respectively.

STOMACH CONTENTS OF GILLED GAME FISH

Stomachs of 176 walleye, 100 northern pike, 17 sauger, and 5 smallmouth bass killed in experimental gill nets were examined for forage items (Table 13). Walleye and pike had the similar fish dominated diets. Invertebrates were found in walleye and sauger. Cisco were the most commonly identified fish found in the diets of walleye and northern pike at 5% and 19%, respectively. Unknown fish were commonly found items in the diets of walleye, northern pike, sauger and bass with 23%, 16%, 12%, and 20%, respectively. Most unidentified fish are likely cisco, particularly in the larger fish. Most fish had empty stomachs, walleye 60%, northern pike 64%, sauger 82%, and bass 40%. The lack of food items in a gillnetted fish is due to purging of the stomach during stress.

Stomachs of 113 walleye, 33 northern pike, 13 sauger, and one smallmouth bass killed in alternating gill nets were examined for forage items (Table 13). Walleye and northern pike had the most diverse diets with unidentified fish being the most common item at 29% and 9%, respectively. Cisco represented the other large portion of the northern pike diet and cisco were likely the largest portion of the unidentified fish. Sauger were found with drum, smallmouth buffalo, and unidentified fish in their stomachs.

LAKE-WIDE ALTERNATING NETTING

Multifilament nets were used from 2001 to 2006 with alternating 25 foot panels creating a 125 feet long net consisting of ¾ inch, 1 inch, ¾ inch, 1 inch, and ¾ inch panels. The purpose of this modified experimental gill net was to capture walleye less than 15 inches. The intent of the gear was to replace the monofilament net survey, which had dismally poor catch rates, and to obtain information on yearling to 4 year-old walleye. The intent of the smaller mesh was to increase sample size of potentially OTC marked walleye. Information from this net may lead to a method to better evaluate recruitment of year classes based on changing stocking rates. Most walleye less than 20 inches were sacrificed so collection of otoliths could be conducted for OTC evaluation. It is important to remember this netting has occurred only in the drought, it will be interesting to see how this tool works when reservoir levels and productivity increase. It's expected many more small walleye, pike, perch, and possibly young salmon will be collected.

Thirty-five nets captured 1,074 fish representing 17 species, for a catch rate of 30.7 fish per set. Goldeye, walleye, and yellow perch were the most abundant species captured with catch rates of 17.7, 3.5, and 2.8 fish per net, respectively. Channel catfish, northern pike, shorthead redhorse had catch rates exceeding 1 fish per net-night. The remaining species had catch rates less than 1 fish per net-night (Table 14).

Walleye

One hundred twenty-three walleye were captured with 121 measuring less than 15 inches. Two were over 22 inches. Therefore, 98% of all walleye captured were target size walleye. The net was effective. Average length and weight was 10.8 inches and 0.5 pounds, respectively. The length frequency histogram indicates a strong size group of fish exists between 9 and 11 inches, representing 2 and possibly 3-year-old walleye (Figure 28). The average relative weight was 87. The ranges for PSD and YAR don't apply to this type of netting as it was designed to increase catch of small fish and limit the number of larger fish.

Table 13. The percentage of various forage items found in stomachs of northern pike, sauger, walleye and smallmouth bass in 2006.

	Game Species							
	WAE SMB	WAE	NOP	NOP	SAR	SAR	SMB	
Net type[1]	Exp.	Alt.	Exp.	Alt.	Exp.	Alt.	Exp.	Alt.
Stomach #=s	176	113	100	33	17	13	5	1
Forage items								
Cisco	5%	---	19%	9%	---	---	---	---
Common Carp	---	2%	---	3%	---	---	---	---
Emerald Shiner	1%	2%	---	3%	---	---	---	---
Freshwater Drum	---	---	---	---	---	8%	---	---
Goldeye	1%	---	---	6%	---	---	---	---
Insects	6%	5%	---	3%	---	---	40%	---
Northern Pike	---	---	1%	---	---	---	---	---
Smallmouth Buffalo	1%	---	---	---	6%	8%	---	---
Spottail Shiner	5%	1%	---	---	---	---	---	---
Unidentified fish	23%	29%	16%	9%	12%	8%	20%	---
Yellow Perch	1%	---	---	3%	---	---	---	---
Empty	60%	61%	64%	64%	82%	77%	40%	100%

1 Exp. = Experimental Alt = Alternating

2 Includes dragonfly larvae, hexagenia spp., and chironomid larvae.

Table 14. Fish captured by 125-foot alternating panel nets in Fort Peck Reservoir, 2006.

	UBD[2]		LBD[3]		LMA[4]		MMA[5]		UMA[6]		Total	
Species[1]	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day	No. Fish	No./ Net Day
BLC							1	0.1	3	0.4	4	0.1
CCF	10	1.4	10	1.4			7	1.0	26	3.7	53	1.5
CIS	15	2.1	5	0.7	1	0.1	5	0.7	2	0.3	28	0.8
COC	3	0.4	7	1.0	2	0.3	2	0.3	11	1.6	25	0.7
FRD					3	0.4			9	1.3	12	0.3
GOE	43	6.1	51	7.3	47	6.7	109	15.6	368	52.6	618	17.7
♀	21	3.0	37	5.3	30	4.3	46	6.6	64	9.1	198	5.7
♂	22	3.1	14	2.0	14	2.0	35	5.0	35	5.0	128	3.7
Immature							28	4.0	100	20.0	120	3.4
LOS									1	0.1	1	0.0
NOP	6	0.9	12	1.7	10	1.4	6	0.9	7	1.0	41	1.2
RIC			2	0.3			1	0.1			3	0.1
SAB			1	0.1					1	0.1	2	0.1
SAR			2	0.3			3	0.4	10	1.4	15	0.4
SHR							4	0.6	37	5.3	41	1.2
SMB									3	0.4	3	0.1
WAE	20	2.9	15	2.1	7	1.0	25	3.6	56	8.0	123	3.5
WHC							2	0.3	3	0.4	5	0.1
WHS					2	0.3	1	0.1			3	0.1
YEP	6	0.9	11	1.6	4	0.6	45	6.4	31	4.4	97	2.8
Total	103	14.7	116	16.6	76	10.9	211	30.1	568	81.1	1074	30.7
No. Net Days	7		7		7		7		7		35	

[1]See list of fish species for abbreviation definitions.
[2]Upper Big Dry: Nelson Cr., Short Cr., Lone Tree Cr., McGuire Cr., Bug Cr., Lost 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 Crooked Cr., Hell Cr., Sutherland Cr., Snow Cr.
[6]Upper Missouri Arm: Timber Cr., Fourchette Bay, Seven Blackfoot, Crooked Cr.

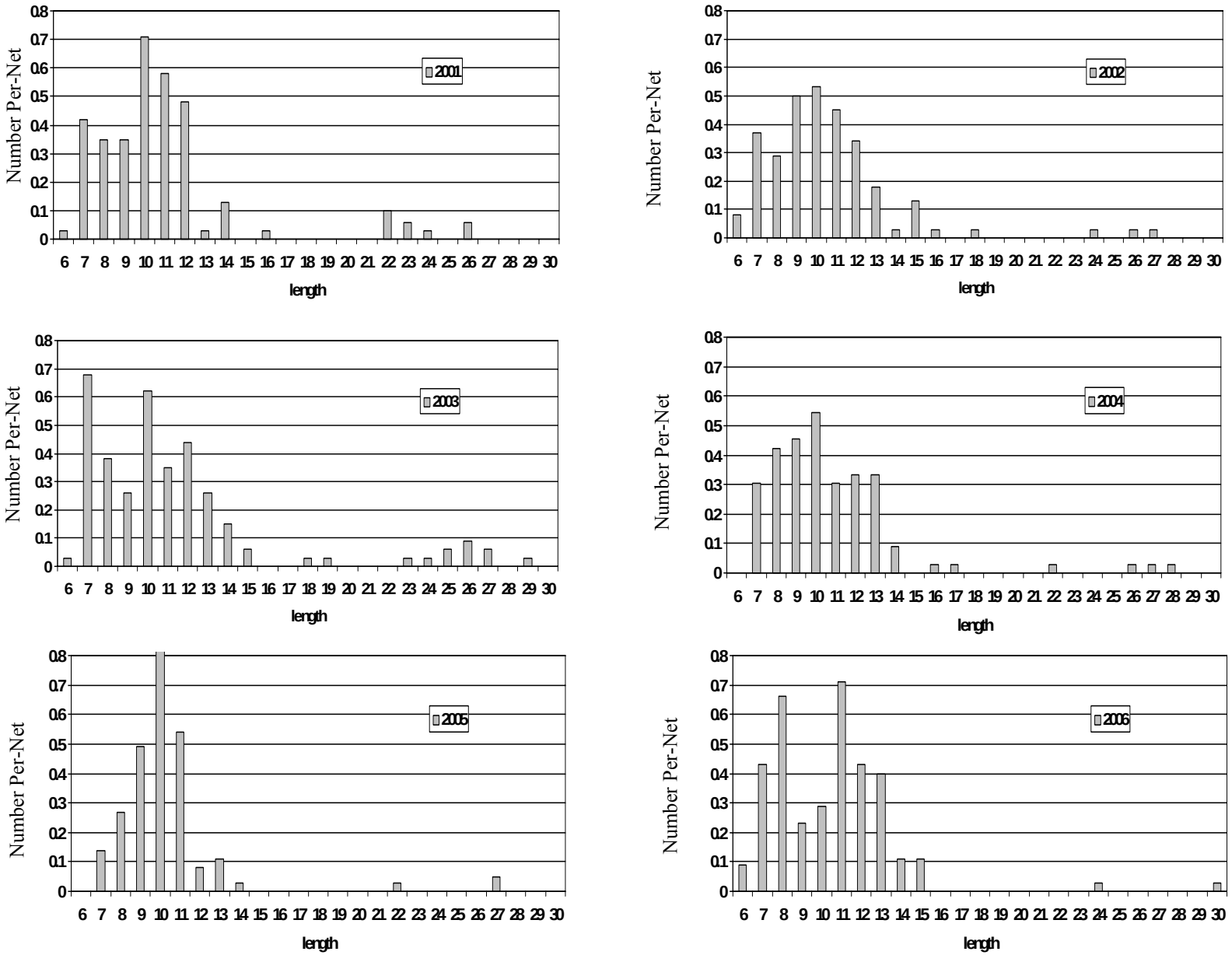


Figure 28. Length frequencies of walleye collected during lake-wide alternating gill-netting on Fort Peck in 2001-2006.

However, with more time to evaluate appropriate values, this may be a good tool to determine if a year class has adequate numbers of fish to provide angler satisfaction. PSD was 8 and the YAR was 64. With time, a relationship of year class strength from alternating nets to experiment nets should develop. This relationship must be measured with adequate samples of aged fish. It will be interesting to see if numbers of small walleye increases in the nets when good recruitment is expected as the reservoir re-fills in the future. Potentially a YAR value above 90 would indicate substantial survival of stocks based on values of 52 to 70 during this drought. The increase in value of the YAR from 52 in 2005 to 64 in 2006 also appeared as a similar trend in the experimental nets. When the drought abates and catches change, evaluation of the alternating and experimental nets should be completed to determine if more experimental net sets and no alternating nets would acquire the same information and reduce the overall gill netting effort. In the experimental nets 139 walleye less than 15 inches for 62% of the catch were collected.

Northern Pike

Forty-one northern pike were captured for a catch rate of 1.2-per net. The range of size from the length frequency shows 6 fish less than 27 inches (Figure 29). This gear may also provide additional insight into northern pike recruitment before they fully recruit to experimental gill nets. Average length, weight, and relative weight were 18.1 inches, 2.5 pounds, and 91.6, respectively. The PSD, RSD-P and YAR with this gear were 52, 83, and 78, respectively. The PSD value for experimental gill net results was 89 rather than 52. The YAR ratio for the experimental nets was only 9% rather than the 78% in the alternating nets. The nets only captured pike of substock size throughout all five regions whereas the experimental captured substock in only in the lower Missouri (7), lower Big Dry Arm (2).

Yellow Perch

This gear also shows promise in following trends in the perch population, as it had a catch rate of 2.8 perch per set compared to a catch rate of 0.7 in experimental nets. This was nearly twice the increase from 1.3 per alternating net that was observed in 2005. The relative abundance of perch present may be related to changes in relative weights of game fish and may be used for future management recommendations. Figure 30 shows most perch in 2001, 2002, and 2004 were between 7 and 7.9 inches, but in 2003 were more abundant between 6 and 6.9 inches. In 2005, the catch rate of all sizes declined from the previous 4 years of sampling. In contrast, during the 2006 season, the number per net increased in all size classes, particularly with those fish in the 5-inch range. Scales were collected from a sub-sample of perch in 2003. Scales were not collected in 2004, 2005, or 2006. Age analysis of perch scales has not been completed at this time.

Other Species

Fifty-three channel catfish were measured with average length, weight, and relative weight calculated at 12.2 inches, 0.62 pounds, and 92, respectively. PSD and YAR of catfish were 12, and 103% indicating a strong year class of catfish may appear in the fishery, particularly in the upper Missouri Arm where most of the substock catfish were captured. Fifteen sauger were captured and measured with average length, weight, and relative weight calculated at 11.8 inches, 0.7 pounds, and 80, respectively. Three smallmouth bass were also captured with average length and weight calculated at 9.0 inches, 0.6 pounds, respectively.

BEACH SEINING

Beach seining was conducted to determine reproductive success of sport and non-sport fish young-of-year, and forage fish (Table 15), and age 1+ sport and non-sport fish (Table 16) from August 8th to September 11th, 2006. Seine hauls at 156 locations captured 22 species for a total of 15,579 fish an average of 98 fish per seine in 2006. The catch rates in 2005, 2004, 2003, 2002, 2001, and 2000 were 188, 161, 258, 75, 114, and 400 fish per seine, respectively. The decrease in shoreline forage essentially follows declines in reservoir elevations (Figure 31). Changes from low elevations in August, the end of a growing season, to the following June high elevation may indicate potential for reproduction (Figure 32). An exception would

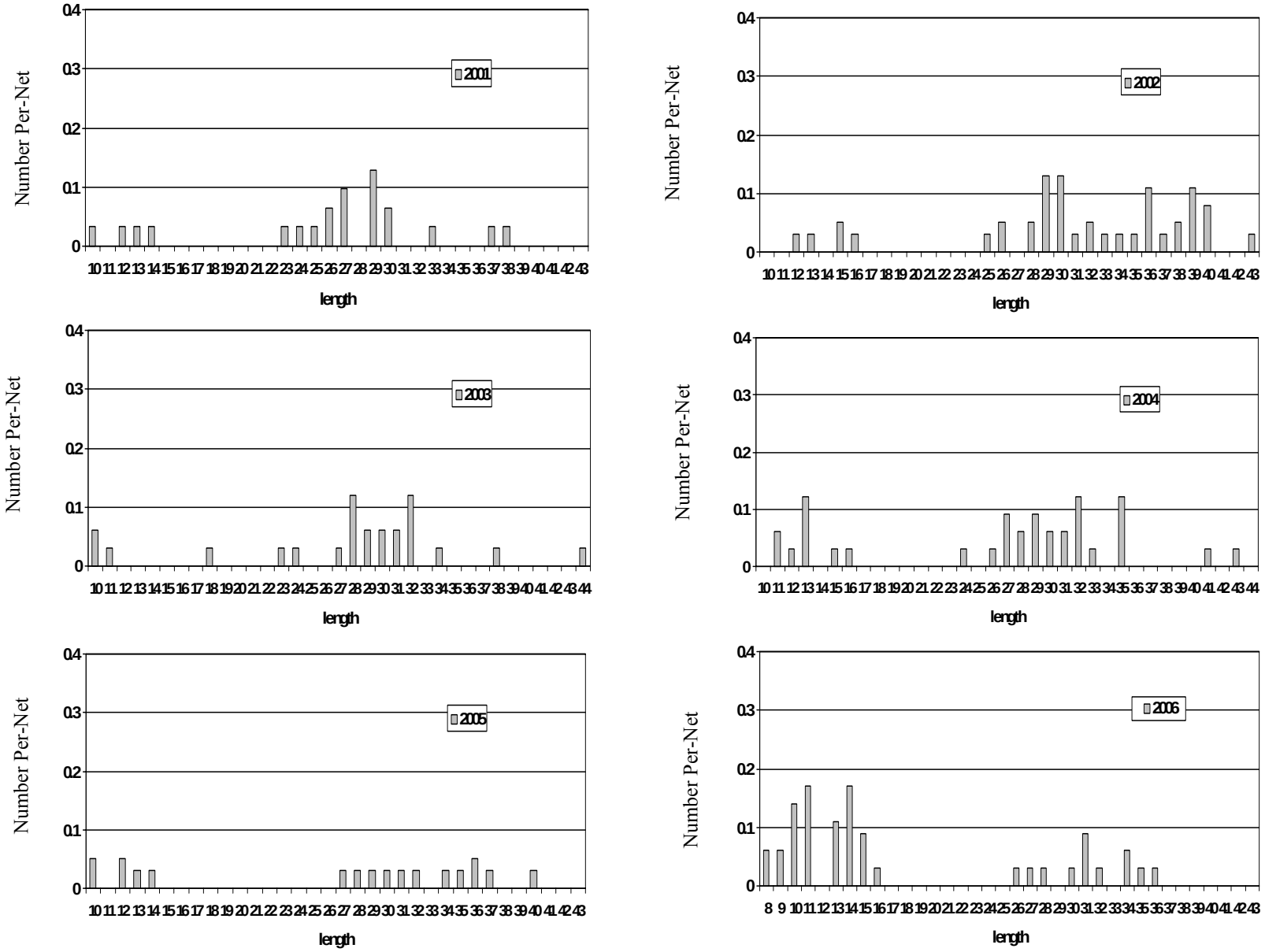


Figure 29. Length frequencies of northern pike collected during lake-wide alternating gill-netting on Fort Peck in 2001-2006.

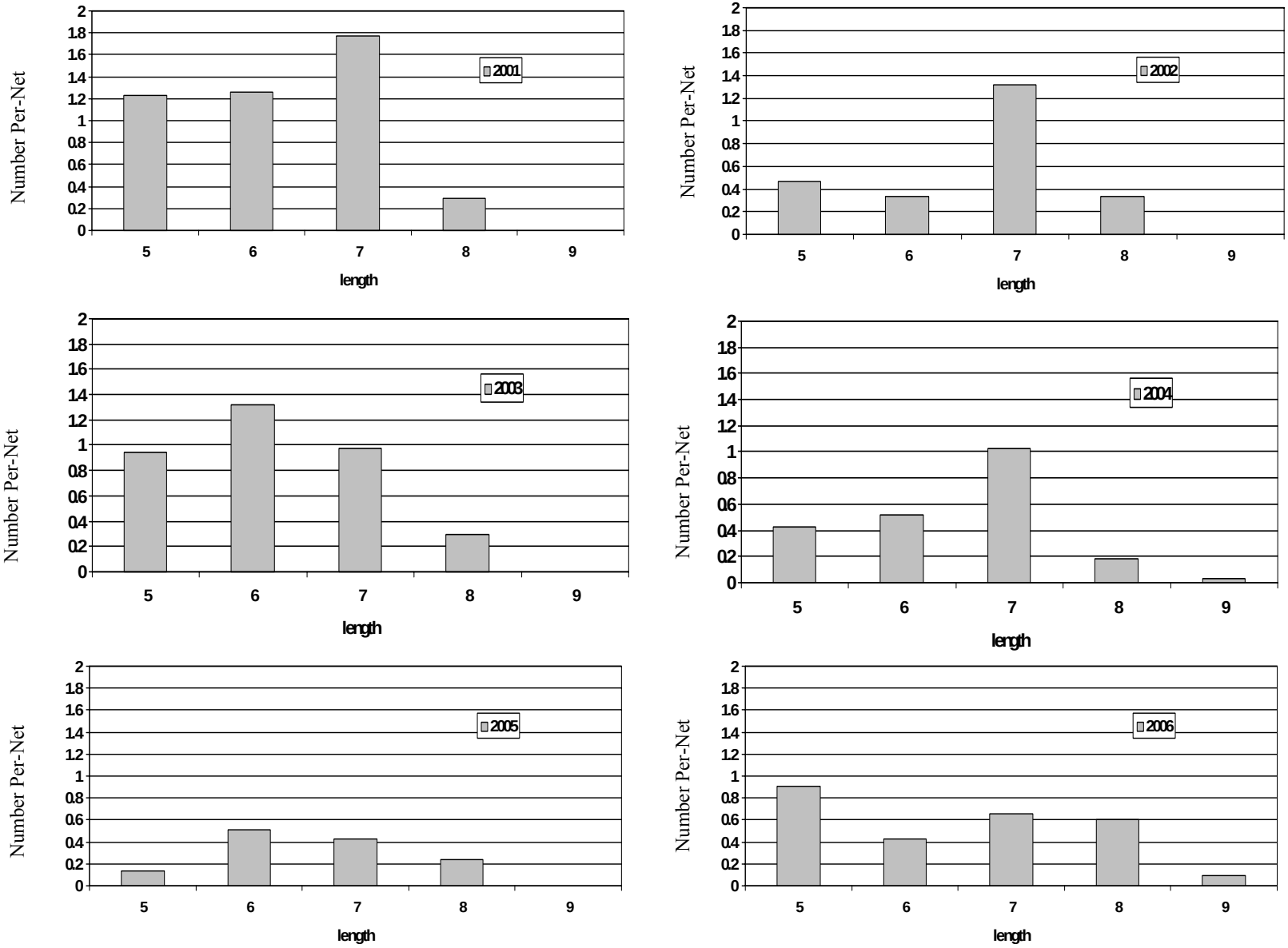


Figure 30. Length frequencies of yellow perch collected during lake-wide alternating gill-netting on Fort Peck in 2001-2006.

Table 15. Species and number of forage minnows and young-of-year fish captured by seining in Fort Peck Reservoir, August 8th to September 11th, 2006.

	Upper Big Dry		Lower Big Dry		Lower Missouri Arm		Middle Missouri Arm		Upper Missouri Arm		Totals	
Species[1]	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul	Fish	Haul
BLB*	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	1	0.0
BRM	0	0.0	2	0.1	0	0.0	0	0.0	0	0.0	2	0.0
CCF*	2	0.1	0	0.0	0	0.0	0	0.0	17	0.6	19	0.1
COC*	2	0.1	9	0.3	2	0.1	8	0.3	4	0.1	25	0.2
CRA*	5	0.4	51	1.5	38	1.2	230	7.4	158	5.3	482	3.1
EMS	585	19.5	659	20.0	498	15.6	2392	77.2	1725	57.5	5859	37.6
FLC	1	0.0	4	0.1	0	0.0	3	0.1	0	0.0	8	0.1
FRD*	8	0.3	5	0.2	31	1.0	16	0.5	68	2.3	128	0.8
GOE*	0	0.0	0	0.0	0	0.0	1	0.0	28	0.9	29	0.2
HBO	1	0.0	1	0.0	0	0.0	30	1.0	2222	74.1	2254	14.4
NOP*	14	0.5	28	0.8	5	0.2	13	0.4	0	0.0	60	0.4
RIC*	3	0.1	4	0.1	0	0.0	1	0.0	3	0.1	11	0.1
SAB*	17	0.6	19	0.6	2	0.1	9	0.3	25	0.8	72	0.5
SAR*	0	0.0	0	0.0	0	0.0	3	0.1	7	0.2	10	0.1
SHR*	0	0.0	0	0.0	1	0.0	0	0.0	2	0.1	3	0.0
SMB*	83	2.8	28	0.8	141	4.4	98	3.2	39	1.3	389	2.5
SPS	428	14.3	860	26.1	625	19.5	2347	75.7	9	0.3	4269	27.4
WAE*	1	0.0	9	0.3	11	0.3	1	0.0	4	0.1	26	0.2
WHS*	0	0.0	7	0.2	0	0.0	0	0.0	0	0.0	7	0.0
YEP*	138	4.6	333	10.1	112	3.5	663	21.4	72	2.4	1318	8.4
Total	1293	43.1	2021	61.2	1468	45.9	5815	187.6	4383	146.1	14980	96.0
Total Hauls	**30**		**33**		**32**		**31**		**30**		**156**	

[1]See list of fish species for abbreviation definitions.

*Denotes young-of-year or small specimens for that species.

Table 16. Species and number of age-1 and older fish captured by seining in Fort Peck Reservoir, August 8th to September 11h, 2006.

	Upper Big Dry		Lower Big Dry		Lower Missouri Arm		Middle Missouri Arm		Upper Missouri Arm		Totals	
Species[1]	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul	No. Fish	No./ Haul
BIB	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	1	0.0
BUR	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	1	0.0
CCF	6	0.2	11	0.3	2	0.1	14	0.5	70	2.3	103	0.7
COC	6	0.2	7	0.2	26	0.8	29	0.9	7	0.2	75	0.5
CRA	0	0.0	0	0.0	2	0.1	3	0.1	0	0.0	5	0.0
FRD	4	0.1	3	0.1	2	0.1	4	0.1	9	0.3	22	0.1
GOE	1	0.0	9	0.3	2	0.1	2	0.1	0	0.0	14	0.1
NOP	0	0.0	4	0.1	9	0.3	8	0.3	2	0.1	23	0.1
RIC	1	0.0	2	0.1	2	0.1	2	0.1	0	0.0	7	0.0
SAB	6	0.2	3	0.1	9	0.3	6	0.2	6	0.2	30	0.2
SAR	0	0.0	0	0.0	0	0.0	1	0.0	6	0.2	7	0.0
SHR	0	0.0	1	0.0	0	0.0	0	0.0	4	0.1	5	0.0
SMB	12	0.4	4	0.1	16	0.5	20	0.6	6	0.2	58	0.4
WAE	0	0.0	1	0.0	0	0.0	0	0.0	1	0.0	2	0.0
YEP	44	1.5	75	2.3	58	1.8	57	1.8	12	0.4	246	1.6
Total	80	2.7	121	3.7	128	4.0	147	4.7	123	4.1	599	3.8
Total Hauls	**30**		**33**		**32**		**31**		**30**		**156**	

[1]See list of fish species for abbreviation definitions.

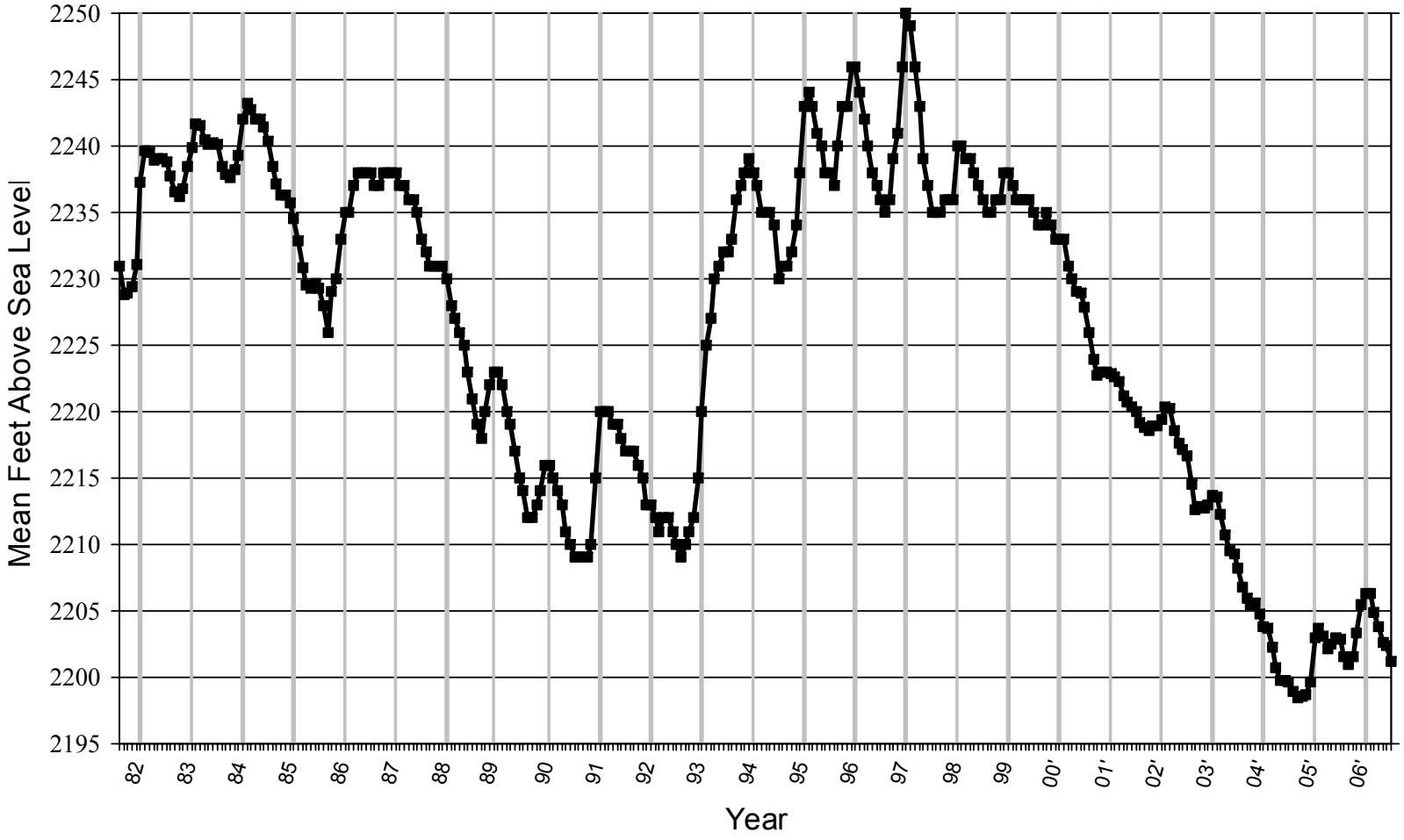


Figure 31. Annual peak monthly elevations on Fort Peck from January 1982 to January 2006. Gray bars indicate June in each year.

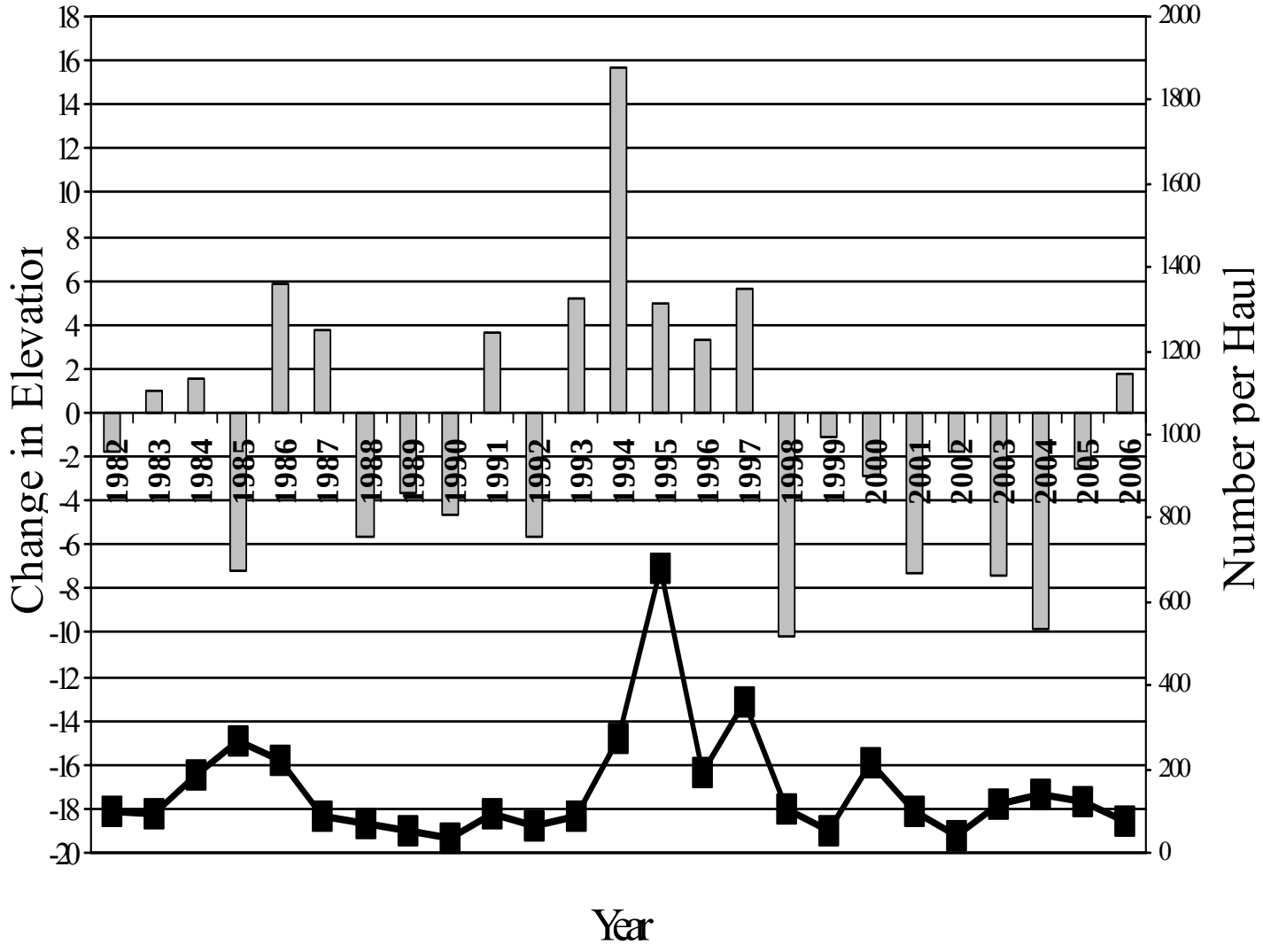


Figure 32. Change in elevation from peak in prior August to low in the following June compared to combined number of yellow perch and crappie young-of-year and total numbers of emerald and spottail shiners from 1982 to 2006.

be the increase in 1986 in Figure 32 as the elevation change was dramatic after June of 1985 to June of 1986 as shown in Figure 31. Changes less than 3 feet above the previous year provide little suitable habitat for forage fish to spawn over and for juveniles to use as cover. In 2006 the reservoir water elevation improved but during the most critical time ample water wasn't present. It was however the first year since 1998 and 2005 with such a significant increase of water in late summer. These conditions may have provided some limited relief to fish for late spawning and rearing habitat. It's also believed tumbleweeds, particularly in the Dry Arm provided spawning structure and cover for northern pike and yellow perch.

Walleye

Walleye fingerling abundance was normal for the last ten years (Table 17). Walleye fingerlings were captured in all regions of the reservoir. The highest catch rates were in the lower Missouri Arm and lower Big Dry Arm with catch rates of 0.3 per seine, respectively. Both the middle Missouri Arm and upper Big Dry Arm had the lowest catch rates with 0.03 fish per seine. A total of 26 walleye fingerlings were caught with a catch rate of 0.2 per seine reservoir wide. Pyloric caecums were counted to identify *Sander spp.* in question.

Sauger

Seven sauger young-of-year were found in the Upper Missouri Arm with a regional catch rate of 0.2 per seine. The overall catch rate was low, at less than 0.1 per seine, 0.2 per seine is a typical value. Only in 1987, 1989, 1993, and 2004 were sauger young-of-year recorded at such a low rate when compared to other years from 1981 to 2006 (Figure 33). Seven age 1 + sauger were captured in Fort Peck, one in the middle Missouri Arm and six in the Upper Missouri Arm (Table 15). Catch rates of adult sauger were less than 0.1 for the middle Missouri Arm and 0.2 in the Upper Missouri Arm and less than 0.1 reservoir-wide.

Northern Pike

Northern pike young-of-year were captured by seine in 2006 with a catch rate of 0.4 per seine. They were captured in all areas except the upper Missouri Arm. The largest catch rate was measured in the lower Big Dry Arm with 0.8 per seine haul. Improvement was also documented in the upper Big Dry Arm with a catch rate of 1.6 per seine. It's believed submerged tumbleweeds that were blown into the reservoir provided spawning habitat. At times during the walleye spawn in 2005 the waters surface was nearly covered by tumbleweeds blown in by high winds. Northern pike were stocked in 2006 to supplement the limited recruitment that was entirely dependant on natural reproduction. Figure 34 shows pike young-of-year numbers overall remain relatively low particularly compared to the 1994 high of 14 per seine. Limited stocking of pike is anticipated in 2007 due to poor recruitment measured in the last 8 years, the available pike should be stocked in the lower and middle Missouri Arms.

Smallmouth Bass

Smallmouth bass continue to be one of the most abundant game species captured in seine hauls with a catch rate of 2.5 per haul in 2006. Seine hauls decreased from 3.8 in 2005 and now closely resemble those during 2002 and 2003 (Figure 34). They were captured in all regions with the highest catch rate per seine was in the lower Missouri Arm with 4.4 fish per haul. The lower and middle Missouri Arms were approximately 3.4 per seine. Overall catch rates of bass are above average for the time period from 1981 to 2005. Smallmouth bass have successfully spread to all areas of Fort Peck. No smallmouth bass were stocked in Fort Peck in 2006. All fingerling represent natural reproduction. Unallocated smallmouth bass stocks should be considered for the upper Missouri Arm in 2007 if available.

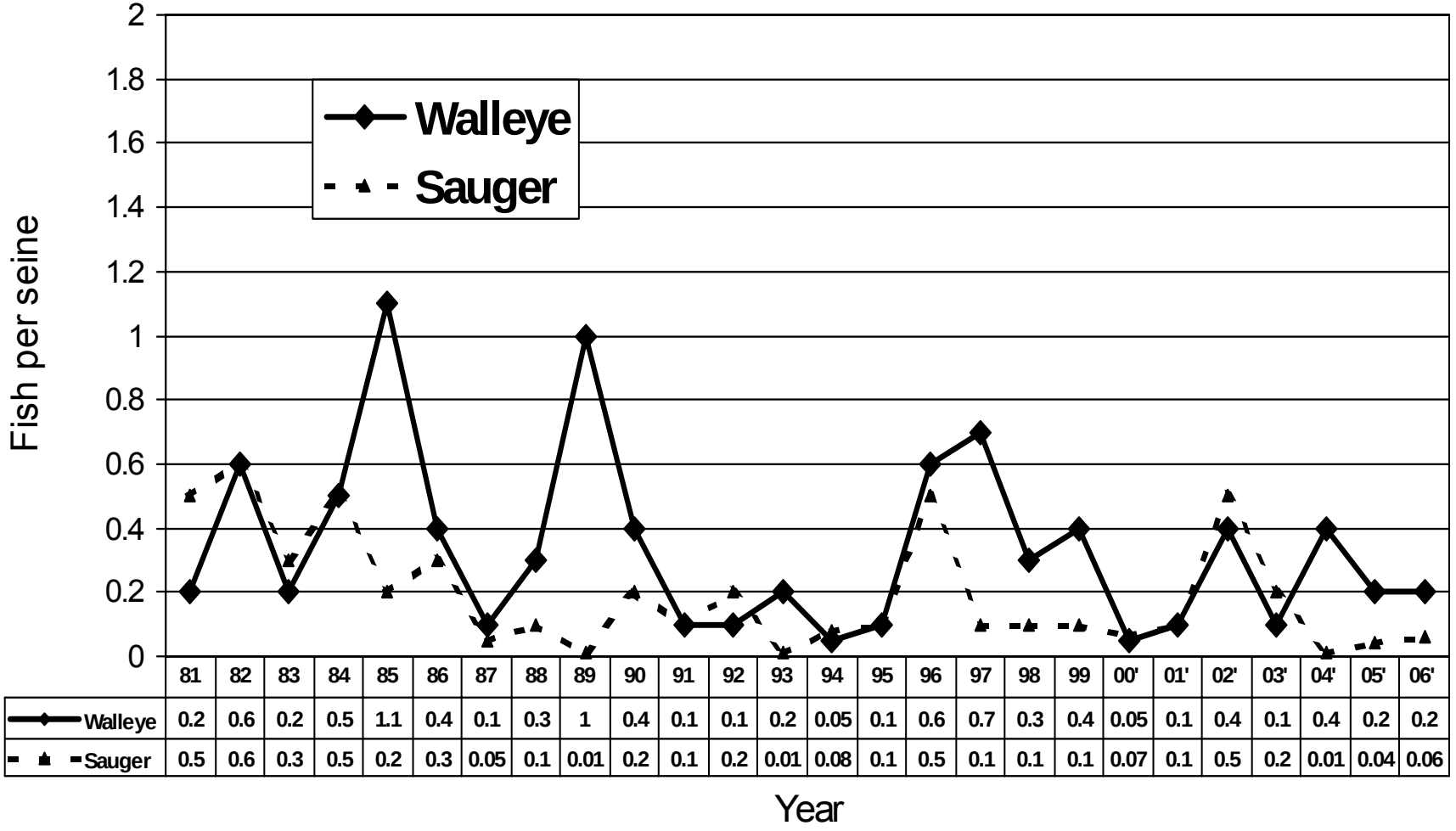
Table 17. Summaries of the total catch and catch rate for selected sport and forage fish taken by seining in Fort Peck Reservoir, 1992-2006.

		Species[1]						
		WAE	NOP	SAR	SMB	YEP	GOE	WHS
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	14.3	<0.1	0.6	47.9	0.1	0.5
1995	No. Hauls--195							
	No. Sampled	25	25	28	967	5,452	630	376
	No./Haul	0.1	0.1	0.1	5.0	27.9	3.2	1.9
1996	No. Hauls—164							
	No. Sampled	71	101	84	271	5,762	95	188
	No./Haul	0.4	0.6	0.5	1.7	35.1	0.6	1.2
1997	No. Hauls—158							
	No. Sampled	108	38	20	500	10,506	24	303
	No./Haul	0.7	0.2	0.1	3.2	66.5	0.2	1.9
1998	No. Hauls—162							
	No. Sampled	43	7	18	681	2,221	560	11
	No./Haul	0.3	<0.1	0.1	4.2	13.7	3.6	<0.1
1999	No. Hauls—166							
	No. Sampled	58	33	15	437	5,172	21	29
	No./Haul	0.4	0.2	0.1	2.7	31.2	0.1	0.2
2000	No. Hauls-87							
	No. Sampled	7	32	6	60	988	26	9
	No./Haul	<0.1	0.4	<0.1	0.7	11.4	0.3	0.1
2001	No. Hauls-153							
	No. Sampled	21	27	9	748	803	63	125
	No./Haul	0.1	0.2	0.1	4.9	5.2	0.4	0.8
2002	No. Hauls-101							
	No. Sampled	39	33	52	223	437	154	7
	No./Haul	0.4	0.3	0.5	2.2	4.3	1.5	0.1
2003	No. Hauls-152							
	No. Sampled	13	89	24	316	748	6	30
	No./Haul	0.1	0.6	0.2	2.1	4.9	<0.1	0.2
2004	No. Hauls-154							
	No. Sampled	59	30	0	625	760	42	408
	No./Haul	0.4	0.2	0.0	4.1	4.9	0.3	2.6
2005	No. Hauls-156							
	No. Sampled	31	130	7	593	816	47	42
	No./Haul	0.2	0.8	<0.1	3.8	5.2	0.3	0.3
2006	No. Hauls-156							
	No. Sampled	26	60	10	389	1318	29	7
	No./Haul	0.2	0.4	0.1	2.5	8.4	0.2	<0.0

Table 17. Continued.

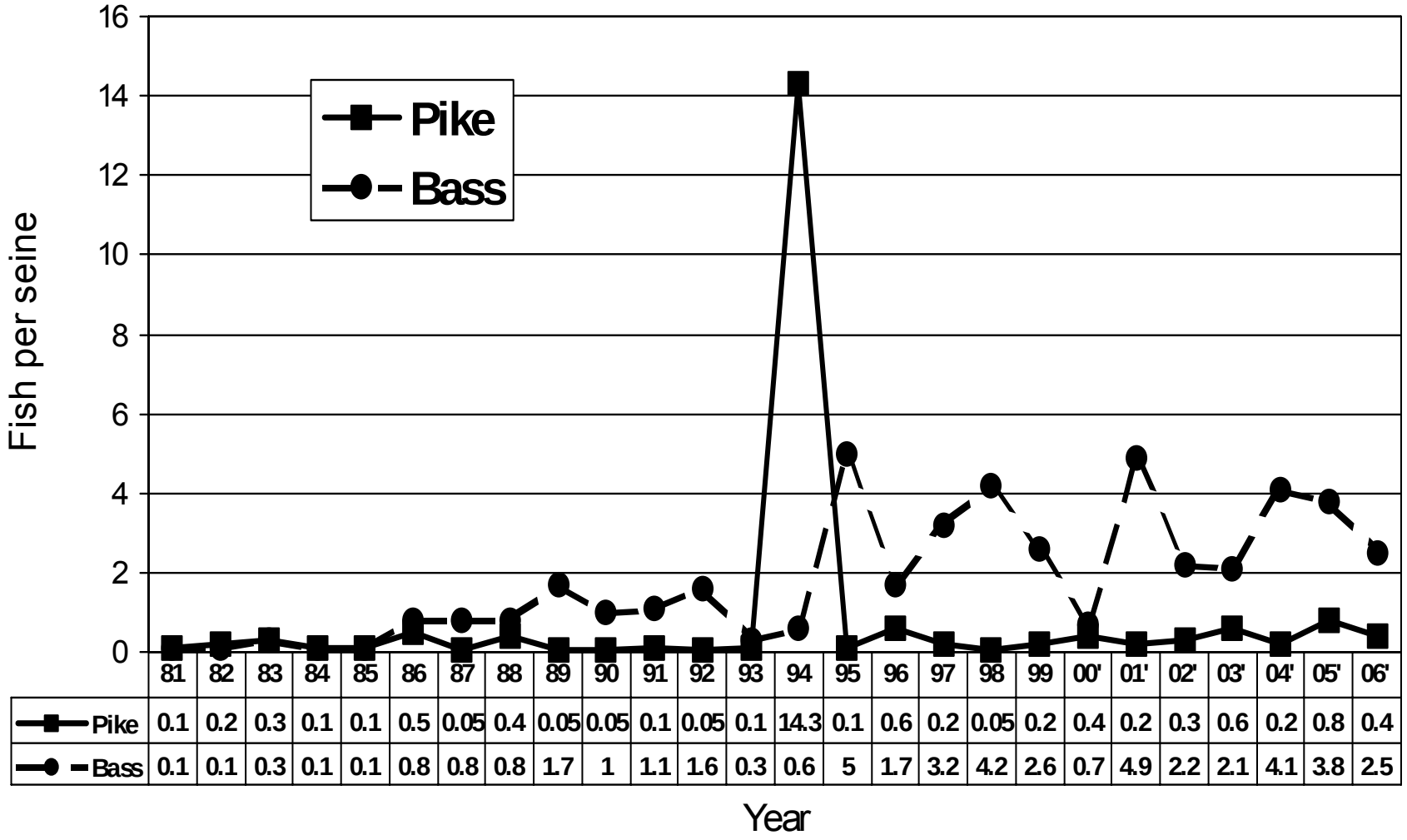
		Species[1]					
		BSP	COC	FRD	CRA	EMS	SPS
1992	No. Hauls--133						
	No. Sampled	----	8	26	57	3,974	2,849
	No./Haul	----	<0.1	0.2	0.4	29.9	21.4
1993	No. Hauls--176						
	No. Sampled	161	85	---	1,331	2,960	10,679
	No./Haul	0.9	0.5	---	7.6	16.8	60.7
1994	No. Hauls--173						
	No. Sampled	161	335	19	10,835	8,366	19,753
	No./Haul	0.9	1.9	0.1	62.6	48.4	114.2
1995	No. Hauls--195						
	No. Sampled	1,379	552	23	21,754	1,419	104,411
	No./Haul	7.0	2.8	0.1	111.6	7.3	535.4
1996	No. Hauls--164						
	No. Sampled	255	901	335	3,163	1,063	21,918
	No./Haul	1.6	5.5	2.0	19.3	6.5	133.7
1997	No. Hauls--158						
	No. Sampled	496	455	107	8,527	1,646	35,953
	No./Haul	3.1	2.9	0.7	54.0	10.4	227.5
1998	No Hauls--162						
	No. Sampled	2,306	327	1,016	7,296	1,377	5,546
	No./Haul	14.8	2.1	6.5	46.7	8.5	34.2
1999	No. Hauls--166						
	No. Sampled	----	164	211	3,168	4,663	5,996
	No./Haul	----	1.0	1.3	19.1	28.1	36.1
2000	No. Hauls---87						
	No. Sampled	2,187	60	62	1,036	13,736	2,828
	No./ Haul	25.1	0.7	0.7	11.9	157.9	32.6
2001	No. Hauls---153						
	No. Sampled	121	158	270	104	10,383	2,926
	No./ Haul	0.8	1.0	1.8	0.7	67.9	19.1
2002	No. Hauls---101						
	No. Sampled	337	49	224	672	969	1,783
	No./ Haul	3.3	0.5	2.2	6.7	9.6	17.7
2003	No. Hauls---152						
	No. Sampled	75	116	294	383	14,312	2,291
	No./Haul	0.5	0.8	1.9	2.5	94.2	15.1
2004	No. Hauls-154						
	No. Sampled	66	457	520	1,633	3,791	15,669
	No./Haul	0.4	3.0	3.4	10.6	24.6	101.7
2005	No. Hauls-156						
	No. Sampled	505	459	244	811	7,873	9,169
	No./Haul	3.2	2.9	1.6	5.2	50.5	58.8
2006	No. Hauls-156						
	No. Sampled	72	25	128	482	5,859	4,269
	No./Haul	0.5	0.2	0.8	3.1	37.6	27.4

[1]See table of species and abbreviations.



	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
Walleye	0.2	0.6	0.2	0.5	1.1	0.4	0.1	0.3	1	0.4	0.1	0.1	0.2	0.05	0.1	0.6	0.7	0.3	0.4	0.05	0.1	0.4	0.1	0.4	0.2	0.2
Sauger	0.5	0.6	0.3	0.5	0.2	0.3	0.05	0.1	0.01	0.2	0.1	0.2	0.01	0.08	0.1	0.5	0.1	0.1	0.1	0.07	0.1	0.5	0.2	0.01	0.04	0.06

Figure 33. Catch rate of walleye and sauger young-of-year during annual seining on Fort Peck from 1981-2006.



	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
Pike	0.1	0.2	0.3	0.1	0.1	0.5	0.05	0.4	0.05	0.05	0.1	0.05	0.1	14.3	0.1	0.6	0.2	0.05	0.2	0.4	0.2	0.3	0.6	0.2	0.8	0.4
Bass	0.1	0.1	0.3	0.1	0.1	0.8	0.8	0.8	1.7	1	1.1	1.6	0.3	0.6	5	1.7	3.2	4.2	2.6	0.7	4.9	2.2	2.1	4.1	3.8	2.5

Figure 34. Catch rate of northern pike and smallmouth bass young-of-year during annual seining on Fort Peck from 1981-2006.

Yellow Perch

Yellow perch recruited poorly from 2001 to 2005 with catch rates less than 5.5 per seine annually. Length frequencies indicate perch between 2.0 and 2.8 inches made the bulk of the young-of-year catch (Figure 35). Those collected during 2006 had a slightly larger length distribution that ranged from 2.0 to 3.1. Sampling continued until mid September for both years. Yellow perch were high in abundance in 2006 with a catch rate of 8.4 per seine (Table 17). They were most abundant in the middle Missouri Arm with a catch rate of 21.4 per seine (Table 15). Catch rates in the remaining areas were between 2.4 found in the upper Missouri Arm to 10.1 per seine in the lower Big Dry Arm. The highest catch rate of age 1+ perch was in the lower Big Dry Arm with a catch rate of 2.3 per seine compared to the high of 1.2 per seine in 2005. A slight increase of reservoir elevations may be responsible for some available spawning structure coupled with tumbleweeds resulted in the increase (Figure 37). Another possible explanation would be the increase in the adult population captured in alternating nets.

Crappie

Crappie increased in relative abundance from 2003 at 2.5 per seine to 10.6 per seine in 2004 and declined in abundance to 5.2 per seine in 2005. Crappie abundances declined once again in 2006 yielding 3.1 per haul. Length frequency of crappie in 2005 indicated crappie between 1.9 and 2.8 inches made the bulk of the young-of-year catch and the 2006-year class had a similar but slightly larger length distribution (Figure 36). It's believed the timing of collections accounts for some of the difference between length frequencies; however, 2005 and 2006 seining efforts were conducted during the same time frame. Differences in length frequencies may also result from location and duration of the growing season (flooded vegetation and water temperatures).

Emerald Shiner

Emerald shiner numbers decreased in relative abundance from 50.5 in 2005 to 37.6 in 2006. Since 1991, the lowest catch rate was 0.4 per seine in 1992 and the highest was 157.9 per seine in 2000 (Table 17). In 2005, emerald shiner catch in all regions ranged from 2.3 per seine in the lower Missouri Arm to 219.3 per seine in the upper Missouri Arm. In 2006, emerald shiner catches ranged from 15.6 per seine to 77.2 per seine in the (Table 15). Length frequency of emerald shiner in 2005 indicates a good percentage of emerald shiners between 1.1 and 1.8 inches and another between 2.7 and 3.2. Peaks in size in 2006 follow the same bimodal shape but there appears to be a decrease in percentage of 1.1 to 1.8 inch fish. Length distributions are slightly ahead of peaks in 2005, this may again be a factor of an extended growing season (Figure 38).

Spottail Shiner

Spottail numbers decreased in abundance from 58.8 to 27.4 and most notable in the upper Missouri Arm. Spottail catch rates ranked from highest to lowest was in the upper Missouri Arm, upper Big Dry Arm, lower Big Dry Arm, lower Missouri Arm, and middle Missouri Arm at 98, 88, 72, 26, and 17 per seine in 2005. In contrast to 2005, 2006 catch rates were highest to lowest as follows: middle Missouri Arm, lower Big Dry, lower Missouri Arm, upper Big Dry, and upper Missouri Arm at 75.7, 26.1, 19.5, 14.3, and 0.3(Table 15). In 2004, the highest concentration of spottails was found in the lower Missouri Arm with 243 caught per seine. Length frequency of spottail shiner in 2005 and 2006 indicates smaller fish between 1.0 and 2.0 inches dominated the catch. However, catch rates of spottails larger than 2.5 inches was much greater than those in 2005 (Figure 39). Once again, this could be a factor of good growing season. The best catch rates of spottail shiners have been documented during rising pool years from 1993 to 1997, with catch rates ranging from 60.7 per seine to 535.4 per seine (Figure 24 and Table 17). The average catch from 1991 to 2006 was 96 per seine; the catch of 58.5 represents only 61% of the long term average.

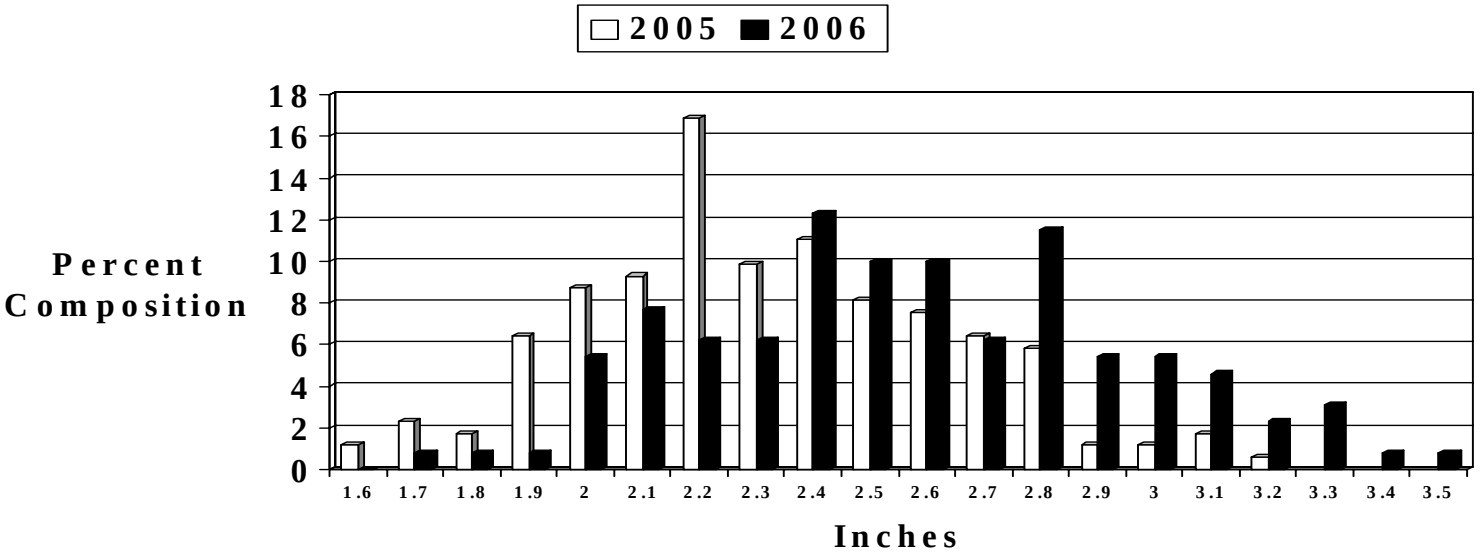


Figure 35. Length frequency of subsampled yellow perch young-of-year collected in 2005 and 2006 seining efforts.

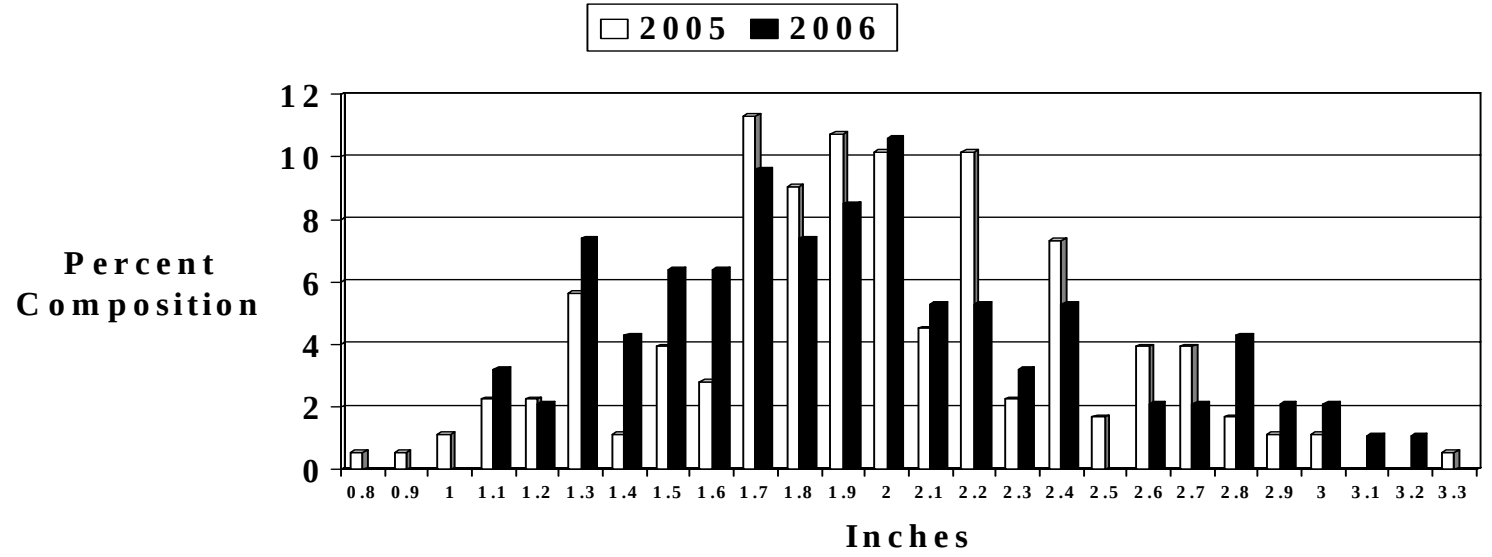


Figure 36. Length frequency of subsampled crappie young-of-year collected in 2005 and 2006 seining efforts.

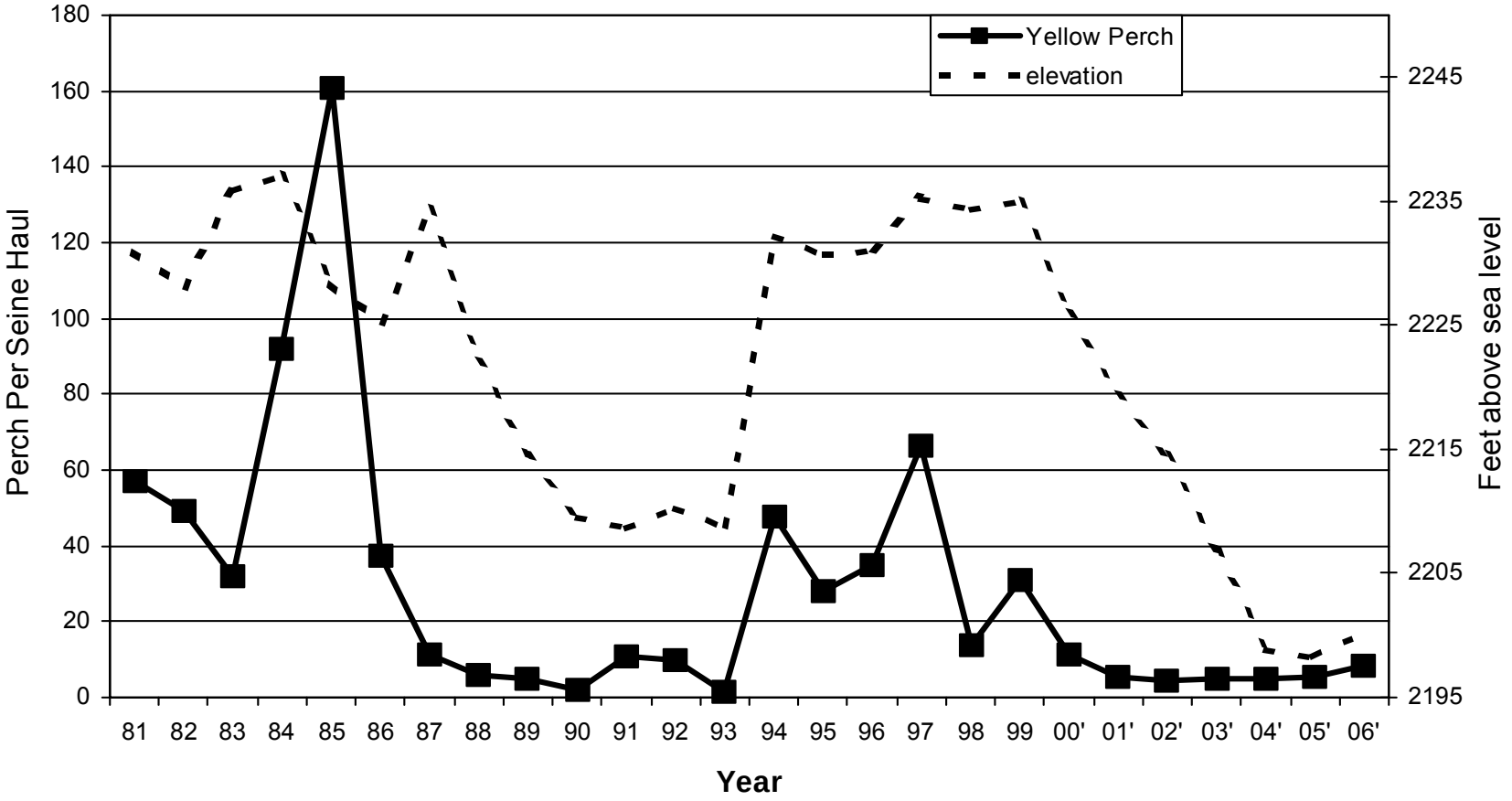


Figure 37. Young of year yellow perch per seine haul compared to minimum annual lake elevations 1981 to 2006.

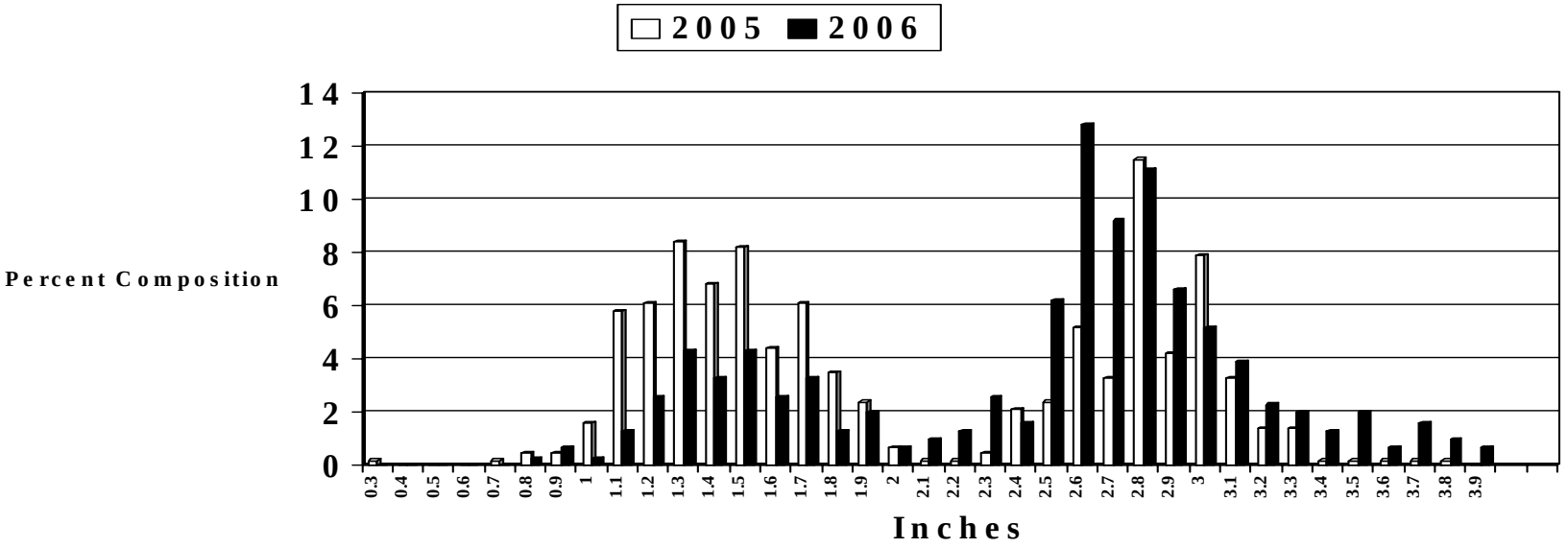


Figure 38. Length frequency of subsampled emerald shiners captured in 2005 and 2006 seining efforts.

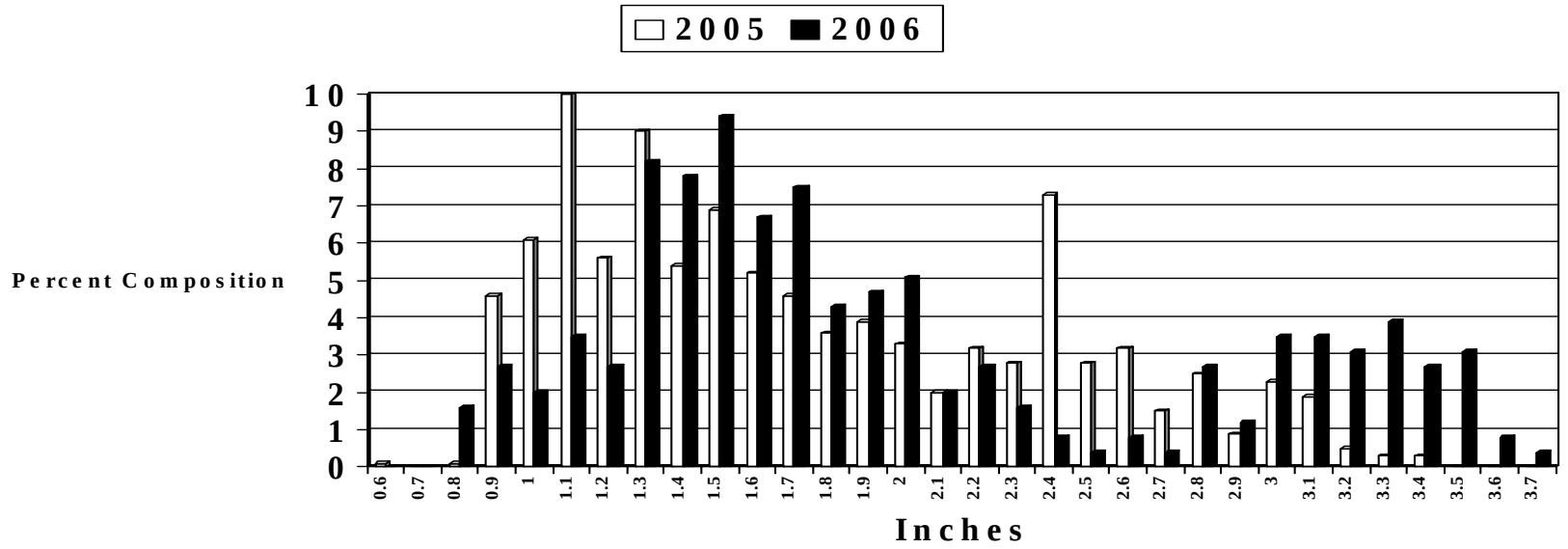


Figure 39. Length frequency of subsampled spottail shiners captured in 2005 and 2006 seining efforts.

CHINOOK SALMON

Chinook salmon were stocked in Fort Peck in the spring and fall of 2006 (Figure 41 and 42). One hundred seventy-five thousand spring-stocked fish were stocked in June averaging 119 per pound for a total weight of 1,468 pounds. A total of 4,988 fall-stocked fish were adipose clipped and reared to nine per pound for a combined weight of 529 pounds. These fish were reared to a larger size in an attempt to create salmon large enough to avoid predation. South Dakota Fish and Game has used this strategy in the past and been successful in developing a return run from fewer, but larger fall stocked chinook salmon.

The salmon pens were not used in 2006 to rear the salmon but were raised in the Fort Peck Hatchery because uniform growth and health can be maintained in this system. It was recommended to stock 50,000 spring stock fin-clipped salmon at 45 to the pound or by the 3rd week of June which ever comes first. In addition, it was recommended to stock 150,000 fall stocked, non-fin clipped salmon at 15 or fewer to the pound or the last week of September, which ever comes later. Instead, the hatchery-reared, spring-stocked salmon were released from June 7th to June 15th, 2006 and averaged 108 to 129 per pound upon release. These fish should have been held back to be released at a later date and a larger size, but they were unable due to water quality issues at the hatchery. A loss is documented in Table 19 as this was directly measured. High rates of spring-stocked fish have not created adequate returns; the ability for a high rate of fall stock exists with the new hatchery.

Return of salmon to the release site has been minimal the past few years (Figure 42). The salmon ladder was not set up in 2006 based on limited numbers that began filtering into the Marina Bay area. Instead, FWP relied on electrofishing to obtain brood stock for the annual chinook salmon egg-take. Electrofishing was conducted from October 3rd to October 24th in various embayments adjacent to the marina and also off the face of the dam. The average length and weight for spawners in 2006 was 28.2 inches and 11, 25.4 inches and 8.2 pounds for females and males, respectively. Fifty-seven females and 121 males were captured. However, only 36 females were spawned due to egg quality. Annual egg-take effort for Montana resulted in 124,140 green eggs, which averaged 3,448 eggs per female. In addition, North Dakota was able to supplement eggs needed to obtain our goal of 200,000-eyed eggs needed for stocking requirements. The eggs were eyed at Garrison National Fish Hatchery and later transported to the Fort Peck Hatchery.

Figures 43 and 44 compare stocking rates by number and pound of chinook, respectively. It's believed the pound of salmon stocked best relates to potential returns. Montana has typically stocked fewer number and pounds as ND and SD, but since 2000 it has increased stocking numbers and/or size in efforts to create a more stable fishery (Table 18). Frustratingly, the program has not met demands of the public or provided more fish for spawning. Plans for the 2007 stock include a combination of spring and fall stock salmon. The Fort Peck Hatchery will enable FWP to rear a substantial number of fall-stocked fish. It will be recommended to stock 100,000 spring stock fin-clipped salmon at 45 to the pound or by the 3rd week of June which ever comes first. It is also recommended to stock 100,000 fall stocked, non-fin clipped salmon at 15 or fewer to the pound or the last week of September, which ever comes later. In addition to the fin clip, salmon will also be given a thermal mark on their otoliths to differentiate between spring and fall stocks.

One chinook salmon was captured by a merwin trap in the spring of 2005, this salmon was 10.8 inches long and was not fin clipped. Therefore it was a fish from the spring stock of 2004.

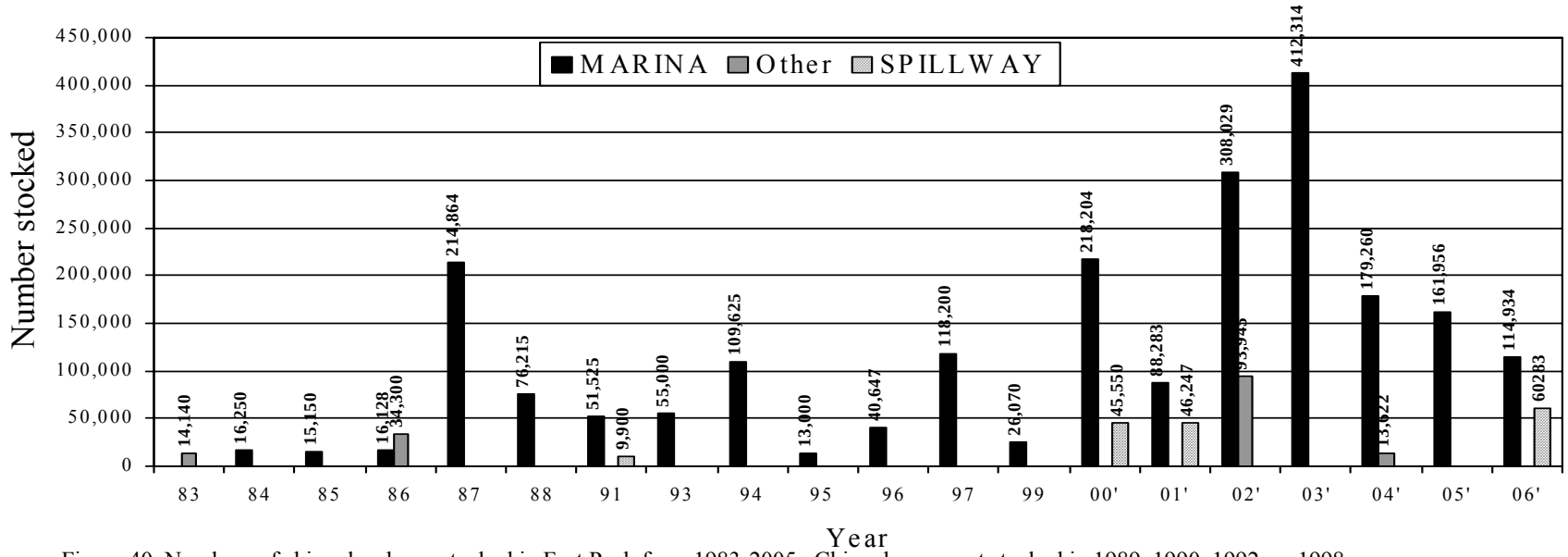


Figure 40. Numbers of chinook salmon stocked in Fort Peck from 1983-2005. Chinook were not stocked in 1989, 1990, 1992, or 1998.

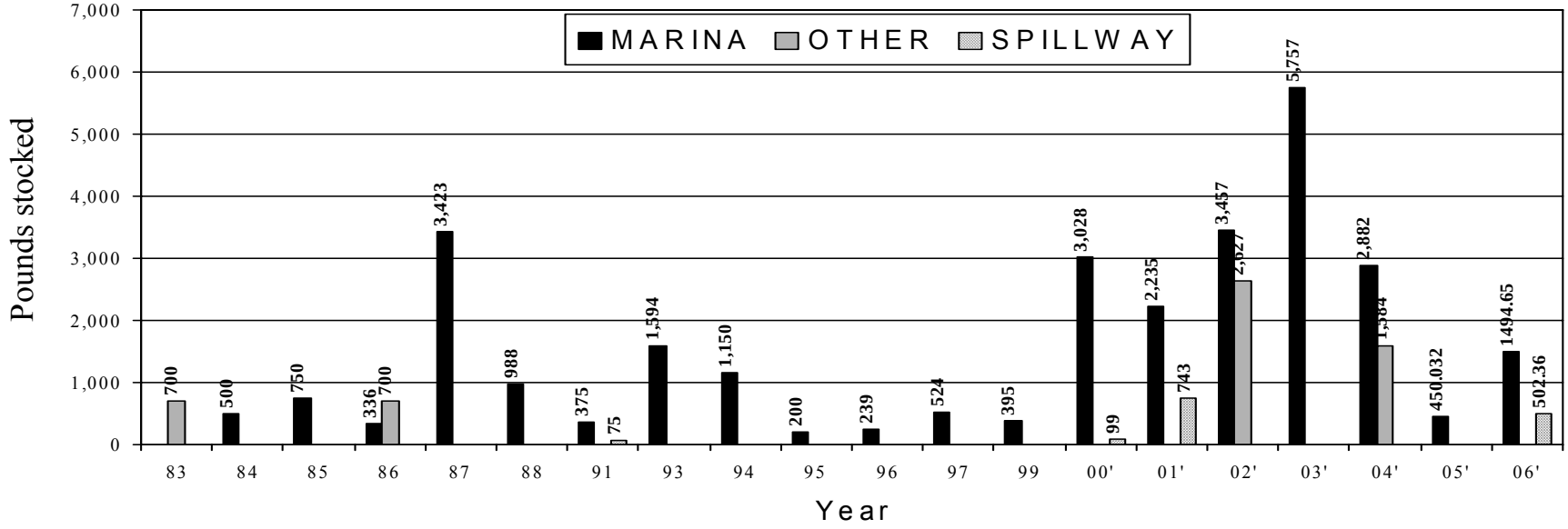


Figure 41. Pounds of chinook salmon stocked in Fort Peck from 1983-2006. Chinook were not stocked in 1989, 1990, 1992, or 1998.

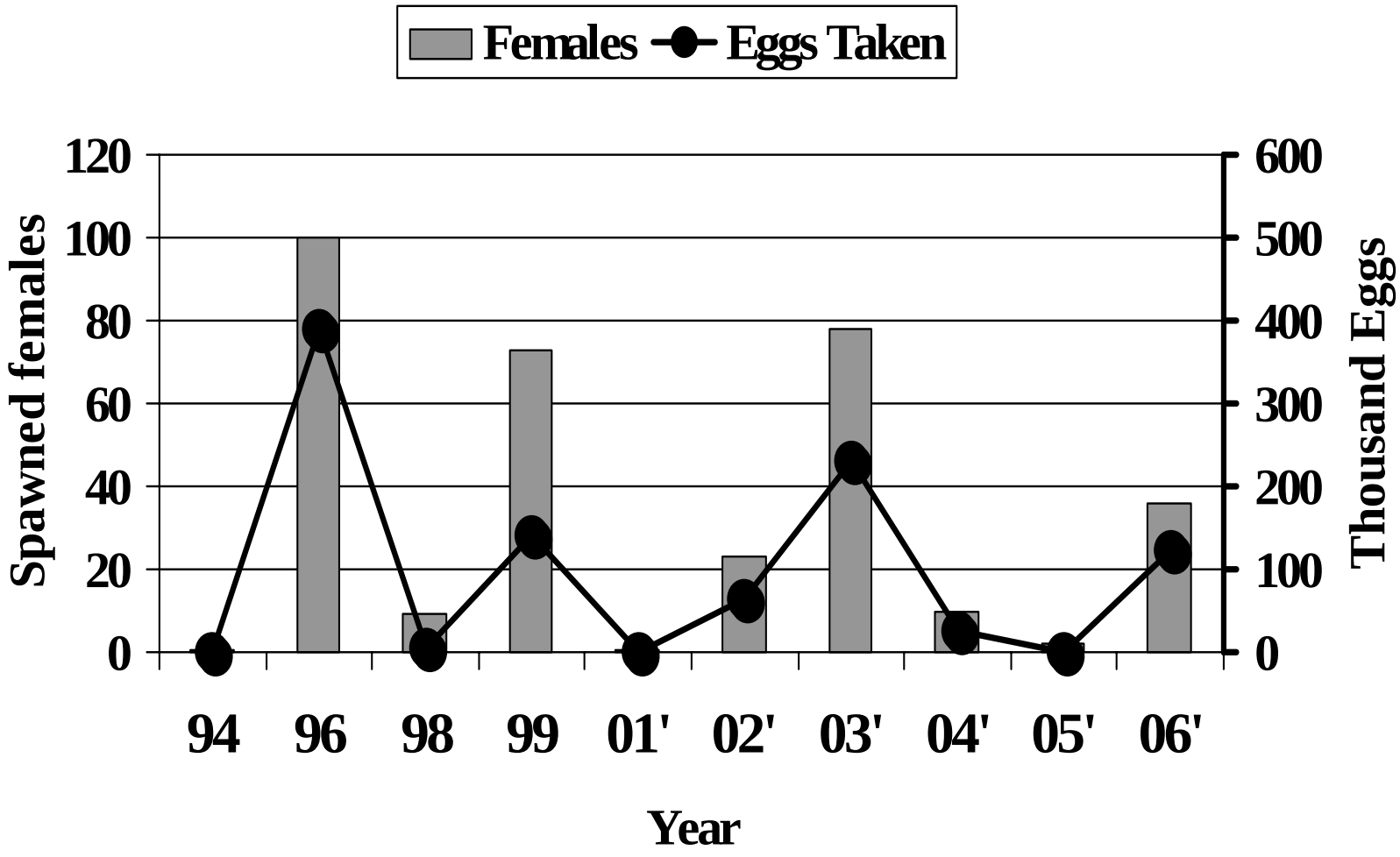
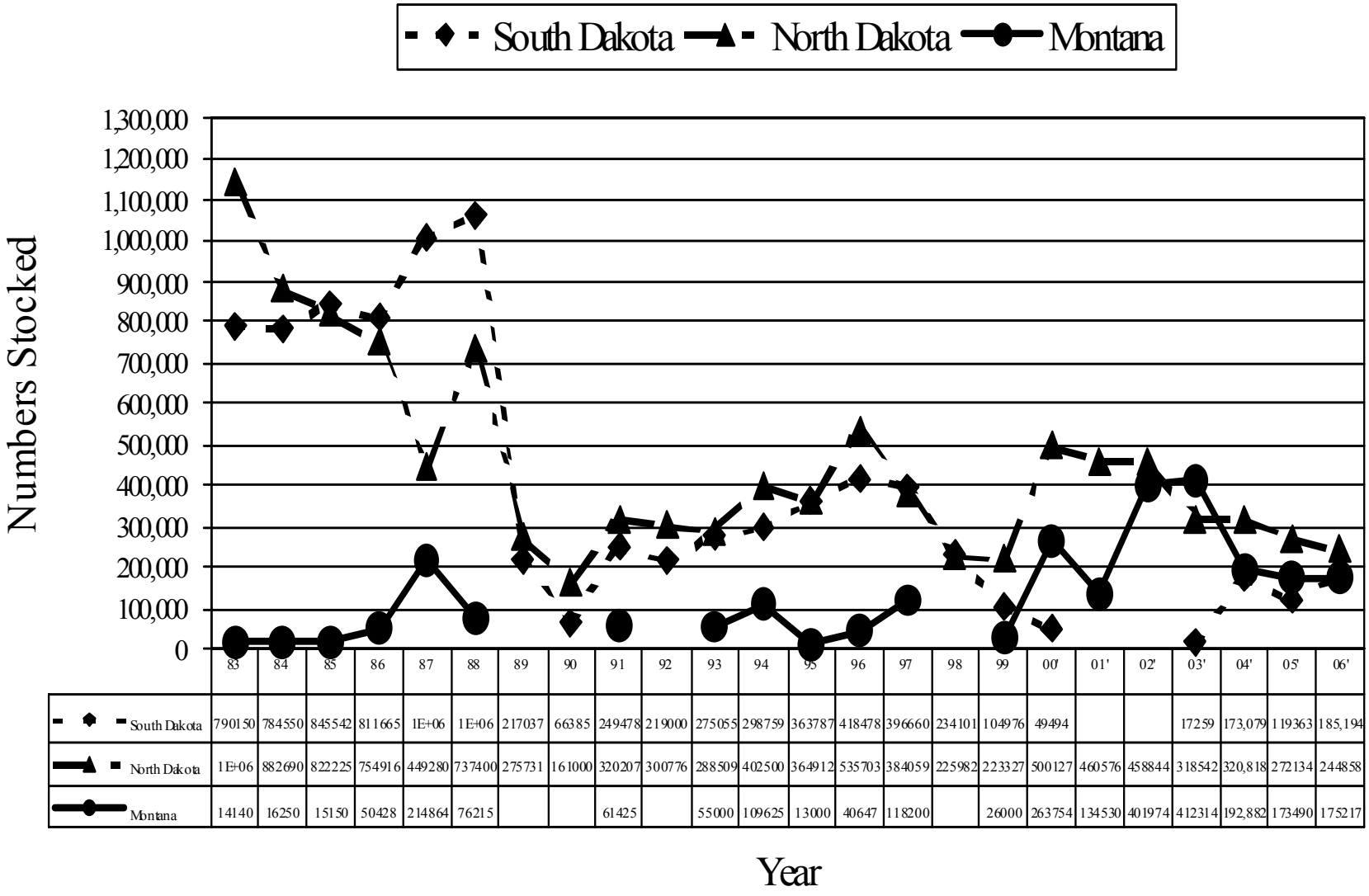
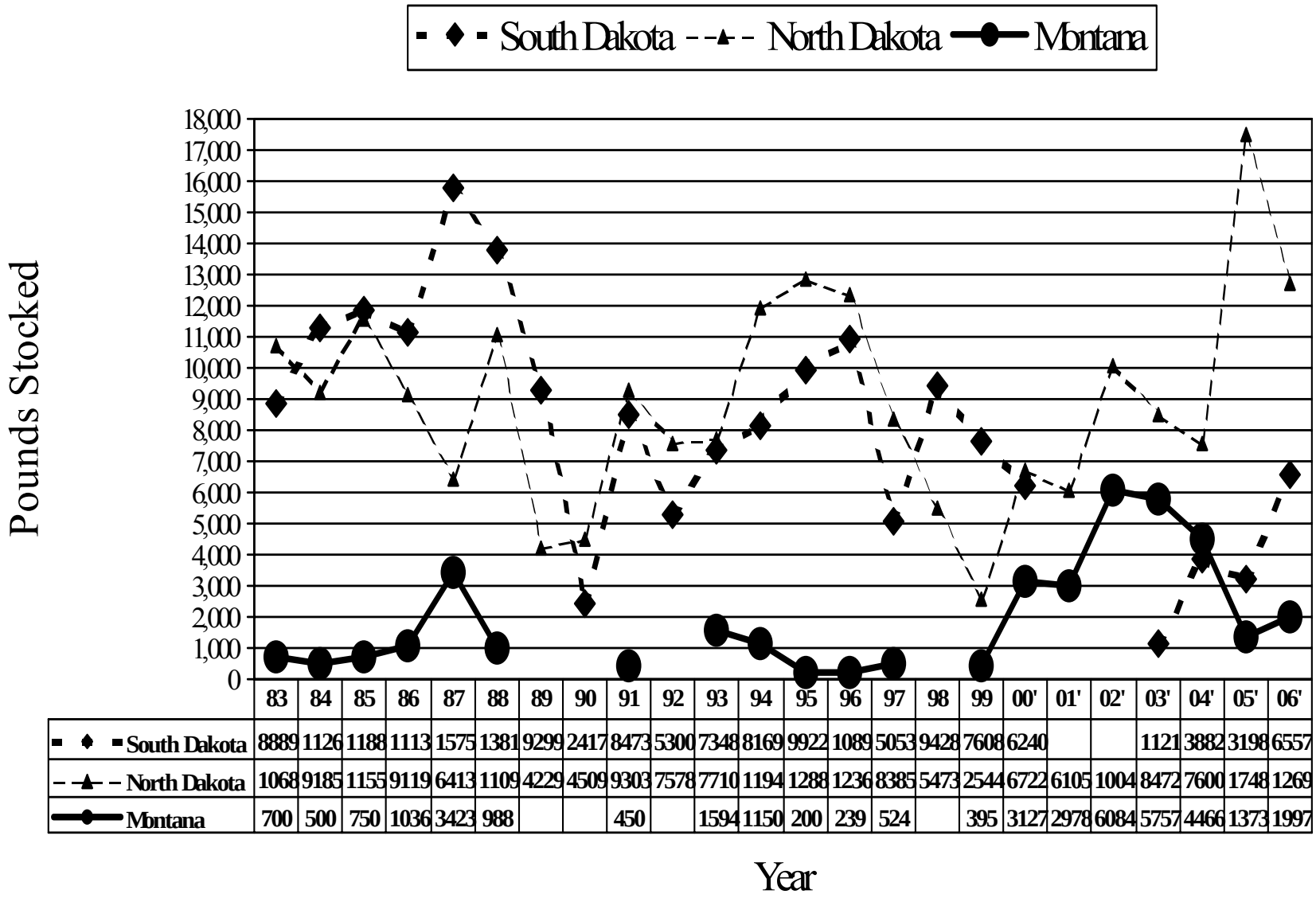


Figure 42. Annual comparison of chinook salmon spawned and eggs taken.



	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
South Dakota	790150	784550	845542	811665	1E+06	1E+06	217037	66385	249478	219000	275055	298759	363787	418478	396660	234101	104976	49494			17259	173,079	119363	185,194
North Dakota	1E+06	882690	822225	754916	449280	737400	275731	161000	320207	300776	288509	402500	364912	535703	384059	225982	223327	500127	460576	458844	318542	320,818	272134	244858
Montana	14140	16250	15150	50428	214864	76215			61425		55000	109625	13000	40647	118200		26000	263754	134530	401974	412314	192,882	173490	175217

Figure 43. Annual comparison of chinook salmon numbers stocked in Fort Peck, Garrison, and Oahe.



	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
South Dakota	8889	1126	1188	1113	1575	1381	9299	2417	8473	5300	7348	8169	9922	1089	5053	9428	7608	6240			1121	3882	3198	6557
North Dakota	1068	9185	1155	9119	6413	1109	4229	4509	9303	7578	7710	1194	1288	1236	8385	5473	2544	6722	6105	1004	8472	7600	1748	1269
Montana	700	500	750	1036	3423	988			450		1594	1150	200	239	524		395	3127	2978	6084	5757	4466	1373	1997

Figure 44. Annual comparison of chinook salmon pounds stocked in Fort Peck, Garrison, and Oahe.

Table 18. Chinook salmon stocked by number, size, and location in Fort Peck, 2001-2006

Date	Number	Hatchery	No./lb.	Mark	Location
6/11/2001	88,283	Giant Springs	64.7	None	Marina Bay
6/12/2001	46,247	Miles City	80.5	None	Spillway
3/13/2002	22,201	Blue Water Springs	109	None	Pines
4/25/2002	80,400	Miles City	200	None	Marina Bay
4/25/2002	93,465	Miles City	81.7	None	Marina Bay
5/31/2002	71,744	Blue Water Springs	29.6	None	Pines
6/13/2002	134,164*	Giant Springs	26	None	Marina Bay
4/22/2003	232,618	Giant Springs	69.1	None	Marina Bay
6/13/2003	70,522	Giant Springs	28.7	Adipose**	Marina Bay
6/14/2004	70,537	Giant Springs	62	None	Marina Bay
10/5/2004	13,622	Giant Springs	8.6	Adipose	Marina Bay
6/30/2005	97,008	Giant Springs	183-196	None	Marina Bay
9/28/2005	11,534	Giant Springs	13	Adipose	Marina Bay
6/7/2006	65,558	Fort Peck	128.92	None	Marina Bay
6/14/2006	60,283	Fort Peck	120	None	Spillway
6/15/2006	49,376	Fort Peck	108	None	Marina Bay
10/13/2006	4,988	Fort Peck	9.43	Adipose	Marina Bay

*Released by storm

**86% were clipped as result of hole in pen

In 2005 and 2006, no yearling salmon were captured by summer gill nets. Since 1985, which represents 19 years of sampling, at least one or more salmon yearlings were captured as part of the summer netting surveys. They were sampled in 1985, 1988, 1993, 1996, 2001, 2002,2003, and 2004. In 2002, 2003, and 2004 19, 16, and 12 yearling salmon were captured. Far fewer were collected annually in 2001, 1996, 1993, 1988, and 1985 with 1,2,4,1, and 5 begin captured respectively, in summer gill nets. Gill net catch rates of yearling salmon indicate they move throughout the reservoir as they were are caught in all the regions during the summer. It does appear from the few that have been captured over the years that the fish disperse up the Missouri Arm to areas above Snow Creek. Of the 60 yearling salmon captured in summer gill nets 24 (40%) were captured in the upper Missouri Arm. The remaining salmon were more dispersed with 5 (8%), 17 (28%), 7 (12%), and 7 (12%) being captured in the upper Big Dry, lower Big Dry, lower Missouri Arm, and middle Missouri Arm, respectively. At this time no real conclusions can be drawn from this information, however it will be interesting to see if the salmon continue moving upstream after they are reared in the Fort Peck Hatchery rather than Giant Springs Hatchery which is discharged into the Missouri River above Fort Peck.

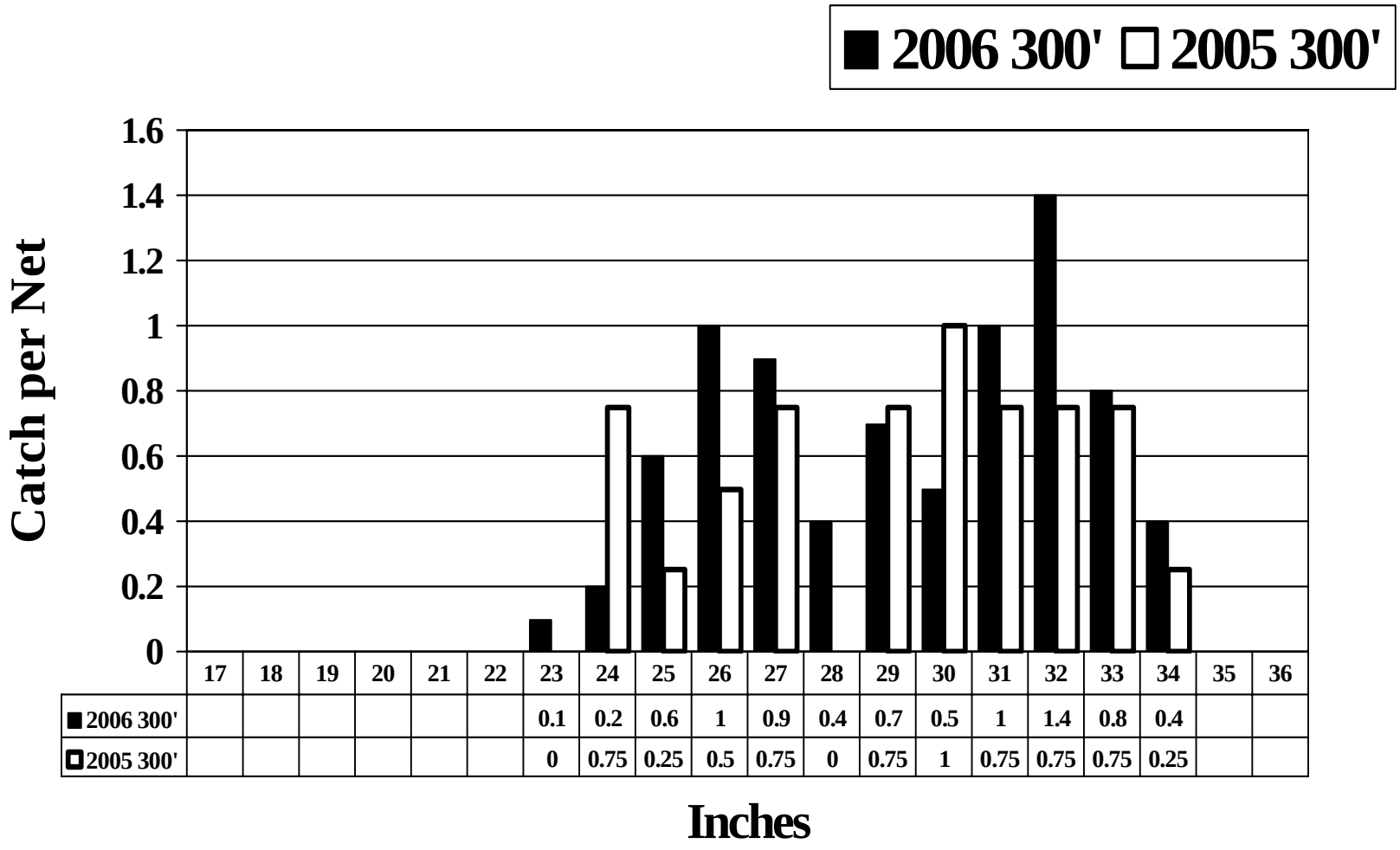
LAKE TROUT

Lake trout were not spawned in 2006, but the netting and tagging survey continued. Due to reduced available spawning habitat on the dam, its probable spawning has been limited for the past 6 years. Over 80% of suitable spawning habitat on the dam has been exposed at this time. Lake trout would have been spawned in 2006; however, weather conditions and the chinook egg-take did not allow for lake trout sampling until the first week of November. It is likely that lake trout netting started too late to capture the spawners in 2006 as indicated by the number of spent females and water temperatures declining to 45 degrees. Netting should be initiated for spawners beginning in the last week of October.

Lake trout were captured with 300 feet long 6 feet deep nets with three 100 feet long panels of 2", 3", and 4" mesh and the standard 125 feet long 6 feet deep nets with 5 panels each ¾", 1", 1 ¼", 1 ½", and 2" mesh. Typically each night, two 300 feet nets and one 125 feet net was set. The 125-foot nets were set to evaluated if smaller lake trout were present, but not effectively captured with the larger mesh 300-feet nets. In 2006, only 2 nights were netted; as manpower was limited in the late fall. It's believed the majority of the spawn occurred before netting occurred on 11/3/06 through 11/16/06. Once again, length frequency analysis resulted in no lake trout captured less than 22 inches. Peak frequency occurred between 27 and 33 inches regardless of net fished or year (Figure 48 and 49).

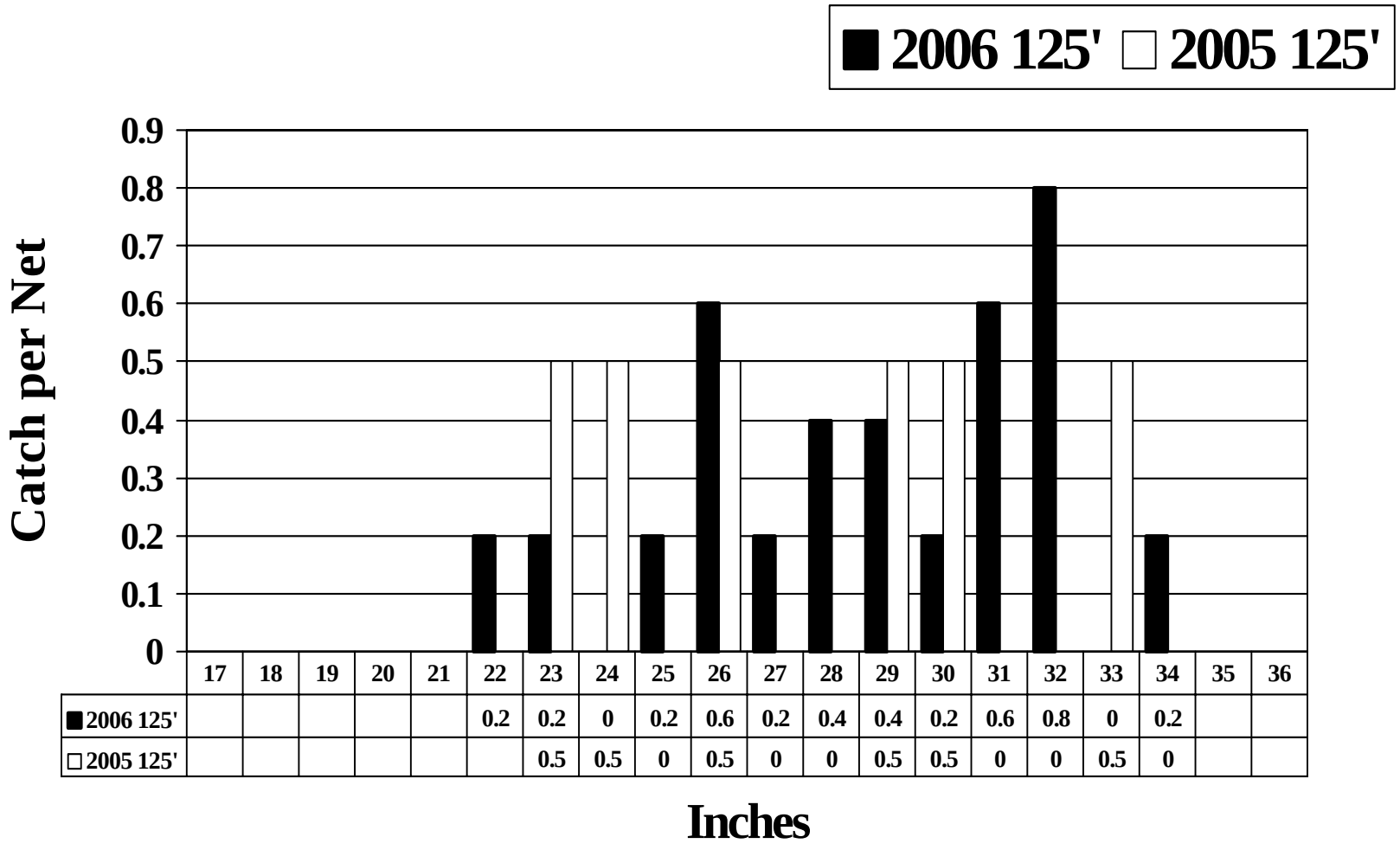
In 2005, the 300-feet lake trout nets captured 3 female and 22 male lake trout while the 125-feet experimental nets captured 0 females and 6 male lake trout. In 2006, they captured 21 females and 59 males while the 125-feet captured nine females and 11 males (Table 19). The 300-feet nets have a higher catch rate by net but have more area to capture fish with. However, they captured fewer fish than experimental nets.

One hundred twenty-five foot experimental nets captured nine species with cisco, walleye, and white sucker being the next most commonly captured species compared to lake trout. Three hundred foot lake trout nets captured 5 species with lake trout being the most commonly captured species with 8.0 per net compared to the 6.5 lake trout per net in 2005. Lake trout in experimental nets averaged 28.8 inches and 8.3 pounds, 29.4 inches and 9.4 pounds for females and males, respectively. Lake trout in lake trout nets averaged 29.2 inches and 8.5 pounds, 31.6 inches and 10.3 pounds for females and males, respectively. Relative weight averaged 81 and 88 for lake trout in experimental and lake trout nets, respectively. Male relative weights averaged 90 and 87 in experimental and lake trout nets, respectively. Females averaged 83.8 in lake trout nets. The relative weights declined in 2006 from 2005 for females in lake trout nets. This is likely a function of spent females that were collected later in the spawning season than in 2005.



	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
2006 300'							0.1	0.2	0.6	1	0.9	0.4	0.7	0.5	1	1.4	0.8	0.4		
2005 300'							0	0.75	0.25	0.5	0.75	0	0.75	1	0.75	0.75	0.75	0.25		

Figure 45. Length frequency of lake trout captured in 300' 2", 3", and 4" mesh 2005 and 2006.



	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
2006 125'						0.2	0.2	0	0.2	0.6	0.2	0.4	0.4	0.2	0.6	0.8	0	0.2		
2005 125'							0.5	0.5	0	0.5	0	0	0.5	0.5	0	0	0.5	0		

Figure 46. Length frequency of lake trout captured in 125' ¾",1", 1 ¼", 1 ½", and 2" mesh in 2005 and 2006.

Table 19. Summary of fish captured during lake trout survey using 125' experimental nets and 300' lake trout nets in 2006.

	Experimental Nets 125-Feet					Lake Trout Nets 300-Feet				
Species	Number	#/net	Average Length	Average Weight	Average Relative Weight	Number	#/net	Average Length	Average Weight	Average Relative Weight
Channel Catfish	2	0.4	15.7	1.3						
Cisco	11	2.2	15.9	1.7						
Common Carp	4	0.8	19.4	3.1		2	0.2	22.1	4.1	
Freshwater Drum						1	0.1	18.3	2.9	
Lake Trout ♀	9	1.8	28.8	8.3	89.6	21	2.1	31.6	10.3	83.8
Lake Trout ♂	11	2.2	29.4	9.3	90.5	59	5.9	29.2	8.5	86.5
River Carpsucker						8	0.8	21.8	6.3	
Sauger	4	0.8	15.8	1.0						
Redhorse	1	0.2	17.6	2.2						
Sm. Bass	2	0.4	12.9	1.5						
Walleye	8	1.6	15.0	1.5		39	3.9	27.3	9.3	
White Sucker	6	1.2	17.1	2.1						
Total	58	11.6				131	13.1			

The average size of walleye in the nets was slightly smaller compared to summer gill netting with 15.0 inches and 1.5 pounds in experimental nets and 27.3 inches and 9.3 pounds in lake trout nets. The summer gill net average in the lower Missouri Arm was 16.0 inches and 2.5 pounds in 2006.

Lake trout were captured in the lake trout nets from 1990 to 1993 and again in 2003 to 2006 during spawning. Comparisons of length frequencies show few immature fish are captured during the spawn and the size of fish captured are similar (Figure 47). This may be a factor of drought occurring during sampling, reducing recruitment, or it may be smaller immature fish don't occupy the spawning area. More in depth evaluation using past creel survey data should be conducted to further address this issue. Lake trout nets followed up with experimental nets should be used annually to monitor the fishery in the future. The percent of mortality in 2006 for lake trout captured in 300 and 125-foot experimental nets was 7.5% and 0%, respectively.

Since 2004, 328 lake trout have been tagged with 93 being tagged in 2006. Six fish were recaptured in 2006 with all fish being tagged from 2004. Fish with tags 98, 110, 121, 200, and 202 were all males when recaptured. Fish 98 was 32.6 inches and 11.5 pounds in 2006 and 31.0 inches and 10.2 pounds in 2004. Fish 110 was 31.1 inches and 10.5 pounds in 2006; however, this fish was reported as harvested by a previous angler in 2004. Fish 121 was 29.1 inches and 8.7 pounds in 2006 and 28.6 inches and 8.1 pounds in 2004. Fish 200 was 33.5 inches and 12.9 pounds in 2006 and 33.9 inches and 12.8 pounds in 2004. Fish 202 was recaptured twice and was 32.7 inches and 12.6 pounds in 2006 and 33.7 inches and 13.7 pounds in 2004. Fish 90 was a female that weighed 32.3 inches and 9.5 pounds in 2006 and 32.4 inches and 10.7 pounds in 2004. As one can see the weight measurements are not very accurate due to the rocking boat. Attempts are made to move out of direct wave action when possible but not always achieved. Lengths are more accurate but fish 202 was different by 1 inch of loss in a year, which isn't likely. The other fish each differed by a tenth of an inch but is likely within measurement error resulting in no measurable growth. Three tags were returned from open water anglers in 2006, two were captured in Bear Creek and one off the face of the dam. All three were males and all were harvested. During winter of 2007, one tag was also returned from a lake trout caught in Rock Creek.

Unfortunately, at this time the Fort Peck Hatchery will not be allowed to rear lake trout, as it was not included on the legislatively authorized list and was debated in the 2005 legislation as well. The legislative session recommended rearing the specific fish listed for the Fort Peck Hatchery and the ability to rear lake trout would be re-evaluated in the 2007 session. The FWP director made an agreement with Walleyes Unlimited to not rear trout in the Hatchery during his tenure, or until a consensus agreement can be made. Many of the political problems will exist for future spawns. Based on information gathered, lake trout should be spawned in 2007. Limited stocking of 100,000 fingerling should be attempted with all being adipose fin clipped at minimum.

CISCO

Young-of-year cisco

Twenty-four, ½ inch mesh; 100 x 6 foot vertical gill nets were used to sample young-of-year cisco in the Fort Peck Reservoir from September 18th to September 27th, 2006 (Table 20). The lower Big Dry, lower Missouri, and middle Missouri Arms were sampled. Neither upper arm was sampled because they lacked areas over 80 feet deep.

Catch rates continued to improve in to 2006, averaging 137 young-of-year cisco per-net. The catch rates were 31 and 84 in 2004 and 2005, respectively. In contrast, the overall catch rate in 2003, and 2002 was low, at 3 and 6 young-of-year per-net, respectively. The last strong year class was in 2001 with a catch rate of 219 per-net. A total of 3,292 young-of-year cisco and 48 adults were caught in 2006. Average length for YOY annually was from 4.4, 5.4, 5.7, 5.1, 5.5, 5.5, 5.1, 5.5, and 5.1 inches in 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, and 2006, respectively.

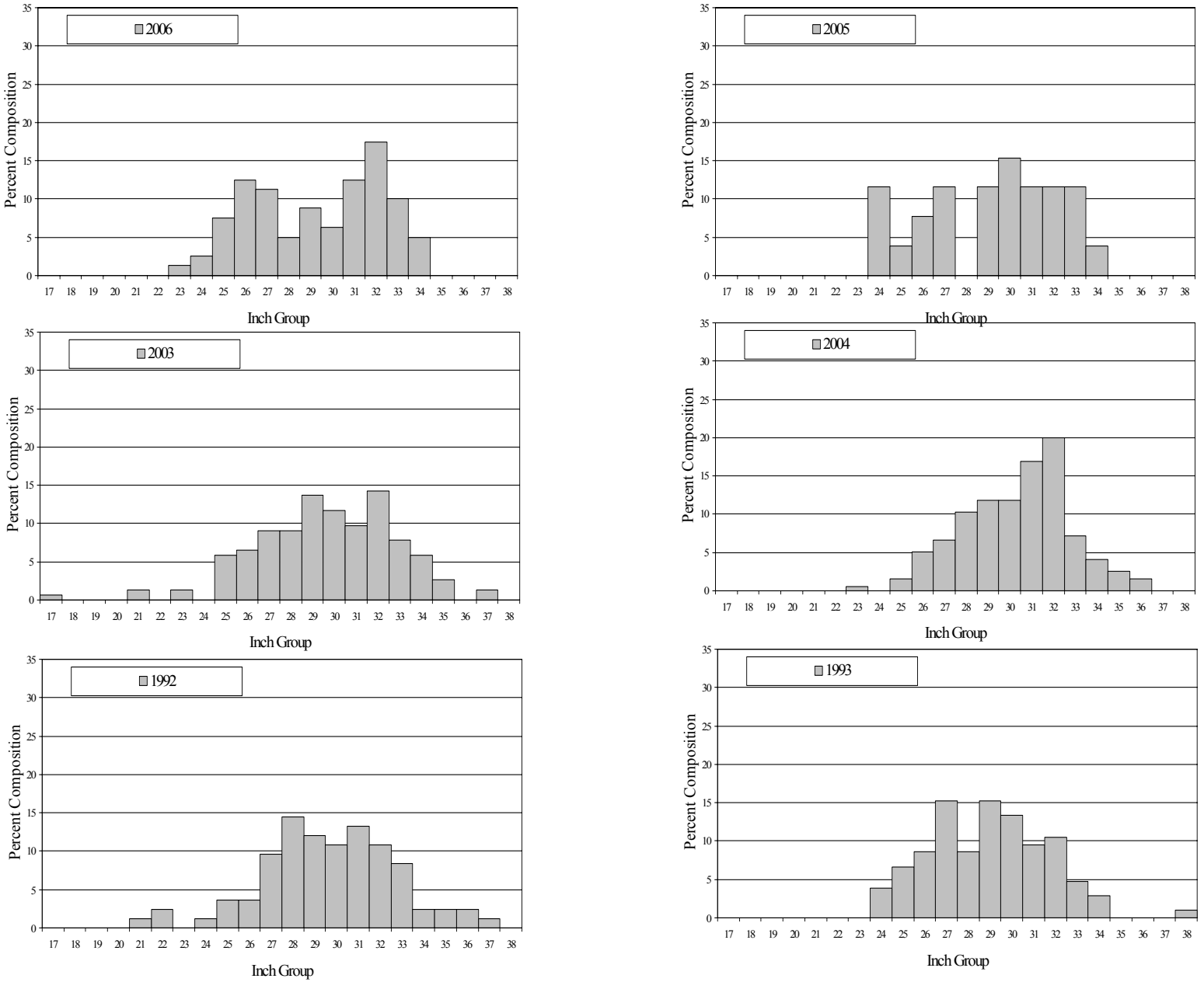


Figure 47. Length frequency of lake trout captured in 300' 2", 3", and 4" mesh from 1992 to 1993 and 2003 to 2006.

Table 20. Average of young-of-year cisco taken by vertical gill-nets and site in Fort Peck Reservoir during September and October 1994-2006.

	Young-of-Year Per Set												
Station	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06
Upper Big Dry													
Bug Creek	26	--	--	0.5	3	2	6	--	--	--	--	--	--
Lower Big Dry													
Bear Creek West	52	--	1	29	6	5	4	143	1	1	18	0	37
Rock Creek	232	--	--	3	32	4	33	197	--	--	--	--	--
Sandy Arroyo	--	--	--	--	--	--	--	193	--	3	--	--	--
Spring Creek	--	--	--	--	--	--	--	370	--	3	13	16	--
Bobcat	--	--	--	--	--	--	--	--	--	--	2	3	100
Lower Missouri Arm													
Dam	543	20	--	81	--	--	--	--	--	--	--	--	--
Duck Creek	293	--	15	18	58	62	27	47	6	13	31	321	139
Fifth Point	--	--	--	--	--	--	--	185	--	--	--	--	200
Marina	50	2	0.5	4	0.5	35	18	77	3	1	2	26	256
Milk Coulee	--	--	--	--	70	19	33	123	18	19	--	121	--
Sage Creek	--	--	--	--	--	--	--	153	--	1	1	82	201
Shaft Houses	76	2	9	29	45	3	1	--	11	1	86	--	70
Bear Creek	45	3	13	12	139	24	66	143	5	11	213	261	58
Middle Missouri Arm													
Cattle Crooked Cr.	--	--	--	--	--	--	--	556	--	7	2	77	67
Pines-Gilbert Cr.	370	2	14	121	89	30	17	517	--	7	11	38	247
Hell-Sutherland	518	--	31	245	15	33	15	119	--	14	--	--	--
Snow Creek	--	--	--	--	--	--	16	185	--	--	--	--	--
7^{th} Point	--	--	--	--	--	--	--	--	--	--	8	32	--
8^{th} Point	--	--	--	--	--	--	--	--	--	--	8	82	27
Upper Missouri Arm													
Bonetrail	--	--	--	--	--	--	--	155	--	--	--	--	--
Devils Creek	166	--	--	34	--	--	--	--	--	--	--	--	--
Seven Blackfoot	--	--	--	--	1	--	11	--	--	--	--	--	--
Timber Creek	267	--	5	25	1	--	7	--	--	--	--	--	--
Wagon Creek	--	--	--	--	--	--	--	206	--	--	--	--	--
Avg. No. Cisco per net/night	259	3	12	69	35	19	6	219	6	3	31	84	137

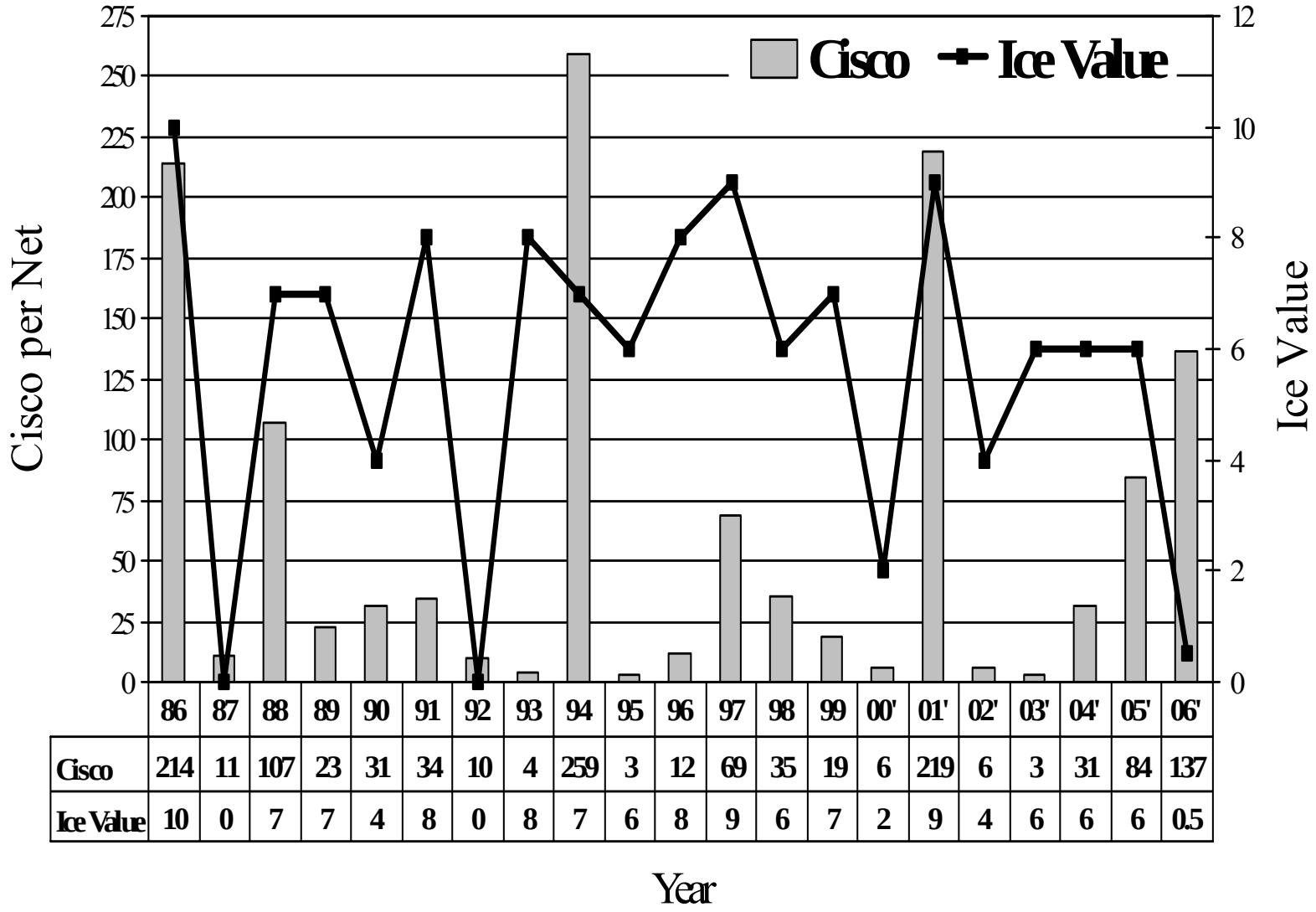
Ice cover occurred on January 8th, 2004 and January 5th, 2005 but not until February 24th, 2006. Earlier ice cover and potentially reduced competition created a better year class of cisco in 2004 and 2005. Early ice cover appears to correlate with increased cisco abundance; the ice rank is used to graphically show relative timing of ice cover annually. However, ice rank does not take into account smaller portions of the reservoir that freeze first. In 2006, the ice cover was late and competition although not high, was thought to be enough to hold back the year class in 2006. However, the fourth largest year class was produced since 1986. Possible explanations could be the large number of spawning adults that were remnants of the 2001-year class and decreases in reservoir volume that restrict cisco distribution resulting in an increase in catch rates. The cisco in Fort Peck appear to have established a cycle of high and low abundances, if the pattern persists as shown in Figure 48, its likely the year class in 2007 will be a small to moderate year class. Its not believed reservoir water declines in the winter seriously affect production of cisco. Since 2004, cisco recruitment has continued to improve even though 4.3, 1.5, and 2.5 feet of water were lost over the winters of 2004, 2005, and 2006 (Figure 49). For example, in 2001, nearly 6 feet of water was lost and the reservoir froze in early December, resulting in a record year class of cisco. It should be noted in 1994 when water levels were increasing over winter, the only time since 1981, the best year class of cisco was produced; the ice covered the reservoir in late December that year as well.

Two spottail shiners were collected at 70 and 90 feet, three *hybognathus spp*. were collected between 40 and 50 feet, 19 goldeye were collected between 0 and 80 feet, one channel catfish was collected at 70 feet, and one walleye was collected at 80 feet. Young-of-year game fish were also present during YOY cisco sampling which included: two young-of-year walleye collected at 50 and 60 feet, and two young-of year crappie collected at 10 and 60 feet. No salmon or lake trout were captured during sampling. All nets were set at 100-foot depths.

Adult Cisco

Adult cisco netting did not occur in 2005 due to manpower shortage and the ramps having ice over them early. In 2006, sampling was limited to two days on December 1st, and December 8th due to hazardous weather conditions and inoperable boat ramps. Therefore, nets were limited to the Marina Bay and portions of Duck Creek. A total of 302 cisco were collected for a catch rate of 37.8 per net with an average length and weight of 10.7 inches and 0.4 pounds. The largest adult cisco measured was a 18.5 inch and 2.5 pound male. Male to female was ratio was nearly 3:1 with 218 males and 83 females being sampled. The male to female ratio was 3:1, 1:1, and 2:1 in 2004, 2003, and 2002, respectively.

Catch rate of adult cisco in the lower Missouri Arm were 38 per net in 2006. Catch rates for the lower Missouri Arm in 2004, 2003, and 2002 were 110, 47, and 45 per net, respectively. The reason for the large number of adults sampled in 2004 was a result of the 2001-year class becoming sexually mature. Possible explanations for lower catch rates in 2006 include limited sampling and lower water temperatures. Water temperatures during the two sampling days ranged from 35 to 38 degrees and most females were spent on the last day of sampling with males also drying up. It should be noted that during the last day of lake trout netting in 2006, that adult male cisco began to congregate off the face of the dam when water temperatures were around 46 degrees. The reservoir didn't completely freeze until January 12th, 2007.



	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00'	01'	02'	03'	04'	05'	06'
Cisco	214	11	107	23	31	34	10	4	259	3	12	69	35	19	6	219	6	3	31	84	137
Ice Value	10	0	7	7	4	8	0	8	7	6	8	9	6	7	2	9	4	6	6	6	0.5

Figure 48. Number of young-of-year cisco caught per net compared to an ice on value from 1986-2006.

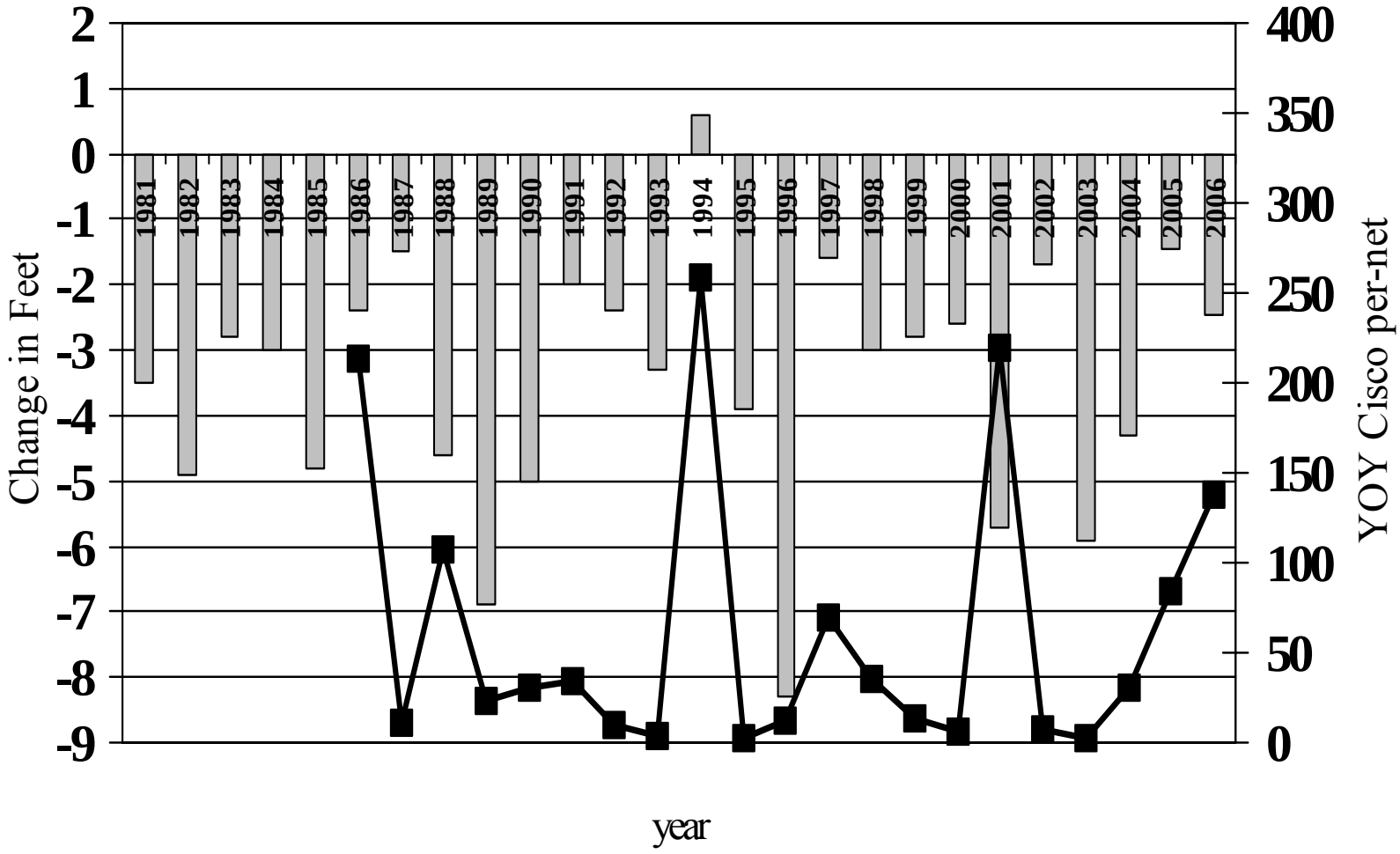


Figure 49. Fort Peck changes in reservoir elevation (bars) from December high to March low elevations from 1981 to 2006 in contrast with number of young-of-year cisco catch rate (line) in vertical nets.

RECOMMENDATIONS

- Spring trapping of spawners from the wild walleye population will continue to provide an egg source for sustaining this sport fishery.

- Continue use of sperm extender in the 2007 walleye spawn.

- Provide walleye eggs to researchers developing methods to produce sterile walleye.

- Collect additional genetic samples to estimate amount of hybridization between walleye and sauger during the walleye spawning operations. A funding mechanism needs to be found for this recommendation, before future samples will be taken, likely none available in 2006.

- Resume OTC marking of walleye potentially in 2007, fry single mark and fingerling double marked.

- Work with South Dakota and North Dakota to develop a stronger tri-state chinook salmon fishery. This may require traveling out of-state to help collect and spawn salmon to receive additional eggs or collection of eggs from Fort Peck to support ND or SD needs.

- An evaluation of stocking strategies indicates the size of salmon released is more important than the timing of release. Efforts should be made to increase the numbers of pounds stocked as opposed to numbers of fish. In 2007, plans are in place to produce larger fall stock fingerlings

- Evaluate the success on thermal marking otoliths in chinook salmon. This method could be a cost and time effective alternative to fin clipping for the purpose of mass marking stocked fingerlings.

- Continue efforts to spawn Fort Peck salmon when numbers of adults permit.

- Satellite rearing ponds will be filled by COE in 2007 with water levels permitting. Ponds will be used to rear northern pike fingerlings.

- Routine sampling with frame traps, experimental gill nets, alternating gill nets, vertical gill nets and beach seines will continue to obtain information on game and forage fish distribution, abundance, production and condition.

- Consider the use of ½ inch mesh; 125 x 6 foot gill nets to sample young-of-year walleye and determine reproductive success and contribution of stocking efforts. This gear also has the potential to target other young-of-year game and non-game species.

- Evaluate native species (sauger, channel catfish, and burbot) more closely by continuing to collect additional length and weight information during routine sampling.

- Reservoir water levels will be monitored to determine impacts to the overall fishery. Information will be utilized to make recommendations to Corps of Engineers for Annual Operating Plan in conjunction with the Missouri River Natural Resource Committee. In addition, assist the COE with water quality sampling on Fort Peck Reservoir.

- Continue attempt to create or have additional FTE provided for Fort Peck Reservoir. An additional 2 FTE would aid in completing goals of the management plan. FTE of 0.7 for summer help would be immediately beneficial.

- Secure funding for a lake wide creel survey in early summer to fall of 2008.

- Continue annual public informational meetings to disseminate information from the previous years work and to discuss stocking goals and work plans for the coming year beginning each March or April.

- Consider a second pontoon boat for spawning work, a cost of $35,000. The pontoon would aid the walleye spawn as well as coldwater spawns.

- Continue transferring or entering historical data into excel to create a full database of all documented work with Fort Pecks Fishery.

- Develop strategies for Fort Peck biological and Fort Peck hatchery staff to assist each other without detriments to either program.

- Complete aging analysis for all samples not done on walleye, pike, perch, bass, lake trout, and chinook salmon and provide results in the 2007 report.

- Complete a new analysis of 1997 creel data and correct the 1997 report.

- Continue tagging lake trout in 2007 and evaluate existing data from past creels and netting data to further evaluate recruitment or lack of recruitment.

- Attempt to spawn lake trout in 2007 if conditions allow. Lake trout will be reared in powerhouse.

- Prepare a boat for electrofishing to be used to capture salmon spawners.

- Evaluate and identify partners for a habitat and access project for Duck Creek. Habitat would be created using rock dikes with some being formed for access with potential ADA access.

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