MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-113-R-4 STUDY TITLE: SURVEY AND INVENTORY OF COLDWATER AND WARMWATER ECOSYSTEMS

JOB NO.: V-e JOB TITLE: NORTHEAST MONTANA WARMWATER ECOSYSTEMS INVESTIGATIONS

JOB PERIOD: JULY 1, 2003 THROUGH JUNE 30, 2004

ABSTRACT

Paddlefish harvest and tagging records were maintained for the Fort Peck Reservoir/Missouri River Paddlefish population. Overall harvest on this population remains low but average size is decreasing and recruitment has been poor. Gill netting and beach seining were conducted at Fresno and Nelson Reservoirs. Gill netting and beach seining was conducted at Beaver Creek Reservoir. The fishery in Bailey reservoir is maintaining despite low water levels. Walleye, yellow perch and tiger muskies are doing well in Little Warm Reservoir. Gill netting was conducted in the Fort Peck tailwater and dredge cut areas of the Missouri River.

OBJECTIVES AND DEGREE OF ATTAINMENT

Survey and Inventory - Objective is to survey and monitor the characteristics and trends of fish populations, angler harvest and preference, and to assess habitat conditions in selected waters. Objective accomplished, data presented.

Fish Population Management - Objective is to implement fish stocking and/or fish eradication actions to maintain fish populations at levels consistent with habitat conditions and other limiting factors. Objective accomplished. Eliminated illegal introduction of goldfish in Olson Pond. Assisted hatcheries in fish stocking, provided stocking requests and maintained planting records.

Technical Guidance - To review projects by federal, state and local government agencies and private parties that have the potential to affect fisheries resources, and to provide technical advice or decisions to mitigate impacts on these resources. To provide landowners and other private parties with technical advice and information to sustain and enhance fisheries resources. Objective accomplished: Eighteen 310 projects were reviewed and twelve 124 projects were reviewed with state and local agencies; advised Rocky Boy Indian Tribe on Beaver Creek Management Plan and management of Williamson Reservoir; supplied input to Compact Commission relative to water needs assessment on Rocky Boy Indian Reservation and Fort Belknap Reservation; assisted Ft.Belknap tribes with survey and fish capture at Snake Butte Reservoir; advised Rocky Boy

Reservation on stream enhancement projects; supplied comments to Bureau of Land Management (BLM) relative to development of new fishing reservoirs; twelve meetings were attended with schools related to the "Hooked on Fishing" program; other information is presented in data.

PROCEDURES

Floating and sinking standard experimental gill nets 125 feet in length and 6 feet deep consisting of 25-foot panels of 3/4-, 1-, 1 1/4-, 1 1/2-, and 2-inch mesh were fished to acquire information on adult fish populations. Beach seining to determine abundance and reproductive success of sport and forage fishes was conducted in late summer utilizing a 100- X 10-foot seine of 1/4-inch square mesh. Whenever possible, fish were measured for total length (TL) and weighed to the nearest .01 pound. Scales and/or spines were taken from walleye and lower dentaries from paddlefish for aging purposes. Six and 8-feet deep by 100-feet long gill nets of 4-inch bar mesh were drifted to capture paddlefish in the Missouri River.

RESULTS AND DISCUSSION

Paddlefish

Fort Peck Reservoir and Missouri River Upstream

Tagging and harvest records for previously tagged fish were maintained. During the period 1973-92, a total of 527 paddlefish were tagged in the Missouri River above Ft.Peck Reservoir. In 1993, a project was initiated to tag up to 500 paddlefish each year. Since 1993, 3,032 paddlefish have been tagged, 259 of them in 2003. No spawned out females were captured in 2003 but a female, running eggs, was taken on May 23 at Fred Robinson Bridge. The tagging effort encompassed the time period from May 8 to June 17. Flows were low in May, rose slightly in early June then receded for the rest of the summer.

Berg (1981) noted that significant upstream movement of paddlefish did not occur until flows reached 14,000 cubic feet per second (CFS) at the Virgelle gauging station. The 14,000 cfs flow is considered to be a "trigger" flow for spawning fish. Trigger flows did not occur until May 31, 2003 and lasted only 5 days (Figure A). However, a male paddlefish, tagged in 2002, was snagged by a fishermen 100 miles above Fred Robinson Bridge just a few days after trigger flows were reached.

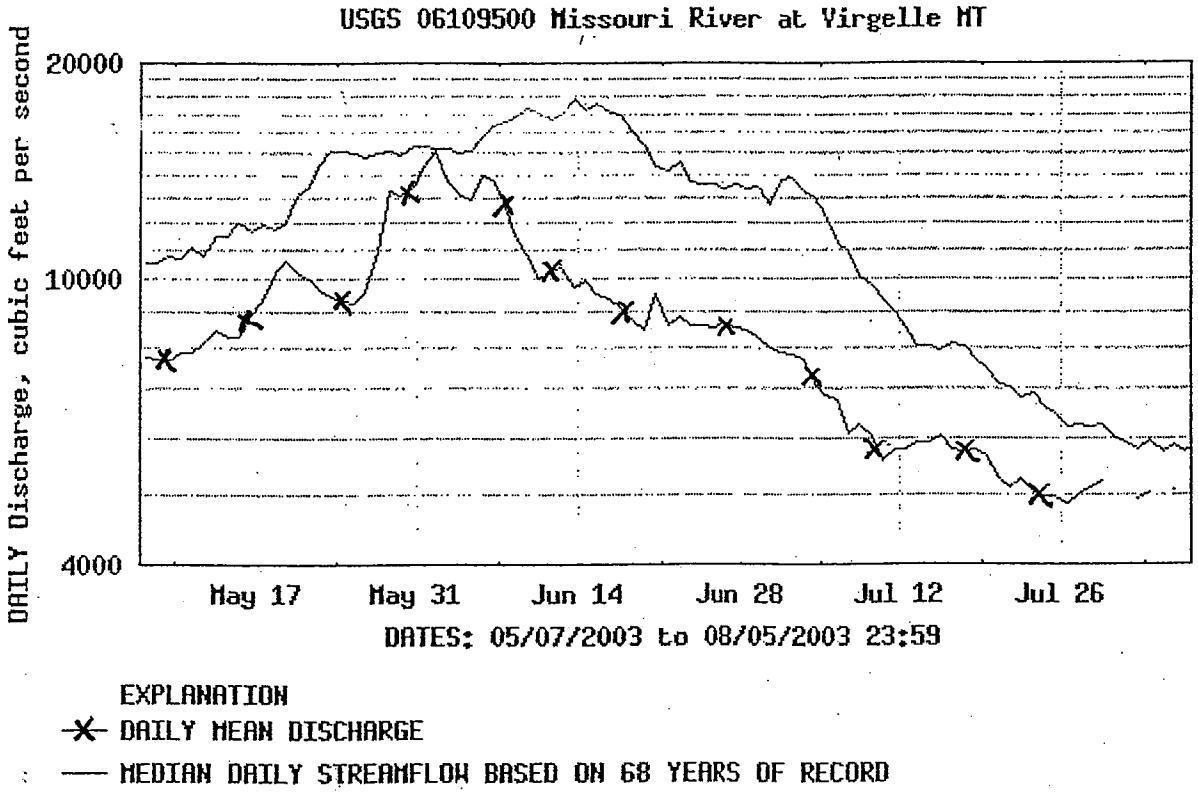

Figure A. Missouri River hydrograph at Virgelle during the paddlefish spawning season (May 15-July 15) 2003.

Forty-three tagged paddlefish were reported harvested by snaggers in 2003. Five of the tags were from fish tagged in 2003. Tag return data indicates a low rate of harvest for this paddlefish population as summarized in Table 1. The average annual rate of harvest for tagged cohorts has varied from 0.0% to 2.4% over the period 1977-03.

Table 1. A summary of paddlefish tagging and harvest data from the Missouri River and Fort Peck Reservoir, 1977-03. Percent of harvest was derived by adjusting for previous harvest of tagged fish.

Year	No. Tagged	No. Tags Returned In 2003	Total No. Tags Returned	% Harvest	Avg. Annual % Harvest
1977	60	0	8	13.3	0.5
1978	224	1	42	18.8	0.7
1979	10	0	4	40.0	1.6
1980	33	0	13	39.4	1.6
1983	2	0	1	50.0	2.4
1986	13	0	5	38.5	2.1
1992	29	0	5	17.2	1.4
1993	434	1	66	15.2	1.4
1994	499	7	79	15.8	1.6
1995	456	3	31	6.8	0.8
1996	281	4	41	14.6	1.8
1997	483	6	41	8.5	1.2
1998	368	4	32	8.7	1.5
1999	380	7	30	7.9	1.6
2000	88	1	8	9.0	2.3
2001	13	0	0	0.0	0.0
2002	221	4	7	3.2	1.6
2003	259	5	5	1.9	1.9
	3,032	43	418	13.8	

As previously mentioned, harvest rates do not appear to be excessive at present. However, the low number of successful spawning runs (based on observed trigger flow occurrence and duration) in recent years, warrants additional scrutiny on the ability of this sport fishery to recruit sufficient numbers of adults in future years to maintain existing harvest rates.

Mean weight of female paddlefish has been monitored for many years and was thought to be an indicator of over-harvest. An assumption was made that paddlefish weight was directly related to age. It was believed that if the average size of females decreased significantly, it would indicate an over-harvest of older, egg bearing fish on which the future of the stock depended. However, information gathered from tagged fish, at large as long as 25 years, does not strongly support this assumption. Aging of harvested fish was not routinely conducted and no age/weight relationships over time were investigated until recently. It is now generally agreed that the majority of paddlefish growth occurs in the juvenile or early adult stages. After reaching maturity, paddlefish growth is often insignificant. Mean annual weight gain was examined in adult fish to determine if growth after reaching sexual maturity was significant. Mean annual growth was determined from fish tagged and recovered from the Fort Peck/Missouri River stock (Table 2). Eleven adult males, at large since initial tagging an average of 16.5 years (range 11-

24), provided a basis for analysis. Mean annual weight change for male paddlefish was +0.2 pounds/year (range -0.9 to +1.7).

Nine adult females, at large since initial tagging an average of 16.9 years (range 10-25), had a mean annual weight change of +0.2 pounds/year (range -0.1 to +1.1). Unless there is significant tagging related growth suppression, it would appear that the maximum size achieved by any particular paddlefish is likely due to food availability and habitat conditions present in Fort Peck Reservoir during the fish's early growth period. This period would encompass about the first 13 years for males and the first 17 years for females.

Table 2. Weight differential over time for male and female paddlefish from the Fort Peck/Missouri River stock based on recaptures of tagged fish.

Tag No.	Date Tagged	Date Caught	No. Yrs. Growth	Initial Weight	Capture Weight	Difference (lbs.)	Mean Annual Change
MALES							
694	4/78	6/02	24	23.0	25.5	+ 2.5	+0.1
646	5/78	5/01	23	25.0	22.0	- 3.0	-0.1
777	5/78	5/98	20	26.0	30.0	+ 4.0	+0.2
016	5/73	5/93	20	30.5	32.0	+ 1.5	+0.1
661	4/78	5/95	17	21.0	38.0	+17.0	+1.0
711	4/78	4/93	15	27.0	24.5	- 2.5	-0.2
695	4/78	5/92	14	20.0	35.0	+15.0	+1.1
779	5/78	5/91	13	27.0	32.0	+ 5.0	+0.4
789	5/78	5/90	12	17.0	37.0	+20.0	+1.7
033	4/74	4/86	12	13.0	22.0	+ 9.0	+0.8
947	4/80	5/91	11	55.0	45.0	-10.0	-0.9
FEMALES							
508	5/73	6/98	25	50.0	66.0	+16.0	+0.6
758	5/78	6/03	25	65.0	63.0	- 2.0	-0.1
461	4/74	4/94	21	88.0	89.0	+ 1.0	+0.1
756	5/78	5/94	17	52.0	57.0	+ 5.0	+0.3
242	4/78	4/93	15	85.0	79.0	- 6.0	-0.4
181	5/77	5/91	14	50.5	68.5	+18.0	+1.3
639	4/78	5/91	13	84.0	80.0	- 4.0	-0.3
048	4/74	5/86	12	64.0	62.0	- 2.0	-0.2
793	6/78	5/88	10	79.0	80.0	+ 1.0	+0.1

The number of large paddlefish in the population has declined significantly since the early 1970's when empirical data was first collected. At least 25% of females handled in the 1970's weighed over 90 pounds. In the last decade that percentage has declined to less than 5% (**Figure B**). In 2000 and 2001 no fish exceeded 90 pounds. There appears to be a steady decline in size, rather than a leveling off, which would be expected after the initial trophic upsurge had run it's course in the reservoir.

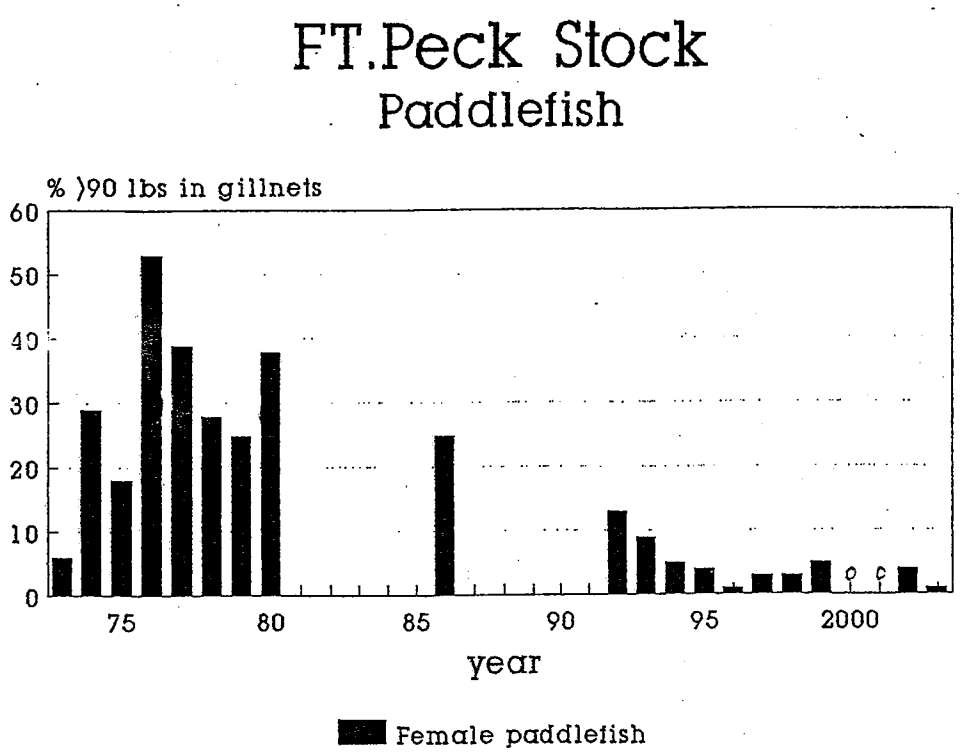

Figure B. Percent of female paddlefish greater than 90 pounds captured in spring gill net sets from Ft.Peck stock, 1973-2003.

Annual spawning migrations were rated as to their probable success based solely on the fish's ability to ascend the river and reach spawning sites above Fred Robinson Bridge (FRB) (Table 3). As mentioned, trigger flows of 14,000 cfs appear to be necessary to initiate spawning migrations upriver. Ratings of good, marginal or poor were assigned to each of the last 25 spawning seasons. **Good** years were determined to be those in which trigger flows occurred, and the duration of those flows exceeded 30 days during the mid-May to mid-July spawning period. A **Marginal** rating was assigned to those years in which trigger flows occurred, but the duration during the spawning seasoning was less than 30 days. A **Poor** rating was assigned to those years in which trigger flows were not reached and successful spawning was unlikely or severely limited. From 1974 to 1983, 7 good years, 2 marginal years, and 1 poor year were experienced. In contrast, 7 of the next 10 years were rated marginal or poor. Low recruitment is anticipated from those years. It is possible that no year-classes were developed within the 6-year span from 1985 to 1990. The potential loss of recruitment will not be evident in the snagging fishery until 1995 and could persist until the year 2005. Aging of harvested fish from year-classes of that time period may validate the spawning success assumption based on trigger flows. Another six consecutive years of poor recruitment have occurred since 1998. Age calculations from dentaries were not complete at the time of this report.

Table 3. Paddlefish spawning success ratings for the years 1974-03 using trigger flow[1] (TF) incidence and duration as the sole criteria.

Year	Good	Marginal (#days> TF)	Poor
1974	X	-----	-
1975	X	-----	-
1976	X	-----	-
1977	-	-----	X
1978	X	-----	-
1979	-	X(20)	-
1980	X	-----	-
1981	X	-----	-
1982	X	-----	-
1983	-	X(29)	-
1984	X	-----	-
1985	-	-----	X
1986	-	X(19)	-
1987	-	-----	X
1988	-	-----	X
1989	-	X(05)	-
1990	-	X(03)	-
1991	X	-----	-
1992	-	-----	X
1993	X	-----	-
1994	-	X(06)	-
1995	X	-----	-
1996	X	-----	-
1997	X	-----	-
1998	-	X(25)	-
1999	-	X(13)	-
2000	-	-	X
2001	-	-	X
2002	-	X(16)	-
2003	-	X(5)	-

[1]Flows measured at the Virgelle Measuring Station

A system for angler tagging of harvested paddlefish was first implemented on the Missouri River in 1992. This system had been used successfully for a number of years on the Yellowstone River. A 2-fish per year limit was imposed statewide in 1992. In 1994, fisherman were allowed to harvest only one paddlefish from the Yellowstone and Lower Missouri River, while two per year could still be taken from the upper Missouri fishery. The only other significant regulation difference between the Yellowstone and Missouri River fisheries is that snaggers may immediately release a snagged fish if they so desire at the middle Missouri River fishery, but any fish snagged on the Yellowstone or lower Missouri River must be immediately tagged. Some limited catch and release has been allowed at the Intake fishery since 1996. No post-release snagging mortality has been observed on the Missouri river. All the mortality previously observed was connected with high grading of fish held for long periods or from injuries sustained after propeller strikes. Snaggers would often tie up fish and then release them later if a larger fish was caught. The new tagging regulation eliminates this type of mortality. The "must keep"

regulation on the Yellowstone River fishery is primarily designed to help reduce sociological conflicts associated with severe crowding. Severe crowding does not occur on the Missouri River as the fishery is spread over many miles of river. Long-term observations and discussions with veteran snaggers indicate there is a significant voluntary effort to return large females to the river which would otherwise be harvested under a no release restriction. There was some concern that restricting the harvest to one fish on the Yellowstone River might cause a mass relocation of fishermen to the Missouri River. Angler interviews since 1994 indicate this has not occurred.

Egg Sampling

A small benthic trawl was designed to sample eggs from the river gravels. A sampling site was chosen after observing a large concentration of paddlefish in the area in 2002, and sampling eggs at the site. The trawl was deployed for a single 25 yard haul on June 10, 2003 about 500 yds above the upper CMR Refuge boundary at approximately river mile 1931. River depth at the site was seven feet and flows were approximately 10,000 cfs. The bottom was comprised of gravel/cobble, 2-8 inches in diameter. Flows had reached as high as 15,000 cfs the week before. The tow collected one recently hatched larval fish with eggshell still attached. The fish is either a paddlefish or a sturgeon which has yet to be positively identified. Two eggs were sent away for positive identification in 2002 from this locale, but identification was inconclusive. Two benthic tows were also made above Woodhawk Creek on June 10, 2003 however, no paddlefish eggs were sampled at this site.

Fresno Reservoir

Fresno Reservoir is a highly fluctuating reservoir of 5,757 surface acres located on the Milk River 12 miles northwest of Havre. In most years the demand for irrigation water results in water level fluctuations of 10-25 feet, though maximum depth is only 48 feet. Severe drought reduced the storage volume to 8% of capacity in 2001 and only 4% of capacity entering the winter of 2002-2003. Systematic gill netting, at predetermined stations, was conducted in the 1960's and 1970's, but was discontinued in 1974. Sampling of traditional gill-net stations resumed in 1987 to determine changes in sport fish abundance and species composition. Samples were collected utilizing six experimental gill nets fished overnight on two consecutive days (12 net-days).

Crayfish and burrowing mayflies, which were in very low numbers in 2002 appear to be making a good comeback in 2003.

Lake Superior whitefish continue to comprise a significant portion of the gill-net catch, but are rarely caught by fisherman (**Figure C**). Whitefish exhibit high growth rates in the reservoir, and thereby escape predation from all but the largest walleye and pike. Lake whitefish appear to reproduce successfully in years of stable over-winter storage. Over 90% of the 2003 catch was YOY fish. The role of whitefish in this reservoir, either as a forage fish or competitor, is not understood at this time. Few Lake whitefish have been found in stomachs of walleye or northern pike.

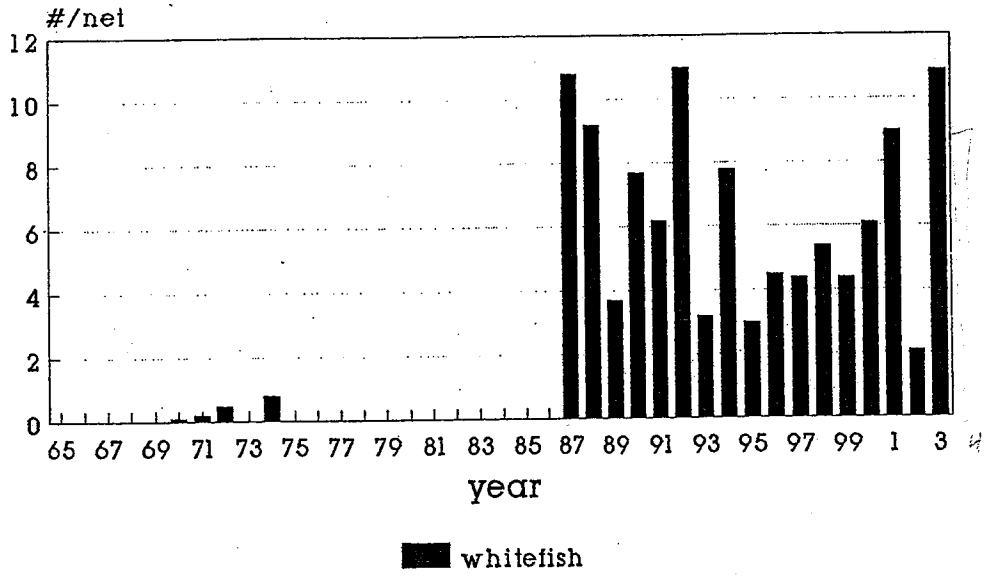

Figure C. Gill net catches of lake whitefish in Fresno Reservoir, 1965-2003. No netting was conducted from 1975-1986.

The paucity of adult yellow perch in the gill-net catch, since their introduction in 1968, can only be explained as the result of consistent heavy predation. Reproduction appears to be significant in most years, but few adult perch are ever captured by gill nets (**Figure D**). The low catch-per-unit-effort (CPUE) is of concern, as it is far below that of all other north central walleye/perch fisheries. The adult perch catch-rate increased almost 10 fold in 2001 due to a transplant of 37,500 adult perch from local waters and Lake Mary Ronan in April. Another 18,500 adult pre-spawn perch were added in 2002 following another year of drought. Reservoir elevation did not rise early enough to provide any reproduction in either year despite the massive amount of spawning vegetation developed on dewatered shorelines over the last two drought years. An additional 37,000 adult perch were transplanted prior to spawning in 2003. Reservoir levels were ideal for spawning and a fair year-class was established. Though reproduction has been marginal the past few years, the low numbers of walleye have reduced predation and allowed for excellent survival and recruitment of perch.

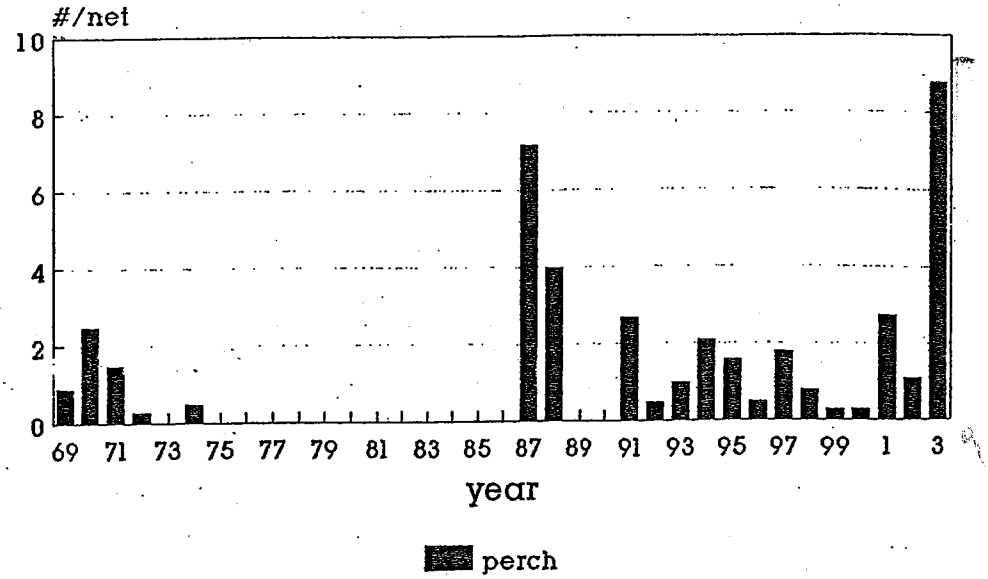

Figure D. Catches of yellow perch from gill nets in Fresno Reservoir, 1965-2003. No netting was conducted from 1975-1986.

The northern pike population had been declining steadily since 1995 (Figure E); however, ice fishermen consistently take several fish over 20 pounds each winter. A bumper crop of pike was produced in 2003 and good recruitment is evident from previous years of marginal production.

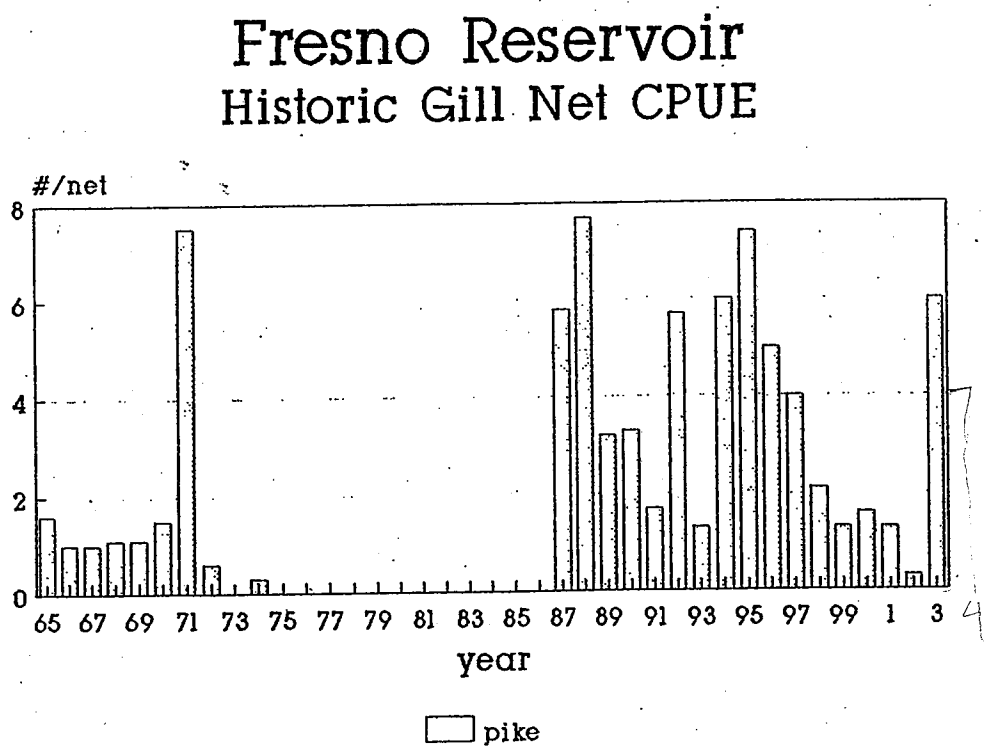

Figure E. Gill net catches of northern pike in Fresno Reservoir, 1971-2003. No netting was conducted between 1975 and 1986.

The walleye gill-net catch remained low in 2003 due to poor recruitment (**Figure F**). The gill net catch in 2002 was the lowest number of walleye encountered since their initial introduction. One half of the fish captured were four-year-olds from the 1998 year-class. It is apparent that little recruitment has occurred in the last three years. Relative weight of walleye had been declining steadily since 1997 but began increasing in 2002 and walleye continued to exhibit high condition indices in 2003. The increase in condition is attributable to a forage base adequate for the existing population of predators rather than an over abundance of forage. The declining condition of walleye coincided with supplemental stocking of walleye fingerlings in 1997 (**Figure F**). It is believed that the supplemental stocking of walleye, at a time when walleye populations were at an all time high and forage abundance was low, probably contributed to or precipitated the decline in the condition of walleye. Severe drought experienced in both 2000 and 2001 reduced habitat, increased water temperatures and turbidity and hampered forage fish production. The drought factors exacerbated the problem but did not initiate it.

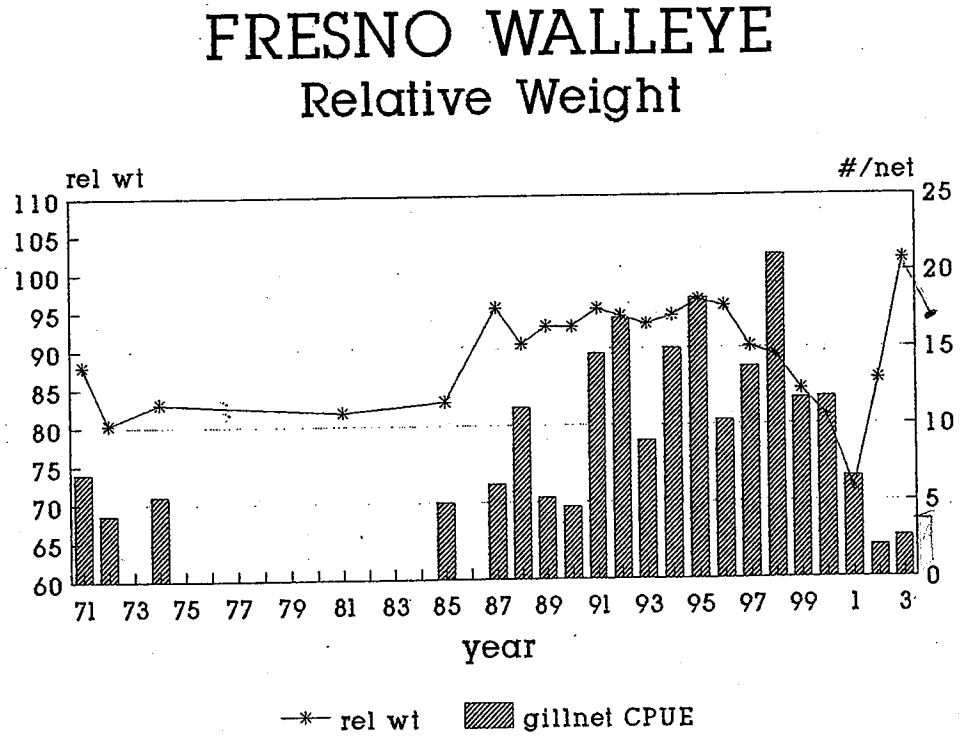

Figure F. Gill net catches of walleye and relative weight for the years 1971-2003. No sampling occurred from 1975-1984.

Trout have not been planted in Fresno Reservoir since the 1970's. A combination of low numbers of walleye and pike currently present in the reservoir and the large number of unallocated trout available from hatcheries due to the statewide drought, provided a window of opportunity to perhaps develop an interim trout fishery while the walleye and pike

trout and 93,000 kokanee salmon were planted in the reservoir in 2002. Fall netting captured three trout 11-12 inches long and a 6.7-inch kokanee. An additional plant of 100,000 4-inch rainbow trout was made in the spring of 2003. Few trout have been reported caught by fishermen.

Beach seining was conducted at 12 standard sampling sites around the reservoir in a continuing effort to evaluate reproductive success of sport fishes and assess forage fish abundance(Table 6). Despite excellent spawning conditions, walleye reproduction was poor and there was little or no survival of the additional 100,000 small fingerlings also planted. Yellow perch production was well below the 10-year average but many fish are expected to recruit due to low walleye numbers. Spottail recruitment was low but emerald shiner production the last few years has been exceptional. Large numbers of northern pike were produced and should allow the population to get a head start on the walleye, which is not expected to be advantageous for the walleye fishery. Crappie YOY were found in large numbers. The combination of rising water levels in June and low predator numbers took some pressure off this species. Rising waters allowed nests to remain under water and shoreline vegetation was flooded late, providing areas of refuge not usually found.

Table 4. A summary of forage fish and YOY game and sport fish taken with a 100- x 9-foot x ¼-inch square mesh beach seine in Fresno Reservoir, 1968-03.

Date	Seine Hauls	*Stizostedion*	No. Pike	Yellow Perch	Emerald Shiner	Crappie Sp.	Spottail Shiner	Sucker sp.[1]	Minnow sp.[2]	Other[3]
August 1968	12	16	6	2,909	147	552	0	0	161	0
August 1969	12	4	6	1,140	385	67	0	2	380	0
August 1970	12	27	45	10,151	521	883	0	1	122	0
August 1972	12	102	22	1,005	205	379	0	0	72	0
August 1974	12	13	59	1,583	29	1,355	0	0	25	0
August 1975	11	10	32	4,154	155	59	0	0	0	0
August 1978	12	22	42	10,684	12	3	0	0	0	0
August 1979	12	29	45	8,516	340	127	0	1	0	1
August 1982	12	102	70	8,993	121	166	0	0	0	3
August 1983	12	23	0	2,254	448	9	0	1	7	0
August 1984	12	247	0	197	375	0	2	40	55	0
August 1985	12	64	0	379	684	3	2	0	9	0
August 1986	12	0	23	6,077	142	2	20	1	5	1
August 1987	12	80	113	6,233	1,979	7	3	0	3	0
August 1988	12	53	4	3,122	182	0	20	0	1	0
August 1989	12	56	32	24,706	22	0	16	2	0	0
August 1990	12	8	57	2,033	7	465	44	1	2	0
August 1991	12	8	36	3,425	0	42	53	0	0	0
August 1992	12	45	2	6,550	28	0	48	0	1	0
August 1993	12	24	9	5,595	12	2	162	0	0	0
August 1994	12	19	19	2,960	3	287	1,421	1	0	0
August 1995	12	5	2	1,080	0	2	129	0	1	0
August 1996	12	52	21	3,576	0	1	1,484	42	0	0
August 1997	12	46	15	3,006	2	1	887	2	0	0
August 1998	12	44	1	1,413	9	0	1,041	1	3	0
August 1999	12	50	7	4,271	176	12	182	13	0	0
August 2000	6	29	0	1,396	2	2	30	2	0	1
August 2001	6	86*	0	39	3	0	3	3	1	0
August 2002	12	28*	2	86	128	400	154	4	29	0
August 2003	12	4	46	1,871	5,539	90	207	0	0	1

[1]Consists of white and longnose sucker
[2]Consists of silvery minnows, lake chubs, flathead chubs, and fathead minnows
[3]Consists of burbot, smallmouth bass, and brook sticklebacks
* almost entirely sauger

Nelson Reservoir

This reservoir is utilized by the Bureau of Reclamation for off-stream storage of irrigation water. At full storage capacity, it covers approximately 4,500 surface acres. Water levels in the reservoir have been good to very good over the last decade, which has provided almost optimum growing conditions for sport and forage fish. However, drought in 2000,2001 and 2002 severely reduced storage in the reservoir. Spottail shiners were initially introduced to the reservoir in 1984, to supplement the existing forage base. Three artificial walleye spawning shoals were constructed in 1993, and were utilized the following spring by spawning walleye, as well as spawning white suckers. Beach seining is conducted annually to determine reproductive success of sport and forage fishes. Beach seining was conducted in late July at a number of sites around the reservoir, encompassing 530 feet of shoreline. The sport fish YOY catch consisted of 3 walleye, 33 northern pike, and 361 yellow perch (Table 5). The catch of YOY northern pike was the highest recorded in 30 years of sampling. Black crappie production was also very high and may provide the main source of forage in the next year. Three smallmouth bass were seined. Though a few adult smallmouth bass have been gill netted in the reservoir in past years, no reproduction had been observed until this year.

Table 5. A summary of walleye, yellow perch, and northern pike YOY captured by beach seining in Nelson Reservoir, 1974-03.

		Walleye		Yellow Perch		No. Pike	
Year	Shoreline Seined (ft.)	No.	No./ 1,000 (ft.)	No.	No./ 1,000 (ft.)	No.	No./ 1,000 (ft.)
1974	1,590	36	22.6	1,365	860	0	0.0
1975	1,845	112	60.5	3,008	1,630	0	0.0
1976	1,590	119	74.8	74	50	1	0.6
1977	1,740	1	0.7	2,939	1,690	0	0.0
1978	870	428	492.0	6,568	7,550	0	0.0
1979	1,530	23	15.0	1,832	1,200	2	1.3
1980	----------No Seining Conducted----------						
1981	651	31	50.6	8859	14,300	1	1.6
1982	660	0	0.0	4,553	6,898	3	5.0
1983	1,420	4	2.8	138	100	18	12.7
1984	1,530	0	0.0	133	87	0	0.0
1985	510	3	6.0	2,272	4,445	16	31.4
1986*	700	0	0.0	3	4	7	10.0
1987*	495	5	10.1	1,987	4,014	0	0.0
1988*	520	0	0.0	783	1,506	0	0.0
1989*	910	10	11.0	736	809	4	4.4
1990	1,320	7	5.3	2,631	1,993	1	0.8
1991*	660	8	12.1	77	117	1	1.5
1992	635	21	33.0	140	220	6	9.0
1993*	520	3	5.8	8,287	15,937	1	1.9
1994*	830	6	7.2	1,802	2,171	10	12.0
1995*	760	36	47.4	232	305	0	0.0

Table 5 (Con't)

Year	Shoreline Seined (ft.)	Walleye No.	Walleye No./1,000 (ft.)	Yellow Perch No.	Yellow Perch No./1,000 (ft.)	No. Pike No.	No. Pike No./1,000 (ft.)
1996*	870	25	28.7	4,521	5,197	13	14.9
1997*	890	53	59.5	2,205	2,478	0	0.0
1998*	340	0	0.0	126	371	0	0.0
1999	750	11	14.7	1,489	1,895	2	2.7
2000*	440	4	9.0	449	1,020	2	4.5
2001	430	2	4.7	72	167	1	2.3
2002*	415	2	4.8	19	46	4	9.6
2003	530	3	5.7	361	681	33	62.3

*Years in which walleye fry or fingerlings were stocked

Sporadic gill netting has been attempted at Nelson Reservoir in the past, but sampling was neither uniform, nor consistent enough, to develop useful trend data on game fish population size, or composition. In the fall of 1991, five experimental gill-net stations were established and sampled for the first time. In 1993, five additional stations were added to increase sample size and reservoir coverage. Since 1993, all 10 stations have been utilized.

The CPUE of adult walleye increased to an all time high in 1996 and has continued at high levels through 2003 except for one year (2002), which was related to extreme drought. The population decreased by 50% in 2002. (Table 6). The walleye population is comprised of good numbers of 3,4 and 5 year-old fish and recruitment of 0 and 1 year-olds is improving. Condition of walleye remains good. Yellow perch CPUE was on the rise until the droughts experienced in 2000, 2001 and 2002. Adult perch exhibited a significant rebound in 2003 however. The northern pike catch remained quite stable through 2001, but plummeted in 2002. Pike have returned to normal levels and are expected to explode in the next few years based on the number of YOY produced in 2003.The white sucker population was declining but is also rebounding. The gill net catch of goldeye in 2003 was the highest ever recorded. Population trends of key sport fish are exhibited in Figure G.

Table 6. Relative catches of fishes from Nelson Reservoir with experimental sinking gill nets, fall 1991-03.

Year	No. Nets	Walleye n	Walleye CPUE	Yellow Perch n	Yellow Perch CPUE	Northern Pike n	Northern Pike CPUE	Lake Whitefish n	Lake Whitefish CPUE	White Sucker n	White Sucker CPUE	Goldeye n	Goldeye CPUE
1991	5	49	9.8	51	10.0	15	3.0	25	5.0	18	3.6	24	4.8
1992	5	36	7.2	37	7.4	19	3.8	29	5.8	26	5.2	2	0.4
1993	10	76	7.6	38	3.8	21	2.1	22	2.2	182	18.2	11	1.1
1994	10	115	11.5	32	3.2	24	2.4	60	6.0	82	8.2	3	0.3
1995	10	120	12.0	23	2.3	10	1.0	37	3.7	113	11.3	16	1.6
1996	10	183	18.3	68	6.8	18	1.8	32	3.2	135	13.5	22	2.2
1997	10	175	17.5	73	7.3	26	2.6	21	2.1	91	9.1	16	1.6
1998	10	158	15.8	83	8.3	30	3.0	12	1.2	86	8.6	38	3.8
1999	10	115	11.5	113	11.3	26	2.6	14	1.4	95	9.5	11	1.1
2000	10	112	11.2	25	2.5	25	2.5	33	3.3	116	11.6	51	5.1
2001	10	186	18.6	21	2.1	28	2.8	45	4.5	175	17.5	52	5.2
2002	10	92	9.2	19	1.9	8	.8	32	3.2	65	6.5	41	4.1
2003	10	121	12.1	77	7.7	29	2.9	27	2.7	97	9.7	116	11.6

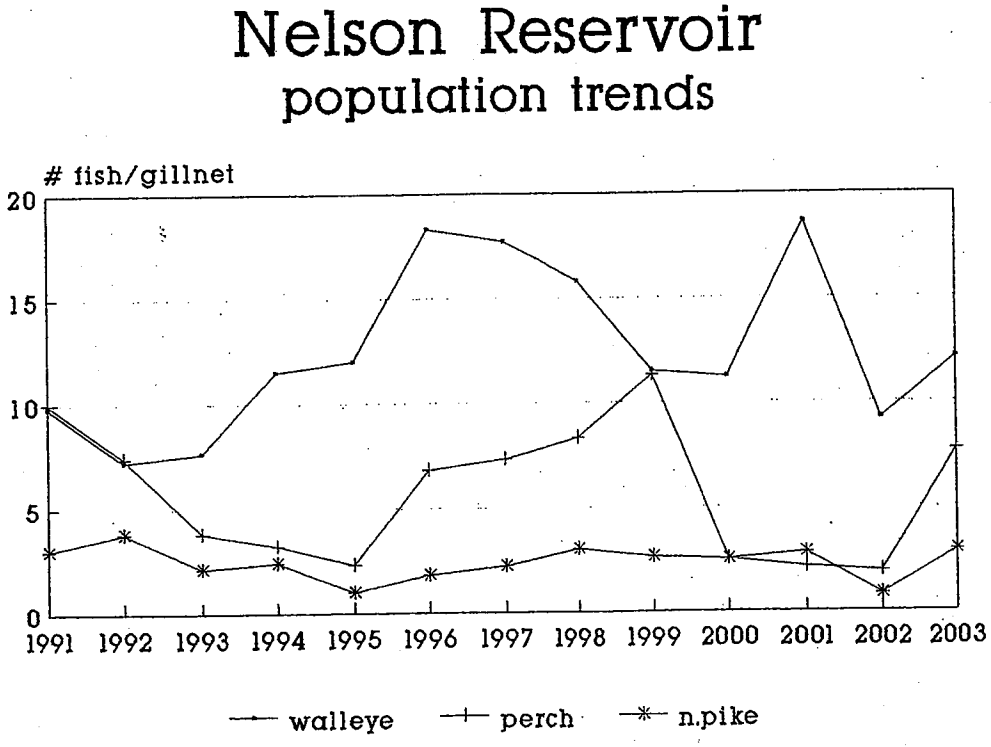

Figure G. Population trends of three key sport fishes in Nelson Reservoir using CPUE of fall gill nets.

Beaver Creek Reservoir

This 200-acre reservoir has a maximum depth of 90 feet and has provided a rainbow trout fishery of varying success since its initial filling in 1975. Its proximity to the city of Havre makes this reservoir a valuable local resource and it has been managed intensively in recent years with a variety of species. The statewide fishing pressure survey for 2001 indicated it was the second most fished reservoir in Region Six behind Ft.Peck Reservoir. In the early 1980's, largemouth bass were introduced to help curb excessive sucker numbers and provide an additional sport fish. Although bass reproduction was documented, no recruitment occurred and largemouth bass are no longer found in the reservoir. Soon after bass introductions were made, northern pike were found in the reservoir from an illegal introduction. The northern pike population increased steadily and peaked in the early 1990's. Reproductive success of pike has been spotty allowing for several years of good trout survival. Pike reproduction in 2003 was excellent and a strong year-class was produced. Some of the initially introduced pike exceeded 35 pounds when caught. Northern pike often severely reduce rainbow trout numbers despite increased trout stocking rates.

Yellow perch were first found in the reservoir in 1986. Beach seining indicated good initial reproduction in 1987 (Table 7). Like the northern pike, perch numbers peaked in the early 1990's and are maintaining a population at rather high levels. Yellow perch, spottail shiners and suckers provide the bulk of the forage base. Seining in 2003 captured 19 white sucker YOY and large numbers of spottail shiners. Spottail shiners were introduced in 1988 to supplement the forage base. They have become well established, as evidenced by the large numbers captured in the last few years. They are utilized as forage by pike, walleye, perch, trout and smallmouth bass.

Walleye were stocked in 1987 due to local demand. The walleye management plan included 3 consecutive years of stocking, followed by 2 non-stocking years to evaluate natural reproduction. Fry plants appeared to be quite successful in establishing a fishable population. However in later years fry planting did not provide sufficient recruitment. A single YOY walleye was seined in 1997. This fish was a result of natural reproduction, as no fry or fingerling were stocked prior to seining. This is the first confirmed natural reproduction in this reservoir since the introduction of walleye in 1987. The reservoir is currently stocked annually with fingerling walleye. Poor survival of naturally produced and hatchery walleye was evident in 2003, as only 1 YOY was captured. Eighteen walleye were captured in the fall gill netting. The walleye averaged 14.7 inches (range 8.3-23.1 in) and 1.48 pounds (range 0.24-4.58 lbs).

Table 7. A summary of sport fish YOY and forage fish taken by beach seining from Beaver Creek Reservoir, 1985-03.

		Species[1]									
Date	No. Hauls	WSU/ LSU	YP	LK CH	FTHD MIN	S/P MIN	ID	EM SH	SP SH	NP	WE
9-04-85	5	2,535	0	7	0	0	11	0	0	0	-
6-16-86	4	3,110	0	1	0	0	2	0	0	9	-
8-19-87	6	969	2,281	1	0	0	72	0	0	10	-
8-23-89	6	54	4,401	0	0	0	4	0	1	0	-
8-21-90	6	1	42	0	0	0	2	1	93	2	0
8-13-91	6	348	8,615	0	0	2	0	2	835	12	0
8-10-92	6	492	1,938	0	0	0	4	0	156	0	0
8-18-93	6	0	0	0	0	0	11	0	455	27	0
8-08-94	6	49	707	0	0	0	0	0	181	11	0
8-19-95	6	6	7,210	0	0	0	0	0	1,438	13	0
8-12-96	6	261	5	0	0	0	7	0	247	5	7
8-15-97	6	31	17	0	0	0	6	0	193	13	1
8-14-98	6	0	870	0	0	0	0	0	141	6	1
8-16-99	6	0	592	0	0	0	0	0	86	7	2
8-14-00	6	1	402	0	1	0	0	0	190	3	23
8-16-01	6	10	357	0	0	0	0	0	216	0	3
8-19-02	6	0	331	0	0	0	0	0	592	0	95
8-14-03	6	19	506	0	0	0	2	0	2,355	15	1

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

Walleye stomach analysis indicates yellow perch and spottail shiners are heavily utilized. Predation on trout by larger walleye has been documented, but it is not felt to be as large a factor as northern pike predation in reducing trout numbers. Growth and condition of walleye exceeds that of other local populations.

Bailey Reservoir

This reservoir floods approximately 70 surface acres at full pool and has a maximum depth of 28 feet. It was constructed in the mid-1970's primarily for use as a fishing reservoir. Though privately owned, it has been under management of MFWP. Initial introductions of rainbow trout provided an excellent fishery. Northern pike were illegally introduced about 1980. No other fish were present in the reservoir and predation on trout soon became excessive. During a severe drought in 1984, the remaining trout winterkilled, but the northern pike survived. Larger trout were planted to reduce the level of predation, but without success. Chemical rehabilitation was considered, but at the request of the landowner the MFWP began to cool/warm water fishery. Trout stocking was discontinued. Yellow perch and black crappie were introduced in 1987,

followed by largemouth bass in 1988. Reproductive success of all department-introduced fish has been good in most years.

Monitoring of adult sport fish by gill netting was initiated in 1990. Two overnight experimental sinking gill-net sets were utilized in the sampling (Table 8). Yellow perch, black crappie and northern pike have grown exceptionally fast in this productive reservoir. Large catches of perch exceeding 0.50 pounds were commonly taken throughout the summer of 1991, and the following winter. A party of three fishermen remarked that they had taken home 93 pounds of perch fillets in a single weekend of ice fishing. Fishermen report that the average perch size is increasing though numbers remain below target levels.

Table 8. Total catch from two experimental gill net sets at Bailey Reservoir, 1990-03.

	Northern Pike			Yellow Perch			Black Crappie		
Date	No.	$\bar{X}$ L (in.)	$\bar{X}$ WT (lbs.)	No.	$\bar{X}$ L (in.)	$\bar{X}$ WT (lbs.)	No.	$\bar{X}$ L (in.)	$\bar{X}$ WT (lbs.)
8-08-90	24	18.1	1.23	34	7.7	0.26	21	5.7	0.10
9-27-91	7	24.7	3.21	58	10.1	0.56	4	8.5	0.35
9-11-92	6	26.8	4.29	34	8.1	.29	16	4.7	0.08
9-10-93	2	31.8	7.55	21	6.6	0.15	127	6.7	0.12
9-19-94	7	20.1	2.59	38	6.0	0.10	43	6.3	0.14
9-12-96	14	23.8	3.54	86	7.2	0.19	15	6.8	0.21
1997	----------No netting----------								
9-17-98	3	22.2	2.43	132	8.0	0.26	32	9.0	0.44
1999	----------No netting----------								
2000	----------No netting----------								
2001	----------No netting----------								
6-21-02	0	0.0	0.0	32	9.9	0.49	31	11.2	0.82
2003	----------No netting----------								

A 5.5 pound largemouth bass was captured by electrofishing in 2000 and fishermen report regular catches of yearling bass and occasional fish up to three pounds. Black crappie are being taken in good numbers and the population appears to be quite healthy. Fishing pressure on northern pike is occasionally heavy. During the winter of 1989-90, as many as 32 spearing houses were on the reservoir on any given day. Dozens of large pike (>10 pounds) were reportedly harvested that same winter. The catch of adult pike since that winter has declined noticeably. The gill-net catch and poor fishermen success are suggestive of a low pike population at present. Good northern pike reproduction was last observed in 1990. A plant of 5,000 northern pike fingerlings was made in 1993 to supplement expected natural reproduction. Though high water levels in 1993 were conducive to spawning, no sign of naturally produced fish or hatchery fish were found by late summer. A transplant of 710 18-inch pike was made in August of 1994. These were fish that were "hook and-lined" from nearby Fresno Reservoir. An additional 140 22-inch pike were transplanted from Fresno Reservoir in October of 1995. Some YOY pike were observed in 1996, indicating at least some natural production occurred. Though no netting was conducted in 1995, fishermen reported good catches of pike throughout the winter of 1995-96. Several walleye in excess of 8 pounds have recently been caught by fishermen and two walleye of 4 and 9 pounds

were gill netted in 2002. These fish were apparently survivors from a single plant made in 1989. Alternate year stocking of walleye was initiated in 1999 in order to provide an additional sport fish and utilize the abundant yellow perch population. Recruitment of these fish has been verified by recent fishermen catches. The continuing drought has lake levels down about 14 feet, going into the winter, and the upper end of the reservoir has been cut off and is isolated at present. Any fish present in this isolated section are expected to winterkill.

Little Warm Reservoir

Little Warm Reservoir provided good fishing for northern pike and yellow perch until the dam washed out by flooding in 1986. The reservoir was subsequently drained for repair and refilled in 1988. The reservoir is privately owned and utilized for stock water and irrigation. The department manages the fishery, which is open to the public. The reservoir was initially stocked with walleye fry for several years and is now managed with annual plants of fingerlings. Sixty-eight ripe adult crappie were introduced in 1989. Some reproduction was observed but few adult crappie have been captured since.

Other species found in the reservoir are brook stickleback, Iowa darter, white sucker, golden shiner, yellow perch, black bullhead and fathead minnow. Most of these fish are common to the drainage and probably were introduced from upstream sanctuaries. Because of a large increase in white sucker numbers, an additional piscivore was considered for introduction. The tiger musky was chosen and 429 7-inch fingerlings were introduced in the fall of 1993. Another 2,500 2-inch fingerlings were planted in 1997. Two tiger muskies were netted in 1997, weighing 4.80 and 4.58 pounds. Reports of larger muskies are common.

Two over-night sinking gill nets were fished in mid May 2003. They captured 1 walleye (6.2 pounds) and 32 yellow perch. Six tiger muskies averaging 5.5 pounds were also netted. White suckers were plentiful but no crappie were captured.

Water levels have been extremely low throughout the last few years. The reservoir would benefit greatly from better water levels. A metal boat ramp was installed while water levels were low. Management plans include annual stocking of walleye fingerlings and alternate year tiger musky fingerlings, to maintain fishable populations.

Fort Peck Dredge Cuts and Tailwater

Fort Peck Dredge Cuts and tailwater complex fish population sampling continued in June and September 2003. For both months, ten 125- x 6-foot multifilament experimental gill nets and four 100- x 8-foot 1/2-inch bar mesh monofilament gill nets, were set overnight. Nets were set for an average of 19.5 hours each. This sampling effort, initiated in 1979, was to obtain information on the overall fish population due to potential impacts associated with proposed construction of re-regulation dam below Fort Peck Dam. Another objective is to evaluate the abundance of game fish in relation to cisco and rainbow smelt.

The walleye/sauger combined catch was the highest in the area in 1980 (94 were netted). This is believed to have been associated with the migration of large numbers of rainbow smelt from lake Sakakawea, ND.

However, the combined walleye/sauger catch in 1998 was also 94, and was not accompanied by a large number of rainbow smelt being present (only 7 captured). In 2003, only 66 walleye/sauger were netted (Tables 11 and 12), with only 2 rainbow smelt taken (Table 11).

The combined cisco net catch in 2003 was 96 (Table 11; Table 12). Cisco first appeared in this sampling in 1985, one year after they were introduced into Fort Peck Reservoir. Since then, they have become a significant forage fish in the area immediately below Fort Peck Dam.

A combined total of 77 shovelnose sturgeon were captured in standard experimental gill nets in 2003 (Table 11), down from 80 in 2002. Standard fork length and standard length measurements were taken and numbered spaghetti tags were inserted through the base of the dorsal fin on all shovelnose. This was done to augment on-going shovelnose and pallid sturgeon research in the lower Missouri and Yellowstone Rivers.

Table 11. Summary of 2003 June and September combined standard experimental gill netting with 390 hrs. and 20 nets in the Fort Peck Dredge pools.

Species[1]	Average Length (in)	Average Weight (lbs.)	Number	CPUE Per Hr.	CPUE Per Net
SNS	24.9[2]	2.16	77	0.20	3.9
GE	11.7	0.51	175	0.45	8.8
LW	18.2	2.10	8	0.02	0.4
CI	10.2	0.37	96	0.25	4.8
RBS	6.5	0.07	2	<0.01	0.1
NP	24.6	3.9	23	0.06	1.2
CP	19.3	3.63	3	<0.01	0.2
RC	16.4	2.16	24	0.06	1.2
BSU	28.1	8.09	2	<0.01	<0.01
BMB	15.9	2.37	1	<0.01	<0.01
SMB	20.5	4.02	5	0.01	0.3
SHR	17.0	2.19	15	0.04	0.8
WS	14.3	1.44	47	0.12	2.4
CC	16.6	1.44	59	0.15	3.0
YP	5.8	0.19	4	0.01	0.2
SG	15.9	1.2	28	0.07	1.4
WE	17.2	1.87	37	0.09	1.9
TOTAL			606	1.55	30.3

[1]SNS-Shovelnose Sturgeon
GE-Goldeye
LW-Lake Whitefish
CI-Cisco
RBS-Rainbow Smelt
NP-Northern Pike
CP-Carp
RC-River Carpsucker
SMB-Smallmouth Buffalo
SHR-Shorthead Redhorse
BMB-Bigmouth Buffalo
WS-White Sucker
CC-Channel catfish
YP-Yellow Perch
SG-Sauger
WE-Walleye
BSU-Blue Sucker
[2]Fork Length

Table 12. Summary of 2003 June and September combined standard Smelt netting with 163.5 hrs and 8 nets in the Fort Peck dredge pools.

Species[1]	Average Length (in)	Average Weight (lbs)	Number	CPUE per hour	CPUE per net
GE	11.3	0.44	3	0.02	0.4
EMS	3.8	n/a	1	<0.01	0.1
STS	-	-	1	<0.01	0.1
RC	17.7	2.75	1	<0.01	0.1
SHR	15.8	1.87	1	<0.01	0.1
YP	3.9	0.02	1	<0.01	0.1
WE	16.7	1.43	1	<0.01	0.1
Total			9	0.08	1.0

GE-Goldeye
EMS-Emerald Shiner
STS-Spottail Shiner
RC- River Carpsucker
SHR-Shorthead Redhorse
YP- Yellow Perch
WE- Walleye

RECOMMENDATIONS

The 2-paddlefish annual limit, utilizing fishermen tags, should be continued on the Missouri River. The ability to immediately release a paddlefish should be retained. Annual collections of paddlefish jaws should be made to assist in determining the age structure of the Fort Peck Reservoir paddlefish stock. A mail/phone survey should be conducted periodically, using database of anglers who purchased tags. Attempts should be made to tag 300+ paddlefish each year. On-site creel census should be conducted at least every other year. This information is invaluable in determining harvest rates and total harvest and pressure. Enforcement activities should be logged so a record of monitoring can be established.

Standardized late-summer seining to assess sport fish reproduction and forage fish abundance should be continued at Fresno Reservoir. Sampling of adult sport fishes should be continued utilizing fall gill netting to gather recruitment information relating to walleye year-class strength and winter reservoir water levels. Efforts should be made to increase perch production through habitat improvement and transplants of adult perch. Transplanting of adult perch to the reservoir should continue until a catch rate of 3.0 perch/net is attained. If projected water levels and existing forage base allows, .1 -.25 million walleye fingerlings should be stocked in 2004 to establish a large year-class.

Walleye reproduction is still considered to be below optimum at Nelson reservoir, but appears to be improving. Alternate years of walleye fingerling stocking should be continued. If water level projections are good, 100,000 fingerling walleye should be planted in 2004 to establish a strong year-class. Monitoring of reproductive success of sport and forage fish should continue, as well as, evaluation of current and forecast water levels to determine future stocking needs.

Beach seining and gill netting should be continued at Beaver Creek Reservoir to monitor growth and survival of stocked walleye and forage availability. Spring and fall fingerling walleye plants should be made.

Sampling of adult sport fish at Bailey Reservoir should continue to establish trend data and monitor growth and recruitment. Occasional supplemental stocking of walleye and northern pike should continue if water levels improve.

Continue alternate year stocking of walleye and tiger musky in Little Warm Reservoir. Evaluate annually by gill netting.

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

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Waters referred to:

16-5140 Fort Peck Reservoir
16-2500 Missouri River Sec. 05
16-2520 Missouri River Sec. 06
15-5240 Fresno Reservoir
15-6480 Nelson Reservoir
15-4570 Beaver Creek Reservoir
15-4535 Bailey Reservoir
15-6105 Little Warm Reservoir

Key words or fish species:

Paddlefish, harvest, walleye, water levels, creel census, population estimates, recruitment, tiger musky, stocking, cisco, smelt

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Date: June 30, 2004