MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATION

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

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JOB PERIOD: JULY 1, 2011 THROUGH JUNE 30, 2012

TABLE OF CONTENTS

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS 1
ABSTRACT 2
PROCEDURES, RESULTS, & DISCUSSION 3
Fort Peck Reservoir and Upper Missouri River Paddlefish Stock *3*
Hill County Fishing Waters *16*
Blaine County Ponds *277*
PHILLIPS COUNTY FISHING WATERS *30*
RECOMMENDATIONS 37
Paddlefish: Fort Peck Stock *37*
Fresno and Nelson Reservoir *37*
Beaver Creek Reservoir *37*
Hill, Blaine & Phillips Co. Ponds *37*
REFERENCES 377
WATER CODES OF WATERS REFERRED TO 399

ABSTRACT

Paddlefish tagging was conducted on the Missouri River paddlefish population upstream of Ft. Peck Reservoir. Throughout the sampling period paddlefish tagging and harvest records were maintained. A paddlefish creel survey was conducted on a 28-mile stretch of the Missouri River. The telemetry study was continued for a fifth year on paddlefish in the Missouri River using existing fixed stations. In addition, young-of-year paddlefish surveys were conducted in the headwaters of Ft. Peck Reservoir. Overall harvest on this population has been reduced in recent years (regulation changes occurred in 2007 and 2008) to offset a decade of severe drought resulting in poor spawning conditions and recruitment. The average size of adult fish remains stable, and recruitment has been excellent in recent years due to high spring flows and elevated reservoir levels.

Standardized gill netting and beach seining surveys were conducted at Fresno, Nelson, Dry Fork, and Beaver Creek Reservoirs. Select ponds were sampled through Hill, Blaine, and Phillips Counties to assess fish population levels, survival and recruitment. Self-creel boxes were also maintained at select ponds in Hill, Blaine, and Phillips Counties to assess fishing pressure. Results of all other sampling are presented.

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 programs and/or fish eradication actions to maintain fish populations at levels consistent with habitat conditions and other limiting factors. Objective accomplished, data presented.

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. Provide landowners and other private parties with technical advice and information to sustain and enhance fisheries resources. Objective accomplished: (20) 310 and (7) 124 projects were reviewed along with one waste water review with state and local agencies; attended four walleye unlimited meetings and helped with five school programs and fishing events related to the "Hooked on Fishing" program.

Angler Education- 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. Objective accomplished through staff participation in the "Hooked on Fishing" programs with local grade school children, planning and conducting of fall and winter fishing trips with area grade school and junior high children. Public presentations were also given on area fisheries in Havre and Malta. Staff also attended Walleye Unlimited meetings in Havre and Malta to provide information.

PROCEDURES, RESULTS, & DISCUSSION

Fort Peck Reservoir and Upper Missouri River Paddlefish Stock

The Ft. Peck stock was isolated from the Yellowstone-Sakakawea population upon closure of the Ft. Peck Dam in June of 1937. Completion of the Ft. Peck Dam isolated the F. Peck stock but it also created productive rearing habitat. This resulted in increased numbers and size of paddlefish and in turn created a valuable recreational snag fishery in the Missouri River.

However, the alteration of flows from upstream dams and low water levels on Ft. Peck Reservoir prior to 2008, are thought to be a reason for poor reproductive success of paddlefish over the last 10 to 15 years as well as reduced sizes of adults and fecundity of females in the Upper Missouri River. In addition, the popularity of the fishery has increased during this time period bringing into question whether or not natural reproduction and recruitment is adequate for current harvest levels.

The goal of current management is to provide a stable recreational fishery while ensuring a sustainable population size and historical age structure of the spawning stock. To meet this goal, regulations were changed during the 2007-snagging season. These regulations limited harvest to one paddlefish per person and required snaggers to choose the area they wanted to fish (Missouri River above Ft. Peck Reservoir; Ft. Peck Dredge Cuts; lower Yellowstone River/Missouri River below Ft. Peck Reservoir). To distribute harvest and reduce size selective harvest, mandatory catch and release days (Sunday, Monday, & Thursday), and mandatory harvest days (Friday, Saturday, Tuesday, & Wednesday) were implemented. Additionally snagging was limited to 6 am to 9 pm to help reduce potential illegal take of paddlefish and make enforcement of the regulations more manageable.

Based on the results of the 2007 season, additional changes were made during the 2008 season. A harvest cap of 500 fish was established, a season was set (May 1st to June 15th), hook size restriction were set, mandatory catch and release and harvest days were eliminated, and immediate release was further defined for paddlefish.

Data Collection Methods

For more effective management of the Ft. Peck paddlefish stock, a thorough understanding of several key aspects of their life history was necessary. Data collected includes population size, harvest rates, spawning periodicity, age-structure, reproductive success, recruitment, spawning locations, movements, and habitat use of paddlefish during their spawning migrations.

Baseline data on the paddlefish population above Ft. Peck Reservoir has been collected since the early 1970s. In 1993, a standardized monitoring program was established to assess population size, harvest rates, spawning periodicity, and gather baseline data on movement patterns and spawning sites. To gather this information, sampling occurs in the Missouri River during the time when paddlefish are staging around the Fred Robinson Bridge. Sampling typically occurs from April through May on the ascending arm of the hydrograph, typically at or above 8,000 cfs. Adult paddlefish are collected using drifted floating gill nets measuring 100 to 150 ft long, 6ft deep, with 4 inch mesh. Collected paddlefish are weighed, measured (eye-fork length), sexed, and tagged with an individually numbered jaw tag that is either a metal or plastic chicken leg band.

To assess angler pressure, catch and harvest rates of paddlefish, information on the ratio of tagged fish harvested, the size, sex, and age of fish harvested we conduct on-site roving creel surveys on a 28 mile stretch of the Missouri River downstream of the Fred Robinson Bridge. In addition a phone creel survey has been conducted since 2003 to assess harvest outside of the creel areas and as a check on the accuracy of the on-site creel surveys.

Beginning in 1996, concern over low flows and recruitment prompted the establishment of visual count surveys in the headwaters of Ft. Peck Reservoir as a means of producing an annual index of recruitment of young of year (YOY) paddlefish. Visual counts have been found to be the most

effective means to survey YOY paddlefish. Counts are conducted from an open bow powerboat using standardized methods and fixed transects. Observed YOY paddlefish are divided into age groups based on estimated length.

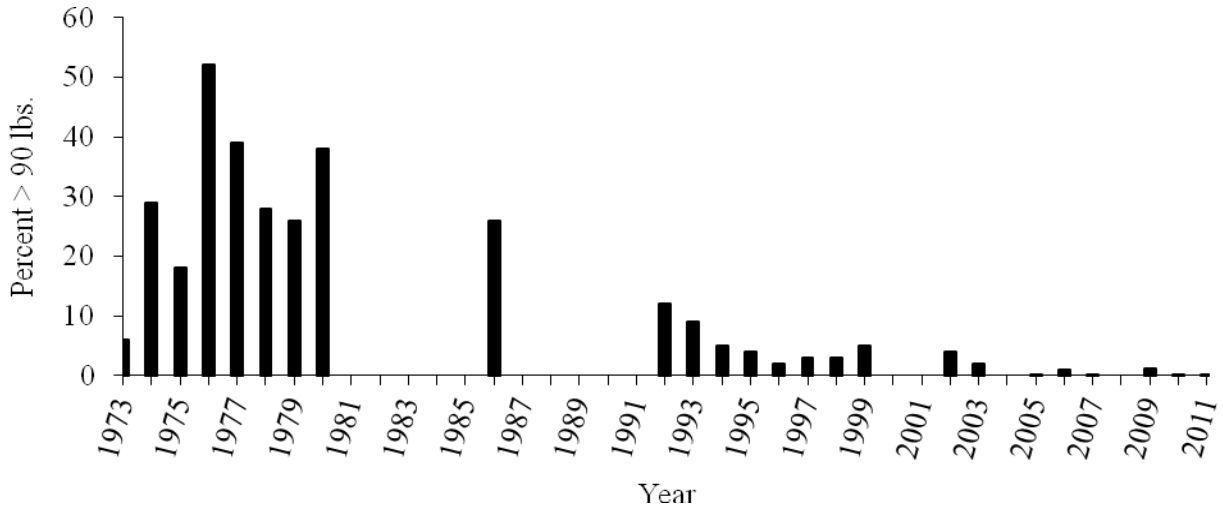
To increase our specific knowledge of the spawning locations, movements, and habitat use of paddlefish above Ft. Peck Reservoir, a contract with the University of Idaho was initiated in 2006 to conduct a four-year telemetry and egg sampling study (Miller and Scarnecchia, 2011; Miller et al., 2011). The telemetry study was continued in 2011 using fixed telemetry stations.

Adult Paddlefish Monitoring and Tagging

In 2011, paddlefish tagging started on April 26th. Tagging efforts were continued until May 16th when we tagged our 275th paddlefish. Since tagging was initiated in 1977, 6,610 paddlefish have been tagged and 719 tagged paddlefish have been recaptured during annual gill netting surveys. On average, approximately 10.9% of the annual catch is comprised of recaptured fish. In 2011, 13.5% of the paddlefish captured were recaptured fish. Based on the tagging and recapture data, the reproductive periodicity of male paddlefish is one to two years and for females it is every two to three years. Since 1973 FWP has monitoring the number of female paddlefish weighing greater than 90 pounds captured during our tagging efforts (Figure 1). This data has confirmed a long standing hypothesis that as Ft. Peck Reservoir aged, the productivity within the reservoir would gradually decrease, resulting in smaller female paddlefish with lower fecundity. In 2011, less than one percent of all female paddlefish captured during our tagging efforts weighed more than 90 pounds (Figure 1).

Since tagging was initiated in 1977, a total of 826-tagged paddlefish have been reported as harvested, which is about 12.5% of all tagged paddlefish. While snaggers are encouraged to report catches of tagged fish, reporting rates are low in years when on-site creel surveys are not conducted. In 2011, 45-tagged paddlefish were reported as harvested and 6-tagged paddlefish were reported as snagged and released. Anglers harvested 11 paddlefish tagged in 2011.

Figure 1. Percent of female paddlefish captured during adult tagging efforts weighing more than 90 pounds from 1973-2011.



Preliminary Population Estimates

Estimates of population size of the recruited portion of the Ft. Peck stock were developed from 1993 through 2011 based on mark recapture sampling associated with gill netting and tagging conducted prior to and during the paddlefish snagging season. Point estimates and confidence intervals were developed using two approaches for estimate verification purposes: a modified Schnabel estimate and a modified Peterson estimate. Modifications, which allow for multiple years of marking and recapture data, were necessary because only a fraction of the recruited paddlefish stock matures and thus migrates upstream in a given year.

While the preliminary estimates were run for the entire tagging period, the most reliable Peterson estimates were developed from 1993 to 1999, when all five succeeding years of net catches could be used to assemble recaptures and high numbers of paddlefish were tagged during those years. Based on the Peterson estimates the population size was approximately 20,500 fish from 1993 to 1999. The Schnabel estimate based on tagging over the period of 1993 to 1999 was 17,373 paddlefish with a 95% confidence interval of 15,614 to 20,336 fish. In 2010, both estimates indicated that the population size of recruited adult fish is approximately 20,000 fish and has changed very little over the last 19 years. The number of adults that migrate in any given year is directly affected by the annual flows, however based on the periodicity of the fish (males every 1-2 years and females 2-3 years), this means that approximately 11,700 fish migrate up the Missouri River to spawn and are vulnerable to harvest per year. As a comparison, the Yellowstone-Sakakawea stock has approximately 22,000 adults that migrate up the Yellowstone & Missouri Rivers are vulnerable to harvest in any given year and their total population size is approximately 48,000 (Dennis Scarnecchia, personal communication, February 14, 2012). Questions have been raised about the viability of these estimate models and more research is being conducted on a number of models/methods to estimate the population sizes of all stocks in the future.

Spawning and Recruitment

The spawning success and recruitment rate of paddlefish is directly influenced by the magnitude, timing, and duration of peak flows. Berg (1981) postulated that a minimum flow of 14,000 cfs maintained for a period of 30 days is required to trigger paddlefish to move out of their staging areas and migrate upriver to spawning locations. This requirement has been observed in the Ft. Peck stock by monitoring flows (Table 1) and movement patterns, and comparing those to year class strength through aging, as well as with YOY sampling.

During the 1980s and 90s only 12 of the 20 years met the requirements necessary for successful migration and spawning (Figure 2 and 3). From 2000-2007, flows did not meet the minimum flow and duration requirements (Figure 4). However, these requirements have been met since (2008-2011). In 2011, flows on the Missouri River stayed between 11,500 and 15,000 cfs from April 23rd to May 10th and then jumped to 25,000 cfs on May 12th and remained stable until May 21st. Flows peaked at 70,200 cfs on June 11th and declined to 13,000 cfs on July 31st. Peak flows met and exceeded trigger flows (14,000 cfs; Berg 1981) for about 98 days, a two-fold increase from the 72-year average of 45 consecutive days (USGS 2011). The peak flow of 70,200 cfs experienced on June 11, 2011 was the fifth highest ever recorded at the Landusky gauge (77 years).

Hydrograph information (Figure 2, 3, and 4) suggests that good spawning conditions vary widely among years (Table 1). Poor recruitment due to low flows and reduced water levels on Ft. Peck Reservoir from 2000-2007 has been identified by YOY surveys, which have been conducted annually since 1997 (Kozfkay & Scarnecchia 2002; Bowersox 2004; Miller 2005; Miller & Scarnecchia 2006). Effort has varied among years due to scheduling conflicts, limited personnel, and pit tagging effort. Good recruitment of YOY paddlefish was observed in 1997 and 1998 when flows mimicked the historical hydrograph and Ft. Peck Reservoir levels were high. In 2011, 61 YOY and three yearling paddlefish were observed during the fixed transects between RM 1866.5 and 1881.5 (Table 2). In

addition to the standardized counts, we applied a total of 27 hours of random search time during the weeks of July 25th, August 1st, and August 8th in hopes of identifying habitats containing YOY paddlefish not sampled during the transect counts (Table 3). These random searches were conducted near the river/reservoir interface (RM 1875- 1888). Random counts yielded a total of 205 YOY, two sub-adult, and 13 adult paddlefish being observed, with the highest counts occurring during the weeks of August 1st and August 8th. Approximately 36 YOY paddlefish were collected and sacrificed by the University of Idaho for lipid and stomach analysis.

Table 1. Paddlefish spawning success ratings for the years 1974-2011 using trigger flow1 (TF) incidence and duration as the sole criteria.

	Paddlefish Spawning Rating		
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(05)	
2004			X
2005		X (05)	
2006		X (09)	
2007			X
2008	X		
2009	X		
2010	X		
2011	X		

[1]Flows measured at the Virgelle Measuring Station

Figure 2. - Historical and observed Missouri River hydrograph at the USGS Virgelle, MT gauging station 1980-1989.

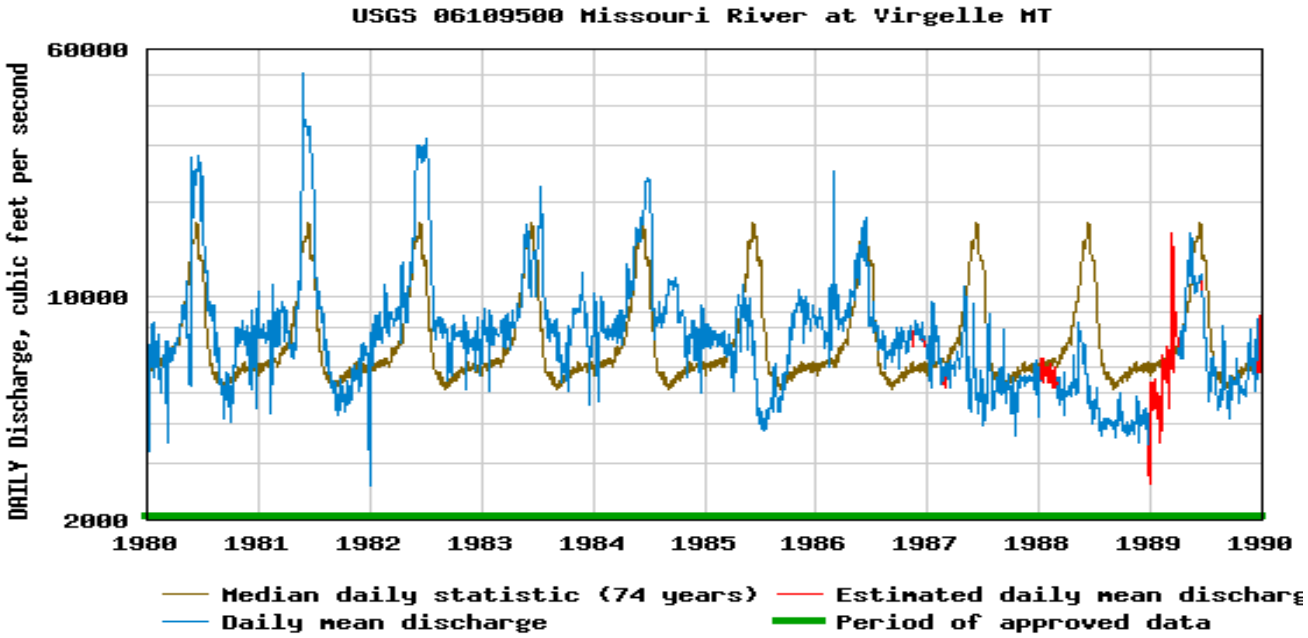


Figure 3. - Historical and observed Missouri River hydrograph at the USGS Virgelle, MT gauging station 1990-1999.

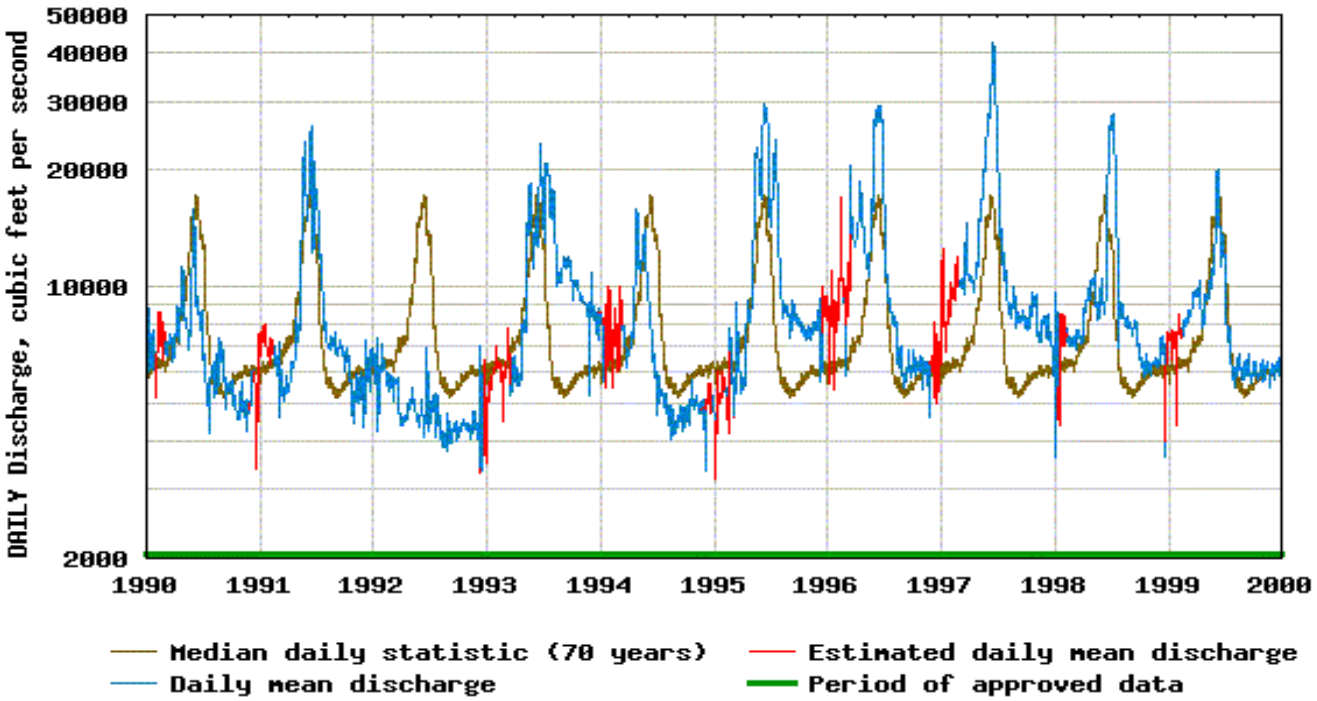


Figure 4. - Historical and observed Missouri River hydrograph at the USGS Virgelle, MT gauging station 2000-2011.

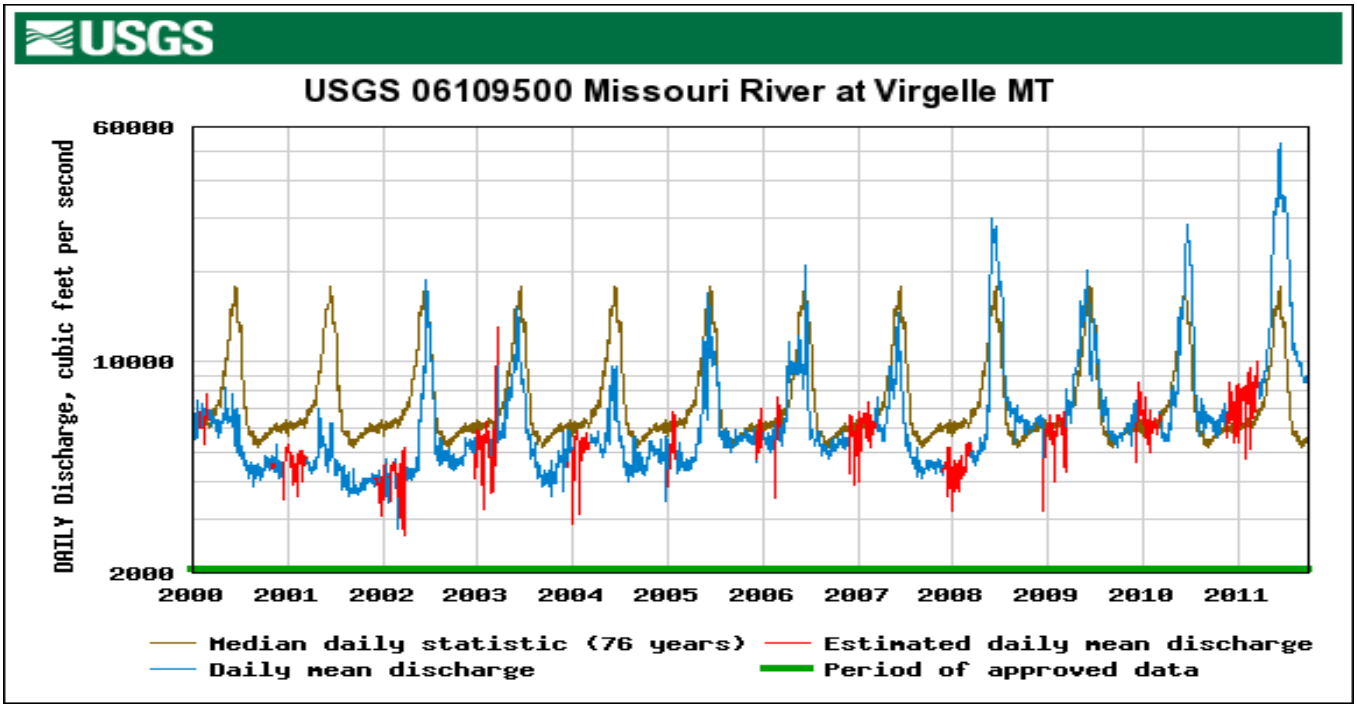


Table 2. - Results of standardized YOY paddlefish visual count surveys conducted in the headwaters of Ft. Peck Reservoir from 1997 to 2011.

Year	Transect Dates	# Stations	Station Locations (RM)	No. Transects	No. YOY	No. Yearlings	Collector
1997				69	113	3	
1998	7/27 to 9/23	8	1888 to 1866	216	97	54	Kozfkay
1999	8/25 to 9/20	8	1888 to 1866	174	3	10	Kozfkay
2000				90	0	11	
2001				90	1	0	
2002			1862 to 1856 ?				Bowersox ?
2003			1862 to 1856 ?	54	2	4	Bowersox ?
2004			1853 to 1838	54	0	3	
2005	8/8 & 8/16	6	1853 to 1838	36	1	0	Miller
2006	7/24 & 7/30	6	1853 to 1838	36	2	1	Miller
2007	7/31 & 8/6	6	1854 to 1838	6	0	2	Miller
2008	8/6 & 8/12	6	1844 to 1858	12	4	3	Miller
2009	8/11 & 8/17	6	1843 to 1858	12	0	0	Miller
2010	7/27 & 8/3	6	1863.5 to 1878.5	12	0	0	Miller
2011	7/28 to 9/1	6	1866.5 to 1881.5	30	61	3	Hemingway

Table 3. - Results of random YOY paddlefish visual count surveys conducted in the headwaters of Ft. Peck Reservoir from 2008 to 2011.

Year	Transect Dates	Effort (Hours)	Station Locations (RM)	No. YOY	No. Yearlings	No. Adults	Collector
2008	8/6-8/13	24	1859-1861	42	0	--	Miller
2009	8/11-8/17	12	1857-1862	2	3	--	Miller
2010	7/26-9/27	75	1874.5-1884	0	26	--	Miller
2011	7/25-8/8	27	1875-1888	205	2	13	Hemingway

-- No data collected for observed period of record

Harvest: Paddlefish Creel Survey 2011

Methods

A five-year native species creel survey was conducted by FWP Region 6 personnel from 2005-2009 to better understand catch and harvest rates, age structure of harvested fish, angler pressure, and angler demographics from the Fred Robinson Bridge to Peggy's Bottom (Figure 5). Since 2010 the creel has been conducted annually by vehicle and boat from May 1st to June 15th from the Fred Robinson Bridge to Peggy's Bottom and focuses solely on paddlefish and paddlefish anglers.

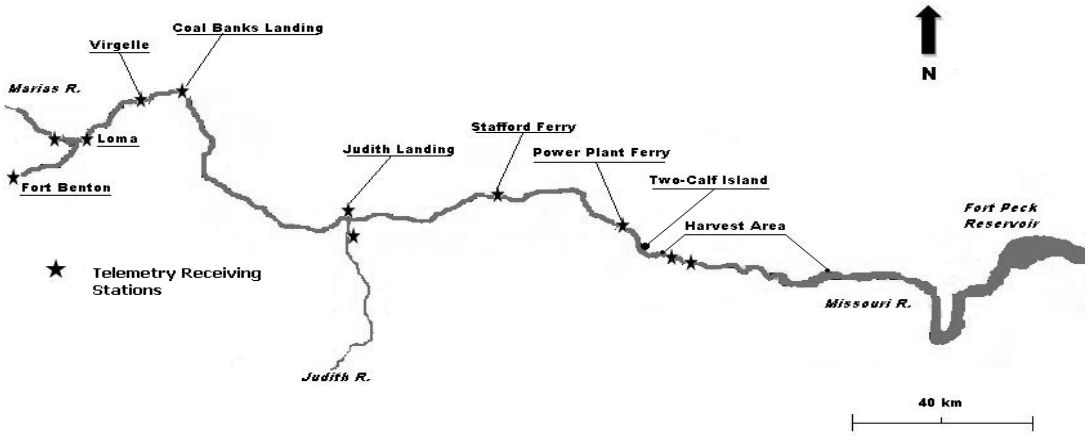
Schedule

A roving creel survey was conducted from May through June from the Fred Robinson Bridge to Peggy's Bottom. Two creel clerks were used to conduct all interviews and pressure counts. Schedules were divided to cover the entire week with overlapping schedules occurring on the weekends when fishing pressure increased.

Effort

Instantaneous pressure counts were performed once a day by vehicle or boat. Starting times were randomly chosen from the fishing day (7:00 to 19:00) to estimate angling pressure from river mile (RM) 1897-1921.

Figure 5. Map of the creel area including locations of fixed telemetry receiving stations in the Upper Missouri River above Fort Peck Reservoir. Harvest area encompasses RM 1897-1921.



Harvest and Catch

Angler interviews were conducted at all boat ramps and fishing access/camping sites on the north side of the Missouri River between Fred Robinson Bridge (RM 1921) and lower Peggy's Bottom (RM 1987). Interviews were conducted at each site, during each sampling day except when road conditions prevented travel to certain sites. The creel clerks attempted to interview every fisherman on the river each sampling day. When the creel clerk encountered too many anglers at a location, the clerk systematically sub sampled every *k*th fisherman (*k* = interval demanded by the number of fishermen present) to ensure that all locations were sampled. Boat fishermen who launched within the area were interviewed even if they fished out of the study reach. Survey cards were distributed or deposited on windshields of vehicles when boat anglers were not available for interviews.

During interviews one randomly selected actively fishing person per party was interviewed. This individual was asked a series of questions relating to residence, number in party, length of stay, time spent fishing, whether a boat was used, type of gear used, and primary species being sought. Fishermen were asked how many paddlefish were caught, released and/or kept and if any of these fish had tags and if so the type, color, and number on the tag. When tagged paddlefish were caught, the fisherman was provided with the original tagging location, date, and weight of the fish. In addition, if fishermen released a paddlefish they were asked the reason for the release to determine if size-selective harvest was occurring.

When possible, eye-fork (body) length measurements and weight were taken for harvested paddlefish. Jaws were also taken for aging purposes (with anglers consent). These samples were then sent to the University of Idaho for aging.

Data Analysis

Fishing effort (angler-hours and total effort), catch rates, and harvest estimates were calculated using the Creel Census Program (McFarland and Roche 1987), which was developed using methods outlined in Neuhold and Lu (1957). To reduce error, the creel survey time was broken down into two periods (May and June) and by boat or shore fishing. Effort was not broken down by fishing method or by species because all anglers creeled were snagging and targeting paddlefish.

Results

In 2011, a total of 427 parties from 11 states and 40 of the 56 Montana counties were interviewed from May 1st to June 15th. In 2011, the highest percentage of anglers in Montana came from Yellowstone (20.5%), Gallatin (10.1%), and Cascade (9.6%) counties. In 2011, the average party contained 4.0 anglers (range = 1 to 20 anglers), 87% of which were males. In 2011, the average length of stay was 2.6 day/trip (range = 1 to 9 days).

Effort

In 2011, paddlefish snagging effort totaled 14,056 angler days (Table 4) and consisted of 22,103 angler hours (Table 5) during the months of May and June, respectably. In 2011, 79.4% of the angling effort (hours) occurred from shore and 91.3% of the angling effort occurred in May, which coincides with the peak of the paddlefish spawning migration.

Harvest Statistics- Paddlefish

In 2011, a total of 854 paddlefish were caught and reported to creel clerks with a combined (shore and boat) catch rate of 0.096 paddlefish/hour. Total paddlefish snagged was estimated at 1,055 fish (Table 6) with an estimated harvest of 608 paddlefish (Table 7).

In 2011, harvested paddlefish ranged in length from 32.0 to 57.0 inches (eye-fork length) and weight from 19.0 to 127 pounds (Table 8 and Figure 7). Forty-five percent of the harvested paddlefish sexed were males and 45/427 (10.5 %) of the harvested paddlefish and 6/455 (1.3 %) of the released paddlefish creeled had jaw tags. Harvested paddlefish ranged in age from 8 to 58 years with 68.5% of the harvested fish being 20 to 58 years old, age 14 males comprised the highest percent (11.3%) of the catch (Figure 6). Eighteen and a half percent of the harvested fish were less than 16 years old (new recruits).

Table 4. - Estimated snagging effort (angler-days) by month and angler type for the Upper Missouri River (RM 1897 to 1921), May-June 2011.

	Shore	Boat	Overall
May	4,616.18	8,548.9	13,165.03
June	891.00	0.00	891.00
Overall	5,507.18	8,548.9	14,056.03

Table 5. - Estimated snagging effort (angler-hours) and standard error (SE) by month and angler type for the Upper Missouri River (RM 1897 to 1921), May-June 2011.

	Shore	SE	Boat	SE	Overall
May	15,624.00	1,522.25	4,559.00	611.17	20,183.00
June	1,920.00	1,440.00	0.00	0.00	1,920.00
Overall	17,544.00		4,559.00		22,103.00

Table 6. Estimated total catch of paddlefish by month and angler type for the Upper Missouri River (RM 1897 to 1921), May-June 2011.

	Shore	Boat	Overall
May	822	233	1,055
June	0	0	0
Overall	822	233	1,055

Table 7. Estimated harvest of paddlefish by month and angler type for the Upper Missouri River (RM 1897 to 1921), May-June 2011.

	Shore	Boat	Overall
May	474	134	608
June	0	0	0
Overall	474	134	608

Figure 6. Age structure of harvested male and female paddlefish collected in the Upper Missouri River (RM 1897-1921) during the 2011 paddlefish creel survey.

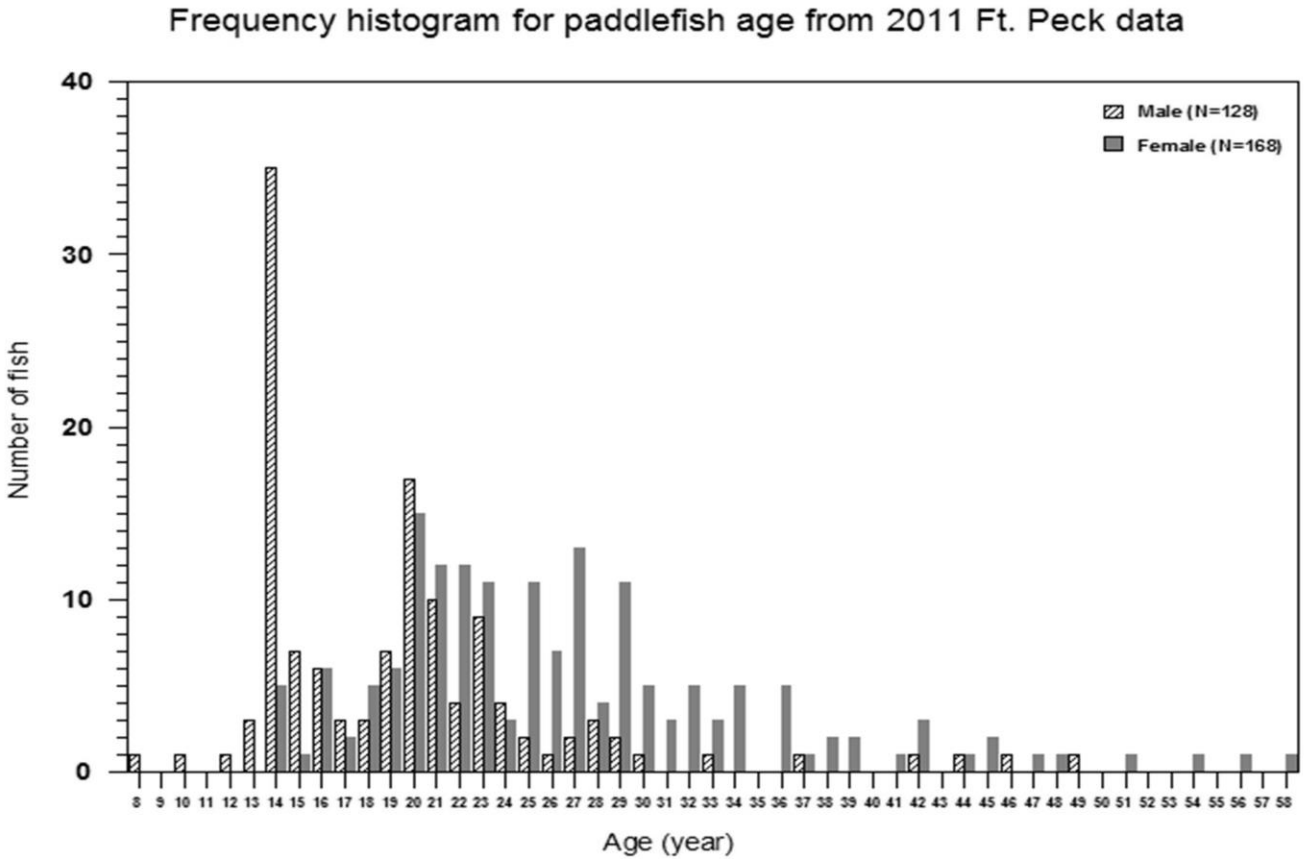


Figure 7. Size structure (weight (kg)) of harvested male and female paddlefish collected in the Upper Missouri River (RM 1897-1921) during the 2011 paddlefish creel survey.

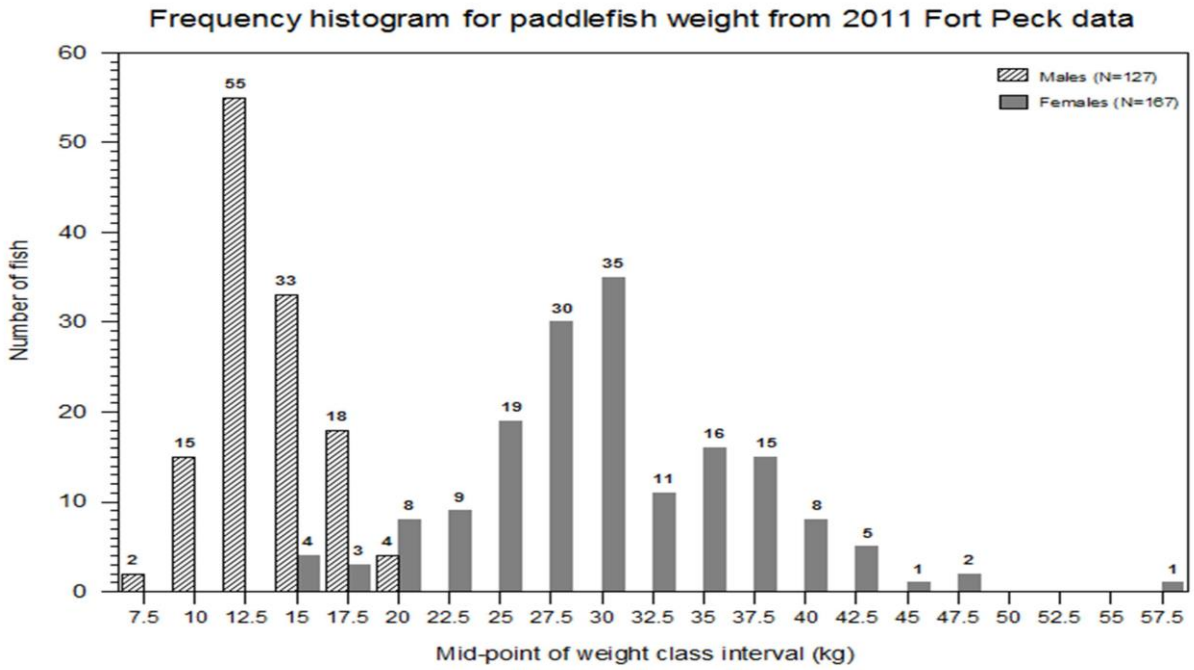


Table 8. – Length, weight, and condition indices of harvested paddlefish from anglers creeled in the Upper Missouri River (RM 1897-1921), May-June 2005-2011.

Species	Year	Sample Size	Length Range (in.)	Length Avg	Length SD	Weight Range (lbs.)	Weight Avg	Weight SD
PF	2005	241	33.3-60.5	41.7	1.2	12.0-90.0	40.3	47.6
PF	2006	259	28.1-65.0	42.7	1.3	15.1-112.0	47.0	36.5
PF	2007	179	27.0-72.0	42.3	1.1	24.5-69.0	47.7	97.3
PF	2008	322	26.0-56.8	41.0	5.7	13.0-104.0	43.5	20.8
PF	2009	249	24.0-54	41.7	5.9	16.0-100	47.6	21.2
PF	2010	300	28.0-60.0	42.0	5.5	16.0-115	49.4	21.8
PF	2011	484	32.0-57.0	42.7	5.3	19.0-127.0	50.5	21.4

Paddlefish Phone Creel (2003-2011)

Vic Riggs with the Montana Fish, Wildlife & Parks (FWP) and Larry Brooks with the University of North Dakota (Riggs 2005) designed and conducted the paddlefish phone creel survey annually from 2003 to 2005. This survey was continued solely by FWP in 2006. This survey was originally conducted (1) to determine the harvest of paddlefish at sites other than the Intake Fishing Access Site, (2) as a check on the accuracy of the Intake creel survey, (3) as a possible replacement for the Intake creel survey, which would free up technician time for other data collection needs, and (4) to

obtain harvest statistics for the Fort Peck population, and in 2005 and 2006, (5) to assess angler support for changes to regulations for the Fort Peck populations.

From 2003 to 2011, harvest statistics were obtained for the Fort Peck population (Table 9). On average approximately 2,161 anglers fish for paddlefish above Ft. Peck Reservoir representing approximately 6,082 fishing days. On average approximately 1,618 paddlefish are caught annually above Ft. Peck Reservoir with approximately 53.3% of the paddlefish being released (Table 9). When anglers were asked in 2005 why they released their paddlefish, 53% said they were catch and release fishing, either because they did not want to harvest a paddlefish or because they wanted to fish for their entire fishing trip and harvest a fish on one of their last days. Seventeen percent of paddlefish were released because they were too big, indicating that these people were releasing the larger females. Twenty-seven percent of paddlefish were released because they were too small, indicating that these people are high grading for the larger females and are trophy fishing.

Table 9. –Summary of estimates for the Fort Peck paddlefish population from the Montana paddlefish telephone creel survey (2003-2011).

Missouri River Above Fort Peck									
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Number of Anglers	1,902	2,859	2,705	2,476	2,481	1,816	1,579	1,729	1,901
Total Days Fished*	5,757	9,172	8,385	7,565	-	4,426	2,748	5,789	4,816
Total Hours Fished*	27,433	44,400	42,277	39,800	-	-	-	-	-
Number Caught	1,583	1,102	1,516	2,290	-	845	2,342	1,851	1,411
Number Harvested	868	787	1,028	1,067	634	300	564	575	598
Harvest Rate (fish/day)	0.151	0.086	0.123	0.141	-	0.068	0.205	0.173	0.096
Harvest Rate (fish/hour)	0.032	0.018	0.024	0.027	-	-	-	-	-
Percent Released	45.17%	28.58%	32.19%	53.42%	-	64.50%	75.90%	68.90%	57.62%
Percent Contacted by FWP Creel Clerk						85.71%	62.14%	38.61%	14.60%

* Includes hours spent catch and release fishing

Discussion

Recruitment and growth is highly variable among years for this stock (Table 2). Annual Ft, Peck Reservoir pool elevations and flows in the Missouri River appear to influence reproductive success and growth of this stock. Flows in the Missouri River from 1998-2007 were not consistently high enough to produce large year classes of paddlefish due to prolonged drought conditions (Leslie 2005, 2006). In addition, the average size of adults has significantly decreased over the last 30 years (Bowersox 2004). These declines, especially in growth, were believed to be the result of decreased productivity due to the aging of Ft. Peck Reservoir (nursery grounds for paddlefish) and lower Ft. Peck Reservoir levels from 1999-2007. However, since 2008 flows in the Missouri River have more closely mimicked the historical hydrograph and in 2011 the fifth highest flow ever recorded at the Landusky gauge (77 years) was documented. In addition, Ft. Peck Reservoir water levels increased in 2008, 2009, 2010, and in 2011 the spillway was running water for the first time since 1997. Successful paddlefish reproduction is evident based on YOY transect data and adult fish captured during spring tagging efforts are in very good condition.

The combination of prolonged drought conditions affecting the low number of successful spawning years (based on observed trigger flow occurrence and duration; Table 1) and decreased size of adults has been noted and will continue to be monitored (Figure 1). The results of reduced

recruitment of YOY paddlefish will not be evident in the spawning population for a few years, However it would be prudent to consider the effects of reduced recruitment and reduced fecundity of the adult population. Snaggers are also allowed to immediately release a snagged paddlefish if they desire. Based on analysis of the fishery and public support, the fishing limit was reduced in 2007 from two paddlefish to one paddlefish annually. In 2008, the paddlefish season was reduced from a 365-day season to a 46-day season (May 1 to June 15), making monitoring total catch more feasible. Furthermore, an annual harvest cap of 500 paddlefish has been implemented since 2008. These regulation changes have resulted in a shorter season and fewer paddlefish being harvested annually (Table 10). Estimated harvest by our current creel census program is highly variable when compared to the number of paddlefish being reported to our on-site creel clerks (Table 10). However, this variability has decreased since the harvest cap was implemented in 2008. Modifications or even changing the program we currently use may further reduce this variability, resulting in improved harvest estimates. FWP continues to refine its paddlefish creel survey to obtain the most accurate information possible over such a broad geographical range, in a short period of time.

Table 10. Summary of data collected during the on-site creel outlining season duration, closure, catch and release days, number reported as caught, number reported as harvested, sex, estimated harvest from creel census, estimated harvest from phone creel, and the three average of estimated harvest by our creel census from 2005-2011.

Year	Season Dates	Harvest Closure (Date)	# of Catch and Release Days after Harvest Closure	# Reported as Caught to Creel Clerks	# Reported as Harvested to Creel Clerks	Reported Males Harvested	Reported Females Harvested	Phone Creel Est. Harvest	On-site Creel Est. Harvest	3-Year Avg. Est. Harvest
2005	4/1-6/14[-]	None	--	995	787	152 (64%)	85 (36%)	1,028	576	--
2006	4/1-6/19[-]	None	--	989	382	160 (61%)	101 (39%)	1,067	1,289	--
2007	4/1-6/19[+]	None	--	400	249	120 (50%)	121 (50%)	634	477	781
2008	5/1-6/15*	None	--	421	322	172 (58%)	127 (42%)	300	355	707
2009	5/1-6/15*	5/22	24	881	249	124 (53%)	112 (47%)	564	594	475
2010	5/1-6/15*	5/16	30	974	301	140 (55%)	116 (45%)	575	607	519
2011	5/1-6/15*	5/14	32	854	484	191 (45%)	230 (55%)	598	608	603

+ Season open year-round with mandatory harvest on Friday, Saturday, Tuesday, and Wednesday and mandatory catch and release on Sunday, Monday, and Thursday. Creel ran from 4/1-6/19.

- Season open year-round with anglers allowed to harvest two paddlefish.

- Season open from May 1-June 15 with a 500 fish harvest cap.

Hill County Fishing Waters

Select waters throughout Hill County were sampled to determine fish abundance using sinking multi-filament experimental gill nets mearching125 feet in length and 6 feet deep, consisting of 25-foot panels of ¾", 1", 1 ¼", 1 ½", and 2" mesh unless otherwise specified. Voluntary creel boxes were maintained at many of the ponds to determine fishing pressure, catch rates, and satisfaction.

Bailey Reservoir

Bailey Reservoir is a privately owned reservoir that was constructed in the mid-1960s. At full pool, Bailey Reservoir covers approximately 70 surface acres and has a maximum depth of 28 feet. Bailey was initially managed as a rainbow trout fishery, and rainbow trout thrived within the reservoir until 1980 when northern pike were illegally introduced. In 1984, the remainder of rainbow trout winterkilled due to severe drought. Chemical rehabilitation was considered, but at the request of the landowner a cool/warm water fishery was started. And as a result, yellow perch and black crappie were introduced in 1987, largemouth bass in 1988, and walleye in 1989. Rainbow trout are stocked periodically to supplement the fishery and in 2005, 10,000 four-inch rainbow trout were stocked in late fall. In addition, 10,000 fingerling walleye were stocked in the spring of 2005 and 261 yellow perch were transplanted from the Havre Water District Ponds in Kremlin. In 2006, an additional 4,758 pre-spawn yellow perch were transplanted. Supplement plants of 3,880, 850, and 1,500 yellow perch occurred in 2007, 2008, and 2009. Since 2005 Bailey Reservoir has received alternate year plants of walleye fingerlings.

Adult sport fish populations have been monitored since 1990 with two experimental gill net sets. In addition, trap netting and electrofishing occurs periodically. In 2005, 6 traps nets were set in the spring to capture adult black crappie for transporting to Home Run Pond. In addition a voluntary creel box was erected in the summer of 2005 and maintained through 2010 to determine angler use, catch, and satisfaction. Bailey ranked 28th in the region for angler pressure in 2009/2010 (365 +/- 200 angler days; McFarland 2010). No statewide creel has been conducted since; however, Bailey Reservoir was one of the most talked about reservoirs on the internet during the winter months with reports of anglers ice fishing daily in 2011.

Gill net surveys suggest the population of all sport fish (walleye, northern pike, yellow perch, black crappie) remain well below population densities prior to 2000 (pre-drought years; Table 11). From 1990-2002 Bailey Reservoir supported one of the best yellow perch and black crappie fisheries on the Hi-Line (Table 11), Extensive removal of spawning adult yellow perch and black crappie (from 1999-2007) combined with low reservoir levels, and less than ideal spawning conditions could be the most likely explanation for population densities we have today.

Table 11. - Catch rate (CPUE (fish/net)), average length (TL, in.), and average weight (lb.) of northern pike, yellow perch, black crappie, rainbow trout, walleye, and white sucker in Bailey Reservoir, 1985 to 2011.

		Northern pike			Yellow Perch			Black Crappie			Rainbow Trout			Walleye			White Sucker		
Year	Nets	CPUE (#/net)	Len Avg (in.)	Wt Avg (lbs.)	CPUE (#/net)	Len Avg (in.)	Wt Avg (lbs.)	CPUE (#/net)	Len Avg (in.)	Wt Avg (lbs.)	CPUE (#/net)	Len Avg (in.)	Wt Avg (lbs.)	CPUE (#/net)	Len Avg (in.)	Wt Avg (lbs.)	CPUE (#/net)	Len Avg (in.)	Wt Avg (lbs.)
1985	1	17	21.44	1.13	0	--	--	0	--	--	1	12.2	0.9	--	--	--	0	--	--
1990	3	8	18.1	1.23	11.33	7.7	0.26	7	5.7	0.1	0	--	--	--	--	--	0	--	--
1991	2	3.5	24.7	3.21	29	10.1	0.56	2	8.5	0.35	0	--	--	--	--	--	0	--	--
1992	2	3	26.8	4.29	17	8.1	0.29	8	4.7	0.08	0	--	--	--	--	--	0	--	--
1993	2	1	31.8	7.55	10.5	6.6	0.15	63.5	6.7	0.12	0	--	--	--	--	--	0	--	--
1994	2	3.5	20.1	2.59	19	6	0.1	21.5	6.3	0.14	0	--	--	--	--	--	0	--	--
1995										No Netting Conducted									
1996	2	7	23.8	3.54	43	7.2	0.19	7.5	6.8	0.21	0	--	--	--	--	--	0	--	--
1997										No Netting Conducted									
1998	2	1.5	22.2	2.43	66	8	0.26	16	9	0.44	0	--	--	--	--	--	0	--	--
1999										No Netting Conducted									
2000										No Netting Conducted									
2001										No Netting Conducted									
2002	2	0	0	0	16	9.9	0.49	15.5	11.2	0.82	0	--	--	1	25.7	6.79	1	17.9	2.41
2003										No Netting Conducted									
2004										No Netting Conducted									
2005	2	3.5	17.44	1.56	1.5	9.2	0.39	1	4.05	0.03	0	--	--	--	--	--	0	--	--
2006	2	16	17.23	1.2	3.5	7.29	0.28	0	--	--	0	--	--	6.5	9.54	0.31	0	--	--
2007	2	5.5	20.8	2.05	0.5	11.3	0.9	0	--	--	0	--	--	3	12.5	0.65	0	--	--
2008										No Netting Conducted									
2009	2	2	20.6	1.97	1	13	1.38	0	--	--	0	--	--	2	18.2	2.28	1	19	3.07
2010	2	0	--	--	0	--	--	0	--	--	0	--	--	0.5	19	2.22	0	--	--
2011	2	2	19.4	1.67	0.5	7.5	0.2	0	--	--	0	--	--	1.5	20.1	2.84	0	--	--

Beaver Creek Reservoir

Beaver Creek Reservoir, located south of Havre, is a 200-acre reservoir, which has a maximum depth of 90 feet. Its proximity to the city of Havre makes this reservoir a valuable local resource and it has been managed intensively in recent years for a variety of species. Beaver Creek Reservoir ranked 6th in the region for angler pressure in 2009/2010 (8,520 +/- 1,553 angler days; McFarland 2010).

This reservoir was established as a rainbow trout fishery in 1975. However, the illegal introduction of northern pike (1980s) and yellow perch (1980s) has resulted in the rainbow trout fishery having varying success. As a result, the fisheries management plan was expanded to include other warm water species, which were introduced to control undesirable species and enhance the fishing opportunity within the reservoir. Currently this reservoir receives annual plants of 50,000 (250/acre) catchable size Eagle Lake, Erwin and Arlee rainbow trout.

In an effort to maintain the balance between the rainbow trout fishery and the warm water fishery, the use of live minnows for bait has been allowed since March of 2000. The regulation is intended to increase harvest of northern pike and perhaps open up a winter fishery for walleye. Though fishermen use live minnows regularly, a winter fishery for walleye has not developed. The trout daily limit was reduced from 5/day to 3/day in March of 2002 due to increasing fishing pressure and many anglers have expressed their frustration with this regulation since. FWP has evaluated this regulation and will propose the daily limit be raised to 5/day during the next regulation cycle.

Population Status of Adult and Young-of-Year Fishes

In August 2011 DNRC had to make repairs to the steel gate and hydraulic cylinders that allow DNRC to manage outflows, resulting in pool elevations 15-20 feet lower than average. Low water levels eliminated two historic gill net sites and adult fish populations were monitored at four of the six fixed experimental gillnetting stations, which were established in 1986. Furthermore, adult population sampling was conducted one week earlier (August 30th) in 2011 due to a conflicting schedule with YOY paddlefish surveys on Ft. Peck Reservoir. Gillnetting was conducted over night utilizing two sinking and two floating experimental gill nets (4 net-days). The sinking and floating experimental gill nets measured 125 feet in length and 6 feet deep consisting of 25-foot panels of ¾", 1", 1 ¼", 1 ½", and 2" mesh. Fish were measured for total length (TL: inches) and weighed to the nearest 0.01 pound (lb). Prior to 1986, adult fish populations were monitored, however sampling was neither uniform, nor consistent enough to develop useful trend data on game fish population size, or composition. As a result this data was excluded from analysis and is only included within the tables for reference to the illegal introduction of northern pike and yellow perch.

The abundance and reproductive success of sport and forage fishes were monitored at six predetermined stations. Beach seining was conducted in early August using a 100- x 9-foot x ¼ inch square mesh beach seine. The fish were sorted by species and counted.

Northern pike

Since their illegal introduction in the 1980s, northern pike abundance has maintained stable levels within Beaver Creek Reservoir (Table 13). Northern pike populations are cyclical within Beaver Creek Reservoir, YOY catch had increased significantly in 2005 and 2006 and these fish have successfully been recruited into the population (Table 12 & 13). In 2007, the YOY catch was greatly reduced and no YOY northern pike were observed in 2008. Spring spawning conditions have been favorable in recent years however, YOY catch of northern pike remain below historic averages (Table 12).

Yellow perch

Yellow perch were illegally introduced into Beaver Creek Reservoir in 1987. Since their introduction, yellow perch have thrived within the reservoir (Table 13). As a result Beaver Creek Reservoir is a popular ice fishing destination and has historically been a source of yellow perch for kids fishing ponds, such as Home Run Pond, in Glasgow.

Beaver Creek Reservoir's yellow perch population peaked in the late 1990s and while the relative abundance is good, it is currently at half the late 1990 levels due to drought and reduced spawning success (Table 12 & 13). While yellow perch populations remain low compared to 1990 levels they are steadily increasing and remain at favorable levels. The population still consists of numerous quality and preferred size fish (TL > 8 in.; Table 13). Spawning conditions have been excellent the last five years and yellow perch densities will continue to remain at good levels.

Walleye

Walleye were initially stocked by FWP in 1987 to provide a greater diversity of fishing opportunities within the reservoir. Natural reproduction is limited within the reservoir and as a result, approximately 10,000 1.4-inch and 5,000 3-inch walleye fingerlings are stocked annually

Walleye within Beaver Creek Reservoir have high growth rates and relative weights (Table 13) due to abundant forage. As a result these walleye can be hard to catch and elude all but the best walleye fishermen. Since their initial introduction, high quality walleye have thrived within Beaver Creek Reservoir and below its dam. Consecutive years (2010 and 2011) of high runoff increased adult walleye (> 15 inches) entrainment which might explain the reduced relative abundance of walleye during our fall gillnet surveys (Table 13).

Smallmouth bass

Smallmouth bass were first introduced by FWP in 1997 and were stocked annually until 2000. As a result there is now a self-sustaining population of smallmouth bass exists in Beaver Creek Reservoir. While smallmouth bass had a low relative abundance during gill netting surveys (Table 13), due to selectivity of the gear, catches of 8 to 10 inch bass by anglers are common. In addition, smallmouth bass reproduction has been good in most years due to relatively stable reservoir levels during early summer and good spawning habitat (Table 12).

Table 12. – Summary of young of year yellow perch (YP), white sucker (W SU), spottail shiner (SP SH), Iowa Darter (IOWA), fathead minnow (FH MN), largemouth bass (LMB), northern pike (NP), walleye (WE), and other fishes captured by beach seining in Beaver Creek Reservoir, 1980 to 2011.

Date	Sites	YP (yoy)	YP (adult)	W SU	SP SH	IOWA	FH MN	LMB	SMB (yoy)	SMB (adult)	NP (yoy)	NP (adult)	WE (yoy)	WE (adult)	Other Sp.[1]
Jul-80	5	--		650	--	0	42	--	--		--		--		46
Jul-81	5	--		1,671	--	0	75	12	--		--		--		38
Jul-82	5	--		7	--	0	0	54	--		0		--		0
Jun-83	5	--		46	--	0	0	5	--		5		--		0
Aug-84	7	--		189	--	10	0	4	--		0		--		0
Sep-85	5	--		2,648	--	11	0	33	--		3		--		7
May-86	4	--		1,749	0	2	0	0	--		1		--		24
Jun-86	6	--		3,132	0	2	0	0	--		1		--		1
Aug-86	6	--		134	0	8	0	2	--		9		--		0
Sep-86	6	--		1,111	0	34	29	184	--		6		--		11
Jul-87	6	1,968		2,276	1	24	3	0	--		20		11		3
Aug-87	6	2,315		973	0	59	1	16	--		19		19		5
Jun-88	6	20		17	0	6	0	0	--		1		3		0
Aug-88	6	4,973		62	1	4	0	0	--		1		2		0
Aug-89	6	50		48	603	0	0	0	--		2		4		5
Aug-90	6	42		1	93	2	0	0	--		2		0		1
Aug-91	6	8,642		348	835	0	0	0	--		17		0		4
Aug-92	6	1,888		492	156	4	0	0	--		4		0		0
Aug-93	6	42		0	355	11	0	0	--		27		0		0
Aug-94	6	707		49	181	0	0	0	--		11		0		0
Aug-95	6	7,210		6	1,438	0	0	0	--		13		0		0
Aug-96	6	51		261	248	7	0	0	0		5		7		0
Aug-97	6	17		31	193	6	0	0	8		13		2		0
Aug-98	6	872		0	141	0	0	0	41		6		1		0
Aug-99	6	592		4	87	0	0	0	16		7		2		0
Aug-00	6	402		1	190	0	1	0	12		3		23		0
Aug-01	6	357		10	216	0	0	0	8		0		3		0
Aug-02	6	333		0	592	0	0	0	7		0		93		0
Aug-03	6	557		19	2,355	2	0	0	9		15		1		0
Aug-04	6	1,545		0	0	1	0	0	5		2		2		0
Jul-05	6	185		3	1	0	0	0	0		36		12		0
Aug-06	6	1,154		8	608	0	0	0	12		32		11		0
Jul-07	6	253		0	0	0	0	0	13		4		9		0
Jul-08	6	113		0	0	0	0	0	2		0		0		0
Aug-09	6	1,177	135	0	3	0	0	0	1	1	15	1	63	1	0
Aug-10	6	0	491	0	0	0	0	0	6	0	0	0	2	4	0
Aug-11	6	201	66	629	0	0	0	0	1	0	1	2	0	0	0

[1] Consists of emerald shiners, northern redbelly dace, lake chub, western silvery/plains minnow, brassy minnow, and longnose dace

Table 13.- Summary of relative abundance (catch per unit effort (CPUE)), average total length, and relative weights of fishes collected in fall gillnetting surveys in Beaver Creek Reservoir, 1974-2011.

			Rainbow Trout			Yellow Perch			Northern Pike			Smallmouth bass			Walleye			Longnose sucker		White sucker	
Date		Nets	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	CPUE (fish/net)	Ave TL (in.)
Sep-74	1974	3	24.00	10.91	111.26	--	--	--	--	--	--	--	--	--	--	--	--	7.33	10.49	82.33	10.23
Nov-77	1977	3	35.00	10.05	86.31	--	--	--	--	--	--	--	--	--	--	--	--	2.33	9.66	113.00	9.75
Sep-80	1980	3	23.33	10.12	81.04	--	--	--	--	--	--	--	--	--	--	--	--	1.33	6.33	156.00	8.86
Sep-81	1981	3	7.33	10.88	82.77	--	--	--	--	--	--	--	--	--	--	--	--	6.67	8.78	165.33	8.70
Oct-82	1982	3	8.33	11.78	99.67	--	--	--	2.33	15.79	109.67	--	--	--	--	--	--	3.33	9.66	109.67	9.69
Oct-83	1983	3	3.33	11.79	94.66	--	--	--	3.67	25.10	117.07	--	--	--	--	--	--	1.33	--	98.33	--
Sep-84	1984	3	3.00	11.26	95.43	--	--	--	3.67	26.64	111.21	--	--	--	--	--	--	0.67	11.00	58.33	10.50
Sep-86	1986	6	15.00	11.50	98.90	--	--	--	4.17	16.68	109.86	--	--	--	--	--	--	0.00	--	42.00	--
Sep-87	1987	6	11.33	13.61	92.06	0.33	6.30	--	5.17	22.43	91.71	--	--	--	0.00	--	--	0.00	--	18.00	--
Sep-88	1988	6	9.67	14.74	90.40	8.17	5.93	105.50	3.00	27.55	123.61	--	--	--	0.67	10.58	86.48	4.00	--	14.00	--
Sep-89	1989	6	10.67	13.15	93.45	9.17	7.59	96.04	1.17	30.31	94.56	--	--	--	0.00	--	--	2.50	--	14.33	4.13
Sep-90	1990	6	18.50	11.96	88.66	4.00	8.51	95.13	0.67	20.95	100.49	--	--	--	2.67	13.69	81.72	9.17	8.04	9.67	14.12
Sep-91	1991	6	15.50	12.78	93.26	12.00	7.39	103.98	2.33	16.57	95.37	--	--	--	5.67	13.98	90.24	2.83	--	8.17	--
Sep-92	1992	6	13.67	13.74	93.42	6.00	6.37	91.54	3.33	25.64	113.39	--	--	--	2.33	17.84	94.80	1.33	--	7.67	--
Sep-93	1993	6	3.17	16.43	94.48	12.33	7.20	109.06	2.00	27.49	100.01	--	--	--	3.33	16.75	95.36	0.00	--	8.67	--
Sep-94	1994	6	27.67	11.73	99.87	23.83	7.65	101.80	2.83	25.52	114.54	--	--	--	1.67	17.39	103.33	0.00	--	6.00	--
Sep-95	1995	6	20.17	13.42	96.73	20.00	7.71	102.97	3.50	21.66	96.62	--	--	--	2.50	17.96	90.90	0.00	--	12.83	--
Sep-96	1996	6	7.83	12.56	96.59	38.00	7.58	105.79	2.83	24.86	103.02	0.17	10.10	119.26	3.33	16.68	96.53	0.00	--	11.00	3.75
Sep-97	1997	6	6.83	13.00	91.31	39.50	7.22	94.54	4.17	21.70	99.11	0.00	--	--	2.17	17.65	96.90	0.00	--	6.17	--
Sep-98	1998	6	4.50	15.53	86.75	47.17	7.55	93.84	4.83	24.43	94.79	0.33	11.65	114.91	4.33	18.04	96.05	0.00	--	10.17	13.74
Sep-99	1999	5	4.20	12.26	104.04	40.60	8.39	93.18	2.20	24.17	105.00	0.80	8.95	119.90	4.40	15.24	95.74	0.20	17.30	4.60	13.39
Sep-00	2000	6	1.00	15.07	93.40	25.00	7.52	96.67	2.50	25.33	99.20	0.50	7.80	104.56	4.67	16.66	96.31	0.00	--	4.17	0.00
Sep-01	2001	6	14.50	12.09	92.76	30.67	7.39	100.86	1.00	27.73	96.81	0.17	10.40	108.60	4.50	13.93	93.62	0.17	17.10	8.67	14.72
Sep-02	2002	6	3.33	11.98	96.85	21.67	7.98	100.11	1.17	25.76	96.31	0.50	9.43	99.04	7.67	14.90	89.57	0.17	--	5.33	--
Sep-03	2003	5	15.80	11.46	102.26	12.20	7.94	125.10	2.00	13.90	108.18	0.20	10.40	96.53	3.60	14.74	101.16	0.00	--	2.60	--
Sep-04	2004	6	12.83	11.62	93.09	16.17	8.34	99.43	0.67	23.90	103.89	0.33	8.20	103.42	2.50	15.32	68.68	0.17	19.20	5.17	15.99
Sep-05	2005	6	5.50	13.63	97.00	12.33	8.35	102.88	0.50	29.23	104.05	0.00	--	--	3.33	15.29	96.82	0.00	--	6.00	16.57
Sep-06	2006	6	3.00	13.38	143.90	23.00	7.71	101.30	1.50	26.94	97.10	0.00	--	--	3.00	15.08	98.10	0.00	--	3.00	16.89
Sep-07	2007	6	9.00	11.80	95.70	29.33	7.90	107.00	1.67	27.50	101.50	0.17	9.20	107.20	5.17	12.80	103.80	0.00	--	17.00	17.20
Sep-08	2008	6	10.00	12.05	104.30	26.50	8.01	102.48	1.00	28.10	97.53	0.17	14.00	113.20	2.67	19.80	94.20	0.00	--	1.83	16.89
Sep-09	2009	6	4.00	11.80	100.90	20.00	8.20	100.40	2.33	26.40	95.16	0.17	15.70	124.59	3.67	18.26	104.72	0.00	--	0.83	16.90
Sep-10	2010	6	3.67	12.12	110.10	19.20	7.35	106.30	0.83	24.32	92.23	0.17	10.20	113.73	1.33	14.48	87.10	0.00	--	1.17	16.59
Aug-11	2011	4	3.75	12.93	98.08	26.50	7.76	92.06	1.75	18.10	83.31	0.25	8.20	76.40	0.75	13.63	81.05	0.00	--	6.00	16.07

Fresno Reservoir

Fresno Reservoir, located 12 miles northwest of Havre is a mainstem reservoir built in 1939 on the Milk River to function as an irrigation storage facility. Fresno is a highly fluctuating mainstem reservoir of 5,757 surface acres with a mean depth of 27 feet, and a maximum depth of 48 feet. Fresno was initially developed as a rainbow trout fishery in the 1940's and 50's, however an illegal introduction of northern pike in the 1940's resulted in a severe decline in the rainbow trout fishery. As a result, Fresno was developed as a warm-water fishery supporting walleye, yellow perch, crappie, largemouth bass, smallmouth bass, Lake Superior whitefish, emerald shiner, and spottail shiners. Over the years, kokanee salmon, brown trout, and rainbow trout have been introduced to supplement the fishery when walleye and northern pike populations were low. Fresno ranked 2nd behind Fort Peck Reservoir in the region for angler pressure in 2009/2010 (19,362 +/- 2,392 angler days; McFarland 2010). Fresno continues to build its reputation as one of the premiere walleye reservoirs in Montana.

The fishery in Fresno has fluctuated throughout the years largely due to high fluctuations in surface water levels. On average, water levels in Fresno fluctuate 21.1 feet per year with an annual water retention rate of 4 days (storage capacity (acre-feet)/average annual inflows (acre-feet)). The timing of this fluctuation greatly impacts the reproduction and survival of forage and sport fish. The fishery in Fresno was severely impacted in 2001 and 2002 when severe drought reduced the reservoir to 8% and 4% of storage capacity, respectively. Forage fish populations were drastically reduced and abundance and condition of key sport fish was at an all time low. As a result, a supplemental plant of 170,000 pre-spawn adult yellow perch from Lake Mary Ronan was conducted from 2001-2004 to increase population levels. This management action was implemented so that when water levels increased, forage fish populations could rebound. In addition, 100,000 walleye fingerlings have been stocked annually since 2003. In 2011, 6,627 pre-spawn adult yellow perch were planted in Fresno because water levels were predicted to reach and surpass full pool elevations thus creating optimal spawning conditions. Yellow perch took advantage of the higher than normal water conditions and produced the highest year-class in 18 years when compared to historic summer seining results (Table 14).

In 2004, water levels increased and flooded shoreline vegetation, allowing the successful spawning and recruitment of forage fishes. From 2005 to 2011, water levels remained high during spring spawning and early summer rearing allowing sport and forage fish populations to rebound to levels not seen before. The continued recovery of the fishery is dependent on maintaining water levels that will allow the successful spawning, recruitment, and overwintering of forage and sport fishes.

Population Status of Young-of-Year Fishes

The abundance and reproductive success of sport and forage fishes were monitored at 12 fixed sites, which were established in 1968. Beach seining was conducted in late summer using a 100- x 9-foot x ¼ inch square mesh beach seine. Fish were sorted by species and counted.

Historically, the abundance of YOY fishes has been dictated by the timing and annual fluctuations in water levels within Fresno Reservoir. The timing of this fluctuation greatly impacts the reproduction and survival of forage and sport fish. The extreme draw down of Fresno in 2001 and 2002 greatly reduced the population levels of most fishes in Fresno except for sauger, which took advantage of the increased riverine habitat (Table 14).

Since 2002, YOY forage and sport fish populations have been increasing and with sound water management should continue to recover. While the reservoir levels were reduced, vegetation regenerated along the shoreline and provided spawning habitat for forage and sport fish when water levels increased in 2003. As a result, forage fish such as yellow perch, emerald shiners, and spottail shiners as well as black crappie and northern pike successfully spawned (Table 14).

The yellow perch population is starting to recover and will continue to increase if water levels are maintained during spawning and rearing stages (April-September). Northern pike YOY levels

have fluctuated throughout the years, however the population appears to be on the upward trend. From 2008-2011, Fresno filled to capacity and flooded a substantial amount of shoreline vegetation creating prime spawning and rearing habitat. Summer seining efforts revealed walleye, northern pike, yellow perch, spottail shiner, and black crappie, have all benefited from this rise in water levels with excellent reproduction and survival, the timing and duration of high water levels directly impacts the spawning success of all species (Table 14).

Table 14. – A summary of forage fish and young-of-year forage and sport fish collected using a 100- x 9-foot x ¼ inch square mesh beach seine in Fresno Reservoir, 1968-2011.

Year	Seine Hauls	*Sanders*	Walleye	Sauger	Northern Pike	YP (yoy)	YP (adult)	Emerald Shiner	Crappie Sp.	Spottail Shiner	Sucker sp.[1]	Minnow sp.[2]	Other[3]
1968	12	16	--	--	6	2,909	--	147	552	0	0	161	0
1969	12	4	--	--	6	1,140	--	385	67	0	2	380	0
1970	12	27	--	--	45	10,151	--	521	883	0	1	122	0
1972	12	102	--	--	22	1,005	--	205	379	0	0	72	0
1974	12	13	--	--	59	1,583	--	29	1,355	0	0	25	0
1975	11	10	--	--	32	4,154	--	155	59	0	0	0	0
1978	12	22	--	--	42	10,684	--	12	3	0	0	0	0
1979	12	29	--	--	45	8,516	--	340	127	0	1	0	1
1982	12	102	--	--	70	8,993	--	121	166	0	0	0	3
1983	12	23	--	--	0	2,254	--	448	9	0	1	7	0
1984	12	247	--	--	0	197	--	375	0	2	40	55	0
1985	12	64	--	--	0	379	--	684	3	2	0	9	0
1986	12	0	--	--	23	6,077	--	142	2	20	1	5	1
1987 +	12	80	--	--	113	6,233	--	1,979	7	3	0	3	0
1988	12	53	--	--	4	3,122	--	182	0	20	0	1	0
1989 +	12	56	--	--	32	24,706	--	22	0	16	2	0	0
1990	12	8	--	--	57	2,033	--	7	465	44	1	2	0
1991+	12	8	--	--	36	3,425	--	0	42	53	0	0	0
1992 +	12	45	--	--	2	6,550	--	28	0	48	0	1	0
1993+	12	24	--	--	9	5,595	--	12	2	162	0	0	0
1994+	12	19	--	--	19	2,960	--	3	287	1,421	1	0	0
1995	12	5	--	--	2	1,080	--	0	2	129	0	1	0
1996+	12	52	--	--	21	3,576	--	0	1	1,484	42	0	0
1997+	12	46	--	--	15	3,006	--	2	1	887	2	0	0
1998+	12	44	--	--	1	1,413	--	9	0	1,041	1	3	0
1999	12	50	--	--	7	4,271	--	176	12	182	13	0	0
2000	6	29	--	--	0	1,396	--	2	2	30	2	0	1
2001	6	86*	--	--	0	39	--	3	0	3	3	1	0
2002	12	28*	--	--	2	86	--	128	400	154	4	29	0
2003+	12	4	--	--	46	1,871-	--	5,539	90	207	0	0	1
2004+	12	--	12	2	10	2,898-	--	69	48	56	0	2	1
2005+	12	--	26	2	19	934	--	39	15	39	0	0	0
2006+	12	--	27	0	57	2,283	--	80	5	923	0	0	0
2007+	12	--	7	0	13	769	--	68	54	1,106	2	0	0
2008+	12	--	65	0	1	2,329	--	5	721	287	11	0	0
2009+	12	--	24	0	24	1,427	224	13	25	716	1	0	0
2010+	12	--	10	0	7	1,247	4	6	4,517	849	0	0	0
2011+	12	--	18	0	4	4,961-	6	5	890	499	0	0	0

[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, pumpkinseed sunfish, and brook sticklebacks

+ Years in which walleye fry or fingerling were stocked

- Years in which pre-spawn adult yellow perch were supplementally stocked

* Primarily Sauger

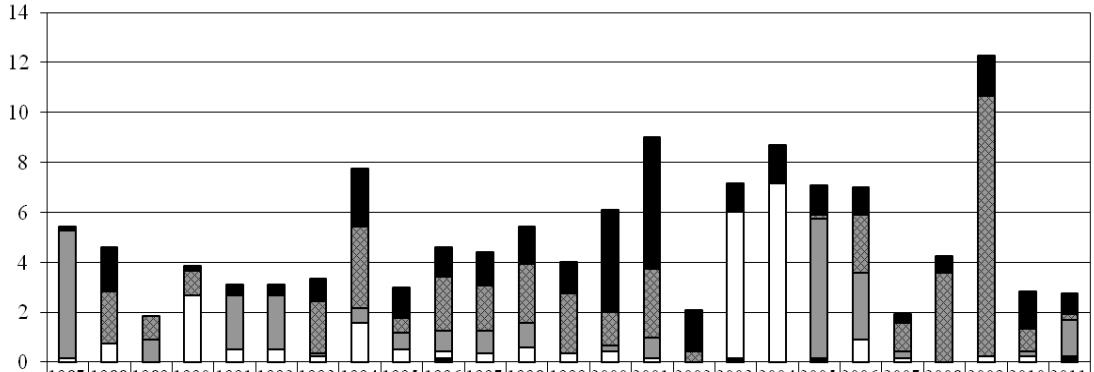
Population Status of Adult Fishes

Adult fish populations were monitored from 1965 to 1974, using systematic gill netting at predetermined stations. Sampling at 12 predetermined stations was resumed in 1987 to determine changes in sport fish abundance and species composition. Samples were collected over two days utilizing six sinking multi-filament experimental gill nets each day (12 net-days). The sinking multi-filament experimental gill nets measuring 125 feet in length and 6 feet deep consisting of 25-foot panels of ¾", 1", 1 ¼", 1 ½", and 2" mesh. Fish were measured for total length (TL) to the inch and weighed to the nearest 0.01 pound. Prior to 2005, scales were collected for aging from all walleye and sauger. From 2005 to 2011, otoliths were collected from walleye for aging and oxytetracycline (OTC) analysis.

Lake Superior Whitefish

Lake Superior whitefish (whitefish) in Fresno Reservoir historically have comprised a significant portion of the gill net catch (Figure 8), but are rarely utilized by anglers. Whitefish exhibit high growth rates in the reservoir, and thereby escape predation from all but the largest walleye and northern pike. Whitefish appear to reproduce successfully in years of stable over-winter storage.

Figure 8. - Relative abundance and size structure of lake whitefish collected with sinking experimental gill nets in Fresno Reservoir, 1987-2011.



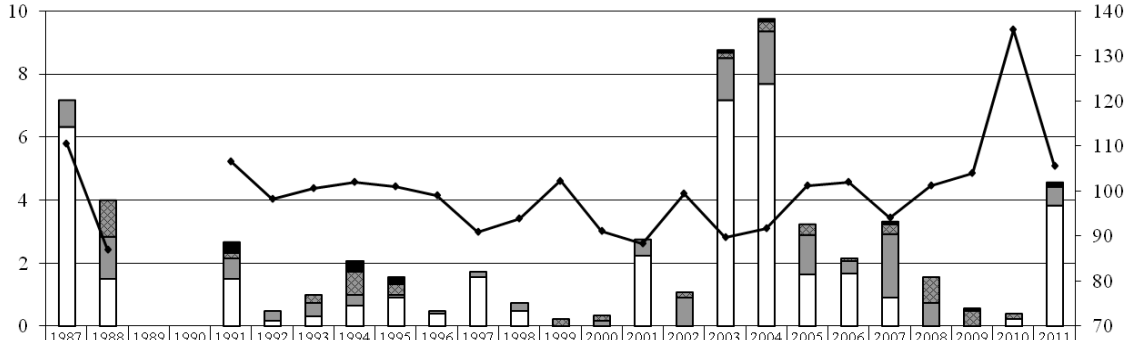
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>18.0 in.)	0.08	1.75	0.00	0.17	0.42	0.42	0.92	2.33	1.25	1.17	1.33	1.50	1.25	4.08	5.25	1.67	1.17	1.42	1.17	1.08	0.333	0.66	1.583	1.5	0.833
Preferred (14.0-17.9 in.)	0.08	2.08	0.92	1.00	0.00	0.00	2.08	3.25	0.58	2.17	1.83	2.33	2.42	1.33	2.75	0.42	0.00	0.00	0.17	2.33	1.17	3.5	10.42	0.917	0.25
Quality (11.0-13.9 in.)	5.08	0.00	0.92	0.00	2.17	2.17	0.08	0.58	0.67	0.83	0.92	1.00	0.00	0.25	0.83	0.00	0.00	0.08	5.58	2.66	0.25	0.08	0	0.166	1.42
Stock (6.0-10.9 in.)	0.08	0.75	0.00	2.67	0.50	0.50	0.25	1.58	0.50	0.25	0.25	0.58	0.33	0.42	0.17	0.00	5.83	7.17	0.00	0.92	0.167	0	0.167	0.25	0.083
Sub Stock (<6.0 in.)	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.08	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0	0	0.083	0	0.166

Yellow Perch

The yellow perch fishery in Fresno was negatively impacted by drought in the early 2000s due to extreme draw downs in 2001 and 2002, yellow perch were not able to successfully spawn (Table 14) and population levels were drastically reduced (Figure 9). To remedy this situation, 170,000 pre-spawn adult yellow perch were supplemented from 2001 to 2004 to increase population levels so when water levels increased these forage fish populations could rebound. In 2003 and 2004, water levels increased, flooding shoreline vegetation, and allowing the successful spawning and recruitment of forage fish and stocking of pre-spawn perch was discontinued in 2005. However, high densities of walleye due to increases in stocking effort have limited the number of YOY yellow perch that actually recruit into the population, regardless of spawning conditions and success.

Since stocking of adult yellow perch was discontinued in Fresno Reservoir, the abundance of adult yellow perch was decreasing and mimicked pre-drought levels (Figure 9). Low water levels throughout the fall and winter months limit good rearing habitat and increase the vulnerability of YOY yellow perch to walleye and northern pike predation. However, four good water years (2008-2011) have allowed for better overwinter water levels thus inundating littoral habitats and creating refuge areas for YOY yellow perch to successfully recruit in to the population (Figure 9).

Figure 9. - Relative abundance, size structure, and relative weight of yellow perch collected with sinking experimental gill nets in Fresno Reservoir, 1987-2011.

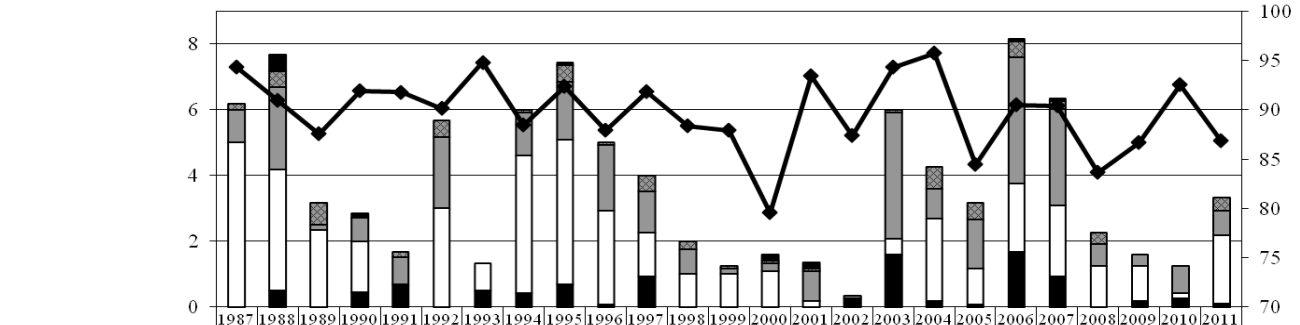


	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>12 in.)	0	0	0	0	0.33	0	0	0.33	0.25	0	0	0	0	0	0	0	0.08	0.08	0	0	0.083	0	0.083	0	0.083
Preferred (10-11.9 in.)	0	1.17	0	0	0.17	0	0.25	0.75	0.33	0	0	0	0.17	0.17	0	0.17	0.17	0.33	0.33	0.08	0.333	0.833	0.417	0.167	0.083
Quality (8-9.9 in.)	0.83	1.33	0	0	0.67	0.33	0.42	0.33	0.08	0.08	0.17	0.25	0.08	0.17	0.5	0.92	1.33	1.67	1.25	0.42	2	0.667	0.083	0	0.583
Stock (5-7.9 in.)	6.33	1.5	0	0	1.5	0.17	0.33	0.67	0.92	0.42	1.58	0.5	0	0	2.25	0	7.17	7.67	1.58	1.67	0.917	0.08	0	0.167	3.83
Sub Stock (<5 in.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08	0	0	0	0	0.083	0
Relative weight	110.6	86.99			106.6	98.12	100.6	101.9	101	98.99	90.84	93.84	102.3	91.07	88.25	99.3	89.66	91.6	101.1	102.0	94.1	101.1	104	135.8	105.6

Northern pike

Since the illegal introduction of northern pike in Fresno Reservoir in the 1940s, their population has fluctuated over the years (Figure 10). Extreme drought from 2000 to 2002 reduced the abundance of northern pike however, the population rebounded in 2003 with increased water levels and flooding of shoreline vegetation. Since 2003, reproduction has steadily increased with high numbers of YOY being collected during annual beach seining surveys. However, northern pike recruitment has been reduced in recent years (Table 14).

Figure 10. - Relative abundance, size structure, and relative weight of northern pike collected with sinking experimental gill nets in Fresno Reservoir, 1987-2011.



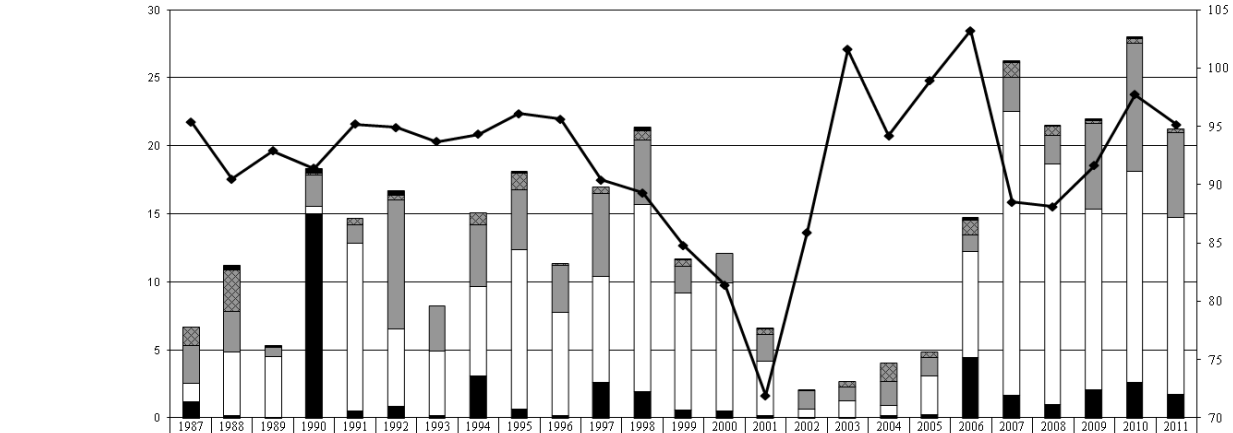
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>34 in.)	0.00	0.50	0.00	0.14	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.08	0.08	0	0	0	0
Preferred (28-33.9 in.)	0.17	0.50	0.67	0.00	0.17	0.50	0.00	0.08	0.50	0.08	0.50	0.25	0.08	0.08	0.08	0.00	0.08	0.67	0.50	0.5	0.25	0.333	0	0	0.416
Quality (21-27.9 in.)	1	2.5	0.17	0.71	0.83	2.17	0	1.33	1.75	2	1.25	0.75	0.17	0.25	0.92	0.08	3.83	0.92	1.5	3.83	2.917	0.667	0.333	0.833	0.75
Stock (14-20.9 in.)	5.00	3.67	2.33	1.57	0.00	3.00	0.83	4.17	4.42	2.83	1.33	1.00	1.00	1.08	0.17	0.00	0.50	2.50	1.08	2.08	2.167	1.25	1.08	0.167	2.08
Sub Stock (<14 in.)	0.00	0.50	0.00	0.43	0.67	0.00	0.50	0.42	0.67	0.08	0.92	0.00	0.00	0.00	0.00	0.25	1.58	0.17	0.08	1.67	0.917	0	0.167	0.25	0.083
Relative weight	94.29	90.89	87.52	91.88	91.77	90.15	94.79	88.41	92.34	87.88	91.78	88.37	87.90	79.51	93.43	87.41	94.29	95.72	84.43	90.50	90.4	83.6	86.65	92.5	86.86

Walleye

From 2003 to 2011 approximately 100,000 fingerlings were stocked annually in Fresno Reservoir. In 2006, 200,000 fingerling walleye were stocked due to unallocated productions at the Ft. Peck fish hatchery.

In 2007, walleye were at their highest abundance levels on record (CPUE=26.25 fish/net; Figure 11) indicating excellent survival and recruitment of stocked YOY walleye, especially the 2005 and 2006-year class. In 2008 and 2009, walleye abundance decreased slightly (CPUE=21.5 and 22.05 fish/net; Figure 7), but remained well above abundances observed in the late 1990s and early 2000s. With several years of excellent water levels to produce abundant forage, walleye abundance was at an all time high in 2010 (CPUE=28 fish/net). Walleye densities remained high in 2011 (CPUE=21.2 fish/net) and the success of our walleye stocking program is quite evident. However, the high walleye densities in Fresno have put a lot of pressure on the current forage base and a normal or marginal water year could have detrimental effects on the entire fish community.

Figure 11. - Relative abundance, size structure, and relative weight of walleye in Fresno Reservoir for the years 1987-2011.



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>25 in.)	0	0.33	0.17	0.29	0	0.33	0	0	0.08	0	0	0.25	0.08	0	0.08	0	0	0	0	0.25	0.17	0.08	0.166	0.166	0
Preferred (20-24.9 in.)	1.33	3	0	0.14	0.5	0.33	0	0.92	1.25	0.17	0.5	0.67	0.42	0	0.42	0.08	0.42	1.33	0.42	1.08	1.08	0.67	0.166	0.333	0.25
Quality (15-19.9 in.)	2.83	3	0.67	2.29	1.33	9.5	3.33	4.5	4.42	3.42	6.08	4.75	2	2.17	1.92	1.33	1	1.75	1.33	1.17	2.5	2.08	6.33	9.42	6.2
Stock (10-14.9 in.)	1.33	4.67	4.5	0.57	12.33	5.67	4.75	6.58	11.67	7.58	7.83	13.75	8.58	9.42	4	0.67	1.25	0.75	2.83	7.83	20.83	17.67	13.25	15.5	13
Sub-stock (<10 in.)	1.17	0.17	0	15	0.5	0.83	0.17	3.08	0.67	0.17	2.58	1.92	0.58	0.5	0.17	0	0	0.17	0.25	4.42	1.67	1	2.083	2.58	1.75
Relative weight	95.4	90.5	92.9	91.4	95.2	94.9	93.7	94.3	96.1	95.6	90.4	89.3	84.8	81.4	71.9	85.9	101.6	94.2	98.9	103.2	88.5	88.1	91.62	97.71	95.15

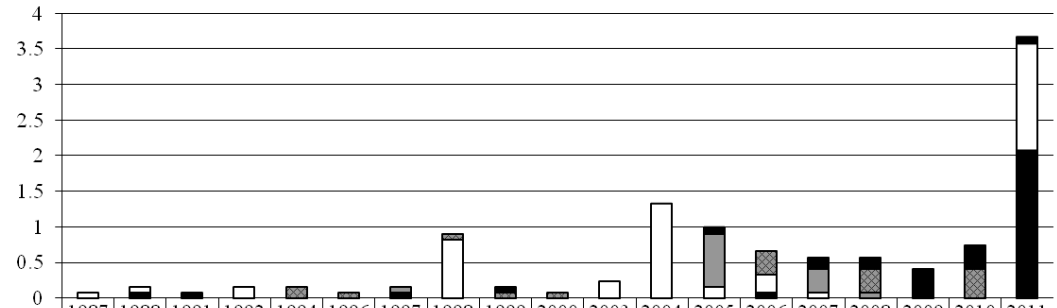
Sauger

Sauger populations have been relatively low in Fresno Reservoir since the construction of the Fresno Dam. Sauger have been captured periodically, primarily in the upper reservoir where the Milk River enters Fresno Reservoir. Sauger populations increased in 2001 and 2002 when drought and extreme drawdowns resulted in an increase in riverine habitat (Table 14), however no sauger were collected in 2011.

Black Crappie

Black crappies were most likely introduced into Fresno in the 1950s however the first record of stocking by FWP occurred in 1991. Since 1968, YOY crappie numbers have fluctuated. In 2010, YOY black crappie abundance was the highest on record since 1974 and another good year of reproduction occurred in 2011 (Table 14). The recent spawning success of black crappie is due to good reservoir pool levels during the spawning period (June), with water levels rising or remaining stable during this period. Elevated water levels have also contributed to three good year-classes being produced (2008, 2010, and 2011) and recruiting into the population. Currently, the adult population of black crappie in Fresno Reservoir is at record highs with good densities of spawning fish greater than 10 inches and three good year-classes coming up (3.0-7.5 inches; Figure 12).

Figure 12. - Relative abundance and size structure of black crappie collected with sinking experimental gill nets in Fresno Reservoir, 1987-2011.



	1987	1988	1991	1992	1994	1996	1997	1998	1999	2000	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>12.0 in.)	0	0	0	0	0	0	0	0	0.083	0	0	0	0.083	0	0.166	0.166	0.416	0.333	0.083
Preferred (10.0-11.9 in.)	0	0	0	0	0.166	0.083	0	0.083	0.083	0.083	0	0	0	0.333	0	0.333	0	0.417	0
Quality (8.0-9.9 in.)	0	0	0	0	0	0	0.083	0	0	0	0	0	0.75	0	0.333	0.083	0	0	0
Stock (5.0-7.9 in.)	0.083	0.083	0	0.166	0	0	0	0.83	0	0	0.25	1.33	0.166	0.25	0.083	0	0	0	1.5
Sub Stock (<5.0 in.)	0	0.083	0.083	0	0	0	0.083	0	0	0	0	0	0	0.083	0	0	0	0	2.08

Blaine County Ponds

Select waters throughout Blaine County were sampled to determine fish abundance using sinking multi-filament experimental gill nets measuring125 feet in length and 6 feet deep consisting of 25-foot panels of ¾", 1", 1 ¼", 1 ½", and 2" mesh unless otherwise specified. Voluntary creel boxes were maintained at many of the ponds to determine fishing pressure, catch rates, and satisfaction.

April Reservoir

April Reservoir is a 2-acre BLM reservoir located approximately 10 miles northeast of Zurich. The dam was constructed in 2001 and BLM personnel notified FWP about the potential for a new fishery. In 2010, one gill and trap net were set overnight to determine if any fishes existed within the reservoir and a thorough depth profile was done to determine if water levels were sufficient enough to sustain a fishery. The nets contained no fish and the depth profile found a max depth of 12 feet. April Reservoir was stocked in the fall of 2011 with bluegill and survival of fish will be monitored closely.

BR 012

BR 012 is a 68-acre reservoir located on BLM lands 10 miles north of Zurich. The reservoir was first stocked with largemouth bass in 1937. Black bullhead, black crappie, bluegill, channel catfish, and rainbow trout have all been stocked periodically since then. BR 012 has always had a problem with winterkills to the species stocked and in 2008 a windmill aeration system was installed to reduce the chances for winterkill.

In 2010, two gill nets and four trap nets were set overnight to determine the aeration system efficiency at the reservoir. Gill nets contained no fish and the trap nets combined total 1,024 fathead minnows. Water levels on BR 012 rarely fluctuate more than 3 feet/year however, depths within the reservoir are too shallow to sustain any sport fishery and the aeration system was removed and there are no plans to continue any stocking of sport fish. In 2011, high spring run-off breached the dam near the spillway and this reservoir will no longer be managed as a fishery.

BR 047

BR 047 is an 11-acre BLM reservoir located approximately 6 miles north of Zurich. The reservoir was first stocked by FWP in 1940 with largemouth bass and black crappie, bluegill were

stocked in 1943. Water levels rarely fluctuate more than one foot/year on BR 047 and in 2010 one gill net and two trap nets were set overnight to determine the fish composition and a depth profile was conducted to determine overwinter survival of game species. The gill net contained no fish and the trap nets combined captured 120 fathead minnows. The depth profile found a max depth of 11 feet. BR 047 was stocked in 2011 with bluegill. A windmill aeration system was installed to increase likely survival of fish through the winter months.

Butch Reservoir

Butch reservoir is located in south Blaine County and historically contained a fishery for rainbow trout, largemouth bass, and bluegill. Butch also had a windmill aerator system, which assisted in over winter survival of fish. In the summer of 2005, a voluntary creel box was erected at Butch reservoir to determine fishing pressure, angler success, and angler satisfaction. In 2005, anglers reported summer catch rates of rainbow trout as 4.28 fish/hour, catches of bluegills as 1.36 fish/hour, and largemouth bass as 2.47 fish/hour (n=4). Anglers reported fall catch rates of rainbow trout as 1.65 fish/hour, catches of bluegills as 0.04 fish/hour, and largemouth bass as 2.13 fish/hour (n=5). The box was destroyed by cows during the winter of 2005/2006 and not replaced. In 2011, high spring runoff nearly washed out the primary spillway and BLM has no intention of repairing it due to cost issues. Furthermore, the high water coming into the reservoir through bare coulees deposited huge amounts of sediment load into the reservoir and the max depth is now approximately six feet. The windmill aerator was removed and FWP will no longer manage Butch as a fishery unless the dam is breached, dredged, and repaired.

Cow Creek Reservoir

Cow Creek Reservoir is a privately owned 65-acre pond located in the Bears Paw Mountains. Cow Creek Reservoir has been managed as a warm water fishery since 1994. Since 1994, walleye, channel catfish, black crappie, and tiger muskie have been stocked and yellow perch were illegally introduced in 2001. In 2007, 5,000 walleye, 3,000 channel catfish, and 820 7 inch tiger muskie were stocked into Cow Creek Reservoir. Starting in 2008, 5,000 walleye and 1,000 channel catfish will be stocked in alternate years. Tiger Muskie will be stocked on an as need basis. In 2010 12,000 pre-spawn yellow perch were transferred and stocked into Cow Creek Reservoir from the Kremlin Water Ponds and 50 advanced fingerling tiger muskie from South Dakota were planted in the fall. The primary food sources for these sport fish are white suckers, fathead minnows, golden shiners, and northern red belly dace.

The dam at Cow Creek Reservoir has been eroding at a rapid rate since 2006 due to small and limited amounts of rip-rap combined with a dam face that is directly hit by prevailing westward winds. In 2010 the landowners along with FWP have agreed to design and fund a dam restoration project to fill, re-slope, and place larger rock rip-rap at Cow Creek Reservoir.

Catch rates for all species were low in 2010 when compared to long-term averages (Table 15). Walleye average lengths continue to be low and anglers are voicing their dissatisfaction. No sampling occurred in 2011 due to extremely low reservoir levels created by the owner in fear of the dam breaching due to high flows from Cow Creek.

Table 15. Catch rate (CPUE (fish/net)) and average length of yellow perch, channel catfish, white sucker, walleye, and tiger muskie using gill nets in Cow Creek Reservoir (1994-2010).

		Yellow Perch		Channel Catfish			White Sucker		Walleye			Tiger Muskie	
Date	Nets	CPUE	Ave. Length	CPUE	Ave. Length	Rel. Weight	CPUE	Ave. Length	CPUE	Ave. Length	Rel. Weight	CPUE	Ave. Length
Aug-94	2.0		--	0.0	--		2.0	--	23.5	7.2		0.0	--
Sep-95	1.0	0.0	--	0.0	--		2.0	--	15.0	10.0	82.5	0.0	--
Sep-96	2.0	0.0	--	5.0	9.1	116.1	1.0	--	48.0	11.1	82.3	0.0	--
Sep-97	2.0	0.0	--	9.5	10.5	118.1	1.0	--	30.5	11.9	86.9	0.0	--
Sep-98	3.0	0.0	--	6.3	13.9	107.7	7.0	14.6	11.3	13.2	87.1	0.0	--
Sep-01	2.0	0.5	5.6	4.5	17.0	103.7	0.5	--	12.5	13.3	94.7	0.5	15.7
May-03	2.0	0.0	--	11.0	19.5	115.7	8.0	15.9	1.0	13.0	97.0	1.5	19.4
Jul-05	2.0	1.0	9.8	9.0	21.3	104.3	6.0	17.6	8.0	14.7	85.5	0.0	--
Jul-06	2.0	1.5	9.6	9.5	21.5	108.4	7.0	17.6	12.0	13.0	87.1	0.0	--
Jul-07	2.0	0.5	10.3	7.0	23.5	118.8	0.0	--	7.5	11.8	92.2	1.5	21.5
Jul-08	2.0	0.0	0.0	6.0	14.4	120.4	2.5	18.1	4.5	9.3	90.5	0.0	0.0
Jun-09	2.0	0.5	10.4	8.0	22.7	111.3	1.5	15.2	13.0	10.0	96.1	0.5	19.7
Jun-10	2.0	0.5	5.8	0.5	13.4	135.9	2.5	17.1	7.0	9.8	97.3	0.0	0.0

Dry Fork Reservoir

Dry Fork Reservoir is a 300 surface acre reservoir located seven miles north of Chinook. This reservoir has historically been a popular yellow perch and northern pike fishery. In 2001, drought and dam operations resulted in a severe decrease in water levels. As a result the fishery was destroyed and black crappie and northern pike were reintroduced in 2002 when the reservoir re-filled. Rainbow trout were stocked from 2002 to 2005 to supplement the fishery and walleye were re-introduced in 2004. This reservoir had almost fully recovered and angling pressure had increased to 1,028 angler days in 2005 (Regional rank=17th). However, from 2006-2010 water levels once again were reduced to severe levels (max depth = 3ft) due to drought conditions and irrigation practices.

In 2006, two experimental gill nets were set within Dry Fork Reservoir and the voluntary creel box was maintained. Results of netting in 2006 indicate good growth and/or recruitment of sport fishes within the reservoir with the highest fish abundance on record.

Approximately 12,000 four-inch rainbow trout have been stocked annually from 2002 thru 2005. In 2006, the average size of rainbow trout captured in gill nets was 21.6 inches (CPUE=3 fish/net). Northern pike were reintroduced with one small stocking in 2002. Since that time northern pike have successfully reproduced and recruited within the reservoir. The average length of northern pike captured in 2006 was 25.9 inches (CPUE= 12 fish/net). Black crappie were reintroduced in 2002 with a plant of 1,000 three-inch fish and followed in 2003 by a plant of 1,800 adult crappie. The average size of black crappie captured in 2005 was 7.29 inches indicating that black crappie are successfully reproducing and recruiting within the reservoir (CPUE= 9 fish/net). From 2004 through 2006, 5,000 walleye fingerlings were planted. While their relative abundance (CPUE=1.5 fish/net) remains low, walleye have exhibited excellent growth since their reintroduction in 2004. In 2006, walleye averaged 20.4 inches TL in the late summer gill netting surveys.

In 2011, high spring runoff and rain events re-filled Dry Fork and 3,400 pre-spawn yellow perch, 3,000 fathead minnows, 93 adult black crappies, and 10,000 rainbow trout were planted, respectably. Northern pike and walleye will be planted in 2012.

Phillips County Fishing Waters

Select waters throughout Phillips County were sampled to determine fish abundance using sinking multi-filament experimental gill nets measuring 125 feet in length and 6 feet deep consisting of 25-foot panels of ¾", 1", 1 ¼", 1 ½", and 2" mesh. Voluntary creel boxes were maintained at many of the ponds to determine fishing pressure, catch rates, and satisfaction.

Bison Bone Reservoir

Bison Bone Reservoir is a 26-acre pond located on BLM land in south Phillips County. Bison Bone was established as a fishery in 1984 with the introduction of yellow perch. Tiger muskie were introduced in 2002 and 2004 to control the white sucker population. A gill netting survey in 2005 indicated tiger muskie have successfully controlled the white sucker population with no suckers being collected. In 2008, no fish were captured in a single gill net set overnight. However, one trap net was fished overnight and captured 470 yellow perch (TL = 3.0-10.4 in; $\bar{x}$ TL = 4.5 in.; $\bar{x}$ wt = 0.10 lbs.), two white suckers ($\bar{x}$ TL = 18.1 in.; $\bar{x}$ wt = 2.81 lbs.), and 54 fathead minnows.

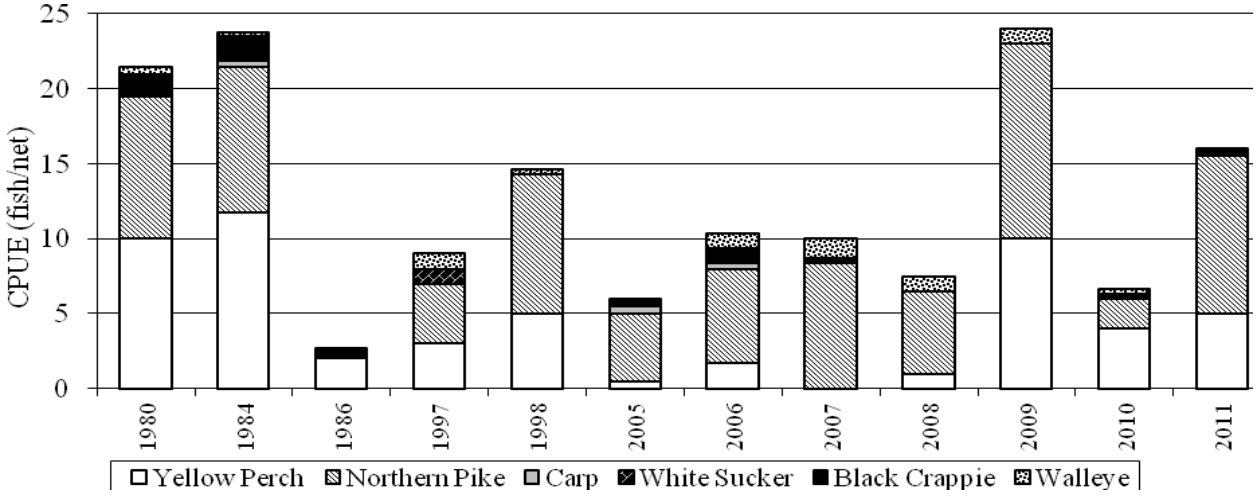
In 2011, one gill net and two trap nets were set overnight to collect fish health samples on fathead minnows and yellow perch. The gill net contained 90 yellow perch ($\bar{x}$ TL = 7.2 in.) and the two traps totaled 626 yellow perch and 30 fathead minnows. Bison Bone will be utilized as donor source for yellow perch in the next few years.

Ester Lake

Ester Lake is a 139-acre pond located on state land and has been managed by FWP since the 1950s. In the 1960's Ester was a productive fishery with high numbers of yellow perch, black crappie, and walleye. Since the 1980s the fishery has been in decline due to poor water levels however, water levels have been excellent in recent years.

In 2009 and 2010, Ester received 8,000 and 2,600 pre-spawn yellow perch to boost the forage base that has been non-existent since the early 1980s (Figure 13). The supplemental plants of yellow perch have boosted the population and in 2011 approximately 3,900 fathead minnows were planted to establish a secondary forage species. Ester Lake is currently dominated by smaller northern pike (TL < 9.0 in.) suggesting this population is stunted and needs to be reduced.

Figure 13. - Relative abundance of yellow perch, northern pike, carp, white sucker, black crappie, and walleye in Ester Lake (periodic sampling 1980 to 2011).



Nelson Reservoir

Nelson Reservoir, located 19 miles east of Malta, is a Milk River off-channel storage reservoir constructed in 1915 for irrigation storage. At full storage capacity, Nelson covers approximately 4,320 surface acres, has a mean depth of 14.2 feet, and a maximum depth of 50 feet. Nelson is a relatively stable reservoir, which is not affected by drought when compared to other regional reservoirs, with an average annual fluctuation of 8.36 feet and average water retention time of 24 days (storage capacity (acre-feet)/average annual inflow (acre-feet)).

Nelson was established as a fishery in the 1930s & 40s with the introduction of largemouth bass, crappie, bullheads, and rainbow trout. Commercial fishing for carp, buffalo, and goldeye was conducted in the 1920s, 30s, and in the mid 60s. Nelson has approximately 26 fish species and is managed primarily as a walleye fishery. Walleye reproduce naturally in Nelson; however walleye fingerlings have been stocked annually since 2003 in order to boost an already good population. This increased stocking effort has had little impact to the walleye population thus far and will be evaluated in coming years. Spawning shoals were constructed in 1993 at three locations within the reservoir to improve the spawning habitat for walleye and their contribution to the overall spawning success of walleye is unknown.

Population Status of Adult and Young-of-Year Fishes

Since 1993, adult fish populations were monitored at 10 fixed experimental gill netting stations. Gill netting was conducted over a two-day period utilizing five sinking experimental gill nets each day (10 net-days). The sinking multi-filament experimental gill nets measured 125 feet in length and 6 feet deep consisting of 25-foot panels of ¾", 1", 1 ¼", 1 ½", and 2" mesh. Fish were measured for total length (TL: inches) and weighed to the nearest 0.01 pound (lb). Otoliths were collected from walleye for ageing and oxytetracycline (OTC) analysis.

Prior to 1991, adult fish populations were monitored, however sampling was neither uniform, nor consistent enough to develop useful trend data on game fish population size, or composition. As a result this data was excluded from all analysis.

The abundance and reproductive success of sport and forage fishes were monitored at 10 predetermined stations. Beach seining was conducted in early August using a 100- x 9-foot x ¼ inch square mesh beach seine. Fish were sorted by species and counted.

Table 16. - A summary of forage fish and young-of-year forage and sport fish collected conducted at nine fixed sites using a 100- x 9-foot x ¼ inch square mesh beach seine in Nelson Reservoir, 1982-2011.

	Shorline Seined (ft)	Walleye	Yellow Perch	YP (Adult)	Northern Pike	Spottail Shiner	White Sucker	Black Crappie	Goldeye	Buffalo sp[1]	Smallmouth Bass	Longnose Sucker
1982	660	0	4,553	--	3	0	202	245	0	0	0	0
1983	1,420	4	138	--	18	0	543	238	0	0	0	0
1984	1,530	0	133	--	0	0	0	0	0	0	0	0
1985	510	3	2,272	--	16	1	16	67	1	0	0	0
1986*	700	0	3	--	7	0	10	232	0	0	0	0
1987*	495	5	1,987	--	0	4	45	10	7	0	0	0
1988*	520	0	783	--	0	1	0	35	0	0	0	0
1989*	910	10	736	--	4	43	1,503	135	0	0	0	0
1990	1,320	7	2,631	--	1	56	181	21	0	0	0	0
1991*	660	8	77	--	1	54	33	26	0	0	0	0
1992	635	21	140	--	6	387	175	18	0	4	0	0
1993*	520	3	8,287	--	1	520	2,688	62	0	0	0	0
1994*	830	6	1,802	--	10	621	697	49	0	0	0	0
1995*	760	36	232	--	0	3,780	180	163	0	0	0	0
1996*	870	25	4,521	--	13	21	101	0	0	0	0	0
1997*	890	53	2,205	--	0	159	534	1	0	0	0	0
1998*	340	0	126	--	0	33	235	4	0	0	0	0
1999	750	11	1,489	--	2	222	497	1	0	0	0	0
2000*	440	4	449	--	2	189	258	5	6	0	0	0
2001	430	2	72	--	1	27	800	88	0	0	0	0
2002*	415	2	19	--	4	8	38	482	21	62	0	0
2003	530	3	361	--	33	49	235	6,597	0	0	3	0
2004*	443	10	1,781	--	0	19	195	5	1	0	10	0
2005*	754	5	423	--	2	34	155	278	23	5	1	0
2006*	831	3	773	--	8	66	319	89	0	3	1	0
2007*	489	6	586	--	2	75	596	5	0	12	9	0
2008*	500	10	62	--	0	8	272	1,237	11	94	11	0
2009*	750	4	4,522	--	4	3	478	20	8	2	61	14
2010*	750	11	2,914	184	3	98	224	131	0	0	115	2
2011*	750	8	2,404	530	6	34	181	69	0	0	40	0

*Years in which walleye fry or fingerlings were stocked

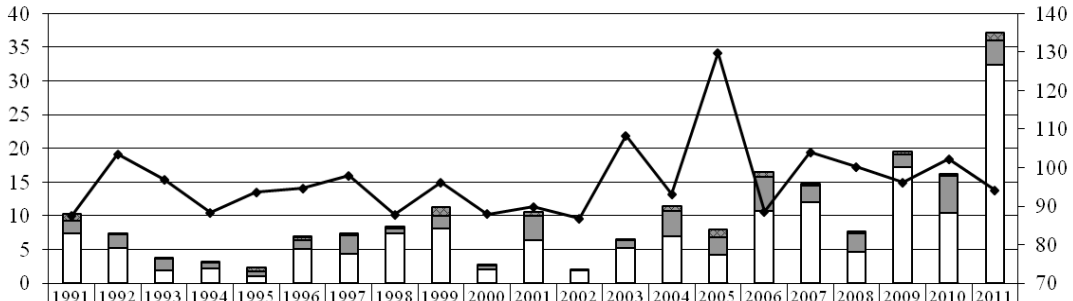
[1] Consists of bigmouth buffalo and smallmouth buffalo

Yellow Perch

The yellow perch fishery in Nelson Reservoir has been cyclic over the last 14 years due to drought and water fluctuations. In the early 1990s and in 2000 and 2002 the relative abundance of yellow perch was significantly reduced due to severe drought conditions. However, since 2003 spring and summer rains have enabled water levels to flood shoreline vegetation and remain stable during crucial spawning and rearing periods (April-October), resulting in the highest yellow perch densities seen in Nelson (Table 16; Figure 14).

In 2011, yellow perch densities were highest ever recorded with 37.1 fish/net. Currently, the population of adult yellow perch consists mostly of stock (5-7.9 in.) and quality (8.0-9.9 in.) sized fish.

Figure 14. - Relative abundance, size structure, and relative weight of yellow perch collected with sinking experimental gill nets in Nelson Reservoir, 1991-2011.



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>12 in.)	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0
Preferred (10-11.9 in.)	1.00	0.20	0.20	0.20	0.60	0.40	0.30	0.10	1.30	0.10	0.60	0.00	0.10	0.80	1.20	0.70	0.3	0.3	0.4	0.4	1.2
Quality (8-9.9 in.)	1.80	2.00	1.80	0.90	0.70	1.20	2.70	0.70	2.00	0.60	3.50	0.10	1.20	3.70	2.60	5.10	2.4	2.7	1.9	5.4	3.5
Stock (5-7.9 in.)	7.40	5.20	1.80	2.10	1.00	5.10	4.30	7.40	8.00	2.00	6.40	1.80	5.10	6.90	3.80	10.60	12	4.6	17.2	10.2	32.4
Sub Stock (<5 in.)	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.3	0	0	0	0	0.2	0
Relative weight	87.70	103.58	96.83	88.45	93.77	94.56	97.87	87.94	96.13	87.97	89.95	86.76	108.25	93.10	129.76	88.60	104	100.23	96.15	102.3	94.08

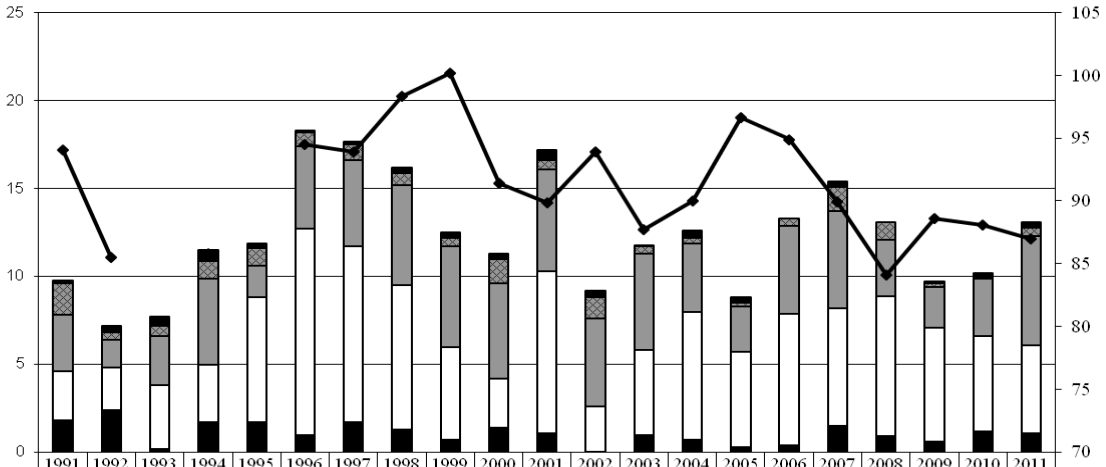
Walleye

Walleye fingerlings have been periodically stocked into Nelson Reservoir to augment natural reproduction. From 2002 to 2011 (with the exception to 2006), all walleye fingerlings stocked into Nelson Reservoir have been marked with 750 ppm OTC to allow the calculation of survival on stocked fish and to distinguish stocked fish from naturally reproduced fish. In 2006, only half of the walleye stocked were marked with OTC due to problems with reaction of the walleye to the chemicals.

Even with the addition of these fish, catch of YOY walleye during seining surveys remained low when compared to pre-drought levels (Table 14). However, the high proportion of stock (10-14.9 in.) and quality size (15.0-19.9 in.) walleye in the population indicates good survival YOY walleye from 2003 through 2011 (Figure 15). OTC analysis suggests the majority (> 75%) of YOY walleye recruiting into the population are naturally reproduced.

The relative abundance of adult walleye has remained relatively stable over the last five years with minor decreases in catch rates in 2005, 2009, and 2010 (Figure 15).

Figure 15. - Relative abundance, size structure, and relative weight of walleye collected with sinking experimental gill nets in Nelson Reservoir, 1991-2011.

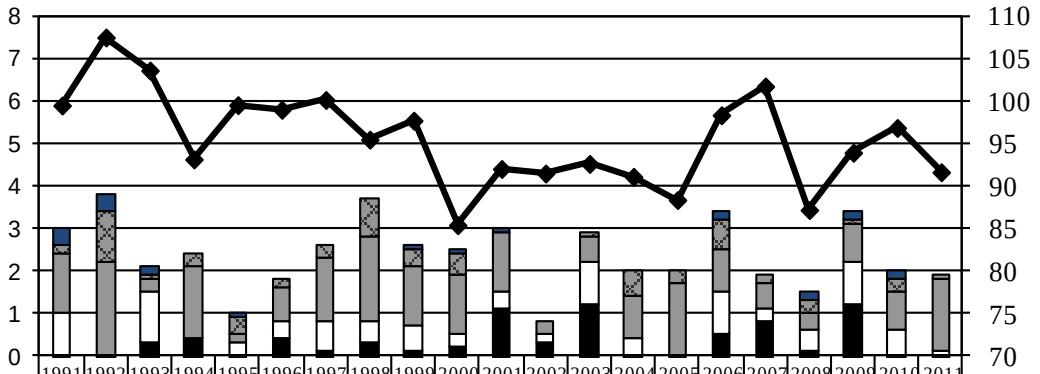


	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>25 in.)	0.20	0.40	0.50	0.60	0.30	0.10	0.20	0.30	0.30	0.30	0.60	0.40	0.10	0.40	0.30	0.00	0.3	0	0.1	0.2	0.3
Preferred (20-24.9 in.)	1.80	0.40	0.60	1.00	1.00	0.80	0.90	0.70	0.50	1.40	0.50	1.20	0.40	0.30	0.20	0.40	1.4	1	0.2	0.1	0.5
Quality (15-19.9 in.)	3.20	1.60	2.80	4.90	1.80	4.70	4.90	5.70	5.70	5.40	5.80	5.00	5.50	3.90	2.60	5.00	5.5	3.2	2.3	3.3	6.2
Stock (10-14.9 in.)	2.80	2.40	3.60	3.30	7.10	11.70	10.00	8.20	5.30	2.80	9.20	2.50	4.80	7.30	5.40	7.50	6.7	8	6.5	5.4	5
Sub-stock (<10 in.)	1.80	2.40	0.20	1.70	1.70	1.00	1.70	1.30	0.70	1.40	1.10	0.10	1.00	0.70	0.30	0.40	1.5	0.9	0.6	1.2	1.1
Relative weight	94.03	85.50		85.80		94.50	93.90	98.33	100.1	91.43	89.83	93.93	87.71	89.98	96.65	94.90	89.9	84.1	88.59	88.1	86.98

Northern pike

Historically, the abundance of adult northern pike has remained relatively low and stable consisting of a high proportion of quality, preferred, and memorable size fish (Figure 16). Northern pike populations were significantly reduced in 2002 due to severe drought conditions, however the population was quickly replenished with the recruitment of YOY fishes in 2003 (Figure 16). In 2011, the northern pike population remained stable at 1.9 fish/net and is dominated by quality sized fish (Figure 16).

Figure 16. - Relative abundance, size structure, and relative weight of northern pike collected with sinking experimental mesh gill nets in Nelson Reservoir, 1991-2011.

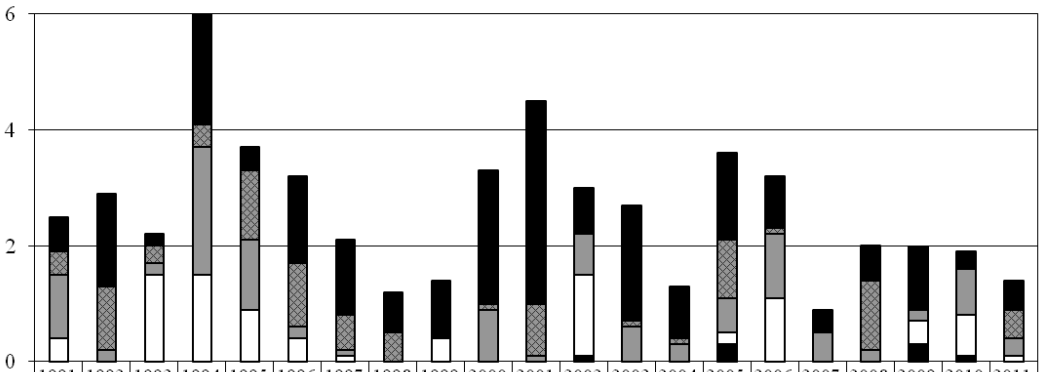


	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>34 in.)	0.40	0.40	0.20	0.00	0.10	0.00	0.00	0.00	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.20	0	0.2	0.2	0.2	0
Preferred (28-33.9 in.)	0.20	1.20	0.10	0.30	0.40	0.20	0.30	0.90	0.40	0.50	0.00	0.00	0.10	0.60	0.30	0.70	0.2	0.3	0.1	0.3	0.1
Quality (21-27.9 in.)	1.40	2.20	0.30	1.70	0.20	0.80	1.50	2.00	1.40	1.40	1.40	0.30	0.60	1.00	1.70	1.00	0.6	0.4	0.9	0.9	1.7
Stock (14-20.9 in.)	1.00	0.00	1.20	0.00	0.30	0.40	0.70	0.50	0.60	0.30	0.40	0.20	1.00	0.40	0.00	1.00	0.3	0.5	1	0.6	0.1
Sub Stock (<14 in.)	0.00	0.00	0.30	0.40	0.00	0.40	0.10	0.30	0.10	0.20	1.10	0.30	1.20	0.00	0.00	0.50	0.8	0.1	1.2	0	0
Relative weight	99.55	107.5	103.6	93.18	99.59	99.04	100.2	95.52	97.76	85.42	92.05	91.52	92.65	91.13	88.38	98.40	101.8	87.2	93.97	96.9	91.67

Lake whitefish

Lake whitefish populations have fluctuated since 1991 due to fluctuations in water levels and temperature, which have reduced recruitment of YOY fish to the population (Figure 17). In 2007, there was a massive summer kill of lake whitefish and fall gill netting surveys indicated a decrease in the abundance of lake whitefish (CPUE = 0.9 fish/net; Figure 13; Leslie 2007). Gill netting surveys conducted in 2011 reveals the population has stabilized and is comprised of mostly adult fish (Figure 17).

Figure 17. - Relative abundance, size structure, and relative weight of lake whitefish collected with sinking experimental mesh gill nets in Nelson Reservoir, 1991-2011.

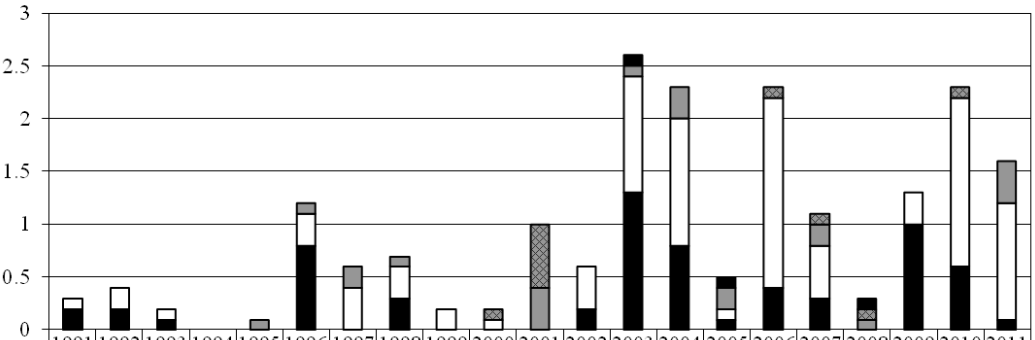


	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>18.0 in.)	0.6	1.6	0.2	1.9	0.4	1.5	1.3	0.7	1	2.3	3.5	0.8	2	0.9	1.5	0.9	0.4	0.6	1.083	0.3	0.5
Preferred (14.0-17.9 in.)	0.4	1.1	0.3	0.4	1.2	1.1	0.6	0.5	0	0.1	0.9	0	0.1	0.1	1	0.1	0	1.2	0	0	0.5
Quality (11.0-13.9 in.)	1.1	0.2	0.2	2.2	1.2	0.2	0.1	0	0	0.9	0.1	0.7	0.6	0.3	0.6	1.1	0.5	0.2	0.2	0.8	0.3
Stock (6.0-10.9 in.)	0.4	0	1.5	1.5	0.9	0.4	0.1	0	0.4	0	0	1.4	0	0	0.2	1.1	0	0	0.4	0.7	0.1
Sub Stock (<6.0 in.)	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.3	0	0	0	0.3	0.1	0

Black Crappie

Historically there has been a low abundance of black crappie in Nelson Reservoir. In 2003, black crappie reproduction was the highest on record (Table 16) and recruitment of YOY crappie into the population resulted in a high abundance of adult black crappie (Figure 18). High reproductive success over the last seven years indicates the conditions within Nelson Reservoir have been favorable for black crappie, and if conditions remain stable the population will continue to remain at good levels.

Figure 18. - Relative abundance, size structure, and relative weight of black crappie collected with sinking experimental gill nets in Nelson Reservoir, 1991-2011.



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Memorable (>12.0 in.)	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0	0
Preferred (10.0-11.9 in.)	0	0	0	0	0	0	0	0	0	0.1	0.6	0	0	0	0	0.1	0.1	0.1	0	0.1	0
Quality (8.0-9.9 in.)	0	0	0	0	0.1	0.1	0.2	0.1	0	0	0.4	0	0.1	0.3	0.2	0	0.2	0.1	0	0	0.4
Stock (5.0-7.9 in.)	0.1	0.2	0.1	0	0	0.3	0.4	0.3	0.2	0.1	0	0.4	1.1	1.2	0.1	1.8	0.5	0	0.3	1.6	1.1
Sub Stock (<5.0 in.)	0.2	0.2	0.1	0	0	0.8	0	0.3	0	0	0	0.2	1.3	0.8	0.1	0.4	0.3	0	1	0.6	0.1

Other fishes

A variety of other fishes are found within Nelson Reservoir, however they are rarely utilized as a sport fishery due to low abundances or their non-game status. Channel catfish, stonecats, bigmouth buffalo, smallmouth buffalo, and smallmouth bass are all present at low levels within Nelson Reservoir. Spottail shiners are also present and provide an important forage base, however in recent years their populations have been reduced and adult spottail shiners have not been present in high numbers within the annual seining surveys (Table 16).

Sagebrush

Sagebrush reservoir is a 5.2-acre BLM pond located in south Phillips County. Sagebrush was historically managed as a rainbow trout fishery until largemouth bass were introduced by FWP in 1989 followed by bluegill and channel catfish in 2001. Rainbow trout are stocked periodically, with the last stocking occurring in 2002. A windmill aerator system was installed in 2000 or 2001 and this reservoir is currently full. Bluegill and largemouth bass populations are self-sustaining and rainbow trout have exhibited excellent growth and survival. In 2009, one gill net and one trap net were set overnight. The gill net contained one largemouth bass (TL= 13.2 in.) and the trap net had 163 bluegill and one largemouth bass. In 2010 and 2011 Sagebrush Reservoir was utilized as a donor source for bluegill, approximately 1,270 bluegill have been removed and planted in Karsten Coulee, PR 018, and Lark Reservoirs.

Taint Reservoir

Taint reservoir is a 5.7-acre reservoir located on BLM land in south Phillips County. This reservoir is a popular bluegill fishery with high catch rates and good lengths of fish. In 2010 and 2011 Taint Reservoir was utilized as a donor source for bluegill, approximately 700 bluegill were removed and planted in Karsten Coulee and Lark Reservoirs.

RECOMMENDATIONS

Paddlefish: Fort Peck Stock

Annual tagging efforts should continue with over 300 paddlefish being tagged annually. An on-site paddlefish creel survey should be conducted in 2012 to monitor 500 fish harvest cap and to collect jaw samples to assist in determining the age structure of the Fort Peck Reservoir paddlefish stock. A phone survey should be conducted in 2012, using database of anglers who purchased tags to assess angler harvest of paddlefish. Telemetry study will be continued in 2012 with all data being collected from the fixed stations only. Additionally, harvest rates should be closely monitored and the harvest cap will be implemented.

Fresno and Nelson Reservoir

Standardized late-summer seining should continue to assess sport fish reproduction and forage fish abundance in Fresno and Nelson Reservoirs. Standardized sampling of adult sport fishes should be continued utilizing fall gill netting to gather recruitment information relating to walleye and other key sport and forage fish year-class strength and winter reservoir water levels. Walleye fingerling stocking program on Fresno and Nelson should be re-evaluated to determine best stocking strategy for each reservoir.

Beaver Creek Reservoir

Standardized late-summer seining should continue to assess sport fish reproduction and forage fish abundance at Beaver Creek Reservoir. Standardized sampling of adult sport fishes should be continued utilizing fall gill netting to gather recruitment information relating to sport and forage fish year-class strength and to monitor growth and survival of stocked walleye, rainbow trout, and forage availability. Spring and fall plants of walleye fingerlings and advanced fingerlings should be continued.

Hill, Blaine & Phillips Co. Ponds

Sampling of adult sport fish populations should continue annually at Bailey Reservoir, Ester Reservoir, and Cow Creek Reservoir. All other ponds should be sampled every two to three years to assess adult fish populations, growth, and recruitment. In addition, self-creel survey boxes that still remain will be maintained to assess the fishing pressure at these ponds. This information will allow us to tailor our management and stocking efforts to meet the needs of the public. Yellow perch should be collected from the Kremlin Water District Ponds and Bison Bone Reservoir and transferred to Ester, Dry Fork, and Fresno in the spring of 2012.

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Water Codes of Waters Referred To

154531	April Reservoir
154535	Bailey Reservoir
154570	Beaver Creek Reservoir
164466	Bison Bone Reservoir
156940	BR 012
157445	BR 047
164575	Butch Reservoir
164789	Cow Creek Reservoir
155083	Dry Fork Reservoir
155120	Ester Lake
165140	Fort Peck Reservoir
155240	Fresno Reservoir
162500	Missouri River Sec. 05
162520	Missouri River Sec. 06
156480	Nelson Reservoir
168047	Sagebrush Reservoir
168475	Taint Reservoir

Key words:
Paddlefish, harvest, walleye, Lake Superior whitefish, northern pike, black crappie, yellow perch, goldeye, channel catfish, sauger, shovelnose sturgeon, pallid sturgeon, burbot, smallmouth buffalo, largemouth buffalo, age, water levels, creel census, population estimates, recruitment, tiger musky, stocking, Cisco, smelt

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