

**MONTANA FISH, WILDLIFE, & PARKS
FISHERIES DIVISION
JOB PROGRESS REPORT**

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

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

JOB NO.: V-d TITLE: NORTHEAST MONTANA COLDWATER ECOSYSTEM
INVESTIGATIONS

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

ABSTRACT

The coldwater fisheries in Hill, Blaine, and Phillips counties were impacted in various locations by the 2011 winter severity. Record snowfall and extremely low temperatures kept most ponds snow covered for up to 5 months and many reports of partial or total winterkills were reported and observed, however windmill aeration systems help reduce the fish loss on several ponds. Furthermore, spring runoff throughout the area had many creeks out their banks and reservoir spillways running which resulted in many ponds that were once dewatered or unsuitable for fish, now being planted.

Rainbow trout growth and survival in Beaver Creek Reservoir has been good in the past few years. Rainbow and brook trout fisheries in Bear Paw Lake have responded well to control efforts of white suckers. Fishing pressure has increased in response to increased size of trout within Bear Paw Lake. Growth and condition of rainbow trout in Choteau, Sentinel, and Faber Reservoir remains good. Ponds in Hill, Blaine, and Phillips, counties were monitored in 2011 and results and management recommendations for all these waters 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.

METHODS

Floating and sinking multi-filament experimental gill nets 125 feet in length and 6 feet deep consisting of 25-foot panels of $\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ ", and 2" mesh were fished to acquire information on adult fish populations in ponds and reservoirs. Whenever possible, fish were measured for total length (TL: inches) and weighed to the nearest 0.01 pound.

RESULTS AND DISCUSSION

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. The statewide fishing pressure survey for 2009/2010 indicated it received 8,520 angler days (McFarland 2009).

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 70,000 catchable size Eagle Lake, Erwin and Arlee rainbow trout as well as 5,000 advanced fingerling walleye.

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.

Population Status of Young of Year Fishes

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 $\frac{1}{4}$ inch square mesh beach seine. The fish were sorted by species and counted.

Lower reservoir levels (maintenance on the dam's infrastructure) limited our seining success in 2011 (Table 1). Summer seining efforts indicate that reproductive success for many species was poor. However, this is a bad representation of the overall spawning success. Spring water levels created excellent spawning conditions for all species and future fall gill net surveys should confirm this as these fish grow and recruit into the population. The high density of YOY white suckers is most likely due to high flows in Beaver Creek and these fish flushing over Bear Paw Lake spillway.

Table 1. – 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), smallmouth bass (SMB), 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

Population Status of Adult 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. Extremely low reservoir levels only allowed us to sample adult fish populations at four of the six fixed experimental gillnetting stations, which were established in 1986. Gillnetting was conducted over night utilizing two sinking and two floating experimental gill nets (4 net-days). The sinking and floating experimental gill nets were 125 feet in length and 6 feet deep consisting 25-foot panels of $\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ ", and 2" mesh. Fish were measured for total length (TL: inches) and weighted 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.

Rainbow Trout

Rainbow trout population levels fell below 10 fish/net in 2005 and 2006 however they increased to 9 fish/net in 2006 (Table 2). In 2003 and 2004, 84,443 and 61,459 Arlee and Eagle Lake rainbow trout were stocked and the abundance of rainbow trout was above 10 trout/net, respectively (Table 3). In 2005, 41,416 rainbow trout were stocked which may account for the decreased abundance (CPUE=5.5 fish/net) of rainbow trout (Table 3). In addition the yellow perch populations were at their highest levels since 2001/2002 and northern pike have been increasing. Decreased stocking levels in 2005 due to PCB cleanup at Big Springs Fish hatchery, combined with increased competition and predation are the primary causes for decreased catch rates of rainbow trout. In 2006, stocking rates of rainbow trout returned to normal (70,000 RBT / year) and catch rates increased to target levels in 2007 and 2008 (Table 2 and Table 3). Rainbow trout catch rates fell below target levels again in 2009, 2010, and 2011 (Table 2). There are a number of variables influencing rainbow trout densities, high spring flows flushing fish through the spillway, high yellow perch and northern pike densities, and reduced plants are all contributing factors to the recent decline. Yellow perch and northern pike will be monitored closely and rainbow trout stocking rates may be adjusted accordingly.

Table 2. 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.

Date	Nets	Rainbow Trout			Yellow Perch			Northern Pike			Smallmouth bass			Walleye			Longnose sucker		White sucker	
		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	3	24.00	10.91	111.26	--	--	--	--	--	--	--	--	--	--	--	--	7.33	10.49	82.33	10.23
Nov-77	3	35.00	10.05	86.31	--	--	--	--	--	--	--	--	--	--	--	--	2.33	9.66	113.00	9.75
Sep-80	3	23.33	10.12	81.04	--	--	--	--	--	--	--	--	--	--	--	--	1.33	6.33	156.00	8.86
Sep-81	3	7.33	10.88	82.77	--	--	--	--	--	--	--	--	--	--	--	--	6.67	8.78	165.33	8.70
Oct-82	3	8.33	11.78	99.67	--	--	--	2.33	15.79	109.67	--	--	--	--	--	--	3.33	9.66	109.67	9.69
Oct-83	3	3.33	11.79	94.66	--	--	--	3.67	25.10	117.07	--	--	--	--	--	--	1.33	--	98.33	--
Sep-84	3	3.00	11.26	95.43	--	--	--	3.67	26.64	111.21	--	--	--	--	--	--	0.67	11.00	58.33	10.50
Sep-86	6	15.00	11.50	98.90	--	--	--	4.17	16.68	109.86	--	--	--	--	--	--	0.00	--	42.00	--
Sep-87	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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

Table 3. Rainbow trout historic stocking rates as it relates to densities stocked, strain, length and month on Beaver Creek Reservoir, 1990-2011.

Year	# Stocked	Strain	Length (Inches)	Month Stocked
1990	19,634	I	8.5	April
1990	2,200	A	7.0	April
1990	4,025	A	7.5	July
1990	180	A	10.9	September
1990	5,123	I	4.8	September
1991	10,136	I	8.6	April
1991	1,947	A	8.9	June
1991	25,004	A	6.3-7.2	September
1992	9,320	I	9.5	April
1992	10,935	A	7.0	April
1992	2,032	A	8.9	June
1992	22,871	A	7.4	September
1993	15,179	I	9.1	September
1993	29,376	A	7.4	September
1994	13,347	T	7.7	April
1994	35,160	A	3.7-4.8	May
1994	19,002	I	5.4	June
1995	12,959	T	7.7	April
1995	15,665	A	3.7	April
1995	35,305	A	4.3	May
1995	1,620	T	9.5	June
1995	14,746	I	5.6	June
1995	12,953	A	6.5	September
1996	13,080	T	6.6	April
1996	39,908	A	4.3	May
1996	20,813	I	6.0	June
1996	7,943	I	4.2	July
1997	19,990	T	6.7-7.3	April
1997	52,722	A	3.6	May
1997	19,219	I	5.9	June
1998	11,358	T	6.8	April
1998	5,200	T	7.3	May
1998	40,086	A	4.0	June
1998	19,992	I	5.6	June
1999	17,010	T	7.0	April
1999	10,413	A	6.8	April
1999	4,858	T	8.7	June
1999	18,691	A	5.8	July
1999	6,975	I	3.0	August
2000	10,557	A	6.0	April
2000	25,010	T	6.7	April
2000	18,955	I	4.2	July
2000	36,758	A	6.8	September
2001	21,151	T	6.2	April
2001	6,012	N	4.2	June
2001	52,578	A	6.5	September
2001	15,433	I	4.6	September
2002	20,010	T	6.5	April
2002	4,992	A	3.2	April
2002	47,721	A	6.7-7.3	September
2002	2,992	T	9.0	September
2003	20,705	T	6.2	April
2003	48,563	A	5.6-7.2	September
2003	15,175	N	6.4	September
2004	20,040	T	5.9	April
2004	7,000	I	4.1	August
2004	17,149	I	4.4	September
2004	45,663	A	6.3-7.0	September
2004	9,998	I	3.8	October
2005	10,440	T	6.6	April
2005	30,976	A	7.7	September
2006	20,045	T	6.7	April
2006	19,125	A	3.2	May
2006	54,854	A	6.7-7.9	September
2007	19,121	I	8.0	April
2007	52,058	A	6.5-7.6	September
2007	24,823	I	4.3	September
2008	20,168	R	6.9	April
2008	50,222	A	6.1-7.5	September
2009	10,005	R	7.2	April
2009	8,364	I	8.6	May
2009	49,210	A	7.8-8.4	September
2010	19,995	R	6.9	April
2011	10,120	R	6.6	April
2011	24,486	A	7.7	September

Bearpaw Lake

Bearpaw Lake is a very popular 45 surface-acre reservoir located on Beaver Creek in the Bearpaw Mountains and received 10,058 angler days in 2009 (2009/2010; McFarland 2009). Bearpaw Lake has been managed as a trout fishery since 1960 and is currently maintained with annual plants of 15,000 catchable size Arlee rainbow trout. Stocking of cutthroats was discontinued in 2010 due to poor growth and condition of these fish in Bearpaw Lake. Wild brook trout moving out of Beaver Creek are also found in the lake. Because of this lakes popularity and the desire by the public to catch larger fish, the daily limit for trout was reduced from five to three fish per day in the spring of 2002.

Bearpaw Lake also sustains a very healthy population of white suckers, which has negatively impacted the rainbow trout fishery. As a result walleye and smallmouth bass have been established within the reservoir. Smallmouth bass have been naturally reproducing within the reservoir since 1998. Walleye were illegally introduced in the 1990s and were then utilized as a control measure for white suckers with periodic stockings from 1992 to 1997. Since 2006, a supplemental plant of 5,000 advanced fingerlings has been planted to replenish the aging walleye population. Following a chemical rehabilitation of Bearpaw Lake conducted in 1983, a manual sucker control program was initiated in 1989 in an effort to reduce food competition between trout and white suckers and thus improve growth and survival of rainbow trout.

Population Status of Adult Fishes

Adult fish populations were monitored at three fixed experimental gillnetting stations, which were established in 1984. Gill netting was conducted over night utilizing two sinking experimental gill nets and one floating experimental gill net (3 net-days). The sinking and floating experimental gill nets were 125 feet in length and 6 feet deep consisting of 25-foot panels of $\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ ", and 2" mesh. Fish were measured for total length (TL: inches) and weighted to the nearest 0.01 pound (lb).

Since 1989, manual control of white suckers has been attempted on an annual basis. Control efforts involve setting five trap nets for one to two weeks during the spawning season (April/May). Traps are checked daily and white suckers are transferred to other lakes, given to local farmers for fertilizer, or killed and returned to the lake.

Rainbow and Yellowstone Cutthroat Trout

Rainbow trout and Yellowstone cutthroat trout have been stocked in Bearpaw Lake since the 1960s and 1980s, respectively (Table 5). Rainbow trout are currently stocked in Bearpaw Lake at a rate of 15,000 catchables per year (Table 5).

The relative abundance of rainbow and Yellowstone cutthroat trout has fluctuated greatly since their introduction (Table 3). The primary reasons for these fluctuations are stocking densities, fishing pressure, and changes in survivability as a result of multiple factors including competition with white suckers. In 2011 relative abundance of rainbow trout increased to their highest level in three years (26.33 fish/net) whereas brook trout relative abundance remained low (0.33 fish/net).

Rainbow and brook trout have had relatively poor growth rates due to fishing pressure and competition with white suckers for food. However, since the initiation of manual control of white suckers and the introduction of smallmouth bass (1992) and walleye (legally in 1995; Table 5), the average length of trout has increased from lengths recorded in the late 1990s (Figure 1; Table 4).

White Sucker

The white sucker population has been significantly reduced since control efforts were initiated in 1984 (Figure 1; Table 4). Chemical rehabilitation was attempted in 1983 however white suckers quickly re-populated the lake from Beaver Creek. In 1989, a manual removal program was initiated. In 1992 and 1995 smallmouth bass and walleye were introduced to help control YOY and adult white sucker populations. From 1989 to 2011, 145,380 white suckers have been removed using trap nets and gill nets

(Table 6). Overall the average size of white suckers has been increasing (Table 4), indicating that control efforts have helped prevent adults from spawning, and smallmouth bass have been helping control YOY white sucker populations. In 2011, spring trap netting and fall gill netting removed a total of 340 pounds of white suckers (Table 6).

Smallmouth Bass

Smallmouth bass were introduced in 1992 to assist with the control of YOY white suckers. Since 1998, smallmouth bass have been successfully reproducing and recruiting into the population. In addition to providing control of white suckers, smallmouth bass have become an important addition to the fishery. In 2011, fall gillnetting surveys yielded zero smallmouth bass (Table 4). However anglers did report catching many smallmouth bass throughout the summer.

Walleye

Walleye were illegally introduced into Bearpaw Lake in the early 1990s. They were first documented in the lake in 1992. From 1992 to 1997, walleye fry and fingerlings were stocked to help control adult white sucker populations. Since 2006 supplemental plants of 5,000 advanced fingerlings were stocked to replenish the aging walleye population. Since their legal introduction, walleye have exhibited poor growth and their contributions with control of white suckers are unclear.

Figure 1. - Comparison of white sucker relative abundance during fall gill netting surveys and average length of trout (rainbow, brook, and Yellowstone cutthroat) in Bearpaw Lake (1984-2011).

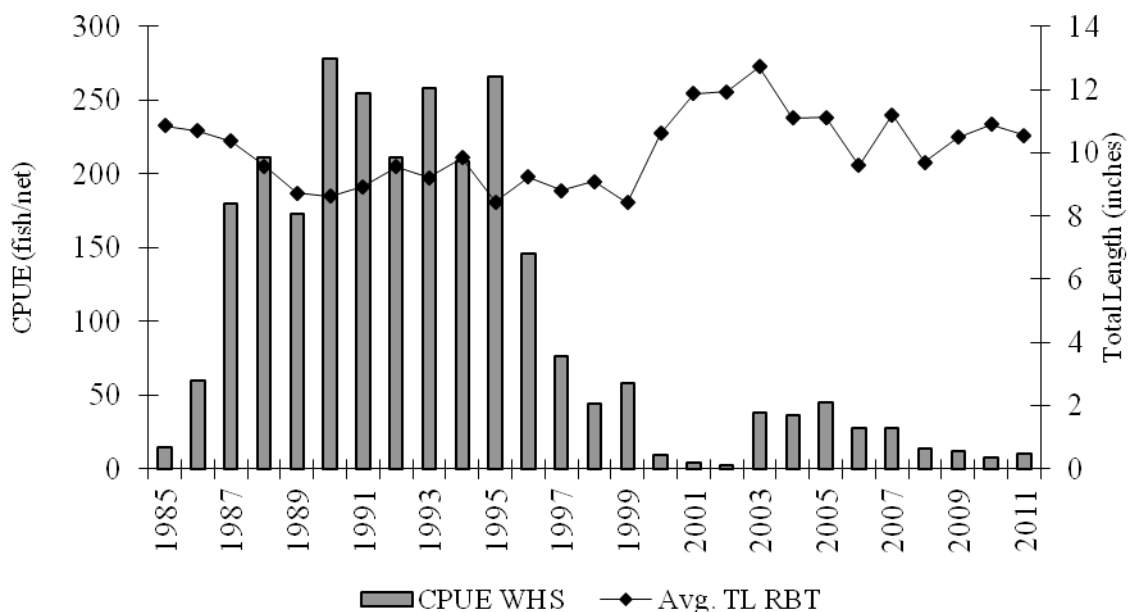


Table 4.- Summary of relative abundance (catch per unit effort (CPUE)), total length (TL), and relative weights of fishes collected in fall gillnetting surveys in Bear Paw Lake since chemical rehabilitation in 1983.

		Rainbow Trout				Brook Trout			Yellowstone Cutthroat Trout			White Sucker			Smallmouth Bass			Walleye		
		CPUE Ave TL				CPUE Ave TL			CPUE Ave TL			CPUE Ave TL			CPUE Ave TL			CPUE Ave TL		
Date		Nets	(fish/net)	(in.)	Rel Wt	(fish/net)	(in.)	Rel Wt	(fish/net)	(in.)	Rel Wt	(fish/net)	(in.)	Rel Wt	(fish/net)	(in.)	Rel Wt	(fish/net)	(in.)	Rel Wt
Sep-84	1984	2	0.00	--	--	0.00	--	--	15.50	10.13	86.34	13.50	8.00	--	--	--	--	--	--	--
Sep-85	1985	3	1.33	12.03	97.49	1.00	9.05	109.72	27.33	11.50	86.83	6.33	--	--	--	--	--	--	--	--
Sep-86	1986	3	0.00	--	--	3.33	10.41	106.78	16.67	11.01	86.45	94.33	6.40	--	--	--	--	--	--	--
Sep-87	1987	3	17.00	11.27	93.31	3.00	10.31	103.48	25.67	9.52	86.21	192.67	7.00	--	--	--	--	--	--	--
Aug-88	1988	3	9.33	10.66	83.05	1.33	10.48	100.24	9.00	7.60	90.08	210.33	11.67	93.74	--	--	--	--	--	--
Sep-89	1989	3	15.33	8.64	88.09	0.67	9.50	106.91	19.33	8.08	85.50	173.67	8.00	--	--	--	--	--	--	--
Aug-90	1990	3	9.00	9.95	81.94	0.33	7.20	86.56	22.33	8.71	77.85	277.67	8.00	--	--	--	--	--	--	--
Aug-91	1991	3	4.00	10.23	88.55	0.67	7.45	104.75	15.00	9.12	85.36	255.33	8.00	--	--	--	--	--	--	--
Sep-92	1992	3	17.00	9.83	90.97	0.33	10.10	90.14	58.67	8.79	77.22	212.00	8.00	--	--	--	--	0.33	13.90	97.61
Sep-93	1993	3	0.00	--	--	0.33	9.30	105.94	6.00	9.15	81.65	258.33	8.00	--	0.00	--	--	0.00	--	--
Sep-94	1994	3	6.33	10.59	101.87	0.00	--	--	13.67	9.09	79.87	208.67	8.00	--	0.00	--	--	0.00	--	--
Sep-95	1995	2	21.50	9.07	92.20	0.00	--	--	89.50	7.82	81.30	399.00	8.00	--	1.00	5.80	111.70	0.00	--	--
Sep-96	1996	3	1.67	10.36	102.97	0.33	8.40	90.25	60.67	8.94	85.64	146.00	8.80	--	0.67	6.80	96.44	1.33	8.73	81.46
Sep-97	1997	3	24.67	9.16	93.58	0.00	--	--	26.00	8.47	80.26	76.00	10.00	--	0.67	9.90	103.82	1.00	7.73	72.03
Sep-98	1998	3	10.00	9.34	86.71	0.00	--	--	3.67	8.84	72.68	44.33	12.02	84.89	0.33	6.00	90.19	1.33	8.43	80.59
Sep-99	1999	3	43.33	8.31	97.60	0.00	--	--	19.33	8.54	79.14	57.33	12.00	--	0.00	--	--	1.33	10.43	83.95
Sep-00	2000	2	46.00	11.36	97.54	1.50	9.67	98.77	20.00	10.81	80.53	14.00	12.00	--	6.00	9.76	103.09	3.50	11.30	88.39
Sep-01	2001	2	11.00	13.39	98.99	6.50	11.36	101.16	15.00	10.91	81.14	6.00	8.00	--	2.00	10.83	102.66	0.00	--	--
Sep-02	2002	2	19.50	12.58	98.57	0.00	--	--	6.50	11.31	83.45	3.00	13.52	99.67	0.00	--	--	2.00	19.50	82.57
Sep-03	2003	3	16.33	12.72	94.32	0.00	--	--	0.00	--	--	37.67	8.00	--	5.67	12.21	112.80	1.00	19.60	101.96
Sep-04	2004	3	13.33	11.11	--	0.00	--	--	0.00	--	--	36.67	12.60	--	0.33	14.50	--	0.67	20.45	--
Sep-05	2005	3	24.67	11.12	92.19	0.00	--	--	0.33	--	--	44.67	13.14	99.05	5.67	9.07	112.75	1.33	20.53	101.17
Sep-06	2006	3	32.00	10.62	98.00	0.00	--	--	0.67	9.35	96.10	28.00	15.31	108.20	9.00	9.84	109.80	0.33	15.40	104.20
Sep-07	2007	3	13.33	11.20	96.30	0.00	--	--	2.33	9.20	80.90	28.00	13.40	102.30	9.00	9.00	115.70	4.33	7.60	96.10
Sep-08	2008	3	30.33	9.73	94.58	0.00	--	--	7.67	9.03	84.95	14.00	14.12	108.86	5.67	10.94	147.97	5.00	8.07	97.96
Sep-09	2009	3	9.66	10.50	73.45	0.33	10.00	100.88	9.00	9.33	62.37	12.33	14.58	95.00	7.66	11.31	104.73	2.66	10.25	80.07
Sep-10	2010	3	14.33	10.90	104.35	0.33	10.00	111.49	0.00	--	--	7.67	13.80	104.10	1.67	8.94	117.20	6.00	10.62	98.00
Aug-11	2011	3	26.33	10.56	98.91	0.33	10.60	106.02	0.00	--	--	10.00	14.28	102.92	0.00	--	--	0.67	12.40	103.88

Table 5. Stocking summary of rainbow trout, Yellowstone cutthroat trout, smallmouth bass, and walleye in Bearpaw Lake, 1984-2011.

Rainbow Trout				Yellowstone Cutthroat Trout			Smallmouth Bass		Walleye	
Date	# Stocked	Strain	Month	# Stocked	Strain	Month	# Stocked	Month	# Stocked	Month
1984	--	--	--	21,234	M	April/Sept.	--	--	--	--
1985	--	--	--	8,120	M	May/Aug.	--	--	--	--
1986	--	--	--	12,727	M	June/Sept.	--	--	--	--
1987	13,008	D and I	April/Sept.	19,248	M	April/Sept.	--	--	--	--
1988	8,018	I	Sept.	28,904	M	April/Sept.	--	--	--	--
1989	500		May	6,000	M	May	--	--	--	--
1990	--	--	--	5,025	M	May	--	--	--	--
1991	9,965	A	Sept.	7,574	M	May	--	--	--	--
1992	6,879	A	Sept.	8,023	M	May	25,000	Aug.	--	--
1993	11,040	A	Sept.	5,058	M	May	41,250	July/Aug.	--	--
1994	9,394	A	Sept.	5,040	M	May	23,995	July/Aug.	--	--
1995	--	--	--	10,064	M	May	--	--	5,000	June
1996	11,398	A	Sept.	9,997	M	May	20,000	July	4,000	June
1997	13,448	A	Sept.	8,924	M	May	5,000	Aug.	6,000	June
1998	13,904	A	Sept.	5,047	M	May	5,000	July	--	--
1999	17,160	A	June	4,048	M	May	--	--	--	--
2000	4,995	A	Sept.	3,973	M	May	--	--	--	--
2001	10,000	A	Sept.	3,991	M	May	--	--	--	--
2002	10,700	A	Sept.	4,320	M	May	--	--	--	--
2003	15,215	A	Sept.	4,200	M	May	--	--	--	--
2004	12,549	A	Sept.	4,384	M	May	--	--	--	--
2005	14,520	A	Sept.	5,600	M	May	--	--	--	--
2006	12,628	A	Sept.	6,214	M	April/May	--	--	5,112	Sept.
2007	20,000	A and I	Sept.	8,127	M	May	--	--	--	--
2008	15,000	A	Sept.	7,293	G	May	--	--	--	--
2009	15,000	A	Sept.	5,024	G	May	--	--	--	--
2010	5,000	I	June	--	--	--	--	--	--	--
2011	5,104	I	June	--	--	--	--	--	--	--

Table 6. - Numbers of white suckers removed from Bearpaw Lake by trap netting and fall gill netting, 1989-2011.

Year	Number Trap Netting	Number Gill netting	Total Number	Total Pounds
1989	12,545	521	13,066	9,359.19
1990	44,622	833	45,455	10,396.52
1991	18,140	766	18,906	4,932.86
1992	4,133	636	4,769	955.42
1993	5,239	775	6,014	1,205.33
1994	6,995	626	7,621	882.49
1995	5,653	798	6,451	2,396.44
1996	1,991	438	2,429	817.39
1997	13,485	228	13,713	8,227.80
1998	6,708	133	6,841	5,309.22
1999	8,239	172	8,411	7,614.72
2000	2,225	28	2,253	2,591.20
2001	331	12	343	562.69
2002	17	6	23	21.65
2003	1,564	113	1,677	2,362.17
2004	222	110	332	418.32
2005	1,895	134	2,029	2,311.74
2006	1,893	84	1,977	2,491.02
2007	1,705	84	1,789	2,111.02
2008	560	42	602	818.72
2009	175	37	212	290.44
2010	104	23	127	173.99
2011	310	30	340	418.20
Totals	138,751	6,629	145,380	66,076

Blaine County Ponds

Ponds throughout Blaine County were sampled using gill and trap nets to assess species composition, relative abundance, and size distribution of fish or the voluntary creel boxes were maintained.

Anderson Reservoir

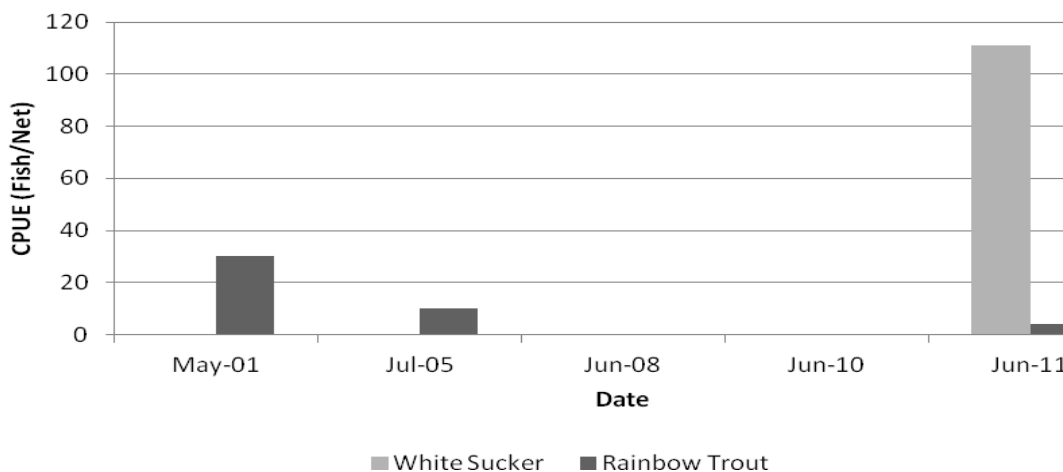
Anderson reservoir is a privately owned reservoir, which has been managed as a rainbow trout fishery since 2003. This reservoir is maintained with annual plants of 2,000 four-inch Arlee rainbow trout. In addition, a creel box was erected during the summer of 2005 but was destroyed by cows.

Initially, the trout exhibited excellent growth and survival in Anderson reservoir. However, winterkills have occurred in 2008 and 2010 which have limited the abundance and size of fish (Figure 2). Population surveys conducted in 2010 indicate a dense population of fathead minnows (CPUE= 13,007)

and no adult rainbow trout. Heavy spring rains in 2010 have increased the water levels on Anderson and 2,000 rainbow trout were stocked in May. In 2011, fish health samples were collected for trap and transport of fathead minnows, one gill net and two trap nets were set overnight and captured 10 rainbow trout, 783 white sucker, 8,500 fathead minnows, 236 brassy minnow, 3 creek chubs, 3 northern redbelly dace, 1 brook stickleback, and 1 mountain sucker.

The rainbow trout stocked in 2010 show excellent growth and have exceeded 15 inches in total length. The high diversity of species found in Anderson Reservoir during the 2011 sampling effort was caused by a high spring runoff event that had many creeks running out of their banks and small dams either breaching or spillways running.

Figure 2. - Relative abundance of rainbow trout and white suckers in Anderson Reservoir based on gill netting surveys from 2001 to 2011.



Brookie Pond

Brookie Pond is a privately owned reservoir that has been managed as a brook trout fishery by Montana Fish, Wildlife & Parks since 2003. In 2005, Brookie Pond was entered into a five-year contract under the Private Lands Fishing Access Program and this contract was renewed in October 2010 for another five years. This pond has a windmill aeration system and from 2004 to 2007 the pond was managed with annual stocks of 3,000 fingerling brook trout. From 2008 to 2012 the pond will be managed with alternate year plants of 1,500 fingerling brook trout.

In 2008, a total of 22 brook trout were collected ranging in length from 8.2 to 17.1 inches (\bar{x} = 11.4 inches) and in weight from 0.52 to 2.94 pounds (\bar{x} = 0.96 pounds). Brookie Pond winterkilled in 2010 due to extremely low water levels during the summer 2009 and throughout the winter 2009/2010. One gill and trap net were set overnight to assess the severity of the winterkill. The gill net contained no fish and the trap net contained two fathead minnows. High runoff during the spring of 2011 filled Brookie Pond to full capacity and Brook trout were planted in May 2011.

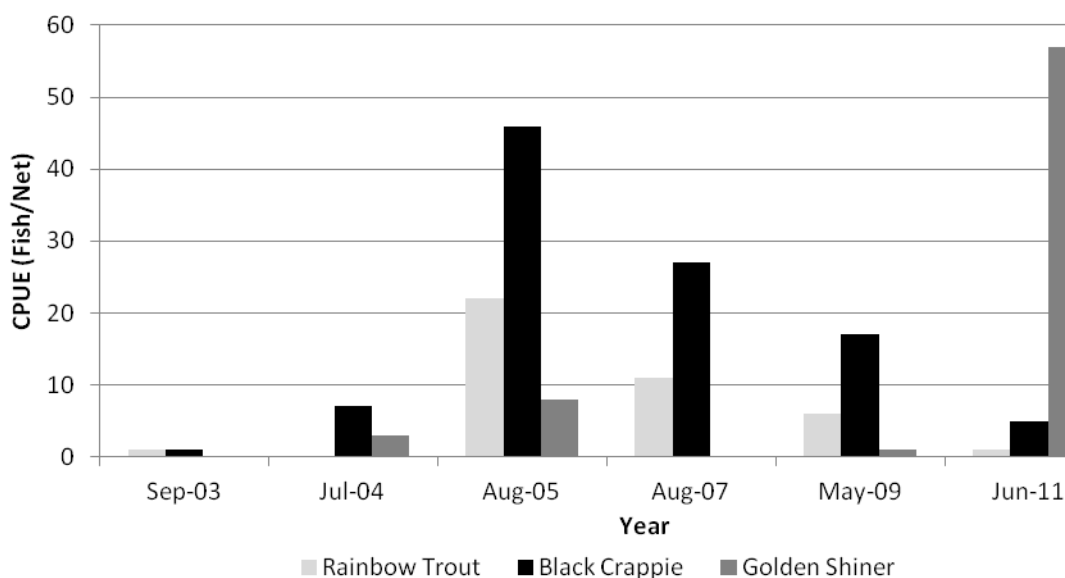
Choteau Reservoir

Choteau Reservoir is located in north central Blaine County and contains a rainbow trout and black crappie fishery. Black crappie were introduced in 2002. The reservoir is currently maintained with biennial plants of 1,500 fingerling rainbow trout. Choteau also has a windmill aerator system to assist with over winter survival of fish.

In 2005, a voluntary creel box was erected to determine fishing pressure, angler success, and angler satisfaction. The creel box was maintained in 2011. Choteau Reservoir experienced a partial winterkill in 2011 as water levels were very low (max depth 7ft.) and aquatic vegetation was abundant.

In 2011, two trap nets and one gill net were set overnight to indicate the severity of winterkill, effects of flushing due to high spring runoff, and to disease test black crappie for trap and transfer purposes. The trap and gill nets contained black crappie, rainbow trout, fathead minnows, and golden shiners (Figure 3). The severe winters experienced in north central Montana over the last three years has resulted in partial winterkills of rainbow trout and black crappie, this has enabled golden shiner densities to increase significantly as they can withstand lower dissolved oxygen levels through the winter months (Figure 3).

Figure 3. - Relative abundance of rainbow trout, black crappie, and golden shiner in Choteau Reservoir based on gill netting surveys from 1972 to 2011.



Faber Reservoir

Faber Reservoir, a 25-surface-acre reservoir located 30 miles south of Chinook near Cleveland, is one of the most popular fishing access sites in north central Montana. This reservoir became a fishing access site in 1986 and the contract was renewed in 2006 for another 20 years. Faber reservoir ranked 12th in the region for fishing pressure in 2008/2009, with a total of 2,123 angler days. Faber has been a consistent producer of quality rainbow trout for three decades.

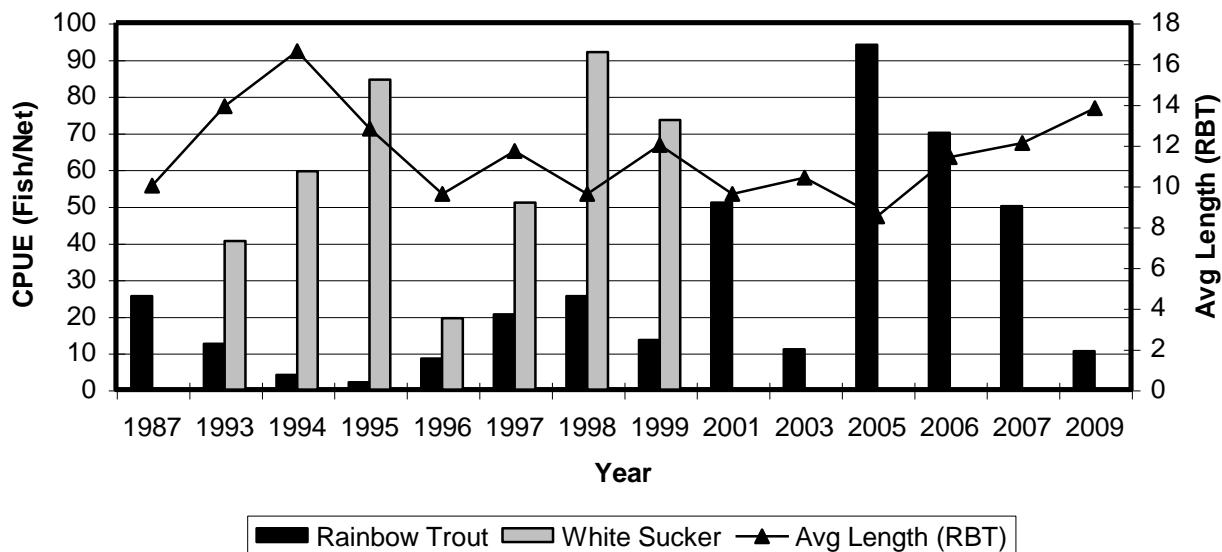
This reservoir was rehabilitated in 2000 due to the illegal introduction of largemouth bass and white suckers. Fingerling Arlee rainbow trout were re-stocked in the spring of 2001 and approximately 10,000 fingerling trout are stocked annually. However, in 2004 an additional 10,000 fingerling rainbow trout were stocked. In 2007 a partial summer kill of rainbow trout was reported.

Since the rehabilitation in 2000, rainbow trout populations have been recovering (Figure 4). Gill net surveys conducted in 2009 indicated that rainbow trout catch rates have greatly decreased since 2007 (CPUE= 10.5 fish/net) however, average total length greatly increased (Avg. TL= 13.8). One trap net set overnight captured 700 fathead minnows.

In 2011, anglers reported catching trout in late August with some exterior abnormalities. In response to these reports crews set one gillnet for approximately 8 hours and two rainbow trout (TL=15.4

and 15.1; weight 1.15 and 1.05 lbs.) were captured and showed no evidence of the reported abnormalities. We hypothesized extremely high temperatures during the late summer months caused stressing to some fish and they became susceptible to parasites.

Figure 4. - Relative abundance of rainbow trout and white sucker and Avg. length of rainbow trout in Faber Reservoir based on gill netting surveys from 1987 to 2009.



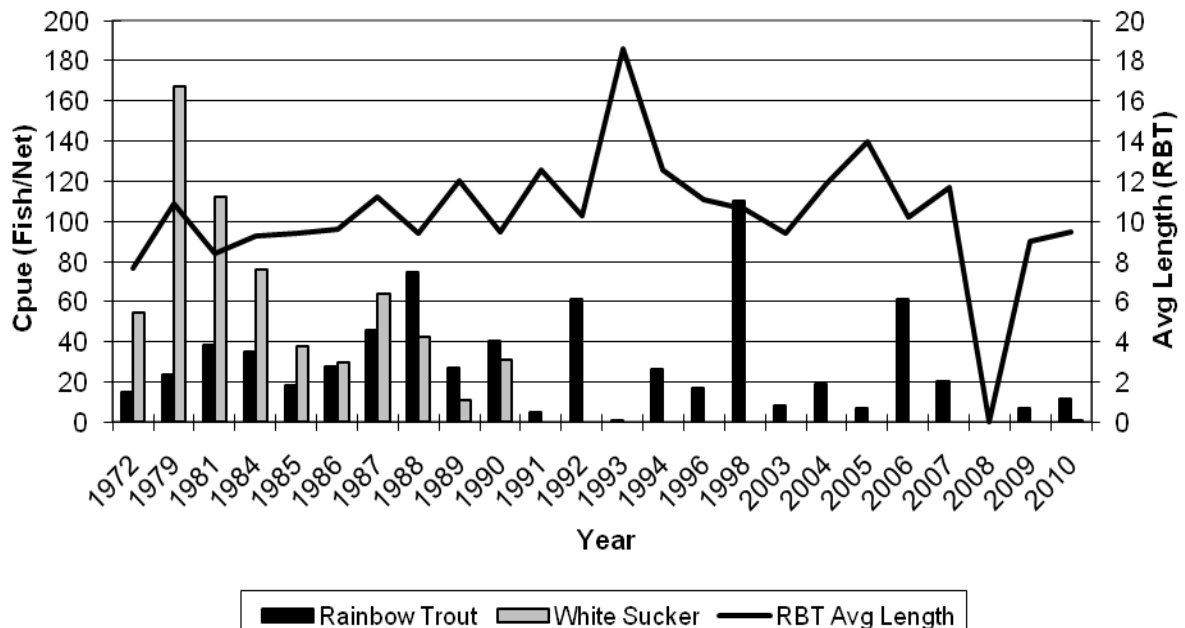
Grasshopper Reservoir

Grasshopper Reservoir is a privately owned 19-surface-acre reservoir located approximately 12 miles south of Chinook. Grasshopper Reservoir was first stocked with rainbow trout in 1947, and trout have exhibited good growth and survival rates in this reservoir. Grasshopper is currently maintained with annual plants of 2,500 fingerling Arlee rainbow trout and biennial plants of 3,000 advanced fingerling Eagle Lake rainbow trout. In 2011, FWP and S Bar B Ranch entered into a 5-year agreement through the Private Lands Public Fishing program to ensure public access to the reservoir. In return FWP provided \$7,800 to upgrade the access road across the dam.

Grasshopper experienced a winterkill in 2007/2008. Anglers who filled out creel cards reported catching no fish during late ice (n=2) and one reported seeing over 100 dead trout along the east bank. In the spring of 2008 heavy rains raised water levels and the reservoir received a supplemental stocking of 2,500 Arlee rainbow trout.

Gill netting surveys conducted in 2010 resulted in lower rainbow trout catch rates (CPUE= 12 fish/net) when compared to historic averages (Figure 5). Rainbow trout averaged 9.5 inches in length (TL= 6.5-21 in.) and weighed 0.42 lbs. (WT= 0.08-3.5 lbs.). White suckers were chemically removed in 1991 and have since been undetected in netting surveys. However, in 2010 one white sucker (TL=7.4; WT=0.16lbs.) was captured and future surveys will be closely monitored to detect population trends of this species.

Figure 5. - Relative abundance of rainbow trout and white suckers and average total length of rainbow trout in Grasshopper reservoir based on gill netting surveys from 1972 to 2010.



H.C. Kuhr Reservoir

H.C. Kuhr reservoir is a 25-acre privately owned reservoir located south of Chinook. H.C. Kuhr has been open to public fishing since the 1960s and was entered into a 10-year contract under the Private Lands Fishing Access program in 2005. H.C. Kuhr is currently managed as a rainbow trout fishery with annual stocks of 3,000 4-inch trout.

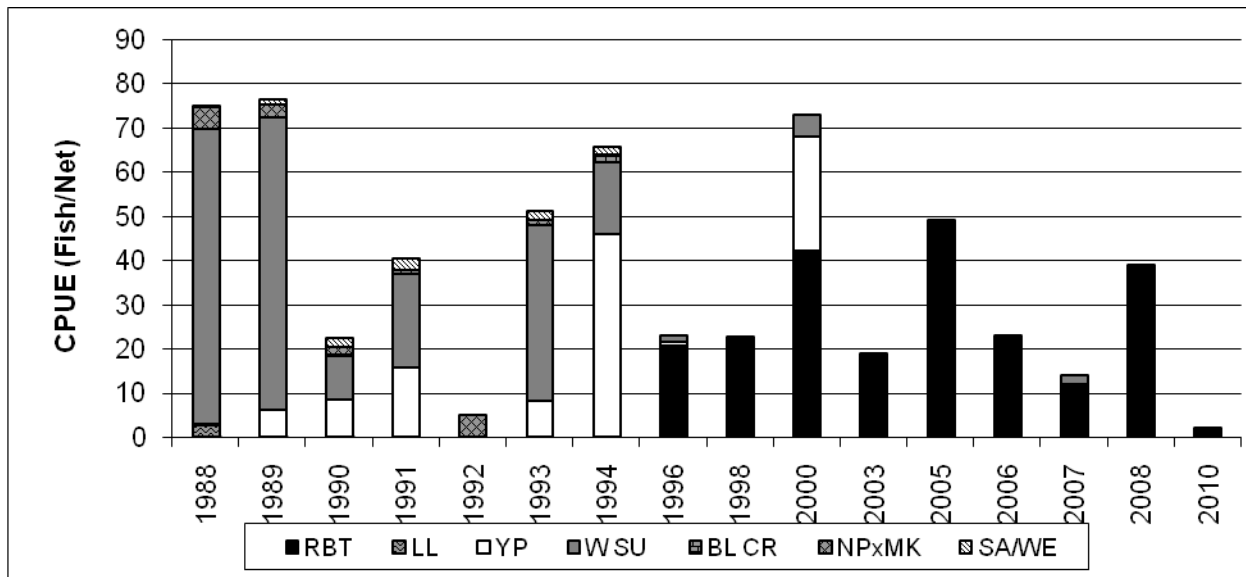
Prior to 1996, the reservoir was managed as a warm water fishery with varying densities of black crappie, yellow perch, tiger muskie, walleye, sauger, and white suckers (Figure 6). In 1996 as a result of decreased white sucker populations, the rainbow trout fishery began to increase. In 2003, drought all but dewatered H.C. Kuhr and the opportunity to kill off a remnant yellow perch, tiger muskie, and white sucker population presented itself. The reservoir was restocked in 2003 and closed to fishing until 2004. When the fishery reopened in 2004, there were reports of 3 to 4 pound rainbow trout being caught in the reservoir.

Since the restoration in 2003, the fishery has been monitored using summer gill netting surveys. In addition, a voluntary creel box was erected in 2005 to assess fishing pressure and angler success rates.

In 2010 reservoir levels were once again excellent and the spillway was running for over a month. One gill and trap net were set overnight to assess population densities. The gill net contained two rainbow trout and the trap net contained 305 fathead minnows and 36 brook stickleback.

In 2011, anglers reported catching trout in late August with some exterior abnormalities. In response to these reports crews set one gillnet for approximately 6 hours and no fish were captured. We hypothesized extremely high temperatures during the late summer months caused stressing to some fish and they became susceptible to parasites.

Figure 6.- Relative abundance of rainbow trout (RBT), brown trout (LL), white sucker (W SU), black crappie (BL CR), tiger muskie (NPxMK), and sauger/walleye (SA/WE) in H.C. Kuhr based on gillnetting data from 1988 to 2010. Rehabilitation of this reservoir and restocking of rainbow trout occurred in 2003.

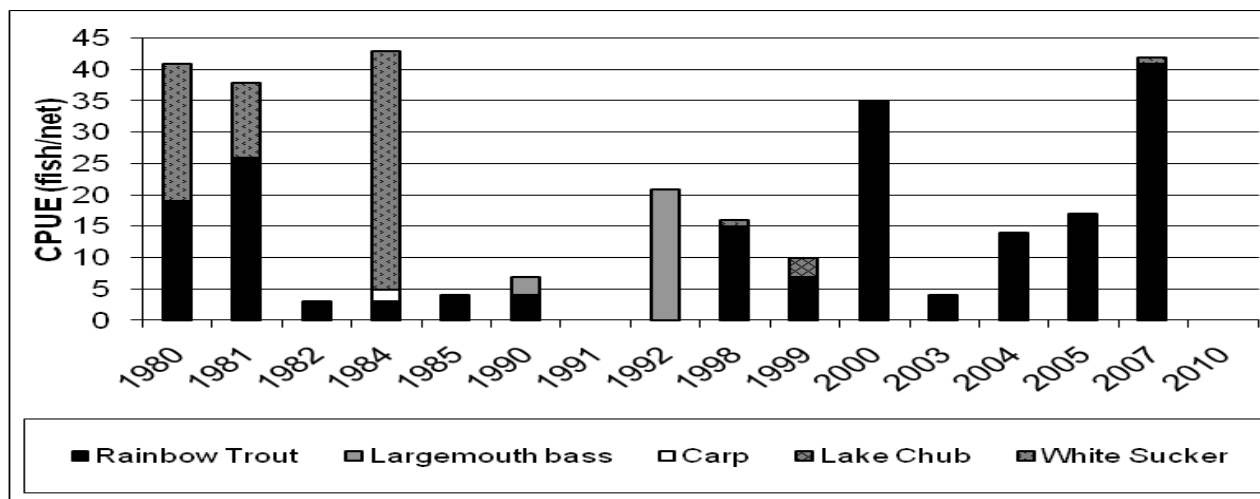


North Faber Reservoir

North Faber reservoir is a five-acre pond that has been managed as a rainbow trout fishery since 1972. This reservoir is maintained with annual plants of approximately 2,500 fingerling rainbow trout. Various other species have been found within the reservoir during annual surveys however the stocking records are not complete so it is not clear if these fish were legally or illegally introduced. However, since the partial winter kills in 1991 and 1992, rainbow trout has been the predominate species in North Faber.

In 2007, summer gill netting survey's resulted in high catch rates of rainbow trout, 41 fish/net (Figure 7). Rainbow trout collected ranged in total length from 5.7 to 15.3 inches (\bar{x} = 9.8 in.) and in weight from 0.08 to 1.24 pounds (\bar{x} = 0.49 lbs.). In August 2007, a partial summer kill was observed due to low water levels and increased temperatures. In 2010, gill and trap net surveys suggest a winterkill occurred in 2010 as no rainbow trout were captured. The trap net contained 20 fathead minnows. North Faber received 1,500 rainbow trout in May 2010 and 2011.

Figure 7. - Relative abundance of rainbow trout, largemouth bass, carp, lake chub, and white suckers in North Faber Reservoir, 1980 to 2010.



RECOMMENDATIONS

Beaver Creek Reservoir: Continue annual stocking of 50,000 catchable size Eagle Lake, Erwin and Arlee rainbow trout. Continue to monitor fishery annually with the use of seining and gillnetting at fixed stations. Continue with three fish/day fishing limits.

Bearpaw Lake: Continue annual stocking of 15,000 catchable size Arlee rainbow trout. Add additional walleye stockings to supplement the population to assist with the control of high-density white sucker population. Continue manual removal of adult suckers by trapping and/or electrofishing in the spring, and gillnetting in the fall. Continue to monitor fishery annually with the use of fall gillnetting at fixed stations.

Blaine County Ponds: Monitor ponds every two to three years to assess survival and growth of stocked fish. Attempt to establish riparian fencing around some of the ponds to prevent over grazing of shoreline vegetation to improve the fisheries. Also, start a more aggressive public education program alerting the public to the problems associated with the use of live bait.

Phillips County Ponds: Monitor ponds every two to three years to assess survival and growth of stocked fish. Attempt to establish riparian fencing around some of the ponds to prevent over grazing of shoreline vegetation to improve the fisheries. Look into establishing alternative forage/sport fishing opportunities in ponds containing only largemouth bass with the introduction of bluegill and black crappie.

Waters Codes:

154515	Anderson Reservoir
154770	Beaver Creek Reservoir
154560	Bearpaw Lake
154719	Brookie Pond
154745	Choteau Reservoir
155140	Faber Reservoir
153880	Grasshopper Reservoir
155880	H.C. Kuhr Reservoir
156535	North Faber Reservoir

Key Words or Fish Species:

Arlee; Eagle Lake; Erwin; rainbow trout, Yellowstone cutthroat trout; brown trout; brook trout; mottled sculpin; longnose dace; mountain sucker; fathead minnow; lake chub; white sucker; white sucker control; smallmouth bass; walleye; northern pike; largemouth bass; yellow perch;

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Prepared by: Cody J. Nagel
Date: May 9, 2012

