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, 2010 THROUGH JUNE 30, 2011

ABSTRACT

The coldwater fisheries in Hill, Blaine, and Phillips counties have been impacted in various locations by drought over the past ten years, however the installation of windmill aeration systems and years with increased winter snowfall and summer rains are allowing these populations to recover.

Rainbow trout growth and survival in Beaver Creek Reservoir has been good in the past few years. Rainbow and brook trout fisheries in Bearpaw Lake have responded well to control efforts of white suckers. Fishing pressure has increased in response in increased size of trout within Bearpaw 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 2010 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: (26) 310 and (15) 124 projects were reviewed along with one sub-division and one waste water review with state and local agencies; attended three walleye unlimited meetings and helped with three 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 ¾", 1", 1 ¼", 1 ½", 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 ¼ inch square mesh beach seine. The fish were sorted by species and counted.

Extremely high reservoir levels limited our seining success in 2010 (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.

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), northern pike (NP), walleye (WE), and other fishes captured by beach seining in Beaver Creek Reservoir, 1986 to 2010.

Date	Sites	YP (yoy)	YP (adult)	WSU	SP SH	IOWA	FH MN	LMB	SMB (yoy)	SMB (adult)	NP (yoy)	NP (adult)	WE (yoy)	WE (adult)	Other Sp.[1]
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

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

Population Status of Adult Fishes

Adult fish populations were monitored at six fixed experimental gillnetting stations, which were established in 1986. Gillnetting was conducted over night utilizing three sinking and three floating experimental gill nets (6 net-days). The sinking and floating experimental gill nets were 125 feet in length and 6 feet deep consisting 25-foot panels of ¾", 1", 1 ¼", 1 ½", 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 target levels of 10 fish/net in 2005 and 2006 however they increased to 9 fish/net in 2006 (Table 2). In 2003 and 2004, the abundance of rainbow trout was above the target however, during these years 84,443 and 61,459 Arlee and Eagle Lake rainbow trout were stocked, respectively. In 2005, 41,416 rainbow trout were stocked which may account for the decreased abundance (CPUE=5.5 fish/net) of rainbow trout. 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. Rainbow trout catch rates fell below target levels in 2009 and 2010 (Table 2). The affects of high yellow perch and northern pike densities could be the primary contributing factor limiting rainbow trout catch rates. This is similar to observations made in 2005/2006, both yellow perch and northern pike densities will be monitored very closely in future years.

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, 1974-2010.

			Rainbow Trout			Yellow Perch			Northern Pike			Smallmouth bass			Walleye		
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
Sep-74	1974	3	24.00	10.91	111.26	--	--	--	--	--	--	--	--	--	--	--	--
Nov-77	1977	3	35.00	10.05	86.31	--	--	--	--	--	--	--	--	--	--	--	--
Sep-80	1980	3	23.33	10.12	81.04	--	--	--	--	--	--	--	--	--	--	--	--
Sep-81	1981	3	7.33	10.88	82.77	--	--	--	--	--	--	--	--	--	--	--	--
Oct-82	1982	3	8.33	11.78	99.67	--	--	--	2.33	15.79	109.67	--	--	--	--	--	--
Oct-83	1983	3	3.33	11.79	94.66	--	--	--	3.67	25.10	117.07	--	--	--	--	--	--
Sep-84	1984	3	3.00	11.26	95.43	--	--	--	3.67	26.64	111.21	--	--	--	--	--	--
Sep-86	1986	6	15.00	11.50	98.90	--	--	--	4.17	16.68	109.86	--	--	--	--	--	--
Sep-87	1987	6	11.33	13.61	92.06	0.33	6.30	--	5.17	22.43	91.71	--	--	--	0.00	--	--
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
Sep-89	1989	6	10.67	13.15	93.45	9.17	7.59	96.04	1.17	30.31	94.56	--	--	--	0.00	--	--
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

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 stocks of 15,000 catchable size Arlee rainbow trout. Stocking of cutthroats was discontinued in 2010 due to poor growth rates and condition of these fish in Bearpaw 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. In addition, since chemical rehabilitation of Bearpaw Lake was 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 ¾", 1", 1 ¼", 1 ½", 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). 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. Rainbow trout are currently stocked in Bearpaw Lake at a rate of 15,000 catchables per year. In 2004, stocking rates were significantly increased due the need reduce the number of fish at the Big Springs Fish Hatchery for cleanup of PCB contamination. As a result, 12,550 catchables and 5,115 fingerling rainbow trout and 75,883 fingerling Yellowstone cutthroat trout were stocked.

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 2010 catch rates of rainbow trout remain at normal levels (14.33 fish/net) and catch rates of Yellowstone cutthroat trout were reduced to zero..

Rainbow trout and Yellowstone cutthroat 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), the average length of trout has increased from lengths recorded in the late 1990s (Figure 1; Table 3).

White Sucker

The white sucker population has been significantly reduced since control efforts were initiated in 1984 (Figure 1; Table 3). 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 and in 1992 and 1995 smallmouth bass and walleye were introduced to help control YOY and adult white sucker populations. Since 1989, 144,913 white suckers have been removed using trap nets and gill nets (Table 4). Overall the average size of white suckers has been increasing, indicating that control efforts have helped prevent adults from spawning, and smallmouth bass have been helping control YOY populations. In 2010, spring trap netting and fall gill netting removed a total of 174 pounds of white suckers (Table 4).

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 2010, fall gillnetting surveys resulted in low catch rates of smallmouth bass when compared to historic catch rates and was probably due to the higher than normal reservoir levels during sampling (Table 3).

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 assisted with the control of white suckers and provided a new addition to this popular fishery.

Figure 1. - Comparison of white sucker catch rate during fall gill netting surveys and average length of trout (rainbow, brook, and Yellowstone cutthroat) in Bearpaw Lake (1984-2010).

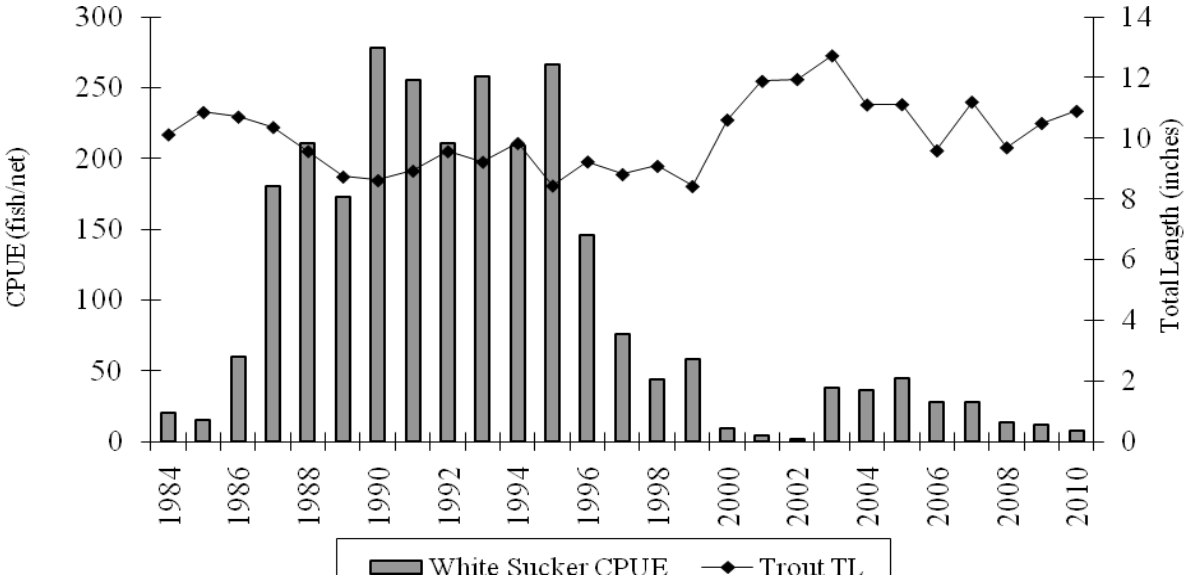


Table 3.- Summary of relative abundance (catch per unit effort (CPUE)), total length, and relative weights of fishes collected in fall gillnetting surveys in Bear Paw Lake since chemical rehabilitation in 1983.

			Rainbow Trout			Brook Trout			Yellowstone Cutthoat Trout			White Sucker			Smallmouth Bass			Walleye		
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.)	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

Table 4. - Numbers of white suckers removed from Bearpaw Lake by trap netting and fall gill netting, 1989-2010.

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
Totals	138,441	6,599	144,913	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. 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.

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. When water levels improve brooke trout will be stocked immediately.

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 2010. Choteau Reservoir experienced a partial winterkill in 2010 as water levels were very low (max depth 7ft.) and aquatic vegetation was abundant.

In 2010, three trap nets were set overnight to indicate the severity of winterkill. The trap nets contained black crappie (CPUE=41.3; Avg. TL=10.0 in.), fathead minnows (CPUE=173), and golden shiners (CPUE=861). Rainbow trout were stocked in May (n=1,500) to augment impacts due to winterkill.

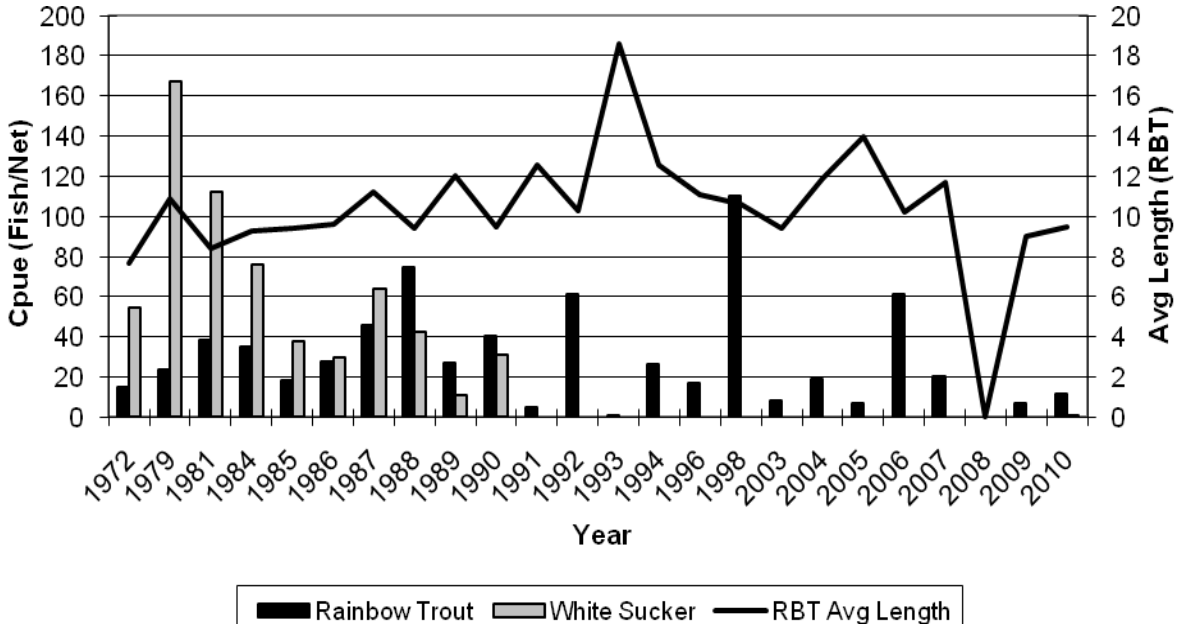
Grasshopper Reservoir

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.

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 2). 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 2. - 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.

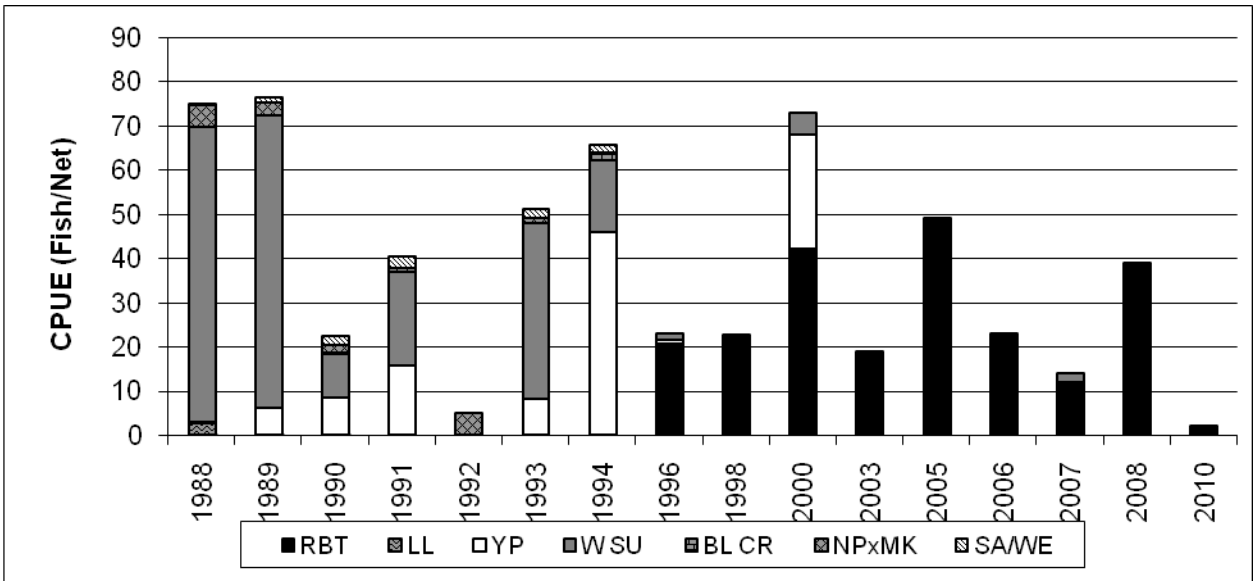
Prior to 1996, the reservoir was managed as a warm water fishery with varying densities of black crappie, yellow perch, tiger muskie, walleye, sauger, and white suckers (Figure 3). In 1996 as a result of decreased white sucker populations, the rainbow trout fishery began to increase. In 2003, drought 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 2008, heavy rainfall received in May and June filled the reservoir to full pool. One experimental gill net and one trap net were fished overnight. Rainbow trout abundance has increased (CPUE=39 fish/net) and the reservoir contains a variety of size classes with fish ranging from 5.9 to 19.5 inches ($\bar{x}$ TL=10.8 in.) and in weighing 0.10 to 3.09 pounds ($\bar{x}$ =0.82 lbs.). The trap net captured one rainbow trout (TL=20.3 in; wt.=3.44 lbs.) and 287 fathead minnows. No white suckers or tiger muskie were observed.

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.

Figure 3.- 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.

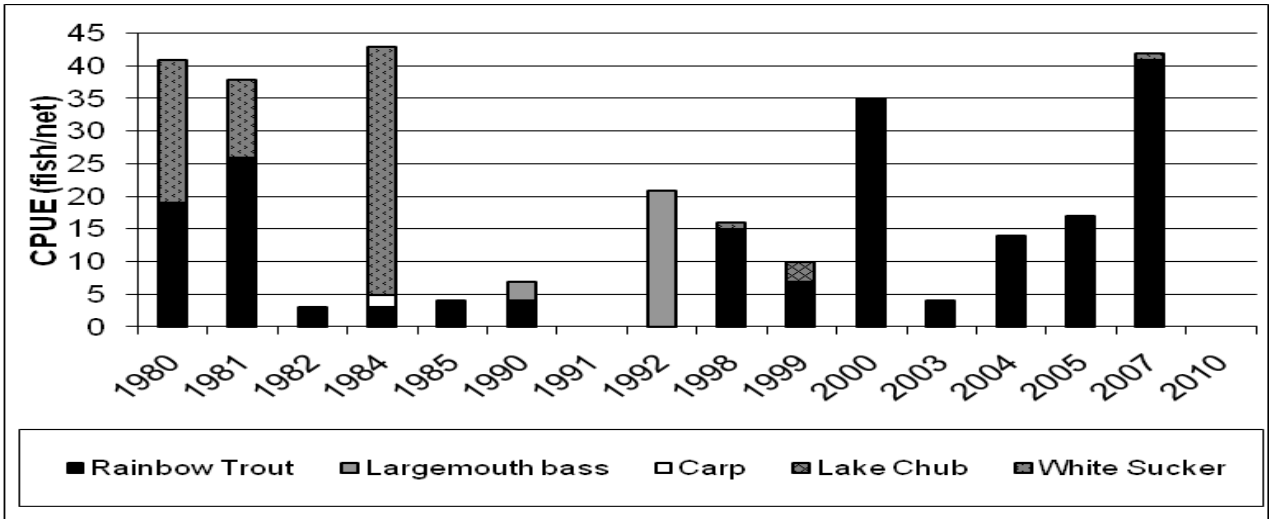


North Faber Reservoir

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 5). 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.

Figure 5. - Relative abundance of rainbow trout, largemouth bass, carp, lake chub, and white suckers in North Faber Reservoir, 1980 to 2010.



Petrie Pond

Petrie pond is a privately owned spring fed 2.5-acre pond north of Turner, which has been managed as a rainbow trout fishery since 1996. In 2003, white suckers were illegally introduced, most likely as a result of illegal bait fishing. Since that time, white suckers have over populated the reservoir and choked out the rainbow trout fishery. In 2004, bluegill and largemouth bass fishery was established in an attempt to control the white sucker population, however this was unsuccessful. As a result Petrie Pond was drained in 2006 to eliminate the white sucker population. Draining of the pond was completed in July of 2006 and the spring water was re-diverted into Petrie Pond in August.

Petrie Pond has received 1,500 brook trout since and in 2010 one gill and two trap nets were set overnight to assess the stocking impacts. The gill net contained 57 brook trout (Avg. TL=8.7; Avg. WT=0.25) and the trap nets contained 158 fathead minnows.

Phillips County Ponds

The voluntary creel boxes were maintained and gill and trap netting surveys conducted on the following ponds are reported.

Rebate Reservoir

Rebate is located in a deep coulee off of Rock Creek and is surrounded by pine trees. This reservoir has been managed as a rainbow trout fishery since 1996. The fishery was maintained from 1996 to 2001 with annual plants of 1,000 fingerling rainbow trout. In 2002, one stocking of brown trout occurred and the plants of rainbow trout were reduced to occur every three years. In 2004, an additional 1,000 rainbow trout were stocked in the fall.

In the summer 2010, water levels were excellent and the reservoir was full. Gill netting surveys indicated good survival and growth of stocked rainbow trout (CPUE= 6; $\bar{x}$ TL=16.2 in.; $\bar{x}$ WT=1.65 lbs.), The trap net contained one rainbow trout (TL=5.1; WT=.06).

Rotator Cup Reservoir

Rotator Cup is BLM pond that has been managed as a rainbow trout fishery since 1996. Since1996, the fishery has been maintained with alternate year plants of 1,000 fingerling rainbow trout. Water levels have been maintained by summer rains, and have remained good for the past five years. In 2010, the catch rate for rainbow trout was 9 fish/gill net ($\bar{x}$ TL=16.3 in.; $\bar{x}$ WT=1.70) and the trap net contained one rainbow trout (TL=15.3; WT=1.74).

Spanky Reservoir

Spanky Reservoir is a BLM pond that has been managed as a rainbow trout fishery since 1996. Since1996, the fishery has been maintained with alternate year plants of 1,000 fingerling rainbow trout.

In the summer 2010, water levels were excellent and the reservoir was full. The catch rate for rainbow trout was 3 fish/gill net ($\bar{x}$ TL=9.3 in.; $\bar{x}$ WT=0.30) and the trap net contained one rainbow trout (TL=9.8; WT=0.32).

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	156605	Petrie Pond
154719	Brookie Pond	167750	Rebate Reservoir
154745	Choteau Reservoir	167979	Rotator Cup Reservoir
153880	Grasshopper Reservoir	168354	Spanky 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;

Literature Cited

McFarland, B. 2010. 2009 Statewide Angling Pressure Use Report. Montana Fish, Wildlife & Parks, Helena, MT. Pp. 170.

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