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

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

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

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

PROJECT PERIOD: JULY 1, 2008 THROUGH JUNE 30, 2009

ABSTRACT

The coldwater fisheries in Hill, Blaine, and Phillips counties have been impacted by drought over the past eight years, however the installation of windmill aeration systems and years with increased summer rains are allowing these populations to recover. However the summer of 2006 & 2007 was exceptionally dry and the effects of decreased water levels especially in Hill and Blaine Counties resulted in partial summer fish kills at Sentinel, Current, Nelson, Faber, North Faber, Beaver Creek, and Floyd Flynn Reservoirs. In 2008, winterkill of rainbow trout occurred at Anderson and Grasshopper, both reservoirs experienced entire fish loss.

Rainbow trout growth and survival in Beaver Creek Reservoir has been good in the past few years. Rainbow and Yellowstone cutthroat 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 H.C. Kuhr, Brookie, and Faber Reservoir remains good. Ponds in Hill, Blaine, and Phillips, counties were monitored in 2008 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. To provide landowners and other private parties with technical advice and information to sustain and enhance fisheries resources. Objective accomplished: five310 projects were reviewed and four 124 projects were reviewed with state and local agencies; advised the town of Big Sandy on environmental impacts of proposed community development project. Commented on oil and gas development in Hill, Blaine, and Phillips Counties; six meeting, school programs, and fishing events were attended with schools 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 2005/2006 indicated it was the fifth most fished reservoir in Region Six (McFarland 2006).

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.

Seining results in 2008 indicated that forage fish and northern pike densities decreased (Table 1). However northern pike had a very successful spawn in 2005 and 2006. The effects of increased pike populations will be monitored and stocking rate adjustments will be made if necessary.

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, 1980 to 2008.

Date	Sites	YP	W SU	SP SH	IOWA	FH MN	LMB	SMB	NP	WE	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

[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.

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, 1974-2008.

		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	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

Bearpaw Lake

Bearpaw Lake is a very popular 45 surface-acre reservoir located on Beaver Creek in the Bearpaw Mountains and is currently ranked number four in Region 6 for fishing pressure (2005/2006; McFarland 2006). 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 and 5,000 catchable McBride Yellowstone cutthroat trout. In 2008 Bearpaw Lake received 8,000 catchable size Goose Lake Yellowstone cutthroat trout. Stocking of cutthroats will be discontinued in the future 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. In 2006 & 2007, a supplemental plant of 5,000 advanced fingerlings was conducted 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.

Water levels within Bearpaw Lake have been relatively stable over the past few years, however in 2006, drought caused water levels to be reduced. In 2007 and 2008 water levels returned to normal and no adverse effects on the fishery were observed from the reduced water levels in 2006.

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. Yellowstone cutthroat trout are stocked annually at a rate of 5,000 catchable. 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 catchable 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 2005 and 2006, catch rates (Table 3) were significantly increased which is most likely due to the increased stocking density in 2004 and continued control efforts on white suckers. In 2007 catch rates of rainbow trout returned to normal levels (13.33 fish/net) and catch rates of Yellowstone cutthroat trout increased significantly to 2.33 fish/net. Catch rates for rainbow and Yellowstone cutthroat trout returned to very high levels again in 2008 (30.33 fish/net; 7.67 fish/net). However, the condition of these fish remains a concern and will be continually monitored.

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). Since 2004, average length of trout has decreased slightly, however this is most likely as a result of increased stocking of rainbow and Yellowstone cutthroat trout in 2004.

White Sucker

The white sucker population has been significantly reduced since control efforts were initiated in 1983 (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, 144,701 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 2008, spring trap netting and fall gill netting removed a total of 710 pounds of white suckers.

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 2008, fall gillnetting surveys resulted in lower catch rates of smallmouth bass when compared to 2006 and 2007 catch rates, however average total length and relative weights have increased (Table 3). Bass collected ranged in length from 5.5 to 15 in. and weighted 0.03 to 1.45 lbs (Table 3). Also the abundance of crayfish has been significantly decreased with the increasing numbers of smallmouth bass.

Walleye

Walleye were illegally introduced within Bearpaw Lake in the early 1990s. They were first documented within the lake in 1992. From 1992 to 1997, walleye fry and fingerlings were stocked to help control adult white sucker populations. In 2006 and 2007, 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 (1979-2008).

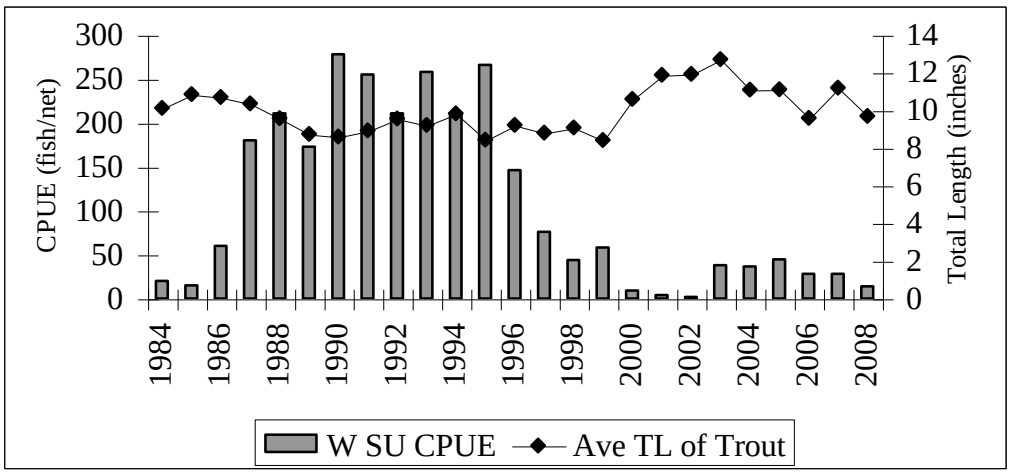


Table 3.- Summary of relative abundance (catch per unit effort (CPUE)), total length, and relative weights of fishes collected in fall gillnetting surveys in Bear Paw Lake since chemical rehabilitation in 1983.

		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	2	0.00	--	--	0.00	--	--	15.50	10.13	86.34	13.50	8.00	--	--	--	--	--	--	--
Sep-85	3	1.33	12.03	97.49	1.00	9.05	109.72	27.33	11.50	86.83	6.33	--	--	--	--	--	--	--	--
Sep-86	3	0.00	--	--	3.33	10.41	106.78	16.67	11.01	86.45	94.33	6.40	--	--	--	--	--	--	--
Sep-87	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	3	13.33	11.11	--	0.00	--	--	0.00	--	--	36.67	12.60	--	0.33	14.50	--	0.67	20.45	--
Sep-05	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	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	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	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

Table 4. - Numbers of white suckers removed from Bearpaw Lake by trap netting and fall gill netting, 1989-2008.

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	710.36
Totals	138,162	6,539	144,701	65,678

Blaine County Ponds

Ponds throughout Blaine County were either 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.

Since their initial introduction, rainbow trout have exhibited excellent growth and survival in Anderson reservoir. In 2003, rainbow trout (CPUE=30 fish/net) had an average length of 10.41 inches (TL=9.66 to 11.22 in.) and an average weight of 0.58 pounds (weight=0.47 to 0.73 lbs.). In 2005, rainbow trout (CPUE=10 fish/net) had an average length of 14.54 inches (TL=7.7 to 20.0 in.) and an average weight of 1.88 pounds (weight=0.20 to 3.55 lbs.). Only one creel card was returned for Anderson reservoir. This angler was from Hill County and had a catch rate of 0.5 fish/hour and had a high satisfaction rate with the size of fish caught.

In 2008, one sinking gill net and one trap net were fished overnight. No fish were captured in the gill net, however, 1,258 fathead minnows were observed in the trap net. Very low water levels combined

with no rainbow trout captured in our gear, suggests this reservoir experienced a winterkill in 2007/2008. Arlee rainbow trout were stocked in the spring of 2008 and water levels have increased significantly from those observed in early May 2008.

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. 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 2007, one gill net was set overnight and a total of six brook trout were collected ranging in length from 14.3 to 16.4 inches ($\bar{x}$ =14.9 inches) and in weight from 1.82 to 2.47 pounds ($\bar{x}$ =2.09 pounds). 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). Anglers are noting the quality-sized fish within this reservoir and it's becoming a local favorite among many.

Choteau Reservoir

Choteau Reservoir is located in north central Blaine County and contains a rainbow trout and black crappie fishery. Black crappie were originally introduced in 2002. In 2003, 1,500 4-inch rainbow trout were stocked, an additional 6,000 4 inch rainbow trout were stocked in 2004, and 3,000 in 2005. The reservoir is currently maintained with annual plants of 3,000 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 2008. In 2005, five creel cards were filled out and no fish were caught. In 2006, three creel cards were filled out and again no fish were caught. In 2007, nine creel cards were filled out and anglers reported catch rates of rainbow trout as 0.715 fish/hour. In 2008, anglers reported spring catch rates of rainbow trout at 0.11 fish/hour (n=23) and summer catch rates of rainbow trout at 0.18 fish/hour (n=7). Anglers expressed great satisfaction in the size of the fish caught.

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 alternate year plants of 3,000 advanced fingerling Eagle Lake rainbow trout. Additionally, Grasshopper ranked 23rd in the region for angler pressure in 2005/2006 (McFarland 2006).

A winterkill occurred in 2002/2003, recent drought and increased irrigation has resulted in marginal over winter water levels. The reservoir was restocked with 5,600 four-inch rainbow trout in the summer and fall of 2003, and they exhibited excellent growth reaching 8.6 to 10.7 inches by the fall. In the spring of 2004, 2,000 four-inch rainbow trout were stocked into the reservoir. During the summer of 2004, a sinking experimental gill net fished for 14 hours, captured 19 rainbow trout (Figure 2; 1.36 fish/hour) ranging in length from 8 to 18 inches ($\bar{x}$ TL = 11.9in, $\bar{x}$ wt. = 0.8 lbs.) with an average relative weight of 112.4.

In 2005, water levels were a few feet low but stable. A voluntary creel box was installed, and a sinking experimental gill net was fished overnight to determine the relative abundance of rainbow trout. In 2005, anglers reported summer catch rates of rainbow trout of 0.49 fish/hour (n=21) and fall catch rates of 0.2 fish/hour (n=5) with an occasional catch of 4 and 5-pound trout.

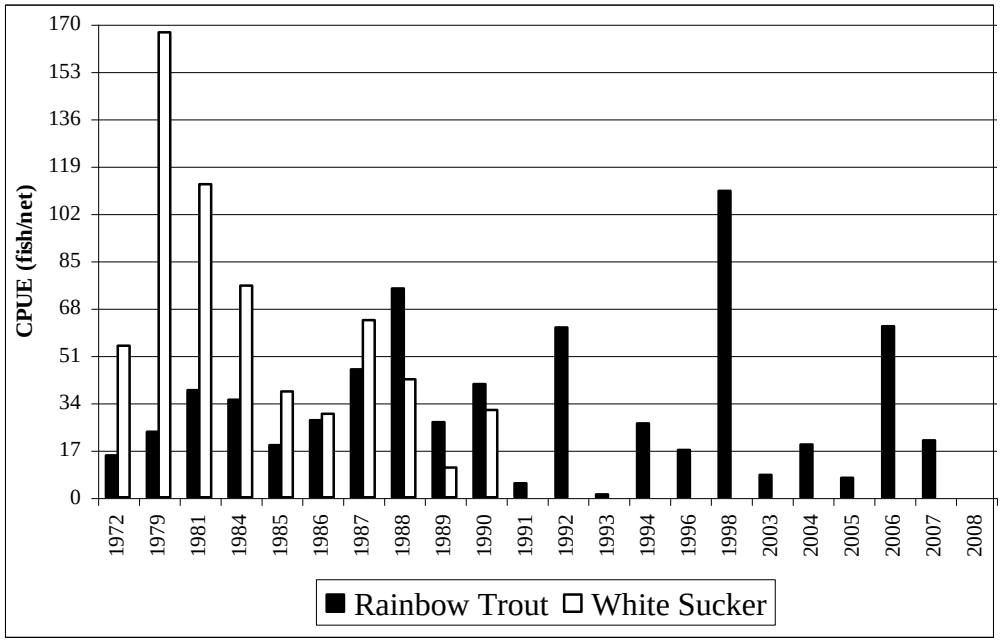
In 2006, water levels were still well below full pool and the effects of decreased water levels on the fishery will have to be monitored. The volunteer creel survey box was continued in 2006 and two sinking experimental gill nets were fished overnight to determine the relative abundance of rainbow trout.

In 2006, anglers who filled out creel cards reported winter catch rates of rainbow trout as 0.62 fish/hour (n=13), spring catch rates of 0.96 fish/hour (n=9), and summer catch rates of 1.57 fish/hour (n=13). Anglers had a high satisfaction rate based on the size and number of fish caught. Additionally, gill net surveys indicate that the rainbow trout fishery has rebounded nicely from the winterkill in 2002/2003. Gill netting surveys resulted in a catch rate of 61.5 rainbow trout/net (Figure 2). On average rainbow trout collected were 10.19 inches in length (TL= 5.0 to 22.0 in.) and weighed 0.74 pounds (weight= 0.02 to 4.20 lbs.).

In 2007, anglers who filled out creel cards reported spring catch rates of rainbow trout as 0.93 fish/hour (n=2) and summer catch rates of 1.16 fish/hour (n=6). Anglers again had a high satisfaction rate based on the size and number of fish caught. Gill netting surveys resulted in a decreased catch rate due the return to normal stocking levels (CPUE= 20.5 rainbow trout/net; Figure 2). On average rainbow trout collected were 12.0 inches in length (TL= 5.9 to 24.7 in.) and weighed 1.01 pounds (weight= 0.01 to 4.90 lbs.).

Grasshopper experienced another 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.

Figure 2. - Relative abundance of rainbow trout and white suckers in Grasshopper reservoir based on gill netting surveys from 1972 to 2008.



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. Additionally, in 2005/2006 H.C. Kuhr ranked 24th in the region for angler pressure with a total of 1,139 angler days (McFarland 2006).

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.

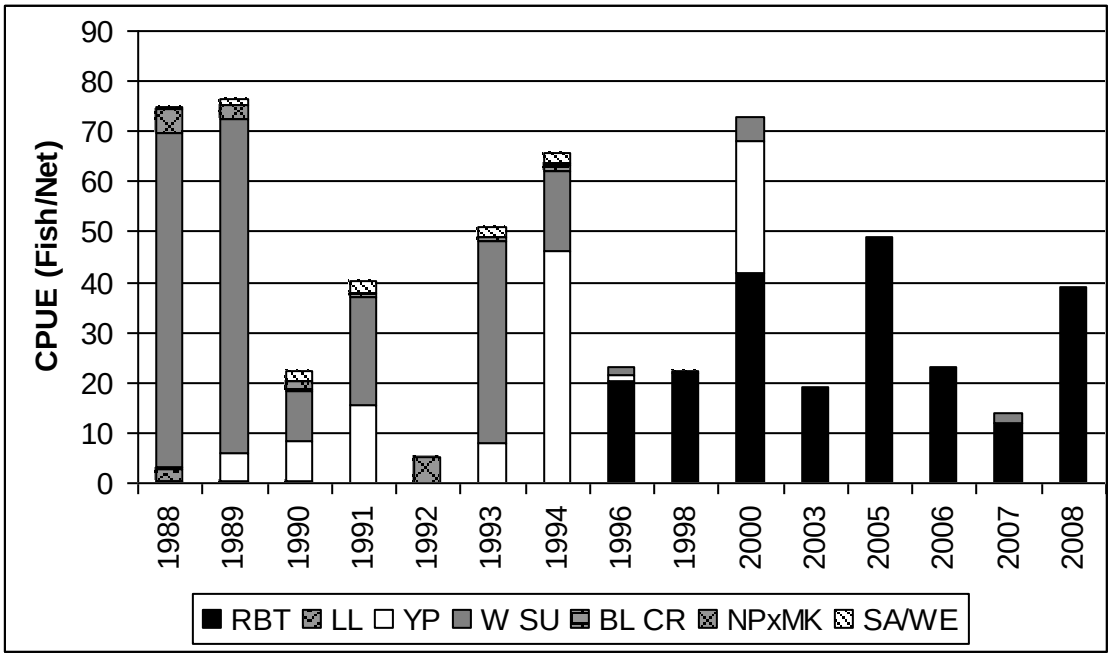
Since the restoration in 2003, the fishery has been monitored using summer gill netting surveys. In addition, a voluntary creel box was erected in 2005 to assess fishing pressure and angler success rates. In the fall of 2003, a gill netting survey captured trout ranging from 6.8 to 10.6 inches (CPUE=19 fish/net). The fish were in excellent shape and no white suckers or yellow perch were netted, indicating a successful rehabilitation. In 2005, the abundance of rainbow trout had increased (CPUE= 49 fish/net) and the fish ranged in size from 7.43 to 21.5 inches ($\bar{x}$ =10.56 in.) and in weight from 0.19 to 4.82 pounds ($\bar{x}$ =0.95 lbs.). In 2005, anglers from Hill, Blaine, and Flathead counties reported summer and fall catch rates of 0.292 rainbow trout RBT/hour (n=11) and ice fishing catch rates of 1.2 RBT/hour (n=1).

In 2006, the overall abundance decreased (CPUE = 23 fish/net) however the average size of fish increased. Fish collected ranged in total length from 6.0 to 17.25 inches ($\bar{x}$ =14.02 in.) and in weight from 0.15 to 2.6 pounds ($\bar{x}$ =1.75 lbs.). The decreased abundance may be the result of increased fishing pressure after the restoration in 2003. Additionally, fall water levels were very low due to high temperatures and lack of rain during the summer. In 2006, anglers from Hill and Blaine counties reported spring catch rates of 0.571 RBT/hour (n=14) and summer catch rates of 2.06 fish/hr (n=6). In addition, angler satisfaction was high with numerous comments about the size of fish caught.

In 2007, white suckers (n=2) were again found within this reservoir and as a result 15 tiger musky ($\bar{x}$ TL=14.6 in.) were collected from Cow Creek and Cow Creek Reservoir and transferred to H.C. Kuhr Reservoir. Rainbow trout abundance decreased again in 2007 to 12 fish/net. The decreased abundance is most likely the result of decreased water levels in 2006. No summer kills were reported in 2007. Rainbow trout collected ranged in total length from 5.1 to 19.8 inches ($\bar{x}$ TL=13.6 in.) and in weight from 0.10 to 3.38 pounds ($\bar{x}$ =1.59 lbs.).

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.

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 2008. Rehabilitation of this reservoir and restocking of rainbow trout occurred in 2003.



Jensen Reservoir

Jensen pond is a privately-owned pond, which has been open to public fishing since 2003. A windmill aeration system was installed to assist with over winter survival and the reservoir is maintained with annual plants of 1,000 fingerling Arlee rainbow trout. In 2008, the voluntary-creel survey box was maintained.

In 2005, anglers expressed high satisfaction rates with their fishing experience, primarily due to the size of fish caught. Anglers reported summer catch rate of rainbow trout as 0.35 fish/hour (n=11) and fall catch rates of 0.37 fish/hour (n=16) with frequent catches of one to six pound trout. However, in 2006 anglers did not report catching any fish during the spring and summer (n=6). In 2007, anglers reported good catch rates of rainbow trout and high satisfaction with the size of fish caught. Anglers reported spring catch rates of 2.90 fish/hour (n=3), summer catch rates of 0.78 fish/hour (n=6) and fall catch rates of rainbow trout at 1.11 fish/hour (n=6). In 2008, one angler reported catching three rainbow trout but did not specify the number of hours fished.

Salmo Reservoir

Salmo reservoir is a four-acre pond with a windmill aerator located on BLM land north of Chinook. This pond has been managed primarily as a rainbow trout fishery since 1978. Salmo currently has a rainbow trout, channel catfish, largemouth bass, and bluegill. In addition, 272 tiger muskie were stocked in 1999. The rainbow trout fishery is maintained with annual plants of approximately 3,000 three-inch fingerlings. In 2004, 4,000 seven-inch and 3,000 three-inch rainbow trout were stocked due to needed repairs at the Giant Springs Fish Hatchery in Lewistown. Four hundred four-inch channel catfish were stocked in 2003. In 2008, Salmo received 1,000 eight-inch rainbow trout due to low water levels.

Salmo Reservoir received 345 angler days in 2005 and ranked 28th in the region. In 2005 and 2006, angler response rates were low for the voluntary creel. In 2005, five anglers participated, and none reported catching any fish. In 2006, anglers reported spring catch rates of rainbow trout as 0.24 fish/hour

(n=11) and summer catch rates of 0.67 fish/hour (n=3). In 2007, anglers reported spring catch rates of rainbow trout as 1.67 fish/hour and bluegill as 0.08 fish/hour (n=3) and summer catch rates of rainbow trout at 3.00 fish/hour and bluegill at 0.99 fish/hour (n=7). In 2008, one angler participated and reported no fish.

In 2008, two trap nets fished overnight captured two rainbow trout (CPUE=1 fish/net; $\bar{x}$ TL=8.8 in.; $\bar{x}$ WT=0.26 lbs.), 64 bluegill (CPUE=32 fish/net; $\bar{x}$ TL=5.6 in.; $\bar{x}$ WT=0.23 lbs.), 74 golden shiner (CPUE=37 fish/net), and 640 fathead minnows (CPUE=320 fish/net). No gillnets were used due to low water levels and recent stocking of rainbow trout.

Phillips County Ponds

The voluntary creel boxes were maintained, and gillnetting surveys conducted on the following ponds are reported.

Current Reservoir

Current Reservoir is a 10-acre pond located on BLM land in south Phillips County. This reservoir has been popular since the 1970s because of its ability to produce quality trout. Water levels have been good with the reservoir spilling in 2004 and 2005. In addition to fishing pressure, this reservoir also receives a fair amount of grazing pressure, which has been blamed in recent years for a reduction in the aquatic vegetation and the quality of the reservoir.

This reservoir has only been monitored periodically since the 1970s, however the relative abundance and size of fish present has been consistent. In 1982, the catch rate of rainbow trout was 14 fish/net and the average length was 13.71 inches (TL=9.37 to 19.2 in.). In 1999, the catch rate of rainbow trout was 58 fish/net, and the average length of rainbow trout was 14.36 inches (TL=7.0 to 20.0 inches). In 2005, the catch rate of rainbow trout was 11 fish/net, with an average length of 15.81 inches (TL=14.27 to 19.6 in.).

In 2008, relative abundance of rainbow trout declined to 8 fish/net, with an average length of 6.33 inches (TL=5.5 to 7.4 in.). One trap net was also set overnight and contained two rainbow trout, 30 sand shiners, nine brook stickleback, and 1,142 fathead minnows.

Thundercloud Reservoir

Thundercloud is located on BLM land and contains largemouth bass and rainbow trout. Largemouth bass were stocked through 1985 and rainbow trout have been stocked since 2003. The rainbow trout fishery is maintained with annual plants of 800 fingerling rainbow trout. Water levels have been good in recent years and a windmill aeration system was installed in 2001. A partial winterkill consisting of rainbow trout and largemouth bass was reported in the spring of 2004. In 2005, gill netting surveys revealed good survival of stocked rainbow trout and no largemouth bass were collected. In 2005, a voluntary creel box was also erected and anglers from Gallatin, Blaine, and Sweet Grass Counties reported summer and fall catch rates of rainbow trout as 0.45 fish/hour (n=4) and catch rates of largemouth bass as 2.0 fish/hour (n=4). In 2006, the box was destroyed by cows and not replaced.

In 2008, one gill net and one trap net were fished overnight. No largemouth bass were captured or observed in the reservoir, however the rainbow trout population remains good. The gill net captured four rainbow trout (CPUE=4 fish/net; $\bar{x}$ TL=9.9 in.; $\bar{x}$ WT=0.33 lbs.) and the trap net captured six rainbow trout (CPUE=6 fish/net; $\bar{x}$ TL=8.2 in.; $\bar{x}$ WT=0.23 lbs.).

Wrangler Reservoir

Wrangler reservoir is located on BLM land and has been managed as a rainbow trout fishery since 1980 and for channel catfish since 2001. The fishery is currently maintained with annual plants of 1,500 fingerling rainbow trout and alternate year plants of 500 four-inch channel catfish. Water levels have been good in recent years and a windmill aeration system was installed in 2000 in an effort to increase over winter survival. In 2004, several dead rainbow trout were reported along the shore after ice-off. In 2005, a voluntary creel box was erected and in the fall of 2005 anglers from Gallatin County reported catch rates of rainbow trout at 0.27 fish per hour (n=5) with no catches of channel catfish. In 2006, the box was destroyed by cows and not replaced.

In 2008, one gill net sampled 3 rainbow trout (CPUE=3 fish/net; $\bar{x}$ TL=13.4 in.; $\bar{x}$ WT=1.04 lbs.) and 12 channel catfish (CPUE=12 fish/net; $\bar{x}$ TL=12.7 in.; $\bar{x}$ WT=0.83 lbs.). One trap net was also set and captured 4 rainbow trout (CPUE=4 fish/net; $\bar{x}$ TL=7.8 in.; $\bar{x}$ WT=0.28 lbs.).

RECOMMENDATIONS

Beaver Creek Reservoir: Continue annual stocking of 70,000 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: Discontinue annual stockings of 8,000 catchable- size McBride strain Yellowstone cutthroat. 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.

Grasshopper Reservoir: Continue with annual plants of 2,500 Arlee fingerlings and alternate- year plants of 3, 00 fingerling Eagle Lake rainbow trout. Continue to monitor fishery annually with the use of fall gillnetting and established two fixed monitoring stations.

H.C. Kuhr Reservoir: Continue with annual plants of 3,000 fingerling Arlee rainbow trout. Continue to monitor the survival and growth of rainbow trout annually at the fixed gill-net site established in 2005. Continue to monitor the white sucker population.

Blaine County Ponds: Continue with stocking rates as described above. 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	158880	(H.C.) Kuhr Reservoir
154560	Bearpaw Lake	155780	Jensen Pond
154719	Brookie Pond	159175	Salmo Reservoir
154745	Choteau Reservoir	168490	Thundercloud Reservoir
164870	Current Reservoir	168990	Wrangler Reservoir
153880	Grasshopper 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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