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, 2013 THROUGH JUNE 30, 2014

ABSTRACT

The coldwater fisheries in Hill, Blaine, and Phillips Counties continue to exhibit excellent growth of hatchery stocked rainbow and brook trout following the historic spring run-off in 2011 that re-filled many ponds and reservoirs that were previously chronically dewatered. Excellent water conditions have remained throughout the area and many water bodies have remained full and stable.

Rainbow trout growth and survival in Beaver Creek Reservoir has been good the past few years. However, a substantial rain event occurred in May 2013 and flushing loss of rainbow trout was evident based on fall gill net surveys. Rainbow and brook trout fisheries in Bearpaw Lake have responded favorably to control efforts of white suckers and fishing pressure has increased in response to the increased size of trout within Bearpaw Lake. Growth and condition of rainbow trout in Plutz, Dry Fork, and Current Reservoirs remains good. Anglers reported black spot in a number of rainbow trout caught at H.C.Kuhr and bacterial infections were seen on a few rainbow trout caught at Faber Reservoir, this occurred in 2012 as well. Ponds in Hill, Blaine, and Phillips Counties were monitored in 2013 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 has 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: (17) 310 and (27) 124 projects were reviewed along with one waste water review with local agencies; attended seven 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 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 with 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 for a variety of species. The statewide fishing pressure survey for 2011/2012 indicated it received 1,936 angler days (MTFWP Fisheries Bureau 2012). The significant drop in pressure is likely due to extreme flooding events, reservoir draw-down to repair outlet structures on the dam, and flushing loss of multiple species.

This reservoir was established as a rainbow trout fishery in 1975. However, the illegal introduction of northern pike (1980s) and yellow perch (1980s) created a variable rainbow trout fishery. As a result, the fisheries management plan was expanded to include other warm water species, which were legally introduced to control undesirable species and enhance the fishing opportunity within the reservoir. Currently this reservoir receives annual plants of 50,000 catchable size Eagle Lake, Erwin and Arlee rainbow trout as well as 10,000 fingerling and 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 in an effort to maintain trout densities under increased fishing pressure.

Population Status of Adult Fishes

Water levels in September were down approximately 3 feet however, during our sampling effort an intense algal bloom was present due to warm air temperatures. Gill netting was conducted overnight with three sinking and three floating experimental gill nets. 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 weighed to the nearest 0.01 pound (lb). Prior to 1986, adult fish populations were monitored, however sampling was neither uniform, nor consistent enough to develop useful trend data on game fish population size or composition. As a result this data was excluded from analysis and is only included within the tables for reference to the illegal introduction of northern pike and yellow perch.

Rainbow Trout

In 2003 and 2004, 84,443 and 61,459 Arlee and Eagle Lake rainbow trout were stocked and the relative abundance of rainbow trout rose above 12 trout/net, respectively (Table 1 and Table 2). Rainbow trout relative abundance fell below 6 trout/net in 2005 and 2006, however they increased to 9 fish/net in 2007 (Table 1). In 2005, 41,416 rainbow trout were stocked which may account for the decreased relative abundance (CPUE=5.5 fish/net; Table 2). In addition, yellow perch populations were at their highest levels since 2001/2002 and northern pike densities were increasing. Decreased stocking levels in 2005 due to PCB cleanup at Big Springs Fish hatchery, combined with increased

competition and predation were likely causes for the decreased abundance of rainbow trout in 2005/2006.

In 2006, stocking rates of rainbow trout returned to normal (70,000 RBT / year) and relative abundance increased to target levels (10 trout/net) in 2007 and 2008 (Table 1 and Table 2). Rainbow trout relative abundance fell below target levels again in 2009, 2010, and 2011 (Table 1). In 2012, rainbow trout relative abundance increased to its highest level in eight years (12.33 fish/net) but fell significantly in 2013 (5.33 fish/net; Table 1).

There are a number of variables influencing rainbow trout densities in Beaver Creek Reservoir: high spring flow's increasing flushing loss of fish, and reduced rainbow trout plants have cut the original stocking plan by 30%.

Table 1. 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, 1974-2013.

			Rainbow Trout			Yellow Perch			Northern Pike			Smallmouth bass			Walleye			Longnose sucker		White sucker	
Date		Nets	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	Rel Wt	CPUE (fish/net)	Ave TL (in.)	CPUE (fish/net)	Ave TL (in.)
Sep-74	1974	3	24.00	10.91	111.26	--	--	--	--	--	--	--	--	--	--	--	--	7.33	10.49	82.33	10.23
Nov-77	1977	3	35.00	10.05	86.31	--	--	--	--	--	--	--	--	--	--	--	--	2.33	9.66	113.00	9.75
Sep-80	1980	3	23.33	10.12	81.04	--	--	--	--	--	--	--	--	--	--	--	--	1.33	6.33	156.00	8.86
Sep-81	1981	3	7.33	10.88	82.77	--	--	--	--	--	--	--	--	--	--	--	--	6.67	8.78	165.33	8.70
Oct-82	1982	3	8.33	11.78	99.67	--	--	--	2.33	15.79	109.67	--	--	--	--	--	--	3.33	9.66	109.67	9.69
Oct-83	1983	3	3.33	11.79	94.66	--	--	--	3.67	25.10	117.07	--	--	--	--	--	--	1.33	--	98.33	--
Sep-84	1984	3	3.00	11.26	95.43	--	--	--	3.67	26.64	111.21	--	--	--	--	--	--	0.67	11.00	58.33	10.50
Sep-86	1986	6	15.00	11.50	98.90	--	--	--	4.17	16.68	109.86	--	--	--	--	--	--	0.00	--	42.00	--
Sep-87	1987	6	11.33	13.61	92.06	0.33	6.30	--	5.17	22.43	91.71	--	--	--	0.00	--	--	0.00	--	18.00	--
Sep-88	1988	6	9.67	14.74	90.40	8.17	5.93	105.50	3.00	27.55	123.61	--	--	--	0.67	10.58	86.48	4.00	--	14.00	--
Sep-89	1989	6	10.67	13.15	93.45	9.17	7.59	96.04	1.17	30.31	94.56	--	--	--	0.00	--	--	2.50	--	14.33	4.13
Sep-90	1990	6	18.50	11.96	88.66	4.00	8.51	95.13	0.67	20.95	100.49	--	--	--	2.67	13.69	81.72	9.17	8.04	9.67	14.12
Sep-91	1991	6	15.50	12.78	93.26	12.00	7.39	103.98	2.33	16.57	95.37	--	--	--	5.67	13.98	90.24	2.83	--	8.17	--
Sep-92	1992	6	13.67	13.74	93.42	6.00	6.37	91.54	3.33	25.64	113.39	--	--	--	2.33	17.84	94.80	1.33	--	7.67	--
Sep-93	1993	6	3.17	16.43	94.48	12.33	7.20	109.06	2.00	27.49	100.01	--	--	--	3.33	16.75	95.36	0.00	--	8.67	--
Sep-94	1994	6	27.67	11.73	99.87	23.83	7.65	101.80	2.83	25.52	114.54	--	--	--	1.67	17.39	103.33	0.00	--	6.00	--
Sep-95	1995	6	20.17	13.42	96.73	20.00	7.71	102.97	3.50	21.66	96.62	--	--	--	2.50	17.96	90.90	0.00	--	12.83	--
Sep-96	1996	6	7.83	12.56	96.59	38.00	7.58	105.79	2.83	24.86	103.02	0.17	10.10	119.26	3.33	16.68	96.53	0.00	--	11.00	3.75
Sep-97	1997	6	6.83	13.00	91.31	39.50	7.22	94.54	4.17	21.70	99.11	0.00	--	--	2.17	17.65	96.90	0.00	--	6.17	--
Sep-98	1998	6	4.50	15.53	86.75	47.17	7.55	93.84	4.83	24.43	94.79	0.33	11.65	114.91	4.33	18.04	96.05	0.00	--	10.17	13.74
Sep-99	1999	5	4.20	12.26	104.04	40.60	8.39	93.18	2.20	24.17	105.00	0.80	8.95	119.90	4.40	15.24	95.74	0.20	17.30	4.60	13.39
Sep-00	2000	6	1.00	15.07	93.40	25.00	7.52	96.67	2.50	25.33	99.20	0.50	7.80	104.56	4.67	16.66	96.31	0.00	--	4.17	0.00
Sep-01	2001	6	14.50	12.09	92.76	30.67	7.39	100.86	1.00	27.73	96.81	0.17	10.40	108.60	4.50	13.93	93.62	0.17	17.10	8.67	14.72
Sep-02	2002	6	3.33	11.98	96.85	21.67	7.98	100.11	1.17	25.76	96.31	0.50	9.43	99.04	7.67	14.90	89.57	0.17	--	5.33	--
Sep-03	2003	5	15.80	11.46	102.26	12.20	7.94	125.10	2.00	13.90	108.18	0.20	10.40	96.53	3.60	14.74	101.16	0.00	--	2.60	--
Sep-04	2004	6	12.83	11.62	93.09	16.17	8.34	99.43	0.67	23.90	103.89	0.33	8.20	103.42	2.50	15.32	68.68	0.17	19.20	5.17	15.99
Sep-05	2005	6	5.50	13.63	97.00	12.33	8.35	102.88	0.50	29.23	104.05	0.00	--	--	3.33	15.29	96.82	0.00	--	6.00	16.57
Sep-06	2006	6	3.00	13.38	143.90	23.00	7.71	101.30	1.50	26.94	97.10	0.00	--	--	3.00	15.08	98.10	0.00	--	3.00	16.89
Sep-07	2007	6	9.00	11.80	95.70	29.33	7.90	107.00	1.67	27.50	101.50	0.17	9.20	107.20	5.17	12.80	103.80	0.00	--	17.00	17.20
Sep-08	2008	6	10.00	12.05	104.30	26.50	8.01	102.48	1.00	28.10	97.53	0.17	14.00	113.20	2.67	19.80	94.20	0.00	--	1.83	16.89
Sep-09	2009	6	4.00	11.80	100.90	20.00	8.20	100.40	2.33	26.40	95.16	0.17	15.70	124.59	3.67	18.26	104.72	0.00	--	0.83	16.90
Sep-10	2010	6	3.67	12.12	110.10	19.20	7.35	106.30	0.83	24.32	92.23	0.17	10.20	113.73	1.33	14.48	87.10	0.00	--	1.17	16.59
Aug-11	2011	4	3.75	12.93	98.08	26.50	7.76	92.06	1.75	18.10	83.31	0.25	8.20	76.40	0.75	13.63	81.05	0.00	--	6.00	16.07
Sep-12	2012	6	12.33	11.75	105.68	36.33	8.53	157.05	1.00	24.07	106.95	0.33	9.40	111.89	3.83	11.76	99.32	0.00	--	3.20	15.14
Sep-13	2013	6	5.33	11.56	104.79	26.00	8.81	104.64	0.33	22.05	92.04	--	--	-- --	2.50	10.18	87.06	0.00	--	5.33	16.28

Table 2. Rainbow trout historic stocking rates as it relates to densities stocked, strain, length and month on Beaver Creek Reservoir, 1997-2013.

Year	# Stocked	Strain	Length (Inches)	Month Stocked
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	August
2012	30,124	A	8.6	September
2013	20,120	AxI	7.2	April
2013	30,000	A	7.2	September

Bearpaw Lake

Bearpaw Lake is a very popular 45 surface-acre reservoir located on Beaver Creek in the Bearpaw Mountains and received 5,041 angler days in 2011 (MTFWP Fisheries Bureau 2012). 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 rates and overall condition of these fish in Bearpaw Lake. Wild brook trout moving out of Beaver Creek are also found in the lake. Due to the lakes popularity and the desire by the public to catch larger fish, the daily limit for trout was reduced from five to three trout per day in the spring of 2002.

Bearpaw Lake and Beaver Creek also sustain a very healthy population of white suckers, which negatively impacts 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 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 or more trap nets for one to two weeks during their spawning period (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 4). Rainbow trout are currently stocked in Bearpaw Lake at a rate of 15,000 catchables annually (Table 4).

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 2012, relative abundance of rainbow trout increased to their highest level in 12 years (34.67 fish/net) and brook trout relative abundance was at its highest level in 11 years (1.33 fish/net). In 2013, relative abundance for both rainbow and brook trout decreased. However, their abundance is still above the long-term average with fall netting surveys capturing 24 rainbow trout/net and 0.66 brook trout/net. Rainbow trout averaged 10.47 inches (TL) with exceptional relative weights (avg. Wr=147), and suggests exceptional forage conditions during the current wet cycle we've experienced across Hill County.

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 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 upstream sources in 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 2013, 146,566 white suckers have been removed using trap and gill nets (Table 5). Overall the average size of white suckers has remained high (Table 3), indicating that control efforts have reduced spawning adult abundance, and walleye and smallmouth bass have been helping control YOY populations. In 2013, spring trap netting and fall gill netting removed a total of 911 pounds of white suckers (Table 5).

Smallmouth Bass

Smallmouth bass were introduced legally 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 2013, fall gillnetting surveys yielded 1.66 smallmouth bass/net (Table 3). Anglers did report catching many smallmouth bass throughout the summer along the dam.

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 slow growth and their contributions with control of larger white suckers are unclear.

Figure 1. - Comparison of white sucker relative abundance during fall gill netting surveys and average length of rainbow trout in Bearpaw Lake (1984-2013).

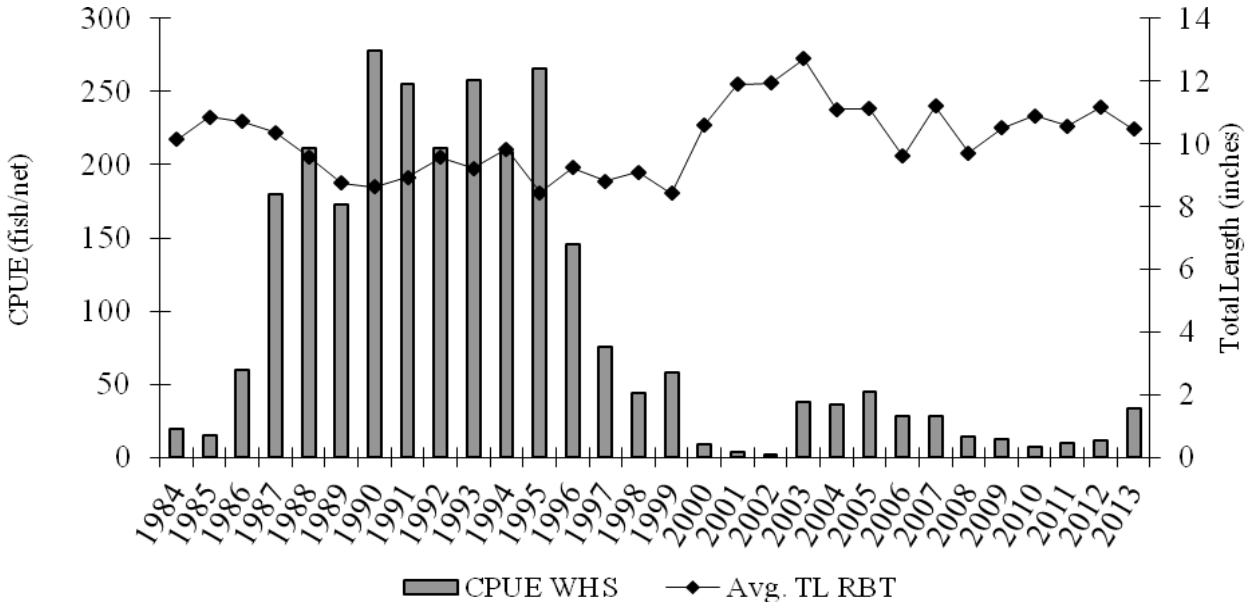


Table 3.- Summary of relative abundance (catch per unit effort (CPUE)), total length (TL), and relative weights of fishes collected in fall gillnetting surveys in Bear Paw Lake since chemical rehabilitation in 1983.

			Rainbow Trout			Brook Trout			Yellowstone 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
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
Sep-12	2012	3	34.67	11.15	99.37	1.33	9.73	99.80	0.00	--	--	12.00	12.26	103.03	0.66	10.80	106.63	1.66	14.90	102.83
Sep-13	2013	3	24.00	10.47	146.81	0.66	8.55	98.05	0.00	--	--	33.33	12.79	106.65	1.66	12.20	104.72	0.33	17.10	109.51

Table 4. Stocking summary of rainbow trout, Yellowstone cutthroat trout, smallmouth bass, and walleye in Bearpaw Lake, 1984-2013.

	Rainbow Trout			Yellowstone Cutthoat 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	--	--	--	--	--	--	--
2012	15,828	A	Sept./Nov.	--	--	--	--	--	--	--
2013	20,000	A	Sept./Nov.	--	--	--	--	--	--	--

Table 5. - Numbers of white suckers removed from Bearpaw Lake by trap netting and fall gill netting, 1989-2013.

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
2012	409	36	445	547.35
2013	641	100	741	911.43
Totals	139,801	6,765	146,566	68,127

Phillips County Ponds

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, 2005, 2011, and 2013. 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 riparian quality surrounding the reservoir.

This reservoir has only been monitored periodically since the 1970s, however the relative abundance and size of fish present has been consistent (Table 6). Severe drought reduced reservoir elevations from 2006-2008 and netting surveys suggest the reservoir may have winter-killed in 2007 and 2010 (based on average lengths; Table 6)

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.), these fish were likely stocked in the spring of 2008. One trap net was also set overnight and contained two rainbow trout, 30 sand shiners, nine brook stickleback, and 1,142 fathead minnows. In 2013, rainbow trout relative abundance remained low but at least three different age classes were sampled, which suggests reservoir pools levels have stabilized enough for the rainbow trout to overwinter and grow to desirable sizes (Table 6). One trap net was also set overnight and contained two rainbow trout, 30 sand shiners, nine brook stickleback, and 1,142 fathead minnows. One trap net was also set overnight and contained 10 rainbow trout, 24 sand shiners, and 1 fathead minnow.

Table 6. Relative abundance, average length, and average weight of rainbow trout collected during periodic gill net surveys on Current Reservoir from 1982-2013.

Rainbow Trout

Date	CPUE	Ave. Length	Avg. Weight
8/18/1982	14	13.71	1.57
8/25/1999	58	16.00	1.25
7/20/2005	11	15.81	1.80
7/9/2008	8	6.32	0.14
7/11/2013	7	12.7	0.86

King Reservoir

King Reservoir is a 9.8-acre pond located on BLM land in south Phillips County. This reservoir has been managed as a fishery since the 1930s and has been managed as a rainbow trout fishery since the 1960s. King is maintained with biennial plants of 3,000 fingerling Arlee rainbow trout. This fishery has a windmill aeration system and is fenced to exclude livestock. In 2005, a voluntary creel box was erected and one angler from Phillips County reported a summer catch rate of rainbow trout as 0.86 fish/hour (n=1). This angler had a high satisfaction rate due to the number of fish caught. In 2006, the box was destroyed by cows and not replaced.

In 2009, one gill and one trap net were set overnight. The gill net contained two rainbow trout that averaged 19.1 inches and 3.07 pounds. The trap net contained 129 fathead minnows. In 2013, one gill and one trap net were set overnight. The gill net contained no fish and the trap net captured 299 fathead minnows.

Plutz Reservoir

Plutz is located on BLM land in south Phillips County. This reservoir was constructed in a deep coulee and has been managed as a fishery since 1994. This reservoir receives biennial plants of 2,000 fingerling rainbow trout and there were brown trout stockings in 2000 and 2001. There is currently no plan to continue stocking brown trout.

Rainbow trout and brown trout have exhibited good growth and survival within Plutz, however not as high as some of the neighboring ponds. In 2011, approximately 1,700 adult fathead minnows were trapped from Compton Reservoir and transferred to Plutz in order to establish an alternate forage base to increase trout growth. In 2013, one gill net and one trap net were set overnight. The gill net contained one rainbow trout (Table 7). The trap net contained one rainbow trout (18.3 inches) and 534 fathead minnows. The presence of fathead minnows confirms the introduction of this species was successful. Furthermore, the size of the two rainbow trout captured surpassed any lengths previously observed in this reservoir and suggests the alternate forage base is contributing to the current increase in trout lengths (Table 7).

Table 7. Relative abundance, average length, and average weight of rainbow and brown trout sampled during periodic gill net surveys in Plutz Reservoir from 2002-2013.

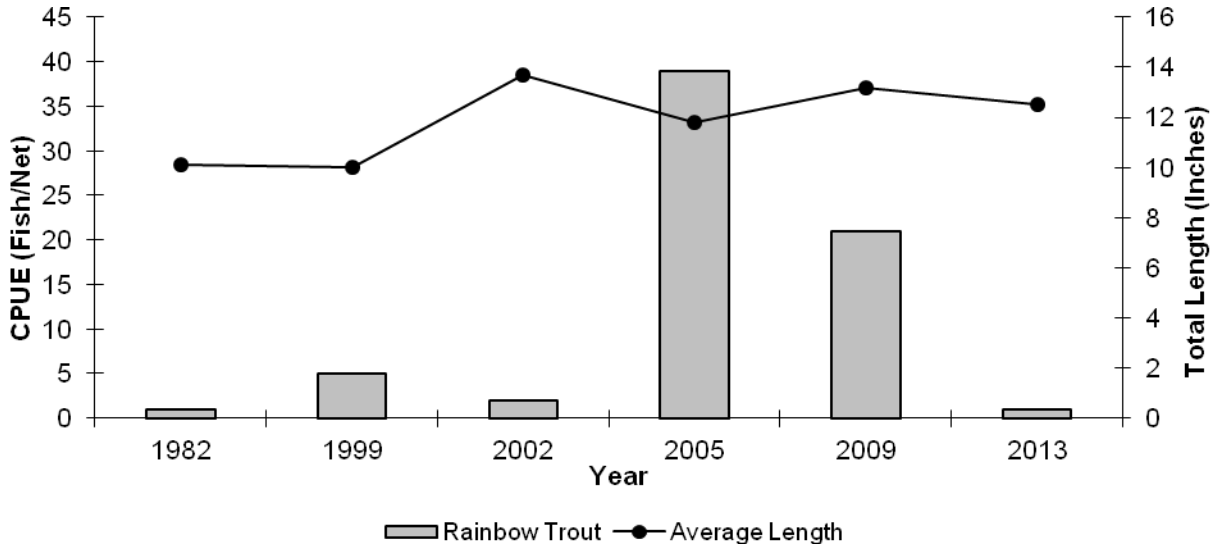
	Rainbow Trout			Brown Trout	
Date	CPUE	Avg. Length	Avg. Weight	CPUE	Avg. Length
4/18/2002	5	8.5	0.25	3	9.6
7/19/2005	17	9.70	0.41	7	13.40
7/22/2009	49	7.10	0.17	0	0.00
7/16/2013	1	17.70	2.48	0	0.00

Sentinel Reservoir

Sentinel is located on BLM land in South Phillips County. This reservoir has been managed as a rainbow trout fishery since 1970. Sentinel receives annual plants of 6,000 fingerling rainbow trout. The reservoir received approximately 236 angler days in 2011 (MTFWP Fisheries Bureau 2012).

In 2009, one gill net and one trap net were set overnight. The CPUE of rainbow trout was 21 fish/net and had an average length of 13.2 inches and average weight of 1.22 pounds. The trap net captured 961 fathead minnows. In 2013, one gill net set overnight captured one rainbow trout (Figure 2) and the trap net captured six rainbow trout and 255 fathead minnows.

Figure 2. - Relative abundance and average total length of rainbow trout in Sentinel reservoir based on gill netting surveys from 1982 to 2013.



RECOMMENDATIONS

Beaver Creek Reservoir: Continue annual stocking of up to 50,000 catchable size Eagle Lake, Erwin, and Arlee rainbow trout. Continue to monitor fishery annually with the use of seining and gill netting at fixed stations. Re-evaluate and possibly change the three trout/day fishing limit to five trout/day. Continue to monitor the impacts to the fishery during extreme water years and impacts of flushing loss over the spillway.

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 gill netting in the fall. Continue to monitor fishery annually with the use of fall gill netting at fixed stations. Re-evaluate and possibly change the three trout/day fishing limit to five trout/day.

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 and water quality. Also, continue public education program alerting the public to the problems associated with the use of live bait (where illegal) and illegal dumping of fish into Montana waters. Continue to look for other ponds with suitable habitats to create new fisheries, work with area wardens and landowners to help identify potential ponds.

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 and water quality. Continue to look for other ponds with suitable habitats to create new fisheries, work with area wardens and landowners to help identify potential ponds.

Waters Codes:

154770 Beaver Creek Reservoir
154560 Bearpaw Lake
164870 Current Reservoir
167880 King Reservoir
167662 Plutz Reservoir
168220 Sentinel 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

MTFWP Fisheries Bureau. 2012. 2011/2012 Statewide Angling Pressure Use Report. Montana Fish, Wildlife, & Parks,
Helena, MT. Pp. 179.

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