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, 2014 THROUGH JUNE 30, 2015

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. 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 Anderson, Faber, and Spanky remains good. Rainbow trout responded well to introductions at South Polly and PR 022. Ponds in Hill, Blaine, and Phillips Counties were monitored in 2014 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 (19) 124 projects were reviewed along with one water pipeline review with local agencies; attended six walleye unlimited meetings and helped with four 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 2013/2014 indicated it received 4,772 (± 1,309) angler days (MTFWP Fisheries Bureau 2014). The significant increase in pressure is likely due to stable weather conditions, no major flooding events, and re-established fish populations.

This reservoir was initially managed as a rainbow trout fishery in 1975. However, the illegal introductions 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 was 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 as expected. 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 12 feet during our sampling effort due to problems with the dam's outlet infrastructure. These conditions created an intense algal bloom due to warmer than average air and water temperatures, and upstream nutrient sources (on-stream grazing plan). 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 (relative abundance=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, 2011 and 2013 (Table 1). In 2014, rainbow trout relative abundance increased to its highest level in 11 years (14 fish/net; Table 1).

There are a number of variables influencing rainbow trout densities in Beaver Creek Reservoir: high spring flow increases flushing loss of fish and the variability in stocking rates.

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, 1974-2014.

			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
Sep-14	2014	6	14.00	12.22	98.22	8.50	8.34	92.12	1.50	25.46	100.97	0.33	13.50	104.83 --	1.83	15.25	83.76	0.00	--	2.66	16.31

Table 2. Rainbow trout historic stocking rates as it relates to densities stocked, strain, length and month on Beaver Creek Reservoir, 1997-2014.

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	6.2	September
2014	50,362	A, R	6.9	April/September

Bearpaw Lake

Bearpaw Lake is a very popular 45 surface-acre reservoir located on Beaver Creek in the Bearpaw Mountains and received 6,449 (± 1,481) angler days in 2013 (MTFWP Fisheries Bureau 2014). Bearpaw Lake has been managed as a trout fishery since 1960 and is currently maintained with annual plants of 20,000 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 killed and returned to the lake or dumped at a landfill.

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 20,000 catchables annually (Table 4).

The relative abundance of rainbow and Yellowstone cutthroat trout has fluctuated greatly since their introductions (Table 3). The primary reasons for these fluctuations are stocking densities, fishing pressure, stream flows (entrainment) over spillway, and changes in survivability as a result of multiple factors including competition with white suckers. In 2014, relative abundance of rainbow trout increased to their highest level since chemical rehabilitation occurred in 1983 (52.3 fish/net) and brook trout relative abundance was at its highest level in 13 years (4 fish/net; Table 3). Rainbow trout averaged 10.46 inches (TL) with good relative weights ($\bar{x}$ Wr=97.25), 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 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 2014, 148,203 white suckers have been removed using trap and gill nets (Table 5). Overall the average size of white suckers has remained high ($\bar{x}$ TL=12.5 inches; Table 3), indicating that control efforts have reduced spawning adult abundance, and walleye and smallmouth bass have been helping control YOY populations. In 2014, spring trap netting and fall gill netting removed a total of 2,014 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 2014, fall gillnetting surveys yielded 0.33 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. Walleye were last stocked in 2006 with 5,000 advanced fingerlings to replenish the aging walleye population. Since their legal introduction, walleye have exhibited slow growth and their densities continue to decline (no walleye captured during fall surveys; Table 3).

Figure 1. - Comparison of white sucker relative abundance during fall gill netting surveys and average length of rainbow trout in Bearpaw Lake (1984-2014).

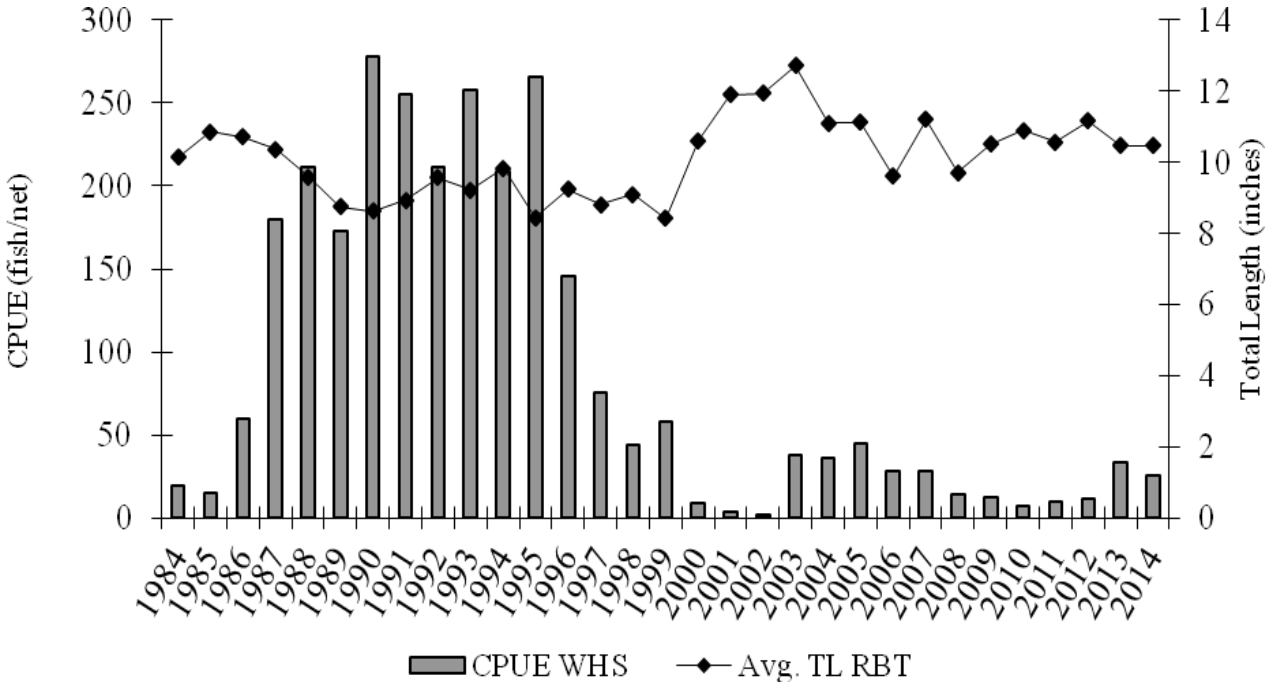


Table 3.- Summary of relative abundance (catch per unit effort (CPUE)), total length (TL), and relative weights of fishes collected in fall gillnetting surveys in Bear Paw Lake since chemical rehabilitation in 1983.

			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
Sep-14	2014	3	52.30	10.46	97.25	4.00	10.05	90.72	0.00	--	--	25.70	13.01	98.94	0.33	12.90	106.22	0.00	--	--

Table 4. Stocking summary of rainbow trout, Yellowstone cutthroat trout, smallmouth bass, and walleye in Bearpaw Lake, 1984-2014.

	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.	--	--	--	--	--	--	--
2014	20,536	A	June/Sept.	--	--	--	--	--	--	--

Table 5. - Numbers of white suckers removed from Bearpaw Lake by trap netting and fall gill netting, 1989-2014.

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
2014	1,560	77	1,637	2,013.51
Totals	141,361	6,842	148,203	70,140

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.

Al's Coulee Reservoir

Al's Coulee is located on BLM lands in southern Blaine County. Historically, this reservoir contained marginal fishery habitat (max depth < 10 feet) and no management actions were taken. In 2011 the BLM notified FWP that reconstruction to the dam had occurred at the reservoir, which increased the storage capacity and max depth, now approximately 12 feet. In 2012 approximately 2,000 catchable rainbow trout were stocked into Al's Coulee. An additional 1,000 catchable rainbow trout were stocked again in June 2014.

In July 2014, one trap net and one gill net were set overnight to assess the density and size of the current rainbow trout population. The gill net captured 58 rainbow trout and the trap net captured 10 rainbow trout. The average length of the rainbow trout captured was 7.63 inches. Water levels were at full pool when sampling occurred however; dense pockets of vegetation inhabited all but a portion of the entire reservoir, making angling opportunities almost impossible. All fish captured were relatively the same size, suggesting all fish captured came from the 2014 stocking which occurred just prior to our sampling and confirmed that overwinter habitat (depth) limited fish survival through the winter months. With this information FWP will no longer actively stock and manage Al's Coulee Reservoir.

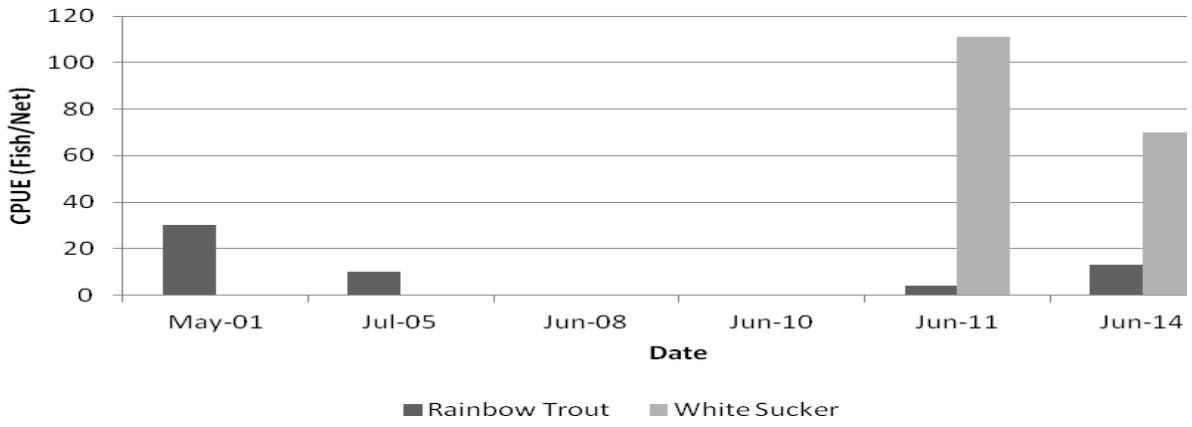
Anderson Reservoir

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 limited the abundance and size of fish (Figure 2). Population surveys conducted in 2010 indicated a dense population of fathead minnows (CPUE= 13,007) and no adult rainbow trout. Heavy spring rains in 2010 increased the water levels in Anderson and 2,000 rainbow trout were stocked in May.

In 2011, fish health samples were collected for trap and transport of fathead minnows, one gill net and two trap nets were set overnight and captured 10 rainbow trout, 783 white sucker, 8,500 fathead minnows, 236 brassy minnow, 3 creek chubs, 3 northern redbelly dace, 1 brook stickleback, and 1 mountain sucker. The rainbow trout stocked in 2010 showed excellent growth and exceeded 15 inches in total length. The high diversity of species found in Anderson Reservoir during the 2011 sampling effort was most likely caused by a high spring runoff event that had many creeks running out of their banks and small dams either breaching or running water over spillways. In 2014 rainbow trout relative abundance increased to 13 rainbow trout/net and averaged 15.5 inches (Figure 2). The reservoir continues to maintain a high white sucker population (70 white sucker/net; Figure 2). The trap net captured 2 rainbow trout, 32 white sucker, 5 mountain sucker, 86 fathead minnow, and 111 brassy minnow.

Figure 2. - Relative abundance of rainbow trout and white suckers in Anderson Reservoir based on gill netting surveys from 2001 to 2014.



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 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 plants of 3,000 fingerling brook trout. From 2008 to 2014 the pond was stocked with alternate year plants of 1,500 fingerling brook trout.

In 2008, 22 brook trout were collected ranging in length from 8.2 to 17.1 inches ($\bar{x}$ =11.4 inches) and in weight from 0.52 to 2.94 pounds ($\bar{x}$ =0.96 pounds). Brookie Pond winterkilled in 2010 due to extremely low water levels during the summer 2009 and throughout the winter 2009/2010. One gill and trap net were set overnight to assess the severity of the winterkill. The gill net contained no fish and the trap net contained two fathead minnows. High runoff during the spring of 2011 filled Brookie Pond to full capacity and Brook trout were planted in May 2011. In 2014, no brook trout were captured in the gill or trap net set overnight, the trap net did contain 5,000 fathead minnows.

Faber Reservoir

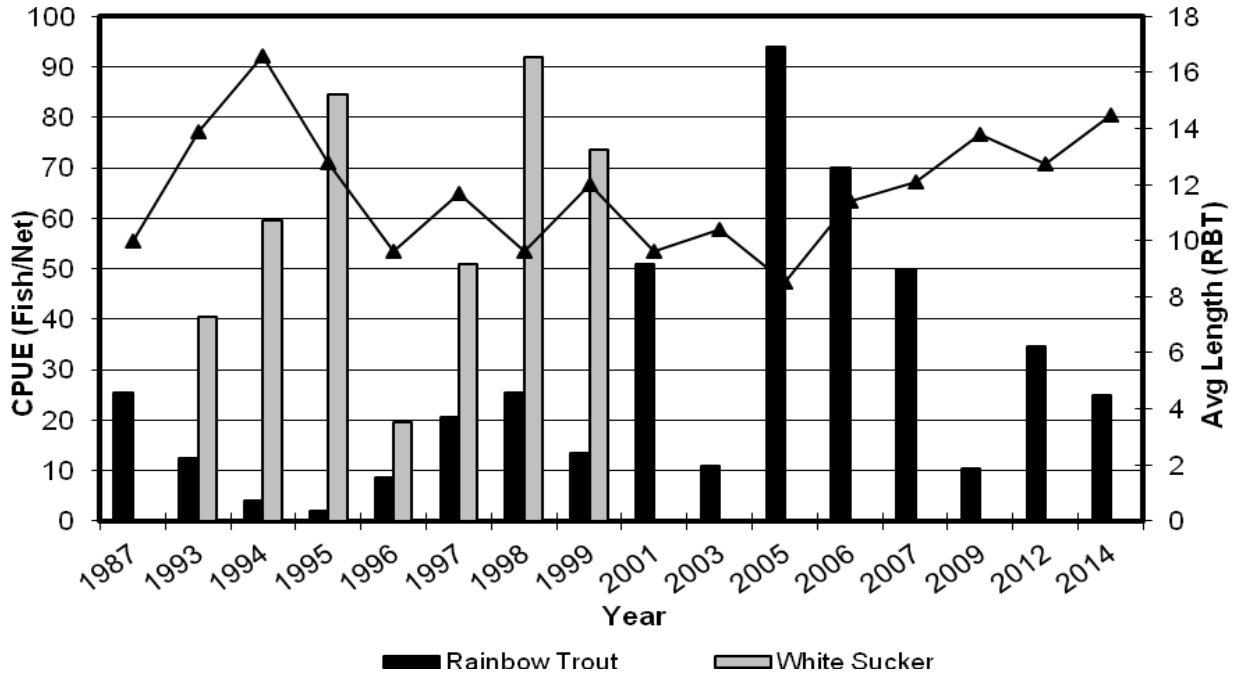
Faber Reservoir, a 25 surface-acre reservoir located 30 miles south of Chinook near Cleveland is a very popular fishing access sites in north central Montana. This reservoir became a fishing access site in 1986 and the contract was renewed in 2006 for another 20 years. Faber reservoir ranked 20th in the region for fishing pressure in 2013/2014, with a total of 1,422 (± 621) angler days. Faber has been a consistent producer of quality rainbow trout for three decades.

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

Since the rehabilitation in 2000, rainbow trout densities have been very good (Figure 3). From 2011-2013, anglers reported catching trout in late August with exterior abnormalities and cyst looking bumps protruding from the skin. In response to these reports crews set one gillnet for approximately 8 hours in 2011 and two rainbow trout (TL=15.4 and 15.1; weight 1.15 and 1.05 lbs.) were captured that showed no evidence of the reported abnormalities. In 2012, anglers were asked to bring trout caught with abnormalities to the Havre area resource office for further evaluation. Three trout with external growths were sent to the fish health lab for analysis. The lab determined the fish had a bacterial infection caused

by warm water temperatures and elevated stress levels. No reports were received pertaining to these abnormalities in 2014. Rainbow trout relative abundance decreased slightly (25 fish/net; Figure 3) in 2014. However, the average length increased to 14.46, the highest in 20 years.

Figure 3. - Relative abundance of rainbow trout and white sucker and Avg. length of rainbow trout in Faber Reservoir based on gill netting surveys from 1987 to 2014.



Petrie Pond

Petrie pond is a privately owned spring fed 2.5-acre pond north of Turner, which had been managed as a rainbow trout fishery since 1996. In 2003, white suckers were illegally introduced and over populated the reservoir. In 2004, a 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 success. The gill net contained 57 brook trout ($\bar{x}$ TL=8.7; $\bar{x}$ WT=0.25) and the trap nets contained 158 fathead minnows. In 2014 the gill net contained 5 brook trout ($\bar{x}$ TL=17.24; $\bar{x}$ WT=3.33) and the trap net contained 1,050 fathead minnows, 365 brassy minnows, and 122 brook stickleback.

South Polly Reservoir

South Polly Reservoir is a 3.5 acre pond located on private lands in north central Blaine County. Historically, South Polly was stocked and managed by a private fishing club. In 2011 FWP entered into a five year access agreement with the landowners through the Private Lands Fishing Access program. This reservoir was first sampled in 2011, with no fish being captured. In 2012, FWP stocked 1,000 fingerling rainbow trout and the reservoir currently receives biannual plants of 500 fingerling rainbow trout.

In 2014, one gill and trap net were set overnight to assess the success of recent stocking events. The gill net captured 29 rainbow trout ($\bar{x}$ TL=14.57 inches; $\bar{x}$ weight=1.19 lbs.) and the trap net captured four rainbow trout ($\bar{x}$ TL=6.43 inches; $\bar{x}$ weight=0.47 lbs.).

Phillips County Ponds

Ponds throughout Phillips 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.

Flake Reservoir

Flake Reservoir is a 6-acre pond located on BLM lands in north central Phillips County. This reservoir has been managed as rainbow trout fishery since 1982 and currently receives biannual plants of 1,000 fingerling rainbow trout. The success of this fishery is highly influenced by reservoir water levels and winter severity (winterkill). In 2013 anglers reported catching rainbow trout larger than three pounds during the spring and summer months. In the spring of 2014 there was a report from a BLM employee that a winterkill had occurred. They reported seeing 44 dead trout (from 14-16 inches) lying along the shoreline. It was also reported that the reservoir was approximately 5.5 feet below full pool.

During the summer of 2014 one gill and trap net were set to assess the severity of the reported winterkill. No fish were captured and suggested a total winterkill had occurred.

PR 022

PR 022 is a BLM pond located in north central Phillips County. This pond experienced low water conditions in 2001. Low water combined with poor water quality, due to over grazing, resulted in a die off of largemouth bass. Largemouth bass were re-introduced in 2003 however this stocking was not successful. In 2005, gill netting surveys found no fish present within the reservoir and the continuation of stocking largemouth bass was questioned due to poor habitat conditions.

Excellent water conditions returned in 2011 and the reservoir filled to capacity. FWP responded by stocking 1,000 fingerling rainbow trout and the reservoir now receives biannual plants of 1,000 fingerling rainbow trout. In 2014 one gill and trap net were set overnight to assess the success of the rainbow stocking efforts. The gill net captured 14 rainbow trout ($\bar{x}$ TL=14.32 inches; $\bar{x}$ WT=1.24 lbs.) and the trap net captured three rainbow trout and 240 fathead minnows.

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. Rainbow trout relative abundance was 3 fish/gill net ($\bar{x}$ TL=9.3 inches.; $\bar{x}$ WT=0.30 lbs.) and the trap net contained one rainbow trout (TL=9.8 inches; WT=0.32 lbs.). In 2014, rainbow trout relative abundance increased to 11 rainbow trout/net ($\bar{x}$ TL=12.54 inches; $\bar{x}$ WT=0.97 lbs.). No fish were captured in the trap net.

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 entrainment over the spillway.

Bearpaw Lake: Continue annual stocking of 20,000 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
164302	Al's Coulee Reservoir
154515	Anderson Reservoir
154719	Brookie Pond
155140	Faber Reservoir
155195	Flake Reservoir
156605	Petrie Pond
156618	PR 022
159350	South Polly Reservoir
168354	Spanky 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. 2014. 2013/2014 Statewide Angling Pressure Use Report. Montana Fish, Wildlife, & Parks,
Helena, MT. Pp. 179.

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