MONTANA DEPARTMENT OF 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, 2003 THROUGH JUNE 30, 2004

ABSTRACT

Trout gill net catch-per-unit effort (CPUE) has increased to a level higher than the 10 fish/net target in Beaver Creek Reservoir. Trout gill net CPUE is good in Bear Paw Lake and growth is improving. Fishing pressure is increasing with the more acceptable size of fish. Trapping has removed 130,162 suckers (25.1 tons) since 1989. The sucker population has been greatly reduced and consists mostly of older fish. Crayfish numbers remain low. Both reductions are due largely to smallmouth bass predation. Growth and condition of rainbow trout at Grasshopper Reservoir remains good following a winterkill in the winter of 2002-2003. Faber Reservoir was restocked with fingerling rainbow following rehabilitation in 2000 and netting indicates good survival and growth. H.C. Kuhr Reservoir was almost dewatered in 2001 and was rehabilitated to remove suckers and perch. Low water levels prohibited restocking until 2003. Management recommendations for all 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

Objective is 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, eighteen NSLPA 310 permit applications and twelve SPA 124 permits were processed; recommendations were made to advisory committee overseeing road construction activities within Beaver Creek County Park, recommendations were forwarded to the Department of Natural Resources concerning the rehabilitation of the dam and spillway at Bear Paw Lake;

assisted with data gathering and negotiations with Rocky Boy and Ft. Belknap Indian Reservations regarding water rights compacts; other related activities are presented.

PROCEDURES

Streams were sampled with a direct current (DC) backpack electrofishing unit. Lakes were sampled with floating and/or sinking experimental gill nets. The gill nets measured 6 feet deep and 125 feet in length and consisted of 25-foot panels of 3/4-, 1-, 1 1/4-, 1 1/2-, and 2-inch square mesh. All fish were measured for total length (TL) and weighed to the nearest .01 pound. Crayfish were captured in 1/4-inch hardware cloth traps of varying size, with throat entrance holes measuring 1.5-2.0 inches in diameter. The traps were set around the entire reservoir in water less than 10 feet deep. Traps were baited with dead fish and canned cat food. Traps were fished for 48-72 hours. Crayfish were marked with a partial clip of the extreme edge of the right uropod and scattered within several hundred yards of the trapping location. A recapture sample was secured eight to twelve days later using the same technique. Body length measurements for crayfish were taken from the tip of the rostrum to the posterior margin of the telson. Suckers were trapped, for population estimation, in 1/4-inch mesh frame traps. They were weighed, measured and marked with a paper punch hole in their tail or finclipped.

RESULTS AND DISCUSSION

Beaver Creek Reservoir

This 200 surface-acre reservoir contains a variety of cold, cool, and warmwater species including rainbow trout, northern pike, walleye, smallmouth bass, yellow perch, white and longnose suckers. The reservoir has been managed primarily as a trout fishery since it's filling in 1974. Over it's stocking history, Eagle Lake rainbow trout, De Smet rainbow trout, brown trout and McBride Yellowstone cutthroat trout have been planted and evaluated. None of these strains have shown a propensity to out-perform domestic Arlee and Erwin rainbow trout for growth or catchability, therefore domestic Arlee rainbow have been the preferred strain with occasional plants of Eagle Lake rainbow which have exhibited greater longevity and upstream spawning capabilities.

Gill-net surveys were conducted in 1974, 1977, and annually since 1980. The surveys were conducted to monitor growth and survival of hatchery trout and to determine relative abundance of other fishes. Results of the netting efforts are summarized in Table 1. The gill net CPUE of trout has risen above the target CPUE of 10/net. This is due a combination of increased stocking and a very low pike population. Condition of trout is fair to good. Poor trout condition has been associated with high sucker numbers. Though the white sucker population remains low, due primarily to northern pike predation, a huge perch population has developed and is currently the greatest competitor with trout for available zooplankton. Stomach contents of larger trout often contain spottail shiners. Smaller trout are primarily feeding on plankton.

Northern pike numbers have remained relatively low for several years. Good reproduction was experienced in 2003, however. Pike are capable of causing significant predation on catchable trout and suckers. During the summer of 1999, the stomachs of 121 pike were examined. Fifty-five (55%) were empty. Of the remaining pike, 85% had ingested trout ranging in length from 4 to 10 inches. Spottail shiner incidence in stomachs was next at 9% and yellow perch were found in 6% of the stomachs. Though perch are the most populous fish in the reservoir, it appears that soft-rayed fishes are much preferred over spiny-rayed fishes by pike.

Walleye gill net CPUE decreased as well as average size of fish. Walleye were introduced in 1987 due to local demand and to help control numbers of yellow perch illegally introduced. No trout

were found in 18 walleye stomachs examined in 1998; however, 5 of 24 walleye examined in 1999 had eaten trout. Perch also appear to be a major food item for walleyes.

Gill net catch-rates for yellow perch have declined since the high catch-rate experienced in1997, but average size has remained relatively stable. Perch are becoming a much sought-after fish by anglers and good catches are made at all times of the year.

Smallmouth bass, which initially flushed downstream from Bear Paw Lake, have grown well in the reservoir due to the abundance of crayfish and are being caught on a regular basis. Stomach content analysis of smallmouth bass indicates a preference for crayfish, followed by spottail shiners and yellow perch.

The use of live minnows for bait was allowed beginning in 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. The department's 2001 pressure survey indicated Beaver Creek Reservoir is the second most highly fished reservoir in the region.

Table 1. Summary of gill net catches and relative abundance of fishes in Beaver Creek Reservoir, 1974-03.

	Rainbow Trout				Northern Pike			Walleye			Yellow Perch			Sucker Sp.
Year	CPUE[1]	Ave. Lgth. (in.)	Ave. Wt. (lbs.)	C[2]	CPUE	Ave. Lgth. (in.)	Ave. Wt. (lbs.)	CPUE	Ave. Lgth. (in.)	Ave. Wt. (lbs.)	CPUE	Ave. Lgth. (in.)	Ave. Wt. (lbs.)	CPUE
1974	24.0	10.7	0.60	48.98	---	---	---	---	---	---	---	---	---	89.7
1977	35.0	10.1	0.39	37.85	---	---	---	---	---	---	---	---	---	115.7
1980	23.3	10.1	0.35	33.97	---	---	---	---	---	---	---	---	---	83.3
1981	7.0	10.4	0.35	31.11	---	---	---	---	---	---	---	---	---	171.7
1982	8.3	11.2	0.55	37.15	2.3	15.8	0.99	---	---	---	---	---	---	112.3
1983	3.3	11.8	0.62	37.74	3.7	25.1	4.78	---	---	---	---	---	---	99.7
1984	3.0	11.3	0.59	40.89	3.7	26.6	5.49	---	---	---	---	---	---	58.7
1985	3.0	11.9	0.77	45.82	4.3	26.0	5.72	---	---	---	---	---	---	68.3
1986	13.0	11.9	0.66	39.16	4.2	16.7	2.13	---	---	---	---	---	---	42.0
1987	11.3	13.6	0.92	36.57	5.2	22.0	2.81	---	---	---	0.3	6.3	0.12	18.0
1988	9.7	14.7	1.17	36.83	3.0	27.6	7.3	0.7	10.6	0.36	8.2	5.9	0.10	18.0
1989	10.7	13.1	0.80	35.59	1.2	30.3	8.31	0.0	---	---	9.2	7.6	0.21	16.8
1990	18.5	12.0	0.61	35.3	0.7	21.0	2.90	1.8	13.2	0.86	13.0	8.5	0.32	9.8
1991	15.5	12.8	0.77	36.72	2.3	16.6	1.2	5.7	14.0	0.97	12.0	7.4	0.26	11.0
1992	13.7	13.7	0.98	38.11	3.3	25.6	5.32	2.3	17.8	2.15	6.0	6.4	0.13	7.7
1993	3.2	16.4	1.67	37.86	2.0	27.5	6.37	3.3	16.8	1.73	12.3	7.2	0.21	8.5
1994	27.7	11.7	0.66	39.2	2.8	25.5	6.77	1.7	17.4	2.68	23.8	7.7	0.25	7.0
1995	20.2	13.5	0.94	38.59	3.5	21.7	2.89	2.5	18.0	2.62	20.0	7.7	0.28	12.8
1996	7.8	12.6	0.84	41.99	2.8	24.9	4.28	3.3	16.7	2.16	38.0	7.6	0.25	12.5
1997	6.8	13.0	0.84	38.23	4.2	21.7	2.72	2.2	17.7	2.42	60.7	7.6	0.24	6.2
1998	4.5	15.5	1.35	36.25	4.8	23.6	3.61	4.3	18.0	2.66	47.3	7.6	0.21	10.0
1999	3.5	12.3	0.89	47.83	1.8	24.2	4.09	3.7	15.2	1.52	44.3	8.5	0.31	0.2
2000	1.0	15.1	1.29	37.47	2.5	25.3	4.17	4.7	16.7	2.60	26.8	7.5	0.23	4.2
2001	2.0	13.1	0.83	36.92	1.0	27.7	5.12	4.5	13.9	1.41	30.7	7.3	0.20	8.8
2002	3.3	11.9	0.65	38.60	1.2	25.7	4.19	7.7	14.8	1.76	11.7	8.1	0.28	5.5
2003	15.8	11.6	0.60	38.44	2.0	13.9	1.27	3.6	14.7	1.48	10.2	8.5	0.28	2.6

[1]Number of fish per gill net

[2]Condition factor = $\frac{W \times 10^5}{L^3}$

Bear Paw Lake

Bear Paw Lake is a 45 surface-acre reservoir on Beaver Creek in the Bear Paw Mountains. It is maintained with annual plants of McBride strain cutthroat and Arlee rainbow trout. Summer fishing pressure has exceeded 150 angler-days per surface acre in some years. Fishing pressure becomes excessive when acceptable-size fish are readily available. Suckers have historically overpopulated this reservoir. The reservoir was chemically rehabilitated in 1983 to reduce sucker numbers. Post-rehabilitation trout growth in 1984 and 1985 was excellent. However, the sucker gill net catch increased from a catch per net of nine in 1985, to 278 per net by 1990 (Figure A). Despite sucker removal efforts, the population remained high until a combination of adult sucker removal and smallmouth bass predation eliminated recruitment. Competition with large numbers of suckers had reduced growth of trout significantly. Fishing pressure had declined dramatically since 1988 due to the small size and poor condition of trout. Recent increases in size and condition of trout have increased fishing pressure significantly. The 2001 Statewide Fishing Survey indicated Bear Paw Lake was number three in fishing pressure in Region Six. Respondents to an angler survey indicated a desire to catch larger fish, even at the expense of catching fewer fish. Due to the increase in fishing pressure, the trout daily limit was reduced from 5/day to 3/day in the spring of 2002.

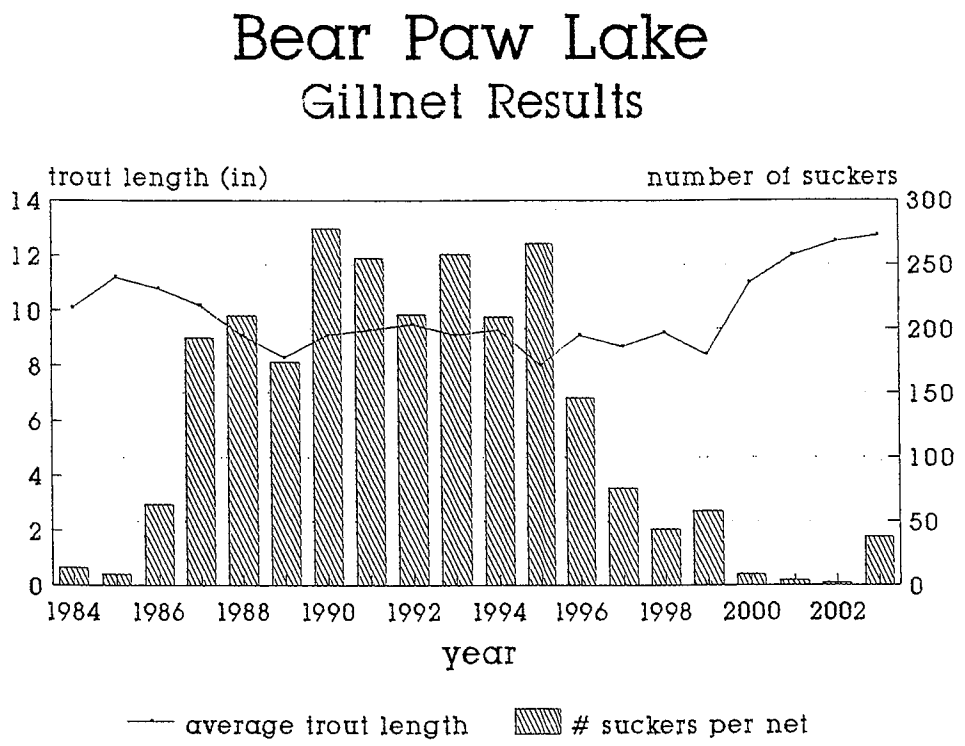

Figure A. Comparison of white sucker numbers, after chemical rehabilitation in 1983, with trout growth in Bear Paw Lake.

Drawdown and chemical rehabilitation has been attempted twice. This, however, is not a preferred option for sucker control in this reservoir, primarily due to the loss of recreation, detoxification time, invertebrate loss, bank sloughing, and subsequent trout mortality.

Gillnetting trend data has been collected in early September since 1984. Utilizing 1988 as a base year, numbers of mature (>10 inches) and juvenile suckers (<10 inches), as they appeared in the

catch, were compared with trout CPUE and condition (Table 2). The trout gill-net catch has remained satisfactory, and average size and condition of rainbows has improved over the last decade. Yellowstone cutthroat trout were absent from the catch for the first time in 2003. Decreased stocking rates and heavy angling pressure have depleted the population to less than desired levels. Eagle Lake strain rainbow trout had been utilized experimentally since 1986, but were replaced in 1991 with spring planted Arlee rainbow. Fall stocking of Arlee rainbow began in 1992 to facilitate hatchery demands.

Table 2. Relative abundance of suckers and trout as indicated by fall gill netting following sucker removal efforts (1988-03) in Bear Paw Lake.

	Suckers				Cutthroat Trout			Rainbow Trout		
Date	No. <10" Per Net	% Chg[1]	No. >10" Per Net	% Chg	No. Per Net	Avg. Lgth.	C[2]	No. Per Net	Avg. Lgth.	C[2]
Fall 1988	122	----	89	----	8.7	7.9	36.5	9.0	10.3	41.18
Fall 1989	152	+25	21	-76	19.0	8.1	30.11	15.3	8.4	33.74
Fall 1990	253	+107	25	-72	22.3	8.7	34.68	9.0	10.0	32.00
Fall 1991	198	+62	57	-36	15.0	9.1	34.5	4.0	10.2	34.87
Fall 1992	127	+4	84	-6	58.6	9.6	24.87	17.0	9.1	45.12
Fall 1993	200	+64	58	-35	6.0	9.1	33.18	0	----	----
Fall 1994	157	+33	52	-42	13.7	9.1	31.85	5.7	9.7	38.34
Fall 1995	125	+1	141	+63	60.0	7.8	33.72	14.7	9.1	35.83
Fall 1996	5	-96	141	+63	60.0	7.8	33.72	14.7	9.1	40.89
Fall 1997	1	-99	75	-16	26.0	8.5	32.57	24.7	9.3	34.81
Fall 1998	0	-100	44	-51	3.7	8.8	29.35	10.0	10.0	34.81
Fall 1999	0	-100	58	-35	19.7	8.4	33.74	43.3	8.2	39.90
Fall 2000	0	-100	9	-90	11.7	10.0	32.00	30.7	11.4	37.80
Fall 2001	2	-98	2	-98	10.0	10.9	39.38	7.3	13.4	39.48
Fall 2002	0	-100	2	-98	4.3	12.3	29.56	13.7	12.6	38.49
Fall 2003	6	-96	32	-36	0	-	-	16.3	12.7	38.06

[1]1988 used as base year determining percent change in relative abundance

[2]Condition factor = $\frac{W \times 10^5}{L^3}$

A sucker control program was initiated in May of 1989. Frame traps were utilized to capture suckers in the spring as they frequented shorelines and the mouth of Beaver Creek prior to spawning. The trapping effort was reduced in the years 1992 through 1996 due to lack of manpower. Increased removal efforts restarted in 1997. Since 1989, 130,162 suckers with a total biomass of 25.1 tons have been removed (Table 3). Initial results of the fall gill netting in 1989 indicated the effort had reduced the number of mature suckers significantly. However, by the fall of 1990, juvenile sucker numbers had increased 107% from 1988 levels. Figure B illustrates how swiftly juvenile suckers increased following removal of adult suckers, and how quickly the sucker population returned to pre-removal levels, even while removal efforts were underway. It appears that the total biomass of suckers remained relatively stable as vast numbers of smaller suckers replaced the larger suckers that were removed. In 1995, however, the catch of adult suckers exceeded the catch of juveniles in the gill net survey for the first time. A dramatic decrease in juvenile sucker numbers has occurred since the introduction of smallmouth bass in 1992 (Figure B). Few suckers less than 10 inches in length have been captured in gill nets since 1998. The catch of adult suckers remained constant through 1995 and 1996. However, after removal of four tons of suckers in the spring of 1997 adult suckers showed a marked decline. Following removal of

an additional 2.8 tons of suckers in 1998, fall gill netting indicated another decline in adult sucker numbers. The decline continued until 2003 when a significant increase was noted. This was probably due to the spring flooding which brought fish from upstream populations and East Fork Dam into the reservoir. Sucker population estimates were discontinued in 2001.

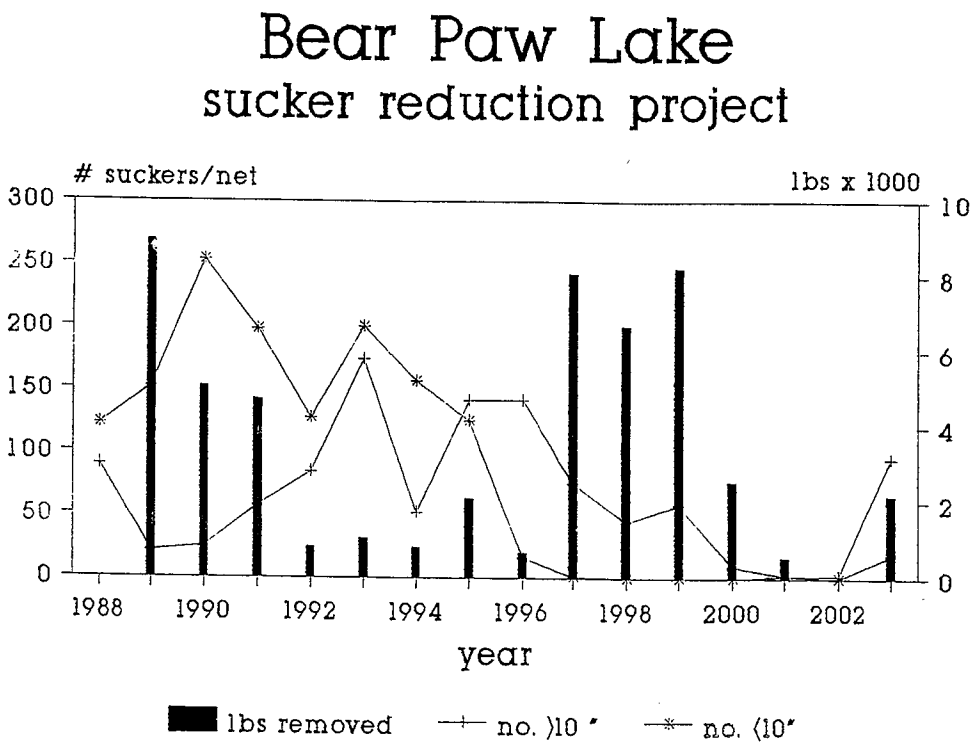

Figure B. Number of juvenile and adult suckers captured per gill net in each year of the study associated with the pounds of suckers removed each year, 1989-03.

Table 3. Number and pounds of white suckers removed from Bear Paw Lake from 1989 to 2003.

Year	Number	Pounds
1989	12,545	8,986
1990	44,622	10,206
1991	18,140	4,733
1992	4,133	828
1993	5,239	1,050
1994	6,995	810
1995	5,653	2,100
1996	1,991	670
1997	13,485	8,091
1998	6,708	5,206
1999	8,239	7,459
2000	2225	2559
2001	331	543
2002	17	16
2003	1,564	2203
Totals	125,179	50,254

Mechanical/physical removal of juvenile suckers is very labor intensive. Juvenile suckers are not as susceptible to capture, as they do not congregate in or near the creek to spawn. The topography of the reservoir with its steep sides and submerged woody vegetation does not readily facilitate frame trapping or seining.

Adult crayfish, ranging in size from 2.6-3.8 inches were estimated at 21,577 with a total biomass of 1,292 pounds, or 29 lbs./acre in 1992. Numbers of crayfish increased in 1993 to 25,906, but average size decreased (range 2.5-3.6 in.). A decrease in average size was reflected in a biomass reduction to 21 lbs./acre. Numbers of crayfish declined to less than 10 lbs./acre in both 1994 and 1995. In 1996 the crayfish population was reduced to 2.5 lbs./acre and in 1997 to 1.6 lbs./acre. Crayfish estimates were discontinued in 1998 due to low numbers. Numbers remain low, evidenced by the fact that few crayfish have been found in gill nets since 1998.

Crayfish, in large numbers, may have an effect on food availability for trout. A study from Newcastle Reservoir in Utah by Hepworth and Duffield concluded that crayfish changed the reservoir ecosystem by altering the food web, thereby reducing energy transfer to rainbow trout. Momot (1978) described the ability of crayfish to dominate the benthic community and prey on amphipods, isopods, chironomids, cladocerans, ostracods, and odonate naiads. Crayfish have also been reported to eat gastropods (Dean, 1969). Crayfish are utilized, to some degree, as food by trout. However, only trout greater than 12 inches appear able to consume them on a regular basis. A 12-inch trout in Bear Paw Lake was a rarity, so utilization of crayfish by trout was negligible.

A proposal was submitted in 1991 to introduce smallmouth bass for the purpose of inflicting significant predation on juvenile suckers. Juvenile bass were expected to feed primarily on YOY suckers, while adult bass were expected to prey heavily on crayfish. Adult smallmouth bass were not expected to consume a significant number of the catchable-size trout stocked annually. Though the primary objective is to improve trout growth, smallmouth bass are expected to make an outstanding addition to the fishery.

A concern that arose during the lengthy environmental review process was that a "no action" alternative, or delay in implementing an action, might cause frustrated fishermen to attempt their own predator introduction. A similar situation (sucker over-population) occurred downstream in Beaver Creek Reservoir in 1982. Unknown individual(s) introduced northern pike into this existing trout fishery apparently to control sucker numbers. Gill netting in Bear Paw Lake in 1992 proved the concern was founded, as a single adult walleye was captured. It is believed that only a few fish were illegally introduced and the probability of successful reproduction in this reservoir is extremely low. A fisherman reported catching a northern pike from Bear Paw Lake in 1994, but the report could not be confirmed.

Following an environmental review, 25,000 smallmouth bass fingerlings, averaging 1.3 inches, were introduced into Bear Paw Lake in August of 1992. It was hoped that YOY suckers would suffer immediate depredation losses; however, the bass were too small to effectively feed on YOY suckers. A cool August and September undoubtedly reduced growth rates of bass and over-winter survival of this introductory plant was questionable. No bass were captured in 56 trap-days of effort in the spring of 1993. However, electrofishing the shoreline in mid-July captured 23 age I smallmouth bass, ranging in length from 2.2-5.1 inches. All but two of the bass were taken from the dam face riprap. Bass preferred rocky substrate to emergent/submerged vegetation, which was plentiful. A total plant of 40,000 1.7-inch bass was made in July and August of 1993. Another plant of 24,000 fingerlings was made in 1994. No bass were stocked in1995 due to unavailability.

A plant of 20,000 bass was made in 1996 and 5,000 were planted in 1998. Stocking of bass was discontinued in 1999, once natural reproduction was documented.

In order to evaluate changes in the forage base due to bass predation, baseline data on sucker and crayfish populations was gathered prior to the smallmouth bass introduction Population data has been gathered annually. Mark-recapture estimates of the sucker population were made between 1992 and 2000 (Figure C). The estimate of suckers in 2000 was 3,237 with a total biomass of 3,711 pounds. Spring trapping removed 2,225 of these fish bringing the population to 1,486 suckers by summer of 2000.

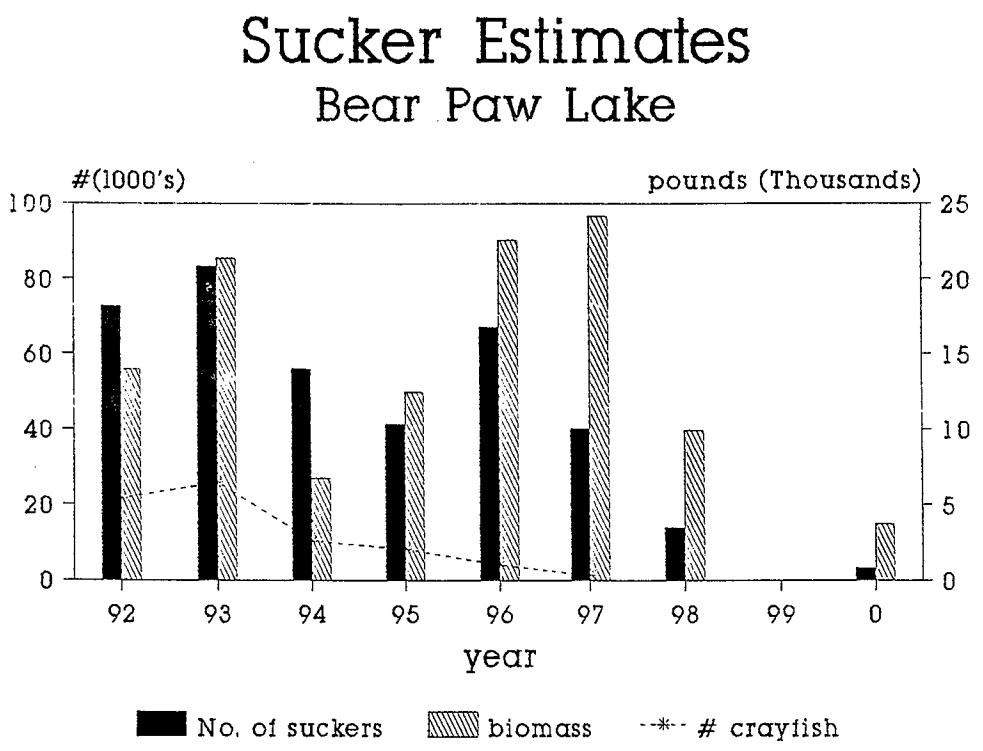

Figure C. White sucker and crayfish estimates for Bear Paw Lake, 1992-00.

The estimate of age II and older suckers was 72, 737 in 1992. Total biomass was 13,992 pounds or 311 pounds per surface acre. The estimate of age II and older suckers in 1993 was 83,328 with a biomass of 21,324 pounds. Sucker biomass increased 163 pounds per acre from 1992 to 1993. However, in 1994, the population decreased to 56,012 fish with a total biomass of only 6,745 pounds. The decrease was primarily due to the loss of adult suckers. This is unexplained at this time as predation by bass could not have been a factor in reducing numbers of older suckers and not that many adults were removed. Sucker estimates made in 1995 indicated the population was at the lowest level since 1992. The sucker estimate for 1996 was 67,100 fish with a total biomass almost double that of the 1995 population. Biomass estimates of suckers in 1997 was similar to that observed in 1996, but total numbers had decreased by 40,000 fish. The 1993 year-class of suckers was the first to be impacted by bass predation. Estimates made since 1992 indicate significant reductions in recruitment due to bass predation.

Smallmouth bass were the first predator fish utilized in this lake in an attempt to reduce sucker numbers. White sucker YOY congregate in dense schools in the upper, warmer, weedier portion of the reservoir in July. At this time suckers are very susceptible to predation. It was determined (Gilge, 1994) that smallmouth bass must be 1.5 inches TL by mid-July to take full advantage of prey size. The 1.3 inch bass, introduced in August of 1992, were too small and planted too late to

affect any predation on the 1992 sucker year class. Their small size also inhibited over-winter survival, as few bass recruited in 1993. Bass stocked in 1994 and 1995 were of sufficient size by mid-July to effectively feed on YOY suckers. Bass utilized suckers heavily for two weeks in July of 1994. However, while YOY suckers apparently moved to deeper water in early August, bass stayed in the shallows and switched to a diet of crayfish and insects (Gilge 1994). Yearling and two-year-old bass appeared to feed primarily on crayfish and YOY bass. As the summer progressed, newly planted bass migrated from the weedy, upper reservoir where they were planted, to the riprap on the face of the dam. All bass older than age 0 were found in the rocks of the dam face. As YOY bass infiltrated the rocky habitat, older bass often cannibalized them. Suckers did not frequent the dam face, but utilized the warmer, weedier upper reservoir causing predator and prey to be spatially separated by late summer. This behavior was observed in each of the three years since introduction. Shoreline rock was placed at two mid-reservoir locations to protect shorelines from wind erosion and provide bass cover. Bass immediately colonized the structures. More detailed food habit analysis was presented in a previous report by Gilge (1994).

Due to the apparent spatial separation of bass and suckers, and the short period of active feeding by bass, it was felt that a suitable level of predation might not be exerted upon the sucker population. The use of walleye was investigated and an Environmental Assessment prepared in 1995 (Gilge, 1995). Walleye fingerlings (5,000 1.5-inch) were introduced in May of 1995, and an additional 500 4-inch fish were planted in early fall. An additional plant of 4,000 walleye fingerlings was made in 1996. Three walleye from the 1996 plant were netted in 1997 and ranged in length from 7.6-7.9 inches. Walleye were again planted in 1997. Walleye netted in 1998 ranged from 7.2-10.5 inches. Walleye stocking was discontinued in 1998 as the desired level of predation was achieved. Three adult walleye were netted in 2003. It appears feasible to continue to remove adult suckers by trapping and rely on the existing predator population to inhibit recruitment of young suckers.

Grasshopper Reservoir

Over-winter water levels have been marginal in recent years due to increased irrigation demand downstream. A winterkill occurred in 2002-2003. An experimental gill net fished in September captured eight rainbow trout from the spring plant. The fish ranged from 8.6 – 10.7 inches and were in very good condition.

Faber Reservoir

This reservoir is one of the most popular fishing access sites in north central Montana. It has been a consistent producer of quality rainbow trout for three decades. Largemouth bass and white suckers were illegally introduced between 1990 and 1993. Low water levels experienced during the drought of 2000 allowed for an inexpensive and complete rehabilitation of the reservoir with rotenone. Fingerling Arlee rainbow trout were stocked in the spring of 2001 and annually since. One experimental gill net fished in September captured 11 trout ranging in length from 8.0 to 18.0 inches. Weight range was 0.2 to 2.90 pounds. No suckers or bass were captured indicating a complete kill was accomplished. Many good reports were received from fishermen in 2003.

H.C. Kuhr Reservoir

Extremely low water conditions afforded an opportunity in 2001 to rid the reservoir of unwanted suckers and perch. The reservoir was treated with rotenone in August of 2001. The reservoir did not fill until 2003 and was restocked with fingerling rainbow trout. A fall gill net set captured 19 trout ranging from 6.8 to 10.6 inches. The fish were in excellent shape and should provide some good angling when the reservoir opens to the public in the spring of 2004. No suckers or perch were netted indicating a successful rehabilitation.

RECOMMENDATIONS

Beaver Creek Reservoir: Continue stocking of Eagle Lake, Erwin and Arlee rainbow catchable-size trout. Evaluate the Erwin domestic strain as a possible replacement for Arlee due to the projected future shortfalls of Arlee rainbow in the hatchery system. Increase stocking rate as northern pike population declines.

Bear Paw Lake: Continue McBride strain cutthroat stocking at reduced rates. Increase Arlee rainbow catchable stocking. Remove adult suckers by trapping and electrofishing in the spring.

Grasshopper Reservoir: Continue with annual plants of Arlee fingerlings and alternate year plants of Eagle Lake rainbow. Monitor with annual gill net survey.

Faber Reservoir: Continue to monitor trout numbers and condition. Adjust stocking rate as needed.

H.C. Kuhr Reservoir: Monitor survival and growth of stocked rainbows annually.

LITERATURE CITED

Dean, J.L.; 1969. Biology of the Crayfish Orconectes causeyi and its use for Control of Aquatic Weeds in Trout Lakes. U.S. Bureau of Sport Fisheries and Wildlife Technical Paper 24.

Gilge, Kent W.; 1994. Inventory and Survey of the Project Area, Job Progress Report for DJ Project F-46-R-7, Job No. V-d. 13pp.

Gilge, Kent W.; 1995. Effects of Introducing Walleye into Bear Paw Lake, Environmental. Assessment for FWP, 19pp.

Hepworth, Dale K. and Daniel J. Duffield; 1987. Interactions Between and Exotic Crayfish and Stocked Rainbow Trout in Newcastle Reservoir, Utah, No. Amer. Jour. Of Fisheries Mgt. 7:554-561.

Momot, W.T., H. Gowing, and P.D. Jones; 1987. The Dynamics of Crayfish and their Role Ecosystems. American Midland Naturalist 99:10-35.

Needham, Robert G., and Kent Gilge; 1987. Inventory and Survey of the Project Area, Job Progress Report for DJ Project F-11-4-34, Job No. I. 40pp. (mimeo).

Waters referred to:

15-4570-03	Beaver Creek Reservoir
15-4560-05	Bear Paw Lake
15-5380-07	Grasshopper Reservoir
15-0320-01	Beaver Creek
15-5140-01	Faber Reservoir
15-5880-01	H.C. Kuhr Reservoir

Key Words or Fish Species:
Arlee, Eagle Lake rainbow trout, sucker removal, crayfish, population estimates smallmouth bass, walleye, dietary studies.

Prepared by: Kent W. Gilge
Date: June 30, 2004