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MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION
JOB PROGRESS REPORT

PROJECT NO. F-78-R-3

STATE: Montana
PROJECT TITLE: Statewide Fisheries Investigations
JOB TITLE: Northcentral Montana Coldwater Lake Ecosystems

PERIOD COVERED: July 1, 1996 through June 30, 1997

ABSTRACT

Various strains of rainbow trout continued to be evaluated in several lakes in Region 4. During the report period, six waters were surveyed in the Choteau area. Good survival was documented for Arlee and AXE rainbow in Bean Lake, Eagle Lake in Nilan Reservoir, and AXE in Willow Creek Reservoir. Grayling stocked in Lake Levale appear to have had good survival. A five-year experiment of stocking rainbow trout into a northern pike fishery at Pishkun Reservoir concluded that predation was excessive. Poor survival of the Arlee strain and fair catches of wild and DeSmet rainbow trout were observed in gill net catches in Smith River Reservoir. Survival of Yellowstone cutthroat and rainbow trout was rated as fair in Newlan Creek Reservoir. Eight waters were surveyed in the Lewistown area. Eagle Lake rainbow trout continued to outperform Arlee rainbow trout in Ackley Lake. Gill netting found poor survival of rainbow trout year classes in Ackley Lake, but was good overall. Rainbow trout gill net catch was fair for 1995 and 1996 plants in Martinsdale and good overall in Yellow water Reservoir. Bair Reservoir had good survival for 1995 and 1996 plants, but older fish were not seen in the gill nets. Big Casino Reservoir was drawn down for sucker removal and walleye will be introduced in 1997 as a sucker control measure. Three other small reservoirs were gill netted.

OBJECTIVES

1. To identify and monitor the characteristics and trends of fish populations, angler harvest and preferences, and habitat conditions in northcentral Montana coldwater lake/reservoir/pond ecosystems.

2. Use survey and inventory information to identify management problems and opportunities, then develop and implement management actions to maintain fish populations at levels consistent with habitat conditions or other limiting factors.

3. Review projects proposed by state, federal, and local agencies and private parties which have the potential to affect fisheries resources and aquatic habitats. Provide technical advice or decisions to reduce or mitigate resource damage.

4. Provide landowners and other private parties with technical advice and information to sustain and enhance fisheries resources and aquatic habitat.

5. Enhance public understanding and awareness of fishery and aquatic habitat resources and issues in northcentral Montana through oral and written communication.

6. Maintain and enhance public access to fishery resources in northcentral Montana.

PROCEDURES

Fish populations were sampled using: standard 125 x 6 ft experimental multifilament nylon gill nets with 25 ft sections of 0.75, 1.0, 1.25, 1.5 and 2.0 inch square mesh; 3 x 4 ft frame trap nets (0.25 inch square mesh); 4 x 6 ft frame trap nets (1.00 inch square mesh); and periodic creel census. Gill nets were fished either sinking or floating. Fish were measured to the nearest tenth of an inch and weighed to the nearest hundredth of a pound. Rainbow trout trapped in Ackley Lake were tagged with numbered anchor tags. Rainbow trout strains were marked with fin clips or tetracycline. Gill net survival ratings were grouped under the following categories: good $\geq$ 8.0 fish per net, fair = 4.0-7.9 fish per net and poor = 0.0-3.9 fish per net. Year classes of trout were based on size structure.

Schnabel population estimates were completed on Ackley Lake. The estimate was done from trapping recaptures using the formula from Van Den Avyle 1993:

$$N = \frac{CM}{R} \qquad \text{with variance } V(1/N) = \frac{R}{(CM)^2}$$

FINDINGS

Choteau Management Area

Bean Lake- Equal numbers of Arlee and AXE rainbow trout (20,000 of each strain) are stocked annually in Bean Lake. Overnight gill nets set in September indicate very good survival of the 1996 plant as 82 trout were taken (Table 1). In addition, trout from earlier planting years were also taken. The Arlee strain typically grows better than the AXE during the first year but growth differential is negligible thereafter. Lake levels remained near average throughout the year, however, some runoff entered the lake in early January. Chinook winds melted snow which in turn produced significant runoff due to frozen ground beneath the snow.

Eureka Reservoir- Two rainbow trout strains, AXE and DeSmet, are stocked in Eureka Reservoir. Thirty thousand fish of each strain are stocked annually. Survival of the 1996 plant is rated poor as few trout were taken in the fall netting survey (Table 1). Poor survival was also reported for the 1995 stocking of these strains (Tews et. al. 1996). Reservoir levels reached dead storage by the end of August due to irrigation demand and lack of precipitation. The lake slowly filled throughout the winter.

Nilan Reservoir- A total of 27 rainbow trout were taken in three overnight gill nets in October (Table 1). These fish represent at least two year classes, but only 4 were of the Arlee strain, with the remaining 23 being Eagle Lake. Forty thousand fish of each strain are stocked annually. Eagle Lake rainbow have shown better survival than Arlee for the past three years.

Pishkun Reservoir- Gill nets fished in September captured 60 kokanee salmon, 4 rainbow trout, 13 northern pike, 34 yellow perch and 23 white sucker (Table 1). The kokanee represent fish stocked in 1991 and 1993. The rainbow trout are of the Eagle Lake strain stocked in 1996.

A five-year experiment involving Arlee and Eagle Lake rainbow trout was carried out on this reservoir from 1992-1996. Approximately 20,000 four-inch fish of each strain were stocked annually from 1992 through 1995 along with 5,000 eight-inch fish of each strain. In 1996, 8,000 eight-inch trout of both strains were planted. Results of the experiment are shown in Table 2. Sixteen planted rainbow were found in 46 northern pike stomachs while 11 planted trout were taken in gill net surveys over the five-year period. It is apparent from this data that few trout survive northern pike predation in this water. Those that do survive, exhibit excellent growth as reported by Tews, Liknes and Hill (1995).

Table 1. Overnight gill netting results in coldwater lakes and reservoirs in the Choteau area of Region 4, 1996.

Water (date)	Surface acres	No. of nets[1]	Mean hours fished/net	Species[2]	No. of fish	Length range (mean)	Weight range (mean)
Bean Lake (9/19/96)	180	2S	17.5	Rb	82	7.7-11.3(9.6)	0.20-0.85(0.43)
					7	14.9-17.1(16.2)	1.45-2.08(1.81)
				FHC	1	(6.7)	(0.13)
Eureka Res. (9/20/96)	50	2F	18.0	Rb-D	1	(11.6)	(0.48)
					2	14.7-16.4(15.6)	1.12-1.42(1.27)
				Rb-AXE	1	(8.2)	(0.18)
				LL	1	(21.2)	(3.27)
				WSu	2	7.0-11.2(9.1)	0.11-0.50(0.33)
Nilan Res. (10/4/96)	325	2F 1S	21.5	Rb-A	1	(10.5)	(0.49)
					3	16.3-19.8(18.4)	1.55-3.09(2.32)
				Rb-I	7	7.5- 9.5(8.5)	0.14-0.38(0.24)
					1	(13.9)	(0.87)
					15	14.9-19.2(15.1)	1.30-2.80(1.52)
				WSu	36	7.1-10.6(8.4)	0.15-0.55(0.25)
					3	16.6-18.0(17.4)	2.36-2.58(2.46)
Pishkun Res. (9/18/96)	1200	4S 3F	19.5	Rb-I	4	9.8-10.3(9.9)	0.29-0.41(0.36)
				KOK	60	16.4-22.5(19.1)	1.44-4.42(2.50)
				YP	18	5.3- 8.6(6.6)	0.09-0.36(0.17)
					14	9.1-10.9(9.9)	0.37-0.74(0.58)
					2	11.0-11.5(11.3)	0.83-0.86(0.85)
				NP	7	12.0-15.8(13.7)	0.41-0.90(0.60)
					6	22.1-25.6(24.3)	2.40-5.25(4.13)
Willow Ck Res. (10/4/96)	450	2F	17.0	Rb-AXE	50	6.7- 9.7(8.5)	0.12-0.34(0.24)
					15	14.1-16.9(15.2)	1.03-1.78(1.29)
					1	(21.4)	(3.80)

[1]/ Standard 125 foot experimental nylon gill nets: F = floating; S = sinking.
[2]/ Species abbreviations: Rb = rainbow trout; LL = brown trout; KOK = kokanee salmon; YP = yellow perch; NP = northern pike; WSu = white sucker; FHC = flathead chub.
Strain abbreviations: D = DeSmet; AXE = Arlee-Eagle Lake cross; I = Eagle Lake; A = Arlee.

Table 2. Number of planted rainbow trout taken in gill nets versus those found in northern pike stomachs (Pishkun Reservoir).

Year	No. of gill nets	No. of trout sampled Arlee	No. of trout sampled Eagle Lake	N. Pike stomachs[1]	Trout in stomachs[2]
1992	7	1	1	6	2
1993	8	0	1	7	0
1994	8	0	3	13	7
1995	7	0	1	7	0
1996	7	0	4	13	7

[1]/ Number of northern pike stomachs analyzed (taken in gill nets).
[2]/ Number of trout observed in northern pike stomachs.

Willow Creek Reservoir- Survival of AXE rainbow trout is rated as very good in this reservoir as evidenced by the numbers taken during the fall netting survey (Table 1). Growth rates are lower from this water than other area lakes. However, growth of the AXE strain in this lake is comparable to Arlee and AXE survival is superior to Arlee.

A sink-hole developed in the dam during extremely wet weather in the spring of 1996, necessitating lowering of the lake level to make repairs. At normal pool the lake covers approximately 1500 surface acres, has a capacity of 32,000 acre feet and a maximum depth of about 60 feet. Following drawdown, these parameters were reduced to 450 acres, 5,000 acre feet and 29 feet. The reservoir is expected to return to normal operation beginning with runoff in the spring of 1997.

Miscellaneous Waters- Approximately 2,000 grayling fry were hauled by pack train and stocked in Lake Levale on August 6, 1996. This mountain lake lies below the Chinese Wall in the Bob Marshall Wilderness. Grayling were also stocked in 1993 and 1994. Some of these fish are now approaching 8-10 inches and were observed feeding on the surface.

Great Falls Management Area

Smith River Reservoir - Fall gill netting work in 1996 found poor survival among the Arlee strain of rainbow trout while wild and DeSmet rainbow trout produced fair catches (Table 3). The mean lengths and weights were lowest for the Arlee strain, followed by wild rainbow trout; the DeSmet strain were on average, the largest and heaviest. However, condition factors were the highest for the Arlee strain of rainbow trout.

We also captured several other species of interest during the annual gill netting at Smith River Reservoir. They included mountain whitefish, burbot, longnose sucker, and white sucker, which averaged 1, 3, 13.5, and 13 per net, respectively.

Newlan Creek Reservoir - During netting activities in 1996, we averaged 7 Yellowstone cutthroat trout in each net set (Table 3), which would be rated as fair survival; however, this is 2 fish per net higher than 1995 (Tews et al. 1996) and the greatest catch per net since 1989. The Yellowstone cutthroat trout captured averaged only 10.5 inches in length and 0.44 pounds. All rainbow trout catches combined produced a catch of 5.4 fish per net or fair survival. The rainbow trout caught also had a relatively short mean length. We also captured ling and longnose suckers, which averaged 1.3 and 20.3 fish per net, respectively.

Table 3. Overnight gill netting results in large lakes and reservoirs in north central Montana during 1996.

Water name (Date surveyed)	Surface acres	# of[1] nets	Mean hours fished/net	Species[2] strain & year planted	Total # of fish	Length (in) Range	Length (in) (Mean)	Weight (lbs) Range	Weight (lbs) (Mean)	Condition Factor Range	Condition Factor (Mean)
Ackley (9/30/96)	240	2F,2S	22.1	Rb-A-96	3	10.0-11.5	(10.8)	0.40-0.56	(0.49)	33.5-42.1	(38.5)
				Rb-I-96	13	8.0-10.6	(9.7)	0.20.0.43	(0.36)	31.4-43.3	(37.6)
				Rb-A-95	3	14.1-15.7	(14.8)	1.03-1.52	(1.25)	36.7-39.4	(38.5)
				Rb-I-95	15	13.9-15.8	(14.7)	0.95-1.50	(1.19)	34.1-41.2	(37.3)
				Rb-I-94+	11	16.6-18.4	(17.5)	1.55-2.27	(1.90)	31.4-38.9	(35.1)
				MW	1	-	(13.0)	-	(0.92)	-	(41.9)
				WSu- small	51	6.0- 9.4	(7.2)	0.08-0.40[3]	(0.16)	27.8-51.4	(36.2)
				WSu- large	66	12.3-19.5	(16.8)	0.86-3.00[3]	(2.19)	13.4-52.2	(43.1)
				LnSu	114	6.6-18.6	(15.9)	0.09-2.85[3]	(1.83)	30.4-52.6	(41.5)
Bair (10/2/96)	272	2s	22.9	Rb-I-96	59	6.8- 9.8	(7.9)	0.10-0.28	(0.16)	24.3-39.4	(31.1)
				Rb-I-95	50	10.0-14.5	(11.6)	0.30-0.98	(0.46)	19.1-40.5	(28.9)
				EB	4	9.3-13.7	(10.8)	0.26-0.70	(0.39)	26.2-39.8	(30.0)
				WSu	332	6.1-14.5	(10.3)	0.07-1.10	(0.41)	17.3-44.1	(33.3)
Martinsdale (10/7/96)	1000	3F,1S	18.4	Rb-1996-A	26	9.9-12.3	(11.1)	0.40-0.80	(0.60)	35.0-49.0	(42.8)
				Rb-1995-A	34	14.7-16.8	(15.5)	1.24-2.10	(1.56)	34.6-47.5	(41.6)
				Rb-1994-A	1	-	(17.8)	-	(2.35)	-	(41.7)
				YCT	5	10.4-11.9	(11.0)	0.38-0.59	(0.47)	32.4-38.6	(35.1)
				LL	6	15.4-34.2	(20.6)	1.30-12.2	(3.80)	30.5-42.9	(35.6)
				WSu	197	7.4-18.2	(13.1)	0.18-2.40	(1.02)	19.1-57.1	(41.3)
				LnSu	22	7.2-17.8	(13.1)	0.06-2.45	(0.95)	15.9-51.2	(36.7)
Newlan Creek Res. (10/21/96)	280	2F,1S	17.7	YCt	22	9.4-17.8	(10.5)	0.29-1.82	(0.44)	29.2-42.4	(35.3)
				Rb-I-1996	14	6.9-9.2	(8.3)	0.12-0.39	(0.26)	33.2-58.3	(43.4)
				Rb-I-1995	2	11.0-11.3	(11.2)	0.53-0.59	(0.56)	39.8-40.4	(40.4)
				LnSu	61	8.3-15.3	(12.9)	0.20-1.34	(0.80)	29.6-46.5	(36.6)
				Ling	4	15.6-20.0	(17.8)	0.84-2.08	(1.43)	22.1-26.0	(24.4)
Smith River Res. (10/21/96)	327	1F,1S	15.2	Rb-A-1995	6	10.2-14.1	(12.0)	0.55-1.14	(0.77)	39.5-51.8	(44.2)
				Rb-Wild	14	6.8-15.6	(12.7)	0.14-1.33	(0.86)	29.5-47.2	(38.8)
				Rb-D-1995,1996	14	12.5-15.6	(13.9)	0.82-1.28	(1.03)	32.3-44.3	(38.9)
				MW	2	14.6-16.2	(15.4)	1.18-1.48	(1.33)	34.8-37.9	(36.4)
				LnSu	27	6.9-18.2	(14.7)	0.12-2.48	(1.59)	35.8-56.8	(43.0)
				WSu	26	6.0-17.4	(14.6)	0.10-2.54	(1.65)	40.0-53.1	(48.7)
				Burbot	6	12.5-23.0	(16.0)	0.49-3.62	(1.22)	21.3-29.8	(24.1)
Yellowwater (9/10/96)	193	1F,1S	20.5	Rb-All	27	13.1-20.9	(17.1)	1.00-3.92	(2.22)	35.3-59.0	(43.5)
				RB-I	7	13.1-16.8	(15.4)	1.00-1.93	(1.57)	40.6-44.5	(42.1)
				WSu	26	11.0-15.3	(13.1)	0.50-1.92	(0.93)	34.5-81.6	(41.1)
				Carp	1	-	(9.8)	-		-	

1-Standard experimental gill nets (nylon and monofilament) F=Floating;S=Sinking 2-Species abbreviations: Rb=Rainbow trout; YCt=Yellowstone cutthroat trout; MW=Mountain Whitefish;WSu=White sucker; LnSu=Longnose sucker; Strain abbreviations: A=Arlee; D=DeSmet; I=Eagle Lake; 3-subsample of weights taken.

Lewistown Management Area

Ackley Lake - Spring trap netting of rainbow trout was completed April 15, 1996 through April 25, 1996. A total of 402 rainbow trout were tagged during 28 trap nights. Ninety-three percent of the trout captured were Eagle Lake rainbow (Table 4). The Schnabel estimate for Eagle Lake rainbow trout based on recaptures from trapping was 1042 fish with a 95% confidence interval of 858 - 1326. This overlaps with last years estimate of 829 (634 - 1213). A population estimate using creel data was not done since only 2 tagged fish were seen during the creel survey. Ten percent of the 1996 tags were returned voluntarily during 1996, compared with 14% of the 1995 tags in 1995. Very few tags were returned after the first year. Tagged fish exhibited very slow growth. Average growth at recapture was -0.3 inches (N=23).

Fall gill netting found survival was poor for all year classes of rainbow (Table 3), but combined survival for all rainbow was rated as good. Rainbow numbers were the lowest found since Ackley Reservoir was poisoned in 1985 (Figure 1). Longnose sucker numbers were the highest ever seen (Tews et al. 1995). White suckers were at higher levels than they have been since 1993 (Figure 1).

Based on fall gill netting, Eagle Lake rainbow continue to outperform and to be longer-lived than Arlee (Figure 2). Catch statistics for creel data collected in 1996 are in Appendix 1. Creel data also indicate that Eagle Lake rainbow outperformed Arlee (Table 5). These are similar results to what was seen last year (Tews et al. 1996). In prior years creel surveys found Arlee were generally caught at least as often as Eagle Lake (Tews et al. 1995). Based on strain analysis for the past 10 years, stocking rates will be changed in 1997 to 30,000 Eagle Lake and 10,000 Arlee instead of 20,000 of each strain. This is the last year rainbow strain evaluation is planned for Ackley Lake.

Bair Reservoir- Numbers of rainbow caught in gill nets were as high as they had been for the past 25 years (Figure 3) and survival for 1995 and 1996 plants was rated as excellent (Table 3). White suckers were also captured at extremely high levels. Rainbow with more than 2 summers of growth continue to be absent from gill nets. During the last 10 years, these older fish were only captured in 1989. Bair Reservoir rainbow continue to have extremely slow growth compared to other large Lewistown area reservoirs. For example, Eagle Lake rainbow with 2 summers growth in Bair Reservoir have averaged less than 0.5 lbs since 1990, but in Ackley Lake the same age Eagle Lake rainbow weigh about 1.5 pounds (Table 3, Tews et al. 1995, Hill et al. 1993,

Table 4. Trap netting catch during 28 trap nights on Ackley Lake conducted April 15-25 1996 with water temperature 42 - 44 °F.

Species & Strain[1]	Total # of fish	Length (in) Range	(Mean)	Weight (lbs) Range	(Mean)	Condition Factor Range	(Mean)
Rb-I	375	8.6-21.4	(16.5)	0.24-3.31	(1.72)	24.7-52.3	(36.9)
Rb-A	27	8.7-20.7	(14.8)	0.30-4.70	(1.42)	27.5-53.0	(39.9)
WSu	about 4200[2]	7.5-19.7	(16.1)	0.16-3.88	(1.99)	29.8-91.9	(45.9)
LnSu	about 600[2]	14.5-18.1	(16.0)	1.25-3.14	(1.85)	33.0-53.0	(43.8)

1-Rb = rainbow trout, A = Arlee strain, I = Eagle Lake strain, 2-only 320 WSu and 43 LnSu were measured, numbers reflect total estimate of trapped fish

Table 5. Rainbow trout statistics from Creel harvest data April - May 1996.

Species	Number measured	% of catch	Length Range	(Average)	Weight Range	(Average)
Arlee	25	26	10.2-18.6	(13.4)	0.44-2.16	(1.09)
Eagle Lake	70	74	10.2-18.3	(14.7)	0.48-2.10	(1.35)

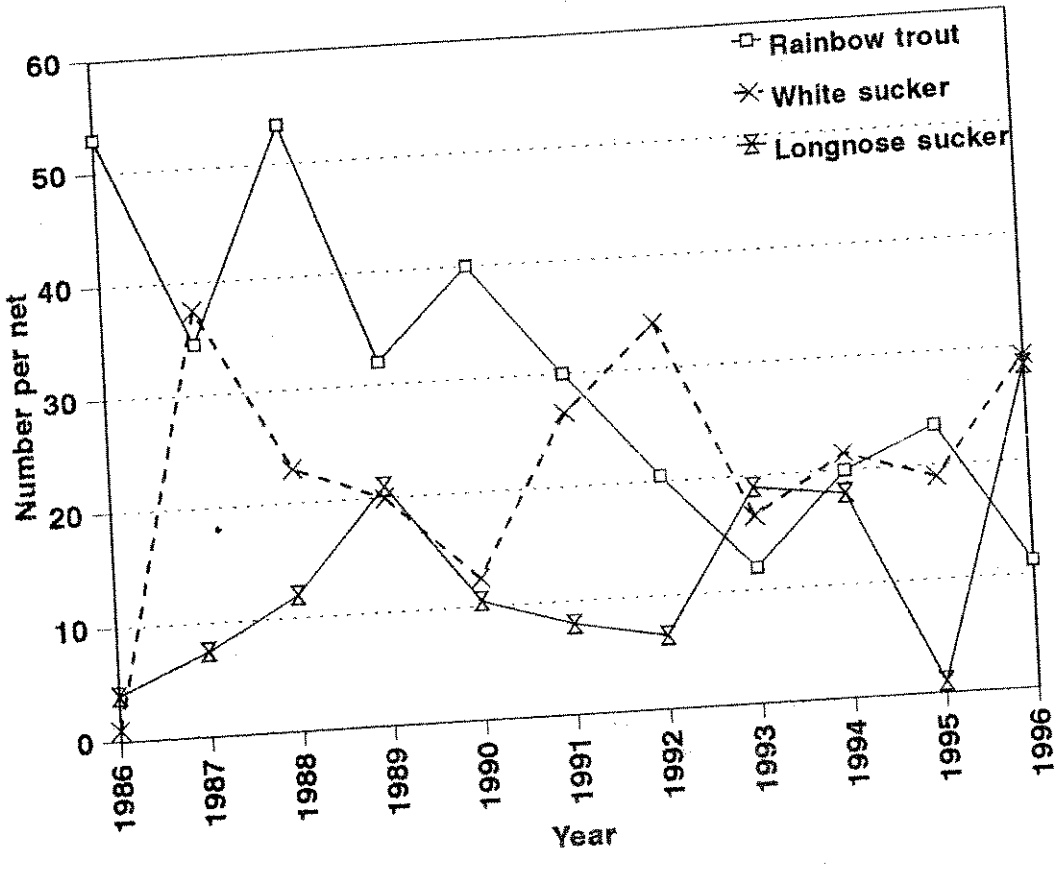
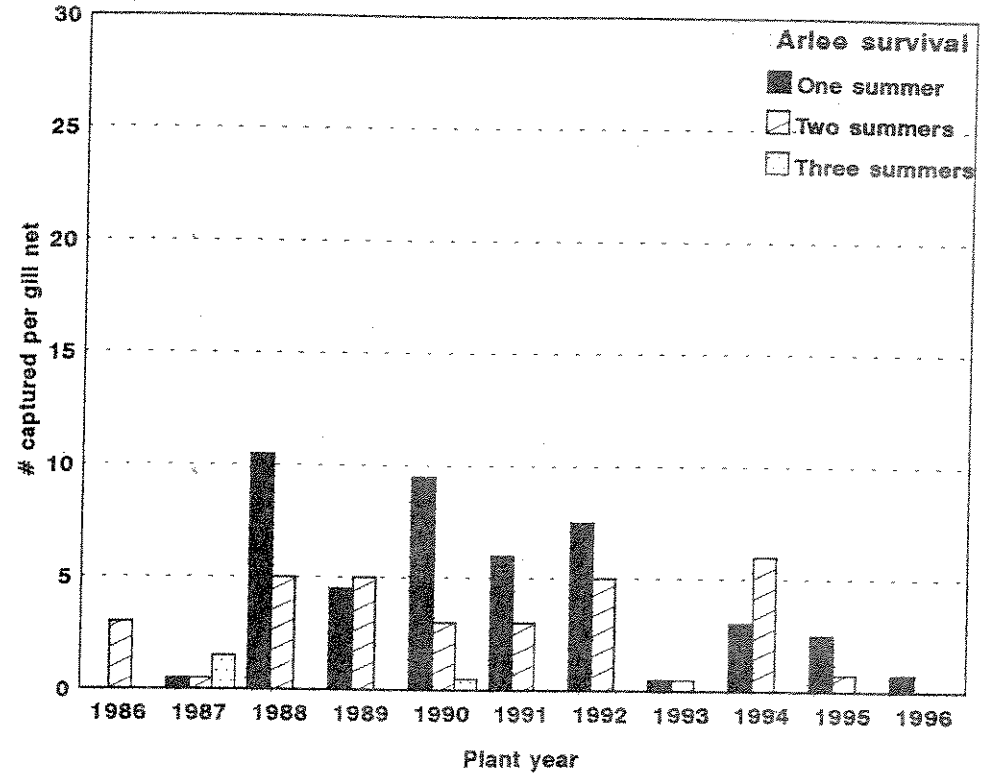


Figure 1. Fall catch per net of common species from floating and sinking gill nets in Ackley Lake 1986 - 1996.



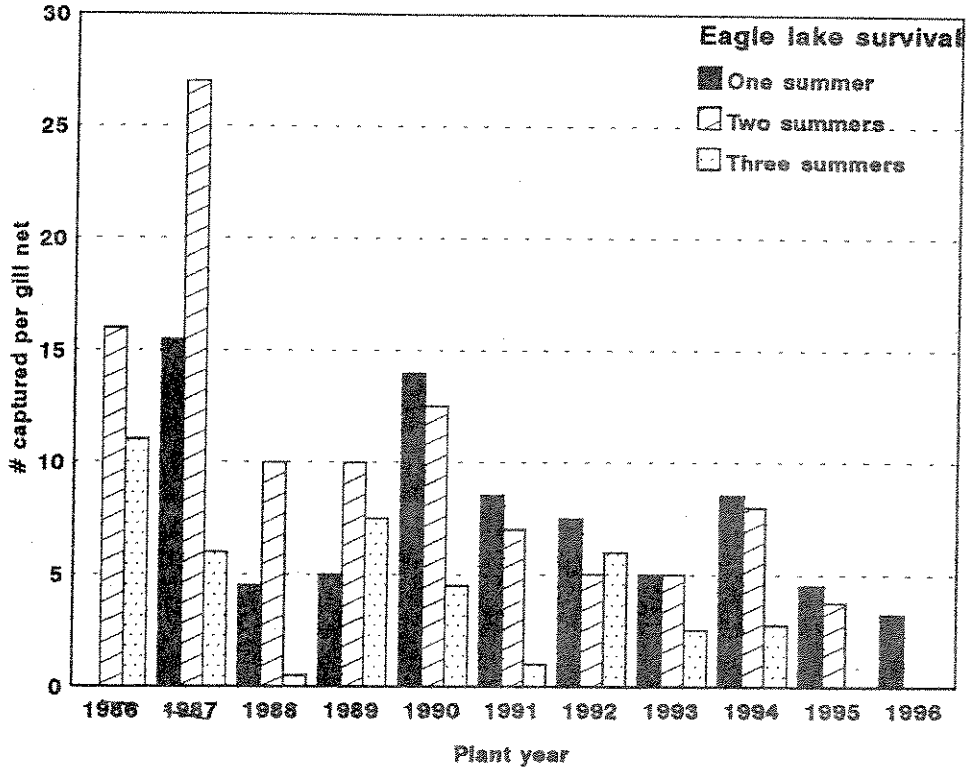


Figure 2. Survival of various year classes of Arlee and Eagle Lake rainbow trout captured per net in fall gill nets in Ackley Lake from 1986-1996.

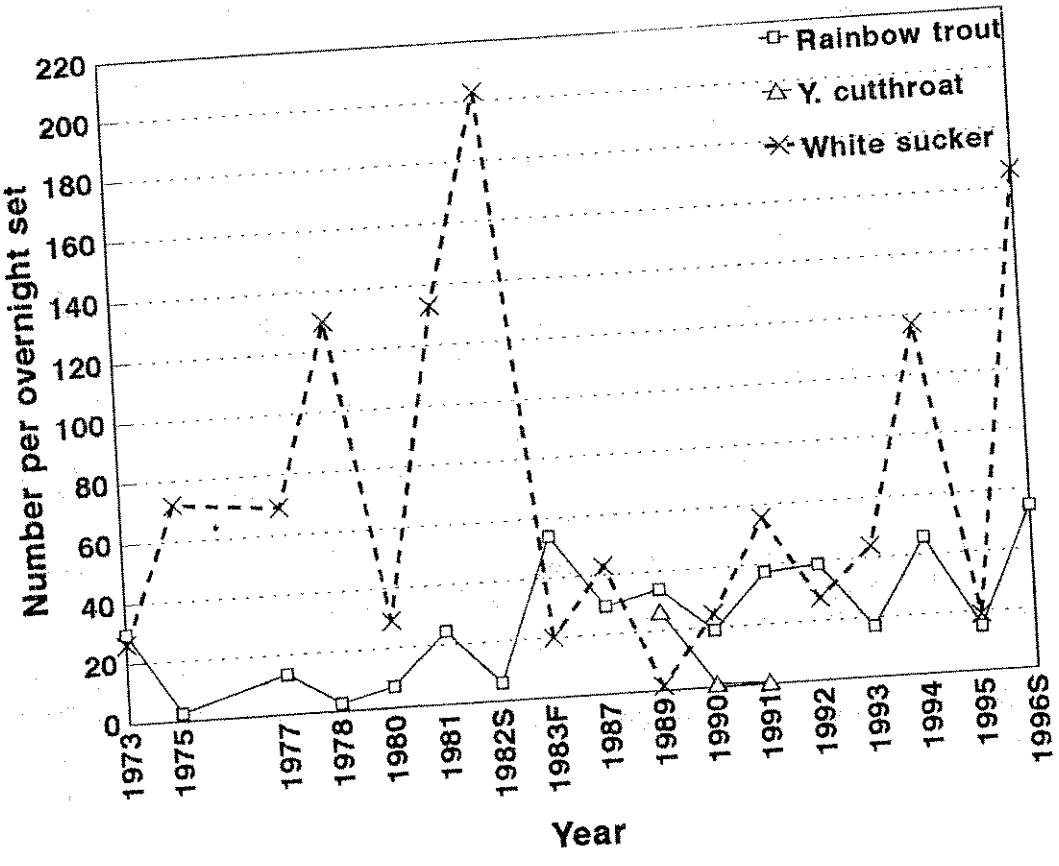


Figure 3. Fall gill net catch per net for common species in Bair Reservoir. Floating and sinking gill nets except those designated by an S are sinking only and those designated by an F are floating only.

and Lewistown files). First year growth is also very slow in Bair Reservoir averaging 1 - 1.5 inches less than seen in Ackley Lake or Martinsdale Reservoirs (Table 6). Competition for food with the abundant small white suckers, high elevation and the steep sided nature of the reservoir probably cause this slow growth. Excellent growth was observed after reservoir draining in 1988 which corresponded to extremely low white sucker numbers (Hill et al. 1990). Extreme drawdown as seen several times in the 1980's is not expected in the future, since the Montana Department of Natural Resources and Conservation is in the process of determining maximum and minimum pools on this and other reservoirs (Jon Hunter, Montana Department of Natural Resources, Lewistown, personal communications).

Martinsdale Reservoir- Gill net catch of rainbow increased slightly from 1995 and survival was rated as fair for 1995 and 1996 plants (Table 3, Figure 4). As in the past few years survival was rated as very poor for older fish. White sucker gill net catch was the highest seen since 1991 (Figure 4). Yellowstone cutthroat survival from the 6 inch 1996 plant was rated as poor, but was the only plant from which cutthroat were caught. No evidence of the 40,000 three inch Yellowstone cutthroat stocked in September 1994 was seen in 1995 or 1996.

Yellow Water Reservoir- Water levels remained high in this reservoir. The number of rainbow and white suckers caught in gill nets declined by about 40% from 1995 (Figure 5). Carp were captured for the first time since 1984 (Lewistown files). Numbers of rainbow captured overall was good and the largest fish caught was 3.92 pounds (Table 3). Average size and weight was larger than found in 1995 (Tews et al. 1996). Fishing pressure increased nearly 10 fold from 1993 - 1995 with point estimates increasing from 789 to 7587 angler days (Montana Statewide Angling Pressure 1993, 1995). This could be responsible for the decrease in fish numbers seen in the last 3 years. Rainbow stocking has been increased to about 24,000 annually which is about 135 trout per acre, a similar level to other large reservoirs in central Montana.

Table 6. Average first year growth for rainbow trout found in three Lewistown area reservoirs from 1991-1995 from FINS (1996) computer program and fall gill netting.

Reservoir	Rainbow strain	Average growth (inches)
Ackley Lake	Eagle Lake	6.5
	Arlee	6.2
Bair	Eagle Lake	4.6
Martinsdale	Arlee	5.6

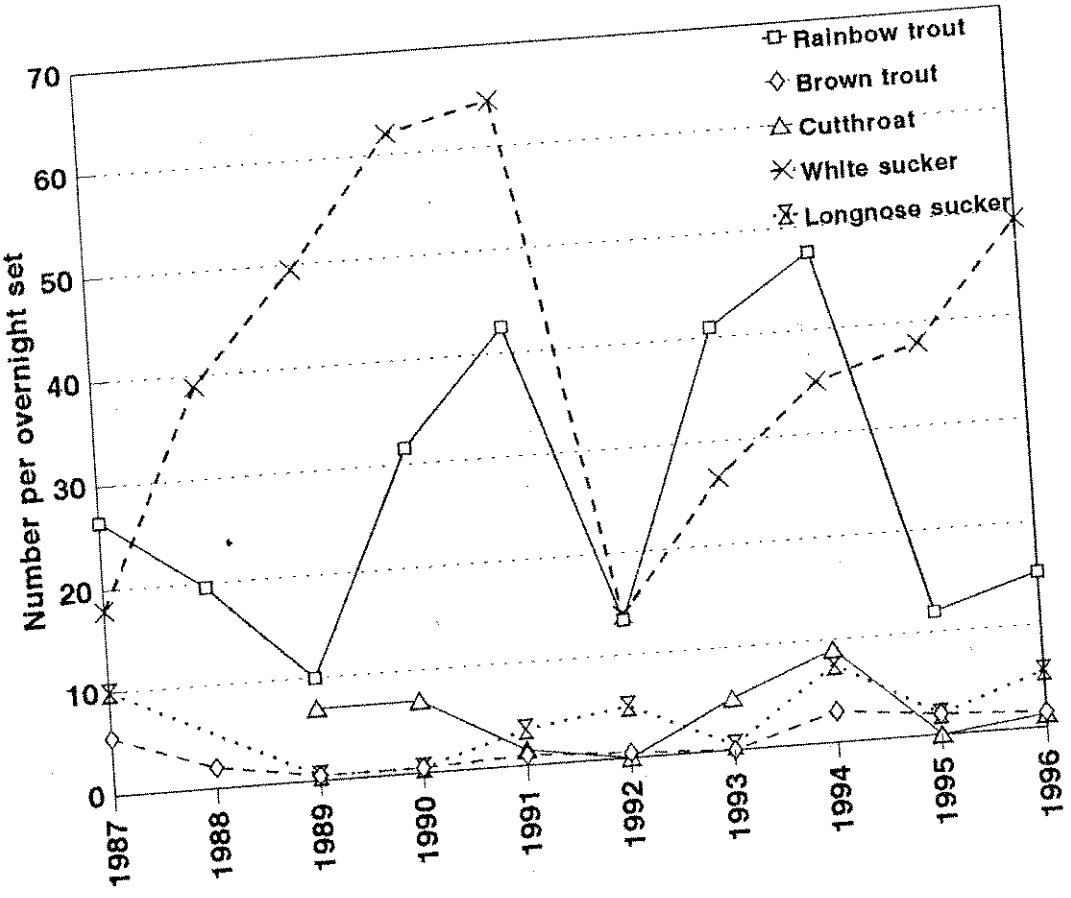


Figure 4. Fall gill netting results from Martinsdale Reservoir.

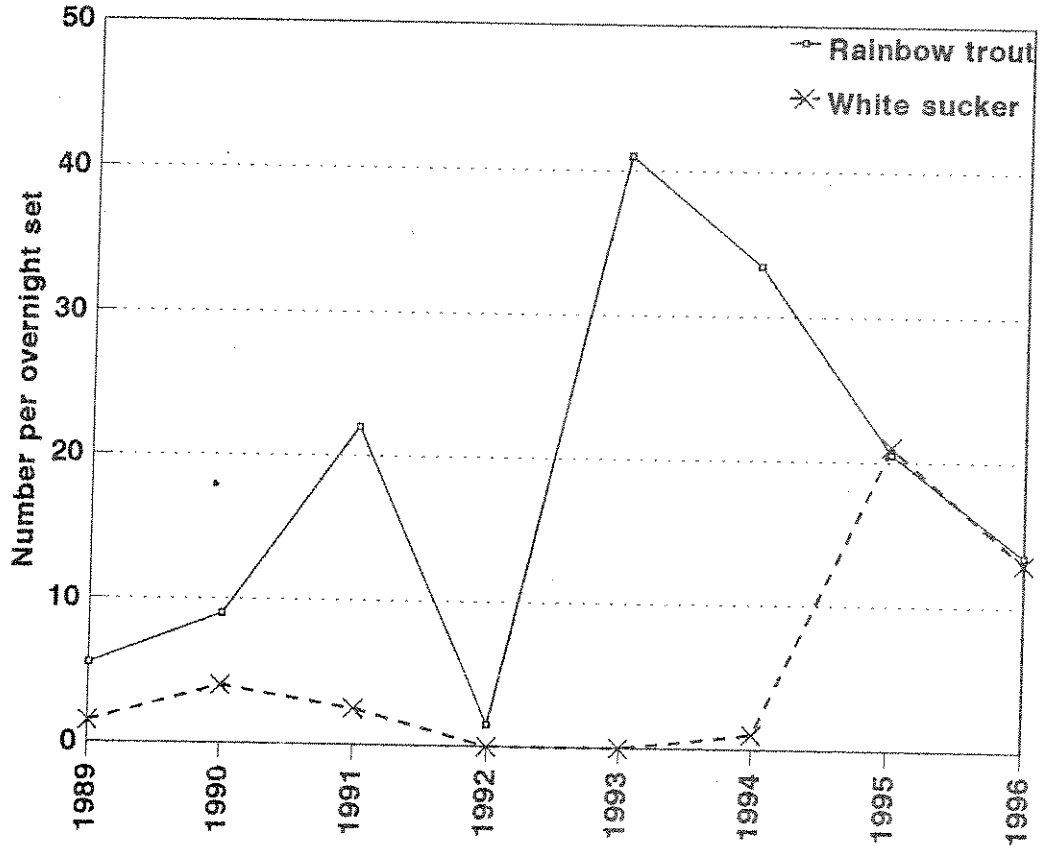


Figure 5. Fall gill netting results from Yellowwater Reservoir since 1988 drawdown.

Small Lewistown Area Reservoirs

Big Casino Reservoir - Environmental Assessments were written to drain, rotenone and introduce walleye into this reservoir. Due to comments by a water right holder on Big Casino Creek the pond was not poisoned. The City of Lewistown drained the reservoir on 10/21/96. It was completely drained by 10/24/96. The reservoir was completely drawn down for about 2 days prior to refilling. Downstream landowners were quoted as saying about the draining, "suckers were so thick in the creek it could be crossed without getting your feet wet." Walleye will be introduced as a predator control measure in 1997. Gill netting results prior to draining indicated that suckers were a big problem. Over 400 suckers were caught in a single sinking gill net (Table 7).

Buffalo Wallow Reservoir-Rainbow survival in Buffalo Wallow Reservoir was excellent (Table 7). No yellow perch were captured indicating a successful rotenoning job in 1994.

Hanson Creek Reservoir -Survival was excellent for the 1995 plant (Table 7). Two Irwin rainbow trout stocked in February 1996 survived to be captured during the spring gill netting.

Upper Carter Pond - Only 2 rainbow were captured, but anglers reported catching several size classes of rainbow trout throughout 1996 (Table 7). Both Upper and Lower Carter ponds have numerous brook sticklebacks. About 200 sticklebacks were captured in a 20 x 40 haul in Upper Carter pond.

Table 7. Overnight gill netting results in small reservoirs in north central Montana during 1996.

Water name (Date surveyed)	# of[1] nets	Mean hours fished/net	Species strain & year planted	Total # of fish	Length (in) Range	Length (in) (Mean)	Weight (lbs) Range	Weight (lbs) (Mean)	Condition Factor Range	Condition Factor (Mean)
Big Casino Creek Reservoir (9/3/96)	1S	19.0	Rb-A/I-96	9	8.4-10.5	(9.1)	0.19-0.46	(0.28)	32.1-42.3	(36.0)
			WSu	40J	6.0-12.8	(7.9)	0.08-0.73[2]	(0.25)	27.9-41.9	(33.8)
Buffalo Wallow Reservoir (6/2/96)	1S	18.8	Rb-95	38	9.4-13.4	(11.9)	0.33-0.90	(0.66)	34.1-49.2	(39.2)
Carter Pond - Upper (5/6/96)	1S	18.2	Rb-A-95	2	11.6-12.4	(12.0)	0.79-0.84	(0.82)	44.1-50.6	(47.3)
Hanson Creek Reservoir (5/28/96)	1S	18.5	Rb - 95/96	10	5.5- 6.9	(6.0)	0.06-0.12	(0.08)	31.3-39.9	(36.2)
			Rb - 95	45	10.0-14.6	(11.7)	0.37-1.32	(0.67)	33.9-55.7	(40.8)

1-S = sinking net; 2-Subsample of weights taken

DISCUSSION

It is recommended to continue stocking of the various strains of rainbow trout into Choteau area waters. On some waters, it is important to stock two strains. Hopefully, one strain will maintain a fishery should the other have poor survival. Little opportunity exists to improve water levels in Eureka Reservoir, but the irrigation district should be encouraged to continue increasing water levels through the winter as they presently do. The trout population in Willow Creek Reservoir should be closely watched for changes in condition that could arise from increased competition with suckers due to lowering of water levels for dam repairs. Mitigation should be requested if it appears that the trout population has been harmed. Additional stocking of grayling into Lake Levale should be delayed until it can be determined whether or not natural reproduction is occurring. Predation by northern pike on stocked rainbow trout in Pishkun Reservoir is considered excessive and it is recommended to delete future plants. It is also recommended to replace the trout plants with kokanee salmon as they are able to occupy habitat not normally frequented by northern pike.

The DeSmet plants should be continued in Smith River Reservoir. If sampling shows low survival of the Arlee strain in 1997, an alternative strain should be planted in Smith River Reservoir. The Eagle Lake rainbow plants in Newlan Creek Reservoir should be continued for another year. We should consider adding another strain of rainbow trout in Newlan Creek Reservoir.

We should consider stocking a predator species in Bair Reservoir to reduce the white sucker population since the rainbow rarely exceed 1 pound and typically do not grow over 0.5 pounds. Smallmouth bass have had an impact on the sucker population in Bearpaw Lake by eating YOY suckers. Tiger Muskie may be a possibility for reducing numbers of large suckers but would also impact the trout population. The high elevation of Bair Reservoir and cold winter temperatures make introduction of these warmwater species problematic. If Yellowstone cutthroat from the 1996 plant of three inch fish in Martinsdale Reservoir are not seen in 1997, then September stocking of these small fish should be abandoned. We should consider stocking of Eagle Lake rainbow trout in Martinsdale Reservoir, in addition to Arlee. Based on what has been observed in Ackley Lake, it is likely the Eagle Lake strain will be longer lived and result in larger fish in Martinsdale.

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REFERENCES

FINS computer program. 1996. Montana Department of Fish, Wildlife and Parks, Bozeman, Montana.

Hill, W.J. and G.A. Liknes. 1993. Northcentral Montana Coldwater Lakes Investigations. Montana Department of Fish, Wildlife and Parks. Job Progress Report F-46-R-6, Job IIe, Helena.

Hill, W.J., G.A. Liknes and S.A. Leathe. 1990. Northcentral Montana coldwater lakes investigations. Survey and inventory of coldwater lakes. Montana Department of Fish, Wildlife and Parks, Fisheries Division. Job Progress Report F-46-R-3, Job II-e, Helena.

Montana Statewide Angling Pressure. 1993. Montana Fish, Wildlife and Parks.

Montana Statewide Angling Pressure. 1995. Montana Fish, Wildlife and Parks.

Tews A.E., G. A. Liknes and W.J. Hill. 1995. Northcentral Montana coldwater lake ecosystems. Montana Department of Fish, Wildlife and Parks. Job Progress Report F-78-R-1.

Tews, Anne E., G. A. Liknes and W. J. Hill. 1996. Northcentral Montana coldwater lake ecosystems. Montana Department of Fish, Wildlife & Parks. Job Progress Report F-78-R-2. Helena.

Van Den Avyle, M.J. 1993. "Dynamics of Exploited Fish Populations," in *Inland Fisheries Management in North America*. C.C. Kohler and W.A. Hubert editors. American Fisheries Society. Bethesda, Maryland

Principal Fish Species Involved: Rainbow trout, Yellowstone cutthroat trout, arctic grayling, brown trout, kokanee salmon, eastern brook trout, burbot, white sucker, longnose sucker.

Code Numbers of Waters Referred to in Report:

14-7320	Eureka Reservoir
16-4300	Ackley Lake
16-4260	Upper Carter Pond
16-4620	Lower Carter Pond
16-4628	Big Casino Creek Reservoir
16-5535	Hanson Creek Dam
17-8720	Bean Lake
17-9330	Newlan Creek Reservoir
17-9616	Smith River Reservoir
18-7340	Buffalo Wallow Reservoir
18-7750	Bair Reservoir
18-8380	Martinsdale Reservoir
18-9500	Yellow Water Lake
20-7650	Lake Levale
20-7900	Nilan Reservoir
20-7950	Pishkun Reservoir
20-8500	Willow Creek Reservoir

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Appendix 1 . Creel survey data April-May 1996 from Ackley Lake.

Month	Type	# Interviews	# hours fished	# Rb kept	# Rb caught	harvest rate (#/hour)	Catch rate (#/hour)
April	Boat	0	0.0	-	-	-	-
	Shore	10	39.1	7	9	.18	0.23
May	Boat	18	50.5	20	30	0.40	0.59
	Shore	53	116.8	13	15	0.11	0.13
June	Boat	21	55.7	39	40	0.70	0.72
	Shore	32	79.4	18	19	0.23	0.24
Sept	Boat	3	6.8	3	3	0.44	0.44
	Shore	2	4.0	2	2	0.50	0.50
Total	Boat	41	110.2	61	72	0.55	0.65
	Shore	98	242.1	41	46	0.17	0.19
	All	139	352.3	102	118	0.33	0.29