# Fisheries Division Federal Aid Job Progress Report

Montana Statewide Fisheries Management

Federal Aid	
Project Number:	F-113-R1; F-113-R2
Project Title:	Statewide Fisheries Management
Job Title:	Northcentral Montana Coldwater Reservoir and Lake Ecosystems
Project Numbers:	3430; 3440; 3450

#### 2001 ANNUAL REPORT (January – December 2001)

## ABSTRACT

In the Great Falls area, Newlan Creek Reservoir, Hound Creek Reservoir and Englandt Reservoir were inventoried in 2001. Rainbow catch was good and Yellowstone cutthroat trout catch was fair in Newlan Creek Reservoir. In Hound Creek Reservoir, gill nets were set for 76 nights to evaluate the success of the 2000 chemical rehabilitation. One brook trout and one white sucker were captured. One black bullhead was captured in Englandt Reservoir. Nine waters were sampled in the Lewistown area. Rainbow trout gill net catch increased from 1999 - 2000 in Ackley Lake. In Bair Reservoir, rainbow trout catch was excellent but Yellowstone trout catch poor. Over two tons of white suckers were slaughtered and returned to Big Casino Reservoir. Rainbow trout length and weight increased dramatically after sucker treatment. Walleye were captured at record high numbers Big Casino Reservoir in September 2001. The illegally introduced yellow perch reproduced in Big Casino in 2001. Rainbow trout stocking has been discontinued in Fritzner Reservoir due to water quality problems.

## **OBJECTIVES**

The purpose of this project is to implement the Fisheries Program on coldwater lake ecosystems in the Missouri River drainage in northcentral Montana. Major watersheds include the Missouri, Sun, Teton, Smith, Marias, Judith and Musselshell drainages.

The mission of the Fisheries Division of MTFWP is to preserve and enhance aquatic species and their ecosystems to meet public demand for recreational opportunities while assuring stewardship of aquatic life. The Fisheries Program is divided into four major elements, with objectives and outcomes as follows:

The **Fisheries Management** element of the fisheries program has 21 objectives and the following desired outcomes:

- 1. A healthy aquatic resource, including native-species fisheries and sport fisheries.
- 2. Public satisfaction with available angling opportunities.
- 3. Public support for ongoing efforts to restore, maintain, and protect the state's aquatic resources.

The **Habitat** element of the fisheries program has 15 objectives and the following desired outcomes:

- 1. Diverse, high-quality aquatic ecosystems that support healthy fish populations and provide fishing opportunities.
- 2. Public participation in efforts (of MTFWP as well as other state and federal agencies) to conserve and improve fish habitat through formation of watershed protection groups and partnerships for the protection and restoration of habitat.

The **Fishing Access** element of the fisheries program has 16 objectives and the following desired outcomes:

- 1. Provide a diversity of fishing opportunities throughout the state that might otherwise be unavailable.
- 2. Provide the public with a variety of incidental, non-angling recreational activities by maintaining access to Montana's waters through the fishing access site program.

The **Aquatic Education** element of the fisheries program has 11 objectives and the following desired outcomes:

- 1. Opportunities for the public, youth and adults, to learn about the state's aquatic ecosystems and their importance.
- 2. Fishing and water safety skills for program participants.
- 3. Enhanced public understanding of Montana's natural and cultural resources.
- 4. An educated public able to make informed decisions about using and preserving Montana's aquatic resources.

## 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 and 4 x 6 ft frame trap nets (1.00 inch square mesh). Shoreline seining was completed with a 50 x 4 ft 1/8 inch mesh beach seine and a 100 x 12 ft <sup>1</sup>/<sub>4</sub> inch mesh beach seine. 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 strains were marked with tetracycline. Gill net survival ratings were grouped under the following categories: good >= 8.0 fish per net, fair = 4.0 - 7.9 fish per net and poor = 0.0 - 3.9 fish per net. Year classes were based on size structure and, in Newlan Creek Reservoir, on tetracycline marks. The W<sub>r</sub> (relative weight) of most species was

calculated using the standard weight equations of Anderson and Neuman (1996) and Bister et al. (2000). Relative weight can vary based on size and season, however high and low values at any time can indicate problems or opportunities for the fishery (Anderson and Neuman 1996). According to Flickinger and Bulow (1993), fish with  $W_r$  close to 100 are in balance with their food supply, while values below 85 may indicate poor food availability and  $W_r$  above 105 may indicate an opportunity to stock more fish.

## Great Falls Management Area

<u>Newlan Creek Reservoir</u> – In 2001, Newlan Creek Reservoir was stocked with approximately 32,000 Eagle Lake rainbow trout, 10,500 Yellowstone cutthroat trout and 526 Yellowstone cutthroat trout (retired brood) from Big Timber State Hatchery. Fall experimental gill nets produced a catch of 8.5 rainbow trout per net. The 1998 and 2001 plants of the Eagle Lake strain each comprised 41% of the rainbow catch. One rainbow stocked in 2000 was captured and was similar in size to the average 1998 rainbow trout. Two wild rainbows and one Eagle Lake rainbow trout from the 2000-year class were also captured. Eagle lake rainbow trout were not stocked in 1999 due to low water. The catch of Yellowstone cutthroat trout was 6.5 per net. This catch rate was half the catch rate seen in 1999 (Tews et al. 2001) comprising ten cutthroat trout from the 2001 fingerling stocking and three of the 2001 retired brood. Although the sample size of 38 longnose suckers per net was similar to recent years (Tews et al. 2001), the mean size increased over an inch to 13.7 inches. Mean  $W_r$  for the rainbow trout and Yellowstone cutthroat trout year classes varied between 73 and 86 (Table 1). One burbot was sampled in 2001.

<u>Englandt Reservoir</u> – Reservoir levels have declined during recent drought years to a maximum depth of 5-6 feet while surface acreage has decreased from 28 acres at full pool to a shallow 15 acres. The Eagle Lake strain of rainbow trout has not been stocked in the reservoir since 1999. In recent years anglers have reported the return of black bullheads after being absent since a reported winterkill in April 1993. Numerous decaying black bullhead carcasses were observed along the shoreline in early May 2001 while surveying the reservoir. One sinking experimental gill net fished overnight in May 2001 sampled one 8.0-inch bullhead weighing 0.31 pounds (Table 1). When water levels improve, a survey will be conducted to determine the status of black bullheads and the potential to restock rainbow trout.

<u>Hound Creek Reservoir</u> – A total of 34 gill nets were set from July 13 – September 25 for 76 total nights to evaluate the success of the 2000 chemical rehabilitation (Table 2). On July 13, 2001, one 10-inch long brook trout was sampled in a sinking gill net and one 7.5–inch long white sucker was sampled in a sinking gill net on Sept 25, 2001. Approximately 2,100 Arctic grayling were stocked into Hound Creek on July 31, 2001. Hound Creek will be surveyed in 2002 using trap nets to evaluate the arctic grayling plant and the status of brook trout and white sucker populations.

#### Choteau Management Area

Information from the Choteau Area will be included in an upcoming report.

## Lewistown Management Area

Nine waters were netted in the Lewistown Area in 2001 (Table 1). Drought continued to plague northcentral Montana throughout 2001. Trout plants were reduced in Yellow Water Reservoir and Martinsdale Reservoir. Some small ponds were not stocked.

<u>Ackley Lake</u> – Rainbow trout gill net catch increased from about 19 per net in 1999 and 2000 to 28 per net in 2001 (Figure 1). Combined catch of white suckers and longnose suckers was similar to 2000. In 2001, overall rainbow trout catch rates were excellent but catch of trout stocked in 2001 was fair, and Arlee from the 2001 stocking were not captured (Table 1). In Ackley Lake approximately 10,000 Arlee and 30,000 Eagle Lake are stocked annually. For strain evaluation, Eagle Lake rainbow trout are marked. Arlee rainbow trout are not marked and cannot be differentiated from wild fish. It is likely that at least some of the six 16-inch plus unmarked rainbow trout captured are wild fish that enter Ackley Lake via the supply canal. Past strain evaluations (Tews et al. 1997) found that Arlee rainbow trout rarely reach 16-inches in Ackley Lake. Mountain whitefish also enter the lake via the canal.

<u>Bair Reservoir</u> –Despite drawdown to below the recommended minimum pool, the reservoir was still about 25 feet deep when netted in September 2001. Catch was excellent for rainbow trout and was higher than observed since 1996 (Figure 2). Total length of Age 1 rainbow trout was similar to 1999. However, average total length for all rainbow trout was longer than found since the 1970's. Rainbow trout  $W_r$  declined dramatically from 1999 to 2000. Mean  $W_r$  was the lowest found in any northcentral Montana reservoir this year (Table 1). Mean white sucker length at 12.3 inches was the longest ever recorded (Lewistown data files). Yellowstone cutthroat trout catch remained poor (Table 1).

<u>Martinsdale Reservoir</u> – Gill nets were not set in Martinsdale. Repairs to the outlet structure required extreme draw down. In November the reservoir only held 180 acre-feet compared to a recommended minimum pool of 1,200 - 1,500 acre-feet.

Small Lewistown Area Reservoirs

<u>Big Casino Reservoir</u> – A total of 4615 white suckers (4753 pounds) were captured in Big Casino Reservoir during 22 trap nights (Table 3). The white suckers were slaughtered and biomass returned to Big Casino Reservoir. Schnabel multiple removal population estimates (Van Den Avyle 1993) were calculated for trapped rainbow trout and walleye. During trapping, 270 rainbow trout were captured and 65 were recaptured for an estimate of 637 rainbow with a 95% CI (normal distribution) of 512 – 841. A total of 130 walleye were captured and 20 recaptured for a point estimate of 398 with a 95% CI (Poisson distribution) of 259 – 653 (Ricker 1975).

Removal of white suckers in Big Casino Reservoir appears to have benefited rainbow trout. A small sample of stomachs taken on May 8, 2001 indicated rainbow trout were eating the dead white suckers. Rainbow trout catch in gill nets was excellent and higher than seen since 1999 (Figure 3). An impressive 50% of the 48 rainbow trout caught during September gill netting were at least 12 inches long and average trout size was 12.5 inches and 0.8 pounds. This is remarkable considering from 1992 – 2000 only 4 of 433 gill netted rainbow reached 12 inches

(Lewistown area data files). Mean rainbow trout  $W_r$  increased from 77.0 in September 2000 to 91.8 in September 2001 (Figure 4). In 2001, Big Casino Reservoir had the second highest rainbow trout  $W_r$  in northcentral Montana reservoirs; from 1998 – 2000 it had the lowest (Tews et al. 2001).

Walleye were captured at record high rates during 2001 fall gill netting (Figure 3, Table 1). The walleye averaged 0.91 pounds, with one at 5.25 pounds. White sucker numbers remained low throughout 2001, with 17 and 14 captured per net in May and September 2001, which is the lowest on record (Figure 3). A total of 1.7 YOY white suckers were captured per seine haul (Table 4). This is similar to the catch rate in 2000 (Tews et al. 2001).

The illegally introduced yellow perch, first found in September 2000, reproduced in 2001. A total of 108 YOY were captured during 7 seine hauls (Table 4). One northern pike, also illegally introduced, was captured during trapping. Since northern pike seem susceptible to trapping in small reservoirs, we are hopeful that they have not reproduced. The illegal introductions could potentially impact fish size structure and abundance in the reservoir. Past illegal yellow perch introductions in another reservoir, resulted in stunted trout and required chemical rehabilitation (Tews et al. 1995). Additional trapping will be completed in 2002.

<u>Buffalo Wallow Reservoir</u> – Trout continue to grow well in this reservoir. Rainbow trout catch was good and  $W_r$  was the highest found in the Lewistown Area (Table 1).

<u>Carter ponds</u> – Both Upper and Lower Carter Pond winter killed during 2000/2001. The ponds were full, but were ice and snow covered for longer than has been seen in recent years.

<u>Frog Ponds</u> – Work continued on an environmental assessment for dredging the Frog Ponds, a Lewistown city park. The city retained engineer David Jones to complete a feasibility study of the ponds. That study and additional work were used to develop a dredging plan.

<u>Fritzner Reservoir</u> – No fish were captured in this reservoir and on May 23, 2001, we saw hundreds on dead trout that had just been planted. Gill nets have not captured fish for several years. Fritzner Reservoir is filled by well water, has not overflowed recently and the conductivity has increased from about  $2600 - 6000 \,\mu$ S/cm over the past 6 years. Water quality samples taken on April 20, 2002 indicate an extremely high alkalinity of 3490 mg/l and a pH of 9.4. This water is not suitable for trout, so they will no longer be planted in Fritzner Reservoir.

<u>Peterson Reservoir</u> – Rainbow trout catch has declined and lake chub numbers have increased since 1999 (Tews et. al 2001). Rainbow trout up to 15.3 inches and lake chub up to 7 inches were captured (Table 1). Small lake chub were also captured during seining (Table 4).

#### ACKNOWLEDGMENTS

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Principal Fish Species Involved: Rainbow trout, Yellowstone cutthroat trout, brown trout, brook trout, grayling, white sucker, longnose sucker, mountain whitefish, walleye, burbot, yellow perch.

Code Numbers of Waters Referred to in Report:

16-1578	Fritzner Reservoir
16-4300	Ackley Lake
16-4260	Upper Carter Pond
16-4261	Lower Carter Pond
16-4628	Big Casino Reservoir
16-5070	Englandt Reservoir
16-6705	Lower Frog Pond
16-7642	Peterson Pond
16-8657	Upper Frog Pond
17-9140	Hound Creek Reservoir
17-9330	Newlan Creek Reservoir
18-7340	Buffalo Wallow Reservoir
18-7750	Bair Reservoir
18-8380	Martinsdale Reservoir
18-9500	Yellow Water Lake

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Reservoir Avg.					Length (Inches)			Weight (lbs.)			Wr		
(Date)	Hr/	<b>G</b> •	Year	NT									
# of Nets	10.9	Species Deinhaustrout		1 A	Min		Mean	Min	Max	Mean	Min		Mean
Ackley	19.8	Rainbow trout	2001 – I 2000 – I	14	1.2	10.7	8.5	0.16	0.50	0.25	/5 72	124	94
Lake		Rainbow trout	2000 - I	18	15.5	15.0	14.3	0.83	1.34	1.06	72	91	84
(9/17/01) 1Sinkar		Rainbow trout	1999+-1	12	10.4	19.0	17.8	1.07	2.24	1.94	/1	90	80
1Floater		Rainbow trout	2000 – A/wild	0	13.0	15.4	14.6	1.00	1.28	1.14	//	92	85
		Rainbow trout	1999+A/ wild	6	16.0	17.7	16.9	1.49	1.88	1.71	75	87	82
		Rainbow trout	Total	56	7.2	19.0	13.9	0.16	2.24	1.13	71	123	85
		White sucker		51	7.7	19.2	13.1	0.23	3.04	1.29	85	120	102
		Longnose sucker		2	16.3	18.8	17.6	1.95	2.88	2.42			
		Mountain whitefish		1	17.4	17.4	17.4	2.36	2.36	2.36	122	122	122
Boir	22.4	Dainbow trout	2001	12	68	86	77	0.10	0.23	0.17	67	06	<b>Q</b> 1
Beservoir	22.4	Rainbow trout	2001	12	0.0	11.0	10.5	0.10	0.23	0.17	45	90 94	73
(9/27/01)		Rainbow trout	1000	20 42	9.0 11.2	12.0	10.5	0.22	0.43	0.50	4J 54	04 02	69
(9/27/01) 1Sinker		Rainbow trout	1999+ Total	42	6.8	12.0	12.0	0.40	0.82	0.51	54 45	05 06	00
1Floater		White sucker	Total	105	6.2	13.2	10.9	0.10	0.82	0.41	4J 66	107	72 Q1
ITTOater		Willie Sucker		195	0.5	14.9	12.5	0.10	1.27	0.75	00	107	04
		cutthroat trout		5	8.2	12.0	9.4	0.17	0.5	0.27	/6	94	85
Big Casino	26.5	Rainbow trout	Ι	13	11.2	13.0	12.2	0.52	0.80	0.63	62	95	81
Reservoir		Rainbow trout	Т	7	10.2	13.2	11.8	0.42	0.87	0.64	78	96	89
(5/8/01)		Rainbow trout	Total	20	10.2	13.2	12.0	0.42	0.87	0.63	67	96	84
1Sinker		Walleve	1000	_° 7	9.8	20.0	12.5	0.26	2.86	0.75	56	91	80
1Floater		White sucker		34	10.8	16.0	13.4	0.58	1.89	1.03	77	106	94
		Yellow perch		1	7.6	7.6	7.6	0.21	0.21	0.21	96	96	96
	10.0		I /T	-	10.6	15.0	10.5	0.40	1.46	0.00		107	
Big Casino	18.2	Rainbow trout	1/1	48	10.6	15.3	12.5	0.42	1.46	0.80	//	107	92
Reservoir		White sucker		26	9.2	22.9	13.0	0.23	5.25	0.91	81	109	92
(9/13/01) 1Sinker 1Floater		white sucker		28	10.0	16.9	13.5	0.46	1.98	1.15	87	119	100
Buffalo	23.5	Rainbow trout	2001	4	10.7	11.8	11.3	0.54	0.69	0.63	87	110	100
Wallow		Rainbow trout	2000	6	12.3	15.8	13.4	0.78	1.73	1.11	97	122	104
(5/23/01)		Rainbow trout	1999+	3	18.2	20.5	19.4	2.13	3.15	2.80	82	97	88
1Sinker		Rainbow trout	Total	13	10.7	20.5	14.2	0.54	3.15	1.35	82	122	99
Englandt	18.8	Black bullhead		1	8.0	8.0	8.0	031	0.31	0.31	97	97	97
Reservoir (5/4/01) 1 Sinker	10.0	Shok Sumicad		I	0.0	0.0	0.0	0.01	0.51	0.01	<i>,</i> ,,	21	21

Table 1. Statistics from fish captured by overnight gill netting in northcentral MT, 2001.

I = Eagle Lake; A= Arlee; T=Irwin

Reservoir (Date)	Avg. Hr/		Year		Lei	ngth (Inc	ches)	W	eight (l	bs.)		Wr <sup>2</sup>	
# of Nets	Net	Species	Stocked	Ν	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Fritzner (5/23/01) 1Sinker	20.8	No fish											
Lower Carter Pond (4/26/01) 1Sinker	19.0	No fish											
Newlan	18.1	Rainbow trout	I-2001	7	6.9	8.0	7.3	0.12	0.20	0.14	74	94	85
Creek		Rainbow trout	I-2000	1	13.9	13.9	13.9	0.84	0.84	0.84	73	73	73
Reservoir (9/27/01)		Rainbow trout	I-1998	7	12.3	15.0	14.0	0.64	1.03	0.90	67	91	76
1Sinker 1Floater		Rainbow trout	Wild	2	14.1	14.6	14.3	0.9	1.00	0.95	67	83	75
		Rainbow trout	Total	17	6.9	15.0	11.3	0.12	1.03	0.59	66	94	79
		Longnose sucker		76	6.8	17.0	13.7	0.09	1.75	0.88			
		Yellowstone	M-2001 Brood	3	14.6	16.4	15.7	0.98	1.52	1.32	82	88	86
		Yellowstone	M-2001	10	8.7	10.8	9.8	0.24	0.37	0.30	68	103	86
		Yellowstone cutthroat trout	Total	13	8.7	16.4	11.2	0.24	1.52	0.54	68	103	86
		Burbot		1	17.2	17.2	17.2	1.00	1.00	1.00	75	75	75
		Crayfish		26									
Dataman	22.2	Doinhous trout		12	11.0	15.2	10.7	0.50	1 70	0.79	66	110	01
(4/27/01) 1Sinker	22.3	Lake chub		15	5.9	7.0	6.3	0.30	0.13	0.18	00	110	04
Upper Carter Pond (4/26/01) 1Sinker	19.0	No fish											
I-Lagie Lake	, A - AB	$1 - 1 \times 11$											

Table 1 continued. Statistics from fish captured by overnight gill netting in northcentral MT, 2001.

Date # and type of nets	Mean hr/ net	# of net nights	Snecies	N	Length (in)
7/12/01 5 Sinkers	26.6	5	Brook trout	1	10.0
7/21/01-7/24/01 5 Sinkers, 2 Floaters	72.1	21	No fish		
7/24/01 5 Sinkers, 2 Floaters	22.5	7	No fish		
8/16/01-8/21/01 5 Sinkers, 2 Floaters	125.4	35	No fish		
9/24/01 5 Sinkers, 3 Floaters	27.2	8	White sucker	1	7.5

Table 2. Gill netting results from Hound Creek Reservoir near Great Falls during 2001.

Table 3. Size statistics of fish captured by overnight trapping in Big Casino Reservoir 2001.

Water Name	# of	Species	Ν	Length				Wr		
(Date)	trap nights			Min	Max	Mean	Min	Max	Mean	Mean
Big Casino	<u></u>	White sucker	4615	10.8	17.2	13.4	0.44	2 20	1.03	03.5
		Willie Sucker	4015	10.0	17.2	13.4	0.44	2.20	1.05	93.5
Reservoir		Rainbow trout	270	8.9	14.4	11.5	0.17	1.16	0.52	77.5
(4/17/01 -		Walleye	130	7.6	22.3	11.2	0.13	4.15	0.50	80.5
4/25/01)		Northern pike	1	18.1	18.1	18.1	1.51	1.51	1.51	107.2
		Yellow perch	1	8.0	8.0	8.0	0.23	0.23	0.23	89.3

Table 4. Size structure of fish captured during seine hauls in 2001.

Reservoir	# of seine			Total	Length (inches)			
(Date)	hauls	Legal Location	Species	Ν	Min	Max	Mean	
Peterson	3	T11N R16E Sec. 20	Lake chub	12	1.0	3.0	1.7	
(4/27/01)	(50 foot							
	seine)							
Big Casino	7	T15N R18E Sec. 27	Rainbow trout	11	10.0	14.2	11.9	
(8/7/01)	(50 and		Mottled sculpin	1	3.8	3.8	3.8	
	100 foot		Walleye	7	7.3	14.1	10.5	
	seine)		White sucker	12	1.4	13.4	3.3	
			Yellow perch	108	3.0	3.9	3.4	
			Minnow	98	1.3	1.9	1.5	



Figure 1. Fall gill net catch from Ackley Lake, 1989 – 2001.



Figure 2. Fall gill net catch from Bair Reservoir 1989 – 2001.

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Figure 3. Gill net catch from Big Casino Reservoir 1990 – 2001.



Figure 4. Relative weight of game fish in Big Casino Reservoir.

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