MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION

JOB PROGRESS REPORT

State: Montana Title: Survey and inventory of Coldwater Streams

Project No.: F-46-R-2

Job No.: I-e Title: Southwest Montana Cold Water Stream Investigations

Period Covered: July 1, 1988 through June 30, 1989

JOB OBJECTIVES

1. Insure within hydrologic constraints that flows do not fall below levels identified in the Yellowstone Reservation and the Upper-Missouri Reservation Application.

Flows for the Yellowstone and Upper-Missouri Rivers were monitored via U.S.G.S. river gauges to determine if they were within levels designated by the reservations and reservation application.

2. Maintain existing populations of native Yellowstone and westslope cutthroat at present or increasing levels.

Conducted electrofishing surveys on some of the smaller tributary streams of the Yellowstone River to identify which have populations of native Yellowstone and westslope cutthroat, plus determining baseline numbers.

3. Maintain fish populations and habitat in streams affected by resource development activity at levels no worse than present condition.

U.S. Forest Service plans were monitored to determine if plans and goals maintained existing quality of fisheries and riparian vegetation.

4. Redistribute cattle in upper Ruby allotments to promote recovery and stabilization of streambanks and riparian zones.

Worked with the Beaverhead National Forest to implement changes in pasture and grazing systems. (State Project)

5. Document response of Bison Creek trout population to removal of granitic sands.

Three sections of Bison Creek were electrofished to determine trout populations levels. (State Project)

6. Collect baseline fisheries data on Deep Creek to assist in determining impacts of highway construction.

No activity on this objective. (State Project)

7. Maintain 95% the region's streambanks and channels in their present or improved condition.

A total of 211 proposed and planned SB 310 and Streambed Preservation Act streambed and channel alteration projects were processed with recommendations being made to minimize damage to or maintain the existing the fisheries resource.

8. Maintain water quality levels as near to baseline as possible.

Fish kills were documented, when located with any water quality violations being reported to the Montana Water Quality Bureau.

9. Maintain wild trout fishery in the East Gallatin River that supports 20,000 angler days of use annually.

A section of the East Gallatin River located both above and below the City of Bozeman sewage effluent was electrofished to obtain wild trout population estimates in the spring and fall to determine the effect of the existing sewage treatment on the wild trout population.

10. Maintain densities of at least 1000 age II and older brown trout per mile in the Ruby River downstream from Ruby Dam supporting 7500 angler days of use annually.

A section of the Ruby River was electrofished to obtain a wild brown trout population estimate to determine numbers of wild brown trout.

11. Maintain densities of a least 2500 age I and older brown trout per mile in Poindexter Spring Creek.

A section of Poindexter Spring Creek was electrofished to obtain a wild brown trout population estimate to determine the status of the population.

12. Improve habitat conditions in spring creeks of the region.

Worked with local county-city planning agencies to protect the quality of the spring creek fisheries habitat, to insure no further degradation of the fisheries habitat and possibly improve existing conditions.

13. Maximize potential of unique small streams capable of producing large trout by utilizing special regulations on selected reaches subject to intense fishing pressure.

No work was done on this objective.

14. Gather population data on reaches of the upper Ruby and Red Rock Rivers.

Electrofishing sections were set up on the upper Ruby and Red Rock Rivers where trout population estimates were made.

15. Gather population and habitat condition data on small streams as need arises.

No populations estimates were made during this period, as no specific need was identified.

VARIANCES

6. This objective is not to be met until 1990.

13. No small trout stream was identified as having the potential to raise large trout,if special regulations were enacted.

PROCEDURES

The study area consisted of trout streams in southwestern Montana included in the upper Missouri and Yellowstone River drainages, excluding the major rivers of the Beaverhead, Big Hole, Gallatin, Jefferson, Madison, Missouri and Yellowstone Rivers.

Electrofishing gear was used to sample fish populations on study sections of Ruby River, East Gallatin River, selected tributaries of the Yellowstone River, Poindexter Slough, Bison Creek and the Red Rock River. Population estimates were made using the Peterson-type mark and recapture method described by Vincent (1971).

Streambanks and channels were protected from poorly designed projects through FWP participation in administration of the Stream Protection Act and Natural Land and Streambank Protection

Act of 1975 (SB 310).

Water discharge permits issued by EPA and the Montana WQB will be reviewed and comments offered. Timber sales, grazing allotment plans, EA's and EIS's will be reviewed to insure adequate protection, mitigation and compensation of fisheries resources.

Spawning populations of Yellowstone cutthroat trout were monitored via fish traps and electrofishing in selected spawning tributaries of the Yellowstone River to determine the success of spawning and recruitment into the Yellowstone River.

A hand held current meter was used to make flow measurements in the Shields River. Temperatures were measured with maximum-minimum thermometers.

FINDINGS

WILLOW SPRINGS

Fisheries survey work conducted by Rehwinkel (1986) indicated a shortage of suitable rainbow trout spawning habitat in the Jefferson River drainage. A catch and release rainbow trout regulation (with no gear restrictions) was instituted in 1986 to protect a small rainbow population dependent on Hell's Canyon Creek. In the 1986 report, it was recommended that other potential spawning tributaries be identified for habitat improvement work to aid the rainbow population. Since then,a private owner of a badly silted spring creek has agreed to cooperate with a stream improvement project.

Willow Springs is located in the upper third of the Jefferson River drainage. The total length of this stream is approximately 5130 feet. Streamflow varies somewhat by season and generally increases from periodic spring inflow as it proceeds downstream to the Jefferson. Discharge measurements taken in April 1983 showed 3.3 cfs at the upstream site and 9.2 cfs at the bottom location. A measurement taken in August 1988 at the lower site(during the irrigation season) revealed 15.0 cfs. Channel measurements indicated a badly degraded situation. Willow Springs averaged 27 feet in width and 6.1 inches in depth.

Fish sampling conducted prior to habitat manipulation showed a population comprised of 88% brown trout and 12% brook trout. Maximum length of trout was 18 and 10 inches for brown and brook trout, respectively. Fish sampling was accomplished on two sections. The first section was in the upper reach and was nearly devoid of any cover. The second section was located in the mid-reach of Willow Springs and did have limited bank cover. The trout population was enumerated at 13 and 100 trout per 100 meters for the upper and lower sections, respectively(White and Skaar, 1986).

Between 1986 and late 1988, the entire length of the stream was fenced on both sides(except for livestock water gaps). Approximately 10 mid-stream willow bars(presumed to be regrowth on old beaver dams) were breached to allow sediment transport. Large amounts of debris and old fencing were also removed. Two bridges were built, one replaced an

under-sized culvert which was severely restricting sediment transport. These changes were accomplished with volunteer assistance of sportsmen, Trout Unlimited, and ranch help.

While these habitat efforts were occurring, rainbow trout eggs were taken from the Hell's Canyon Creek population. These eggs were reared in a hatchery and were then imprint planted into Willow Springs. This planting was done in the fall of 1987, spring and fall 1988. Stocking is planned to continue through 1991. If this effort is successful, the first returning adult rainbow are expected in the spring of 1990 or 1991.

PRICKLY PEAR CREEK

During 1986, the Lewis & Clark and Jefferson Valley Conservation Districts received funds for fishery enhancement work on Prickly Pear Creek. Generally, structures designed to provide improved fish habitat on high gradient streams have not met with a high degree of success.

For this project, a different design was to be employed. These alterations are low profile modified rock drop structures that are positioned in an "S" shape. They are constructed with a lower portion located in the center half of the stream to aid channel definition even at low flows. Below these devices, pools are excavated and water velocity off the structure is intended to maintain the channel depth.

Evaluation of these habitat manipulations was considered essential. The primary consideration was the structures durability. Photo points were established and detailed field notes of the design were kept. Secondly, the impact on the fishery must be quantified.

Prior to construction, two fish population study sections were established. The upper section(Mark's) was 1500 feet in length and would contain the stream alterations. The lower section(Old Altered) was 3300 feet long and would serve as the control. Mark and recapture fish population estimates were conducted during June of 1986. The intent is to return and again enumerate the fish population in five years(1991) to conclude whether this effort was successful.

The Mark's section was populated by rainbow, brown and brook trout. The population estimates are given in Table 1. The Old Altered section was inhabited by rainbow and brown trout. The population estimates are given in Table 2.

Table 1. Rainbow, brown and brook trout population estimates for the Mark's section (1500 ft.) of Prickly Pear Creek, June, 1986. Confidence limits at the 95% level are shown in parenthesis.

LENGTH (inches)	NUMBER	BIOMASS (lbs.)	NO./1000 ft.
		Rainbow trout	
3.5 - 6.9	100 (30)	6	67
7.0 - 9.9	37 (10)	10	25
10.0 - 12.9	159	12	15
TOTAL	159	28	107
		Brown trout	
1.5 - 6.9	59 (38)	3	39
7.0 - 14.5	36 (10)	22	24
TOTAL	95	25	63
		Brook trout	
5.0 - 5.9	7 (4)	0	5
6.0 - 10.9	32 (14)	6	21
TOTAL	39	6	26

Table 2. Rainbow and brown trout population estimates for the Old Altered section (3300 ft.) of Prickly Pear Creek, June 1986. Confidence intervals at the 95% level are shown in parenthesis.

LENGTH (inches)	NUMBER	BIOMASS (lbs.)	NO./1000ft.
		Rainbow trout	
3.5 - 6.9	154 (24)	10	47
7.0 - 9.9	91 (18)	23	28
10.0 - 13.9	53	26	16
TOTAL	298	60	91
		Brown trout	
4.5 - 6.9	40 (18)	3	12
7.0 - 15.9	39 (10)	28	12
TOTAL	79	31	24

BISON CREEK

During the construction of Interstate 15, this area was subjected to serious accidental sediment discharges and unavoidable channel changes. Fish sampling was accomplished after the completion of work to assess the impacts on the trout fishery. Data has been collected and will be presented in future reports.

RUBY RIVER

Trout populations were monitored in fall in the Three Forks Study section in the upper Ruby River to monitor the base populations to coordinate land management programs with the Beaverhead National Forest. Data will be presented in a subsequent report.

Trout populations were monitored in spring in the Silver Spring study section of the lower Ruby River to study the affects of ample angler access and pressure on the resident brown trout population and to study population dynamics in the reach of river which typically sustains some of the more ample flow regimes in the system downstream from the Ruby Dam. Data will be presented in a subsequent report.

RED ROCK RIVER

Trout populations were monitored in the Wellborn section in fall 1987 and in the Dell study section in spring 1989. This was done to describe resident trout populations in the mid - lower river system and to assess the affects of severe dewatering in 1988. Data will be presented in a subsequent report.

POINDEXTER SLOUGH

Trout populations were monitored in the spring in study Section Three. This is an ongoing project to monitor populations in this heavily fished spring creek fishery on public land. Data will be presented in a subsequent report.

YELLOWSTONE - SHIELDS RIVER TRIBUTARIES

Numerous small tributary streams of the Yellowstone and Shields Rivers were sampled to determine fisheries present (Table 3).

SHIELDS RIVER

Streamflows and water temperature in the upper Shields River for the 1987 and 1988 were compared for the months of July and August. Although 1987 and 1988 were exceptionally dry years and the streamflow was low, water temperature was not critical with average maximum water temperartures being 69F and 66F, respectively. Flows for the same period averaged 27.6 cfs for 1987 and 14.9 cfs.

Table 3. Fisheries present in various tributaries of the Yellowstone and Shields Rivers.

STREAM	FISH SPECIES	SIZE RANGE (inches)
	Shields River	
Cottonwood Creek (T4N R8E S17)	Yellowstone Cutthroat	3.2 - 5.9
	Mottled Sculpin	present
Cottonwood Creek (T4N R8E S 26)	White Sucker	3.8 - 19.6
	Mottled Sculpin	present
	Lake Chub	present
	Longnose Dace	present
East F. Smith Cr (T6N R10E S 6) 400ft	Yellowstone Cutthroat	3.1 - 3.9
	Brook Trout	present
Rock Creek(3000ft) (T2N R11E S 8,9)	Yellowstone Cutthroat	6.0 - 14.0
	Brook Trout	3.0 - 10.0
Smith Creek (800ft) (T6N R10E S6)	Yellowstone Cutthroat	3.5 - 10.4
	Brook Trout	present

Table 3 continued

Yellowstone River

Big Creek (600ft) (Mouth of Cliff Cr)	RbXCt and Yellowstone Ct Rainbow Trout	4.8 - 12.2
Billman Cr (500ft) (T2S R8E S 16)	Yellowstone Cutthroat Mottled Sculpin RbXCt Hybrid	4.0 - 9.1 present present
Eightmile Creek (T5S R8E S5)	Brook Trout Yellowstone Cutthroat Rainbow Trout	2.8 - 15.1 present present
Elbow Creek (T5S R10E S29)	Yellowstone Cutthroat	present
Emigrant Cr (300ft) (Mouth of Fridley Cr)	none	
Hunters Creek (T1S R12E S15)	Mosquito fish Longnose Dace	present present
Little Mission Cr (T3S R11E S14)	Yellowstone Cutthroat	3.4 - 8.4
Miner Cr (500ft) (T2S R8E S27)	Yellowstone Cutthroat	4.0 - 9.5
West Pine Creek (T4S R8E S5)	Yellowstone Cutthroat	1.0 - 8.2
West Pine Creek (T4S R8E S10)	Yellowstone Cutthroat	3.4 - 8.2

STREAM PROTECTION

This objective falls under the responsibilities of the Natural Streambed and Land Preservation Act of 1975. Duties implementing this law are shared with local Soil Conservation Districts. Stream projects were inspected in the following Soil Conservation Districts: Beaverhead, Broadwater, Gallatin, Jefferson Valley, Madison, Mile High and Park. During the July, 1988 to July, 1989 period, a total of From 1986 through 1988, a total of 219 small stream alteration projects (SB 310) were mitigated. Approximately 35 SPA projected were also inspected and mitigated.

LITERATURE CITED

Rehwinkel, B.J. 1986. Inventory and Survey of the Waters of the Jefferson and Missouri River Drainages. Job Progress Report, Federal Aid in Fish and Wildlife Restoration Acts. Montana Project No. F-9-R-34, Job Id, 56p.

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White, R. J.and D. R. Skaar. 1986. The Trout Population and Habitat of "Willow Springs Creek" in Madison County, Montana, During April - May, 1983. (An unpublished report). 9 pp.

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