MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION

JOB PROGRESS REPORT

State: MONTANA **Project Title:** STATEWIDE FISHERIES INVESTIGATION

Project No: F-46-R-5 **Study Title:** SURVEY AND INVENTORY OF COLDWATER STREAMS

Job. No: I-h **Job Title:** UPPER BIGHORN RIVER INVESTIGATIONS

Project Period: April 1, 1991 - March 31, 1992

OBJECTIVES AND DEGREE OF ATTAINMENT

1. To maintain a year around minimum flow in the upper Bighorn River of at least 2,000 cfs in eight out of 10 years and at least 2,500 cfs in five out of 10 years.

   Flows were maintained above 2,000 cfs during 1991, and remained above 2,500 cfs during most of the year. Heavy spring rains raised water levels in Bighorn Lake into the exclusive flood pool in June causing the Bureau to spill water through Yellowtail Dam. Flows in the river increased to 12,000 cfs and remained at that level into July. Flows declined through the summer to 2,500 cfs in late August, but were increased again in September as heavy rains raised reservoir levels back into the exclusive flood pool. Flows were reduced below 2,500 cfs in October in preparation for brown trout spawning, but were maintained above 2,000 cfs.

2. To eliminate gas bubble trauma as a significant cause of trout mortality.

   Continued to work with Bureau of Reclamation on this problem. Efforts to use radial gates rather than the sluiceway gate to pass water through the Afterbay Dam appeared to significantly reduce gas supersaturation levels in the Bighorn River. High supersaturation levels were recorded in the spring of 1991 while water was being spilled through Yellowtail Dam, but no adverse effects were noted on the trout population downstream.

3. To maintain average population densities of 5,000 to 7,000 age one and older brown trout and at least 500 18-inch and longer brown trout per mile in the Bighorn River upstream of Bighorn Fishing Access Site (FAS), and to maintain 1,500 to 2,500 age one and older brown trout per mile between Bighorn FAS and Two Leggins FAS.

Normal fall electrofishing was postponed until December in 1991 due to very warm water temperatures in September. At that time mark-recapture estimates were only conducted on the upper shocking section above Bighorn Access. Preliminary analysis of these data indicated that the total brown trout population in the upper river declined from levels seen in 1990, but that the number of age 2 and older brown trout increased significantly. The increase in the number of older brown trout combined with greater than normal growth rates due to warmer water temperatures, appeared to increase the number of 18-inch and longer brown trout over the management goal of 500 per mile for the first time.

No estimate was conducted on the lower river downstream of Bighorn Access in 1991, but results of survey shocking conducted in December indicated that the brown trout population was probably down from 1990 levels. There appeared to be a strong year class of age one brown trout present in both shocking sections in 1991.

4. To maintain average population densities of at least 1,000 age one and older rainbow trout and 150 18-inch and longer rainbow trout per mile in the Bighorn River upstream of Bighorn FAS, and to maintain at least 500 age one and older rainbow trout per mile between Bighorn FAS and Two Leggins FAS.

A rainbow estimate was not obtained in the upper river in 1991, due to poor recapture success. Despite good success at marking rainbows, and at capturing rainbows during the recapture runs, very few marked rainbow were recaptured. These results indicated that the rainbow population remained strong in the upper river in 1991, and that population levels probably continued to exceed management goals for both total numbers and numbers of rainbow 18-inches long and longer. Warm water temperatures in 1991 appeared to improve growth rates for rainbow as well as brown trout.

Survey shocking results indicated the rainbow population remained strong in the lower shocking section, but no real conclusions could be drawn from the limited data collected. Evidence of a strong age one rainbow year class was noted in both shocking sections in 1991. A strong age one year class of rainbow was last observed in the upper section in 1987.

5. To redistribute angler use to achieve use levels of no more than 3,000 angler-days per month above Bighorn FAS and at least 10,000 angler-days annually between Bighorn and Two Leggins FAS (state funded).

Angling pressure declined on the Bighorn River during 1991 primarily due to high flows. Pressure started to increase in early spring, but abnormally high flows in June made fishing difficult, and many anglers canceled scheduled trips. Higher flows kept pressure down during most of the summer. Angling pressure did exceed 3,000 angler-days per month during September and October based on car counter data from Bighorn Access. Due to changes in river access in 1991 it was not possible to make a good comparison between pressure in 1991 and previous years. In 1989 and 1990 many anglers took out at Kenny Schneider's, a private access upstream of Bighorn Access. These anglers did not cross the Bighorn Access car counter. In 1991, Schneider's access was no longer available, so a much higher percentage of the anglers on the river used Bighorn Access. Because no data is available on angler use for Schneider's Access, it is difficult to relate changes in car counter data to actual changes in angler use.

No major increase in angler use was noted on the Bighorn River downstream of Bighorn Access.

6. To make at least 750 creel census contacts per year to assess angler success and opinions (state funded).

More than 750 user contacts were made on the Bighorn River in 1991 as parts of various study activities. The river ranger continued to work on the river between April and November, and made some creel census contacts while floating. However, low fishing pressure during most of the summer and high, fast flows made it very difficult to make many angler contacts during a day's float. As a result, the river ranger spent considerable time at access sites interviewing everyone crossing the car counters to gather data for recalibrating the counters.

Considerable time was spent developing and pre-testing an extensive mail-back survey to be handed out by the river ranger in 1992. This included testing questions by interviewing anglers on the river, and then handing out a sample mail-back survey in late fall.

SUMMARY

Progress was achieved on all objectives during FY92, but abnormal flow patterns affected sampling schedules and angler use.