BONNEVILLE POWER ADMINISTRATION

Hungry Horse Mitigation

Flathead Lake

Annual Report 2003 - 2004 June 2005 DOE/BP-00004100-4

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Hungry Horse Mitigation
Flathead Lake

Annual Progress Report 2004
Project 199101901

Contract 4100

November 2003 - October 2004

by:

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Confederated Salish and Kootenai Tribes

June 2005

INTRODUCTION

The Confederated Salish and Kootenai Tribes (CSKT) and Montana Fish Wildlife and Parks (MFWP) wrote the "Fisheries Mitigation Plan for Losses Attributable to the Construction and Operation of Hungry Horse Dam" in March 1991 to define the fisheries losses, mitigation alternatives and recommendations to protect, mitigate and enhance resident fish and aquatic habitat affected by Hungry Horse Dam. On November 12, 1991, the Northwest Power Planning Council (NPPC) approved the mitigation plan with minor modifications, called for a detailed implementation plan, and amended measures 903(h)(1) through (7). A long-term mitigation plan was submitted in August 1992, was approved by the Council in 1993, and the first contract for this project was signed on November 11, 1993.

The problem this project addresses is the loss of habitat, both in quality and quantity, in the Flathead Lake and River basin resulting from the construction and operation of Hungry Horse Dam. The purpose of the project is to both implement mitigation measures and monitor the biological responses to those measures including those implemented by Project Numbers 9101903 and 9101904.

Goals and objectives of the 1994 Fish and Wildlife Program (Section 10.1) addressed by this project are the rebuilding to sustainable levels weak, but recoverable, native populations injured by the hydropower system. The project mitigates the blockage of spawning runs by Hungry Horse Dam by restoring and even creating spawning habitats within direct drainages to Flathead Lake. The project also addresses the altered habitat within Flathead Lake resulting from species shifts and consequent dominance of new species that restricts the potential success of mitigation measures. Specific goals of this project are to create and restore habitat and quantitatively monitor changes in fish populations to verify the efficacy of our mitigation measures. The project consists of three components: monitoring, restoration and research. Monitoring, for example, includes a spring gillnetting series conducted annually in Flathead Lake and builds on an existing data set initiated in 1981. Monitoring of the experimental kokanee reintroduction was a primary activity of this project between 1992 and 1997. Lake trout, whose high densities have precluded successful mitigation of losses of other species in Flathead Lake, have been monitored since 1996 to measure several biological parameters. Results of this work have utility in determining the population status of this key predator in Flathead Lake. The project has also defined the baseline condition of the Flathead Lake fishery in 1992-1993 and has conducted annual lakewide surveys since 1998. The restoration component of the project has addressed several stream channel, riparian, and fish passage problems, and suppression of non-native fish. The research component of the project began in FY 2000 and measured trophic linkages between *M. relicta* and other species to assist in predicting the results of our efforts to suppress lake trout. Only Objective 1 in the workplan is funded entirely by Hungry Horse Mitigation funds. Additional funds are drawn from other sources to assist in completion of Objectives 2-8.

1. Summary of significant results.

Objective 1: Monitoring: Determine relative abundance of bull and cutthroat trout in Flathead Lake.

We set six floating and six sinking gillnets in Flathead Lake in cooperation with Montana Fish, Wildlife and Parks during spring 2004. The data generated by this sampling contribute to a long-term monitoring index of abundance of westslope cutthroat trout (Figure 1) and bull trout (Figure 2) in the Flathead system. There has been so much variability in capture rates during the period of sampling that there is no clear evidence of a trend in abundance since sampling began.

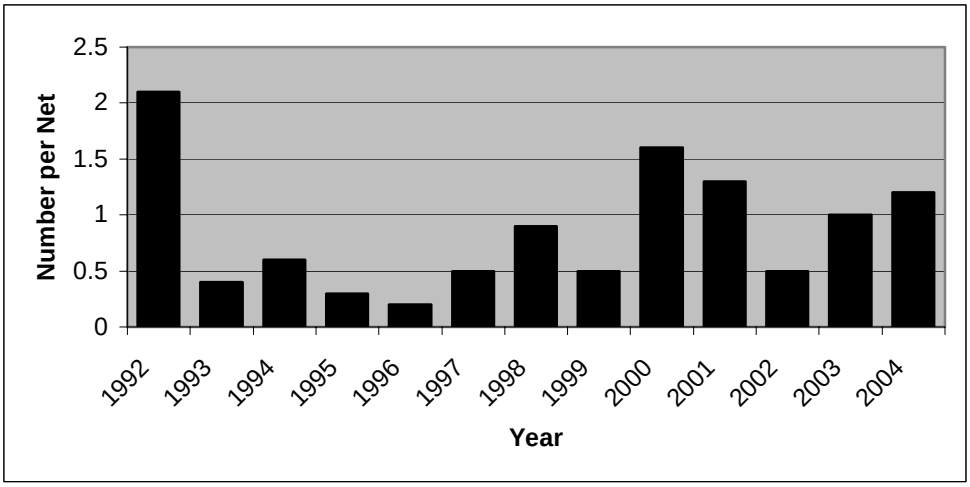

Figure 1. Number of westslope cutthroat trout caught per floating net during spring in Flathead Lake, 1992-2003.

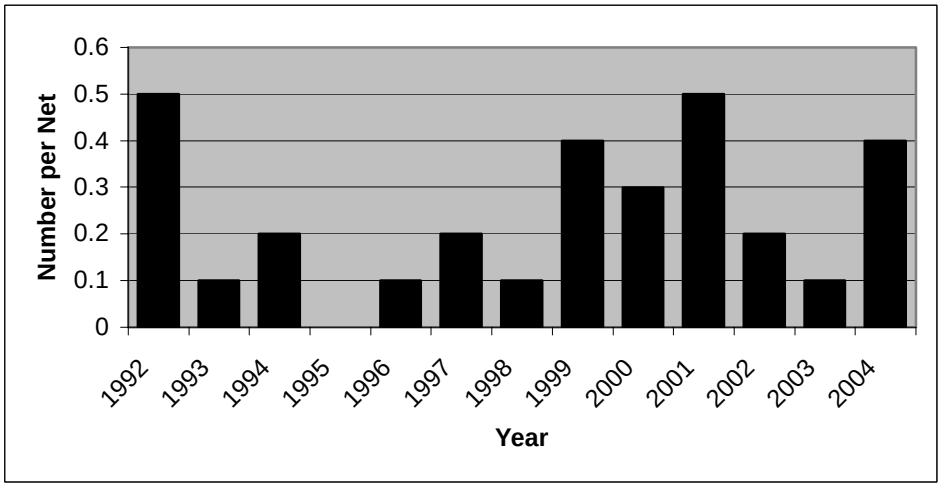

Figure 2. Number of bull trout caught per sinking net during spring in Flathead Lake, 1992-2003.

Objective 2: Monitoring: Conduct creel survey to quantify catch and harvest rates in Flathead Lake.

During 2004 we interviewed 1823 anglers and conducted 206 aerial and ground counts of anglers. Final summarization of the data has not been completed. The average length of lake trout caught by anglers was 498 mm TL and the catch peaked at age six (Figure 3).

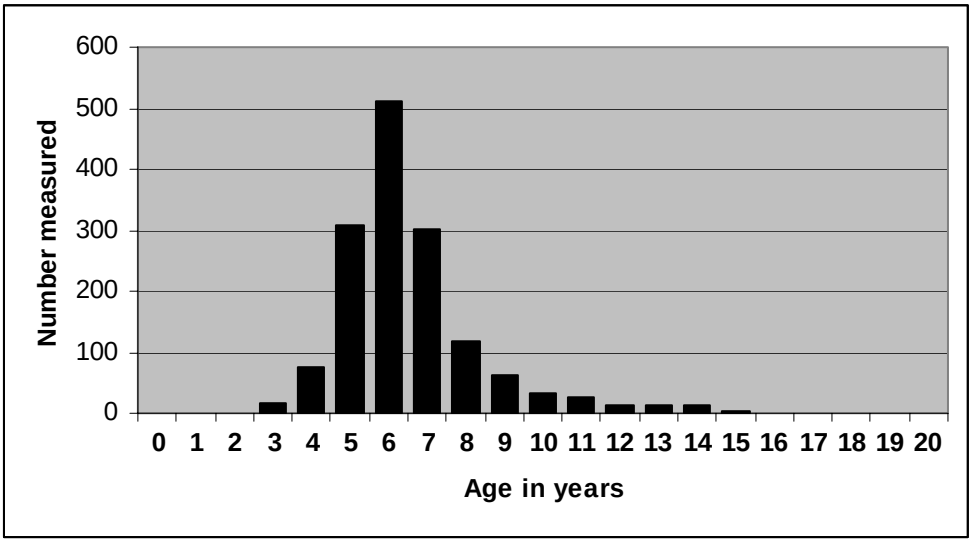

Figure 3. Ages of lake trout measured during creel survey, July 2002 to June 2003.

We estimated that nearly 38,000 lake trout were harvested between July 2003 and June 2004, and that total pressure equaled 34,400 angler days (Figure 4). This is an encouraging upward trend since 2001, although we do not consider this increase to yet be sufficient to suppress lake trout.

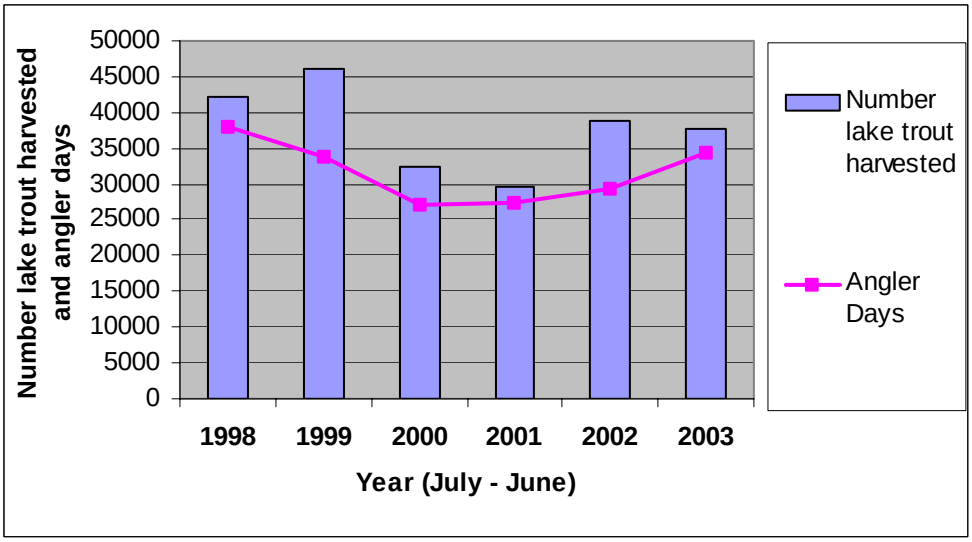

Figure 4. Estimates of annual harvest of lake trout and total pressure, Flathead Lake, 1998 – 2003.

Objective 3: Monitoring: Evaluate parameters of lake trout biology (fecundity, growth, age and length at maturity, cohort strength, and mortality in Flathead Lake to monitor changes in the abundance of this predator.

We set 48 gillnets (12 meshes per net) lake-wide during October 2004 (Figure 5). We captured a total of 394 lake trout ranging in size from 190 to 1005 mm TL. For the purpose of constructing the population age structure, we reduced the sample of lake trout by 57 fish based on coefficients of retention probabilities, and increased the sample by 43 based on coefficients of encounter probabilities. The resulting sample of fish was then partitioned into year classes (Figure 6) based on the previously established relationship between age and total length. Because ages 0-5 are not fully recruited to the sampling gear, their relative abundance could not be accurately estimated. A fairly uniform decline in survival between age 6 and 15 is evident, representing a mortality rate of 0.35 as computed by the Robson Chapman method.

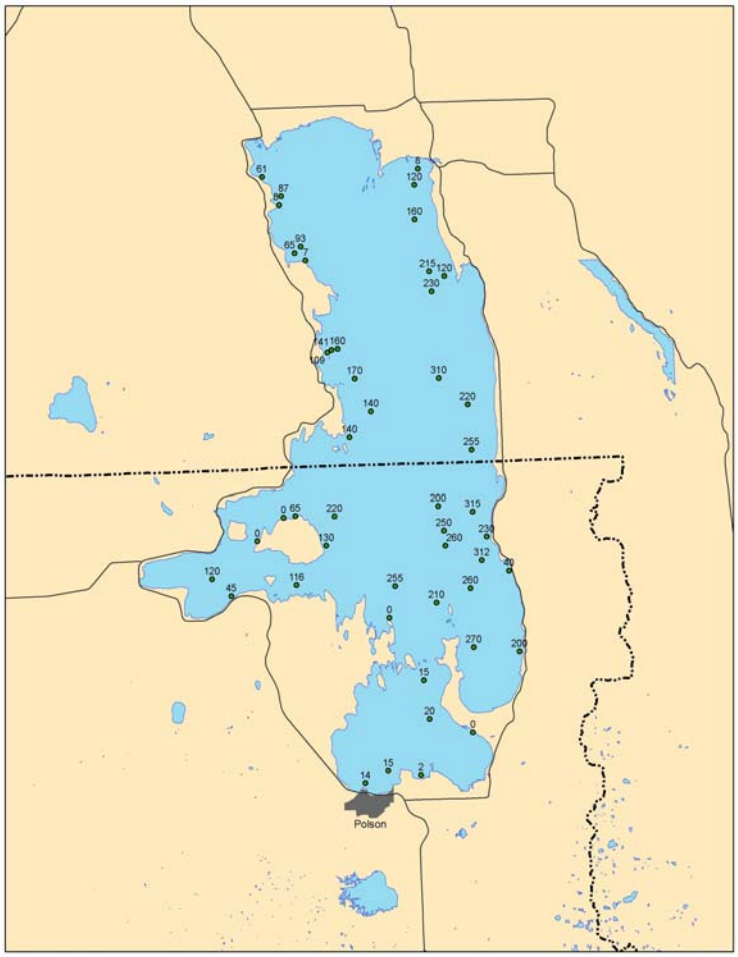

Figure 5. Locations and depths of gillnets set during October, 2004.

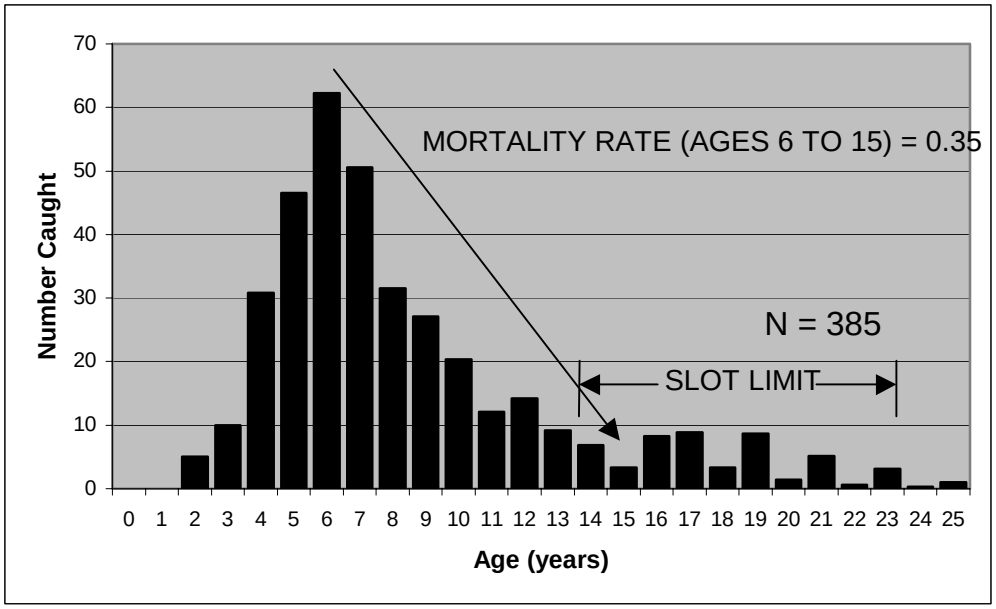

Figure 6. Estimated age structure and mortality rate of lake trout captured in October 2004.

We also examined 239 male and 131 female lake trout for maturity. Males reached 50% maturity at 499 mm TL (Figure 7) and females at 550 mm TL (Figure 8).

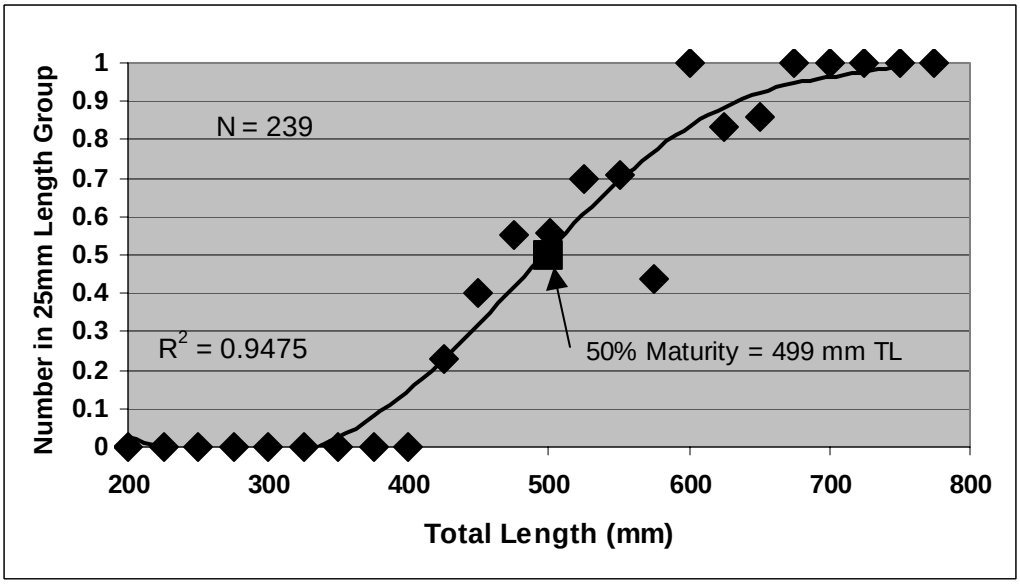

Figure 7. Percent maturity at length of male lake trout captured in 2004.

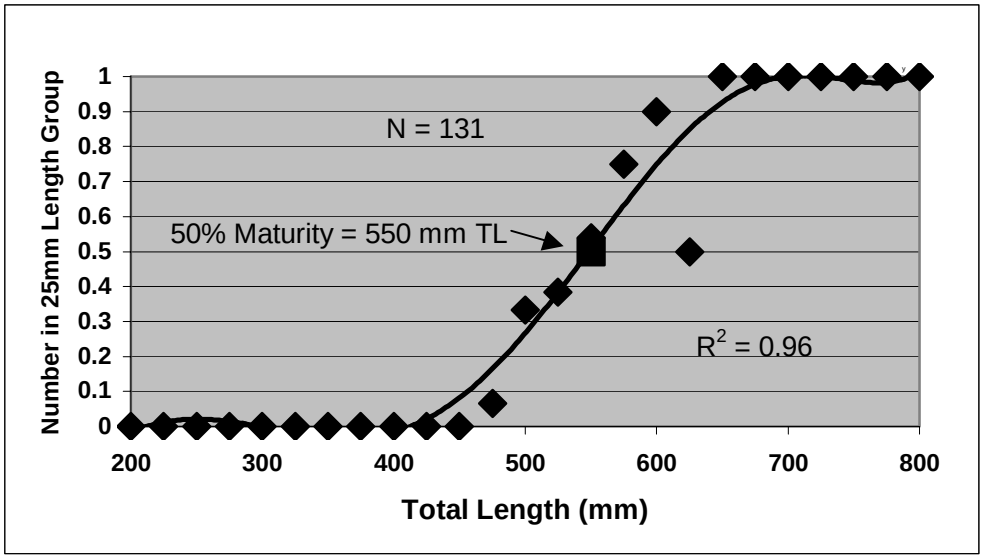

Figure 8. Percent maturity at length of female lake trout captured in 2004.

The period spanning from the onset of maturity to full maturity in male lake trout ranged from ages five to ten (Figure 9) and in females it ranged from ages six to eleven (Figure 10). Based on this information, male and female lake trout do not make substantial contributions to population recruitment until ages six and eight respectively.

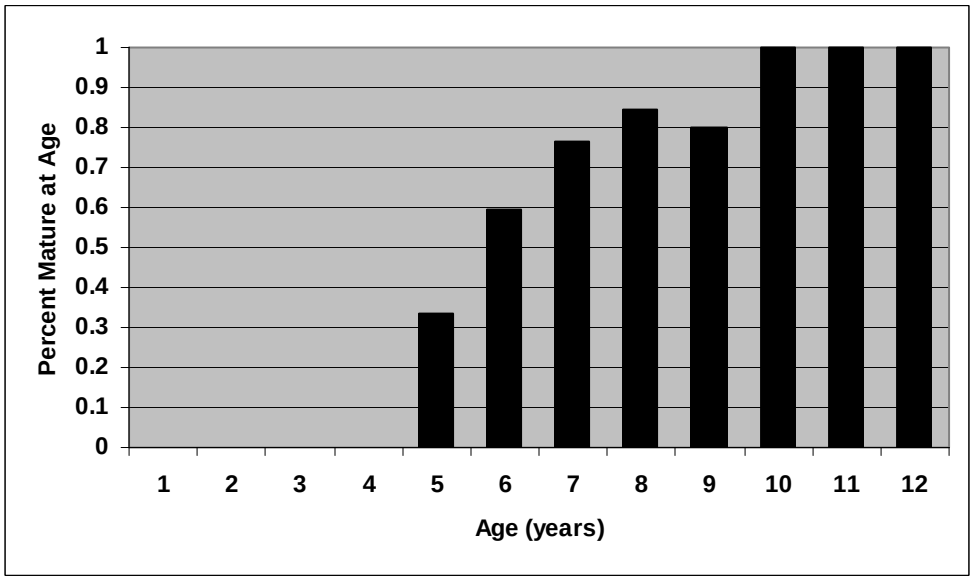

Figure 9. Percent maturity at age for male lake trout, 2004.

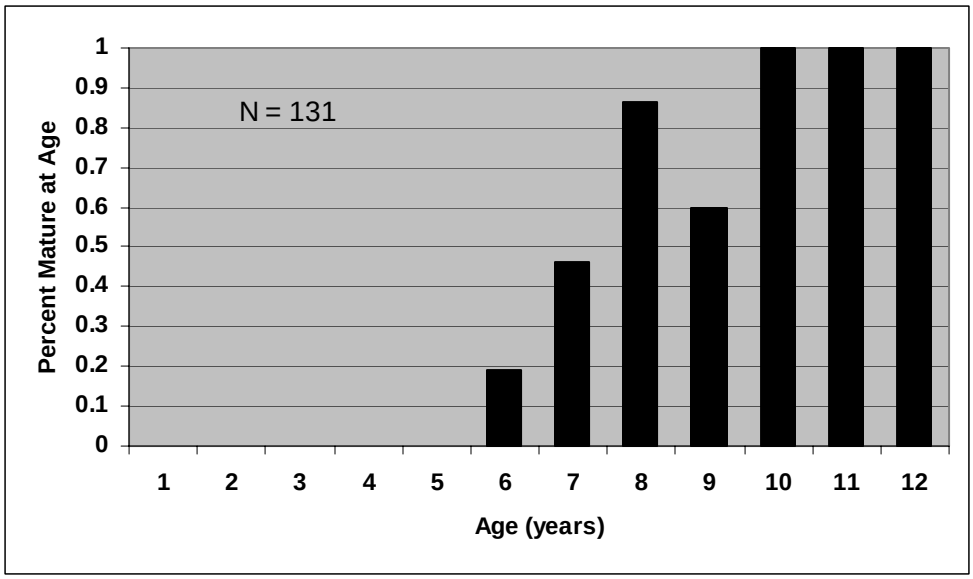

Figure 10. Percent maturity at age for female lake trout, 2004.

Objective 4: Monitoring: Evaluate success of westslope cutthroat and rainbow trout releases in off-site reservoirs.

There was no quantitative evaluation conducted this year. Numerous anecdotal accounts were received that include catches of hatchery trout. Pablo Reservoir is a site where rainbow trout are planted to enhance the quantity and diversity of angler opportunity on the Flathead Reservation. It is predominantly a largemouth bass fishery, but the public has held a long-standing interest in a rainbow fishery there. In September the irrigation project that operates the reservoir drained the impoundment to make repairs to the dam. We utilized this opportunity to inventory the fishery by capturing fish in the outlet canal during the last days of the draining procedure. We did not catch any trout. This may be a misleading indicator because we have evidence that other species and large numbers of individuals were drained from the reservoir during the early stages of draining, prior to our sampling effort. We will continue to evaluate these data and consider terminating the planting of rainbow trout in this reservoir.

Objective 5: Research food web interactions

Progress on this objective was stalled again during 2004. Populating the bioenergetics model with data is nearly complete. We provided fish tissue to the University of Washington to facilitate their efforts to genetically catalog the species of Flathead Lake. This effort will enable them to identify the remaining stomach contents with bone fragments that could not be visually identified to species. This is the last step in completing the bioenergetics study of the Flathead Lake fishery.

Objective 6: Research: Investigate and design solutions to shoreline erosion.

The Blue Bay project, which is in the implementation stage, was monitored during 2004 to quantify adjustments that have occurred since gravel was placed along the eroding shoreline in April 2002. The South Bay project, which is in the research stage, was

monitored for the fourth year. We continue to verify the erosion rates and correlate those with lake elevations and wave energy.

Objective 7: Implementation: Improve habitat conditions and biological productivity in direct tributaries of Flathead Lake to replace recruitment losses attributable to Hungry Horse Dam.

Project No. 1: Skidoo Creek

We continued to sample fish populations within Skidoo Creek to further define the extent of westslope cutthroat trout distribution, to define the extent of overlap with brook trout, and to identify limiting factors. We have determined that there is roughly 1.5 km of stream supporting only westslope cutthroat trout and roughly 2 km where both species exist. We identified two road crossing structures that are passage barriers and will pursue their removal. We identified a private parcel of land within the drainage that is a priority for acquisition that would provide protection for 870 m of stream.

Project No. 2: Mission Creek

We protected from livestock grazing over 3,000 m of riparian area along four streams within the Mission watershed (Figure 11). We invested $12,535 in materials and labor in these projects. Our investment represented 64% of total project costs with the remaining 36% provided by the respective landowners.

Figure 11. Fencing of Post Creek riparian area to exclude livestock and facilitate restoration of riparian vegetation.

Project No. 3: Dayton Creek

We did not conduct habitat restoration projects in Dayton Creek during 2004. Our activities consisted of: 1) compliance monitoring of past projects, 2) evaluation of parcels of land for acquisition, and 3) ongoing watershed-scale monitoring of water quality and temperature.

Project No. 4: Yellow Bay Creek
During 2004 we conducted biological inventories and initiated a watershed assessment. We identified problems relating to the presence of brook trout, passage barriers, and an irrigation diversion.

Project No. 5: Kelly's and Pistol Creek
This project consists of the obliteration or recontouring of forest roads within the Kelly's and Pistol creek watersheds. Because of delays in the planning of this project we have postponed it until FY 2005.

Project No. 6: Lake trout suppression in Flathead Lake
We conducted two fishing contests during 2004, which generated a total harvest of 4607 lake trout. The average length of lake trout harvested in both contests was about 470 mm, and the total weight of lake trout harvested was about 9,700 pounds. There was an upward trend in participation and harvest in these contests relative to previous years. While we consider the current level of harvest to be insufficient to have a meaningful biological effect (see Figure 5), we are optimistic that the annual growth in the scale of these contests will continue and reach a level sufficient to accomplish the desired biological effect.