BIG LOST RIVER 208 PROJECT

Final Report

Submitted by:

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Problems

Excessive streambank erosion along the Big Lost River is the major problem contributing to the degradation of water quality in the river and the Mackay Reservoir.

The upper reach of the project area is characterized by the river meandering through meadow and hay ground in the river bottom area. Trees along this meadow area make it a suitable protected area for calving in the spring. Several operators have placed diversion canals in thes area in order to irrigate pastures and hay ground north of the river in the Chilly area. Also, several recreation homesites have been developed on this portion of the river.

Many of the meanders in this portion of the river have high exposed banks on the outside of the cure in the channel. The high velocity water erodes the gravel base at these points and the upper portion of the bank will then slump into the stream channel. Considerable topsoil and gravel material are carried downstream and the bank area is further eroded. Many times, just upstream from the curve, the stream forces are such that the river will flood across the neck of the meander. This can result in a new channel being cut with consequent erosion. The straightening effects maintaine a higher stream velocity increasing the ability of the river to erode in downstream areas. Another effect stemming from the high velocity water flows and shifting channel is the necessity for operators to periodically move or alter their diversion canals. These changes in the stream often reduce or remove the effectiveness of the diversion.

The topsoil erode from the above actions is carried into the Mackay Reservoir. Gravel and other debris tend to scour the channel enhancing erosion capabilities and reducing feed for the fishery. The gravel is usually deposited on the lower section of the river. Approximately three to five acres of meadow bottom can be lost each year in this matter. Usually, when the river cuts off a meander, the resulting island is unusable to the operator during the time when he has most of his livestock in the river bottom for calving.

The middle reach of the project area is wider and again has meadow and pasture land. The river "sinks" here during late season when water flow is not sufficient to make it across the porous area. The river reappears downstream. During the 1930's the channel was straightened in this section. The resulting high velocity water flow during runoff adds to downstream erosion problems.

The lower reach of the project area also is a river meadow area with brush and trees making it a good wintering and calving place for livestock. During high water peroids much of the gravel removed upstream is deposited in this area. The stream channel is built up by these deposits to a point where the bed is higher than the banks. The river then floods across a portion of adjacent meadow eroding a new channel and leaving a gravel bar in the old stream bed. The topsoil is carried into the reservoir.

To date, the reservoir has lost 22% of its mid--season and late--season irrigation capacity. The sedimentation results from soil erosion due to the unstable river channel described above. Continued sedimentation of the reservoir will reduce its late season capacity to where adequate water supplies for late season irrigation below the dam will no longer be available. At that point, either the water will no longer be available, greatly reducing crop production, or the reservoir will have to be dredged to renew its storage capacity -- an expensive undertaking.

Continued sedimentation of the reservoir will also be determental to recreation and fisheries in the future.

Project Objectives

The objectives of this project are outlined in the following list:

1. Develop a workable and coordinated plan and implementation schedule to protect the water shed and improve the water quality of the Big Lost River and the Mackay Reservoir.
2. Increase coordinated planning efforts between the private landowners, US Forest Service, Bureau of Land Management, Idaho Fish and Game, Soil Conservation Service, and the Butte Soil Conservation District.
3. Evaluate range use and erosion in the upper watershed and work with the US Forest Service and the Bureau of Land Management in developing cost management practices and management plans.
4. Work with private landowners and involved agencies to develop and implement BMPs for riparian zone management.
5. Establish test plots at various locations on critical erosion sites along the river to evaluate plant materials for revegetation purposes.
6. Evaluate the effects of stream discharge and hydraulic geometry on erosion, deposition, and sediment transport rates. This evaluation will slso include sedimetation of the Mackay Reservoir and the effects of the reservoir on upstream channel geometry, bank erosion, and sediment transport.
7. Develop and install both structural and nonstructural BMPs to control streambank erosion while maintaining the natural (dynamic) course of the river.
8. Demonstrate the effectiveness of structural and nonstructural BMPs in controlling streambank erosion. BMPs selected for demonstration purposes are gabions, organic debris placement, and revegetation.
9. Improve fish habitat by rock placement, incorporation of habitat improvement features into BMP installation and revegetation.

10. Work with private landowners along the river to develop 15 soil and water conservation plans and develop management systems for their land adjacent to the river and the reservoir.

Overview of Planning Efforts and Outputs

Our planning efforts have been directed toward developing a coordinated water quality plan for the entire Big Lost River Watershed above the Mackay Reservoir. In order to achieve such a goal numerous federal, state and local agencies had to become involved with the private landowners, living along the Big Lost River.

Once land ownership within the project area was determined a map delineating private, state and federal land was developed. High quality, color aerial photo enlargments of the project area were then obtained.

With these basic tools in hand a streambank stability analysis was initiated. A stream team comprised of a hydrologist from the Bureau of Land Management and the Division of Environment walked the entire project area. All erosional and depositional features were identified and documented for future evaluation. Once the problem sites were identified they were plotted on a set of overlays for the working photos. The aerial photos became the base for numerous overlays showing problem sites, Best Management Practice locations, and other pertinent information for planning.

During the planning and evluation process two sites were selected for the installation of demonstration gabions. The demonstration gabions were to be evaluated as possible BMP alternatives to rock rip-rap.

The gabions were installed at locations having varied river situations. The gabions installed in the upper reach of project area were placed along the toe of a large bank failure. The gabions installed in the lower reach were placed on both banks of a large meander.

The Idaho Department of Fish and Game also installed a set of gabions along the toe of a large bank failure on state land. They used a different technique of installation. Thus giving our demonstration a wider variety of alternatives to be evaluated.

We feel that the demonstration gabions were the key to the success of our planning effort. In the eyes of the landowner's applying a BMP for evaluation was really getting something postive done and actually installed on the land. As a result they became more actively involved with the installation and working on the long range 208 plan. The raport developed between the landowners and the involved agencies was quite exceptional. A lot of old, long standing barriers to progressive planning were torn down and many old grudges put aside.

Another team consisting of BLM hydrologists, SCS District Conservationist, soil conservation technicians and people from specialized fields as needed was formed. This team met with each individual private landowner and evaluated each identified problem or potential problem for possible BMP alternatives. Follow up visits were made with the landowners after the BMP alternatives had been evaluated by specialists from the involved agencies. At the second meeting problem sites and alternatives were prioritized for implementation.

During this basic on going planning process other evaluations were being made and much needed baseline data was being gathered. A summerization of this activity is listed as follows:

1. Completed soil survey of private lands within the project areas.

2. Completed soil survey on BLM lands within the project area.

3. Biological evaluation of project area by BLM, United States Fish & Wildlife Service, SCS, and Idaho Fish & Game Dept. Biologists.

4. Geological evaluation.

5. Vegetative evaluation with emphasis on revegetation potential for critically eroding sites. Sites for vegetative test plots. Evaluation of riparian zone.

6. Experimental willow sprigging project carried out by Boy Scout Troop 340, Pocatello, Idaho.

7. Historical and Archeological clearance obtained.

8. Evaluation of previously installed protective measures.

9. Engineering evaluations and surveys.

10. Initiated USGS study that included the following elements:

a. Streamflow data since 1903.

b. Discharge measurements.

c. Survey of channel cross sections before and after peak flows in order to document channel changes resulting from sediment transport.

d. Collection of suspended and bedload sediment samples.

e. Particle size analyses.

f. Computation of suspended - and bedload - sediment transport rates and volume of material transported.

g. Survey of the Mackay Reservoir to estimate the amount of sediment deposited in the reservoir.

h. Determination of the present rate of sediment delivery was estimated in order to quantify the ongoing problem.

After being involved in the project for some time we soon learned how little was really known about the dynamics of the river. Our major goal changed from trying to quickly control the erosion problems to learning more about what was actually happening in the river system to insure the implementation of proper BMP's. We feel that the methods used in evaluating the Big Lost River system could be used in evaluating other river systems prior to large project implementation. The understanding gained from such intensive investigation will pay great dividends for years to come as those people involved with this precious rescource are called upon to make key management decisions.

The results of this evaluation and planning effort will be published as part of our 208 plan and a special paper prepared by the U.S. Geological survey.

Final Plan

The overall plan for the Big Lost River 208 Project is broken down into four separate planning elements based on ownership as follows:

1. Private land
2. BLM land
3. US Forest Service land
4. State Land

The major emphasis of this planning document has been placed on a 29 mile section of the river above the Mackay Reservoir. The primary planning element in this stretch of river is private land, however, some BLM and state lands are included. The Forest Service lands are all in the upper watershed.

The planning matricies were developed for the 29 mile project area. They present the ownership, problems, locations, prioritized BMP alternatives, and priorities for installation. The matricies form the backbone of the 208 plan. The data displayed on them have provided readily accessible information for the development of the individual conservation plans for the private landowners. The matricies have also proven invaluable in preparing project plans for funding sources such as the Resource Conservation and Development Program and ACP Special Project Program. Separate BLM and Forest Service Planning narratives are included as appendicies (Appendix III and IV)..

State lands within the project area are relatively insignigicant in that only 440 acres occur withinthe project boundaries. Due to the small amount of land involved, a planning narrative was not prepared. However, the Idaho Fish and Game Department has a 25 foot easement on both sides of the river. The IF&G have identified their worst erosion problem and installed gabions and initiated a program of critical area planting on the site. As a result of their efforts, the gabion demonstration portion of the project has been greatly enhanced.

Management Agencies

The Butte Soil Conservation District will have the overall responsibility for the implementation of the plan.

However, certain agencies such as the Bureau of Land Management, U.S. Forest Service and the Idaho Department of Lands will have responsibility for implementation on the lands which they administer.

Implementation Progress

At the present time all work on the demonstration gabions has been completed. In addition 3 gabion drop structures have been installed across an eroding meander node.

Two tests plots for grass seedings have been established. One experimental willow planting has been carried out. Another is scheduled for May of 1982. The willows stock for this planting has been ordered and is in cold storage at the Aberdeen Plant Materials center.

Conservation plans have been prepared and delivered to each individual landowner. This has allowed the landowners to begin implementing BMP's on their own. One landowner has been working on tree placement along his eroding banks this spring. All of the landowners have been carring out a program of clearing and snagging on their own.

As you know the Big Lost River Project has been approved as a RC&D Project by the High Country RC&D. The Big Lost River Project has a number one priority with the High Country RC&D for potential funding this year. A critical area measure plan has been developed for the Big Lost. In this plan, sites and landowners have been prioritized for implementation this year as soon as funding is available. (See copy of plan attached.)

Public Participation

We feel that the public interest and involvement with the Big Lost River 208 Project has been one of the outstanding highlights of the project.

Our first meeting was held on August 27, 1979. At this meeting the Butte SCD and interested landowners were notified of funding and early work plan requirements. Shortly after this first meeting a Butte SCD - land owner meeting was held to elect a steering committee and set up a formal group organization.

Since these early meetings numerous Technical Advisory Commettee meetings have been held. The TAC were held continously through-out the project period. These meetings were used to coordinate all technical planning and evaluation efforts. They were also used for brain storming for solutions to constantly occurring problems.

Public participation meetings were held at key decisions points during the project period. We were very gratified at the turnout of people at these meetings.

Numerous tours of the project area have been held over the past two years. These have ranged from technical advisory committee tours to VIP tours. The most notable tours have been the US Forest Service and Butte SCD joint tour of the watershed and the annual youth conservation tours held every year for the local sixth grade classes by the Butte SCD. In addition the Mackay High School science class was taken on a tour of the project area.

We feel that these tours have been the most effective part of our program. Anytime that we have had a problem develop with personnel from one of the involved agencies we have brought them out into the field for a tour. Everyone that has been able to view the project or project area has gone away with a better understanding of the situation. The tours involving our local youth will surely bear fruit for our conservation efforts now and in the future.

We have used the media as much as possible to tell our story. Numerous news articles have been published in local and reginnal news papers. Articles have also appeared in several of the agencies in house news letters and magazines.

Television crews from Station KID - 3 were on the project twice. They filmed project activities and interviewed a number of the local people involved. The film footage was shown as part of the local news bracasts. A third project follow-up filming is planned for the fall of 1982.

A slide presentation has been worked up amd used for oral presentations dealing with the project. Presentations have been made to all of the involved federal agencies, other soil conservation districts, Idaho Chapter of the American Fisheries Society, R.N. Irving Chapter of the Soil Conservation Society of America, Mackay City Council, local scout groups, civic organizations and schools.

The high point of these activities was our 208 presentation to Governor John Evans and Butte County Officials as part of the Governor's "Capital for a Day Program" in Butte County. We had excellent support by the local people at this meeting. We feel that the dialogue established between the Governor and the local people involved with the project was very productive and rewarding.