BIG LOST RIVER WATER QUALITY MANAGEMENT PLAN

BUTTE SOIL CONSERVATION DISTRICT

MARCH 1982

Submitted by

Jack Jensen, Chairman

The preparation of this report was financed by a PL92-500, Section 208, Water Quality Management Planning Grant from IDHW-DOE.

TABLE OF CONTENTS

I Project Summary

The Big Lost River Project is located in Custer County and involves a 29 mile stretch of river extending from above the Bartlett Point Bridge to the Mackay Reservoir. This section of river flows through private, state and federal lands.

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. Much land has been lost and gravel and sediment deposition threaten productive pasturelands, fish and wildlife habitat. The reservoir storage capacity is vital for irrigation of the lower Big Lost Valley.

The objectives of this plan are to implement the selected Best Management Practices in a coordinated and timely manner and to demonstrate the application of these BMP's on the river. The control of streambank erosion and meander maintenance is very important to the success of this project. To achieve these project objectives, a balanced program of treatment and preventative practices that are technically, economically, environmentally and socially acceptable to both the private landowners and the involved federal and state agencies is needed. BMP implementation plans will be developed for each rancher having identified critical sites located on his or her land adjacent to the river. Estimated cost for the implementation of this plan is $750,000.

The Butte Soil Conservation District will be the designated sponsoring agency. The district has demonstrated its ability to manage this type of project through successful completion of the streambank stabilization demonstration project, carried out as part of the planning effort. The district will administer the Implementation Plan through a memorandum of agreement with the landowners and involved federal, state and local units of government.

Exceptional working relationships have been established between the district, private landowners and the many federal and state agencies involved in this project. Organizations such as the Boy Scouts of America and Trout Unlimited have been very supportive of the project by donating much time and labor.

Public interest and involvement in the project has been very active. Numerous meetings and tours have been held and have been well attended over the past two years. The highlight of these activities was the 208 Project presentation and briefing made by the SCD, landowners, and involved agencies to Governor John Evans in May, 1981.

The implementation of this plan will have a number of positive impacts. The water quality of the Big Lost River and Mackay Reservoir will be improved. The storage capacity of the reservoir will be protected. Fish and wildlife habitat will be enhanced. Productive croplands, pasturelands and riparian habitat will be protected.

Project Sponsor
and numerous help

II Description of the Planning Area

The Big Lost River Valley is one of the three major structural intermountain basins of central eastern Idaho. The valley is an elongated depression formed between two parallel faults running along the White Knob and Lost River Mountains. The watershed above the downstream boundary of the project area at the Mackay Dam has an area of 788 square miles. The watershed is characterized by high rugged mountains.

Geology of the area is comprised mainly of carboniferous sedimentary rock, glacial deposits, alluvial deposits and Challis Volcanics.

Soils within the project area fall mainly into four of the ten orders: Aridosols (dry soils), Entisols (young soils), Histosols (organic soils) and Mollisols (dark soils). These soils are formed from river alluvium originating from a large assortment of Igneous, Sedimentary and Metamorphic rock. The predominate gravels in the soil profiles are quartzite and limestone. The profiles are poorly developed because of low rainfall during summer months and river channel migration with its associated channel erosion.

The climate is characterized by cold winters, hot summers and low precipitation. Seasonal and daily temperatures, wind directions, wind velocities and precipitation can all be highly variable. The average annual precipitation is less than 10 inches with approximately 40% occurring as snowfall.

The vegetation within the project area is quite varied with numerous species being represented within four main vegetative types. The main vegetative types are conifer, sagebrush-grass, wet and semi-wet meadow and riparian. The transition from one type to another is quite abrupt due to changes in elevation and distance from the river channel. This in turn creates excellent wildlife habitat and provides food and cover for numerous species in the area.

The Big Lost River is a unique fishery in that it is isolated from other downstream drainages. The river sinks into the Snake River Aquifer in the lower valley and on the Snake River Plain. As a result of this situation, many nongame fish species that inhabit the upper Snake River drainage are not

found in the Big Lost River. The fish population in the river is comprised of rainbow trout, brook trout, whitefish and sculpins (a small forage fish).

The quality of the area's scenic, fish and wildlife resources make the Big Lost Valley a paradise for recreationists. , The US Forest Service and the Bureau of Land Management maintain a number of recreation sites in the area. There are no registered historical or archeological sites within the project area.

The economy of the area is based mainly on local livestock operations. The town of Mackay is located five miles south of the Mackay Reservoir and provides local shopping and services. Income from recreation also contributes to the local economy.

Water quality of the river is presently being impacted by excessive stream-bank erosion and deposition of gravel and sediment. This problem is quite evident throughout the river system and in the Mackay Reservoir.

See Appendix I for a more detailed description of the project area.

III 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 this area in order to irrigate pasture 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 curve 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 maintain 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 eroded 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 manner. 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 periods 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 detrimental to recreation and fisheries in the future.

See Appendix VI, "Sedimentation in the Mackay Reservoir".

IV 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 watershed 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 also include sedimentation 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.

V Alternative Best Management Practices

The selection of the preferred Best Management Practices was based on a thorough non-point source assessment of the project area. The assessment involved a reconnaissance survey of channel stability, statistical evaluation of water quality conditions in the upper watershed, aerial photo interpretation of erosional and depositional features, reservoir sedimentation evaluation and river sedimentation and channel change evaluation.

The final step in this selection process was carried out on the land with the landowners. The landowners' experience, knowledge, desire and ability to implement the selected practices were key elements of the selection process. The non-structural BMP alternatives selected for implementation on private lands are as follows:

1. Revegetation

   Approximately 64,320 square feet of critical area plantings will be carried out on private land.

2. Gravel Removal

   This BMP will involve a number of sites (indicated on the following planning matrix) primarily in the vicinity just above the Mackay Reservoir.

3. Clearing and Snagging

   This BMP will be carried out on an annual basis after the occurrence of peak flows.

4. On-Farm Management Systems

   These will be developed and worked out with each individual landowner and will be recorded in his conservation plan prepared by the Soil Conservation Service.

5. Riparian Zone Management

These areas will be managed in such a manner that the grazing levels of domestic livestock will allow for suitable vegetative cover. The vegetation in these areas will be allowed to maintain itself through natural reproduction. Livestock wintered in these areas will be moved out early in the spring. Livestock will be moved to federal allotments from May until October. Range management systems on private lands will be coordinated with use on federal lands. (See US Forest Service and Bureau of Land Management range discussions, Appendices III and IV.)

Selected structural BMP alternatives are listed and described as follows:

1. Organic Debris Emplacement

Trees and logs cabled into eroding banks. Rock deflectors will also be used in conjunction with, and as part of, this practice. Approximately 4,325 linear feet will be installed on private land.

2. Gabions

Galvenized steel baskets filled with rocks placed along eroding banks will be used. This practice is especially adapted to critically eroding high banks where stabilization of the bank toe is needed. Approximately 5,974 linear feet will be installed on private land.

3. Rock Riprap

Rock-facing for streambank protection will be used where most advantageous. Approximately 3,706 linear feet of rock riprap will be placed within the project area on private land.

4. Rechannelization

This practice will involve any one of, or a combination of, the above

practices. There will be extensive application of this practice in the Chilly Sinks Channelized Area.

These structural measures will be designed and installed on private land according to SCS standards and specifications. The US Fish and Wildlife Service, Idaho State Fish and Game Department and other involved agencies will be consulted with regard to fish and wildlife habitat mitigation and enhancement measures for these practices.

All needed permits for stream and streambank alterations will be obtained from the Idaho Department of Water Resources prior to any installation activity. The Department of Water Resources will be consulted at various points throughout the planning and implementation stages as needed.

Operation and Maintenance

The Butte Soil Conservation District has developed an Operation and Maintenance Agreement that will be signed by both the involved landowners and the district.

The individual landowners will have direct responsibility for operation and maintenance of BMP's installed. The Butte SCD will have project responsibility for operation and maintenance as the sponsoring organization.

The landowner's responsibility for operation and maintenance begins when a part of or all of the work of installing a measure is completed and accepted or is determined to be complete by the District and the landowner. This responsibility shall continue until the expiration of the expected normal

life for the installed project measure(s).

The District and the landowner will prepare a detailed plan of operation and maintenance for the measure covered by the agreement. The plan will be attached to and become a part of the agreement.

The landowner will inspect the installed structure at least annually and after each major runoff or occurrence of any unusual condition that might adversely affect the project measure(s).

Federal and State agencies having direct involvement may inspect the project at any reasonable time during the period covered by this agreement, as long as they are accompanied by District Representative(s). Upon request of the District and the landowner, the SCS could be invited to assist with inspections.

A written report will be made of each inspection. A copy of each report will be provided by the inspecting party to their party within 10 days. The District will maintain, in a centralized location, a record of all inspections and significant actions taken. The landowner may inspect these records at any reasonable time during the term of the agreement.

VI Demonstration Project

This portion of the planning effort served to actively involve the landowners, numerous agencies, and citizens groups in a common effort. It also demonstrated the use of gabions for erosion control on different types of eroding streambanks.

One site selected for installation was on a high sluffing bank. This type of bank is difficult to protect because of access to the toe of the slope. Gabions proved to be most effective for this type of situation.

The other site selected for gabion installation was in the lower reach of the river just above the reservoir. This site was selected in order to evaluate the use of gabions under a different type of bank erosion situation and flow regime of the river. At this site, two sets of gabions were installed on both banks to establish a controlled meander situation.

The Idaho Fish and Game Department also installed a set of gabions on a high bank that was actively eroding. Their installation technique varied from the SCS designed gabions. This will provide an excellent opportunity to evaluate installation procedures as well as evaluate effectiveness.

The natural or man caused tendency of a river to cut a new channels across and erode through the necks of existing meander points is a critical problem on any river. As part of the gabion demonstration, a series of three gabion structures were installed at key points across an actively eroding meander point. These gabion structures have a dual role to play: they serve as water spreaders and drop structures to help dissipate the water's energy during high flow and they slow down cutting through the meander point.

GABION INSTALLATION COSTS

UPPER SITE - 320 ft.

Labor at $8.00/hr.	=	$ 6,752.00
Equipment	=	$ 6,225.00
Baskets	=	$ 6,146.40
Total		$19,123.40 = $60/Lf.

LOWER SITE - South Bank - 289 ft.

Labor at $8.00/hr.	=	$ 4,600.00
Equipment	=	$ 5,548.00
Baskets	=	$ 4,928.20
Total		$15,076.20 = $52/Lf.

LOWER SITE - North Bank - 230 ft.

Labor at $8.00/hr.	=	$ 2,352.00
Equipment	=	$ 2,777.00
Baskets	=	$ 3,429.20
Total		$ 8,558.20 = $37/Lf.

In the past, rock riprap has been the preferred method for the control of streambank erosion. Limited sources for adequate rock material has become a problem in the Big Lost project area. The cost of blasting and hauling riprap has accelerated dramatically over the past few years. The present average cost, under normal circumstances, for the installation of rock riprap is estimated to be $45.00 per linear foot.

The preceding cost figures on the gabion installation indicate that on the smaller projects costs compare favorably for gabions. However, the time and manpower requirements for lacing the baskets proved to be a problem when installing gabions.

For the large sluffing banks, gabions are the best practice even though the cost figures in this case are greater. This type of site would not be a normal riprap site and would require expensive equipment for installation, thus increasing costs that could easily exceed gabion installation costs.

This project has demonstrated that gabions are a viable BMP alternative and are even preferred on the large sluffing banks. Asthetically, they blend in very well with their surroundings and even enhance the visual quality of the area. Most importantly, they have been very effective in controlling erosion.

Another important element of the demonstration project has been the revegetation of critically eroding areas. A Plant Materials Specialist and Range Conservationist from the Soil Conservation Service evaluated the gabion sites and developed seeding prescriptions for each site. In addition, two sites were selected for the establishment of test plots. These plots were seeded with a number of plant species to be evaluated for future potential critical area treatment. A future test plot will be established for the evaluation of Cottettii willow. The Cottettii willow is small, maximum height 6-7 ft., with a semi-prostrate growth habit, small stems and good layering ability. It is used primarily in the northeastern states for erosion control on streambanks.

The above mentioned specialists toured the entire project area and made seeding recommendations that have been included in each individual conservation plan.

Willow spriggings were also carried out on an experimental basis by Boy Scout Troop 340 of Pocatello, Idaho. They planted and are evaluating the following cuttings:

Brittle Willow - 225 cuttings
Dogwood - 100 cuttings
Green Willow - 125 cuttings
Sandbar Willow - 50 cuttings

KEY TO PLANNING MATRICES

Nonpoint Source Problem Type

AFC - braided channels
B - bridge
BF - bank failure
C -- cut
COM - cut off meander
D - ditch
H - hayland
LBF - large bank failure
LJ - log jam
MW - mass wasting
RR - riprap

Beneficial Use Conflict

AR - access road
B - bridge
Bldg - buildings
CR - county road
H - hayland
ID - irrigation ditch
IH - irrigation heading
IRg - improved range
P - pasture
Riparian zoned
Rg - range
URg - unimproved range
URgRip zone - unimproved range riparian zone

BMP Prioritized Alternatives

C - cut
CA - channel alteration
CM - control meander
CS - clear snagging
Dike
Gabion
GM - gravel manipulation
GRP - gravel removal placement
LBF - log bank failure
LJ Removal - log jam removal
LOD - large organic debris
Monitor
Plug
Rebuild
Rev. - revegetation
Riprap
SM - structure modification
USGS Eval. - US Geological Service Evaluation

(3D) - 3 deposits

I N G M A T R I C E S

Use Conflict	BMP Prioritized Alternatives 1	2	3	4	5	Priority
Rg	Rev.					High
	Monitor					Low
	Rev.					High
R	Rev.					High
R	Rev.					High
	Riprap	LOD	Rev.			High
R.	Rev.					High
	Rev.	Riprap	Monitor			Low
Rg	Gabion					Mod.
Rg	Monitor	Gabion	Riprap			Low
	Rev. Monitor	Riprap				
	Rebuild					High
	Riprap	Gabions	Rev.			High
	Riprap	Gabions	Rev.			High
	Rev.	Monitor				High
	Rev.	Monitor				High
eg Bldg	Monitor					Low
	Riprap	Rev.				High
ogan illiams	LOD	Rev.				Low
	Monitor					Low

ficial Use Conflict		BMP Prioritized Alternatives 1	2	3	4	5	Priority
	Bldg R	Riprap	Rev.	LOD			High
e							
rian		LOD					Mod.
rian		LOD					Mod.
Zone		Gabion	Riprap	LOD			High
t ' ' CR. ton		Gabion	Riprap	LOD			High
		LOD(2C)	M(3D) out of channel storage or dike				High
		LOD cable and stabilize or remove					Mod.
		LOD cable					Mod.
		Monitor LOD(C)					Low
Zone		LOD	Gabion				High
		Rev.	Gabion	Monitor			High
Zone		Monitor	LOD	Rev.			Low
	AR	Rev.	LBP	LJ			High
			Monitor	Remove			H
		Gabion	Rev.				High
		Rev.	Monitor				High
		Gabions	LOD	Riprap			High
	Bitton's	Rev.	Monitor	Gabion			Mod.
;ian							
Zone	"	Gabion	LOD				High
	Bldg	Riprap	Monitor				High

River Mile	Photo Number	Ownership	Site Number	Nonpoint Source Problem Type			Beneficial Use Conflict			BMP Prioritized Alternatives 1	2	3	4	5	Priority
19.69 to 19.36	083	State	40	2C	H		IH	Rg		Monitor	LOD				Low
19.36	"	"	41	LBF			Rg			Gabion	Rev.				Low
19.25	083	IF & G	42	2C			Rip. Zone			Monitor					Low
19.14	"	Vern Johnson	43	C	LJ		Rip. Zone			LOD	Gabion	LJ Remove			Mod.
19.03	"	Vern Johnson	44	LBF			AR	Rg		Rev.					High
18.92	"	State	45	LBF			AR	Rg		Gabion	Rev.				Mod.
18.81	"	Vern Johnson	46	10C	2H		IH	Rip. Zone		Monitor	LOD	Gabions	Rev.		Low
18.70	"	"	46A	C			P			Monitor	Gabions	LOD			
18.70	081	"	47	3C			P			Gabions	LOD	Rev.	Monitor		Low
18.48	"	"	48	2C	LJ	H	IH	P		Gabions	LOD	Rev.	Monitor		Low
18.59 to 18.37	"	State & Vern Johnson	49	5LBF	C		P	Rip.	Rg	Rev.	Monitor				High
18.48	"	BLM-State-Vern Johnson	50	4LJ	C		P	Rip. Zone	Rg	Remove	Monitor				High
18.48	"	Vern Johnson E. Gabert	51	3C			Rip. Zone	P		Gabions	LOD				Low
18.37	"	Vern Johnson	52	LBF			Rg			Rev.	Monitor				High
18.26	"	Townsley Gabert	53	4C	H	LJ	IH			Monitor	Rev.				Low
17.93	"	Egeles	54	C			Rip. Zone			Monitor	LOD				Low
17.82	"	"	55	C	LJ		Rip. Zone			LOD	Remove	Monitor(C)			Low
17.71	"	V. Johnson	56	C			Rip. Zone			Riprap	LOD cable	Monitor			High
17.49	079	V. Johnson	57	LBF			IRg	AR		Gabion	Rev.	Monitor			High

River Mile	Photo Number	Ownership	Site Number	Nonpoint Source Problem Type	Beneficial Use Conflict	BMP Prioritized Alternatives 1	2	3	4	5	Priority
17.38	079	V. Johnson	58	C	Rip. Zone P	Monitor	LOD				Low
17.27	"	"	59	D C	Rip. Zone	Gravel Removal & Placement					Low
17.27	"	BLM	60	LBF	IRg AR	Rev.	Monitor	Gabion			Low
17.05	"	"	61	C	Rg	Gabion	Rev.	LOD			Mod.
16.94	"	"	62	LBF C	Rg AR	Rev.	Monitor	Gabion			Mod.
16.83	"	"	63	C	Rip. Zone	Monitor	LOD	Gabion			Low
16.72	"	"	64	C	Rip. Zone	Dike	Monitor				Mod.
16.61	"	"	65	LBF H LJ	IH Rg	Gabion	Rev.	LJ Remove			High
16.50	"	"	66	C	Pasture Rg	Monitor	LOD	Gabion			Low
16.39	077	Walt Johnson	67	2C	Rip. Zone	Monitor					Low
16.28	"	"	68	C	P Rip. Zone	Riprap Gabions	Rev.	Riprap			Mod.
16.17	"	"	69	C&RR	P	Riprap	Gabion	Rev.			High
16.06	"	"	70	LBF	P IRg	Gabion	Rev.				Mod.
15.84	"	"	71	LBF	IRg	Gabion	Rev.	Riprap			Mod.
15.62	"	"	72	LJ C	P Rip. Zone IH	CS	LOD				High
15.40	"	"	73	LBF	IRg 2IH	Gabion	Rev.				Mod.
15.18	"	"	74	AFC	CH URg	Plug	Dike	Rev.			High
15.73 to 15.18	"	"	75	10C	CH Rip. Zone P	Dike	Rev.	Monitor			High
15.29	075	BLM	76	2C	CH	Dike	Rev.				High
15.07	"	"	77	LBF D	URg ID	Monitor	GRP	Gabion	Riprap		Low
15.07 to 14.63	"	"	78	7C	URg	Monitor					Low

River Mile	Photo Number	Ownership	Site Number	Nonpoint Source Problem Type	Beneficial Use Conflict	BMP Prioritized Alternatives 1	2	3	4	5	Priority
14.63	"	BLM & San Felipe Ranch	79	LBF H	URg IH	Dike	GRP	Gabion	Riprap		Mod.
14.41	"	BLM	80	H LBF	Rip. Zone	Gabion	Riprap				Mod.
14.08	075	BLM	81	C	Rip. Zone	Monitor	Rev.				Low
13.97 to 13.64	068	Byron Coates	82	4C AFC H	P	Monitor	Gabions	Rev.			Low
13.64 to 12.87	068 066	"	83	23C D R	P	CA	GM	Dike	CM	USGS Eval.	High
12.87	066	Realtor	84	BF	URg	CA	GM	Gabion	Riprap	"	High
12.43 to 10.34	066 061 059	WPA	85	C severe	IH URg	CA	GM	Dike	CM	"	High
10.23	059	Herb Whitworth	86	C	Rip. Zone P	CA	GM	Dike			Low
10.01	"	"	87	2C	Rip. Zone P	CA	GM	Gabion	Riprap		Mod.
9.79	"	"	88	C	Rip. Zone P	CA	GM	Gabion	Riprap		Mod.
9.57	028	"	89	2C	H	Dike	Gabion	Riprap	Rev.		Mod.
9.35	"	"	90	C	P Rip. Zone	Gabion	Riprap	CA	Rev.		Low
9.13 to 8.91	"	"	91	3C 2LJ D	P Rip. Zone AR	Monitor					Low
8.69	"	"	92	C	P Rip. Zone	LOD	Rev. Riprap	Rev.	Monitor		High
8.36	026	"	93	LJ	Rip. Zone	CS	Monitor				Low

River Mile	Photo Number	Ownership	Site Number	Nonpoint Source Problem Type			Beneficial Use Conflict			BMP Prioritized Alternatives 1	2	3	4	5	Priority
8.14	026	Herb Whitworth	94	2C	RR	H	Rip. Zone			Monitor					Low
8.03 to 7.59	"	"	95	4C	2H	2RR	IH	Riprap		Monitor	Gabion	Riprap	Rev.		Low
7.48	024	San Felipe	96	C			P	Rip. Zone		Monitor	Gabion				Low
7.37	"	"	97	C			H			Gabion	Riprap	Rev.			High
7.26	"	"	98	2C	RR		P			Gabion	Riprap	Rev.	CA	USGS Eval.	High
7.15	"	"	99	C	RR		P	H		Gabion	Riprap	Rev.	CA	USGA Eval.	High
7.04 to 6.82	"	"	100	2C	H		IH	P	H	Gabion	Riprap	Rev.	CA	USGS Eval.	High
6.82 to 6.49	"	"	101	3C			P	H	Rip.Zone	Gabion	Riprap	Rev.	CA	USGS Eval.	High
6.05 to 5.39	022	"	102	C	RR		P	H	Rip.Zone	Rev.	Monitor	CA	Gabion	Riprap	Low
5.72 to 5.61	"	Terrance Donahue	103	2C			P			Gabion	Rev.	LOD			Low
5.39 to 5.17	"	"	104	2C			P			Gabion	Rev.	LOD			High
5.17	"	"	105	C	H		P	IH		LOD	Gabion	Riprap			High
5.06	"	David Smith	106	C			H			Gabion	LOD	Riprap	Rev.		Mod.
4.84	"	"	107	C			ID	Rip. Zone		Gabion	LOD	Riprap	Rev.		Mod.

River Mile	Photo Number	Ownership	Site Number	Nonpoint Source Problem Type			Beneficial Use Conflict			BMP Prioritized Alternatives 1	2	3	4	5	Priority
4.51	020	David Smith	108	2C	H		H	IH		Monitor					Low
4.29	"	"	109	C			P	H		Gabion	LOD	Riprap			High
4.18	"	"	110	C	H		H			Monitor					Low
3.74 to 3.63	"	D.Smith & county	111	3C	RR		H	B		LOD	Rev.				High
3.52	"	Tommy Pence	112	C	RR		H			Gabion	Riprap				Mod.
3.30	018	"	113	2C	RR	H	H	IH		Monitor	Riprap				Low
2.75	"	"	114	2C			H			Gabion	Rev.	Riprap			High
1.98	016	Bardonna Zollinger	115	3C	LJ		IH	H	P	Gabion	LOD	Rev.	Riprap Settling Pond		High
1.87	"	"	116	4C	H	RR	IH	P		CA	SM				High
1.76	"	Zollinger Jack Goddard	117	C			P	Rip.Zone		Gabion	Riprap	CA			High
1.54	"	"	118	2C			P	Rip.Zone		LOD	Rev.	CA	Monitor		High
1.10 to 0.77	014	"	119	4C	2RR		Highway	P	Rip. Zone	Gabion	Riprap	CA			High
0.77 to 0.00	"	"	120	D			P	Rip.Zone		GR	CA				High

VII. Plans for Implementation of BMP's

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 on the following pages 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 insignificant in that only 440 acres occur within the 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.

VIII. Benefits

The application of BMP's in the Big Lost River project area will have both short and long-term benefits. The installation and maintenance of BMP's to be installed in the critical erosion and sediment producing areas will have some adverse short-term economic impact on the private landowner. Many of the benefits that will be derived from this project will accrue to downstream users and recreationists as well as the landowners installing the practices. The implementation of this plan is expected to have the following benefits:

Short-term Benefits

1. Stabilization of streambanks.
2. A gradual reduction of sediments and bedload materials flowing through the river system.
3. Improved fish and wildlife habitat.
4. Protection of productive agricultural lands.
5. Correct problems created by past channel alterations.

Long-term Benefits

1. Meet national water quality goals of PL92-500.
2. Improve water quality of the Big Lost River and Mackay Reservoir.
3. Reduce amount of gravel deposition occurring in lower reach of the river above the Mackay Reservoir.
4. Reduce sediment load moving into the reservoir.
5. Preserve storage capacity of the Mackay Reservoir.
6. Improve recreational opportunities on the Big Lost River and the Mackay Reservoir.
7. Enhance fish and wildlife habitat along the Big Lost River and in the Mackay Reservoir.
8. Potential for reducing the number of irrigation diversions.
9. Reduced cost of moving maintaining irrigation diversions.
10. Improve management of riparian zones.

IX Environmental Impact Summary

No significant adverse impacts are expected to occur as a result of implementation of the Big Lost River 208 Water Quality Plan. The installation of both structural and non-structural Best Management Practices (BMPs) will have only positive long-term effects on the environment as previously described.

The information presented in the following table ("Evaluation Matrix of Environmental Impacts of Best Management Practice Alternatives") summarizes in matrix format the environmental relationships and impacts expected from the planned BMP implementation. The probable environmental impact analysis for each potential BMP with regard to land, water, and air is presented (Appendix II). The only negative impacts that are anticipated to occur will be short-term in nature. These will result from structural installation. Mitigation plans for onsite disturbances for each structural BMP installation will be required.

Identified BMPs, such as rechannelization and gravel removal, will require more detailed hydrological and biological evaluation. This will be especially necessary with regard to the channelized section in the Chilly Sinks area. When the word "rechannel" is used in this plan, it refers to developing meanders and "S" curves in river sections that have previously been straightened by man. Site specific environmental impact statements may be required when this type of work is done.

Endangered and Threatened Plant and Animal Species - Our consultation with the agencies listed below indicates that there are no endangered and threatened plant and animal species:

State of Idaho - Dept. of Fish & Game
US Dept. of the Interior - Fish & Wildlife Service
USDA - Forest Service
Bureau of Land Management

EVALUATION MATRIX OF ENVIRONMENTAL IMPACTS

OF

BEST MANAGEMENT PRACTICE ALTERNATIVES

Environmental Factors	No Action	Rock Riprap	Gabions	Organic Structures	Revegetation	Land Treatment	Channel Alt.	Clearing & Snagging	Gravel Removal
Basic Resources									
Land:									
Vegetation	-	+	+	+	+	+	+	+	+
Erosion hazard	-	+	+	+	+	+	+	+	+
Flood hazard	-	+	+	+	+	+	+	+	+
Gravel deposition	-	+	+	+	+	+	+	+	+
Water:									
Stream quality	-	+	+	+	+	+	+	+	+
Flow regime	-	+	+	+	+	+	+	+	+
Reservoir storage	-	+	+	+	+	+	+	+	+
Reservoir quality	-	+	+	+	+	+	+	+	+
Air:									
Particulates & toxic	0	0	0	0	+	+	0	0	0
Gases	0	0	0	0	+	+	0	0	0
Odor	0	0	0	0	+	+	0	0	0
Noise	0	0	0	0	+	0	0	0	0
ResourcesUses:									
Crop production	-	+	+	+	+	+	+	+	+
Range & pasture mgt.	-	+	+	+	+	+	+	+	+
Fish & Wildlife	-	+	+	+	+	+	+	+	+
Recreation	-	+	+	+	+	+	+	+	+
Irrigation	-	+	+	+	+	+	+	+	+
Economic development	-	+	+	+	+	+	+	+	+
Social values	-	+	+	+	+	+	+	+	+
Cultural/historical	-	+	+	+	+	+	+	+	+
Visual	-	+	+	+	+	+	+	+	+

Major Impacts:
+ Positive
- Negative
0 None

X Funding

At the present time, funding for implementation of the 208 plan on private land is being actively pursued through two programs.

The Butte Soil Conservation District, acting as the project sponsor, has succeeded in getting the Big Lost River Project accepted by the High Country RC&D as a viable measure with high potential for funding. The District used the data generated from the 208 plan to help them develop the RC&D Critical Area Treatment Plan for the River.

The other source of funding being pursued at this time is through the Agricultural Stabilization and Conservation Service. A request has been made by the District and the landowners for an ACP special project on the river. Also, critical area treatment under the normal ACP program will be pursued on an individual basis by the landowners.

For now, these two funding sources are the most probable. However, as new potential sources develop every effort will be made to acquire the needed funds for this project.

Conclusion

The Big Lost River 208 Project has been called many things since its inception - such as "another damn riprap project," a "lemon," "another dime a dozen stabilization project," a "landmark achievement," "one of a kind," the "ultimate cooperative effort," and even the "Sagebrush Reunion." However, what this project has been is simply people working together using available material and financial resources to evaluate and solve problems related to our precious natural resources.

This planning effort was actually initiated a number of years ago by the individual landowners. For years they have been holding tours and trying to get help or at least a commitment for help from the numerous federal and state agencies. Their quest for assistance led them to the Butte Soil Conservation District. The landowners formed an organized group and signed a Group Cooperative Agreement with the District on 8/8/79. Since then the district has acted as sponsor for the Big Lost 208 Project and has served as the catalyst for planning and implementation efforts.

The demonstration element of the project was very successful and a great asset to the planning effort. The installation of the demonstration gabions made possible immediate positive action that involved the actual application and onsite evaluation of a potential BMP. As a result everyone involved felt that this project was going to be more than just another government planning fiasco.

The installation of the gabions involved many days of donated time, labor, and equipment from the local landowners. Numerous agencies actively participated with technical expertise and labor. Both the BLM and the Forest Service donated YACC time. Equipment and manhours were also given by the Custer County Highway Department. Local Boy Scout troops were active in building the gabion baskets. They were responsible for over $2,000.00 worth of labor. A Scout troop from Pocatello, Idaho initiated an experimental willow sprigging project as part of

the revegetation program.

Another plus for this part of the project was the voluntary involvement of the Idaho Fish and Game Department. The installation of their gabion expanded the gabion demonstration to include a variety of installation designs and techniques.

The planning effort itself has been exceptional. The landowner has been involved at every level. Every opportunity to seek his knowledge and input has been capitalized upon. The landowner's unique body of knowledge, gained by years of experience living with the river, combined with scientific and technical input from the involved agencies has lead to the development of a well coordinated and most comprehensive plan.

The techniques and procedures used in evaluating the Big Lost River will have far reaching benefits beyond the Big Lost River Valley and the State of Idaho. The methodology developed as a result of this project can be applied to any other stream or river system and watershed. Water quality problems related to flowing water systems can be identified and evaluated rapidly and precisely. This will result in a tremendous savings to the people of this country in that costly river stabilization projects can be adequately evaluated prior to large expenditures of federal money for questionable benefits.

TABLE OF CONTENTS FOR APPENDICES