BIG LOST RIVER STREAMBANK
CRITICAL AREA TREATMENT MEASURE

16-6004-023-041

SPONSORED BY

BUTTE SOIL CONSERVATION DISTRICT

HIGH COUNTRY RC&D PROJECT

PREPARED WITH ASSISTANCE FROM

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

NOVEMBER 1981

PREPARED UNDER THE AUTHORITY OF SECTION 102
OF THE FOOD AND AGRICULTURAL ACT OF 1962
(PUBLIC LAW 87-703), AND THE SOIL CONSERVATION
ACT OF 1935 (16 U.S.C. - 590a-f)

I. PLANNING AREA AND RESOURCES

A. Planning Area

The Big Lost River Valley is one of the major structural inter-mountain basins of central eastern Idaho. It is located at the boundary between the northern portion of the Snake River Basin and the southern most section of the Northern Rocky Mountains.

The main stem of the Big Lost River is formed about 29 river miles upstream from Mackay Reservoir by the confluence of the East Fork and North Fork of the Big Lost River.

The Mackay Reservoir, located 5 to 6 miles north and west of the town of Mackay in Custer County, was created following construction of the Mackay Dam in 1917. The Reservoir has a surface area of 1,241 acres and a full capacity of 45,050 acre feet. When filled to spillway elevation, it has a maximum depth of 65 feet.

A number of land management agencies, such as the U.S. Forest Service, Bureau of Land Management, the Idaho Department of Lands, and the Big Lost River Group (private landowners) and others are working in a coordinated effort to reduce streambank erosion and improve the water quality of the watershed above Mackay Reservoir and reduce the sediment transported into the Reservoir. The Big Lost River Group consists of 15 landowners living along the river. The Butte Soil Conservation District is the sponsor for the Big Lost River Group.

The portion of the project area involving the Big Lost River Group extends along a twenty-seven mile stretch of the Big Lost River from above the Bartlett Point Bridge to the Mackay Reservoir. This section of river is characterized by extensive streambank erosion at numerous points downstream to the reservoir. The excessive erosion of these critical areas along this stretch of the river contributes to heavy deposition of sediment. (See site specific erosion study.)

The shifting of bed materials in the channel alters the flow regime of the river. As deposition increases in the lower reaches (see map) of the river, new channels are cut. This results in occasional flooding and continued streambank erosion. The deposition of gravel, sand and silts become critical with regard to the Mackay Reservoir. The reservoir is the lifeline of the Big Lost Valley as far as irrigation water supply is concerned and also is an important fishery.

The landowners within the project area will be applying a variety of structural and nonstructural treatments to 35 identified critically eroding sites (see map). These sites are a portion of the total 120 identified problem sites occurring within the project area. Many of the remaining sites are under going further evaluation by the USGS in order to develop corrective measures.

B. Evaluation of Resource Capabilities

1. Climate

The Big Lost River has a cool semi-arid type climate, characterized by warm, relatively dry summers and cold winters. Seasonal and daily temperatures, wind directions, wind velocities and precipitation can all be highly variable. The approximate frost free period is 100 days. The project area falls within the 8 to 12 inch precipitation zone with most of the accumulation occurring duringwinter months as snow. The occasional occurrence of excessive amounts of precipitation has aggravated the erosion problem in years past.

2. The soils within the Project Area are formed from river alluvium originating from a large assortment of Igneous, Sedimentary and Metamorphic rock. The predominant gravels in the soil profiles are quartzite and limestone. The profiles are mixed and poorly developed.

The majority of soils are shallow to moderately deep gravelly looms over sand and gravel. They are poorly drained with a fluctuating water table between 20 to 40 inches deep. Permeability is 0.63 to 6.3 inches per hour and water holding capacity is 1.5 to 6 inches.

The lower river flood plain is well drained, has moderately rapid permeability and very low water holding capacity.

3. Topography

Elevations in the project area range from 6,000 feet at the Mackay Reservoir to 6,620 feet at the Bartlett Point Bridge. The three major mountain passes of the 788 square mile watershed above Mackay Reservoir include Willow Creek Summit at 7,161 feet. Ridgetop elevations tend to exceed 9,000 feet and range all the way up to 12,656 feet at Mt. Borah.

The mountains of the upper watershed are of very high relief (4,000-5,000 feet), are steep, rugged and moderately dissected Valleys in the headwater regions are often V-shaped from early glaciation. The boundary between timerline and alpine tundra is at about 9,500 feet.

4. Vegetation

The vegetation within the project area is quite varied with numerous species being represented with four main vegetation types. The main vegetative types are conifer (upper reaches), sagebrush-grass, wet and semi-wet meadow and riparian (flood plains). The transition from one vegetative type to another is quite abrupt within the project area due to changes in elevation and distance from the river .

Critical streambank erosion sites identified in the Measure Plan are generally within the sagebrush-grass and riparian vegetation areas. Treatment planned will protect the wet and semi-wet meadows from erosion by stream meanders.

5. Wildlife

The major large animal species found in the project area are deer and antelope. Elk are found in the higher reaches of the watershed. There are also a number of small animals native to this area such as coyotes, fox, racoon, beaver, mink, muskrat, gophers and numberous other rodents.

The Big Lost River also provides riparian habitat for many species of birds, mammals and amphibians. Cottonwood and aspen stands contribute vertical structure to the surrounding agricultural fields, forbs and grasses in the understory provide forage and cover that is not available in the adjacent dry habitats.

Numerous bird species visit the Big Lost River area during migrations. Fewer species actually breed or nest in the area. Some of the more common summer resident bird species are; red-railed hawk, Swainson's hawk, sparrow hawk, magpie robin, gray, partridge, chukar, mourning dove, chipping sparrow, red-winged blackbird, mallard, toal and others. Bald eagles have been seen wintering along the river and on the north end of the Mackay Reservoir.

6. Fisheries

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 Big Lost is comprised primarily of salmonids and sculpins (a small forage fish). Results of electroshocking carried out by the Idaho Fish and Game in the spring of 1980 indicated a fish population made up of rainbow trout, brook trout, whitefish and sculpins.

Overall, the Big Lost River and its many tributaries and lakes are rated as one of the better fisheries in Idaho.

The Big Lost River supplies water to the Mackay Reservoir. The Reservoir is stocked with rainbow trout and kokanee. Big Lost River, Warm Springs Creek and Parsons Creek are vital to these fish as spawning and nursery areas.

7. Archeological and Historical Resources

A review of the National Register of Historical Places, State of Idaho Register of Historical Sites and Consultation with the State Historic Preservation officer has indicated that there are no known existing or eligible historical sites within the project area.

A letter received from the State Archeologist indicates that there are no known archeological sites which will be affected by installation of the Measure Plan.

C. Problems

1. Big Lost River

a. Streambank erosion is the most critical problem within the project area.

b. During high flows extensive movement of large streambed materials occurs. This moving material causes the channel to change its configuration as the material is moved and deposited in new locations downstream. This streambed material is primarily due to excessive erosion of the raw stream banks.

c. As the result of the above described situation, fish spawning areas in the lower reaches of the Big Lost River are destroyed.

2. Mackay Reservoir

a. The Mackay Reservoir has lost approximately 5,000 acre feet of capacity due to sedimentation.

b. Sedimentation in the Reservoir has a detrimental effect on the fishery in that high turbidity occurs. This results in altered temperatures and reduced dissolved oxygen content. Also, food sources have become covered.

3. Agricultural Land

a. Productive pasture hayland and rangeland is lost due to excessive streambank erosion.

b. The deposition of gravel and sand due to overbank flooding also results in the loss of productive pasture and haylands in the lower reaches of river just above the Reservoir.

c. Three residences and accompanying out-buildings are threatened by continued streambank erosion.

d. Irrigation diversion headgates and canals require high operation and maintenance costs due to deposited gravels.

D. Sponsorship

The Butte Soil Conservation District will sponsor this project.

II. Planning Objectives and Alternatives

A. Sponsors Objective

1. Control streambank erosion while maintaining the present course of the river.
2. Reduce sedimentation in Mackay Reservoir.
3. Improve water quality and fish habitat.
4. Reduce the loss of productive pasture and haylands.

B. Alternative Planning Considerations

1. No Action Alternative

Erosion will continue at an excessive rate. Gravel, sand and other sediment will continue to be transported downstream and ultimately into the Mackay Reservoir. As a result, productive land will continue to be lost, the storage capacity of the Reservoir will be reduced at an accelerated rate, residences will be endangered and fish habitat will also be lost.

Various spot solutions will continue to be implemented without regard to the overall erosion problem. This type of solution can have great detrimental environmental and economic consequences.

2. Recommended Alternative

The installation of the recommended alternative will involve coordinated efforts on the part of other federal and state agencies as well as the private landowner. Treatment alternatives have been presented to landowners of each critical area. The following table represents the selected treatment for each site.

Installation of the recommended alternative will control streambank erosion at 31 critically eroding sites and prevent approximately ___ tons of sediment from being deposited into the Big Lost River.

Installation of the recommended alternative will also prevent the downstream delivery of approximately___ tons of sediment into Mackay Reservoir. Improved water quality and improved fish habitat in both the River and the Reservoir can be expected with the implementation of this plan.

III. Installation of Selected Plan

A. Alternative Treatments Selected for Treating Critical Areas on Private Land are Listed as Follows:

Site	Selected Treatment	Approx. Amount	Fiscal Year
1	Critical Area Planting	3,700 Sq. Ft.	1983
2	Riprap	210 L.F.	1983
	Critical Area Planting	840 Sq. Ft.	1983
3.	Riprap	269 L.F.	1983
	Critical Area Planting	4,035 Sq. Ft.	1983
4.	Tree Revetment	370 L.F.	1982
	Critical Area Planting	800 Sq. Ft.	1982
5.	Critical Area Planting	1,314 Sq. Ft.	1982
6.	Critical Area Planting	12,780 Sq. Ft.	1983
7.	Critical Area Planting	5,380 Sq. Ft.	1983
8.	Riprap	840 L.F.	1982
9.	Gabions	620 L.F.	1982
	Critical Area Planting	4,720 Sq. Ft.	1982
10.	Riprap	434 L.F.	1983

11	Riprap	168 L.F.	1983
12	Gabion	236 L.F.	1984
	Critical Area Planting	4,720 Sq. Ft.	1984
13	Gabion	168 L.F.	1984
	Critical Area Planting	3,360 Sq. Ft.	1984
14	Tree Revetment	900 L.F.	1984
	Critical Area Planting	1,800 Sq. Ft.	1984
15	Gabion	370 L.F.	1984
16	Tree Revetment	1,150 L.F.	1983
	Critical Area Planting	2,300 Sq. Ft.	1983
	Rock Deflectors	3	1983
17	Gabions	470 L.F.	1982
	Critical Area Planting	1,410 Sq. Ft.	1982
18	Tree Revetment	400 L.F.	1982
	Critical Area Planting	1,386 Sq. Ft.	1982
19	Gabion	1,000 L.F.	1983
	Critical Area Planting	3,000 Sq. Ft.	1983
20	Gabion	600 L.F.	1984
	Critical Area Planting	1,800 Sq. Ft.	1984
21	Gabion	570 L.F.	1984
	Critical Area Planting	1,500 Sq. Ft.	1984
22	Critical Area Planting	6,760 Sq. Ft.	1983
23	Gabion	770 L.F.	1983
24	Gabion	470 L.F.	1983
25	Tree Revetment	300 L.F.	1984
26	Tree Revetment	300 L.F.	1984

27	Gabion	270 L.F.	1983
28	Gabion	430 L.F.	1983
29	Riprap	785 L.F.	1984
30	Tree Revetment	905 L.F.	1982
	Critical Area Planting	2,715 Sq. Ft.	1982
	Rock Deflectors	3	1982
31	Riprap	1,000 L.F.	1983

TOTALS BY TREATMENT

C.A.P.	64,320 Sq. Ft.
Riprap	3,706 L.F.
Tree Revetment	4,325 L.F.
Gabions	5,974 L.F.
Rock Deflectors	6

Installation will consist of treatment as shown above. Installation is planned to be carried out over a three year period.

B. Installation Costs

The total estimated cost for installation of the critical area treatment planned is $724,894.00 of which $159,379.00 will be borne by local interests and $565,515.00 will be borne by Resource Conservation and Development funds.

The Resource Conservation and Development costs are $424,136.00 installation and construction, $84,827.00 for engineering and other technical assistance and $56,552.00 for administration.

Engineering and other technical assistance includes the direct cost of surveys, investigations, design and preparation of plans and specifications and construction inspection for the works of improvements described in the plan. It does not include the cost of similar services for land rights or for administration.

Administration costs are associated with installation of the works of improvement including the cost of the contract administration, review of plans, government representatives and necessary inspection services during installation to insure that measures are installed in accordance with the plans and specifications.

Local estimated costs include $141,379.00 for construction, $2,000.00 for engineering and other technical assistance, 15,000.00 for the value of the land rights and 1,000.00 for administration.

Installation and construction costs are based on current prices. Technical services and administration were calculated to represent reasonable costs. Cost estimates and distributions are shown in Table 1.

It is understood that treatment on Federal lands is ineligible for Resource Conservation and Development financial assistance.

C. Method of Financing

Resource Conservation and Development (RC&D) funds will be used to pay the Federal share of the costs.

RC&D funds will provide 75% of the installation and construction costs. The District will provide their share of the costs through agreements with landowners.

D. Land Rights and Easements

The Butte Soil Conservation District will acquire all necessary land rights, easements, or work permits for installation of the planned measures.

E. Contracting and Procurement

The planned works of improvement will be installed by Government contract or force account.

IV. OPERATION AND MAINTENANCE

A. The Butte Soil Conservation District will be responsible for the improvements installed with subordinate agreements with the individual landowners.

The estimated annual cost of operation and maintenance is $5,000.00. The evaluated life of these land treatment measures will be twenty years.

B. Inspection

1) Sponsors are to make periodic and special inspections of installed project measures as provided in the plan of O&M. Structure inspections are to be made at least annually and after each major storm or occurrence of any unusual condition that might adversly affect the project measures. At the discretion of the State Conservationist, SCS may assist sponsors with their inspections.

2) Sponsors are to maintain a written record of each inspection and furnish SCS a copy of such record. The SCS will provide the sponsors a copy of a similar record of the independent inspections.

3) The landowner shall perform the O&M work listed as needed in the inspection reports within the time frame established for each item of work. Failure to perform O&M work will be considered a violation of the O&M agreement.

4) Sponsors are to maintain a written record of work performed and a record of other significant O&M activity. The record will identify the measure, item of work, cost of performance and date completed.

5) Sponsor's records relative to the project shall be made available to SCS for examination.

V. Uniform Relocation Assistance and Real Property Acquisition Act

The measure sponsor assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971 and the Regulations issued by the Secretary of Agriculture pursuant thereto.

The costs of relocation payments will be shared by the measure sponsor and the Service as follows:

	Measure Sponsor (Percent)	Service (Percent)	Estimated Payment Costs (Dollars)
Relocation Payments	22	78	$0

Investigation has disclosed that under present conditions the RC&D measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost shared in accordance with the percentage shown.

VI. Mutually Agreeable Plan

Through a request of the Butte Soil Conservation District (called Sponsor) and the cooperative efforts of the Sponsor and the Soil Conservation Service (called SCS), this mutually agreeable RC&D measure has been adopted by the High Country RC&D Council and included in the project plan as a means to accomplishing objectives for the project.

VII. Agreement Required to Obligate Funds

This is not a fund-obligating document. Financial and other assistance to be furnished by the SCS in carrying out the work in this plan is contingent on the appropriation of funds for this purpose.

A separate agreement will be entered into between the SCS and the Sponsor before either party initiates work involving funds of the other party. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific improvements to be installed.

VIII. Compliance with Civil Rights Act

The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964 and the Regulations of the Secretary of Agriculture (7 C.F.R. Sec. 15.1-15.12) which provide that no person in the United States shall, on the ground of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving Federal financial assistance.

IX. No Member of Congress to Benefit

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

This plan may be amended, revised or terminated only by mutual agreement of the parties hereto, except for cause.

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BUTTE SOIL CONSERVATION DISTRICT

By_____

Title_____

Authorized by action of the Butte Soil Conservation District Supervisors at a meeting held on _____

U S D A, SOIL CONSERVATION SERVICE

By_____

State Conservationist

Date_____

TABLE 1 ESTIMATED COST
BIG LOST RIVER STREAMBANK
CRITICAL AREA TREATMENT

Estimated Costs

Cost Item	Unit	Number	RC&D	Other					
			Federal Land	Non-Fed. Land	Total	Fed. Land	Non-Fed Land	Total	Total
Land Treatment									
Rock Riprap	L.Ft.	3,706		125,077.50	125,077.50		41,692.50	41,692.50	166,770.00
Gabions	L.Ft.	5,974		268,830.00	268,830.00		89,610.00	89,610.00	358,440.00
Tree Cabeling	L.Ft.	4,325		19,462.50	19,462.50		6,487.50	6,487.50	25,950.00
Rock Deflectors		6		10,125.00	10,125.00		3,375.00	3,375.00	13,500.00
Critical Area Plantings	Sq.Ft.	64,320		641.00	641.00		214.00	214.00	855.00
Engineering and other Technical Assistance				84,827.00	84,827.00		2,000.00	2,000.00	86,827.00
Relocation Payments			0	0	0	0	0	0	0
Administration				56,552.00	56,552.00		1,000.00	1,000.00	57,552.00
Land Rights			0	0			15,000.00	15,000.00	15,000.00
TOTAL COSTS				565,515.00	565,515.00		159,379.00	159,379.00	724,894.00