

Little Lost River Subbasin Total Maximum Daily Load Agricultural Implementation Plan



**Developed for the
Idaho Department of Environmental Quality**

**Prepared by
Steven Smith
Water Quality Resource Conservationist
Idaho Association of Soil Conservation Districts
Idaho Falls, Idaho**

**In Cooperation with the
Butte Soil and Water Conservation District
Idaho Soil Conservation Commission
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Table of Contents

Acknowledgements	2
Table of Contents	3
Tables and Figures	3
Acronyms	4
Introduction	5
Goals and Objectives	5
Beneficial Use Status	5
Background	5
Accomplishments	6
Problem Statement	7
Pollutant of Concern	7
Sediment	7
Critical Areas	7
Tiers	8
Animal Feed Operations.....	8
Threatened and Endangered Species.....	8
Treatment Units	9
Treatment Unit #1 Stream Channels and Riparian Areas	9
Treatment Unit #2 Irrigated Crop, Hay and Pasture Lands	9
Treatment Unit #3 Range Land	9
Treatment Unit #4 Animal Feed Operation (AFO)	9
Proposed Treatment	10
BMP Implementation	10
Funding	11
Outreach	11
Evaluation & Monitoring	11
References	12
Glossary	13
Appendix A	15
Tables & Figures	16

Tables and Figures

Table 1. Water Quality Limited Segments in the Little Lost River Subbasin.....	5
Table 2. Erosion Estimates for Streams in the Little Lost River Subbasin.....	7
Table 3. Critical Areas by Subwatershed within the Little Lost River Subbasin.....	8
Table 4. Total BMP Costs for the Little Lost River Subbasin.....	10
Table A-1. Detailed BMP Costs for the Little Lost River Subwatershed	16
Table A-2. Detailed BMP Costs for the Sawmill Creek Subwatershed	17
Table A-3. Detailed BMP Costs for the Wet Creek Subwatershed	17
Figure A-1. Little Lost River Subbasin Ownership & 303(d) Listed Streams	18

Acronyms

AFO - Animal Feeding Operation.

BMP - Best Management Practice.

BLM - Bureau of Land Management, USDI.

BPA - Bonneville Power Administration.

BSWCD - Butte Soil and Water Conservation District.

CRM - Coordinated Resource Management.

C-CRP - Continuous Sign-Up, Conservation Reserve Program, FSA.

EPA - Environmental Protection Agency.

EQIP - Environmental Quality Incentives Program, USDA.

FSA - Farm Service Agency, USDA.

HIP - Habitat Improvement Program, IDFG.

IASCD - Idaho Association of Soil Conservation Districts.

ICA - Idaho Cattle Association.

IDEQ - Idaho Department of Environmental Quality.

IDL - Idaho Department of Lands.

ISCC - Idaho Soil Conservation Commission.

ISDA - Idaho State Department of Agriculture.

NRCS - Natural Resources Conservation Service, USDA.

RMS - Resource Management System, NRCS.

RCRDP - Resource Conservation and Rangeland Development Program, ISCC.

TMDL - Total Maximum Daily Load.

TU - Treatment Unit.

UI-CES - University of Idaho-Cooperative Extension System.

USDA - United States Department of Agriculture.

USDI - United States Department of Interior.

USFS - Forest Service, USDA.

USGS - Geological Survey, USDI.

WQLS - Water Quality Limited Segment.

WQPA - Water Quality Program for Agriculture, ISCC.

Introduction

Goals and Objectives

This agricultural component of the Little Lost River Subbasin TMDL Implementation Plan outlines an adaptive management approach for the implementation of BMPs and developing RMS plans to meet the requirements for the Little Lost River Subbasin TMDL. Implementation activities will be focused on 15,271 acres of private agricultural land in the Little Lost Subbasin as shown in the appendix (Figure A.1).

The goal of this plan is to assist and/or compliment other subbasin efforts in restoring beneficial uses for §303(d) listed stream segments. These include the Little Lost River (WQLS #5660 head waters to Big Spring Creek), Little Lost River (WQLS #5656 Big Spring Creek to canal), Sawmill Creek (WQLS #2148 Mill Creek to Little Lost River), Wet Creek (WQLS #2145 Coal Creek to Little Lost River). The objective of this plan will be to reduce the amount of sediment in these stream segments from agricultural sources.

Beneficial Use Status

The State of Idaho designated beneficial uses on rivers, creeks, lakes and reservoirs to meet the requirements of the Clean Water Act. The Little Lost River is designated for cold water biota, salmonid spawning, primary contact recreation, secondary contact recreation, agricultural water supply, wildlife habitat and aesthetics. The Little Lost River exhibits full support for salmonid spawning and falls into the water body assessment category of needs verification for cold water biota beneficial uses (IDEQ 2000).

Sawmill and Wet creeks have cold water biota and salmonid spawning as existing beneficial uses. IDEQ found Sawmill Creek to not fully support salmonid spawning while fully supporting cold water biota. Furthermore IDEQ found Wet Creek to fully support salmonid spawning while cold water biota beneficial use status needs verification. The pollutants of concern are sediment, temperature and flow alteration (IDEQ 2000). Flow alteration was not addressed in the TMDL and EPA has not approved the temperature portion of the TMDL at this time. Therefore this agricultural implementation plan only addresses sediment. Many of the BMPs that affect sediment will positively affect temperature. The status of beneficial uses is shown in Table 1.

Table 1. Water Quality Limited Segments in the Little Lost River Subbasin.

Stream Segment	WQLS#	Pollutant	Status	Concerns
Little Lost River	5660	Sediment	Needs Verification	Bank erosion
Little Lost River	5656	Sediment	Needs Verification	Bank erosion
Sawmill Creek	2148	Sediment	Not Full Support	Bank erosion
Wet Creek	2145	Sediment	Not Full Support	Bank erosion

Background

Private lands are located primarily along watercourses and are used for agricultural production. These include pasture, hay and range lands with some irrigated grain in the lower portion of the subbasin.

There have been several historic impacts that have affected the water quality in the subbasin. Wild fires, grazing, farming, logging, mining, flooding, hydropower, irrigation, ice jams,

channelization and removal of riparian vegetation have changed the hydrology and riparian plant communities in the subbasin (IDEQ 1998).

Some of the earliest concerns about water quality were trying to keep stream flows in Sawmill Creek and the Little Lost River connected. This was accomplished by closing off the side channels on Sawmill Creek during low water. This effort kept more water in the main channel, which allowed fish to migrate into the upper stream reaches to spawn (IDEQ 1998).

Major winter flooding in the town of Howe in 1948 and 1969 flooded approximately 7,500 acres and annual flooded approximately 1,500 to 2,000 acres. This recurring flood damage destroyed roads, buildings, crops, livestock and private wells. The flooding is caused by water freezing in the channel forming ice jams that fill the channel with ice. Then late winter and early spring flows are forced out of the channel. This overland flooding then flows through winter animal feed operations and also overflows septic tanks degrading the water quality. These chronic flood problems led to the creation of the Little Lost River Watershed Improvement District. Their goal was to solve the problem of the flooding in the lower subbasin around the town of Howe.

Following the listing of the Bull trout (*Salvelinus confluentus*) as an endangered species on July 10, 1996, Governor Batt issued an official conservation plan for Bull trout. This plan included 56 key watersheds with the Little Lost River listed as one of them (Batt 1996). This listing helped the Little Lost River get a lot of attention by many of the state and federal agencies including BSWCD, NRCS, BLM, USFS, IDEQ and IDFG.

These agencies formed the Little Lost River Bull Trout Recovery Unit Team, which met in 1998 to put together a problem assessment. This assessment examined water quality and other problems that may affect the survival of Bull trout in the subbasin (IDEQ 1998). Since that time IDEQ, BLM and USFS have conducted stream assessments, sediment cores and stream bank erosion inventories along short reaches of the streams on public land and some private land.

Accomplishments

The Little Lost River Watershed Improvement District completed the Little Lost River Flood Control Project in 1985. This project reduced the annual flooding of roads, buildings and animal feed operations in and near the town of Howe. This was accomplished by installing a series of off-channel trenches to hold winter river flows and allow the water to seep into the aquifer thus keeping the channel free of ice. Mitigation for the trenches was accomplished by installing riparian fences and woody vegetation plantings on seven miles of Sawmill Creek (BSWCD 1985).

The Pass Creek Grazing Association in cooperation with several government agencies developed a CRM plan on the Pass Creek Grazing Allotment in 1999. This plan enables better utilization of the uplands by livestock while reducing the grazing pressure on the riparian areas.

Some landowners, in the subbasin, have installed riparian corridor fencing. Others have installed fencing that created riparian pastures, which are grazed for a very short period. Additionally several landowners have converted from surface flood irrigation to sprinkler systems providing better application and timing of irrigation water thus reducing irrigation induced erosion.

Problem Statement

Pollutant of Concern

The Little Lost River Subbasin TMDL identifies sediment as the pollutant of concern. Based on the stream bank erosion inventory conducted by IDEQ, stream banks were the primary source of sediment (IDEQ 1998). Fine sediment can reduce the quality of spawning and rearing habitat for resident trout species in the Little Lost River and its tributaries. In addition fine sediment can also affect the amount and diversity of aquatic insects, which are an important food source for Bull trout (IDEQ 1998). Riparian vegetation is very critical in controlling fine sediment inputs to a stream and also creates winter cover, hiding places, aquatic insect habitat and shading of the stream (Overton et al 1995 and Rieman et al 1993).

Sediment

The sediment load and reduction allocations were defined in the Little Lost Subbasin TMDL (IDEQ 2000) for the Little Lost River, Sawmill and Wet creeks. These inventoried reaches, sediment loads and percent reductions are listed below in Table 2.

Table 2. Erosion Estimates for 303(d) Streams in the Little Lost River Subbasin.

Stream	Inventory Site	Inventoried Length (feet)	Existing Erosion (tons/year)	Desired Erosion (tons/year)	Percent Reduction
Little Lost River	Upper Little Lost	2,348	32	29	9%
	Upper Middle Little Lost	3,653	135	35	74%
	Lower Middle Little Lost	1,245	41	11	73%
	Lower Little Lost	1,286	23	15	35%
	Subtotal	8,532	231	90	61%
Sawmill Creek	Upper Sawmill	2,150	210	52	75%
	Upper Mid Sawmill	1,159	345	32	91%
	Mid Sawmill	1,350	63	22	65%
	Lower Sawmill	2,956	53	25	53%
	Subtotal	7,615	671	131	80%
Wet Creek	Lower 2	2,134	45	15	67%
	Lower 1	1,246	23	17	26%
	Enclosure	1,308	16	14	13%
	Middle 2	1,014	10	3	70%
	Middle 1	1,099	26	20	23%
	Upper	1,568	115	19	83%
	Subtotal	8,369	235	88	63%
	Total	24,516	1,137	309	73%

Critical Areas

Agricultural areas that contribute excessive pollutants to water bodies are defined as “Critical Areas”. These critical areas are then prioritized for treatment based on their location to a water body of concern and the potential for pollutant transport and delivery to the receiving water body. The following is a list of critical areas within the subbasin:

- Unstable and erosive stream banks
- Over utilized pasture and range lands
- Animal feed operations adjacent to stream corridors
- Irrigation induced sheet and rill erosion

Tiers

There are two tiers delineated within the subbasin. These tiers were determined by the proximity of the critical areas to the §303(d) listed stream segments. Critical area and tier amounts are shown in Table 3.

Tier 1 _____ **Unstable and erosive stream banks and riparian areas or AFOs adjacent to the stream that have a direct and substantial negative influence on the stream.**

Tier 2 _____ **Crop, pasture and range lands and AFOs with an indirect, yet substantial negative influence on the stream.**

Table 3. Critical Areas by Subwatershed in the Little Lost River Subbasin.

Subwatershed	TMDL Implementation Tier 1		TMDL Implementation Tier 2	
	Riparian	AFO	Crop, Pasture and Range Lands	AFO
Little Lost River	339 acres	1	12,676 acres	4
Sawmill Creek	44 acres	0	1,005 acres	2
Wet Creek	41 acres	0	1,112 acres	0
Total	424 acres	1	14,793 acres	6

Animal Feed Operations

National Definition: The term "animal feeding operation" or AFO is defined in EPA regulations as a "lot or facility" where animals "have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period and crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility."

The Idaho Legislature passed the Beef Cattle Environmental Control Act in the spring of 2000. Governor Kempthorne then signed this Act in April 2000. ISDA then went into a rule making process and on September 18, 2000 the "Rules of the Department of Agriculture Governing Beef Cattle Animal Feeding Operations" (IDAPA 02.04.15) became effective. Subsequent to the rules becoming effective, a Memorandum of Understanding (MOU) was written and signed by ISDA, IDEQ, ICA and EPA in January 2001. The MOU gave ISDA authority to regulate beef cattle feeding operations that fall under the definitions of IDAPA 02.04.15 not located on Indian Reservations (ISDA 2000).

Threatened and Endangered Species

The threatened or endangered species in Butte County include Gray wolf (*Canis lupus*), Bald eagle (*Haliaeetus leucocephalus*), Ute ladies' tresses (*Spiranthes diluvialis*) and Bull trout (*Salvelinus confluentus*). The Bull trout is the only fish species in the subbasin that is on the threatened or endangered species list.

Treatment Units

Each agricultural critical area is divided into one or more TUs. These TUs describe critical areas with similar land uses, soils, productivity, resource concerns and treatment needs. These not only provide a method for delineating and describing resource areas but are also used to evaluate impacts to water quality and lead the formulation of alternatives for solving identified problems.

Treatment Unit #1 Stream Channels and Riparian Areas

Acres	Soils	Resource Problems
424	Soils are composed of mixed alluvium and lacustrine sediments with particle sizes ranging from silt to sand with some gravel and cobbles and slopes ranging form 0 to 4 percent.	Unstable and erosive stream banks Lack of riparian vegetation diversity and density

Treatment Unit #2 Irrigated Crop, Hay and Pasture Lands

Acres	Soils	Resource Problems
6,018	Soils are composed of mixed alluvium and lacustrine sediments with particle sizes ranging from silt to sand with gravel and cobbles with slopes from 0 to 10 percent	Irrigation return flows Irrigation induced sheet and rill erosion Pasture lands that are over utilized

Treatment Unit #3 Range Land

Acres	Soils	Resource Problems
8,774	Soils are composed of mixed alluvium and lacustrine sediments with particle sizes ranging from silt to sand with gravel and cobbles with slopes from 0 to 10 percent	Range lands that are over utilized

Treatment Unit #4 Animal Feed Operation (AFO)

Units	Soils	Resource Problems
7	Soils are composed of mixed alluvium and lacustrine sediments with particle sizes ranging from silt to sand with gravel and cobbles with slopes from 0 to 10 percent	Inadequate waste storage Runoff from corrals

Proposed Treatment BMP Implementation

The proposed treatment for sediment reduction will be to implement BMPs through RMS plans with private landowners in TUs. Below is Table 4 which lists the BMPs, estimated amounts and associated costs needed to reduce sediment in the subbasin.

Table 4. Total BMP Costs for the Little Lost River Subbasin.

Treatment Unit	Best Management Practice	Unit Type	Unit Cost	Cost Share Percent	Total Amount	Cost Share Funds	Operator Funds	Total Funds
TU1 Riparian	Channel Vegetation	foot	\$6.00	75%	26,000	\$117,000	\$39,000	\$156,000
	Conservation Cover	acre	\$100.00	75%	160	\$12,000	\$4,000	\$16,000
	Fence, 4-wire	foot	\$1.65	75%	91,100	\$112,736	\$37,579	\$150,315
	Fence, Electric 3 Wire	foot	\$0.80	75%	11,000	\$6,600	\$2,200	\$8,800
	Fence, Jack	foot	\$4.50	75%	7,500	\$25,313	\$8,438	\$33,751
	Heavy Use Area Protection	each	\$2,000.00	75%	40	\$60,000	\$20,000	\$80,000
	Irrigation System, Drip	tree	\$1.50	75%	6,100	\$6,863	\$2,288	\$9,151
	Prescribed Grazing	acre	\$0.70	75%	130	\$68	\$23	\$91
	Riparian Forest Buffer	acre	\$23.00	75%	122	\$2,105	\$702	\$2,807
	Stream Channel Stabilization	foot	\$30.00	75%	4,600	\$103,500	\$34,500	\$138,000
	Stream Bank Protection	foot	\$45.00	75%	8,000	\$270,000	\$90,000	\$360,000
	Tree & Shrub Establishment	each	\$3.00	75%	15,000	\$33,750	\$11,250	\$45,000
	Use Exclusion	acre	\$14.00	75%	122	\$1,281	\$427	\$1,708
Wetland Restoration	acre	\$4,100.00	75%	36	\$110,700	\$36,900	\$147,600	
					Subtotal	\$861,916	\$287,307	\$1,149,223
TU2 Crop, Hay and Pasture Lands	Critical Area Planting	acre	\$160.00	75%	20	\$2,400	\$800	\$3,200
	Fence, 4-wire	foot	\$1.65	75%	20,000	\$24,750	\$8,250	\$33,000
	Fence, Electric 3 Wire	foot	\$0.80	75%	4,000	\$2,400	\$800	\$3,200
	Fence, Jack	foot	\$4.50	75%	1,000	\$3,375	\$1,125	\$4,500
	Irrigation System, Hand Line	acre	\$400.00	75%	200	\$60,000	\$20,000	\$80,000
	Irrigation System, Pivot	acre	\$600.00	75%	200	\$90,000	\$30,000	\$120,000
	Irrigation System, Wheel Line	acre	\$540.00	75%	200	\$81,000	\$27,000	\$108,000
	Irrigation Water Management	acre	\$5.00	100%	6,000	\$30,000	\$0	\$30,000
	Nutrient Management	acre	\$5.00	75%	3,000	\$11,250	\$3,750	\$15,000
	Nutrient Soil Testing	each	\$55.00	75%	200	\$8,250	\$2,750	\$11,000
	Pasture & Hayland Planting	acre	\$65.00	75%	500	\$24,375	\$8,125	\$32,500
	Pipe 100 psi, 12"	foot	\$9.40	50%	2,000	\$9,400	\$9,400	\$18,800
	Pipe, PVC 1.50"	foot	\$1.98	75%	10,000	\$14,850	\$4,950	\$19,800
	Prescribed Grazing	acre	\$0.70	75%	1,500	\$788	\$263	\$1,051
	Pump Plant for Water Control	hp	\$240.00	50%	200	\$24,000	\$24,000	\$48,000
	Spring Development	each	\$2,500.00	75%	2	\$3,750	\$1,250	\$5,000
Watering Facility	each	\$800.00	75%	5	\$3,000	\$1,000	\$4,000	
Well, Livestock Water	each	\$3,500.00	75%	3	\$7,875	\$2,625	\$10,500	
Windbreak/Shelterbelt Est.	foot	\$2.20	75%	5,000	\$8,250	\$2,750	\$11,000	
					Subtotal	\$409,713	\$148,838	\$558,551
TU3 Range Land	Fence, 4-wire	foot	\$1.65	75%	15,000	\$18,563	\$6,188	\$24,751
	Fence, Electric 3 Wire	foot	\$0.80	75%	2,000	\$1,200	\$400	\$1,600
	Fence, Jack	foot	\$4.50	75%	800	\$2,700	\$900	\$3,600
	Pipe, PVC 1.50"	foot	\$1.98	75%	67,000	\$99,495	\$33,165	\$132,660
	Pond, Livestock Water	each	\$3,200.00	75%	4	\$9,600	\$3,200	\$12,800
	Prescribed Grazing	acre	\$0.70	75%	10,600	\$5,565	\$1,855	\$7,420
	Range Planting	acre	\$55.00	75%	1,600	\$66,000	\$22,000	\$88,000
	Spring Development	each	\$2,500.00	75%	8	\$15,000	\$5,000	\$20,000
	Watering Facility	each	\$800.00	75%	25	\$15,000	\$5,000	\$20,000
	Well, Livestock Water	each	\$3,500.00	75%	7	\$18,375	\$6,125	\$24,500
Windbreak/Shelterbelt Est.	foot	\$2.20	75%	8,500	\$14,025	\$4,675	\$18,700	
					Subtotal	\$265,523	\$88,508	\$354,031
TU4 AFO	Nutrient Management	head	\$1.00	75%	2,000	\$1,500	\$500	\$2,000
	Waste Management System	each	\$66,666.00	75%	7	\$349,997	\$116,666	\$466,663
	Windbreak/Shelterbelt Est.	foot	\$2.20	75%	5,000	\$8,250	\$2,750	\$11,000
					Subtotal	\$359,747	\$119,916	\$479,663
					Total	\$1,896,899	\$644,569	\$2,541,468

Funding

Financial and technical assistance for installation of BMPs is needed to ensure success of this implementation plan. There are many sources of funding to make water quality improvements on private lands. These conservation programs could potentially be used in combination with each other to implement BMPs. These programs include WQPA, C-CRP, EQIP, §319, RCRDP, HIP and BPA.

Outreach

An intensive outreach program will be conducted through the BSWCD and its partners (IASCD, ISCC and NRCS) to inform agriculture landowners and operators how conservation practices can benefit their farming or ranching operation. Newspaper articles, district newsletters, direct mailings, project tours, demonstration projects, landowner meetings and individual contacts will make up this intensive outreach program. Other outreach objectives are:

- Provide information about the TMDL process.
- Provide water quality monitoring results.
- Develop landowner support of conservation BMPs
- Provide TMDL implementation progress reports.
- Increase awareness of agriculture's contribution to conserve and enhance natural resources.
- Increase the public's awareness of agriculture's commitment to meeting the TMDL challenge.

Evaluation & Monitoring

Evaluation and monitoring will be an integral component of this implementation plan. At the field level, ISCC, IASCD and NRCS conduct annual status reviews in conservation programs. Evaluation protocols have been developed for several BMPs. However where an appropriate protocol is lacking, the ISCC will work with agencies such as NRCS, UI-CES, IDEQ, IASCD and BSWCD to develop the needed protocol. The ISCC, IASCD and NRCS will also conduct annual project and program reviews. Reviews will be comprehensive from both a technical and administrative standpoint. These reviews will be very important for ensuring sound decision making involved with adaptation of implementation priorities and direction.

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Glossary

Animal feed operation - The term "animal feeding operation" or AFO is defined in EPA regulations as a "lot or facility" where animals "have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period and crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility."

beneficial use - A term used by the Idaho Department of Environmental Quality to identify uses which water quality supports in a given stream or lake.

Best Management Practice (BMP) - The Idaho Agricultural Pollution Abatement Plan definition as a component practice or combination of component practices determined to be the most effective, practical means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

cold water biota - A beneficial use, designated by the Idaho Department of Environmental Quality, which indicates that water quality is high enough to support macroinvertebrates and fish.

critical area - those areas or sources of agricultural pollution identified as having the most significant impact on the quality of receiving waters in the project area.

full support – A category of water quality status. A water body whose status is "Full Support" is in compliance with those levels of water quality criteria listed in Idaho's *Water Quality Standards and Wastewater Treatment Requirements*, or with reference conditions approved by the Idaho Department of Environmental Quality Director in consultation with the appropriate Basin Advisory Group.

hydrology - The scientific study of the properties, distribution and effects of water on and below the earth surface. The effect of flowing water on the land or stream channel.

not full support – A category of water quality status. A water body whose status is "Not Full Support" is not in compliance with those levels of water quality criteria listed in Idaho's *Water Quality Standards and Wastewater Treatment Requirements*, or with reference conditions approved by the Idaho Department of Environmental Quality Director in consultation with the appropriate Basin Advisory Group.

primary contact recreation - A beneficial use, designated by the Idaho Department of Environmental Quality, which indicates that water quality is good enough for any activity in which full or partial, unprotected bodily contact occurs with water (i.e. swimming or wading).

riparian - A vegetative community associated with surface or subsurface waters and watercourses within active watersheds. This community is rich in diversity of plants, as well as wildlife and aquatic organisms. The habitat includes not only lake and river ecosystems, but also wetland communities.

Resource Management System (RMS) - Natural Resource Conservation Service plan that is a combination of conservation practices and resource management for treatment of all identified resource concerns for soil, water, air, plants and animals that meets or exceeds the quality criteria in the Field Office Technical Guide (FOTG) for resource sustainability.

salmonid spawning - A beneficial use, designated by the Idaho Department of Environmental Quality, which indicates that water quality is good enough for salmonid fish to use for spawning with a high chance of egg survival.

secondary contact recreation - A beneficial use, designated by the Idaho Department of Environmental Quality, which indicates that water quality supports any activity in which partial or incidental, protected bodily contact occurs with water (e.g. fishing).

subbasin - A collection of watersheds that forms a much larger area; such as the Lemhi River subbasin, which yet drains into another, larger system, such as the Salmon River Basin.

substrate - The stream bottom, composed of silt, sand, gravel, cobble, boulder or bedrock. The type of substrate and its looseness affects the ability of fish to spawn and the survivability of the eggs.

subwatershed - A collection of drainages that form a watershed; such as the North Sawmill Subwatershed, which yet drains into larger area, such as the Sawmill Watershed.

Total Maximum Daily Load (TMDL) - a tool used in the development and implementation of a watershed management plan. A TMDL determines the total amount of pollutants that can enter a water body before it can no longer fully support its beneficial uses. TMDLs are the sums of individual waste load allocations (WLA) of point sources, load allocations (LA) of nonpoint sources and a margin of safety.

tributary - A river or stream that flows into a larger river or stream.

water body - A homogeneous classification that can be assigned to rivers, lakes, estuaries, coastlines, streams or other water features.

water quality - A term used to describe the biological, chemical and physical characteristics of water with respect to its suitability for a beneficial use.

watershed - A collection of subwatersheds that form a subbasin; such as the Sawmill Watershed, which drains into a larger area, such as the Little Lost River Subbasin.

Appendix A
Tables & Figures

Table A-1. Detailed BMP Costs for the Little Lost River Subwatershed

Treatment Unit	Best Management Practice	Unit Type	Unit Cost	Cost Share Rate	Total Amount	Cost Share Funds	Operator Funds	Total Funds
TU1 Riparian	Channel Vegetation	foot	\$6.00	75%	24,000	\$108,000	\$36,000	\$144,000
	Conservation Cover	acre	\$100.00	75%	160	\$12,000	\$4,000	\$16,000
	Fence, 4-wire	foot	\$1.65	75%	80,000	\$99,000	\$33,000	\$132,000
	Fence, Electric 3 Wire	foot	\$0.80	75%	10,000	\$6,000	\$2,000	\$8,000
	Fence, Jack	foot	\$4.50	75%	5,000	\$16,875	\$5,625	\$22,500
	Heavy Use Area Protection	each	\$2,000.00	75%	30	\$45,000	\$15,000	\$60,000
	Irrigation System, Drip	tree	\$1.50	75%	100	\$113	\$38	\$151
	Prescribed Grazing	acre	\$0.70	75%	100	\$53	\$18	\$71
	Riparian Forest Buffer	acre	\$23.00	75%	100	\$1,725	\$575	\$2,300
	Stream Channel Stabilization	foot	\$30.00	75%	3,000	\$67,500	\$22,500	\$90,000
	Stream Bank Protection	foot	\$45.00	75%	5,000	\$168,750	\$56,250	\$225,000
	Tree & Shrub Establishment	each	\$3.00	75%	9,000	\$20,250	\$6,750	\$27,000
Use Exclusion	acre	\$14.00	75%	100	\$1,050	\$350	\$1,400	
Wetland Restoration	acre	\$4,100.00	75%	30	\$92,250	\$30,750	\$123,000	
					Subtotal	\$638,566	\$212,856	\$851,422
TU2 Irrigated Crop, Hay & Pasture Lands	Critical Area Planting	acre	\$160.00	75%	20	\$2,400	\$800	\$3,200
	Fence, 4-wire	foot	\$1.65	75%	20,000	\$24,750	\$8,250	\$33,000
	Fence, Electric 3 Wire	foot	\$0.80	75%	4,000	\$2,400	\$800	\$3,200
	Fence, Jack	foot	\$4.50	75%	1,000	\$3,375	\$1,125	\$4,500
	Irrigation System, Hand Line	acre	\$400.00	75%	200	\$60,000	\$20,000	\$80,000
	Irrigation System, Pivot	acre	\$600.00	75%	200	\$90,000	\$30,000	\$120,000
	Irrigation System, Wheel Line	acre	\$540.00	75%	200	\$81,000	\$27,000	\$108,000
	Irrigation Water Management	acre	\$5.00	100%	6,000	\$30,000	\$0	\$30,000
	Nutrient Management	acre	\$5.00	75%	3,000	\$11,250	\$3,750	\$15,000
	Nutrient Soil Testing	each	\$55.00	75%	200	\$8,250	\$2,750	\$11,000
	Pasture & Hayland Planting	acre	\$65.00	75%	500	\$24,375	\$8,125	\$32,500
	Pipe 100 psi, 12"	foot	\$9.40	50%	2,000	\$9,400	\$9,400	\$18,800
	Pipe, PVC 1.50"	foot	\$1.98	75%	10,000	\$14,850	\$4,950	\$19,800
	Prescribed Grazing	acre	\$0.70	75%	1,500	\$788	\$263	\$1,051
	Pump Plant for Water Control	hp	\$240.00	50%	200	\$24,000	\$24,000	\$48,000
	Spring Development	each	\$2,500.00	75%	2	\$3,750	\$1,250	\$5,000
Watering Facility	each	\$800.00	75%	5	\$3,000	\$1,000	\$4,000	
Well, Livestock Water	each	\$3,500.00	75%	3	\$7,875	\$2,625	\$10,500	
Windbreak/Shelterbelt Est.	foot	\$2.20	75%	5,000	\$8,250	\$2,750	\$11,000	
					Subtotal	\$409,713	\$148,838	\$558,551
TU3 Range Land	Fence, 4-wire	foot	\$1.65	75%	7,000	\$8,663	\$2,888	\$11,551
	Fence, Electric 3 Wire	foot	\$0.80	75%	2,000	\$1,200	\$400	\$1,600
	Pipe, PVC 1.50"	foot	\$1.98	75%	50,000	\$74,250	\$24,750	\$99,000
	Pond, Livestock Water	each	\$3,200.00	75%	2	\$4,800	\$1,600	\$6,400
	Prescribed Grazing	acre	\$0.70	75%	9,000	\$4,725	\$1,575	\$6,300
	Range Planting	acre	\$55.00	75%	1,000	\$41,250	\$13,750	\$55,000
	Spring Development	each	\$2,500.00	75%	5	\$9,375	\$3,125	\$12,500
	Watering Facility	each	\$800.00	75%	20	\$12,000	\$4,000	\$16,000
	Well, Livestock Water	each	\$3,500.00	75%	5	\$13,125	\$4,375	\$17,500
Windbreak/Shelterbelt Est.	foot	\$2.20	75%	2,500	\$4,125	\$1,375	\$5,500	
					Subtotal	\$173,513	\$57,838	\$231,351
TU4 AFO	Nutrient Management	head	\$1.00	75%	2,000	\$1,500	\$500	\$2,000
	Waste Management System	each	\$66,666.00	75%	7	\$349,997	\$116,666	\$466,663
	Windbreak/Shelterbelt Est.	foot	\$2.20	75%	5,000	\$8,250	\$2,750	\$11,000
					Subtotal	\$359,747	\$119,916	\$479,663
					Total	\$1,581,539	\$539,448	\$2,120,987

Table A-2. Detailed BMP Costs for the Sawmill Creek Subwatershed

Treatment Unit	Best Management Practice	Unit Type	Unit Cost	Cost Share Rate	Total Amount	Cost Share Funds	Operator Funds	Total Funds
TU1 Riparian	Channel Vegetation	foot	\$6.00	75%	1,000	\$4,500	\$1,500	\$6,000
	Fence, 4-wire	foot	\$1.65	75%	5,000	\$6,188	\$2,063	\$8,251
	Fence, Jack	foot	\$4.50	75%	500	\$1,688	\$563	\$2,251
	Heavy Use Area Protection	each	\$2,000.00	75%	5	\$7,500	\$2,500	\$10,000
	Irrigation System, Drip	tree	\$1.50	75%	4,000	\$4,500	\$1,500	\$6,000
	Prescribed Grazing	acre	\$0.70	75%	15	\$8	\$3	\$11
	Riparian Forest Buffer	acre	\$23.00	75%	11	\$190	\$63	\$253
	Stream Channel Stabilization	foot	\$30.00	75%	800	\$18,000	\$6,000	\$24,000
	Stream Bank Protection	foot	\$45.00	75%	1,500	\$50,625	\$16,875	\$67,500
	Tree & Shrub Establishment	each	\$3.00	75%	4,000	\$9,000	\$3,000	\$12,000
Use Exclusion	acre	\$14.00	75%	11	\$116	\$39	\$155	
Wetland Restoration	acre	\$4,100.00	75%	3	\$9,225	\$3,075	\$12,300	
					Subtotal	\$111,540	\$37,181	\$148,721
TU3 Range Land	Fence, 4-wire	foot	\$1.65	75%	6,000	\$7,425	\$2,475	\$9,900
	Pipe, PVC 1.50"	foot	\$1.98	75%	15,000	\$22,275	\$7,425	\$29,700
	Pond, Livestock Water	each	\$3,200.00	75%	1	\$2,400	\$800	\$3,200
	Prescribed Grazing	acre	\$0.70	75%	800	\$420	\$140	\$560
	Range Planting	acre	\$55.00	75%	300	\$12,375	\$4,125	\$16,500
	Spring Development	each	\$2,500.00	75%	2	\$3,750	\$1,250	\$5,000
	Watering Facility	each	\$800.00	75%	3	\$1,800	\$600	\$2,400
	Well, Livestock Water	each	\$3,500.00	75%	1	\$2,625	\$875	\$3,500
Windbreak/Shelterbelt Est.	foot	\$2.20	75%	1,000	\$1,650	\$550	\$2,200	
					Subtotal	\$54,720	\$18,240	\$72,960
					Total	\$166,260	\$55,421	\$221,681

Table A-3. Detailed BMP Costs for the Wet Creek Subwatershed

Treatment Unit	Best Management Practice	Unit Type	Unit Cost	Cost Share Rate	Total Amount	Cost Share Funds	Operator Funds	Total Funds
TU1 Riparian	Channel Vegetation	acre	\$6.00	75%	1,000	\$4,500	\$1,500	\$6,000
	Fence, 4-wire	foot	\$1.65	75%	6,100	\$7,549	\$2,516	\$10,065
	Fence, Electric 3 Wire	foot	\$0.80	75%	1,000	\$600	\$200	\$800
	Fence, Jack	foot	\$4.50	75%	2,000	\$6,750	\$2,250	\$9,000
	Heavy Use Area Protection	each	\$2,000.00	75%	5	\$7,500	\$2,500	\$10,000
	Irrigation System, Drip	tree	\$1.50	75%	2,000	\$2,250	\$750	\$3,000
	Prescribed Grazing	acre	\$0.70	75%	15	\$8	\$3	\$11
	Riparian Forest Buffer	acre	\$23.00	75%	11	\$190	\$63	\$253
	Stream Channel Stabilization	foot	\$30.00	75%	800	\$18,000	\$6,000	\$24,000
	Stream Bank Protection	foot	\$45.00	75%	1,500	\$50,625	\$16,875	\$67,500
	Tree & Shrub Establishment	each	\$3.00	75%	2,000	\$4,500	\$1,500	\$6,000
	Use Exclusion	acre	\$14.00	75%	11	\$116	\$39	\$155
Wetland Restoration	acre	\$4,100.00	75%	3	\$9,225	\$3,075	\$12,300	
					Subtotal	\$111,813	\$37,271	\$149,084
TU3 Range Land	Fence, 4-wire	foot	\$1.65	75%	2,000	\$2,475	\$825	\$3,300
	Fence, Jack	foot	\$4.50	75%	800	\$2,700	\$900	\$3,600
	Pipe, PVC 1.50"	foot	\$1.98	75%	2,000	\$2,970	\$990	\$3,960
	Pond, Livestock Water	each	\$3,200.00	75%	1	\$2,400	\$800	\$3,200
	Prescribed Grazing	acre	\$0.70	75%	800	\$420	\$140	\$560
	Range Planting	acre	\$55.00	75%	300	\$12,375	\$4,125	\$16,500
	Spring Development	each	\$2,500.00	75%	1	\$1,875	\$625	\$2,500
	Watering Facility	each	\$800.00	75%	2	\$1,200	\$400	\$1,600
	Well, Livestock Water	each	\$3,500.00	75%	1	\$2,625	\$875	\$3,500
Windbreak/Shelterbelt Est.	foot	\$2.20	75%	5,000	\$8,250	\$2,750	\$11,000	
					Subtotal	\$37,290	\$12,430	\$49,720
					Total	\$149,103	\$49,701	\$198,804

Figure A-1. Little Lost River Subbasin Land Ownership and 303(d) Listed Streams

