Central Bear (Bear River Mainstem)
TMDL Implementation Plan for Agriculture

Developed for
Idaho Department of Environmental Quality

Prepared by

Steven Smith
Idaho Soil Conservation Commission

Chris Banks
Idaho Association of Soil Conservation Districts

In Cooperation with the
Bear Lake Soil and Water Conservation District
USDA-Natural Resources Conservation Service

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INTRODUCTION

Purpose

The purpose of this plan is to recommend Best Management Practices (BMPs) that would improve or restore physical and biological functions of Bear River in the Central Bear subbasin (Figure 1). This Total Maximum Daily Load (TMDL) Implementation Plan for Agriculture will build upon past conservation projects that have been installed by landowners, Natural Resources Conservation Service (NRCS), Bear Lake Soil and Water Conservation District (BLSWCD), Bear Lake Regional Commission (BLRC) and other interested partners. These past projects and future projects will help to restore beneficial uses in Bear River.

This plan outlines an adaptive management approach for developing conservation plans that will recommend how and when BMPs will be installed to meet TMDL targets. For the purpose of this plan the mainstem of the Bear River will be the only stream that is identified throughout this planning document. The other §303(d) listed streams in the Central Bear subbasin have been included in the Thomas Fork Agriculture TMDL Implementation Plan (Smith, S., 2004).

Goals and Objectives

The goal of this implementation plan is to restore beneficial uses on the Bear River, a §303(d) listed stream segment (IDEQ, 1998). This segment is identified in Table 1.

Table 1. Water Quality Limited Stream Segment

Segment	Segment #	Boundaries	Pollutants
Bear River	2273	Wyoming line to Wardboro	Sediment & Nutrients

The objectives of this plan are to identify critical areas and to recommend BMPs through on farm conservation plans with individual landowners. These plans outline BMPs for reducing sediment and nutrient loading to Bear River along this river segment. The Bear River/Lower Malad River Subbasin Assessment and TMDL divided the Bear River in to four riverine management reaches (MR); this section of the Bear River is located in MR1 (IDEQ, 2006).

Project Setting

This riverine segment of the Bear River is located in the southeastern corner of Idaho in Bear Lake County. This portion of the river drains the southern portion of the Preuss Range and the northern part of the Bear Lake plateau with the Sublette Range to the east. This is a very interesting part in the flow of the Bear River in that the river is flowing north and the makes a 90 degree turn to flow west into Bear Lake. After the Bear River turns west it bisects the Preuss Range, which is part of the Meade Thrust plate. The Meade Thrust plate contains the phosphate formations in eastern Idaho and western Wyoming (Link and Phoenix, 1996). As the river cut its way through the Preuss Range, it created a broad flat alluvial filled valley. The flat alluvial filled valleys contain very productive soils for irrigated crops of small grain and alfalfa.

Surrounding hills are steep and dry; these are primarily used as rangeland consisting mostly of native grasses and shrubs. Examples of native grasses and shrubs present in the Central Bear subbasin are: sagebrush, cool season grasses, and forbs with some conversion to downy brome and bulbous bluegrass. Rangeland offers limited sources of water, requiring livestock to travel long distances to find water.

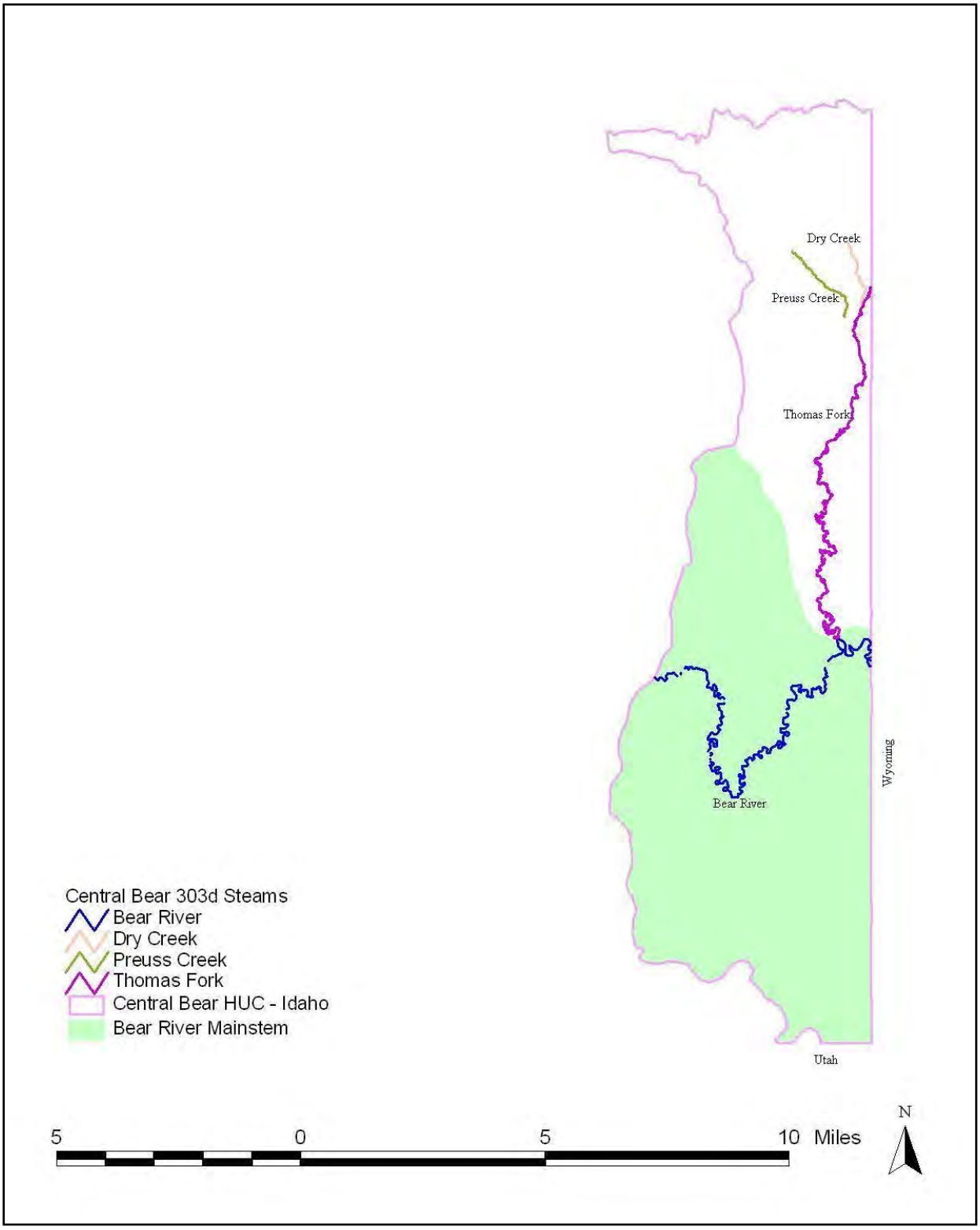

Figure 1. Bear River Mainstem Location in the Central Bear Subbasin

BACKGROUND

High elevations in the Central Bear subbasin make for a short growing season in the area. The average growing season for the area averages 100 days. At the base of the mountains, the Central Bear subbasin opens up to a lush fertile valley created by the Bear River and other small streams. This short growing season limits the crops that can be grown to alfalfa and small grains. Slopes in the irrigated cropland are 0 to 2 percent which reduces the erosion potential for sheet and rill erosion. This combined with the long rotations, 5 to 6 years of alfalfa and 1 to 2 years of small grains reduces cropland erosion to the tolerable soil loss or below making this area a very low priority for cropland erosion treatment.

Irrigation is required due to less than 12 inches of rainfall during the growing season. Most of the precipitation falls as snow from November to March with occasional thunderstorms in the summers. The summer months are typically hot and dry, but the area has been known to experience periods of frost in June, July, and August.

Land Use

This subbasin is very unique in that there is alfalfa hay and small grain crops grown in the bottom of the valley with rangeland in the surrounding hills (Table 2). This may not seem too unusual but the rangeland is very steep and dry, and most of the streams are intermittent. This requires livestock and wildlife to travel long distances to find water. This can have adverse impacts to the streams where they congregate.

Irrigated crops grown in the valley bottoms have been limited to crops which can grow to maturity between the late and early frosts which occur in the area. Most of the irrigated cropland is located in the valley bottom adjacent to the Bear River (Figure 2). Cropland in the surrounding hills is farmed as dry cropland and is primarily enrolled the Conservation Reserve Program (CRP) due to the low yields on these fields.

Table 2. Private Land Uses in the Central Bear Subbasin (Bear River Mainstem)

Land Use	Acres	% of Private Land
Cropland	12,172	24%
Rangeland	37,022	72%
Roads	1,209	2%
Riparian	1,119	2%
Total	51,522	100%

Land Ownership

Land management in the Central Bear subbasin is divided among four entities (Figure 3). These are the Bureau of Land Management (BLM), Caribou – Targhee National Forest (CTNF), Idaho Department of Lands (IDL), and privately owned land (Table 3).

Table 3. Land Ownership in the Central Bear Subbasin (Bear River Mainstem)

Land Owner	Acres	% of Subbasin
CTNF	330	1%
BLM	31,513	36%
IDL	4,140	5%
Private	51,523	58%
Total	87,506	100%

Accomplishments

The Bear Lake Soil and Water Conservation District (BLSWCD), Natural Resource Conservation Service (NRCS), and others have been very active in this portion of the Central Bear subbasin. They have been working with landowners to install BMPs. Some of these practices are summarized in (Table 4).

Table 4. Completed BMPs in the Central Bear Subbasin (Bear River Mainstem)

BMP	Amount	Units	Total Cost	Program
Well	1	each	$3,965	EQIP
Corral Fence	632	feet	$7,835	EQIP
Waste Storage Facility	1	each	$15,877	EQIP
Watering Facility	4	each	$4,437	EQIP
Grade Stabilization	5	each	$3,455	EQIP
Pipeline	1,160	feet	$3,098	EQIP
Pumping Plant	1	each	$3,400	EQIP
Fence	22,459	feet	$8,424	EQIP
Range Planting	254	acre	$180	EQIP
Pest Management	167	acre	$9,978	EQIP
Heavy Use Area	4	each	$3,891	EQIP
		Total Cost	$64,540	

WATER QUALITY PROBLEMS

Beneficial Use Status

The Bear River is the only listed stream segment in this implementation plan. Therefore (Table 5) only lists the beneficial uses for the Bear River.

Table 5. Beneficial Use Status

	Beneficial Uses								
Stream	CWAL	SS	PCR	SCR	DWS	AWS	IWS	WH	Aesthetics
Bear River	Impaired	Impaired	X	n/a	n/a	X	X	X	X

X = beneficial uses that are designated by state water quality standards or applies to all surface water bodies.

Pollutants

This water quality limited segment is listed for flow, nutrients, and sediment. Agricultural activities contribute phosphorus and sediment through leaching and runoff which ends up in the Bear River. Also, grazing livestock contribute some phosphorus and sediment loading to the Bear River.

TMDL load allocations have been set for total phosphorus (TP) and total suspended solids (TSS). The load allocations were set at the Wyoming state line and at Stewart Dam which is downstream of the Central Bear subbasin boundary. Total Suspended Solids (TSS) allocations for MR1 are 31,186 tons at the state line and 30,869 tons at Stewart Dam. Total Phosphorus (TP) load allocations for MR1 are 38.9 tons per year at the state line and 29.4 tons per year at Stewart Dam. These load allocations require reductions for TSS of 14,653 tons per year at the state line and 31,497 tons per year at Stewart Dam. Load reductions for TP are 39.1 tons per year at the state line and 55.3 tons per year at Stewart Dam. The Bear River/Lower Malad River Subbasin Assessment and TMDL divided these reductions into hydrologic periods (IDEQ, 2006).

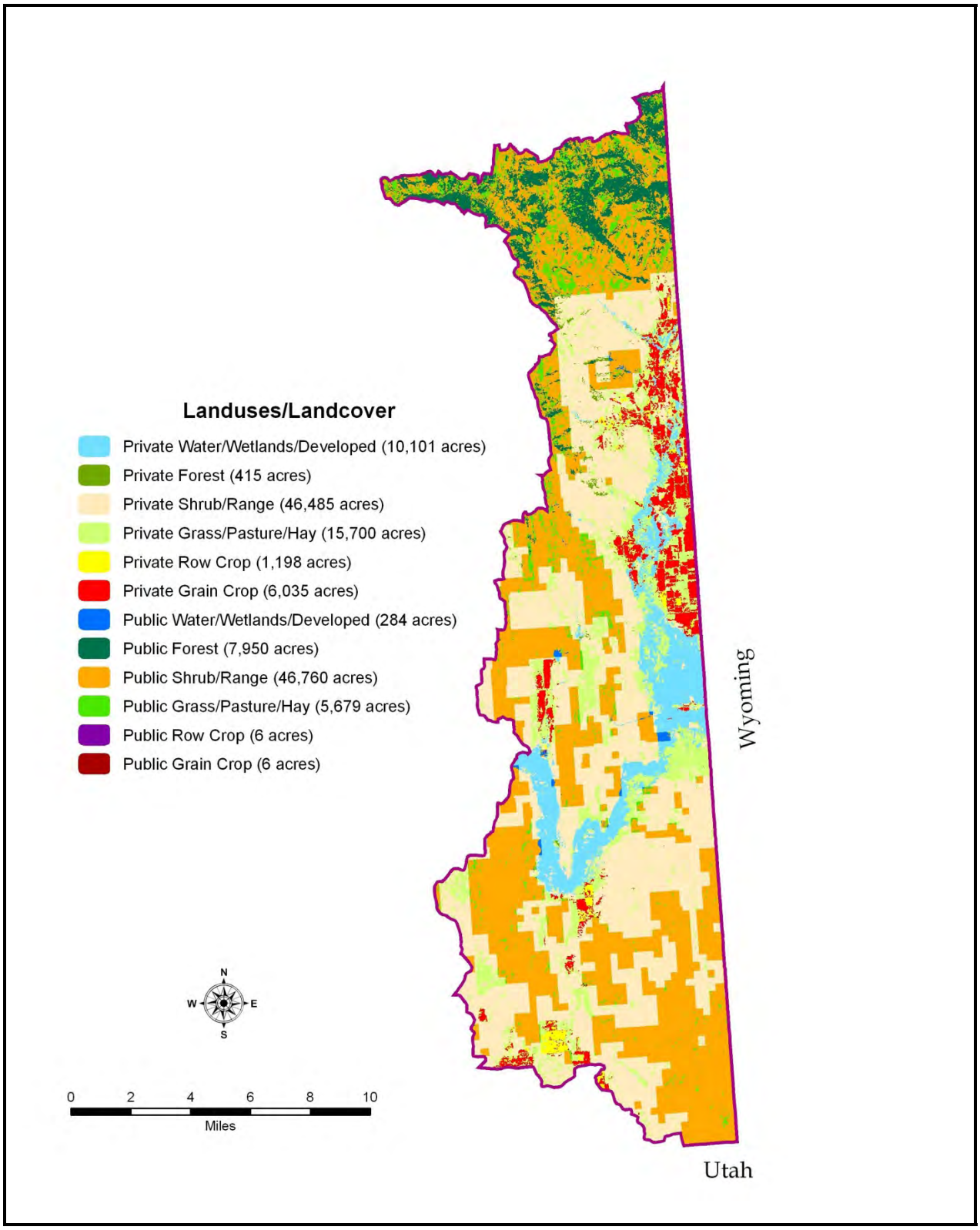

Figure 2. Land Use/Land Cover in the Central Bear Subbasin

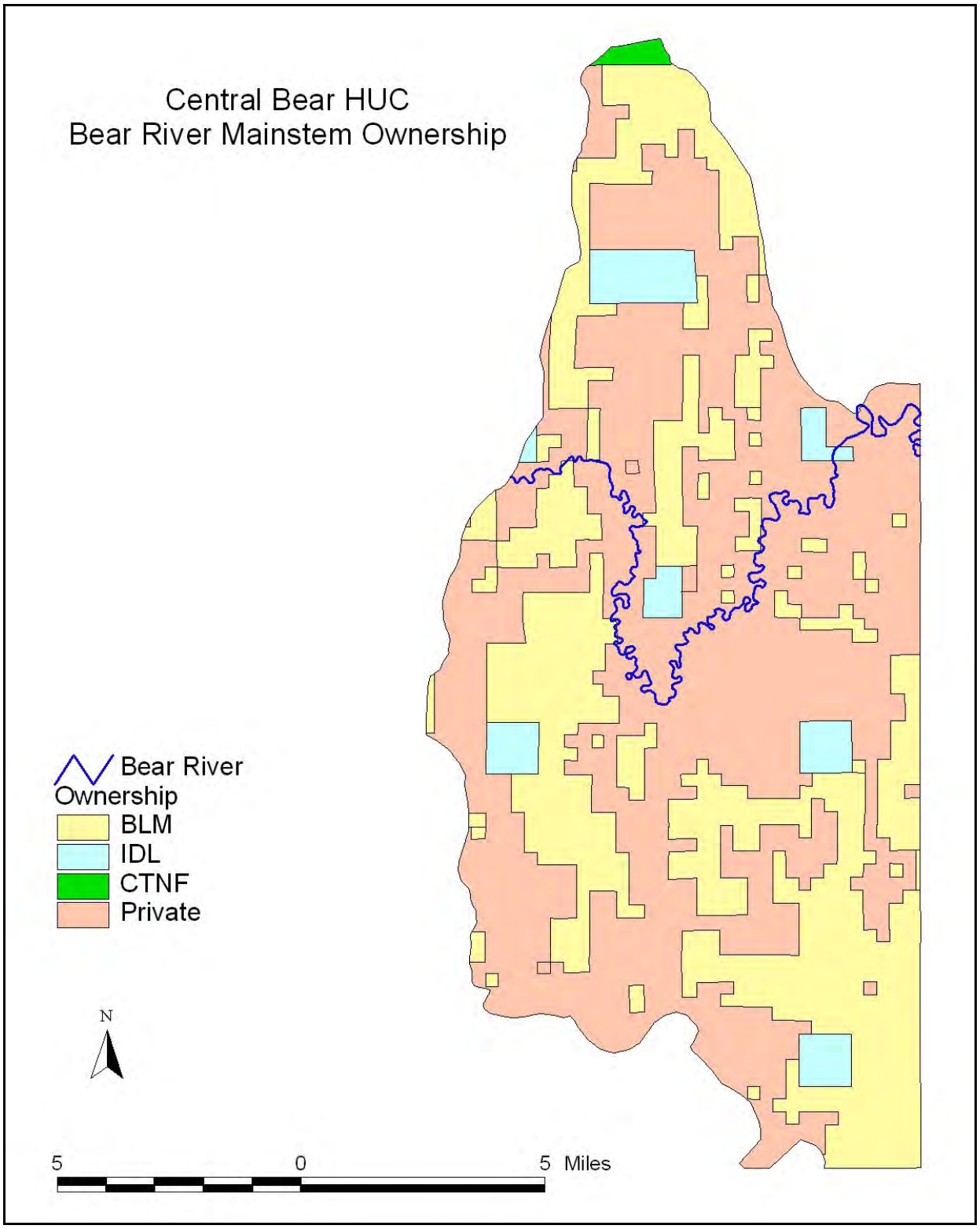

Figure 3. Land Ownership in the Central Bear Subbasin (Bear River Mainstem)

AGRICULTURAL WATER QUALITY MONITORING AND EVALUATION

There has been some monitoring conducted by IDEQ, which dates back to 1953 between the Wyoming state line and Wardboro. This data is summarized in the Bear River/Lower Malad River Subbasin Assessment and TMDL (IDEQ, 2006).

Riparian

In 1992, a streambank erosion survey was conducted along the Bear River from the Idaho – Wyoming state line to Stewart Dam which is downstream of the subbasin boundary (Baxter, 1992). Each eroding bank was measured and located on a map so the survey could be repeated to compare the erosion in the future. There are some vertical banks through this section of the Bear River but in comparing 1992 orthophotos and 2004 NAIP photos the visible changes have been minimal over the course of the past 12 years.

Cropland

Based on the NRCS Conservation System Guide (NRCS, 2008) the cropland in this area is conventionally tilled with 4 to 6 years alfalfa hay and 1 to 2 years small grain. Livestock grazing of crop aftermath occurs in the spring and in the fall of the year before and after they are out on the summer range. The Revised Universal Soil Loss Equation (RUSLE) II runs indicate that the soil erosion for this area is 1 to 5 tons per acre per year. Soils in this area have tolerable soil loss values that range from 3 to 5 tons per acre per year (NRCS, 2008). Depending on the soil and the specific soil erosion rate for a specific soil this may be an acceptable soil erosion rate because if it is below tolerable soil loss level for that soil then it meets NRCS quality criteria. BMPs should focus on areas that exceed tolerable soil loss and will be determined on an individual basis through the NRCS planning process.

Dry Cropland – Dry cropland makes up the majority of the critical acres in the subbasin. Dry cropland is located along the valley margins on slopes ranging from 3 to 12 percent. Elevations along those margins range from 4,000 to 5,500 feet which shortens the growing season to about 100 days. Precipitation ranges from 10 to 14 inches per year, making this area marginal for producing crops without irrigation. To accommodate this, most landowners have a winter small grain, fallow rotation. Tillage practices are fall disc, spring chisel with sweeps, summer chisel with sweeps, drill in the fall, and followed by harvest.

Typical soils are silt loams with a tolerable soil loss rating of 5 and a factor of 0.43. Sheet and rill erosion is a problem due to the steep slopes. South facing slopes which are typically known in the area as barren and lacking in vegetation, are the most prone to sheet and rill erosion. Steeper slopes have ephemeral and classic gully erosion. Dry cropland that has been converted to permanent vegetation or placed in the CRP, applies to all slopes, soil types, and precipitation rages. Wildlife habitat and gully erosion are still a concern in areas that had very severe erosion before the conversion of permanent cover.

Irrigated Cropland – Irrigated cropland is located along the lower valley margins and in the valley bottoms. Slopes range from 0 to 8 percent with steeper slopes sprinkler irrigated and the lower slopes surface irrigated. Soils are loamy sand and finer with tolerable soil loss values 3 to 5. Precipitation ranges from 8 to 12 inches with a growing season of 100 to 120 days. Crops which can withstand periods of early frost are typically grown in this area. Crops grown are alfalfa, small grain, potato, silage, and grain corn. Crop rotations have 5 years alfalfa and 1 to 3 years small grain and corn.

Rangeland

Rangeland vegetation consists of sagebrush and perennial grasses. Precipitation is 12 to 18 inches, most of which falls as snow in winter and early spring. Elevations are from 5,965 to 7,500 feet. Topography consists

of steep slopes and high mountain valleys. Soils are loamy to gravelly. Frost free period ranges from 50 to 100 days. Fencing is generally an existing practice (NRCS, 2004).

Rangeland Assessment – Rangeland Water Quality Indicators (WQI) worksheets were completed on multiple sites throughout the Central Rocky Mountains Semiarid Bear Hills common resource area. The Rangeland WQI provided us a way to evaluate the condition of eight factors to determine water quality impacts and to rate the area in excellent, good, fair, or poor condition. (BLM, 2000; NRCS, 2003; NRCS, 1989)

Current Condition – Approximately 29,617 acres of the private rangeland assessed in the subbasin is in fair condition and has minimal impact on the water quality in the Bear River. The remaining 7,405 acres are in poor condition and could have a negative impact on water quality in the Bear River. According to the results of the WQI, some sheet and rill erosion and classic gullies are evident on gravelly loam soils. Runoff potential is high to moderate in sagebrush steppe communities. Depending upon valley type and the location of the stream within that valley, natural vegetation buffers vary in width between 25 and 200 feet. Current grazing management results in 70 to 90 percent grass/shrub cover, with few bare areas. Grazing animals have unlimited access to creeks and springs with minimal sources of livestock watering facilities. Animal productivity and health has no apparent issues under current management schemes.

Water Quality Impacts – The erosion potential is considerable with the moderately to steep slopes (8 to 35 percent), fine grained to gravelly texture, and erodible soils with rills and gullies from spring snowmelt and storm events. Additional water impacts may include sediment, nutrients, and bacteria from the unlimited access of livestock to creeks and to springs for livestock watering.

Resource Concerns – Existing grazing management may not meet NRCS resource quality criteria or landowner objectives. Facilitation practices may be needed for range improvement and livestock distribution. These concerns include plant productivity, health and vigor; noxious and invasive plants; plant establishment and growth; inadequate domestic stock water; inadequate quantity/quality of feed and forage for domestic animals; and inadequate cover/shelter for wildlife. All resource concerns will be evaluated on a site-specific basis in accordance with NRCS Conservation Planning Process.

Suggested BMPs on Rangelands – The most common rangeland problem is the lack of proper distribution of livestock grazing. The second most prolific problem is the lack of livestock watering facilities, which worsens the distribution problem. Drought periods and wildfires can cause problems with resulting forage shortages. Moreover, federal grazing allotment policy can create problems because additional private grazing must be secured or animals must stay longer on private rangelands. Consequently, the following BMPs are needed for rangelands in the subbasin: Prescribed Grazing (528); Watering Facility (614); Water Well (642); Pumping Plant (533); Spring Development (574); Pipeline (516); Range Planting (550); Prescribed Burning (338); Brush Management (314); Fence (382); and Pest Management (595).

Animal Feeding Operations & Dairies

The Idaho Legislature enacted Idaho law, *I.C. §37-401, Title 37, Chapter 4, Sanitary Inspections of Dairy Products*, which requires sanitary inspections and nutrient management plans for all dairy farms. Existing dairy farms were required to submit a nutrient management plan for approval to ISDA on or before July 1, 2001 (IDAPA 02.04.14.000). In 2000, the Idaho Legislature passed Idaho law, *I.C. §22-4906, Title 22, Chapter 49, Beef Cattle Environmental Control Act*. Beef animal feed operations are required to submit a nutrient management plan to ISDA for approval no later than January 1, 2005 (IDAPA 02.04.15.000).

Threatened and Endangered Species

The only threatened and endangered species present in Bear Lake County is the Canada lynx (*Lynx canadensis)*. Bear Lake County contains no candidate or proposed species (NRCS, 2008). There is one endemic aquatic species of concern; the Bonneville cutthroat trout (*Oncorhynchus clarki utah*) that has received special attention by many different agencies within the Bear River basin.

TREATMENT

Critical Areas

Areas of agricultural land that contribute excessive pollutants to water bodies are defined as "critical areas" for BMP implementation. Critical areas are 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. Areas with the highest potential to transport or deliver sediment or nutrients will be targeted.

Treatment Units

The subbasin is divided into four treatment units that have similar land uses, soils, productivity, resource concerns, and treatment needs. Each of these treatment units will be targeted to receive project funds as they can be secured. Because of the significant levels of load reductions and all of the tributaries discharging into the Bear River it was determined that 100 percent of area would need treatment to meet the load reductions.

Riparian

This treatment unit is the land adjacent to the streams that have riparian or aquatic plants as the primary plant life. Areas considered critical are those areas that are unstable, have eroding banks, or are otherwise impaired and do not meet beneficial uses. This area is singled out because of its importance to stream health.

Cropland

This treatment unit is the area between the riparian area and the rangeland, ranging in elevation from 5,965 and 6,800 feet. This area is traditionally flat to rolling hills and has good soil types for producing crops. This land varies in slope, elevation, soils, precipitation, management, and production. Major crops raised are alfalfa hay, barley, grass hay, and grass pasture. The objective will be to reduce erosion to tolerable soil loss or below. Critical acres are based on croplands that exceed soil loss tolerances.

Rangeland

This treatment unit is characterized by the presence of upland vegetation, including native grasses, forbs, shrubs, and trees. Topography is flat to steep with slopes ranging from 0 to 35 percent. Water is a limiting factor for livestock distribution across grazing units. Installation of offsite watering systems would allow livestock more sources of water and distribute them more across grazing allotments in the area. With the implementation of offsite watering systems, another possibility would be to fence off the Bear River to protect the streambanks and riparian areas. With the implementation of rangeland BMPs, it is expected that a rating of good on the WQI worksheets would achieve the required reductions.

Animal Facility Waste Management

Livestock production is a major industry in the area; confined feeding operations exist throughout the area. Most of the livestock sites are located on or adjacent to a natural or constructed drainage system. These sites represent all types of livestock operations at all levels of management and use. Dairies have been left out of this treatment unit because they all have regulations that require them to contain all their waste.

Recommended BMPs and Estimated Costs

Conservation efforts to date in the subbasin have demonstrated that landowners will install BMPs when technical and financial assistance is available. The proposed treatment for pollutant reduction will be to implement BMPs through conservation plans. Table 6 lists some of the BMPs, which may be used to treat the resource concerns with their unit amounts and costs. With implementation of these and other BMPs, beneficial uses in the subbasin may be obtained.

Table 6. Recommended BMPs and Estimated Costs

Treatment Unit	Best Management Practice	Unit Type	Unit Cost	Unit Amount	Total Funds
TU 1 Riparian Areas 1,119 acres	Channel Vegetation	acre	$2,100	105	$220,500
	Conservation Cover	acre	$60	210	$12,600
	Critical Area Planting	acre	$250	126	$31,500
	Fence, 4-wire	feet	$2	10,210	$20,420
	Heavy Use Area Protection	acre	$50	25	$1,250
	Pest Management	acre	$20	420	$8,400
	Prescribed Grazing	acre	$5	839	$4,195
	Riparian Forest Buffer	acre	$185	210	$38,850
	Streambank Protection	feet	$20	1,634	$32,680
	Stream Channel Stabilization	feet	$35	1,634	$57,190
	Use Exclusion (Riparian)	acre	$100	210	$21,000
				Subtotal	$448,585
TU 2 Cropland 12,172 acres	Conservation Crop Rotation	acre	$2	4,565	$9,130
	Critical Area Planting	acre	$200	304	$60,800
	Nutrient Management	acre	$3	6,086	$18,258
	Pasture & Hayland Planting	acre	$100	3,043	$304,300
	Pest Management	acre	$20	1,522	$30,440
	Water & Sediment Control Basin	each	$800	122	$97,600
				Subtotal	$520,528
TU 3 Rangeland 37,022 acres	Brush Management	acre	$30	2,322	$69,660
	Fence, 4-wire	feet	$2	40,858	$81,716
	Pest Management	acre	$20	1,393	$27,860
	Pipeline, PE 100 psi, 2.0"	feet	$2	51,073	$102,146
	Prescribed Grazing	acre	$3	4,643	$13,929
	Pumping Plant for Water Control	each	$5,000	6	$30,000
	Range Planting	acre	$80	2,322	$185,760
	Spring Development	each	$2,400	8	$19,200
	Structure for Water Control	each	$3,000	1	$3,000
	Water Well	each	$8,250	4	$33,000
	Watering Facility	each	$1,150	39	$44,850
				Subtotal	$611,121
TU 4 Animal Facility Waste Management 2 each	Corral Fence	feet	$15	3,000	$45,000
	Nutrient Management	acre	$3	40	$120
	Pipeline	feet	$2	2,000	$4,000
	Pumping Plant for Water Facility	each	$3,000	2	$6,000
	Water Well	each	$8,250	2	$16,500
	Watering Facility	each	$1,000	4	$4,000
	Waste Storage Facility	each	$20,000	2	$40,000
				Subtotal	$115,620
				Total	$1,695,854

IMPLEMENTATION PRIORITY

Implementation Alternatives

Implementation alternatives were developed that focused on the identified treatment units. The following alternatives were developed for consideration:

1. No action
2. Land treatment with non-structural BMPs on crop and rangelands
3. Land treatment with structural and non-structural BMPs on crop and rangelands
4. Riparian and stream channel restoration
5. Animal facility waste management

Description of Alternatives

Alternative 1 – No action

This alternative continues the existing conservation programs without additional project activities. The identified problems would continue to negatively impact beneficial uses in Bear River.

Alternative 2 – Land treatment with non-structural BMPs on crop and rangelands

This alternative would reduce accelerated sheet and rill, and gully erosion this will improve water quality in the subbasin and reduce pollutant loading to the Bear River. Beneficial uses may be improved with implementation of this alternative. This alternative includes voluntary landowner participation.

Alternative 3 – Land treatment with structural and non-structural BMPs on crop and rangelands

This alternative would reduce accelerated sheet and rill, and gully erosion. It is anticipated this alternative will reduce soil erosion to tolerable soil loss. This will improve water quality in the subbasin and reduce pollutant loading to the Bear River. Beneficial uses would be improved or achieved with implementation of this alternative. This alternative includes voluntary landowner participation.

Alternative 4 – Riparian and stream channel restoration

This alternative would reduce accelerated streambank and bed erosion. This alternative would improve water quality, riparian vegetation, aquatic habitat and fish passage in the subbasin. Beneficial uses would be improved with this alternative. This alternative includes voluntary landowner participation.

Alternative 5 – Animal facility waste management

This alternative would reduce sediment and nutrient runoff from animal facilities. This will improve water quality in the subbasin and reduce pollutant loading to the Bear River. This alternative includes voluntary and mandatory landowner participation.

Alternative Selection

The BLWCD selected Alternatives 3, 4 and 5 for this subbasin. These three alternatives together meet the objectives set forth in the BLWCD five year plan by improving water quality in the Bear River (BLWCD, 2007). Table 7 is an outline of the implementation of alternatives from planning to effectiveness monitoring.

Table 7. Estimated Timeline for TMDL Agricultural Implementation

Task	Output	Milestone
Develop conservation plans and contracts	Completed contract agreements	2013
Finalize BMP designs	Completed BMP plans and designs	2016
Design and install approved BMPs	Certify BMP installations	2022
Track BMP installation	Implementation progress report	2023
Evaluate BMP & project effectiveness	Complete project effectiveness report	2025

FUNDING

Financial and technical assistance for installation of BMPs is needed to ensure success of this implementation plan. There are many potential sources for funding that will be actively pursued by the Bear lake SWCD to implement water quality improvements on private agricultural and grazing lands. These sources include (but are not limited to):

(WQPA) The Water Quality Program for Agriculture;
(RCRDP) The Resource Conservation and Rangeland Development Loan Program;
(CIG) Conservation Improvement Grants;
(SRF) State Revolving Loan Funds are all administered by the ISCC to implement agricultural BMPs or to purchase equipment to increase conservation. http://www.scc.state.id.us/programs.htm

(CWA) Clean Water Act §319 Subgrants are EPA funds that are allocated to the State of Idaho. The IDEQ has primacy to administer the Clean Water Act §319 Nonpoint Source Management Program. Funds focus on projects to improve water quality, and are usually related to the TMDL process.
http://www.deq.state.id.us/

(PL-566) The Watershed Protection and Flood Prevention Act (PL 83-566) authorized NRCS to cooperate with States and local agencies to carry out works of improvement for soil conservation and for other purposes including flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land. http://www.nrcs.usda.gov/programs/watershed/

(AMA) Agricultural Management Assistance provides cost-share assistance to agricultural producers for constructing or improving water management structures or irrigation structures; planting trees for windbreaks or to improve water quality; and mitigating risk through production diversification or resource conservation practices, including soil erosion control, integrated pest management, or transition to organic farming. http://www.nrcs.usda.gov/programs/ama/

(CRP) Conservation Reserve Program is a voluntary program for agricultural landowners. Through CRP, you can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland. http://www.fsa.usda.gov

(CTA) Conservation Technical Assistance provides free technical assistance to help farmers and ranchers identify and solve natural resource problems on their farms and ranches. This might come as advice and counsel, through the design and implementation of a practice or treatment, or as part of an active conservation plan. This is provided through your local Conservation District and NRCS.
http://www.nrcs.usda.gov/programs/cta/

(CCPI) Cooperative Conservation Partnership Initiative is a voluntary program established to foster conservation partnerships that focus technical and financial resources on conservation priorities in watersheds and airsheds of special significance. http://www.nrcs.usda.gov/programs/ccpi/index.html

(EQIP) Environmental Quality Incentives Program offers cost-share and incentive payments and technical help to assist eligible participants in installing or implementing structural and management practices on eligible agricultural land. http://www.nrcs.usda.gov/programs/eqip/

(WRP) Wetlands Reserve Program is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. Easements and restoration payments are offered as part of the program. http://www.nrcs.usda.gov/programs/wrp/

(WHIP) Wildlife Habitat Incentives Program is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Cost-share payments for construction or re-establishment of wetlands may be included. http://www.nrcs.usda.gov/programs/whip/

(GRP) Grassland Reserve Program is a voluntary program offering landowners the opportunity to protect, restore, and enhance grasslands on their property. http://www.nrcs.usda.gov/programs/GRP/

(CSP) Conservation Security Program is a voluntary program that rewards the Nation's premier farm and ranch land conservationists who meet the highest standards of conservation environmental management. http://www.nrcs.usda.gov/programs/csp/

(GLCI) Grazing Land Conservation Initiative provides high quality technical assistance on privately owned grazing lands on a voluntary basis and to increase the awareness of the importance of grazing land resources. http://www.glci.org/

(CPGL) Conservation of Private Grazing Land initiative will ensure that technical, educational, and related assistance is provided to those who own private grazing lands. http://www.nrcs.usda.gov/programs/cpgl/

(EWP) Emergency Watershed Protection Program is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. http://www.nrcs.usda.gov/programs/ewp/

Many of these programs could be used in combination with each other to implement BMPs.

OUTREACH

The BLSWCD works closely with NRCS, IASCD, ISCC, and non-government organizations (NGOs) to inform farmers and ranchers about conservation practices that can benefit their farming and ranching operations, as well as improve the environment. Newspaper articles, project tours, demonstration projects, and formal and informal landowner/operator meetings have been conducted as part of this outreach effort. These activities will continue during the implementation efforts.

MONITORING

Field Level

At the field level annual contract status reviews will be conducted to insure that the contract is on schedule and that BMPs are being installed according to standards and specifications. BMP effectiveness monitoring will be conducted on installed BMPs to determine adequacy of installation, consistency of operation and maintenance, and relative effectiveness of installed BMPs in reducing water quality impacts and the effectiveness of BMPs in controlling agriculture nonpoint source pollution. These BMP effectiveness

evaluations will be conducted according to the protocols outlined in the Agriculture Pollution Abatement Plan and the ISCC Field Guide for Evaluating BMP Effectiveness.

RUSLE II and SISL are models used to predict sheet and rill erosion on non-irrigated and irrigated lands. The Alutin method, Imhoff Cones and direct volume measurements are used to measure sheet and rill, irrigation-induced and gully erosion. SVAP and SECI are used to assess aquatic habitat and streambank erosion and lateral recession rates. Idaho OnePlan, CAFO/AFO assessment worksheet is used to evaluate livestock waste, feeding, storage and application areas. Water Quality Indicators Guide is utilized to assess nitrogen, phosphorus, sediment, and bacteria contamination from agricultural land.

Watershed Level

At the watershed to subbasin level, there are many government and private groups involved with water quality monitoring. The Idaho Department of Environmental Quality (IDEQ) uses the Beneficial Use Reconnaissance Protocol (BURP) to collect and measure key water quality variables that aid in determining the beneficial use support status of Idaho's water bodies. The determination will tell if a water body is in compliance with water quality standards and criteria.

For funded projects annual project reviews will be conducted to insure the project is kept on schedule. With many projects being implemented across the state the ISCC developed a software program to the track costs and the amount of each BMP installed. This program can show what has been installed by project or the watershed level and as well as at the subbasin level and state level. These project and program reviews will insure that TMDL implementation is on schedule and on target. Monitoring BMPs and projects will be the key to a successful application of the adaptive watershed planning and implementation process.

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