APPENDIX C
Hoodoo Creek Sub-Watershed
Agricultural TMDL Implementation Plan

Introduction

Purpose

The purpose of this plan is to recommend agricultural BMPs that would improve or restore physical, chemical, and biological functions of Hoodoo Creek. This agricultural plan has been prepared by the Idaho Soil Conservation Commission, to serve as an attachment to the Implementation Plan for Hoodoo Creek, submitted under contract by HDR Engineering, Incorporated (HDR, 2004).

Goals and Objectives

The goal of this implementation plan is to restore beneficial uses on §303(d) listed stream segments. The objectives of this plan are to identify critical agricultural areas and to recommend BMPs for reducing sediment and thermal loading to Hoodoo Creek.

Background

Project Setting

For details on project setting, see pages 1, 2 (Figure 1-Location Map), 3, 5, 6, and 10 (Figure 6-Watershed Map), (HDR, 2004).

Land Ownership and Use

Tables 1 and 2 below, summarize land ownership and use within the Hoodoo Creek sub-watershed, as documented by HDR Engineering, Incorporated.

Table 1. Land Ownership in the Hoodoo Creek Sub-watershed

Land Use	Acres	Percent of Total
Private	20,264	77.3
Forest Service	3,814	14.6
State of Idaho	1,622	6.2
Bureau of Land Mgt.	501	1.9
Total	**26,201**	**100**

Table 2. Land Use in the Hoodoo Creek Sub-watershed

Land Use	Acres	Percent of Total
Forest	21,481	82.0
Agriculture(Hay/Pasture)	4,400	16.8
Urban/Suburban	180	0.7
Water	140	0.5
Total	**26,201**	**100**

For a detailed description of land use and ownership, see pages 11 (Figure 7-Land Use Map) and pages 18, 19, 22-26, (HDR, 2004).

Accomplishments

The conservation partnership has been active in soil and water conservation activities and public education efforts in Bonner County since the formation of the Bonner SWCD in 1946. The partnership has developed individual conservation plans for local agricultural producers and has pursued funding sources to assist in implementing BMPs. The partnership has additionally restored wetland and riparian areas, stabilized stream banks, coordinated with other agencies and individuals in educational activities for youth, and made educational materials available to the public.

Funding sources utilized by the conservation partnership in Bonner County have included Farm Bill Programs such as Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Continuous CRP (CCRP), Wetland Reserve Program (WRP), and Wildlife Habitat Incentive Program (WHIP); Idaho's Water Quality Program for Agriculture (WQPA); and the Clean Water Act Section 319 Program. Accomplishments on agricultural land in the Hoodoo Creek sub-watershed occurring in the last two years (2007 – 2008) are summarized in Table 3 (Becker, 2009):

Table 3. Completed Agricultural BMPs in the Hoodoo Creek Sub-watershed

BMP	Amount	Units	Project/Program
Riparian Exclusion Fence	2,828	Feet	EQIP
Wetland Enhancement	40	Acres	EQIP

Problem Statement

Beneficial Use Status

IDEQ designated beneficial uses on rivers, creeks, lakes and reservoirs to meet the requirements of the federal Clean Water Act. Hoodoo Creek (HUC 17010214; WQLS 3440 and 3441) is on the state of Idaho's §303(d) list of water quality impaired water bodies and is listed for sediment and water temperature from the headwaters to the mouth at the Pend Oreille River (IDEQ, 1998 and 2005). Beneficial uses that are designated for Hoodoo Creek include cold water aquatic life, salmonid spawning, primary and secondary contact recreation. These beneficial uses are not fully supported (IDEQ 2001). For more details on the 303(d) listing and beneficial use status, see pages 3 and 5-9 (HDR, 2004).

Pollutants of Concern

According to this Hoodoo Creek Implementation Plan, the pollutant of concern is sediment from banks, roads, and land. IDEQ's sediment model for Hoodoo Creek, estimates sediment loads from all land uses, at 6,150 tons/year. The TMDL for Hoodoo Creek recommends an overall 84% sediment reduction needed to fully support the designated beneficial uses. The Hoodoo Creek Implementation Plan speaks of an overall 75% sediment reduction target which computes to 4,613 tons/year. Agriculture, which makes up about 17% of the sub-watershed, has been tasked to reduce its sediment load by 94%, which totals 907 tons/year. For more details on pollutants of concern, see pages 6-8 and 20 (HDR, 2004).

Identified Problems

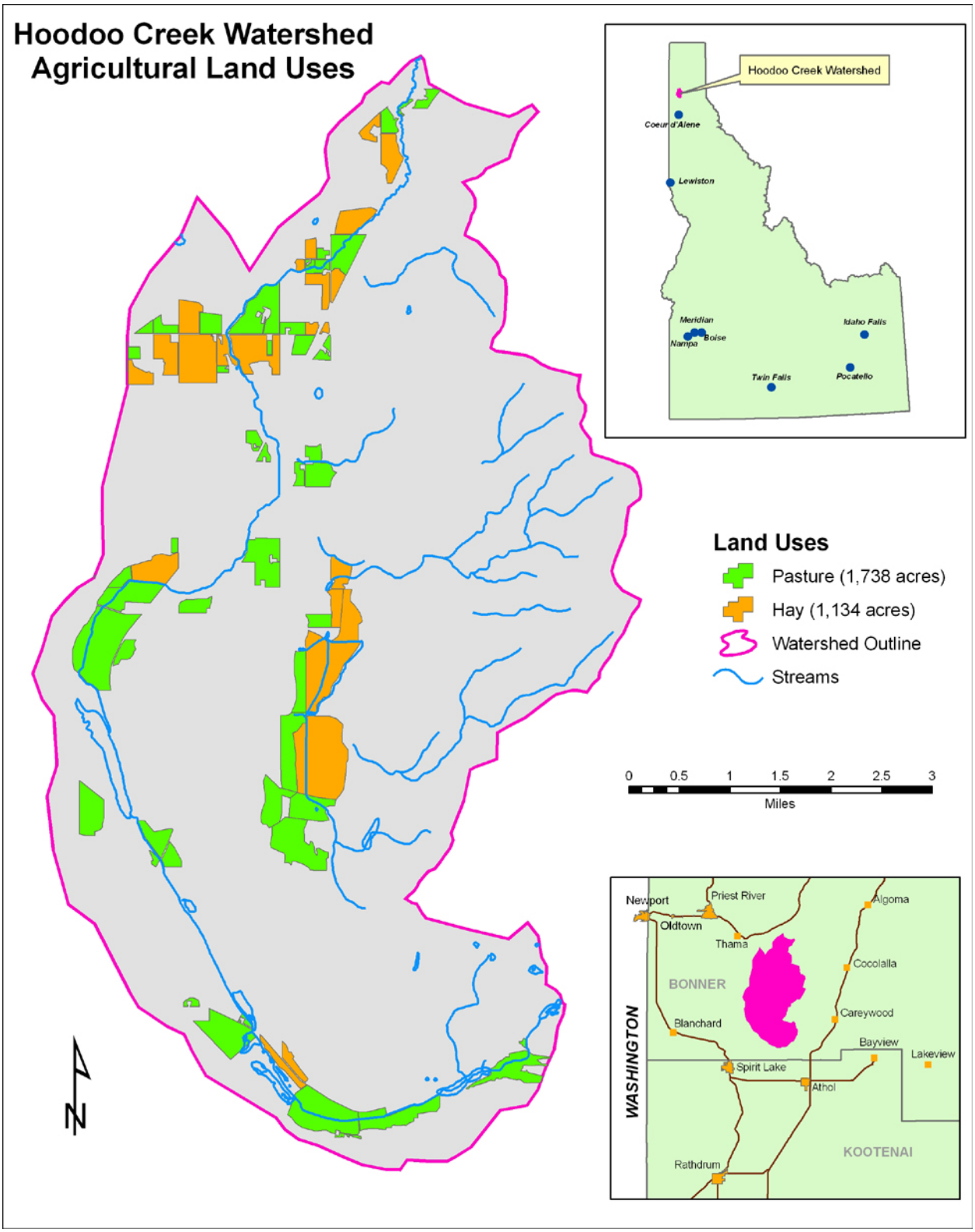
The TMDL cites sediment loads in Hoodoo Creek are dominated by bank mass wasting followed by roads. Hoodoo Creek differs from most Idaho streams, in the fact that, its tributaries do not join to Hoodoo Creek. Instead, the tributaries go subsurface and most likely provide groundwater to the springs that feed Hoodoo Creek. Thus, this particular agricultural plan will not address the tributaries for treatment potential, but will focus on adjacent critical agricultural areas to Hoodoo Creek proper. Specifically, private agricultural pasture and hay land that is encroaching upon the banks and riparian vegetation of Hoodoo Creek.

Water Quality Monitoring Results
To summarize water quality monitoring that has occurred in the Hoodoo Creek sub-watershed after publication of this Implementation Plan, personal communication with IDEQ Coeur d'Alene Regional Office was required. An IDEQ specialist provided the following recent monitoring information (Pettit, G. 2008):

- Stream flow was measured at the mouth of Hoodoo Creek during 2006.
- In order to address water temperature, Potential Natural Vegetation (PNV) was measured throughout Hoodoo Creek, using a solar pathfinder in 2006.

Agricultural Water Quality Inventory and Evaluation
In order to assess agricultural impacts to surface water on TMDL listed streams, the first step was to inventory private agricultural land use that exists within the Hoodoo Creek sub-watershed. For this plan, agricultural land use was inventoried, visually in the field, starting in 2007 and updating through 2009 (Hogen, M. 2007-2009). The main two remaining agricultural uses found for Hoodoo Creek were pasture and hay land. Hay lands within the TMDL watersheds are typically in good to excellent condition and are on relatively flat slopes. Most of the highly productive hay fields are fertilized, but at rates well below recommended. No potential agricultural impacts were observed from hay land and/or pastures, lying outside the TMDL riparian area. The agricultural land use inventory conducted for the Hoodoo Creek sub-watershed has been summarized on Figure 1.

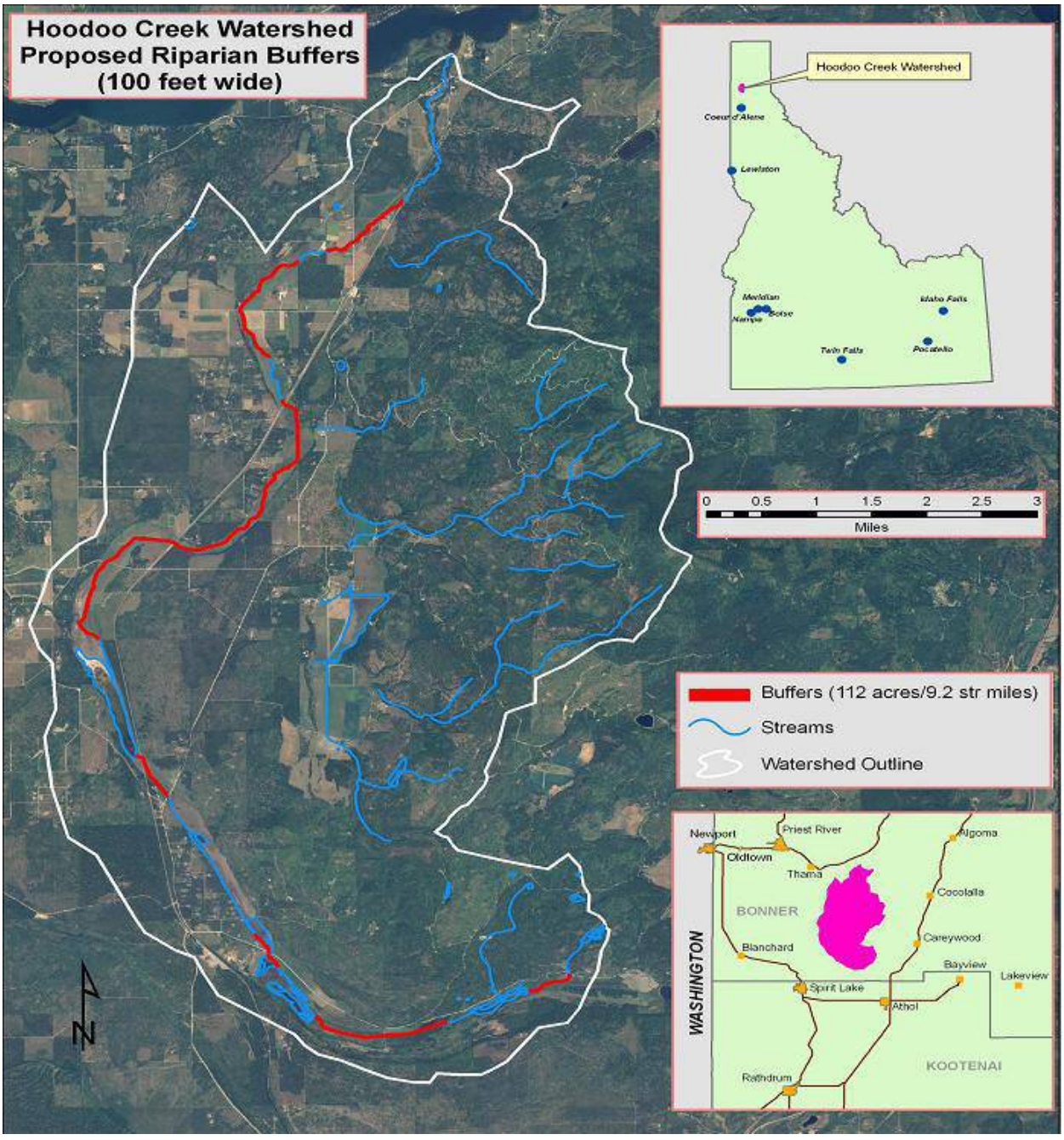
Figure 1: Hoodoo Creek Agricultural Lands



Critical Areas

Agricultural areas that have the potential to contribute excess pollutants to waterways are defined as critical areas for BMP implementation. Critical areas prioritized for this plan were identified during field observations from 2007- 2009. Agricultural critical areas within the Hoodoo Creek TMDL sub-watershed include: those areas where livestock have direct access to streams and riparian areas; and areas adjacent to stream corridors that lack adequate riparian buffering. Figure 2, illustrates the approximate location of these critical agricultural areas.

Figure 2: Hoodoo Creek Agricultural Critical Areas



In summary, approximately 9.2 linear miles of stream bank, consisting of 112 acres of impacted riparian area, have been identified as agricultural critical areas for treatment in the Hoodoo Creek sub-watershed.

Estimated BMP Implementation Costs

The proposed treatment for agricultural pollutant reduction will be to implement BMPs through conservation plans. Table 4 lists the recommended agricultural BMPs and estimated costs, to restore beneficial uses to Hoodoo Creek.

Table 4. Estimated BMP Installation and Costs for the Hoodoo Creek Sub-Watershed

BMPs	Amount (Units)	Estimated Cost
Riparian Fence (Animal Exclusion)	48,580 Feet	$184,600
Riparian Forest Buffer	112 Acres	$388,640
Access Control (3 years)	112 Acres	$22,850
Heavy Use Area Protection	14,400 Square Feet	$72,000
Watering Facilities- On demand	22 Each	$36,300
Pipeline- 1.25” Plastic	11,000 Feet	$40,700
Pumping Plant -170 Watt Solar	850 Watts	$27,630
Total Estimated Costs		**$772,720**

(Above table reflects Draft 2009 EQIP total cost.)

Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 (ESA) requires federal agencies to determine how to use their authorities to further the purpose of the ESA to aid in recovering listed species and address existing and potential conservation issues. Section 7 (a)(2) further states that agencies shall consult with the U.S. Fish and Wildlife Service or NOAA Fisheries to ensure that any action they authorize, fund, or carry out “is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of (designated critical habitat).” As a federal agency, the NRCS is required to follow this mandate for all projects implemented with federal funding. NRCS policy, as outlined in their General Manual, also includes provisions to consider State species of concern in their conservation activities (190-GM, Amend. 8, December 2003).

Impacts to T&E species and species of concern in the Hoodoo Creek sub-watershed will be taken into account in TMDL project implementation. If a proposed action is determined to be within close proximity to habitat used by a Threatened or Endangered (T&E) species or the known location of a T&E species, consultation will be initiated with the appropriate agency. Consultation involves describing the proposed project, assessing potential impacts, describing mitigation efforts for the project, and determining the effect of the project on the species of

concern. The consultation process results in development of reasonable alternatives, and helps to minimize impacts of conservation practices to critical habitat.

The Idaho Department of Fish and Game Conservation Data Center, 2002 Threatened and Endangered Species GIS database is available as a tool in conservation planning. The database contains documented locations for terrestrial species. This can help identify known locations of T&E species and identify critical habitat types that may harbor T&E species. Conservation planners can reference habitat requirements to help land users determine the potential benefits and impacts of their project implementation. These discussions remain confidential between the land user and planners.

Species listed as Threatened or Endangered under the ESA for Bonner County are summarized in Table 5.

Table 5. Federally-listed Threatened and Endangered Species occurring in Bonner County, Idaho (NRCS Field Office Technical Guide)

Species	***Status****
Mammals	
Canada lynx (Lynx canadensis)	LT
Grizzly bear (Ursus arctos horribilis)	LT
Gray wolf (*Canis lupus*)	LE
Woodland caribou (Rangifer tarandus caribou)	LE
Birds	
Bald eagle (Haliaeetus leucocephalus)	LT
Fish	
Bull trout (Salvelinus confluentus)	LT
Plants	
Ute Ladies'-tresses (*Spiranthes diluvialus*)	LT

*LT – Listed as Threatened, LE – Listed as Endangered

Funding

Financial and technical assistance for installation of BMPs is needed to ensure success of this implementation plan. The Bonner Soil and Water Conservation District will actively pursue multiple potential funding sources to implement water quality improvements on private agricultural and grazing lands. Many of these programs can be used in combination with each other to implement BMPs. These sources include (but are not limited to):

CWA 319 –These are Environmental Protection Agency funds allocated to Tribal entities and the State of Idaho. The Idaho Department of Environmental Quality (DEQ) administers the Clean Water Act §319 Non-point Source Management Program for areas outside the Tribal Reservations. Funds focus on projects to improve water quality and are usually related to the TMDL process. Source: DEQ http://www.deq.idaho.gov/water/prog_issues/surface_water/nonpoint.cfm#management

Water Quality Program for Agriculture (WQPA) – The WQPA is administered by the Idaho Soil Conservation Commission (ISCC). This program is also coordinated with the TMDL process. Source: ISCC http://www.scc.state.id.us/programs.htm

Resource Conservation and Rangeland Development Program (RCRDP) – The RCRDP is a loan program administered by the ISCC for implementation of agricultural and rangeland best management practices or loans to purchase equipment to increase conservation. Source: ISCC http://www.scc.state.id.us/programs.htm

Conservation Improvement Grants – These grants are administered by the ISCC. Source: ISCC http://www.scc.state.id.us/programs.htm

PL-566 –This is the small watershed program administered by the USDA Natural Resources Conservation Service (NRCS).

Agricultural Management Assistance (AMA) – The AMA 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. Source: NRCS http://www.nrcs.usda.gov/programs/ama/

Conservation Reserve Program (CRP) – The CRP is a land retirement program for blocks of land or strips of land that protect the soil and water resources, such as buffers and grassed waterways. Source: NRCS http://www.nrcs.usda.gov/programs/crp/

Conservation Technical Assistance (CTA) – The CTA 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. Source: local Conservation District and NRCS: http://www.nrcs.usda.gov/programs/cta/

Environmental Quality Incentives Program (EQIP) – EQIP 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. Source: NRCS http://www.nrcs.usda.gov/programs/eqip/

Wetlands Reserve Program (WRP) – The WRP 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. Source: NRCS http://www.nrcs.usda.gov/programs/wrp/

Wildlife Habitat Incentives Program (WHIP) – WHIP 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. Source: NRCS http://www.nrcs.usda.gov/programs/whip/

State Revolving Loan Funds (**SRF) –** These funds are administered through the ISCC. Source: ISCC http://www.scc.state.id.us/programs.htm

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

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

Grazing Land Conservation Initiative (**GLCI) –** The GLCI's mission is to provide 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. Source: http://www.glci.org/

Habitat Improvement Program (HIP) – This is an Idaho Department of Fish and Game program to provide technical and financial assistance to private landowners and public land managers who want to enhance upland game bird and waterfowl habitat. Funds are available for cost sharing on habitat projects in partnership with private landowners, non-profit organizations, and state and federal agencies. Source: IDFG http://fishandgame.idaho.gov/cms/wildlife/hip/default.cfm

Partners for Fish and Wildlife Program in Idaho – This is a U.S. Fish and Wildlife program providing funds for the restoration of degraded riparian areas along streams, and shallow wetland restoration. Source: USFWS http://www.fws.gov/partners/pdfs/ID-needs.pdf

Outreach

Conservation partners in the Hoodoo Creek sub-watershed will use their combined resources to provide information about BMPs to agricultural landowners and operators to improve water quality. Newspaper articles, Bonner SWCD newsletter, watershed and project tours, landowner meetings, and one-on-one personal contact may be used as outreach tools. Outreach efforts will be coordinated with the other TMDL designated agencies where possible.

Outreach efforts will:

- provide information about the TMDL process
- supply water quality monitoring results
- accelerate the development of conservation plans and program participation
- distribute progress reports
- enhance technology transfer related to BMP implementation
- increase public understanding of agriculture's contribution to conserve and enhance natural resources
- improve public appreciation of agriculture's commitment to meeting the TMDL challenge, and
- identify and encourage the use of BMPs for private land management and recreation activities

Applications for technical and financial assistance will be solicited with emphasis in the Hoodoo Creek sub-watershed, through cooperation of all conservation partners. As assistance is requested from this area, high priority will be given to these and other applicants in areas critical to TMDL implementation. Assistance requests resulting in field visits allow direct contact with land managers and observation of the land. One-on-one time will be utilized to dispense information on water quality, BMPs, and available resources. Treatment applicable to the needs of the Hoodoo Creek sub-watershed will be the focus of discussions with landowners in the vicinity.

Monitoring and Evaluation

Field Level

At the field level, annual status reviews will be conducted to insure that the contracts are on schedule and that BMPs are being installed according to standards and specifications. BMP effectiveness monitoring will be conducted on installed projects to determine installation adequacy, operation consistency and maintenance, and the relative effectiveness of implemented BMPs in reducing water quality impacts. This monitoring will also measure the effectiveness of BMPs in controlling agricultural 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.

The Revised Universal Soil Loss Equation (RUSLE) and Surface Irrigation Soil Loss (SISL) Equation are 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 determine sheet and rill irrigation-induced and gully erosion. Stream Visual Assessment Protocol (SVAP) and Streambank Erosion Condition Inventory (SECI) are used to assess aquatic habitat, stream bank erosion, and lateral recession rates. The Idaho OnePlan's CAFO/AFO Assessment Worksheet is used to evaluate livestock waste, feeding, storage, and application areas. The Water Quality

Indicators Guide is utilized to assess nitrogen, phosphorus, sediment, and bacterial contamination from agricultural land.

Watershed Level

At the watershed level, there are many governmental and private groups involved with water quality monitoring. The Idaho Department of Environmental Quality 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. In addition, IDEQ will be conducting five-year TMDL reviews.

Annual reviews for funded projects will be conducted to insure the project is kept on schedule. With many projects being implemented across the state, ISCC developed a software program to track the costs and other details of each BMP installed. This program can show what has been installed by project, by watershed level, by sub-basin level, and by state level. These project and program reviews will insure that TMDL implementation remains 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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