

**Kootenai River-Moyie River Subbasin  
(17010104 and 17010105)**

**Agricultural TMDL Implementation Plan**



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## Introduction

The Idaho Soil and Water Conservation Commission (SWC) is the designated management agency in Idaho for managing agricultural nonpoint source pollution and is therefore the lead in TMDL implementation activities on agricultural land. Although the SWC does not have regulatory or licensing authority over water quality or pollution control, the mission of the SWC is to provide support to Idaho's Soil and Water Conservation Districts for wise use and improvement of natural resources (RPU 2003). The SWC offers technical assistance to landowners and operators and administers the Water Quality Program for Agriculture (WQPA), the Conservation Improvement Grants program, and the Resource Conservation and Rangeland Development Program (RCRDP) in cooperation with Soil and Water Conservation Districts.

The SWC works with the Boundary Soil Conservation District (BSCD), the Idaho Association of Soil Conservation Districts (IASCD), and the Natural Resource Conservation Service (NRCS) in a conservation partnership to reach common goals and successfully deliver conservation programs in Boundary County.

## Conservation Partnership

Local soil and water conservation districts, the SWC, and NRCS have partnered up, recognizing common conservation goals. Each agency has its own responsibilities and recognizes the need to coordinate efforts to successfully implement conservation programs. This working relationship is referred to as the *conservation partnership*. In Boundary County, the SCD/NRCS Field Office consists of the Boundary SCD, NRCS, and IASCD/SWC staff.

- Boundary Soil Conservation District – Conservation districts are units of local government led by an elected board of supervisors. Utilizing input from other agencies and the public, conservation districts set the priorities that focus conservation efforts locally. They promote clean water and productive soil by assisting agricultural landowners and operators with effective management of natural resources.
- Idaho Association of Soil Conservation Districts – IASCD is a nonprofit association of Idaho's 50 soil and water conservation districts cooperating in the management of Idaho's natural resources. The IASCD was organized to provide a unified voice for conservation at the state level. Its members work closely with the SWC on problems of policy and resource concerns. IASCD participates in the conservation partnership in this capacity and provides staff support to conservation districts throughout the state under SWC supervision.
- USDA – Natural Resource Conservation Service – NRCS is a non-regulatory federal agency that works with private landowners on a request basis. NRCS assists the SWC, conservation districts, landowners and operators, and others in conserving natural resources. Guided by local district priorities, NRCS delivers technical and financial assistance to landowners and operators through voluntary programs to achieve conservation goals. NRCS offers leadership and technical assistance to the SWC, IASCD, conservation district staff, and other agencies, as requested. NRCS

administers a number of Farm Bill programs that provide cost share to eligible participants to facilitate the implementation of Best Management Practices.

The effects of agricultural practices on water quality vary depending on the management practices and location of particular operations in relation to surface and ground water. The conservation partnership assists landowners in implementing Best Management Practices (BMPs) that minimize negative impacts to water quality. The partnership is committed to targeting watersheds listed as water quality limited, and program delivery efforts prioritize projects occurring in degraded watersheds. The BSCD's Five Year Plan lists water quality as one of its top priorities, including TMDL Implementation.

**Purpose**

The agricultural portion of the Kootenai River-Moyie River TMDL Implementation Plan outlines an adaptive management approach for implementation of Resource Management Systems (RMS) and BMPs to meet the requirements of the Kootenai River and Moyie River Subbasins TMDL. The goal of this plan is to complement other efforts in restoring and protecting beneficial uses for 1998 303(d) listed stream segments for which TMDLs have been developed. These segments are identified in Table 1. The watershed locations for the listed segments are shown in Figure 1. Only streams with private agricultural land will be discussed for the purposes of this plan.

**Table 1: 1998 303(d) listed Stream Segments**

<b>Stream</b>	<b>Description</b>	<b>Pollutant(s)</b>
*Blue Joe Creek	First and second order portions of Blue Joe Creek from headwaters to Idaho/Canada border	Sediment
*Boulder Creek	First, second, and third order portions of Boulder Creek from headwaters to East Fork Boulder Creek; third order portion of Boulder Creek from East Fork Boulder Creek to mouth	Sediment
Boundary Creek	First and second order portions of Boundary Creek from Idaho/Canada border back to Canadian border, including main stem Boundary Creek to Fan Creek; third order portion of Boundary Creek main stem from Fan Creek to Canadian border near Kootenai River	Temperature
*Caribou Creek	First and second order portions of Caribou Creek from Roman Nose Lakes to confluence with Deep Creek	Sediment
*Cow Creek	First and second order portions of Cow and Beaver Creeks from headwaters to Cow Creek's confluence with Beaver Creek and third order portion of Cow Creek downstream from confluence with Beaver Creek to Smith Creek	Sediment
Deep Creek	First and second order portions of Deep Creek upstream of McArthur Lake	Temperature
	Third order portion of Deep Creek from McArthur Lake to Trail Creek and fourth order portion of Deep Creek from Trail Creek to Kootenai River	Sediment, Temperature

\*No Private Agricultural Land

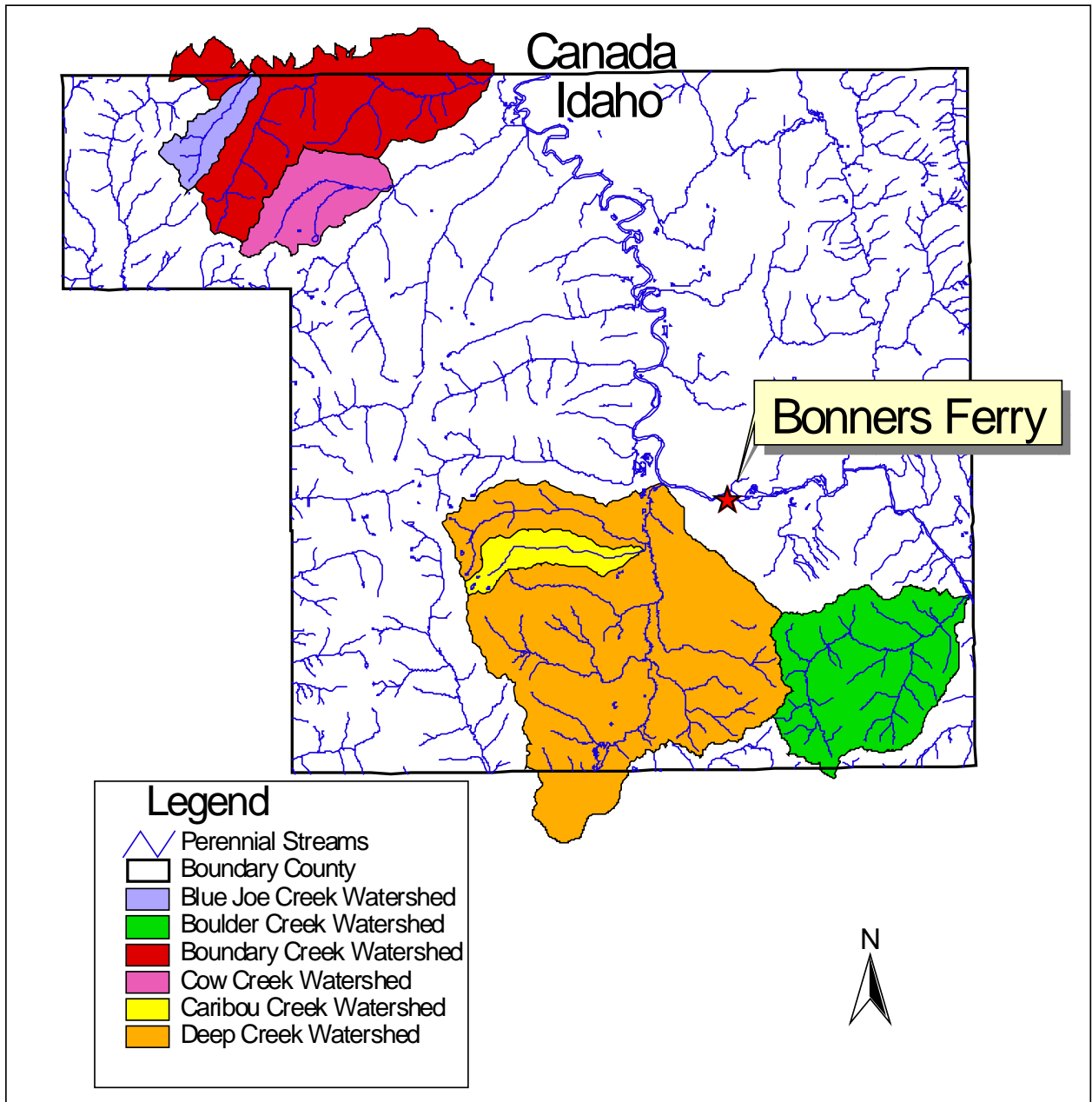
The creeks listed above were found to be not supporting aquatic life uses (cold water and salmonid spawning). Deep Creek was originally listed for sediment and temperature on the 1998 303(d) list. EPA added temperature to Deep Creek and Boundary Creek. It remained listed for sediment and temperature in the 2002 Integrated Report (IR). The 2002 IR listed other waterbodies as impaired. These segments can be found in the IR (IDEQ 2005).

The Moyie River, from the Moyie River Dam to the confluence with the Kootenai River, is not discussed in this implementation plan because it was proposed for delisting. The IDEQ stated the following in the Assessment of Water Quality in Kootenai River and Moyie River Subbasins (TMDL).

The 1998 §303(d) list includes the Moyie River, from the Moyie River Dam to its confluence with the Kootenai River. Excess sediment is the listed pollutant, and based on the 1998 determination, a TMDL would be required. DEQ does not have Beneficial Use Reconnaissance (BURP) monitoring data on this section of Moyie River, and believes the sediment listing decision was based on anecdotal understandings and information. DEQ has evidence that the listing resulted from a single fine sediment deposition event and that the stream has recovered since that event and therefore recommends delisting.

The major objective of this plan will be to reduce the amount of sediment entering the watershed from agricultural sources and increase riparian shading where feasible. Agricultural pollutant reductions will be achieved through the application of RMS and BMPs developed and implemented onsite with individual landowners on a voluntary basis.

In addition, efforts will be made to educate land users in the watershed on the effects of land use on water quality. This will encourage participation in implementation efforts, ensure long-term maintenance of BMPs, and increase awareness of water quality issues. Installed BMPs will be monitored for effectiveness and evaluated in terms of reducing pollutant loading and impacts on designated beneficial uses of the watershed.

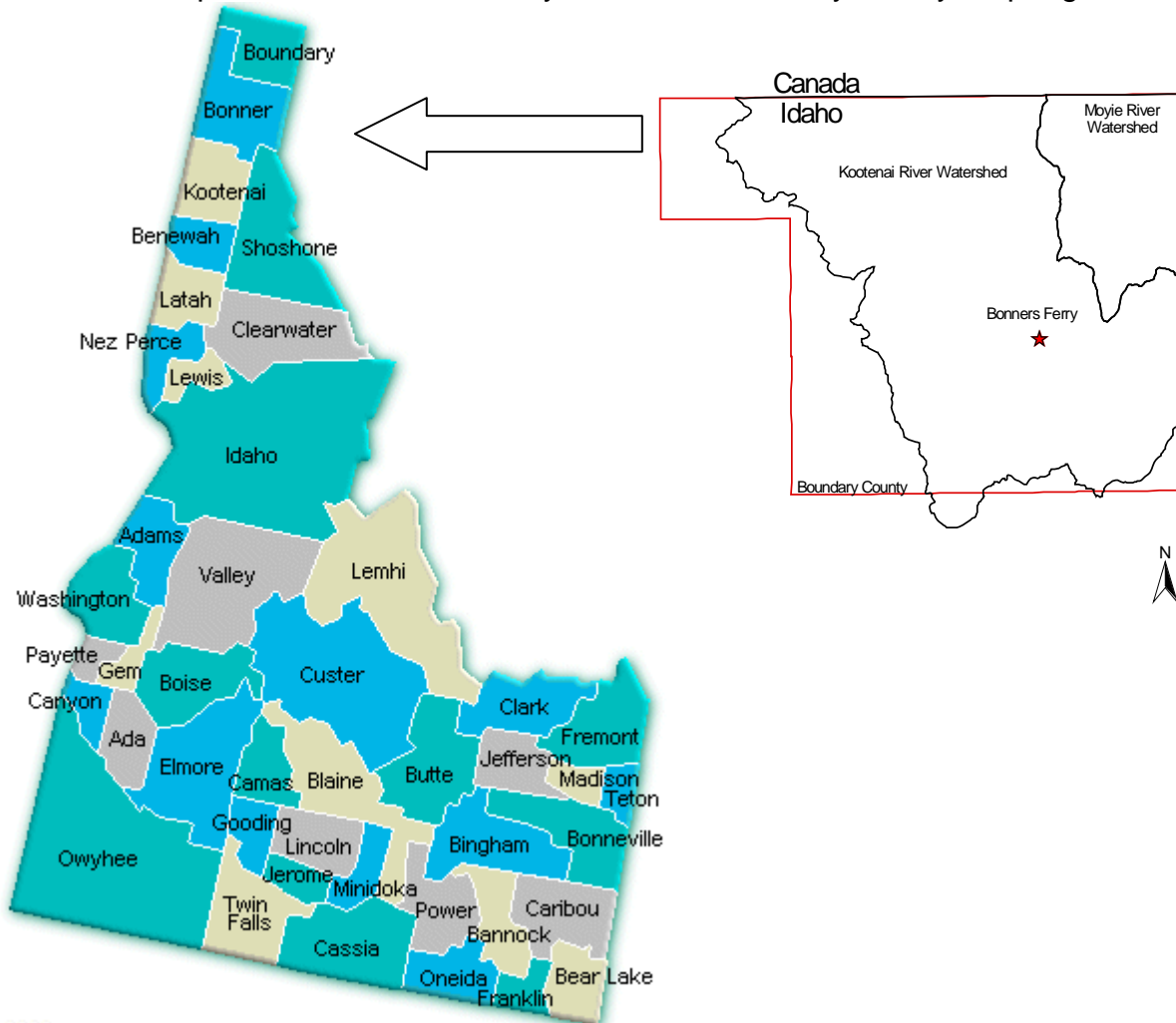


**Figure 1. Watershed Boundaries for 1998 303(d) listed stream segments included in the Kootenai River and Moyie River Total Maximum Daily Loads (IDEQ 2006).**

## Background

### Project Setting

The Kootenai-Moyie River subbasin is located in Boundary County in northern Idaho (Figure 2). The Kootenai River flows west-northwest into Idaho from Montana, turns north near Bonners Ferry, Idaho, and flows into Canada. The Moyie River flows into the Kootenai River upstream of Bonners Ferry near the community of Moyie Springs.

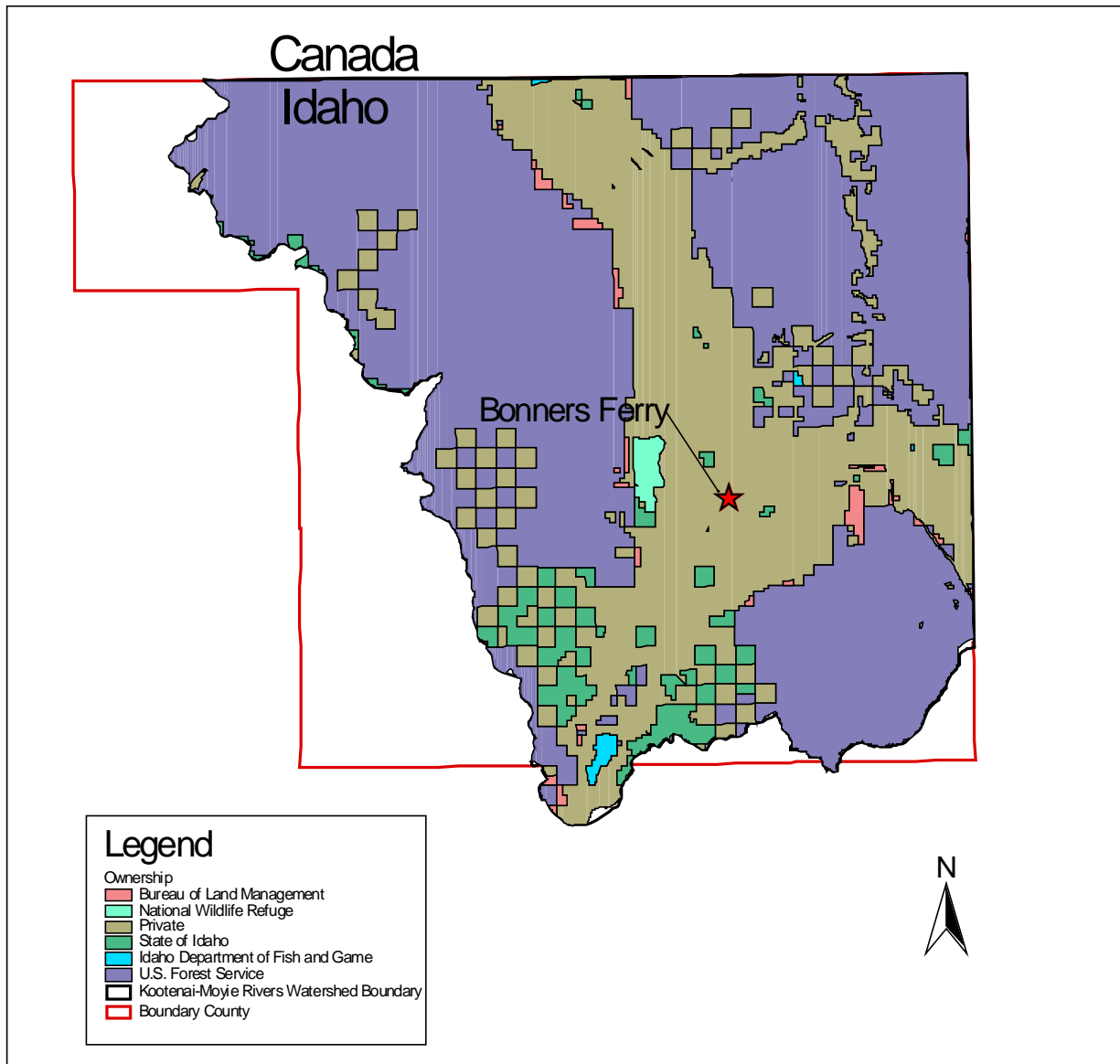


**Figure 2. Location of Kootenai River-Moyie River Subbasin in Idaho (Idaho map from NRCS Idaho home page, September 2005).**

### Land Ownership

Land ownership in the Idaho portion of the Kootenai River-Moyie River subbasin consists of federal, state, and private land. Land ownership, in acres, is summarized in Table 2. Land ownership is shown in Figure 3.





**Figure 3. Land Ownership in the Kootenai River-Moyie River Subbasin.**

**Table 2. Land Ownership in the Idaho Portion of the Kootenai River-Moyie River Subbasin (estimates based on GIS coverage from IDEQ Boise office 2005).**

Land Owner/Manager	Acres
Bureau of Land Management	4,973
National Wildlife Refuge	2,813
Private	215,507
State of Idaho (Department of Lands)	24,367
Idaho Department of Fish and Game	1,621
U.S. Forest Service	393,854
Total Acres	643,135

## **Land Use**

Approximately two thirds of the privately-owned land is in the form of dryland agriculture along the main stem Kootenai River, and roughly one-third is forested. Forest land use includes timber harvest, recreation, and mining. Smaller areas of private land are used for hay and pasture throughout the watershed (IDEQ 2005). The following paragraph from the Assessment of Water Quality in Kootenai River and Moyie River Subbasins (TMDL) describes the extent of farming in the subbasin.

Fertile farming grounds are restricted to roughly 50,000 acres along the old floodplain of the Kootenai River valley and bench areas above the floodplain. Along the floodplain, crops such as spring and winter wheat and canola, spring barley, timothy, and white clover are grown. In the bench areas, spring and winter wheat, spring barley, alfalfa hay and seed, and grass hay are grown (Bonners Ferry Chamber of Commerce 2003).

## **Conservation Accomplishments**

The conservation partnership has been active in soil and water conservation and water quality issues since 1947. The partnership has developed individual conservation plans for local agricultural producers and has pursued funding sources to assist in implementing BMPs. The partnership has restored wetland and riparian areas, stabilized streambanks, coordinated with other agencies and individuals in educational activities, and made educational materials available to the public.

Funding sources utilized by the conservation partnership in Boundary County have included Farm Service Agency's Conservation Reserve Program (CRP) and Continuous Sign-up CRP (CCRP); NRCS's Environmental Quality Incentives Program (EQIP), Conservation Security Program (CSP), and Wetland Reserve Program (WRP); and Clean Water Act Section 319 Grant Program. Accomplishments in the Kootenai River-Moyie River subbasin since the Idaho Department of Environmental Quality's (IDEQ) assessments of the subbasin in 1998 are summarized in Table 3.

**Table 3. Conservation Partnership Accomplishments in the Kootenai River-Moyie River Subbasin since 1998.**

<b>Hydrologic Unit Code</b>	<b>Project Description</b>	<b>Date Implemented</b>	<b>Effectiveness</b>
17010104-060	Long Canyon Creek Streambank and Shoreline protection – 600 linear feet	2006	Reduce bank erosion and sedimentation, improve riparian zone/shading, enhance fish habitat
17010104-015	Curley Creek Tree and Shrub Planting and Forest Road Seeding	2002-2004	Improve hydrology and riparian zone, reduce sheet and rill erosion
17010104-020-050	Kootenai River/Cow Creek CRP* - Planting permanent cover on approx. 1200 acres	1985 and ongoing	Reduce sheet and rill erosion, improve hydrology
17010104-025	Round Prairie Creek WRP* - Restore Wetland Hydrology	1998	Improve hydrology and riparian zone
17010104-030	Tree and Shrub Plantings within Cow Creek Watershed	2002-2003	Improve hydrology and shading, reduce sheet and rill erosion
17010104-030	Cow Creek – prescribed grazing (30 acres), pasture and hayland planting (30 acres), forest management (60 acres), wildlife ponds	2006-ongoing	Reduce sheet and rill erosion, improve hydrology
17010104-030-060	Conservation Cover - Grass and Legumes in Rotation; Hay crops planted approx. 5000 ac/year	Ongoing	Reduced sheet/rill erosion, improve hydrology
17010104-040	Deep Creek Bank Stabilization	1998	Reduced bank erosion and sedimentation
17010104-040	Deep Creek Bank Barbs, Rip Rap, Log Revetment and Riparian Fencing	1999 and 2000	Reduced bank erosion and sedimentation
17010104-040	North Hill Hydro Seeding Project with Idaho Transportation Department along Highway 95	2000	Improve shading, reduce sheet and rill erosion
17010104-040	Deep Creek Log Revetment Structures along outside bend and pole plantings	2000	Reduced bank erosion and sedimentation, improve riparian zone/shading
17010104-040	Ruby Creek/road - Bank barbs, tree and shrub planting, riprap	2000	Reduce bank erosion, increase shading
17010104-040	Tree and Shrub Plantings - Approximately 3000 Trees and Shrubs planted per year in logged areas within Bane Creek watershed.	2000-2004	Improve hydrology and shading

**Table 3 (cont.). Conservation Partnership Accomplishments in the Kootenai River-Moyie River Subbasin since 1998.**

<b>Hydrologic Unit Code</b>	<b>Project Description</b>	<b>Date Implemented</b>	<b>Effectiveness</b>
17010104-040	Ball Creek WRP* - Restore Kootenai River Floodplain, Wetlands, and Hydrology	2003	Improve hydrology and riparian zone
17010104-040	Trail Creek Streambank and Shoreline protection	2004	Reduce bank erosion and sedimentation, improve riparian zone/shading
17010104-040	Deep Creek Bank Barbs, Rip Rap, Brush Revetment, Riparian Fencing, and Tree and Shrub Plantings on bank- 300 linear feet	2005	Reduce bank erosion and sedimentation, improve Riparian zone / shading
17010104-040	Deep Creek (2) Shallow Wildlife ponds and willow plantings	2005	Improve hydrology, reduce sheet and rill erosion
17010104-040 & 050	Conservation Tillage Systems - Reduced tillage and direct seeding systems	1985 ongoing	Reduce sheet/rill erosion, improve hydrology
17010104-040 & 050	CCRP* Filter Strip - Permanent cover along Kootenai River Drain Ditch and Creeks	2002 and on going	Improve hydrology and riparian zone/shading
17010104-050	3 Animal Waste Systems: Kootenai River	1998 and 2003-2004	Reduce animal waste runoff
17010104-050	Unnamed trib (locally named Trow Cr) - Kootenai River (2) wildlife ponds	2005	Improve hydrology
17010104-060	Boundary Creek WRP* - Restore Kootenai River Floodplain, Wetlands, and Hydrology	2000	Improve hydrology and riparian zone
17010104-060	Smith Creek Dike Road Repair-Rock Rip Rap, Bio-engineering, and Rock Barbs	2002	Reduced bank erosion and sedimentation
17010104-060	Smith Creek WRP* - Restore Kootenai River Floodplain, Wetlands, and Hydrology	2003	Improve hydrology and riparian zone
17010105-015	Curley Creek WRP* - Restore Curley Creek Riparian Zone, Semi Wet Meadows, and Floodplain Hydrology	2002	Improve hydrology and riparian zone / shading

*\*WRP – NRCS Wetland Reserve Program, CRP – Farm Service Agency Conservation Reserve Program, CCRP – Continuous sign-up CRP*

Note that there are two Cow Creeks in the Kootenai River-Moyie River subbasin. The Cow Creek listed in Table 1 is a forested watershed in the northwestern area of the watershed. The other Cow Creek flows into the Kootenai River upstream from Bonners Ferry from the south. This watershed has mixed forest and agricultural land, and is the watershed referred to in Table 3.

## Water Quality Problems

### Beneficial Use Status

Idaho water quality standards require that beneficial uses of all water bodies be protected. Beneficial uses can include existing uses, designated uses, and presumed existing uses. Designated uses are uses officially recognized by the state. In cases where designated uses have not been established by the state for a given water body, IDEQ has established the presumed existing uses of supporting cold water aquatic life and either primary or secondary contact recreation. Beneficial uses for waterbodies on the 1998 303(d) list in the Kootenai River-Moyie River subbasin are listed below in Table 4 (IDEQ 2006).

**Table 4. Beneficial Uses for Waterbodies on the 1998 303(d) list in the Kootenai River-Moyie River subbasin**

Waterbody	Assessment Unit	Uses	Type of Use
Boulder Creek- Headwaters to Kootenai River	ID17010104PN032_03 ID17010104PN033_02 ID17010104PN033_03	CWAL, SS, PCR	Designated
Deep Creek- McArthur Lake to Kootenai River	ID17010104PN025_02 ID17010104PN025_03 ID17010104PN019_04 ID17010104PN018_04 ID17010104PN015_04	CWAL, SS, PCR, DWS, SRW	Designated
Blue Joe Creek- Headwaters to Canadian border	ID17010104PN004_02	CWAL, SS, PCR	Designated
Caribou Creek- Headwaters to Snow Creek	ID17010104PN017_02	CWAL, SS, PCR	Designated
Cow Creek- Headwaters to Smith Creek	ID17010104PN006_02 ID17010104PN006_03	CWAL, SS, PCR	Designated
Boundary Creek- Idaho/Canadian border to Idaho/Canadian border	ID17010104PN002_02 ID17010104PN002_03	CWAL, SS, PCR	Designated
Moyie River- Moyie Falls dam to Kootenai River	ID17010105PN001_05	CWAL, SS, PCR, DWS, SRW	Designated

*CWAL – cold water aquatic life, SS – salmonid spawning, PCR – primary contact recreation, SCR –secondary contact recreation, AWS – agricultural water supply, DWS – domestic water supply*

### Pollutants

Land use in the Kootenai River-Moyie River subbasin has increased sediment input to the system and decreased riparian shading. Agricultural activities contribute sediment to waterbodies through runoff and erosion. Sheet and rill erosion from cropland, pasture, and hayland contribute to the sediment load in waterbodies. Agricultural activities that encroach upon the riparian zone and direct livestock impact to

streambanks and riparian vegetation additionally reduce the filtering and shading capacity of the riparian zone and increase streambank erosion.

TMDLs have been developed for two watersheds with agricultural land use within the subbasin. A temperature TMDL was developed for Boundary Creek and temperature and sediment TMDLs were developed for Deep Creek. The TMDL states that, "All sources of sediment to Deep Creek are nonpoint sources." The sets the non-point sediment yield for waterbodies within the subbasin. The target load capacity for sediment in Deep Creeks was set at 50% above background because this is the capacity at which beneficial uses will be fully supported. The Kootenai River and Moyie River Total Maximum Daily Loads analysis calculated a sediment loading capacity of 5,237 tons/year for Deep Creek. The current estimated existing load is 6,122 tons/year. The sediment load reduction required for private lands is 534 tons/year (IDEQ 2006).

The temperature TMDL results estimate that Boundary Creek will require a 4.5% decrease in solar load, based on potential natural vegetation analysis. The report indicates that this level of reduction may fall "within the variability of estimation techniques," and that "Boundary Creek is likely at its potential in terms of shading and solar loading" (IDEQ 2006).

Boundary Creek runs through forested areas until it flattens out into the old Kootenai River floodplain, where previous agricultural activities took place. This area is now restored wetland/floodplain. The existing cottonwood community with shrub and grass understory remains intact along the stream channel (Gondek 2005). Given this information, TMDL implementation for private agricultural lands in the Boundary Creek watershed is considered complete, and regular monitoring of the restored area will continue to ensure that existing vegetation remains. Therefore, Deep Creek is the focus of this plan.

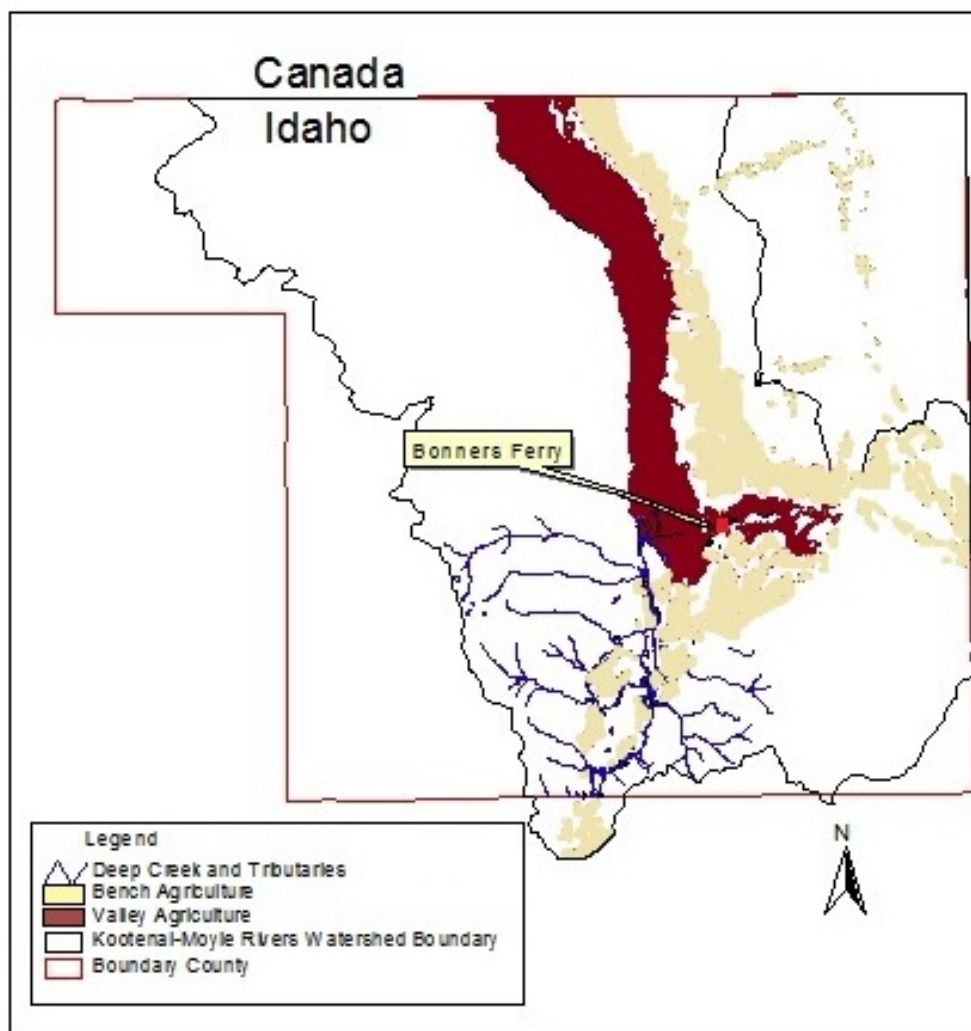
The temperature TMDL results for Deep Creek estimate a 44% reduction in solar loading, based on potential natural vegetation analysis. Targets for reaching this reduction are stated in percent effective shade. Effective shade is defined as "that shade provided by all objects that intercept the sun as it makes its way across the sky," and can be measured with instruments such as solar pathfinders and densimeters (IDEQ 2006). For the upper section of Deep Creek between MacArthur Lake and Brown Creek, the target for reaching the reduction in solar loading is 72% effective shade. For the middle section of Deep Creek (approximately 4.7 miles from Brown Creek to the lower section) 60% effective shade is the target. For the lower 1.5 miles of Deep Creek, the target is 30% effective shade (IDEQ 2006). These targets will be used in the implementation of this plan.

### **Agriculture in the Kootenai River-Moyie River Subbasin**

Agricultural activities in the Kootenai River-Moyie River subbasin occur in two general areas, referred to as *bench* and *valley*. These areas, as well as the location of Deep Creek, are shown in Figure 4. The term *bench agriculture* applies to operations occurring on benches and terraces above the old Kootenai River floodplain. Pasture, hay in rotation with cereal grains, and livestock operations occur in the bench areas.

Soils in the bench areas are highly erodible, although the majority of operations in the bench area are bordered by forestland and other vegetative buffers (Gondek 2005). Deep Creek is primarily in the bench area, with the exception of the land area near the mouth.

*Valley agriculture* refers to operations occurring in the fertile soil of the old Kootenai River floodplain and consists primarily of non-irrigated cropland. Common crops include hops, cereal grains, canola, legumes, and small seed crops. Soils in the valley areas have a high seasonal water table and have been historically drained with ditches. Dikes have been built to protect agricultural land in the valley from flooding associated with water level management of the Kootenai River at Libby Dam upstream in Montana. Ditches and streams traveling through valley agricultural areas drain into the Kootenai River through a system of pumps and drainage gates.



**Figure 4. Bench and Valley Agricultural Areas in the Kootenai River-Moyie River Subbasin.**

Grazed forests are not delineated in this plan due to difficulty in assessing this land use. The United States Forest Service (USFS) and the Idaho Department of Lands (IDL) develop management plans for forested lands in their jurisdiction. IDL is the designated management agency for private forestland. In the event that these agencies desire support in developing grazing plans in grazed forest areas, the conservation partnership is available to provide assistance. Grazing in privately-owned forested areas where jurisdiction is unclear or overlapping will be addressed cooperatively between the conservation partnership and IDL.

## **Treatment**

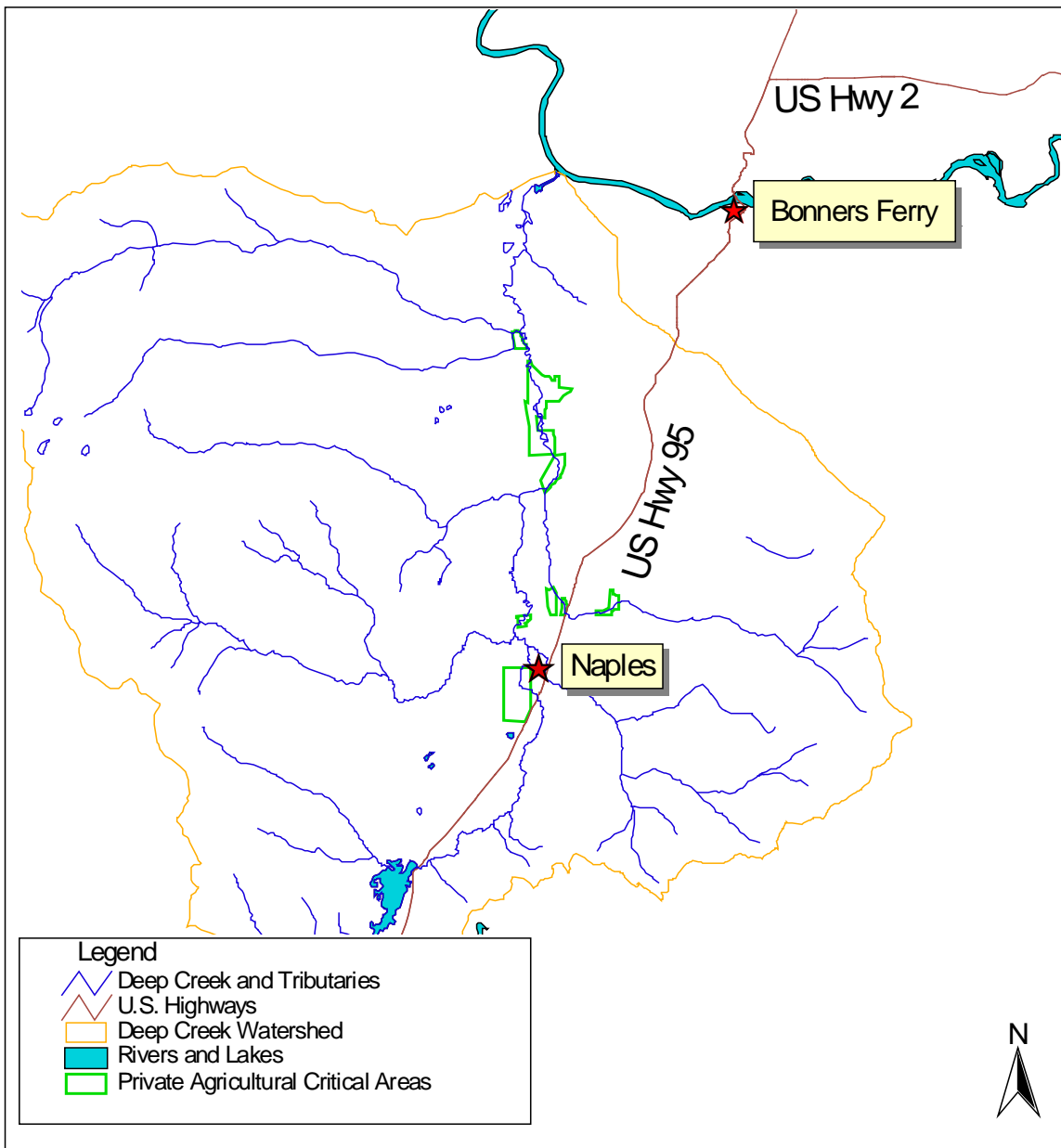
### **Critical Areas**

Agricultural areas that have the potential to contribute excess pollutants to waterways are defined as “critical areas.” Critical areas prioritized for this plan were identified during field observations in July 2005. Agricultural critical areas for this implementation plan are shown in Figure 5.

Agricultural critical areas are prioritized for treatment based on their location relative to Deep Creek and the potential for pollutant transport and delivery to its water. Primary operations of concern are livestock operations with either unrestricted access to riparian areas and/or contributing direct runoff from feedlots, overgrazed pastures, and pasture and hayland that encroaches upon riparian areas.

Based on field observations, approximately 1,000 acres of riparian and hay/pasture critical areas have been identified in the Deep Creek watershed. In addition, two livestock winter feeding areas were identified with direct access to streams.





**Figure 5. Agricultural Critical Areas in the Deep Creek Watershed.**

**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 Kootenai River-Moyie River subbasin 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 Boundary County are summarized in Table 5.

**Table 5. Federally-listed Threatened and Endangered Species Occurring in Boundary County, Idaho (<http://www.fishandgame.idaho.gov/cms/tech/cdc/t&e.cfm> accessed September 1, 2005).**

<b>Species</b>	<b>Status*</b>
<b>Mammals</b>	
Canada lynx ( <i>Lynx canadensis</i> )	LT
Grizzly bear ( <i>Ursus arctos horribilis</i> )	LT
Gray wolf ( <i>Canis lupus</i> )	LT
Woodland caribou ( <i>Rangifer tarandus caribou</i> )	LE
<b>Birds</b>	
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	LT
<b>Fish**</b>	
Bull trout ( <i>Salvelinus confluentus</i> )	LT
Kootenai River White Sturgeon ( <i>Acipenser transmontanus</i> )	LE
<b>Plants</b>	
Water howellia ( <i>Howellia Aquatius</i> )	LT
Spalding's catchfly ( <i>Silene spaldingii</i> )	LT

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

*\*\* Westslope Cutthroat Trout (Oncorhynchus clarki lewisi) and Inland Columbia Basin Redband Trout (Oncorhynchus mykiss gairdneri) are also Idaho Species of Concern. Idaho Species of Concern are species native to Idaho that are “either low in numbers, limited in distribution, or have suffered significant habitat losses” (IDFG).*

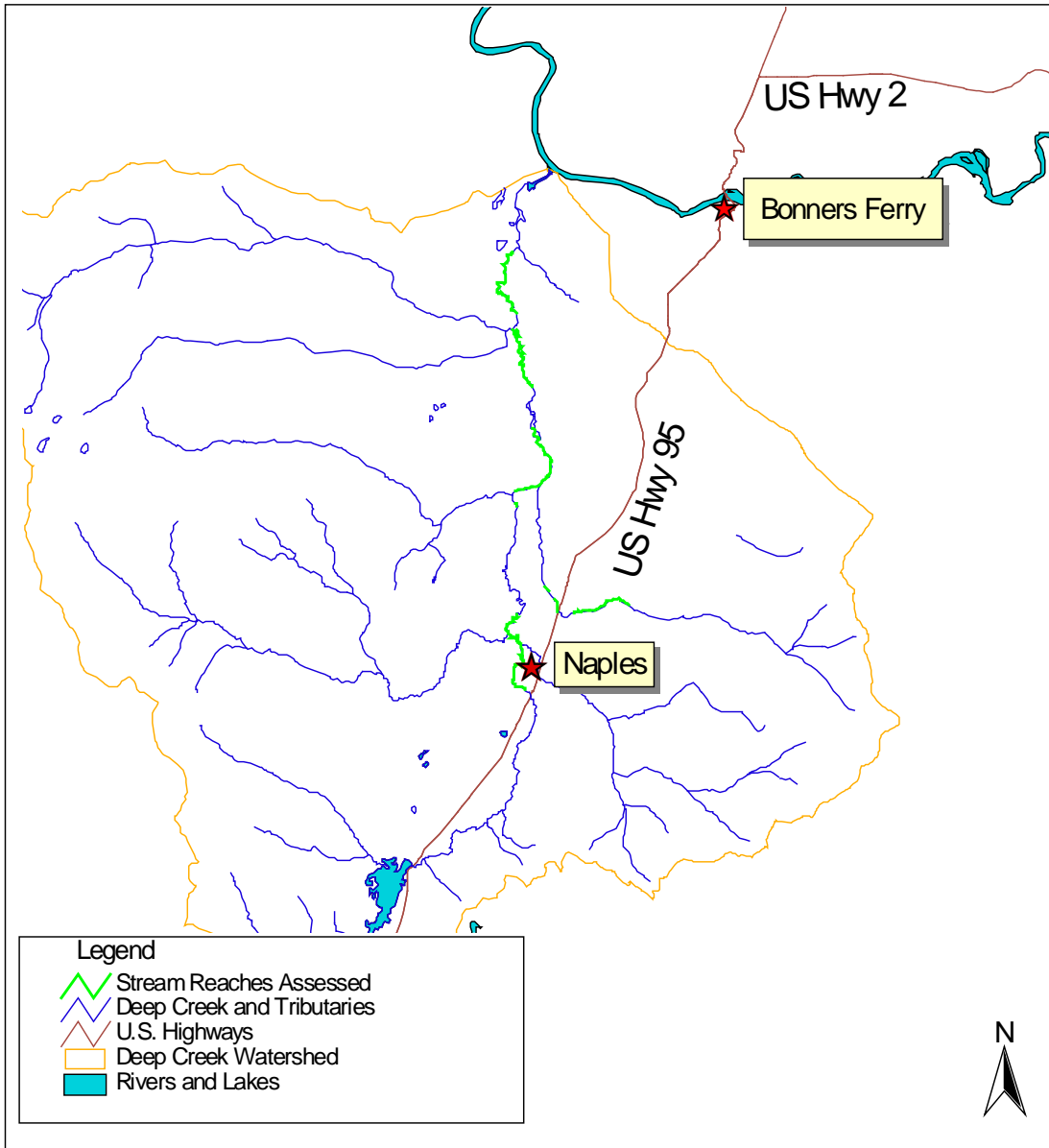
Implementation activities related to fishery resources will follow general recommendations from the NRCS Area Biologist. These recommendations include off-site watering facilities or limited stream access for livestock, riparian fencing, prescribed grazing, whole tree revetments to help stabilize eroding banks, and recruitment of more large woody debris to encourage the development of log jams. Based on observations from July 2005, existing revetments in the watershed have produced deep scour holes, creating vertical diversity, encouraging velocity gradients, and providing feeding lanes, cover, and habitat structure in the creek. More of this type of treatment is expected to provide increased fish habitat (Yetter 2005).

### **Implementation Priority**

The agricultural portion of this implementation plan encompasses watersheds with agricultural land uses that have TMDLs developed. Boundary and Deep Creeks have temperature TMDLs developed, and Deep Creek has a sediment TMDL developed (IDEQ 2006).

Stream Visual Assessment Protocol (SVAP), an NRCS protocol for assessing the condition of a stream segment, was performed on private lands along stream segments in the Deep Creek watershed in July 2005. The stream reaches assessed are shown in Figure 6. The assessment areas were selected based on TMDL loading calculations, land ownership, and access permission. Assessments were completed by interdisciplinary teams consisting of representatives from NRCS, SWC, IASCD, Idaho Department of Fish and Game, and a private ecosystem consultant.

Assessments included observations of channel conditions, hydrologic alterations, riparian zones/canopy cover, streambank stability, water clarity, nutrient enrichment, barriers to fish movement, instream fish and invertebrate habitat, pools, and manure presence. Overall stream condition ratings were obtained by combining scores from these categories. Stream segments were assigned a rating of excellent, good, fair, or poor, based on the overall score. Channel measurements, photo points, eroding banks, and riparian species are also recorded. The teams noted any observed problems and developed recommendations to address these, where feasible. Recommendations for agricultural reaches from these assessments were utilized to develop this plan. Summaries of the agricultural reaches will be delivered to land managers by the Boundary conservation partnership and recommendations discussed. Conservation plans will be developed based on these recommendations, where the land managers have interest.



**Figure 6. Stream Reaches Assessed in the Deep Creek Watershed, July 2005.**

A total of 27 reaches were assessed, totaling approximately 9.6 miles of stream length. The ratings for all reaches are summarized in Table 6.

**Table 6. 2005 Stream Assessment Summary.**

Rating	Length of Stream
Excellent	1,682 feet
Good	17,490 feet
Fair	15,823 feet
Poor	15,643 feet

Many observed problems were associated with disturbance or removal of riparian vegetation, insufficient riparian buffer width, lack of woody vegetation in the riparian area, and water level management associated with the operation of Libby Dam in Montana (in some lower reaches). Unrestricted livestock access to the riparian area, recreational mowing, and other direct vegetative removal was commonly observed during stream assessments.

Among the reaches assessed, many of the surrounding land uses were non-agricultural. A summary of the land uses observed, along with reach summaries and recommendations for the non-agricultural reaches will be provided to the Idaho Department of Environmental Quality (IDEQ) upon completion. The assessed reaches with adjacent agricultural land uses were utilized to prioritize areas for treatment and develop potential BMPs for implementation.

## **Treatment and Costs**

Agricultural critical areas of the Deep Creek watershed have been divided into Treatment Units (TUs). The TUs describe critical areas with similar land use areas, soils, productivity, resource concerns, and treatment needs. The TUs are based on observations from the SVAP assessment mentioned previously and are used to formulate alternatives for solving identified problems. Treatment Units for the Deep Creek watershed include Riparian Areas and Pasture/Hayland. These TUs are described below. Two livestock feeding operations (operations that involve providing livestock with supplemental feed in addition to grazed vegetation) were identified during stream assessment activities. Recommended BMPs included in Treatment Units 1 and 2 apply to concerns in these areas.

Agricultural BMPs are voluntary in nature and, therefore, rely on operator participation. A goal of 75% participation has been set for the BMPs needed to address the resource concerns. Implementation in the form of education, outreach, inventory, planning, and BMP installation is ongoing. Resources will continue to be directed at the Deep Creek watershed with added emphasis.

### **Treatment Unit #1 - Riparian Areas**

The riparian resources of the Deep Creek watershed vary from pasture and hayland vegetation to mixed woody and herbaceous riparian zones extending down from adjacent agricultural, residential, and forested areas. There are approximately 30 acres within this treatment unit, which consists of riparian zones impacted by agricultural areas (This acreage estimate includes approximately 3.7 acres of riparian area that was not inventoried, as access to the property was denied). The acreage was calculated from estimated impacted stream length with a 70 to 100-foot wide buffer (measured from the center of the channel extending out each side).

Riparian areas in the Deep Creek watershed are unstable from lack of woody vegetation and perennial grasses. Riparian area degradation has occurred as a result of livestock overgrazing, direct vegetative removal for facilitation of farming and ranching operations, and, in some cases, water level fluctuations associated with water level management of the Kootenai River at Libby Dam in Montana (on the mainstem of

Deep Creek). Bare, exposed soil and unstable banks resulting from the lack of vegetation can contribute sediment to waterways through erosion and sediment delivery to water. Lack of vegetation also inhibits a stream's ability to filter excess pollutants flowing into the water body from surface runoff and reduces effective shade on the stream. Poorly functioning riparian zones can additionally result in degraded habitat and increased water temperatures.

Varying levels of treatment are recommended for riparian areas, based on the level of impact observed during stream assessments. Combinations of riparian exclusion fence; riparian vegetation; livestock water gaps, hardened crossings, or offsite watering facilities will help restore the functioning condition of riparian areas. In locations where more severe riparian degradation and streambank erosion is occurring, streambank shaping, stabilization, and bioengineering can be applied to restore the condition of the streambanks and riparian vegetation. Table 7 below summarizes potential BMPs and associated costs for improvement projects in the Deep Creek watershed.

**Table 7. Best Management Practices for Treatment Unit #1.**

<b>Best Management Practice (NRCS BMP Practice Code)</b>	<b>Amount</b>	<b>Unit Cost</b>	<b>Estimated Cost</b>
Fence (382)	21,200 feet	\$2/foot	\$42,400
Hardened Crossings (561)	12 each	\$2,500/each	\$30,000
Troughs (614)	10 each	\$1,500/each	\$15,000
Pipeline (516)	3,500 feet	\$2/foot	\$7,000
Riparian Forest Buffer (391)	9 acres	\$2,000/acre	\$18,000
Use Exclusion (472)	14 acres	\$50/acre	\$700
Streambank Protection /Bank Shaping (580)	1200 feet	\$3/foot	\$3,600
Streambank Protection/Bioengineering (580)	2,700 feet	\$20/foot	\$54,000
<b>Total</b>			<b>\$170,700</b>

### **Treatment Unit #2 – Pasture/Hayland**

There are approximately 970 acres of pasture and hayland in this treatment unit (this acreage estimate includes approximately 80 acres of pasture and hayland that was not inventoried, as access to the property was denied). The majority of the hay and pasture soils in this treatment unit are silt loam and somewhat poorly to poorly drained. These soils are susceptible to water erosion (NRCS 2001). Cropping systems consist primarily of alfalfa hay (5-8 years) rotated with small grain as hay or silage for 1 to 3 years (Gondek 2005).

In cases where overgrazing occurs, soil compaction can increase surface runoff versus infiltration. In addition, overgrazing can leave inadequate vegetative cover on the land surface, reducing the ability of the land to hold soil in place. Surface runoff not only has the potential to carry sediment into stream channels, but increased runoff, as opposed to infiltration, can also increase peak flows and associated stream channel erosion. These issues are especially significant where pastures are adjacent to riparian areas. Riparian area treatment was summarized in Treatment Unit #1 above. The BMPs for Treatment Unit # 2 are in addition to riparian treatment where pastures are adjacent to

surface water. Table 8 summarizes potential BMPs and associated costs for Treatment Unit #2.

**Table 8. Best Management Practices for Treatment Unit #2.**

<b>Best Management Practice (NRCS BMP Practice Code)</b>	<b>Amount</b>	<b>Unit Cost</b>	<b>Estimated Cost</b>
Prescribed Grazing (528A)	650 acres	\$1/acre	\$650
Pasture and Hayland Planting (512)	125 acres	\$100/acre	\$12,500
Forage Harvest Management	885 acres	\$0	\$0
<b>Total</b>			<b>\$13,150</b>

## Funding

Funding for installation of BMPs is necessary to ensure the success of implementation. Much of the funding that can be used to implement this plan is available annually on a first-come first-serve basis or through a competitive review and ranking process. The Boise State University Environmental Finance Center is a valuable resource for researching funding for projects (<http://ssrc.boisestate.edu>). Chapter Four of the Idaho Nonpoint Source Management Plan also contains a listing of programs that could potentially be used for implementation funding (IDEQ, 1999). The Boundary conservation partnership will pursue one or more of the following funding sources for implementation of this plan:

*§319 (h)...Nonpoint Source Grants, U.S. Environmental Protection Agency/IDEQ*  
[http://www.state.id.us/water/water1.htm#ww\\_nonpoint](http://www.state.id.us/water/water1.htm#ww_nonpoint)

This program provides financial assistance for the implementation of best management practices to abate nonpoint source pollution. The IDEQ manages the NPS program. All projects must demonstrate the applicant's ability to abate NPS pollution through the implementation of BMPs.

*Conservation Improvement Grants, SWC*  
<http://www.scc.state.id.us/PDF/Conservation%20Improvement%20Grant%20Policy- Revised%20 2 .pdf>

The Conservation Improvement Grant program is administered by SWC, in cooperation with Idaho's 51 soil and water conservation districts. This program provides financial assistance to eligible applicants for the implementation of natural resource conservation projects. The program is aimed primarily at water quality and riparian area improvement projects. A 1:1 match, cash or in-kind, is required. The match cannot originate from another cost-share program or units of government.

*Conservation Reserve Program (CRP), NRCS*  
<http://www.id.nrcs.usda.gov/programs/financial.html>

The CRP program provides a financial incentive to landowners for the protection of highly erodible and environmentally sensitive lands with grass, trees, and other long-term cover. This program is designed to remove those lands from agricultural tillage and return them to a more stable cover. This program holds promise for nonpoint source control since its aim is highly erodible lands.

*Conservation Technical Assistance (CTA), NRCS*  
<http://www.id.nrcs.usda.gov/programs/financial.html>

Technical assistance for the application of BMPs is provided to cooperators of soil conservation districts by the NRCS. Preparation and application of conservation plans is the main form of technical assistance. Assistance can include the interpretation of soil, plant, water, and other physical conditions needed to determine the proper BMPs. The CTA program also provides financial assistance in implementing BMPs described in the conservation plan.

*Environmental Quality Incentives Program (EQIP), NRCS*  
<http://www.id.nrcs.usda.gov/programs/financial.html>

EQIP is a program based on the 1996 Farm Bill legislation and was reauthorized in the 2002 Farm Bill. This program combines the functions of the Agricultural Conservation Program, Water Quality Incentives Programs, Great Plains Conservation Program, and the Colorado River Basin Salinity Control Program. EQIP offers technical assistance, and cost share monies to landowners for the establishment of a five to ten year conservation agreement activities such as manure management, pest management, and erosion control. This program gives special consideration to contracts in those areas where agricultural improvements will help meet water quality objectives.

*Farm Services Agency Direct Loan Program, FSA*  
<http://www.fsa.usda.gov/pas/default.asp>

This program provides loans to farmers and ranchers who are unable to obtain financing from commercial credit sources. Loans from this program can be used to purchase or improve pollution abatement structures.

*National Fish and Wildlife Foundation (NFWF) Grants in Partnership with NRCS*  
<http://www.nfwf.org/programs/nrcsnacd.cfm>

This program is implemented by the NFWF and is designed to support natural resource conservation projects on private land. The program is aimed primarily at farmers and ranchers. Eligible applicants include state and local governments, education institutions, and nonprofit organizations. Special consideration is given to grants in partnership with NRCS, Resource Conservation and Development Areas, and conservation districts. The program requires a 1:1 match of non-federal dollars or goods and services of equal value, although a 2:1 match is encouraged.

*Partners for Wildlife (Partners), U.S. Fish and Wildlife Service*  
<http://partners.fws.gov>

The Partners for Wildlife program is implemented by the U.S. Fish and Wildlife Service and designed to restore and enhance fish and wildlife habitat on private lands through public/private partnerships. Emphasis is on restoration of riparian areas, wetlands, and native plant communities.

*Resource Conservation and Development (RC&D), NRCS*  
<http://www.id.nrcs.usda.gov/programs/financial.html>



Through locally sponsored areas, the RC&D program assists communities with economic opportunities through the wise use and development of natural resources by providing technical and financial assistance. Program assistance is available to address problems including water management for conservation, utilization and quality, and water quality through the control of nonpoint source pollution.

*Resource Conservation and Rangeland Development Program (RCRDP), SWC*

<http://www.scc.state.id.us/loans.htm>

The RCRDP program provides grants for the improvement of rangeland and riparian areas, and loans for the development and implementation of conservation improvements.

*Small Watersheds (PL-566), NRCS*

<http://www.id.nrcs.usda.gov/programs/financial.html>

The Small Watersheds program authorizes the NRCS to cooperate in planning and implementing efforts to improve soil and water conservation. The program provides for technical and financial assistance for water quality improvement projects, upstream flood control projects, and water conservation projects.

*Water Quality Program for Agriculture (WQPA), SWC*

<http://www.scc.state.id.us/docs/wqpafs.doc>

Provides financial incentives to owners and operators of agricultural lands to apply conservation practices to protect and enhance water quality and fish and wildlife habitat.

*Wetlands Reserve Program (WRP), NRCS*

<http://www.id.nrcs.usda.gov/programs/financial.html>

WRP was established to help landowners work toward the goal of "no net loss" of wetlands. This program provides landowners the opportunity to establish 30-year or permanent conservation easements, and cost-share agreements for landowners willing to provide wetlands restoration.

*Wildlife Habitat Incentive Program (WHIP), NRCS*

<http://www.id.nrcs.usda.gov/programs/financial.html>

WHIP was established to help landowners improve habitat on private lands by providing cost-share monies for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife. Additionally, cost share agreements developed under WHIP require a minimum 10-year contract.

## **Outreach**

Efforts to educate land users about the effects of management practices on water quality will be emphasized in the Deep Creek watershed. Because the Deep Creek watershed has impaired beneficial uses, the conservation partnership will put added emphasis on explaining technical and financial assistance available to landowners in the watershed through one-on-one assistance with landowners, and in conjunction with other agencies. Periodic news releases and community activities, such as the

Boundary County Fair, will be utilized to disseminate information on the status of the Deep Creek watershed as well as the Kootenai River-Moyie River subbasin as a whole.

Applications for technical and financial assistance will be solicited with emphasis in the Deep Creek 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. Treatments applicable to the needs of the Deep Creek watershed will be the focus of discussions with landowners in the vicinity.

### **Evaluation and Monitoring**

Component practice BMP evaluation is done in conjunction with conservation plan and program contract implementation. The objective of an individual conservation plan evaluation is to verify that BMPs are properly installed, maintained, and working as designed. An October 2003 publication by SWC and IDEQ, *Idaho Agricultural Best Management Practices: A Field Guide for Evaluating BMP Effectiveness*, provides the specifications and protocol for BMP evaluation to be used by field staff.

Monitoring for pollutant reductions from individual projects consists of spot checks, annual reviews, and evaluation of advancement toward reduction goals. Annual status reviews are typically done within program contracts to ensure compliance with contract rules. These reviews are significant to ensure sound decision-making and adaptation of implementation priorities and focus. The results of these evaluations are used to recommend any necessary adjustments to continue meeting resource objectives. Where riparian improvement projects are implemented in the Deep Creek watershed, effective shade will be monitored in conjunction with annual reviews.

Where conservation plans are developed in cooperation with the BSCD, progress is tracked during the life of a program contract. Local tracking is assisted by NRCS and SWC agency program specialists, where cost-share programs/projects are active. Where cost-share programs are not used, tracking is up to the local field office.

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