

Assessment of Water Quality in Kootenai River and Moyie River Subbasins (TMDL): Temperature Addendum
Implementation Plan for Agriculture
(17010104 & 17010105)



Photo taken from Kootenai River and Moyie River Subbasins TMDL (IDEQ, 2006)

Prepared by the Idaho Soil and Water Conservation Commission
in cooperation with the Boundary Soil and Water Conservation District

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Introduction

The objective of this plan is to address the temperature Total Maximum Daily Load (TMDL) addendums for the Kootenai and Moyie Subbasins (DEQ, 2014). The temperature TMDL addendum provided load allocations for an increase in riparian shade to restore stream temperatures to natural background conditions. Of the factors influencing shade, streamside vegetation and channel morphology are the most likely to be modified by anthropogenic activities and can be most readily addressed and corrected by a TMDL implementation plan (IDEQ, 2014).

The Idaho Soil and Water Conservation Commission is the designated agency responsible for preparing TMDL implementation plans for agriculture and grazing. Implementation activities recommended in this plan will include an array of agricultural best management practices (BMPs) for riparian treatment units which, when implemented, will increase shade and help to restore stream temperatures to natural background conditions.

In accordance with Idaho statute nothing in the plan shall be interpreted as requiring BMP implementation for agricultural operations which are not adopted on a voluntary basis (IC §39-3611(10)).

Project Setting

The Lower Kootenai River Subbasins (hydrologic unit code [HUC] 17010104) is located in the far north of the Idaho panhandle, bordering both Canada and Montana with small portions in each. The Moyie River subbasin (HUC 17010105) is in the very northeast corner of Idaho, also bordering both Canada and Montana, with small portions in each, and surrounded on the west and south by the Lower Kootenai River subbasin. The Kootenai River flows west-northwest into Idaho from Libby, Montana, turns north after Bonners Ferry, and flows into Canada. (Figure 1) The Moyie River, which first flows southward through the Moyie River subbasin, joins the Kootenai River near Moyie Springs, after the Kootenai River has crossed from Montana into Idaho (IDEQ, 2014)

For more information about the subbasin, see the *Assessment of water Quality in the Kootenai River and Moyie River Subbasins (TMDL)*.

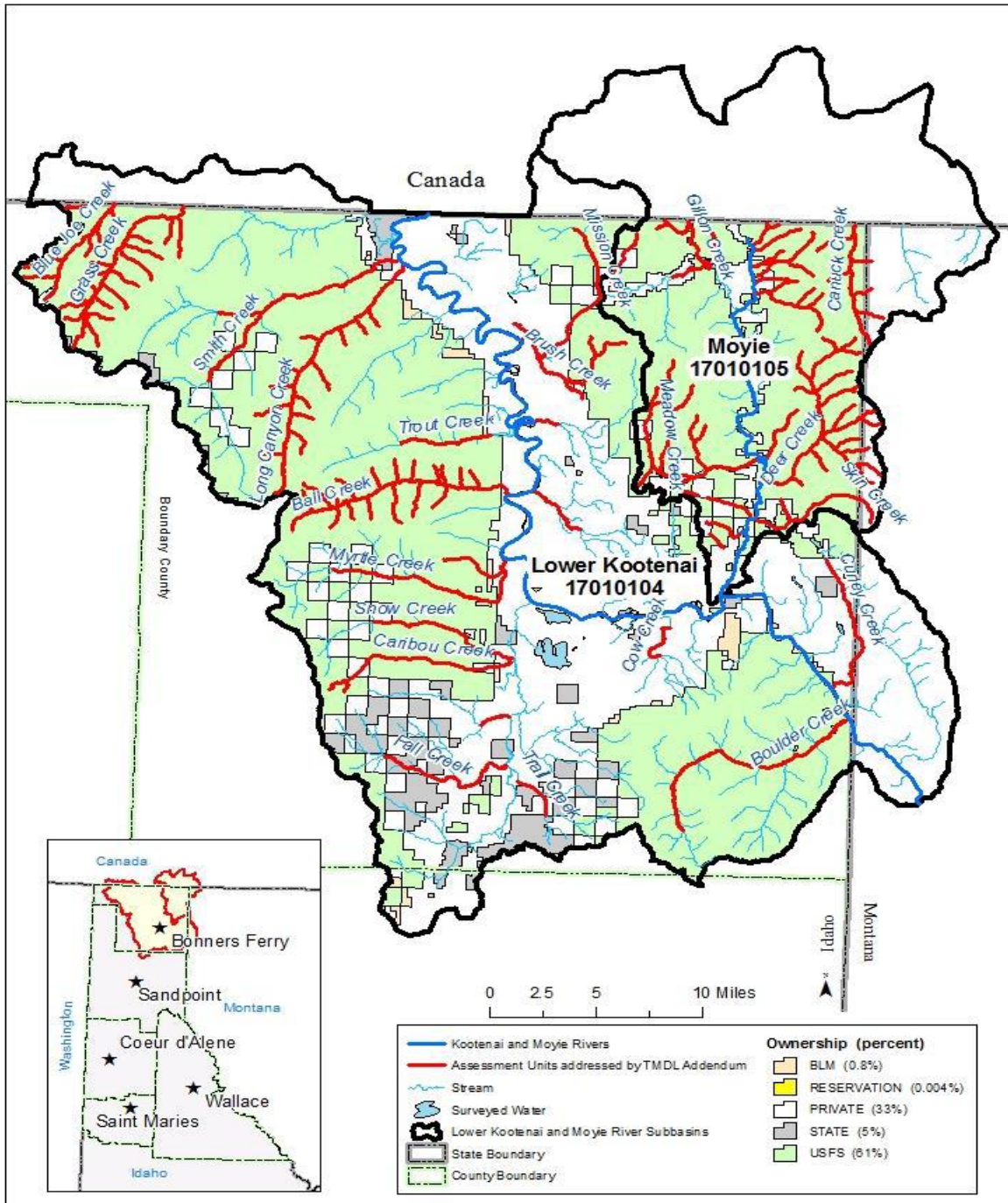


Figure 1. Kootenai and Moyie Subbasin Location Map (IDEQ 2014)

Land Use and Land Ownership

Land ownership in the Idaho portion of the Kootenai River-Moyie River subbasin consists of federal, state, and private land (Figure 2). 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 2006). For a detailed description of land use, please

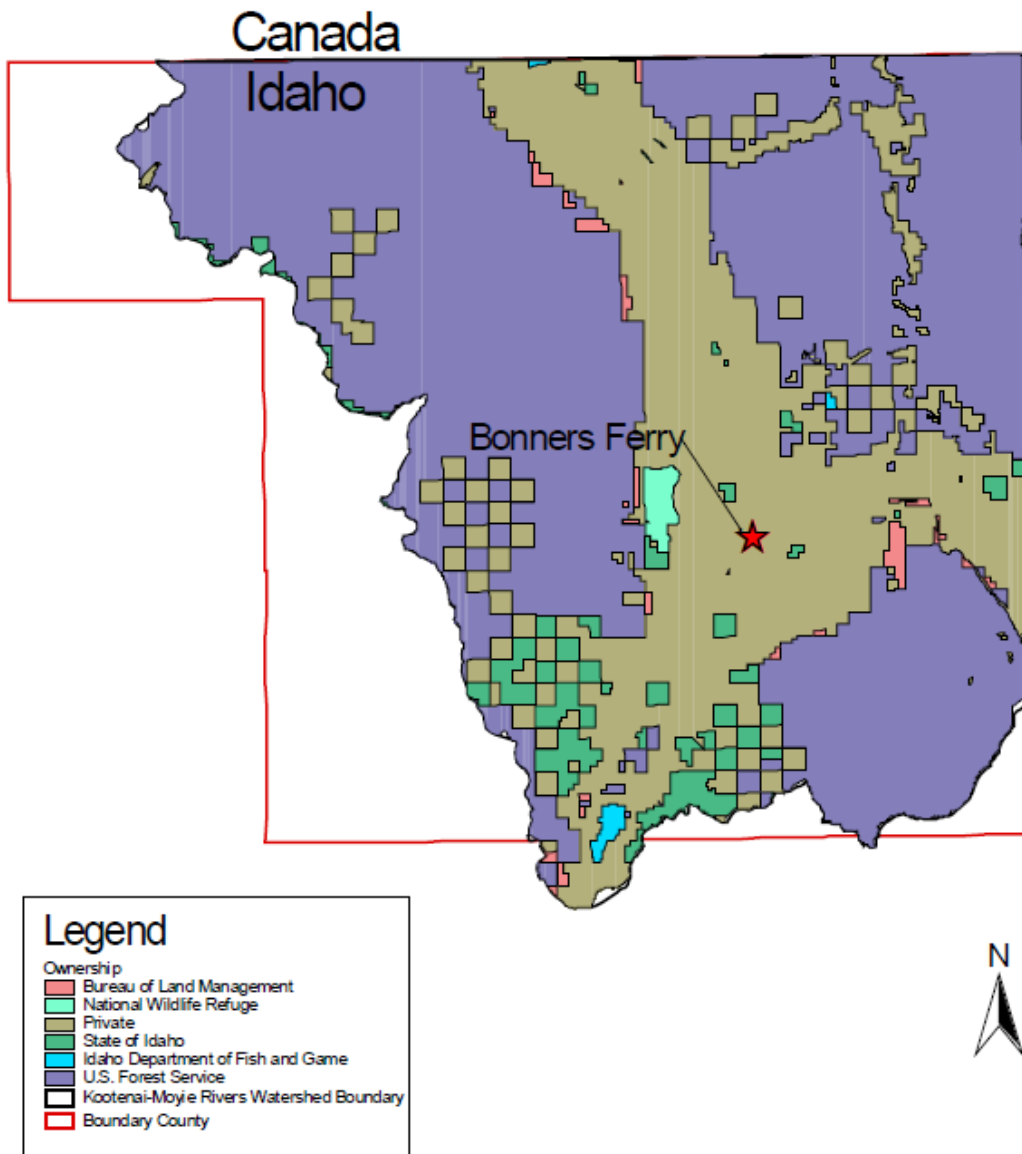


Figure 2. Land ownership in Kootenai and Moyie Subbasins

refer to the original Assessment of Water Quality in the Kootenai River and Moyie River Subbasins (TMDL).

Accomplishments

The “*Assessment of Water Quality in Kootenai River and Moyie River Subbasins (TMDL)*” explains implementation work that has been done. Historically, agricultural BMPs have been implemented to a minor degree within the basin, mainly consisting of fencing to deny cattle access to streams and riparian buffers. Table 1 summarizes the increasing assistance of BMP’s installed using NRCS federal funds between 2008 and 2017 that were not reported in the addendum.

Table 1. BMP Practices installed with NRCS funds 2008 thru 2017

Practice Name	Amount Installed	Unit
Streambank and Shoreline Protection	1459	Feet
Fence	17594	Feet
Tree/Shrub Site Preparation	67	Acres
Tree/shrub Establishment	64	Acres
Channel Bank Vegetation	.5	Acres
Forest Stand improvement	9	Acres
Riparian Forest Buffer	5	Acres
Access Road	536	Feet
Filter Strip	8	Acres
Conservation Cover	8	Acres
Stream Crossing	3	Number
Wetland Restoration	2.5	Acres
Fish Passage	0.2	miles

Resource Concerns

17 streams (23 assessment units) in the Lower Kootenai River subbasin and 9 streams (10 AUs) in the Moyie River subbasin that have been placed in Category 5 of Idaho’s most recent federally approved Integrated Report as a result of exceedance(s) of the Idaho water quality standards for temperature (IDEQ 2014). Since the original impaired listing in 2006, the Kootenai River and Moyie River Subbasin was identified as needing an addendum TDML for temperature. Analyses of temperature data collected from

streams within the Kootenai and Moyie subbasin indicate that 26 streams and their tributaries exceeded Idaho water quality standards for temperature.

Temperature is a water quality factor integral to the life cycle of fish and other aquatic species. Different temperature regimes also result in different aquatic community compositions. Water temperature dictates whether a warm, cool, or cold-water aquatic community is present. Many factors, natural and anthropogenic, affect stream temperatures. Natural factors include altitude, aspect, climate, weather, riparian vegetation (shade), and channel morphology (width and depth). Human-influenced factors include heated discharges (such as those from point sources), riparian alteration, channel alteration, and flow alteration (IDEQ 2014).

Temperature

The “*Assessment of water Quality in Kootenai river and Moyie Rivers Subbasins (TMDL): 2014 Temperature Addendum*” used Potential Natural Vegetation (PNV) for the temperature TMDL. The PNV was modeled for plant community structures using aerial photography. The PNV shade was converted to solar loads. The accuracy of the aerial photo interpretations were field verified with a Solar Pathfinder at eleven sites throughout the subbasin (IDEQ 2014). In the Lower Kootenai River subbasin major agricultural use areas two streams were included in the temperature addendum. Cow Creek (ID17010104PN030_03) is adversely affected by agriculture and stream alteration activities, resulting in a 52% reduction needed. A small section of lower Mission Creek (ID17010104PN038_03) is also adversely affected by agricultural activities resulting in a 44% reduction. In the Moyie river subbasin, one tributary in the major agricultural use area was identified by the temperature addendum. Deer Creek (ID17010105PN004_03) was assessed as needing a 16% reduction in temperature. Figures 3 and 4 display the shade deficits for the major agricultural areas. Table 2 displays the data for the major agricultural areas.

Table 2. Total solar loads and average lack of shade for the major agricultural areas

Water Body	Assessment Unit Number	Total Existing Load in kWh/day	Total Target Load in kWh/day	Excess Load in kWh/day	Necessary Percent Reduction
Mission Creek	ID17010104PN038_03	260,000	96,000	160,000	44%
Cow Ceek	ID17010104PN030_03	80,000	27,000	50,000	52%
Deer Creek	ID17010105PN004_03	190,000	130,000	72,000	16%

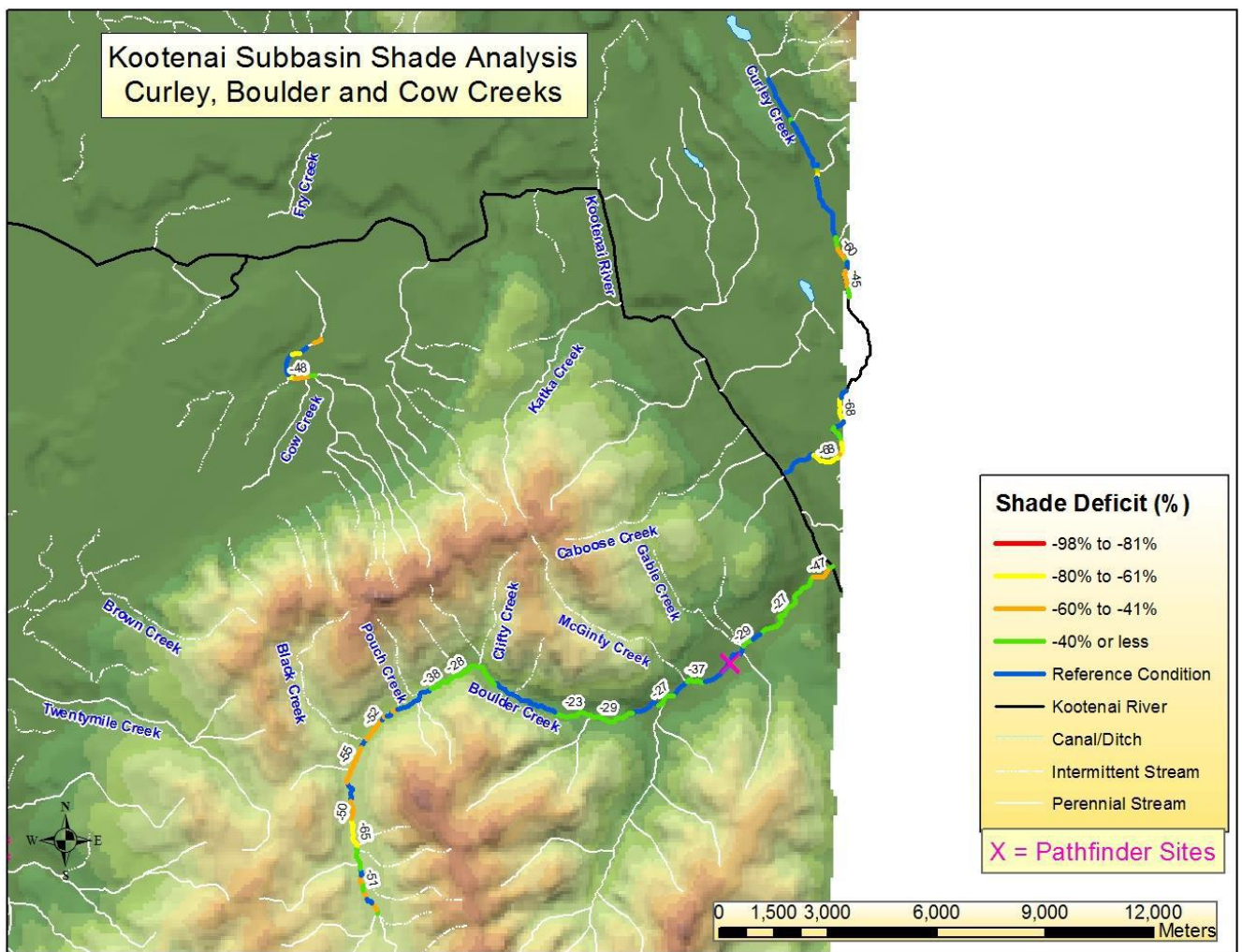


Figure 3. Shade deficit for Cow Creek (IDEQ 2014)

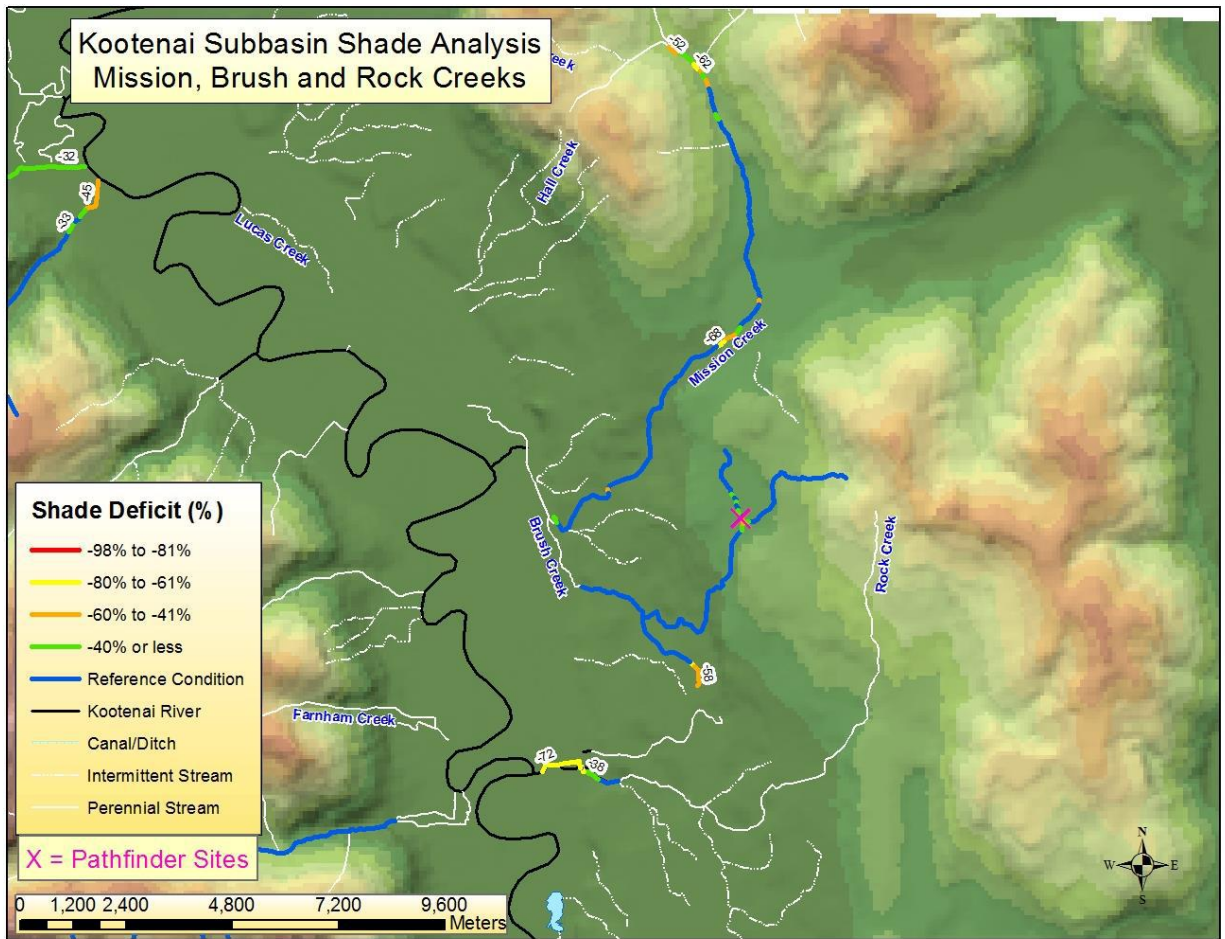


Figure 4. Mission Creek shade deficit (IDEQ 2014)

Agricultural Inventory and Evaluation

The main agricultural areas of concern within the Kootenai River and Moyie River subbasin include the subwatersheds of Cow creek, Mission Creek, and Deer Creek. Major agricultural practices in these areas include haying, grazing, and timber harvesting. Concerns in these areas include riparian grazing, converting of riparian vegetation to crop production, and timber harvesting.

As projects are implemented the existing shade levels should be documented before implementation of practices to verify the PNV aerial photo interpretation of the site. These pre-implementation values should be compared to shade levels after

implementation to determine actual shade increases of each project. This process will also help to evaluate the PNV approach used in developing the temperature TMDL.

Treatment

Temperature critical areas were defined as those areas with 20% or more lack of shade. Increases in shade provided to the stream from riparian vegetation may only take a few year to establish, but many years will be required for vegetation to achieve its full potential to reduce solar inputs. (IDEQ 2014). Treatments should include BMP's that focus on achieving load allocation. Examples of streamside shade improvement projects may include but are not limited to; tree planting, site-specific riparian management plans, riparian fencing, riparian forest buffers, streambank stabilization, and stream morphology improvement.

Funding

Financial and technical assistance for installation of BMPs may be needed to ensure success of this implementation plan. The Bonner Soil and Water Conservation District can assist interested landowners in actively pursuing potential funding sources to implement water quality improvements on private agricultural and grazing lands. The ISWCC and NRCS can provide technical assistance when needed. Many of these programs can be used in combination with each other to implement BMPs. These sources include (but 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.

http://www.deq.idaho.gov/water/prog_issues/surface_water/nonpoint.cfm#management

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

Environmental Quality Incentives Program (EQIP): EQIP provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat. <http://www.nrcs.usda.gov/programs/eqip/>

Regional Conservation Partnership Program (RCPP) - RCPP promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farbill/rcpp/>

The Agricultural Conservation Easement Program (ACEP) – ACEP provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, NRCS helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect and enhance enrolled wetlands.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/>

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.

<http://www.nrcs.usda.gov/programs/cta/>

National Grazing Lands Coalition (NatGLC) –The National Grazing Lands Coalition' promotes ecologically and economically sound management of grazing lands. Grants are available that facilitate the following: (1) demonstration of how improved soil health affects grazing lands sustainability (2) establishment of conservation partnerships, leadership and outreach, (3) education of grazing land managers, professionals, youth and the public (4) enhancement of technical capabilities, and (5) improvement in the understanding of the values and multiple services that grazing lands provide.

<http://www.glci.org/>

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 <http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index>

Conservation Innovation Grants (CIG) –CIG is a voluntary program to stimulate the development and adoption of innovative conservation approaches and technologies for agricultural production.

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/>

State Revolving Loan Funds (SRF) –These funds are administered through the IDEQ.
<https://www.deq.idaho.gov/water-quality/grants-loans/water-system-construction-loans.aspx>

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.

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/alphabetical/csp/>

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. <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. <http://www.fws.gov/partners/pdfs/ID-needs.pdf>

Maintenance, Monitoring, Evaluation

DEQ will continue to monitor the watersheds as per Idaho Code 39-3611, at least on a 5-year interval using BURP protocol. Additional monitoring of BMP’s and the maintenance of BMP’s installed will be performed by the designated agency or the agency that funded the BMP installations. The Boundary Soil Conservation District follows the Natural Resource Conservation Service guidelines for BMP life expectancy and monitors BMP installations for the expected life of each practice to ensure proper maintenance of the practices. Typically, when a volunteer approaches the district for BMP assistance the district evaluates the current site-specific resource concerns. Individual conservation planning with willing landowners will determine the most appropriate BMPs to install on a case by case basis.

All BMP's will be maintained by the landowner for the life of the practice. BMP's will be monitored and evaluated upon completion of the project, during annual reviews, and throughout the life of the practice. Monitoring and evaluations will enable staff to ensure practices are maintained and to evaluate BMP effectiveness for future projects.

References

- Idaho Code § 39.3611. Development and implementation of total maximum daily load or equivalent processes.
- IDEQ. 2014. "Assessment of Water Quality in Kootenai River and Moyie River Subbasins (TMDL): 2014 Temperature Addendum." Idaho Department of Environmental Quality, Coeur d'Alene Regional Office.
- IDEQ. 2006. "Assessment of Water Quality in Kootenai River and Moyie River Subbasins (TMDL)." Idaho Department of Environmental Quality, Coeur d'Alene Regional Office.
- Shumar, M.L. and J. DeVarona. 2009. The Potential Natural Vegetation (PNV) Temperature Total Maximum Daily Load (TMDL) Procedures Manual. Boise, ID:DEQ.