Cocolalla Watershed

Total Maximum Daily Load

Implementation Plan for Agriculture

Developed for the Idaho Department of Environmental Quality

Prepared by:
Idaho Association of Soil Conservation Districts

In Cooperation With:
Bonner Soil and Water Conservation District, the Idaho Soil Conservation Commission,
and the USDA - Natural Resources Conservation Service

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Table of Contents

Introduction

The Idaho Soil Conservation Commission (ISCC) 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 ISCC does not have regulatory or licensing authority over water quality or pollution control, the mission of the ISCC is to provide support to Idaho's Soil and Water Conservation Districts for wise use and improvement of natural resources (RPU 2003). The ISCC 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 ISCC works with the Bonner Soil and Water Conservation District (BSWCD), 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 Bonner County. The BSWCD's 5 year plan identifies water quality as one of the top priorities for Bonner County.

Other partners in the Cocolalla Lake watershed include the Cocolalla Lake Association (CLA). The CLA formed in 1985 with the mission to "halt and reverse the eutrophication process in Cocolalla Lake and preserve it for public benefit and use (CLA 2007)." The CLA currently has a membership of 92 households and consists of an eight-member Board of Directors that hold monthly meetings April through October. The CLA has an effective group of volunteers who work with watershed residents and natural resource managers to improve the water quality in the watershed through on-the-ground and educational efforts. The BSWCD and CLA work together regularly to accomplish common goals.

PURPOSE

The Cocolalla Watershed TMDL Implementation Plan for Agriculture outlines an adaptive management approach for implementation of Resource Management Systems (RMS) and Best Management Practices (BMPs) to meet the requirements of the Upper and Lower Cocolalla Creeks, Fish Creek, and Cocolalla Lake TMDLs. 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.

GOALS AND OBJECTIVES

The goal of this plan is to provide a strategy for agriculture to assist and/or complement other watershed efforts in restoring and protecting beneficial uses for water quality impaired streams in the Cocolalla watershed. These water quality impaired stream segments are identified in the Idaho Department of Environmental Quality (IDEQ) 1998 303(d) list for the Pend Oreille subbasin. Stream segments in the Cocolalla Lake watershed for which TMDLs have been developed are identified in Table 1.

Table 1: 1998 303(d) listed Stream Segments in the Cocolalla watershed with TMDLs developed (IDEQ 2001).

Stream	Description	POLLUTANT(S)
Cocolalla Lake	Tributary to Pend Oreille River	Phosphorus
Upper Cocolalla Creek	Tributary to Cocolalla Lake	Sediment
Fish Creek	Tributary to Upper Cocolalla Creek	Sediment
Lower Cocolalla Creek	Tributary to Pend Oreille River	Sediment

This implementation plan will provide guidance to the BSWCD and agricultural producers in the Cocolalla watershed to identify BMPs necessary to meet the requirements of completed TMDLs on 303(d) listed streams for agricultural lands. The objectives of this plan include reducing the amount of sediment and associated nutrients entering the watershed from agricultural sources and increasing riparian shading where feasible. Implementation of this plan will be coordinated with the efforts of the CLA.

Agricultural pollutant reductions will be achieved by on-farm conservation planning with individual operators and application of BMPs in agricultural critical areas. This plan recommends BMPs needed to meet TMDL targets and suggests alternatives for reducing surface and groundwater quality problems from agricultural related activities. Site-specific BMPs will be developed and implemented onsite with individual landowners on a voluntary basis.

Although the existing TMDLs address only sediment and nutrients, temperature has been identified by IDEQ as contributing to water quality impairment, and temperature TMDLs for Upper and Lower Cocolalla Creeks as well as for Fish Creek are under development. The recommendations in this plan are expected to address temperature impairments as well as nutrient and sediment sources.

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.

Background

PROJECT SETTING

The Cocolalla Creek/Cocolalla Lake watershed is located in Bonner County in northern Idaho, flowing into the Pend Oreille River from the south (Figure 1). It drains approximately 48,577acres between the southern end of Lake Pend Oreille and the Pend Oreille River. Coniferous forest dominates the watershed, with mountainous terrain of up to 4,500 feet in elevation. Cocolalla Lake is located in the middle of the watershed at about 2,200 feet in elevation (IDEQ 2001). Average annual precipitation is approximately 33 inches (RPU 1996).

SUBWATERSHEDS

There are six main tributaries in Cocolalla watershed: Upper and Lower Cocolalla Creeks, Fish Creek, Butler Creek, Westmond Creek, and Johnson Creek. Upper Cocolalla Creek is the largest inflow into Cocolalla Lake. Fish Creek flows roughly from west to east, joining Upper Cocolalla Creek just upstream (south) of Cocolalla Lake. Lower Cocolalla Creek flows out of Cocolalla Lake, through Round Lake, and into the Pend Oreille River. Johnson Creek enters Cocolalla Lake from the west, and Butler and Westmond Creeks enter Cocolalla Lake from the east. Of the lake tributaries, Cocolalla and Westmond Creeks have the highest amount of agricultural land use and are the main focus of this plan.

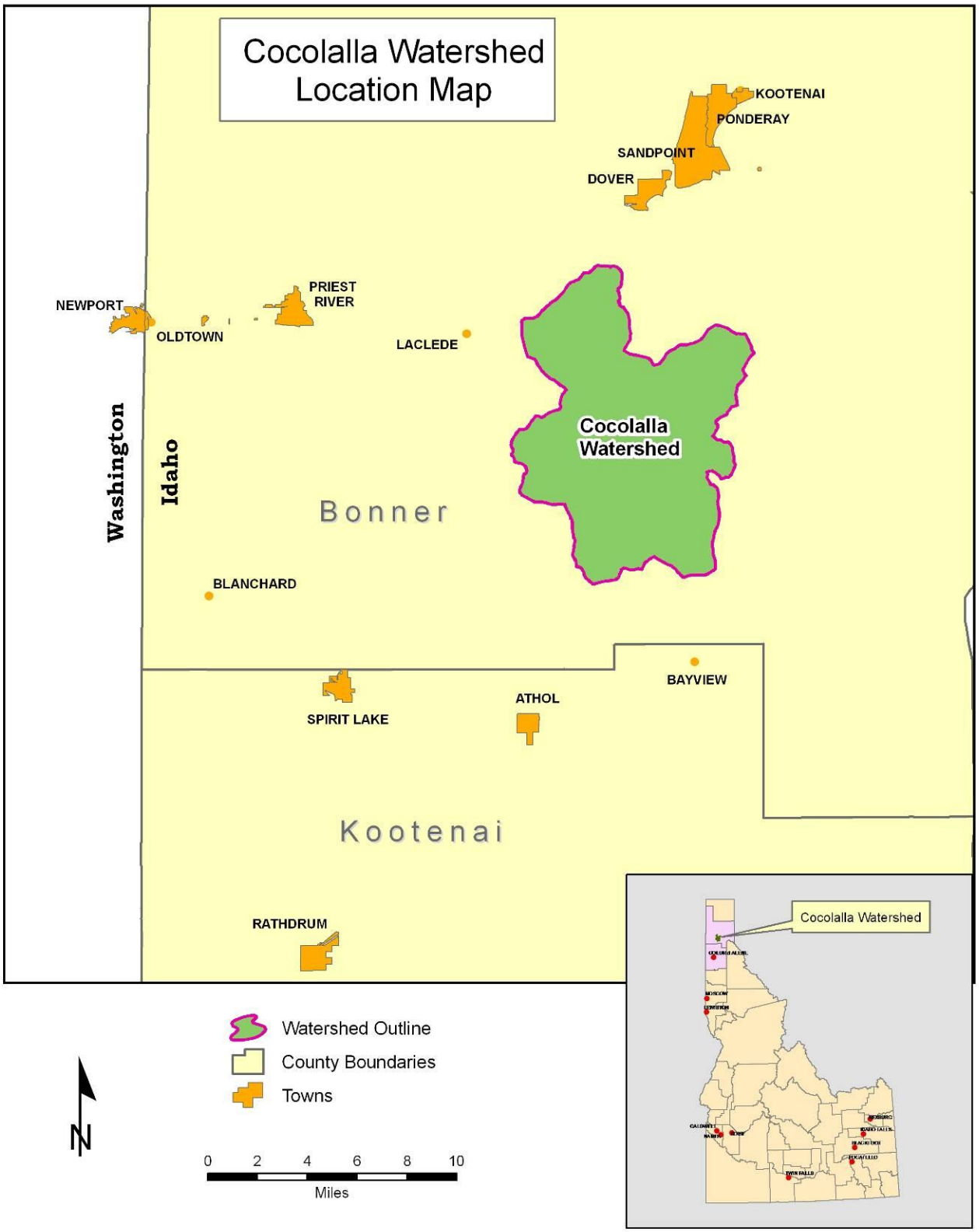

Figure 1. Cocolalla Watershed Location

LAND USE

Land use in the Cocolalla watershed includes forestland, hay and pastureland, livestock feeding areas, wildlife habitat, residential development, and recreation. The watershed is primarily forested in the upland areas. This area is used for recreation, timber harvest, wildlife habitat, some grazing, and residential development. The valley bottoms are utilized for hay production, livestock grazing, wildlife habitat, recreation, and residential development.

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.

LAND OWNERSHIP

Land ownership in the Cocolalla watershed includes federal, state, and private entities. Federal and State forestland, state recreation and wildlife management land, and Round Lake State Park, downstream from Cocolalla Lake, make up about a quarter of the watershed. The remaining ¾ of the watershed is privately-owned, including Burlington Northern Railroad, which owns much of the eastern shoreline of Cocolalla Lake. Table 2 summarizes land management acres for the watershed (for a visual depiction of ownership, see Figure 2 under Agricultural Water Quality Inventory and Evaluation).

Table 2. Land Management in the Cocolalla Watershed

Management	Acres
BLM	1,331
PRIVATE	37,309
STATE	3,239
STATE PARK	200
USFS	6,498

ACCOMPLISHMENTS

The conservation partnership has been active in soil and water conservation and water quality issues since 1946. The BSWCD sponsored the development of the Cocolalla Lake Watershed Management Plan in the mid 1990's through a State Agricultural Water Quality Program (SAWQP) grant from the ISCC, but the plan did not receive funding for implementation through this program. However, the partnership has continued to develop individual conservation plans for local agricultural producers and pursue other funding sources to assist in implementing BMPs. The partnership has restored 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 the Cocolalla watershed have included NRCS's Environmental Quality Incentives Program (EQIP) and the ISCC's SAWQP and Water Quality Program for Agriculture (WQPA). The conservation partnership is currently pursuing funds through the Clean Water Act Section 319 Grant Program to implement a road improvement project in the Fish Creek watershed cooperatively with the CLA and Bonner County.

From 1998 to 2007, conservation plans were developed for approximately 1066 acres in the Cocolalla watershed. Of these, 500 acres are located within the Upper Cocolalla Creek watershed, 317 acres are in the Fish Creek watershed, 24 acres lie within the Butler Creek drainage, and 26 are in the Cocolalla Lake drainage. Specific BMPs from these plans that have been completed to date are shown in Table 3 below. Costs associated with these practices are total costs, including landowner and program share contributions.

Table 3. Completed agricultural BMPs in the Cocolalla drainage by subwatershed.

Subwatershed	BMP	Amount	Units	[redacted]	[redacted]
Butler Creek	Fence (for livestock management)	2,017	Feet		
	Noxious Weed Management	5	Acres		
Fish Creek	Stream Crossing (livestock and equipment)	1	Each		
	Fence (for livestock management)	2,422	Feet		
	Heavy Use Area Protection	1	Each		
	Livestock Water Pond	1	Each		
	Riparian Forest Buffer	1.2	Acres		
Cocolalla Lake	Conservation Cover	11.4	Acres		
	Forest Stand Improvement	14.5	Acres		
	Riparian Forest Buffer	14.5	Acres		
	Shoreline Protection	1,800	Feet		
	Critical Area Planting	1	Acre		
	Fence (for livestock management)	3,671	Feet		
	Livestock Water Tank	1	Each		
	Livestock Use Exclusion (riparian area)	11.5	Acres		
	Pasture & Hayland Planting	17	Acres		
	Pipeline (for livestock water)	351	Feet		
TOTAL:					

Livestock management practices allow producers to control livestock location and duration in particular areas. Restricting livestock access to riparian areas increases riparian vegetation survival, reduces streambank and channel erosion associated with trampling and vegetative removal, and reduces direct delivery of livestock waste. This reduces sediment, nutrient, and bacterial input to water bodies. In addition, the resulting enhancement of the riparian area increases potential shade and surface runoff filtering capacity.

In pasture and hayland areas, heavy use area protection, critical area planting, pasture and hayland planting, and noxious weed control are used in addition to livestock management practices to manage productivity, soil compaction, and related sheet and rill erosion. The riparian forest buffer practice additionally enhances riparian areas where they have been degraded, and shoreline protection reduces erosion and resulting sediment input to the lake. Other BMPs not yet installed but included in existing conservation plans are listed later under Recommended BMPs and Estimated Costs.

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, DEQ has established the presumed existing uses of supporting cold water aquatic life and either primary or secondary contact recreation. Beneficial uses for water bodies on the 303(d) list in the Cocolalla watershed are listed below in Table 4.

Table 4. Beneficial uses for 303(d) listed stream segments in the Cocolalla watershed (IDEQ 2001).

Water Body	Boundaries	Beneficial Uses	Support Status
Cocolalla Lake	Tributary to Pend Oreille River	DWS, AWS, IWS, CWAL, PCR, SCR, SRW (designated)	Not Full Support
Upper Cocolalla Creek	Tributary to Cocolalla Lake	DWS, AWS, PCR, SCR, CWAL (existing)	Not Full Support
Fish Creek	Tributary to Upper Cocolalla Creek	AWS, CWAL, PCR, SCR (existing)	Not Full Support
Lower Cocolalla Creek	Tributary to Pend Oreille River	DWS, AWS, IWS, CWAL, PCR, SCR, (designated)	Not Full Support
Beneficial Uses Key: DWS = Domestic Water Supply; AWS = Agricultural Water Supply; IWS = Industral Water Supply; CWAL = cold water aquatic life; SS = salmonid spawning; PCR = primary contact recreation; SCR = secondary contact recreation; SRW = special resource water			

POLLUTANTS

Land use in the Cocolalla watershed has increased sediment and nutrient input to the system and decreased riparian shading. Agricultural activities contribute sediment and associated nutrients to waterbodies through runoff and erosion. Sheet and rill erosion from degraded pastures 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 and channel erosion.

The Clark Fork/Pend Oreille Sub-basin Assessment and Total Maximum Daily Loads analysis concluded that Cocolalla Lake is impaired by low dissolved oxygen and nutrient pollution. Upper Cocolalla Creek and Fish Creek, a major tributary to Cocolalla Creek, were determined to be impaired by excess sediment and temperature. Lower Cocolalla Creek was found to be impaired by excess sediment and thermal modification (IDEQ 2001). The required pollutant reductions from the TMDL analysis for these areas are summarized in Table 5 below. This does not incorporate the temperature TMDL analyses that are under development by IDEQ for the Pend Oreille Subbasin currently. However, the recommendations in this plan will address concerns related to temperature and potential riparian vegetation.

Table 5. 1998 303(d) listed stream segments: identified pollutants and required reductions (IDEQ 2001).

Water Body	303(d) Listed Pollutants	Required Reduction to meet TMDL	Agricultural Concerns
Cocolalla Lake	Nutrients, Dissolved Oxygen	269 kg/year phosphorus	Tributary Loading, Pasture Condition
Upper Cocolalla Creek	Sediment, Temperature	760.86 tons/year sediment	Pasture Condition, Encroachment on Riparian Zone
Fish Creek	Sediment, Temperature	none	No Significant Agricultural Activity
Lower Cocolalla Creek	Sediment, Thermal Modification	534 tons/year sediment	Pasture Condition

Historic point and nonpoint source discharges from lake and tributary drainages have contributed excess phosphorus to Cocolalla Lake. Direct sewage discharges prior to 1999 were documented from a former sewage lagoon on the western side of Cocolalla Lake (IDEQ 2001). Additionally, land disturbing activities in the vicinity of the lake as well as in tributary watersheds contributed sediment and nutrients to the lake itself. These historic inputs increased the nutrient load residing in lake sediments. Although land use practices and infrastructure have improved, these existing nutrients contribute to internal nutrient recycling. The target of 8 micrograms per liter of phosphorus in Cocolalla Lake is expected to eliminate internal nutrient cycling in the lake, which will,

in turn, meet dissolved oxygen standards. Therefore, the TMDL focuses solely on phosphorus (IDEQ 2001).

The TMDL analysis concluded that, in order to reach the target of 8 micrograms per liter of phosphorus present in Cocolalla Lake, an annual load reduction of 2,693 kilograms per year from all sources. The report estimated that approximately ten percent of the watershed draining into the lake was in agricultural land use (IDEQ 2001). Therefore, ten percent of the required reduction, or 269 kilograms per year, is the target for this implementation plan.

Upper Cocolalla Creek is the largest tributary to Cocolalla Lake. In addition to being impaired by sediment and temperature, the TMDL analysis concluded that it contributes 25% of the external phosphorus load to Cocolalla Lake (IDEQ 2001). The lower portion of this tributary (approximately 7 miles), where the surrounding valley is wide and flat, contains the majority of hay and pasture land within the Cocolalla Lake drainage. The channel in this section has been historically straightened, altering the hydrology. This, in addition to degraded riparian zones, increases channel erosion and sediment delivery.

The TMDL analysis calls for a sediment load reduction of 5,072.4 tons per year for Upper Cocolalla Creek from all land uses. The report estimated that fifteen percent of the land use in this drainage was agricultural (IDEQ 2001). Therefore, fifteen percent of the load reduction for Upper Cocolalla Creek, or 760.86 tons per year, is the target for this plan.

Fish Creek joins Upper Cocolalla Creek from the west less than a mile before it empties into Cocolalla Lake. The TMDL analysis estimated that Fish Creek contributes 20% of the external phosphorus and 24% of the sediment load entering Cocolalla Lake. Much of the excess sediment load is attributed to residential development, roads, and silviculture activities (IDEQ 2001). Agricultural areas of concern identified in the TMDL analysis as well as by the CLA have been addressed through installation of a stream crossing as well as implementation of livestock management BMPs.

The TMDL analysis indicates that the primary concern in the Fish Creek watershed is the forested portion. As far as agricultural concerns, the pasture areas near the mouth of Fish Creek are listed in the TMDL document (IDEQ 2001). Part of this area has undergone treatment, including riparian vegetation and riparian fencing to reduce livestock impacts to the channel. Maintenance of these practices is expected to meet existing TMDL requirements. In addition, the Idaho Department of Fish and Game has managed a portion of the land at the mouth of Fish Creek for wildlife habitat since late 2001. This area is not used for livestock grazing.

Lower Cocolalla Creek, like Upper Cocolalla Creek, has a higher proportion of agricultural land relative to the rest of the watershed, although very little agricultural land encroaches upon the riparian area. Due to the orientation of this segment of the watershed, as the outlet from Cocolalla Lake, the characteristics differ from Upper Cocolalla Creek significantly. The impairment by thermal modification is due to the

influence of Cocolalla Lake, where the water exiting the lake has been heated by sun exposure. In addition, the slough at the mouth of Lower Cocolalla Creek is seasonally influenced by the operation of Albeni Falls Dam on the Pend Oreille River. The water level in the slough area is higher (and more slow-moving) throughout the summer months.

Agricultural land use in this lower portion of the watershed was inventoried in 2007. Riparian impacts in the Lower Cocolalla Creek watershed were not determined to be a concern, as these areas are largely inaccessible to agricultural activities. Pastures in the lower watershed were inventoried and are included in the pasture condition inventory described below.

The TMDL analysis calculated a background sediment load of 55 tons per year from pasture. The current sediment yield from pastures was calculated to be 589 tons per year (IDEQ 2001). The difference between current and background sediment loads from pasture, or 534 tons per year, is the load reduction goal for agricultural land uses.

WATER QUALITY MONITORING

The CLA has been performing volunteer water quality monitoring in Cocolalla Lake since 1987 through IDEQ's Citizen Volunteer Monitoring Program (CVMP). Monitoring has included phosphorus, chlorophyll, dissolved oxygen, temperature, and clarity. Monitoring data are collected an average of 5 times per season (Rothrock 2008). Between 1987 and 2005, the clarity, as measured by Secchi disc depth, increased by approximately 1.15 meters (CLA 2005). Trends in total phosphorus and chlorophyll a have not shown a decline during this time period. In addition, the dissolved oxygen profile has not shown a discernible change. These trends are based on seasonal averages of data collected from March through October annually (Rothrock 2008). Regular monitoring by the CLA continues, and the data are housed at the Idaho Department of Environmental Quality Coeur d'Alene Regional Office (Pettit 2008).

AGRICULTURAL WATER QUALITY INVENTORY AND EVALUATION

In order to assess agricultural impacts to surface water on TMDL listed tributaries in the Cocolalla watershed, the first step was to inventory private agricultural land use that exists within the area of concern. For this plan, agricultural land use was inventoried starting in 2004 and updating through 2007. Agricultural activities in the Cocolalla watershed consist of seasonal livestock operations – primarily cow-calf operations - hay production, pasture land, and some animal feeding operations, included cattle, bison, and horses.

Agricultural land uses occur primarily in flat bottomlands of the tributaries, with the exception of hay and pastureland existing on terrace areas in the Lower Cocolalla Creek watershed. Soils in the bottomland areas adjacent to tributaries are well to somewhat poorly drained silt loams. The majority are somewhat poorly drained. Seasonal high water tables limit root growth and are susceptible to livestock trampling late winter through early spring (SCS 1982). Soils in hay and pasture lands in the lower portion of

the watershed are shallow and somewhat poorly drained. Root depth and drainage are limited by hardpan at 10-20 inches depth. Soils in these areas are also susceptible to trampling by livestock late winter through early spring (SCS 1982).

Land use in the Cocolalla area is changing rapidly as pasture and hayland areas are being subdivided and developed. New homebuilders are acquiring larger lots on which they can keep a small number of animals, usually horses. As urban sprawl continues to take over historic agricultural areas within Bonner County, and certainly around the lakes, land management becomes even more critical. If this pattern continues, impacts from small acreage horse grazing will most likely out-weigh cattle impacts to the lakes and tributaries.

Small confined horse feeding operations were observed around Cocolalla Lake. Depending on their proximity to surface water, these feeding areas can contribute nutrient and pathogen loading that eventually reaches the lake. Although subdivisions with horses are not considered traditional agricultural operations, the conservation partnership will work to educate these landowners and will provide assistance as appropriate. The conservation partnership will strive to work with adjacent land users that have livestock, as a number of small operations can often contribute as much, if not more, nonpoint source pollution than a single agricultural operation (RPU 2003).

Field inventories conducted in 2007 on private agricultural lands included stream channel/riparian assessments and pasture condition evaluations. In order to identify critical areas for treatment, stream assessments were performed along agricultural areas in the Upper Cocolalla Creek and Westmond Creek drainages. Streams and riparian zones were assessed using the NRCS's Stream Visual Assessment Protocol. Pasture conditions were assessed using the NRCS Guide to Pasture Condition Scoring.

Riparian

Stream Visual Assessment Protocol (SVAP), an NRCS protocol for assessing the condition of a stream segment, was performed on private agricultural lands along stream segments of Upper Cocolalla and Westmond in August 2007 (NRCS 1998). The stream reaches assessed are shown in Figure 2. The assessment areas were selected based on TMDL loading calculations, CLA input, land ownership, and access permission. Assessments were completed by interdisciplinary teams consisting of representatives from ISCC, IASCD, NRCS, and the Pend Oreille Basin Commission.

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 were also recorded. During assessments, the teams noted any observed problems and developed general recommendations to address these, where feasible. These recommendations for agricultural reaches from these assessments were utilized to develop this plan.

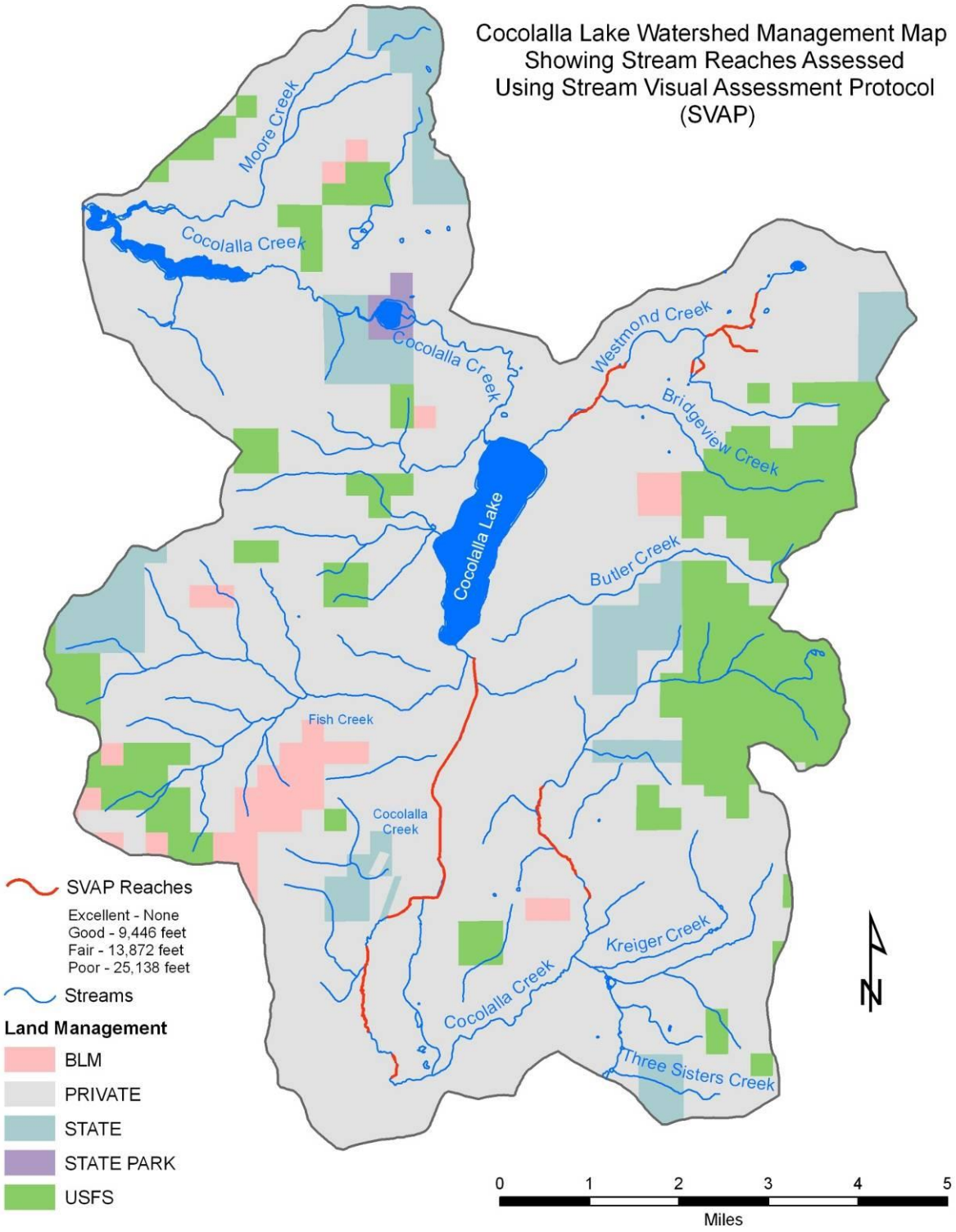

Figure 2. Stream Reaches Assessed in the Cocolalla Watershed, August 2007.

A total of 23 reaches were assessed, equaling approximately nine miles of stream length. Ratings for all reaches are summarized in Table 6. The Stream Visual Assessment Protocol and field form can be viewed online at http://www.nrcs.usda.gov/technical/ECS/aquatic/svapfnl.pdf.

Table 6. 2007 Stream Assessment Summary.

Rating	Length of Stream in Feet
Excellent	none
Good	9,446
Fair	13,872
Poor	25,138

Poor riparian zone conditions and historic stream channel alterations were common in inventoried areas. Many observed problems were associated with disturbance or removal of riparian vegetation, insufficient riparian buffer width, and lack of woody vegetation in the riparian area. Unrestricted livestock access to the riparian area and other direct vegetative removal was commonly observed during stream assessments. Many of the degraded riparian areas were infested with invasive plants such as tansy and spotted knapweed. In many inventoried areas, the stream channel has been historically straightened, altering the hydrology of the tributaries and increasing channel erosion. Summaries of the agricultural reaches will be delivered to land managers by the Bonner conservation partnership and recommendations discussed. Individual conservation plans will be developed based on these recommendations, where the land managers have an interest.

Pasture

All pastures in the watershed that could be viewed from public roads were visually inventoried for condition. In addition, these visual inventories were supplemented with completion of on-the-ground Pasture Condition Scoresheets, following NRCS guidelines for scoring (NRCS 2001). The pasture condition inventory was completed in late summer and early fall 2007, at the end of the grazing season. Only pastures that are not used for hay production were assessed. It was assumed that areas cut for hay are generally productive.

Pastures were assigned a score ranging from 1-5, with 1 being the worst condition (major effort required to rehabilitate) and 5 the best (no changes needed). All areas that received a score of 1 or 2 are considered critical areas for treatment. Indicators scored include *percent desirable plants, percent plant cover, plant diversity, plant residue, plant vigor, percent legumes, uniformity of grazing use, livestock concentration areas, soil compaction,* and *erosion.* The Pasture Condition Scoresheet can be viewed at ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/pasture-score-sheet.pdf.

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 Cocolalla 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 landusers determine the potential benefits and impacts of their project implementation. These discussions remain confidential between the landuser and planners.

Agricultural conservation planning will be coordinated with other species recovery and protection efforts in the watershed to improve bull trout habitat and address any potential impacts from BMP implementation. Improvements in water quality, achieved from BMPs installed on agricultural lands, are not expected to adversely affect these listed species and should improve or enhance their habitat. Any BMP implementation that will affect T&E species or habitat will follow Endangered Species Act (ESA) consultation requirements.

ANIMAL FEEDING OPERATIONS AND DAIRIES

There are no dairies, 5 known commercial livestock operations, and at least 8 small confined horse feeding operations in the Cocolalla watershed (this is based on the best available data at the time of plan development). Concerns associated with operations that feed livestock over winter are related to pastures and/or degraded riparian zones. These

concerns will be addressed through improvements made in these two treatment units and are included in the acreage estimates for critical areas below.

Implementation Priority

Information from inventory and evaluations was used to identify critical agricultural areas affecting water quality and set priorities for treatment. In addition, the Cocolalla Lake Association was consulted in prioritizing subwatersheds for treatment.

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 in 2007. Critical areas were identified based on proximity to surface water, pasture condition scores, and SVAP scores. Figure 3 shows agricultural land uses in the Cocolalla watershed as well as critical areas.

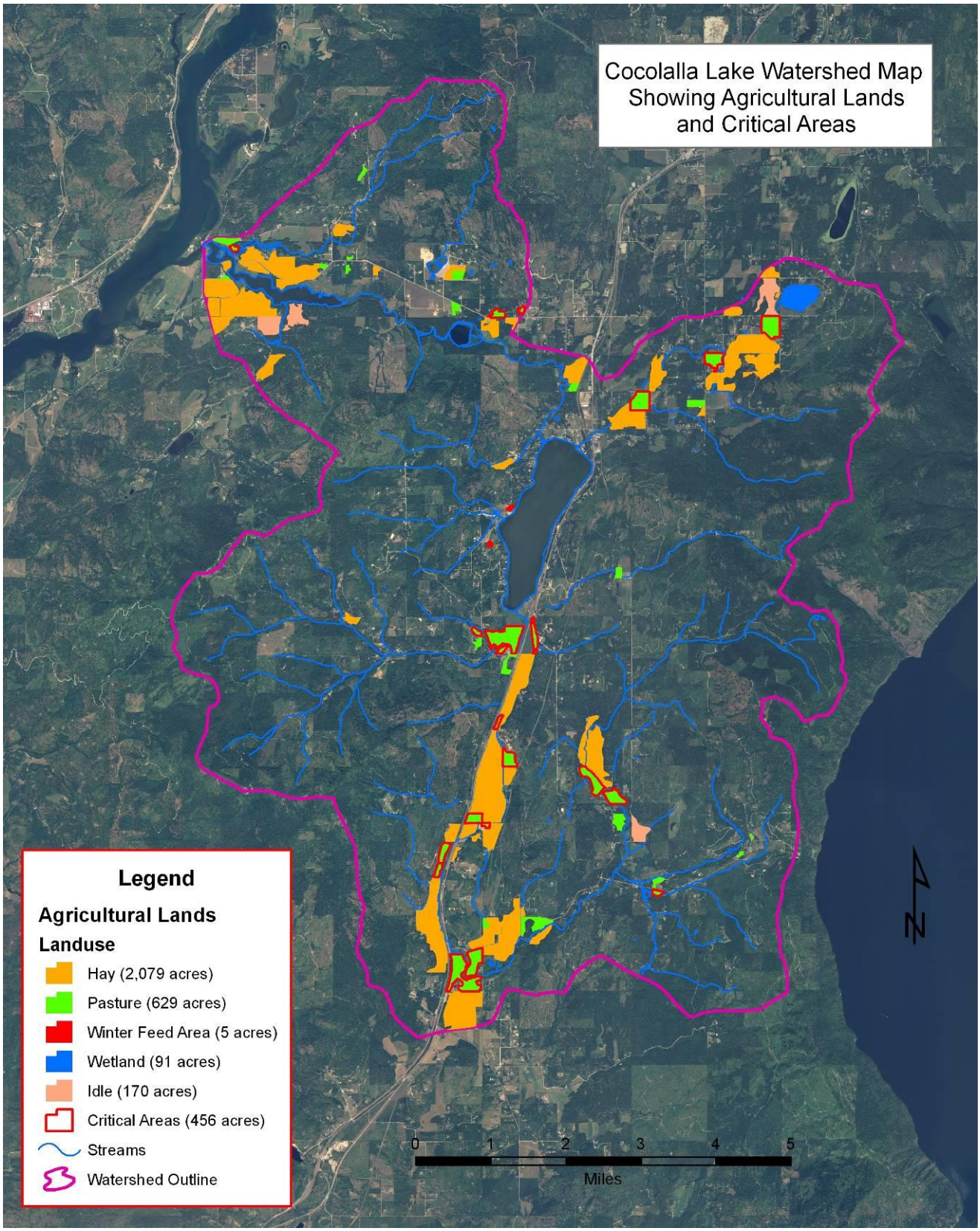

Figure 3. Agriculture Critical Areas in the Cocolalla Watershed.

Agricultural critical areas are prioritized for treatment based on their location relative to Cocolalla Lake and its tributaries and the potential for pollutant transport and delivery to its water. Primary areas of concern are degraded riparian areas and excessively eroding streambanks, overgrazed pastures, and agricultural areas that encroach upon riparian areas. Approximately 39,010 linear feet of streambank/riparian areas and 461 acres of pasture have been identified as critical areas for treatment in the Cocolalla watershed.

RECOMMENDED PRIORITIES FOR BMP IMPLEMENTATION

Practices already included in individual conservation plans (mentioned previously under Accomplishments) are top priority for implementation. These are listed below in Table 7. These are the BMPs that are currently scheduled for installation between 2008 and 2010. The cost estimates are based on the approved cost list for the associated program from the year each plan was developed.

Based on the existing TMDLs for 303(d) listed segments, the presence of agricultural lands, and recommendations from the CLA, Upper Cocolalla Creek and Westmond Creek are high priority subwatersheds for TMDL implementation. The conservation partnership, as well as the CLA, have determined Fish Creek to be lower priority due to completed treatment, as stated previously. Based on visual observations from 2007, Lower Cocolalla Creek is also considered lower priority than Westmond and Upper Cocolalla Creeks. The agricultural areas in this portion of the watershed do not encroach upon the riparian areas. Much of Lower Cocolalla Creek is deep and marsh-like, making the areas in proximity of the channel not conducive to agricultural activities.

Westmond and Upper Cocolalla Creeks have relatively wide, flat valleys more suitable for agricultural uses than the mountainous terrain, where slopes range from 15-50% (IDEQ 2001). In addition the valley bottoms of the Cocolalla and Westmond Creek drainages consist of soils subject to flooding (RPU 1996). Flooded areas are generally more suspectible to soil compaction where livestock are present. These watersheds experience higher levels of riparian degradation as well. Although assistance from the conservation partnership is available to any agricultural landowner in the Cocolalla watershed by request, IASCD/ISCC field staff will work to engage landowners in prioritized subwatersheds specifically.

Table 7. Planned Agricultural BMPs in the Cocolalla Drainage by subwatershed.

Subwatershed	BMP	Amount Planned	Units	[redacted]	[redacted]
	Fence (for livestock management)	3,300	Feet		
	Livestock Use Exclusion (riparian area)	11.5	Acres		
	Noxious Weed Management (non-cropland)	5.3	Acres		
	Spring Development (for livestock water)	1	Each		
	Stream Crossing	1	Each		
	Tree and Shrub Establishment	1	Acre		
	Pasture & Hayland Planting	6.2	Acres		
	Prescribed Grazing*	352	Acres		
TOTAL:					

*Cost associated with prescribed grazing is calculated using an average of the NRCS approved rates for range and pasture through EQIP. The total acreage reflects prescribed grazing planned for pastures, hay aftermath, and grazed forests.

Treatment

TREATMENT UNITS (TU)

The following Treatment Units (TUs) describe critical areas in the Cocolalla watershed with similar land uses, soils, productivity, resource concerns, and treatment needs. These TUs not only provide a method for delineating and describing land use, but are also used to evaluate land use impacts to water quality and in the formulation of alternatives for solving water quality problems. BMPs to improve water quality are suggested for each treatment unit.

Treatment Units for the Cocolalla watershed include Riparian Areas and Pasture. These TUs are described below. Thirteen livestock feeding operations (operations that involve providing livestock with supplemental feed in addition to grazed vegetation) were identified during inventory 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. The BMPs proposed in this plan to address the resource concerns are based on inventory. Since inventory was not performed on every acre of private agricultural land, actual implementation may vary as site-specific plans are developed with agricultural operators. Implementation in the form of education, outreach, inventory, planning, and BMP

installation is ongoing. Resources will continue to be directed at the Cocolalla watershed with added emphasis.

Treatment Unit #1 - Riparian Areas

The riparian resources of the Cocolalla 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. The acreage was calculated using the total length of Fair or Poor inventoried reaches (39,010 feet) and a 32-foot wide buffer. The buffer width was calculated based on twice the weighted averages of bankful channel widths of Fair and Poor SVAP reaches (1 bankful channel width on each side of inventoried reaches with a rating of Fair or Poor).

Riparian areas in the Cocolalla watershed are unstable from lack of woody vegetation and perennial grasses. Riparian area degradation has occurred as a result of livestock overgrazing and direct vegetative removal for facilitation of farming and ranching operations. 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 contribute to 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.

Treatment Unit #2 – Pasture

There are approximately 461 acres in this treatment unit. The majority of the soils in this treatment unit are silt loam and somewhat poorly to poorly drained. Soils in the valleys present wetness limitations for cutting and grazing seasons. Areas on terraces are generally better drained, but use is restricted by depth and risk of compaction (SCS 1982).

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 and are exacerbated by noxious weed infestations.

BMPs recommended for pastures are intended to aid in maintaining pasture productivity by minimizing weed infestation and localized pressure from livestock. 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.

RECOMMENDED BMPS AND ESTIMATED COSTS

The BMPs recommended for this implementation plan, in addition to those already scheduled, are broken down by treatment unit. Table 8 below shows these BMPs and associated costs by treatment unit. Costs are based on the NRCS 2008 Environmental Quality Incentive Program approved cost list.

Table 8. Recommended BMPs and estimated costs by treatment unit.

Treatment Unit 1 – Riparian Areas		
Recommended BMPs	Amount	Estimated Costs
Fence	46,038 feet	$79,646
Riparian Forest Buffer	10 acres	$11,250
Riparian Herbaceous Cover	2 acres	$450
Critical Area Planting	1 acre	$188
Tree and Shrub Establishment	2 acres	$1,000
Livestock Watering Facility (Trough/Tank)	16 each	$18,000
Pipeline (for livestock water)	3,200 feet	$6,720
Streambank Stabilization	1,550 feet	$46,500
Stream Crossing	5 each	$13,125
Pest Management	2 acres	$30
	subtotal	$176,909
Treatment Unit 2 – Pasture		
Recommended BMPs	Amount	Estimated Costs
Prescribed Grazing*	461 acres	$2,305
Pasture and Hayland Planting	461 acres	$46,100
Fence	8,000	$13,840
Livestock Watering Facility (Trough/Tank)	8 each	$9,000
Pipeline (for livestock water)	1,600	$3,360
Pest Management	461 acres	$6,915
	subtotal	$81,520
TOTAL:	total cost	$258,429

*Cost associated with prescribed grazing was calculated using the NRCS approved rate for pure pasture.

The estimated cost for implementation, including scheduled BMPs in existing conservation plans (Table 7) as well as all recommended BMPs for critical areas (Table 8), totals $273,613.

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):

Avista Utilities – Local natural resource improvement project funding is available through the Clark Fork Settlement Agreement. This was part of the Clark Fork River Project relicensing, and is intended to mitigate for impacts of continued operation of Noxon Rapids and Cabinet Gorge Dams in the watershed. Source: www.avistautilities.com/resources/hydro/clarkfork/default.asp

CWA 319 –These are Environmental Protection Agency funds allocated to the Nez Perce Tribe 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 Nez Perce Reservation. Funds focus on projects to improve water quality and are usually related to the TMDL process. The Nez Perce tribe has CWA 319 funds available for projects on Tribal lands on a competitive basis. Source: DEQ http://www.deq.idaho.gov/water/prog_issues/surface_water/nonpoint.cfm#management

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

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 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

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/

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

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

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

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

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/

Outreach

Conservation partners in the Cocolalla watershed will use their combined resources to provide information about BMPs to improve water quality to agricultural landowners and operators. Newspaper articles, Bonner SWCD and CLA newsletters, watershed and project tours, public meetings, landowner meetings, and one-on-one personal contact may be used as outreach tools. Outreach efforts will be coordinated with the Pend Oreille Lake*A*Syst program. Lake*A*Syst materials will be utilized in educational efforts, and other Lake*A*Syst activities in Bonner County will be utilized to benefit the Cocolalla watershed by the Bonner SWCD and CLA.

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 property and recreation activities.

Applications for technical and financial assistance will be solicited with emphasis in the Cocolalla 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 Cocolalla 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.

Stream Visual Assessment Protocol (SVAP) is 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 bacteria 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.

The CLA performs annual lake water quality monitoring through IDEQ's CVMP. Monitoring through this program will continue. According to the IDEQ Coeur d'Alene Regional Office, the CLA is one of the more "consistent and conscientious groups conducting citizen monitoring," and is, therefore, high priority for continued funding through this program (Rothrock 2008). Parameters measured include phosphorus, chlorophyll, dissolved oxygen, temperature, and clarity.

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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