Lindsay Creek Watershed

Total Maximum Daily Load

Implementation Plan for Agriculture

Developed for the Idaho Department of Environmental Quality
Prepared by: Idaho Soil Conservation Commission
In Cooperation With: Nez Perce Soil and Water Conservation District

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Introduction

The Idaho Soil Conservation Commission is responsible for seeing that the agriculture and grazing components of a TMDL Implementation Plan are addressed. This document will serve as a supplement to the overall TMDL Implementation Plan for Lindsay Creek. Information gathered in this document will come from the various partners and agencies that have a stake in the natural resource and water quality improvement of this watershed. These entities include, but are not limited to, the Nez Perce Soil and Water Conservation District (NPSWCD), Idaho Soil Conservation Commission (ISCC), the Idaho Association of Soil Conservation Districts (IASCD), the North Central District Health Department, the Idaho Department of Environmental Quality (IDEQ), and the Lindsay Creek Watershed Advisory Group (WAG).

Purpose

The Lindsay Creek Total Maximum Daily Load (TMDL) Implementation Plan for Agriculture outlines an adaptive management approach for implementation of best management practices (BMPs) and resource management systems (RMS) on agricultural lands to meet the requirements of the Lindsay Creek TMDL. The purpose of this plan is to recommend BMPs that would improve or restore physical, chemical, and biological functions of Lindsay Creek as it flows through this urban interface watershed.

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 the two, 303(d) listed stream segments on Lindsay Creek. These water quality impaired stream segments are identified in the Idaho Department of Environmental Quality (IDEQ) 2002 Integrated Report 303(d) list for the Clearwater sub basin.

Table 1. 2002 303(d) list for Lindsay Creek.

Water body	*Listed Pollutants*
Lindsay Creek	Bacteria, Nutrients, & Sediment
(17060306CL003_02 & _03)	

This implementation plan will provide guidance to the Nez Perce Soil and Water Conservation District and agricultural producers in the Lindsay Creek watershed to identify BMPs necessary to meet the requirements of the TMDLs on 303(d) listed streams. The objective of this plan is to reduce the amount of pollutants entering this water body from agricultural-related practices. Agricultural pollutant reductions will be achieved by on-farm conservation planning with individual operators and application of BMPs in agricultural critical areas. This plan will recommend BMPs needed to meet TMDL targets in the Lindsay Creek

watershed, and suggest alternatives for reducing surface and groundwater quality problems from agricultural related activities.

Background

Project Setting

Lindsay Creek is a third order tributary to the Clearwater River, a part of Hydrologic Unit Code 17060306, which is located within north central Idaho. Lindsay Creek is a small watershed encompassing approximately 14,200 acres (Figure 1). The main stem of Lindsay Creek originates from springs at the wetland just below Mann's Reservoir, and flows northwest to its confluence with the Clearwater River in Lewiston, Idaho.

Creek elevation varies from approximately 1,800 feet above sea level at the headwaters to approximately 750 feet near the confluence. The creek flows through farmland in the upper reaches through a canyon, until it passes into a tunnel drain through the Clearwater Levee built by the Army Corps of Engineers as part of the Lower Granite Dam project. The drainage area of the Lindsay Creek watershed is approximately 22 square miles. The creek's main stem is approximately 8 miles long, and its tributaries, both intermittent and perennial, are approximately 19 miles long.

North Central Idaho is dominated by Pacific maritime air masses and prevailing westerly winds. Over 85% of the annual precipitation occurs during late fall, winter, and spring months. Cyclonic storms, consisting of a series of frontal systems moving east, produce long duration, low-intensity precipitation during this period of the year. In winter and spring, this inland maritime regime is characterized by prolonged gentle rains, fog, cloudiness, and high humidity, with deep snow accumulations at higher elevations. Winter temperatures are often 15 to 25 ^{o}F warmer than continental locations of the same latitude.

The Lindsay Creek watershed is located in a semi-arid area, where summer months are hot and dry, with rainfall stemming from occasional thunderstorms and brief heavy precipitation events (DEQ 2006)

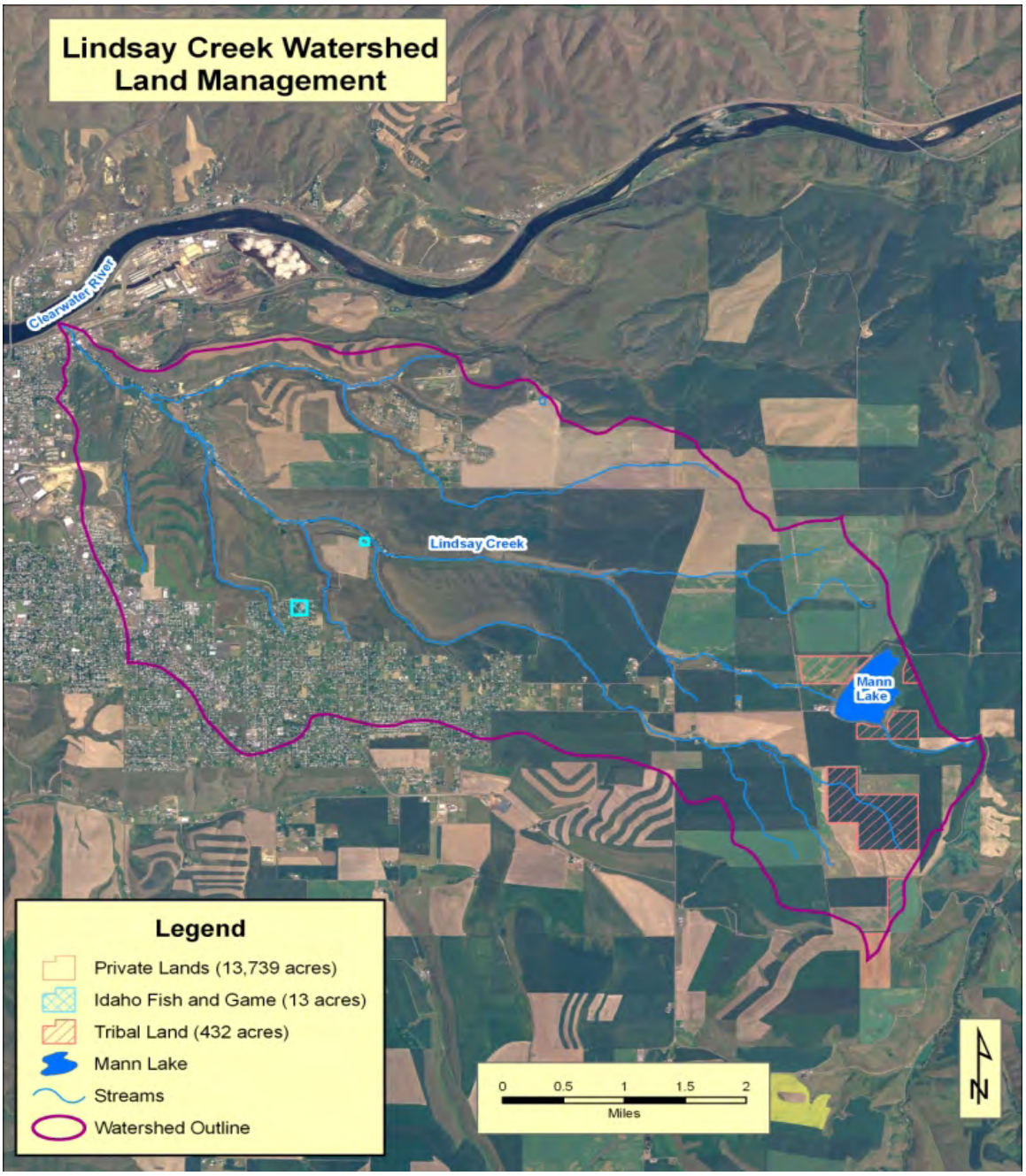

Figure 1. Land Management

SUBWATERSHEDS

The Lindsay Creek watershed can be divided into two smaller watersheds based on hydrology: South Fork Lindsay Creek and East Fork Lindsay Creek (Figure 2, page 11). Other ephemeral creeks within the watershed contribute flow to Lindsay Creek in the winter and spring but are generally dry all summer.

The South Fork Lindsay Creek is a second order tributary that flows 5.9 stream miles to its confluence with Lindsay Creek near Lindsay Creek Road, changing the main stem to third order. Annual flows in the creek averaged 0.28 cubic feet per second (cfs) during the 2001-2002 monitoring season, or approximately 8% of the annual flow within the watershed. The geology and soil deposits mirror the upper Lindsay Creek reaches dominated by rich loess soil.

The East Fork Lindsay Creek is a first order tributary and drains adjacent to Lapwai Creek Road flowing 5.6 stream miles to its confluence with the main stem. The geology consists mainly of alluvium and colluvium deposits in and near the stream bed. Average annual flow from the 2001-2002 monitoring season was 0.15 cfs, averaging 4% of the annual flow to Lindsay Creek (DEQ 2006).

Land Ownership and Use

The City of Lewiston is the only city in the watershed, with a majority of the watershed located in the northwest section of Nez Perce County, Idaho. Approximately 72% of the land in the Lindsay Creek watershed is used for non-irrigated agriculture (IASCD 2002). The lower segments of the watershed flow adjacent to city and county roads through suburbanized areas of Nez Perce County and the City of Lewiston where land uses vary from residences and small ranches to industrial based businesses

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. Designated beneficial uses for Lindsay Creek are listed below in Table 2. (Reference - Lindsay Creek TMDL)

Table 2. Lindsay Creek designated beneficial uses.

Water Body	*Assessment Unit ID#*	*Designated Beneficial Uses*
Lindsay Creek	(17060306CL003_02 & _03	Cold Water Aquatic Life, Secondary Contact Recreation

Pollutants: Monitoring Summary

This section summarizes and analyzes the available biological, chemical, and physical data for the Lindsay Creek watershed as it relates to determining beneficial use support status and compliance with Idaho water quality standards. Data used for the development of the total maximum daily loads (TMDL), was provided by the Idaho Association of Soil Conservation Districts (Appendix B, Lindsay Creek TMDL). Additional data was collected by DEQ personnel and is also described in the Lindsay Creek TMDL.

A water quality sampling project was conducted by the Idaho Association of Soil Conservation Districts personnel from February 27, 2001 to February 25, 2002. Specific parameters that were sampled for included total phosphorus, ortho-phosphate, nitrite+nitrate-nitrogen, *E. coli* and fecal coliform bacteria, total suspended solids, turbidity, specific conductance, pH, % dissolved oxygen saturation, temperature, flow and dissolved oxygen. Instantaneous sampling occurred approximately every two weeks at six sites throughout the watershed (IASCD 2002). The established sites are shown in Figure 2.

Bacteria TMDL

Forty-one percent of the *E. coli* bacteria samples collected on Lindsay Creek during the 2001-2002 monitoring season were measured and found to be above Idaho's instantaneous water quality criteria.

Water quality monitoring conducted in April of 2005 showed *E. coli* bacteria concentrations measured in samples collected from Lindsay Creek to also be above the secondary contact recreation water quality standard criterion set by the State of Idaho. DNA analysis of samples collected at the mouth show no human markers in e-coli, suggesting septics are not the major source of e-coli. The combined monitoring results indicate that the development of a bacteria TMDL is needed to comply with Idaho water quality standards.

An *E. coli* bacteria TMDL was developed and allocated a concentration equal to the State standard to all nonpoint sources contributing *E. coli* bacteria to the Lindsay Creek watershed. Table 3 lists the 66% required pollutant load reduction needed to meet the TMDL.

Temperature

Temperature data collected during the 2001-2002 monitoring season showed no violations of the instantaneous maximum of 22 ^{o}C allowed in Idaho water quality standards. Diurnal temperature data was collected from August 14, 2005 through August 21, 2005 at site LZ-1 to assess stream temperatures when ambient air temperatures were assumed to be the highest. On August 21, 2005, the maximum diurnal stream temperature was 18.28 ^{o}C, the daily average was 16.1 ^{o}C, and the maximum daily ambient air temperature was 104 ^{o}F, indicating a temperature TMDL is **not** needed for Lindsay Creek.

Dissolved Oxygen

Instantaneous dissolved oxygen concentrations measured in Lindsay Creek during the 2001-2002 season exceeded 6.0 mg/L at all times. Diurnal monitoring conducted at site LZ-1 during August, the hottest period of 2005, verified that dissolved oxygen levels are being sustained at levels above the 6.0 mg/L required by the state water quality standards.

Nutrient TMDL

The dominant functional feeding groups identified in Lindsay Creek are those that feed on fine particulate organic matter. High dominance by this feeding group indicates possible environmental stress from organic inputs to the stream. Nitrogen concentrations in the groundwater indicate impacts are occurring to ground water quality causing nitrogen concentrations to exceed the ground water manage action threshold for nitrate nitrite in ground water. There are no indications that total phosphorus or nitrite-nitrate concentrations have seasonality, as values remained constant with the exception of the individual spike events noted.

In agricultural areas, the application of fertilizers to crops can be a source of nutrient loading to water by percolation through the soil or from runoff. Soil reaching the creek can add both phosphorus and nitrogen to the stream. Manure from pets, wildlife, and livestock can contribute nutrients to the creek as well.

Additional ground water testing for nitrogen isotopes has shown that we have both organic (waste) and inorganic (fertilizer) as sources for nitrogen in ground water. Oxygen and hydrogen isotopes analyzed show the nitrogen to be in the

upper shallow saturated inter beds, including the Sweetwater Formation. It then flows into Lindsay Creek where the interbeds are exposed to the canyon walls and stream substrate.

A nutrient TMDL was developed to initiate protective ground water quality management actions, reduce nitrogen loading to the creek, and address the effects on the cold water aquatic life in the creek. Please refer to the Lindsay Creek TMDL Table 19 for a more detailed account of the loading calculations on a month by month basis.

Sediment (TSS) TMDL

Guidance developed by DEQ for application of the narrative sediment criteria for protection of aquatic life beneficial uses states that a sediment target should incorporate both concentration and duration of exposure, not only to properly protect aquatic life, but also to allow for episodic spikes in Total Suspended Solids (TSS) that can occur naturally with spring runoff or heavy precipitation events. Total suspended solids was chosen based on availability of data and on the additional margin of safety over total suspended sediment as total suspended solids includes both mineral and organic material.

Allowable daily and monthly loads were exceeded in January, February, and May. Sediment loads will need to be decreased during these critical time periods.

Monitoring results also showed that elevated turbidity values mirrored elevated total suspended solids (TSS) on the same sampling dates. Sites LZ-1, LZ-2, LZ-3, and LZ-5 were above 50 NTU on the same occasion of heavy tilling of a field prior to 0.50 inches of precipitation. Site LZ-6 was above 50 NTU on August 27, 2001. Site LZ-3 was above 50 NTU on January 3, 2002 and January 28, 2002. Measured turbidity values at site LZ-4 did not exceed 22.0 NTU.

A sediment TMDL has been developed to maintain protection of existing fish populations and restore habitat conditions in the watershed. The sediment TMDL allocates a gross load to all nonpoint sources of total suspended solids upstream from the LZ-1 control point. Please refer to the Lindsay Creek TMDL Table 20 for a more detailed account of the loading calculations on a month by month basis.

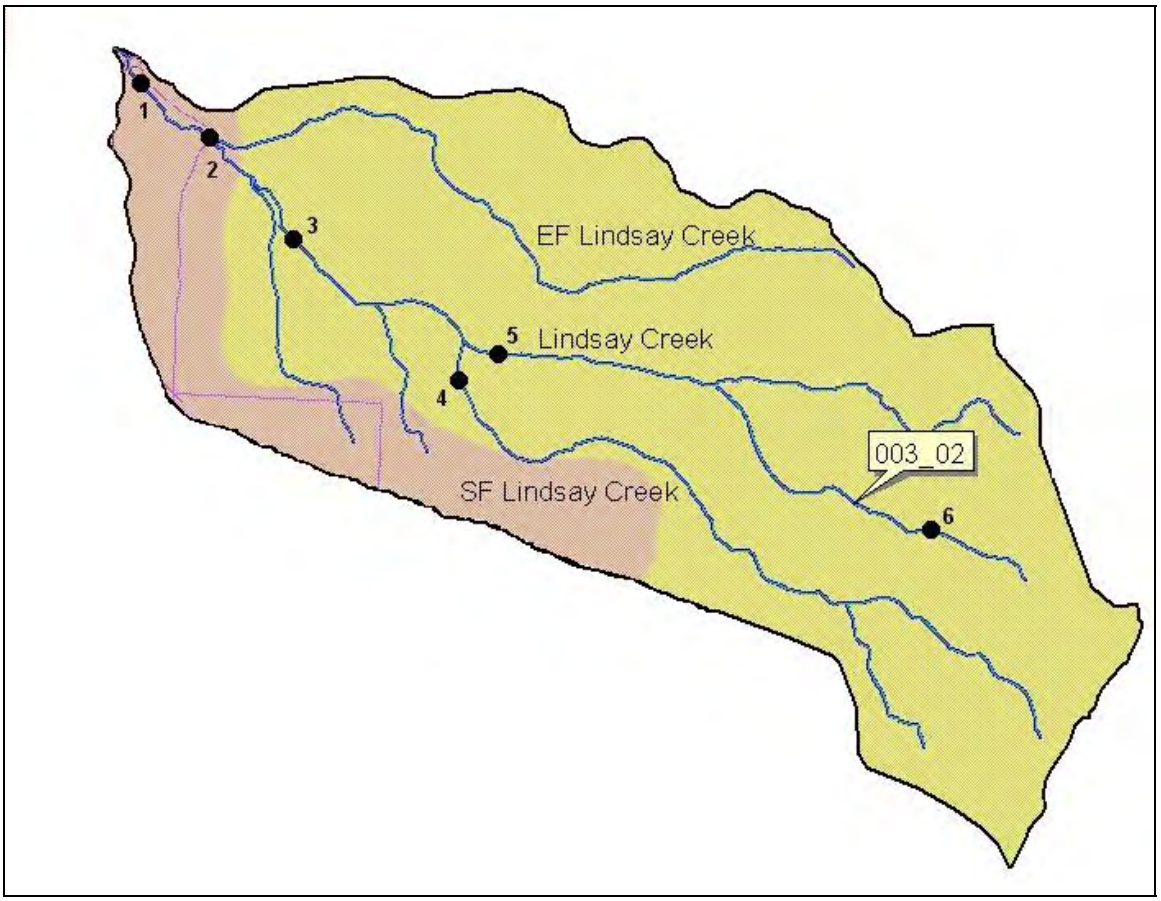

Figure 2. IASCD Monitoring Sites

Total Maximum Daily Load(S)

A Total Maximum Daily Load calculates the allowable amount of a pollutant that can be in the water body according to state water quality standards. The allowable amount of the pollutant is called the pollutant load capacity. Once the load capacity is calculated, it is distributed or allocated amongst the sources of the pollutant in the watershed.

There are two kinds of pollutant sources: point sources and nonpoint sources. Point sources get a waste load allocation; nonpoint sources get a load allocation. Background is considered part of the load allocation, but it is not available for distribution.

Load Allocation and Waste Load Allocations

The sediment TMDL allocates approximately 79% of the available load capacity to nonpoint sources and provides a 3% waste load allocation for possible inclusion into the city of Lewiston's future MS4 NPDES permit. A Lewiston MS4 Storm Water waste load allocation of 3% and reserve for growth of 8% was estimated using the percent of land area in the watershed with current storm water drainage systems and the land area currently lacking significant drainage systems which may evolve in the future. The estimated percent of the watershed for these two land areas are considered to reflect the percent potential for contribution to Lindsay Creek and the Lindsay Creek TMDL storm water load and provide a means to develop a waste load allocation as a percent of the load capacity. The waste load allocation and reserve for growth are considered temporary until more current and applicable data becomes available.

Reserve for Growth

Residential development is scheduled to occur on the plateau between Lindsay Creek and the Lewiston Orchards. Potential for pollutant discharge from future land use changes is currently unknown. A temporary reserve for growth of 8% of the available load capacity is included in this total maximum daily load for the MS4 storm water waste load allocation for the drainage system development anticipated to occur within the City of Lewiston (DEQ 2006)

Table 3 lists the three identified pollutants for TMDL development, the required reductions, and related agricultural concerns. The Agricultural concerns were limited to livestock and pet animals. The potential septic system or other urban issues will not be addressed in this document but will be addressed in the main TMDL Implementation Plan. Please refer to the Lindsay Creek TMDL Table's 19 and 20 for a more detailed account of the loading calculations on a month by month basis.

Table 3. Lindsay Creek, April 2005: Identified pollutants and required reductions.

Water Body	*303(d) Listed Pollutants*	*Load Allocation*	*Required Reduction to meet TMDL*	*Agricultural Concerns*
Lindsay Creek	E.coli Bacteria	126cfu/100ml	240cfu/100ml (66%)	Livestock
	Nutrients	See Table 19	in TMDL	Livestock
	Sediment	See Table 20	In TMDL	Livestock

Conservation Accomplishments

There have been very few conservation-based practices implemented in this watershed to date. This could be caused in part by being an urban interface watershed.

Modern pollution control efforts in the Lindsay Creek watershed have focused on implementation of existing rules and regulations associated with livestock management and human health sanitation.

Recently, cattle businesses have been confronted with changing state environmental laws and cattle business owners have either made the operational changes, quit the business, or are working with the Idaho Department of Agriculture to make improvements and meet the requirements of state environmental law (DEQ 2006)

Cultivated agricultural practices have focused on production and agricultural stewardship of the land. The Nez Perce County Soil Conservation District is unaware of local agricultural producers' efforts to adopt agricultural best management practices to specifically protect water quality in this watershed (Herman 2005).

Implementation Priority

In addition to significant Idaho State interest in the Lindsay Creek watershed, there is strong local interest among residents to actively address water quality issues associated with Lindsay Creek. In March of 2001, the Nez Perce Soil and Water Conservation District (NPSWCD) surveyed the local watershed community to determine natural resource conservation priorities.

Residents prioritized the following issues of concern:

Water Availability/Quantity
Water Quality
Drinking Quality
Weeds
Irrigation Water Management
Rural Development/Urban Sprawl
Animal Waste
Loss of Agricultural Land
Suburban Water Pollution
Suburban Land Use

When the residents were asked to identify priority conservation programs and services, they identified the following as the most valuable:

Erosion and Sediment Control
Conservation Planning
Water Quality Planning
Educational Programs
Cost Share Programs

The following planned implementation efforts from the NPSWCD runs consistent with the issues and concerns expressed by the local community within the Lindsay Creek watershed (NPSWCD, 2008).

Planned Implementation Efforts

The **Nez Perce Soil and Water Conservation District** is presently putting together an EPA 319 Clean Water Act Grant Proposal titled:" Lindsay Creek Water Quality Improvement Project". The following data was taken directly from this proposal.

The project goals include:

1. Reduce nutrient and sediment delivery to Lindsay Creek by 30 percent on 2000 acres of cropland.
2. Identify road, urban, and streambank runoff sources of pollution and develop a treatment strategy for any identified concerns.
3. Identify nutrient inputs from urban areas.
4. Reduce nutrient inputs from urban areas.
5. Reduce bacteria loading by 20 percent

Project Actions

Project treatments are grouped into three categories; sediment, nutrient, and bacteria. The first step in the project will be to complete a stream and road inventory. This inventory will identify site specific projects and allow the NPSWCD to focus efforts in high priority areas. The inventory will be used as the basis for future 319 proposals.

A) Inventory

Stream Assessment

The stream inventory and assessment are completed using the Stream Assessment Methodology (SAM) developed by the NPSWCD. SAM incorporates the USDA-Stream Visual Assessment Protocol, Rosgen Channel Classification, and NRCS Stream Erosion Condition Index protocols. SAM provides a very basic, high level assessment of stream health and is not considered monitoring. The inventory is completed using teams of 2 to 4 people who walk along the stream and record data. The data is then analyzed and compiled in order to prioritize and identify project locations. The NPSWCD has successfully used this methodology within the Big Canyon and Lapwai Creek watersheds, where over 900 miles of stream were inventoried and projects identified. Approximately 19 miles are proposed for survey within the Lindsay Creek watershed. Partners for this effort include the North Central District Health Department (NCDHD), Idaho Department of Fish and Game (IDFG), Idaho Soil Conservation Commission (SCC) and Nez Perce County. The NCDHD plans to complete a septic system survey as part of this effort. The NCDHD has prepared a separate 319 proposal identifying their project actions.

Road Inventory

The road inventory focuses on rural and farm access roads. Priority inventory areas are those along stream corridors. The inventory is completed by physically driving and mapping roads within the watershed. Road erosion areas are identified and prioritized through this process. The NPSWCD has successfully used this approach in the Lapwai Creek watershed, where over 22 projects were identified for improvements. Partners for this effort include Nez Perce County and local landowners.

Urban Fertilizer and Irrigation Survey

An urban fertilizer and irrigation survey will be completed in key areas that may be contributing nutrients to groundwater sources. The Lewiston Orchards Irrigation District (LOID) includes over 3,000 irrigators, with an estimated 60% of these within the Lindsay Creek watershed. The survey's goal is to identify current practices and to select four sites to complete an intensive irrigation and

fertilizer management plan. These four sites will serve as a model for other landowners and as a source of technology transfer.

B) Sediment Treatments

Sediment treatments will focus on cropland, road and streambank areas within the watershed.

Cropland Treatment

Treatment includes erosion control structures and direct seeding management systems.

Treatments to address upland sources of sediment may include longer and improved crop rotations, conservation tillage, improved soil quality, and contour farming. Factors including slope, soil type, precipitation, land use and soil depth all contribute to the types of management possible for upland sediment. Soils are one of the primary limiting factors for this treatment group as shallow, rocky soils do not have adequate soil depth to support many of the treatments.

Slopes exceeding 15% need careful evaluation before selecting practices. Cropland practices which decrease slope lengths should also be considered such as strip cropping, terraces, and water and sediment control structures. The majority of cropland lacks adequate buffers from drainage ways and streams, increasing the potential for sediment delivery to the *stream.*

Stream reaches within cropland fields identified as having a high Soil Erosion Condition index will be treated for gully erosion. Sediment trapping practices such as sediment basins, vegetative filters, and terraces will decrease the amount of sediment transported to the stream.

Priority areas for treatment are those areas within 1,000 linear feet of a drainage way and those with soil erodibility K factors greater than 0.32. The NPSWCD contacted the six major cropland producers within the watershed. Of these, four have agreed to participate in the project. Site specific locations for installation of direct seeding and erosion control structures will be determined after the stream inventory component of the project. The stream inventory will help identify high sediment concern areas. Cropland BMPs will be installed in these areas in order to achieve the highest amount of sediment reduction.

The TMDL lists the primary sources of sediment to be surface sources and stream bank erosion. Treatment areas were prioritized by soil group and sediment loading areas identified in the TMDL. Table E from proposal, identifies the BMPs identified for treatment, their costs, and the expected reduction.

Table E. Cropland BMP summary

BMP	Installation Cost	Units	Load Reduction
Direct Seeding	$50/acre	2,000	43%
Grade Stabilization Structures	$3,000/each	2	80%
Erosion Control Structures	$5,000/each	5	80%

Streambank Treatment

Many of the streambank areas are grazed. The remaining lands are adjacent to and/or impacted by urban developments, roads, wildlife areas, and cropland. Streambank treatment measures incur high costs due to soil type, precipitation, and weed control issues.

Due to the high costs of treatment, the NPSWCD proposes to identify and prioritize areas for treatment. This assessment will result in the identification of erosion areas, identify appropriate treatment alternatives, and prioritize areas for treatment. Treatment includes the installation of conservation practices such as channel vegetation, fencing and streambank stabilization. Once completed, the assessment and treatment plan will allow for future installation activities.

The TMDL lists the primary sources of sediment to be surface sources and stream bank erosion. Table F from proposal, identifies the BMPs identified for treatment, their costs, and the expected reduction.

Table F. Streambank Treatment

BMP	Installation Cost	Units	Load Reduction
Tree planting	$5.00/LF	4,000	25%
Fencing	$3.50/LF	1000	50%
Bank erosion control	$75/LF	500	50%

Future on ground treatment efforts within this watershed will be based on annual status reviews and inventories of existing BMP's installed. 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.

Road Treatment

Roads were identified as a source of sediment. The NPSWCD plans to complete a road erosion inventory. The inventory will be completed in partnership with Nez Perce County. The inventory and assessment will identify road segments delivering sediment to the stream, prioritize those segments for treatment, and develop treatment alternatives. Two road treatment areas are proposed through this project. Estimated costs are $8,000. The site specific locations will be determined after the road inventory is completed.

C) Nutrient Treatment

The majority of the Lewiston Orchards are irrigated lawns. One source for nutrients is the over application of irrigation water and fertilizers. The NPSWCD plans to complete a lawn survey to identify irrigation and fertilizer practices as well as assess the willingness of landowners to change lawn management. In addition, the NPSWCD and LOID will implement a Water Wise Garden program modeled from the Virginia Extension Service program. Cropland nutrients are addressed through the installation of 2,000 acres of nutrient management plans. The plans are developed as a component of the direct seeding management system described under sediment treatments. Four sites within the LOID boundaries will be selected to implement nutrient and irrigation water management plans. In addition, LOID will be installing approximately 200 water meters to assist in proper irrigation management.

D) Bacteria Treatments

Bacteria treatments include septic systems and livestock waste management systems. The NPSWCD proposes to replace 13 septic systems within the watershed. The North Central District Health Department (NCDHD) will provide the design and construction inspections for these systems. The NPSWCD will work with landowners to obtain contracts and pay for systems. The NPSWCD completed a livestock inventory within the watershed in Lindsay. This inventory in

conjunction with the stream inventory will be used to prioritize livestock operations for BMP installations. BMPs will include fencing, alternative water systems, stream crossings, and waste systems. The District plans to select three sites for implementation.

If funding is approved for this project, the funds would be available in the spring of 2009. The NPSWCD is asking for $250,000 of cost-shared funds from the EPA 319 Clean Water Act Program.

The **Palouse-Clearwater Environmental Institute (PCEI)** is also acquiring $250,000 of cost-shared grant funds from the EPA 319 Clean Water Act Program to advance implementation and restoration efforts in the Lindsay Creek watershed. The following information was also taken directly from this proposal.

The Riparian Animal Management Project on Lindsay Creek that PCEI is undertaking is based on watershed priorities and goals derived from the Lindsay Creek Total Maximum Daily Load (TMDL) and the LC WAG. Restoration work under this project is designed to reduce sediment, one of the pollutants for which the TMDL was established. This proposal represents ongoing effort by PCEI to improve water quality in the Snake River watershed supporting conservation efforts and progress made by the Nez Perce Soil and Water Conservation District (NPSWCD). PCEI is currently completing the second implementation project and the high visibility of the project on Tammany Creek, an adjacent watershed, and has generated interest by community members.

The Walton's will be PCEI's first project under this contract agreement. Discussions are underway with additional landowners on Lindsay Creek that are considered priority in the watershed due to excessive sediment, nutrient and bacteria inputs. During the life of the project PCEI will be working to garner support for restoration efforts on Lindsay Creek and make this a multi-landowner project increasing our outreach potential and the potential to help improve water quality in Lindsay Creek.

The Lindsay Creek Riparian Animal Management Project will focus on streambank restoration and stabilization, tree and shrub plantings along the stream corridor, and public outreach.

Project actions will include:

1.Development of restoration and outreach plan.
2.Obtain all required building permits (federal, state and local agencies).
3.Excavate and restore streambank and floodplain.
4.Install streambank stabilization structures including rock vanes.

5. Planting native riparian vegetation, including bank seeding of native grasses.
6. Implement a public outreach and education program to educate the community regarding watershed issues and riparian restoration.
7. Collect, analyze, and report monitoring information to funding agency, Lindsay Creek WAG, and local community.
8. Evaluate project and utilize adaptive management strategies to improve project success.

All of these tasks will be accomplished through the recruitment, training, and mobilization of volunteers, private property owners, AmeriCorps members, subcontractors, agency personnel, and the PCEI technical staff.

Both projects proposed by the NPSWCD and PCEI should be a great jump-start to improving the natural resources and water quality to the Lindsay Creek watershed.

There are many other sources of funding available through various state and federal sources. A more complete list of these funding sources can be found toward the back of this document under “Funding”.

Monitoring and Evaluation

FIELD LEVEL

At the field level, annual status reviews will be conducted to insure that the contracts are on schedule and that BMPs are being installed according to standards and specifications. BMP effectiveness monitoring will be conducted on installed projects to determine installation adequacy, operation consistency and maintenance, and the relative effectiveness of implemented BMPs in reducing water quality impacts. This monitoring will also measure the effectiveness of BMPs in controlling agricultural nonpoint-source pollution. These BMP effectiveness evaluations will be conducted according to the protocols outlined in the Agriculture Pollution Abatement Plan and the ISCC Field Guide for Evaluating BMP Effectiveness.

The Revised Universal Soil Loss Equation (RUSLE) is used to predict sheet and rill erosion on non-irrigated lands. The Alutin Method, Imhoff Cones, and direct-volume measurements are used to determine sheet and rill irrigation-induced and gully erosion. Stream Visual Assessment Protocol (SVAP) and Streambank Erosion Condition Inventory (SECI) are used to assess aquatic habitat, stream bank erosion, and lateral recession rates. The Idaho OnePlan’s CAFO/AFO

Assessment Worksheet is used to evaluate livestock waste, feeding, storage, and application areas. The Water Quality Indicators Guide is utilized to assess nitrogen, phosphorus, sediment, and bacterial contamination from agricultural land.

WATERSHED LEVEL

At the watershed level, there are many governmental and private groups involved with water quality monitoring. The Idaho Department of Environmental Quality uses the Beneficial Use Reconnaissance Protocol (BURP) to collect and measure key water quality variables that aid in determining the beneficial use support status of Idaho's water bodies. The determination will tell if a water body is in compliance with water quality standards and criteria. In addition, IDEQ will be conducting five-year TMDL reviews. Water quality monitoring for nitrogen will continue on a quarterly basis to create a database for trend analyses to be completed on a five year cycle. Nitrogen isotopes will be collected from surface water to compare with isotope analyses conducted on groundwater samples. DNA sampling will occur this summer (2008), to determine e-coli DNA throughout the watershed, adding to the initial sampling at the mouth.

Monitoring BMPs and projects will be the key to a successful application of the adaptive watershed planning and implementation process. The Idaho Association of Soil Conservation Districts personnel will be asked to conduct future water quality sampling within Lindsay Creek. Specific parameters that were sampled in the past and would be collected again include total phosphorus, ortho-phosphate, nitrite+nitrate-nitrogen, *E. coli* and fecal coliform bacteria, total suspended solids, turbidity, specific conductance, pH, % dissolved oxygen saturation, temperature, flow and dissolved oxygen.

Funding

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

CWA 319 –These are Environmental Protection Agency funds allocated to 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

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

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

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

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

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

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

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

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

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

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

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

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

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

Grazing Land Conservation Initiative (**GLCI) –**The GLCI's mission is to provide high quality technical assistance on privately owned grazing lands on a voluntary basis and to increase the awareness of the importance of grazing land resources. Source: http://www.glci.org/

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

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

Outreach

Conservation partners in the Lindsay Creek Watershed will use their combined resources to provide information about BMPs to improve water quality to agricultural landowners and operators within this watershed. A local outreach plan will be developed.

Newspaper articles, district newsletters, watershed and project tours, landowner meetings and one-on-one personal contact will be used as outreach tools.

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
Organize informational tours bringing together the Nez Perce Soil and Water Conservation District, their Board of Supervisors, the North Central District Health Department, the Lindsay Creek WAG, and other interested agency partners.

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