Little Salmon River
Total Maximum Daily Load
Implementation Plan for Agriculture, Forestry, and Urban/Suburban Activities

November 2008

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Acknowledgements

The Little Salmon River Watershed Advisory Group (WAG) would like to acknowledge that water quality concerns in the Little Salmon River Watershed are meant to be shared by all entities that own land, live or work in the watershed. The development of this document has brought some of these groups and individuals together, but it is recognized that other responsible parties have not yet engaged in the water quality improvement efforts.

The WAG would like to acknowledge the difficulty in implementing specific improvement projects with what some entities believe is limited water quality data. Recommendations for future monitoring locations will help focus future implementation projects. It is recognized that the details within this implementation plan are being proposed as best solutions considering the information available.

The WAG would also like to acknowledge that the improving the water quality in the LSR watershed is an ongoing and adaptive process that involves implementing BMPs; monitoring and assessing the effectiveness of BMPs; comparing results to expected outcomes; and adjusting the TMDL or implementation activities where necessary.

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Preface

The Little Salmon River Total Maximum Daily Load (TMDL) Implementation Plan was drafted by land management agencies and private land owners that affect water quality in this area.

The Idaho Association of Soil Conservation Districts (IASCD) in cooperation with the Idaho Soil Conservation Commission (ISCC), Valley Soil and Water Conservation District (Valley SCD) and United States Department of Agriculture (USDA) -Natural Resources Conservation Service (NRCS) represent private land owners and wrote the agricultural implementation plan.

The United States Forest Service (USFS), Idaho Department of Lands (IDL, Western Pacific Timber (WPT), and the Department of Environmental Quality (DEQ) wrote the forestry implementation plan. Potlatch Corporation provided review.

The city of New Meadows and Brundage Mountain Resort developed the Storm Water Runoff and Urban/Suburban Pollution Implementation Plan.

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Tracking and Accomplishments

The Department of Environmental Quality will review implementation progress on a five year rotation in conjunction with the Little Salmon River TMDL. The Little Salmon River Watershed Advisory Group (WAG) members agree to meet annually to assess projects and activities.

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CHAPTER I. AGRICULTURE IMPLEMENTATION PLAN

Developed for the Idaho Department of Environmental Quality

Prepared by the Idaho Association of Soil Water Conservation Districts and the Idaho Soil Conservation Commission in cooperation with the Adams Soil and Water Conservation District

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Introduction

Purpose

The Little Salmon River (LSR) 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 Little Salmon River Subbasin Assessment and TMDL (Little Salmon River TMDL). The intent of the BMPs and RMS outlined in the plan is to restore designated beneficial uses on the §303(d) listed streams within the Little Salmon River watershed by reducing pollutant contributions from privately owned parcels of agricultural land.

Goals and Objectives

The primary goal of this plan is to assist and/or compliment other efforts in the watershed to restore beneficial uses for the §303(d)-listed stream segments within the LSR subbasin. These water quality impaired stream segments are identified in the 2002 §303(d) list for the LSR subbasin (Table 1). The primary objective of this plan is to reduce the amount of pollutants from agricultural-related practices entering these listed water bodies.

Table 1. 2002 §303(d)-listed water bodies in the Little Salmon River subbasin.[a]

Water Body	Listed Pollutants	TMDL Developed
Little Salmon River	sediment and temperature	temperature, bacteria, nutrients
Big Creek	unknown	Bacteria
Elk Creek	sediment	None
Indian Creek	sediment	None
Shingle Creek	sediment	None
Brundage Reservoir	temperature	None

a. DEQ, 2006

The State of Idaho has adopted a non-regulatory approach to control agricultural nonpoint pollution sources. However, regulatory authority can be found in the Idaho Water Quality Standards and Wastewater Treatment Requirements (Idaho Administrative Procedure Act 58.01.02.350.01 through 58.01.02.350.03), which provides direction to the agricultural community and includes a list of approved BMPs.

The Little Salmon River Watershed Advisory Group (WAG), Idaho Department of Environmental Quality (DEQ), United States Forest Service (USFS), Idaho Department of Lands (IDL), Idaho Soil Conservation Commission (ISCC), and Idaho Association of Soil Conservation Districts (IASCD) were involved in developing the pollutant allocation and their continued participation will be critical while implementing this TMDL Implementation Plan for Agriculture. A portion of the *Idaho Agricultural Pollution Abatement Plan* (APAP; ISCC and DEQ 2003) outlines the responsible agencies or elected groups that are designated to address nonpoint source pollution problems.

For agricultural activities on private land, the Adams Soil and Water Conservation District (Adams SWCD), in cooperation with the ISCC, the IASCD, and the Natural Resources Conservation Service (NRCS), can assist landowners in developing and implementing conservation plans that incorporate BMPs that will help meet TMDL allocation targets.

Additional objectives of this plan are the implementation of a water quality outreach program, a BMP effectiveness evaluation process, and an ongoing water quality monitoring program. The intent of the outreach program will be twofold: first, to educate landowners about the TMDL process and how reducing agricultural impacts can help support the designated beneficial uses of the listed stream segments, and second, to encourage landowner participation in the application of BMPs. The BMP effectiveness evaluation process and monitoring program are designed to measure a BMP's effectiveness in reducing pollutants and through before-and-after water quality monitoring, to show any improvement in the water body itself.

Background

Project Setting

The Little Salmon River subbasin covers approximately 369,000 acres (576 square miles) in western Idaho (Figure 1). The subbasin is 45 miles long and covers areas of both Adams County and Idaho County. The subbasin is very sparsely populated with a total population of 1,948 citizens in 2000 (NRCS, 2007). However, development is expanding the northern portion of the subbasin due to its proximity to the resort community of McCall. The two primary cities in the subbasin are the town of New Meadows, population 533, and the town of Riggins, population 410 (2000 data; www.city-data.com).

The Little Salmon River drains the subbasin from the south near New Meadows to the north where it enters the mainstem Salmon River near Riggins (Figure 1). The subbasin is bounded by the Seven Devils Mountains to the west and the Salmon River Mountains to the east. Elevations in the subbasin range from over 9,000 feet in the Seven Devils headwaters to less than 1,800 feet at the mouth (NRCS, 2007). The subbasin can be divided into three primary areas: high elevation mountains with slopes of 60% or more covered with mixed conifer forests, where the majority of precipitation falls and feeds the Little Salmon River via its tributaries; the meadows area in the upper valley bottom above Round Valley Creek, characterized by a low-gradient, meandering stream channel with a native grass and shrub community; and the canyon section of the valley bottom below Round Valley Creek with steeper stream gradients and a warmer, more arid landscape (DEQ, 2006; NRCS, 2007).

Climate in the subbasin varies greatly by elevation. Annual precipitation ranges from more than 50 inches at Brundage Mountain to the north to less than 20 inches in the town of Riggins at the mouth. Most precipitation occurs as snow. In general, winters are cold and wet and summers are hot and dry. Average January temperatures range from 7 – 30 °F in New Meadows to 27 – 41 °F in Riggins. Average July temperatures range from 42 – 84 °F in New Meadows to 58 – 92 °F in Riggins (DEQ, 2006).

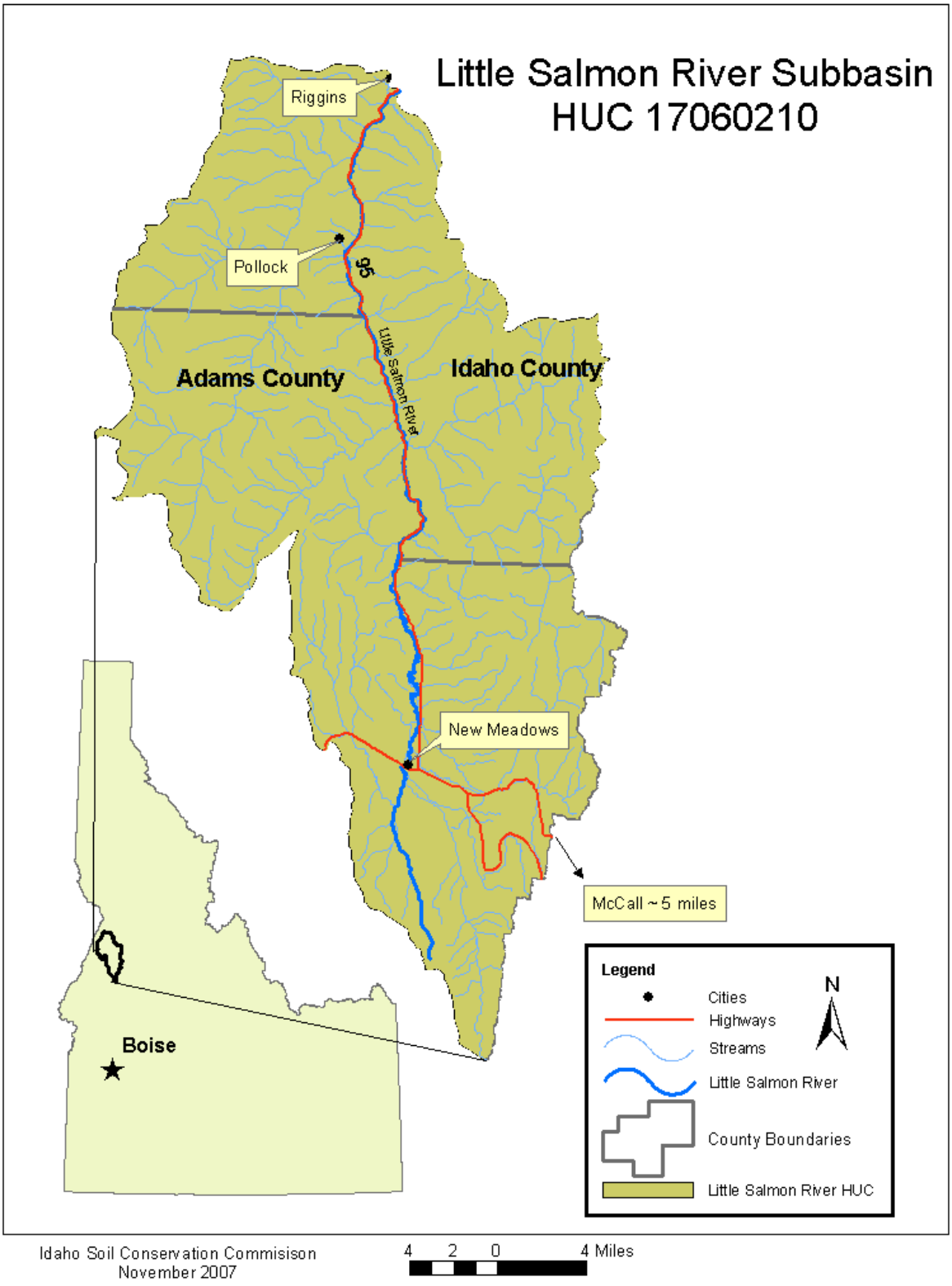

Figure 1. Little Salmon River subbasin location in Idaho.

The LSR subbasin contains seven level IV ecoregions (Figure 2). The five ecoregions that cover the most ground in the subbasin are described as follows. The flat valley bottom around New Meadows is located within the High Glacial Drift-Filled Valleys region characterized by outwash plains, wetlands, and hills. This area is referred to as the Little Salmon River meadows area. Native vegetation in this region is typically sedge and rush in wet bottom areas with bunchgrass, sagebrush, lodgepole pine, and ponderosa pine on drier sites. This ecoregion has been mainly converted to agriculture or residential development; therefore, it is the ecoregion where most of the agricultural BMPs recommended in this plan will be implemented. The Southern Forested Mountains region, located in the subbasin's eastern headwaters, has drought-prone granitic soils covered with an open Douglas-fir dominated forest with areas of ponderosa pine, sagebrush, and grasses. The Wallowa/Seven Devils Mountain region spans the subbasin's northwestern high elevation headwaters. This region also contains Douglas fir and ponderosa pine forests. Little Salmon River tributaries from the Seven Devils mountains tend to have steep gradients with deeply eroded canyons. Finally, the lower southwestern headwaters area falls within the Canyons and Dissected Highlands region and the area around the mouth of the Little Salmon River is within the Canyons and Dissected Uplands region. These two regions are characterized by dry deep river canyons in the rain shadow of the Seven Devils mountains. Native vegetation in the Highlands area is primarily Douglas fir and ponderosa pine while the lower, drier Uplands area is predominantly grassland (McGrath, Woods, Omernik, Bryce, Edmondson, Nesser, Shelden, Crawford, Comstock, and Plocher, 2002.).

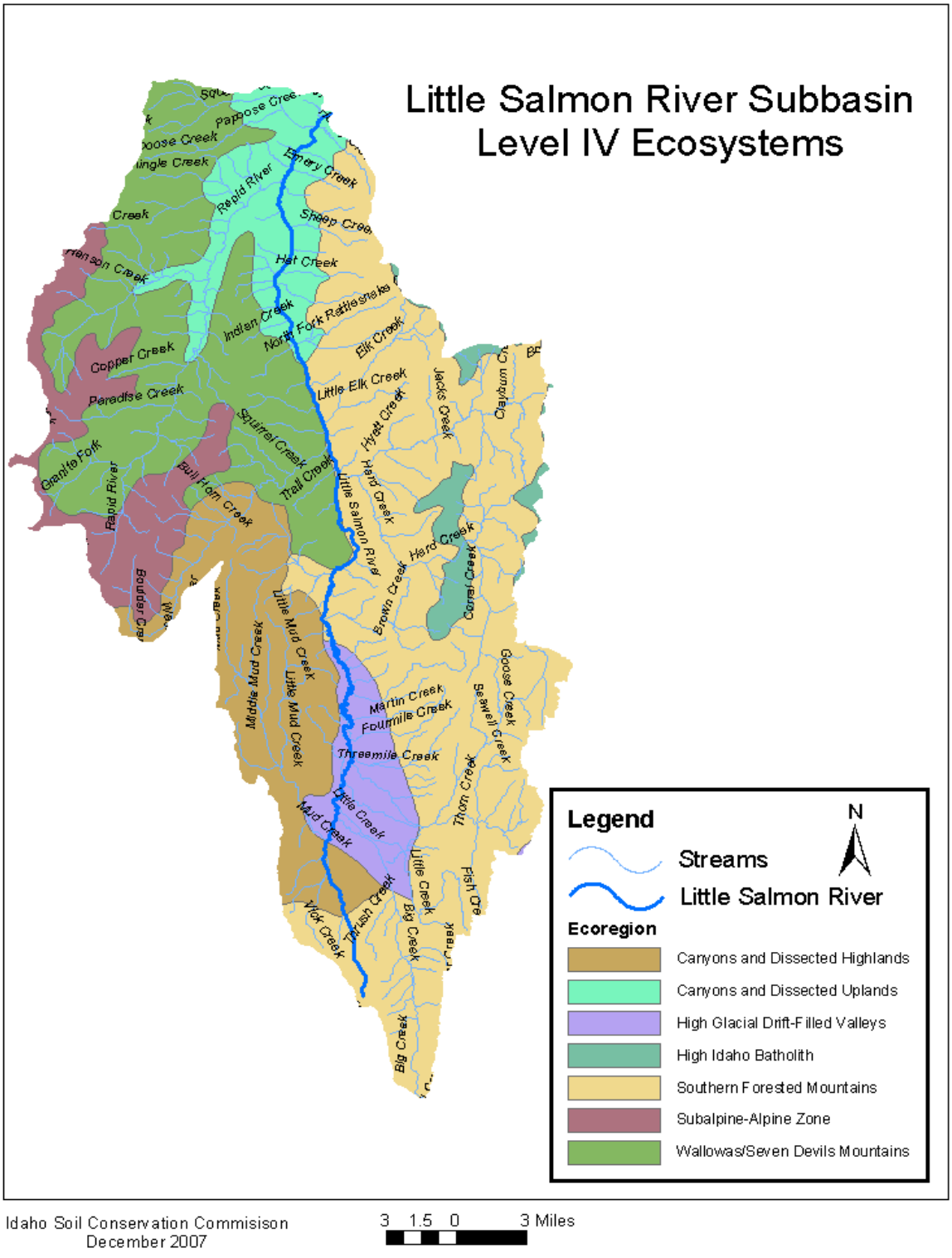

Figure 2. Level IV ecoregions in the Little Salmon River subbasin.

Subwatersheds

The Little Salmon River (LSR) subbasin is a cataloging unit, the fourth classification level in the scheme used by the United States Geological Survey (USGS) to classify and number hydrologic units. The LSR subbasin hydrologic unit code (HUC) is 17060210. For an explanation of the HUC system, please see the USGS Web site at http://water.usgs.gov/GIS/huc.html.

This implementation plan will only consider the subwatersheds in the LSR subbasin with streams that do not meet water quality criteria and therefore have a completed TMDL (Table 1). These are the four subwatersheds that feed the Upper Little Salmon River (meadows area) above Round Valley Creek, which will be considered together in this plan, and Big Creek (Figure 3, Table 2).

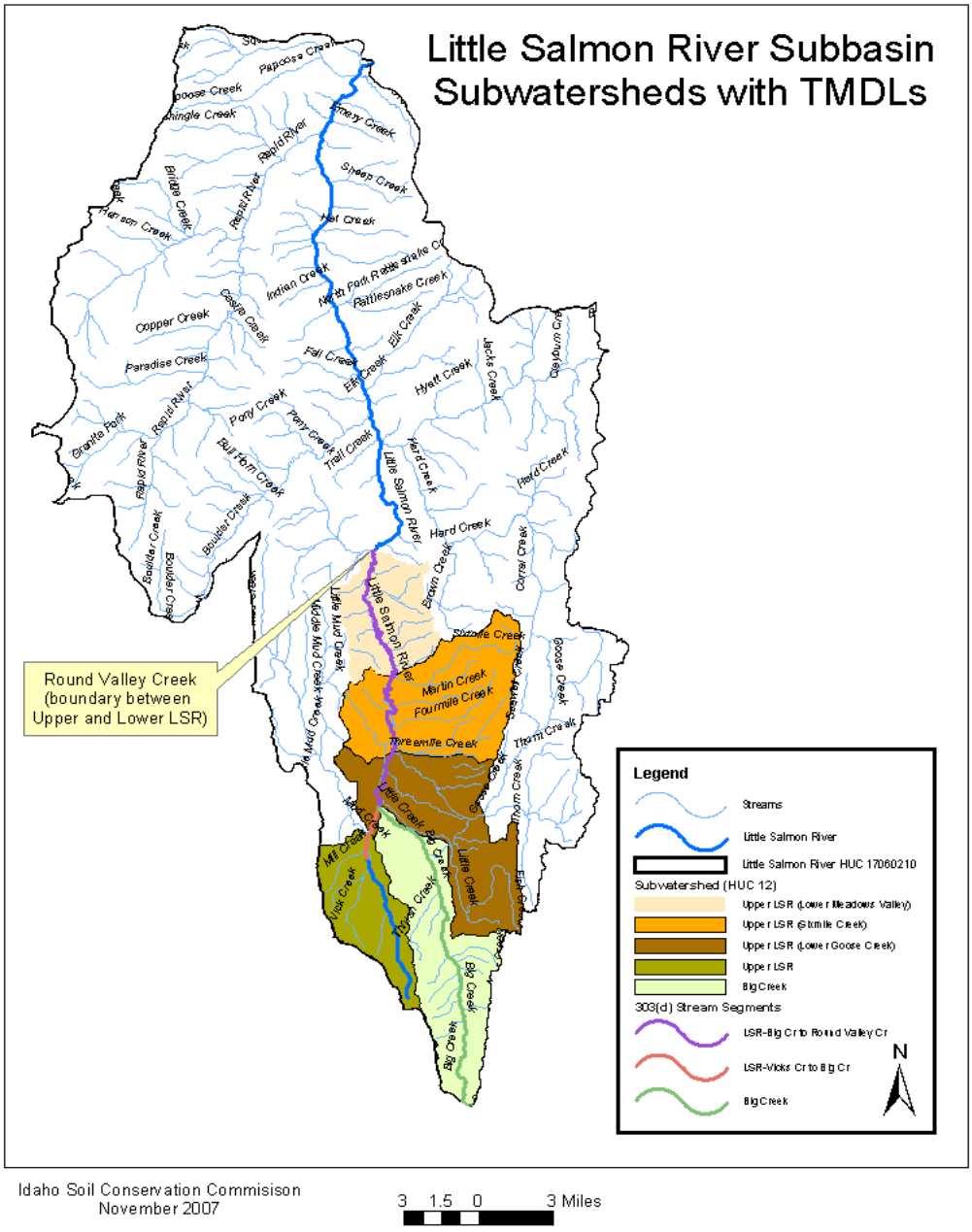

Figure 3. Subwatersheds with TMDLs and §303(d) streams in the Little Salmon River subbasin.

Table 2. Subwatersheds in the Little Salmon River subbasin with developed TMDLs.[a]

Subwatershed	HUC[b] 12 Subwatersheds	§303(d)-listed Segments	Stream Length	Listed Pollutants
Upper Little Salmon River	Lower Meadows Valley, Sixmile Creek, Lower Goose Creek, Upper Little Salmon River	Big Creek to Round Valley Creek	12.5 miles	temperature, bacteria, nutrients
		Vicks Creek to Big Creek	2.5 miles	temperature
Big Creek	Big Creek	1st and 2nd order streams	4.4 miles	bacteria, nutrients

a. DEQ, 2006; USGS 1:24,000 DLG stream GIS data; & USGS HUC GIS data
b. HUC – hydrologic unit code

The Upper Little Salmon River subwatershed upstream of Round Valley creek is characterized by a low gradient Rosgen C channel type with good access to the natural floodplain (DEQ, 2006). This reach flows almost entirely through privately owned agricultural and urban residential lands. The subwatershed upstream of Vicks Creek is forested.

Big Creek drains the southeast side of the upper subbasin. This tributary begins at 6,600 feet in publicly owned timber lands and flows north through private timber and rangeland before flowing through the low gradient private agricultural lands and rural residential parcels in the valley bottom. Big Creek enters the Little Salmon River about one mile southwest of New Meadows (DEQ, 2006).

Land Ownership

Land in the Little Salmon River subbasin is approximately 69% publicly owned and 31% privately owned. The primary public land management agency in the subbasin in the USFS followed by the BLM and the State of Idaho. The Nez Perce Tribe owns a small parcel (less than five acres) near the Rapid River (Table 3). Private lands are concentrated along the lower elevation flood plains and valley bottoms, while public lands are primarily located in the uplands (Figure 4) (DEQ, 2006).

Table 3. Land ownership in the Little Salmon River subbasin.[a]

Land Owner	Approximate Acreage	Percentage of Subbasin
Private	114,350	31%
USFS	224,790	61%
BLM	16,170	4%
State	13,410	4%
Nez Perce Tribe	<5	<1%
TOTAL	~368,720[b]	100%

a. DEQ, 2006
b. Estimates of total acreage in the basin vary by source.

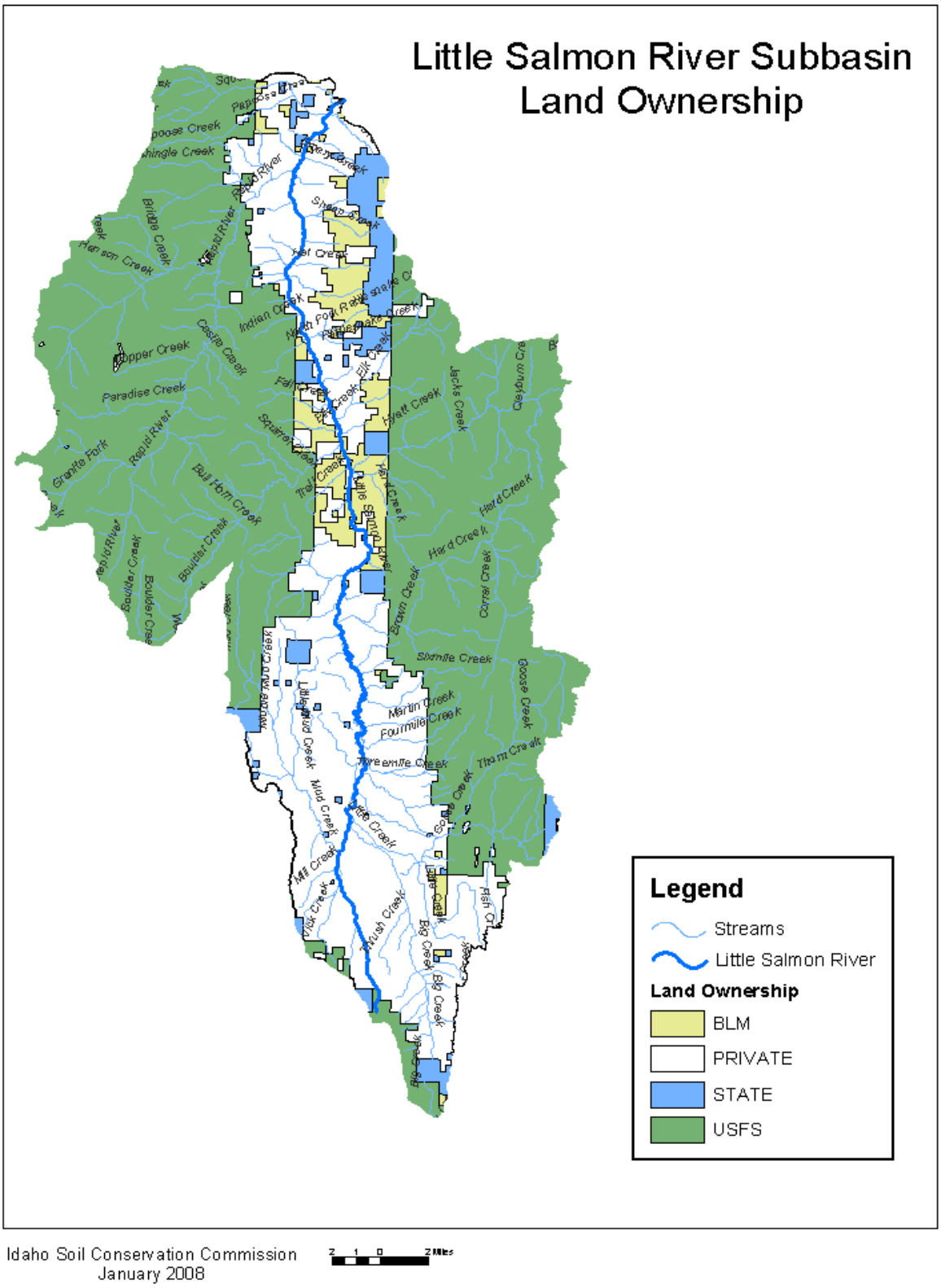

Figure 4. Little Salmon River Subbasin land ownership.

Land Use and Cover

The primary land use in the Little Salmon River subbasin is forestry. Forested lands are located in the higher elevations and are used primarily for grazing, timber, wildlife habitat, and recreation. The shrub rangelands are located directly below the forested elevations and are used primarily for grazing, wildlife habitat, and recreation. Grazing season on public lands is from mid-April to mid-November. Cattle are moved to private lower elevation grass, pasture, and hay lands during the winter months. These areas include both surface irrigated lands in the valley bottoms and non-irrigated hay lands. Grain crops and protected wetland acres cover only a very small portion of the subbasin (NRCS, 2007). The remainder of land is located in developed areas like the towns of New Meadows and Riggins, and the Meadow Creek Golf Resort. Lands classified as barren are primarily located on mountain tops. See Figure 5 and Table 4 for additional information on land use in the subbasin.

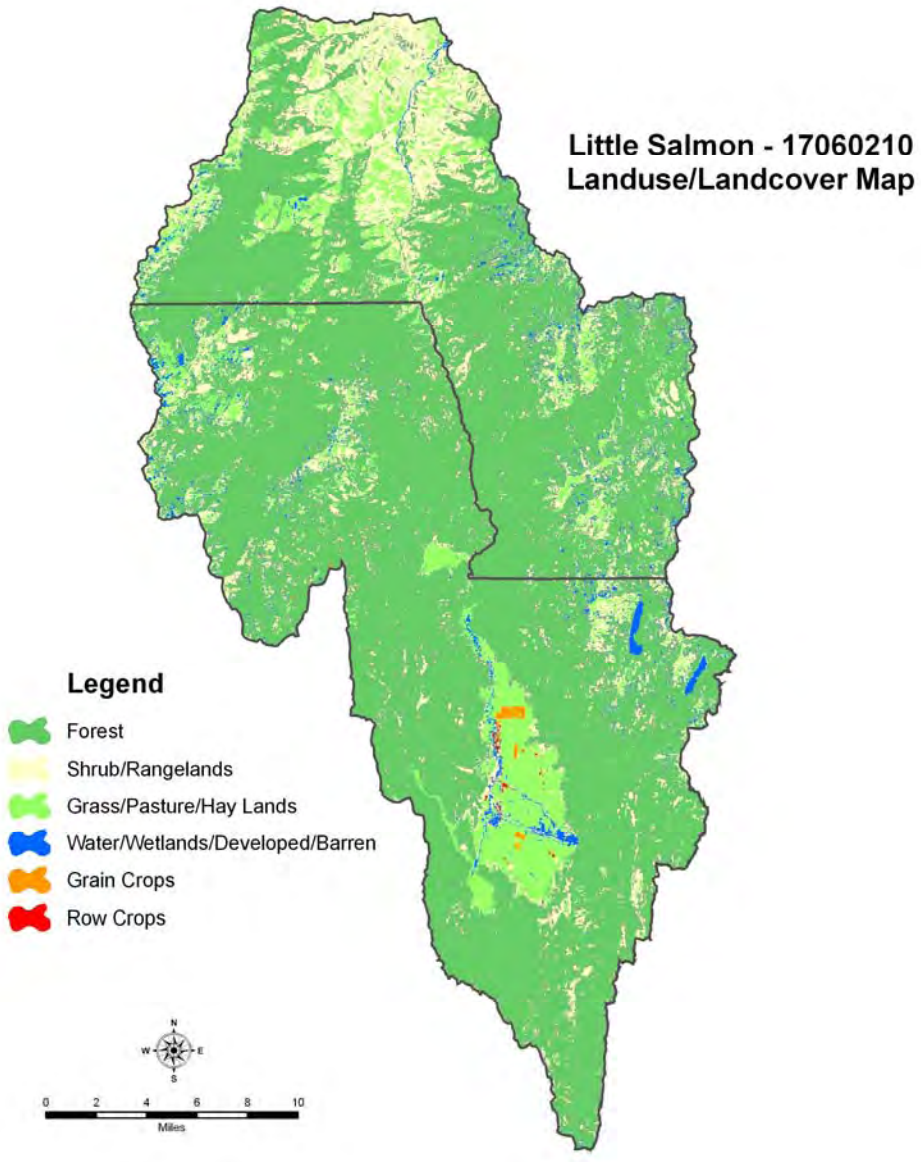

Figure 5. Land use and land cover in the Little Salmon River Subbasin.

Table 4. Land use/land cover in the Little Salmon River subbasin.[a]

Land Use/Land Cover Category	Approximate Acreage	Percentage of Subbasin
Forest	247,410	~67%
Brush/shrub	47,870	~13%
Grass (non-agriculture)	28,890	~8%
Barren/rock	12,000	~3%
Agriculture	11,580	~3%
Riparian	9,620	~2.5%
Burn areas	4,360	~1%
Water	1,808	<1%
Urban	160	<1%
No data available	5,750	~1.5%
TOTAL	369,448[b]	~100%

a. Idaho Water Resources Board (IWRB), 2001
b. Estimates of total acreage in the basin vary by source.

Conservation Accomplishments

Part of the TMDL implementation planning process includes reviewing and summarizing conservation practices (BMPs) installed to date in the subbasin. These existing BMPs are monitored for effectiveness by field staff (see the Monitoring and Evaluation section of this plan) as part of the adaptive management approach and the recommendations for new BMP implementation priorities take into consideration the location and effectiveness of BMPs currently in place. For the purpose of this plan, only agriculture-related conservation efforts in subwatersheds containing water bodies that do not meet water quality criteria are considered in this process. These water bodies are all located in the upper subbasin above the mouth of Round Valley Creek.

Recent Conservation Treatments in the Upper Subbasin

The NRCS tracks conservation treatments installed in the subbasin through both their cost-share programs and other state or federal cost-share programs. BMPs installed as treatment in these cost-share programs reflect an investment by landowners to improve resource conditions on their lands. Individual conservation treatments applied during fiscal years 2005 and 2006 are summarized in Table 5 below.

Table 5. Recently applied conservation treatments in the upper Little Salmon River subbasin.[a]

Conservation Treatment (Best Management Practice)	Fiscal Year 2005	Fiscal Year 2006	TOTAL
Fence (riparian or other)	4,692 ft	1,964 ft	6,656 ft
Fish passage (number)	-	3	3
Irrigation system, surface and subsurface	156 acres	-	156 acres
Pest management	-	200 acres	200 acres
Pipeline	-	2,585 acres	2,585 acres
Prescribed grazing	-	1,980 acres	1,980 acres
Row arrangement	1 acre	-	1 acre
Spring development (number)	-	3	3
Streambank and shoreline protection	-	500 ft	500 ft
Structure for water control (number)	-	2	2

a. Natural Resources Conservation Service (NRCS), 2007

Wetlands Reserve Program

There are 274 acres of wetland habitat protected in a 30-year conservation easement under the Wetlands Reserve Program in the Upper Little Salmon River subwatershed. This project is the product of the collaboration between the private landowner and the NRCS, BLM, Idaho Department of Fish and Game (IDFG), United States Fish and Wildlife Service (USFWS), and Adams SWCD. In 2000, project sponsors began the process of converting marginal pasture land into wetland by plugging drainage ditches to raise the water table, reestablishing river access to old oxbows, planting native willow species along more than two miles of the Little Salmon River, installing fencing to protect the riparian area, and developing off-site water sources for livestock. Since 2000, the extent and health of native riparian vegetation in this protected wetland has increased, providing critical wildlife habitat and improving water quality, by increasing bank stability and providing shade and a means to trap sediments and nutrients from overland flows.

Figure 6. Overlook of Wetland Reserve Project area on the Little Salmon River (2001).

Conservation Reserve Program

There are 14 acres enrolled in the Conservation Reserve Program (CRP) on the East Branch of Goose Creek in the Upper Little Salmon River subwatershed. These riparian acres have been excluded from livestock use since 2000, and will remain in exclusion until 2011. With the help of use exclusion and willow plantings, this area shows good recovery of riparian functions (personal communication with Ron Brooks, NRCS 1/2/08).

Brundage Watershed Land Treatment Project

The Brundage Watershed Land Treatment Project was initiated in the 1990s for the purpose of improving pasture management and productivity, irrigation water management, and grazing management in the LSR subbasin. This NRCS project was implemented over 10 years and involved 14 landowners, 3, 467 acres of pasture/hay land, and an investment of $566,000. BMPs installed through this project included pasture management planning, hay land planting, fencing, stock water systems, and irrigation water management systems including land leveling, structures for water control, and gated pipe. BMPs were installed on agricultural lands adjacent to or near the Little Salmon River and the following tributaries: Martin Creek, Four Mile Creek, Six Mile Creek, Big Creek, East and West branches of Goose Creek, Little Creek, and Three Mile Creek. This project accomplished significant improvements in the resource condition of the treated acres and the areas that were seeded have now mostly converted back to native grasses (personal communication with Ron Brooks, NRCS 1/9/08).

Water Quality Problems

Beneficial Use Status

Beneficial uses describe the possible uses of a water body in its unpolluted, fully functioning state. Idaho water quality standards require that the beneficial uses of all water bodies in the state be protected. Beneficial uses can include existing uses, designated uses, and presumed existing uses. If beneficial uses have not been designated, the water body is presumed to have cold water and primary or secondary contact recreation beneficial uses (DEQ, 2006). If DEQ determines, through their water body assessment process, that beneficial uses are not supported, as they did on the Little Salmon River and Big Springs Creek in this subbasin, that is an indication of water quality problems, and those water bodies are placed on the subbasin's §303(d) list for water quality improvement. As stated earlier, the primary objective of this plan is to reduce the amount of pollutants entering §303(d)-listed water bodies from agricultural-related practices in order to support beneficial uses. Beneficial uses for water bodies in the LSR subbasin that are on the §303(d) list and have TMDLs developed are listed in Table 6.

Table 6. Beneficial uses and support status for §303(d)-listed stream segments in the Little Salmon River subbasin.[a]

Water Body (Subwatershed)	Beneficial Uses	Support Status
Upper Little Salmon River (meadow area)	cold water, salmonid spawning, primary contact recreation, domestic water supply, special resource water	not full support
Big Creek	undesignated—presumed cold water and primary/secondary contact recreation	not full support
Brundage Reservoir	undesignated—presumed cold water and primary/secondary contact recreation	full support—proposed for delisting
Elk Creek	undesignated—presumed cold water and primary/secondary contact recreation	full support—proposed for delisting
Indian Creek	undesignated—presumed cold water and primary/secondary contact recreation	full support—proposed for delisting
Shingle Creek	undesignated—presumed cold water and primary/secondary contact recreation	full support

a. DEQ, 2006

Pollutants

As indicated by their inability to support beneficial uses, the Upper Little Salmon River and Big Creek subwatersheds have significant water quality problems. These problems occur in the meadows reach of the Upper Little Salmon River, the low gradient, meandering reach located above Round Creek in the Upper Little Salmon River subwatershed, and the lower portion of the Big Creek subwatershed during the summer months when naturally low flows are further diminished by irrigation withdrawals. During this critical period, excess phosphorus load

combined with higher water temperatures and low stream flows leads to excess aquatic plant growth which drives dissolved oxygen levels below water quality standards. Monitoring data also show that *E. coli* levels exceed water quality standards in these areas. Sediment is not considered a concern at this time (Campbell, 2005, 2006, 2007). Pollutants of concern in these subwatersheds are phosphorus, bacteria, and temperature (DEQ, 2006).

Phosphorus

Idaho State Department of Agriculture (ISDA) monitoring data show that phosphorus levels in the Upper LSR and lower Big Creek exceed state criteria and promote a nuisance level of periphyton (algae) (Campbell, 2005, 2006, 2007). A TMDL was written for total phosphorus (TP) for the Upper LSR between Big Creek and Round Valley Creeks and for Big Creek. Critically high TP and depressed dissolved oxygen levels occur only during the summer months; therefore, the load capacity target for TP set in the TMDL applies only during the critical period defined by DEQ as June 21 – September 22 (DEQ, 2006). See Table 7 for the load capacity and required reductions for TP in the Upper LSR and Big Creek.

Bacteria

As with TP, ISDA monitoring data show that *E. coli* levels exceed state water quality standards during the summer months at monitoring sites on the Upper LSR and Big Creek. The TMDL for bacteria also follows the same critical period as TP, June 21 – September 22. See Table 7 for the load capacity and required reductions in bacteria in the Upper LSR and Big Creek.

Temperature

DEQ water quality monitoring data show temperatures in the Upper LSR exceed the state maximum daily average standard. A TMDL for temperature was developed for the LSR Meadows Valley area. DEQ used percent effective shade cover as a surrogate target for temperature; therefore, the potential natural vegetation (PNV) shade cover represents the maximum thermal loading capacity in the TMDL. DEQ estimated existing shade cover for the Upper LSR using an aerial photograph analysis combined with solar pathfinder field verifications. Existing shade estimates are compared to PNV cover estimates to determine the thermal load reductions required in the TMDL (DEQ, 2006). See Table 7 for the solar load capacity and required reductions in solar thermal load in the Upper LSR.

Table 7. 2002 §303(d)-listed stream segments: identified nonpoint source pollutants and required reductions.[a]

Subwatershed	§303(d) Segments	Listed Pollutants	Load Capacity (LC)	Reduction Required to Meet LC	Percent Reduction Required
Upper Little Salmon River	Big Creek to Round Valley Creek	Temperature	2,034,631 kWh[b]/day	-365,630 kWh/day	-13%
		Bacteria	1.02 E11 cfu[c]/day (average)	-3.69 E 11 cfu/day (average)	-71% (average)
		Nutrients (TP)[d]	12.3 kg/day	-1.22 kg/day	-12%
	Vicks Creek to Big Creek	Temperature	2,034,631 kWh/day	-365,360 kWh/day	-13%
Big Creek	n/a	Bacteria	3.58 E10 cfu/day		-94%
		Nutrients (TP)	1.84 kg/day	-0.95 kg/day	-41%

a. DEQ, 2006
b. Kilowatt hours
c. Colony-forming units
d. Total phosphorus

Nonpoint Source Pollution Sources

There are many different factors that may be contributing to the water quality problems in the Upper Little Salmon River and Big Creek subwatersheds. Hot, dry summers lead to naturally low stream flows and higher water temperatures during the critical period of June 21 – September 22. Irrigation withdrawals in the subbasin during this same period further diminish flow which exacerbates high temperatures and the problems caused by excess phosphorus. While excess levels of phosphorus (P) have been identified through ISDA monitoring as described above, no specific studies to quantify different sources of phosphorus have occurred in the subbasin. One potential source of phosphorus is cattle manure transported to the listed water bodies by surface water irrigation (Campbell, 2006). Other possible factors contributing to the transport of phosphorus into surface water are the desorption, dissolution, and extraction of phosphorus from the soils, unstable stream banks, lack of riparian vegetation buffers, precipitation, runoff events, temperature, and anaerobic soil conditions (Shewmaker, 1997).

Water Quality Monitoring

In response to the placement of the Upper Little Salmon River and Big Creek on the §303(d) list of impaired water bodies in Idaho, water quality monitoring has occurred in these subwatersheds to better understand the causes of the impairment. In addition to the monitoring conducted by DEQ as part of the Little Salmon River subbasin assessment, the Idaho State Department of Agriculture (ISDA) conducted three seasons of water quality monitoring from 2004 – 2006 at the request of the Little Salmon River Watershed Advisory Group (WAG). This project analyzed suspended sediment concentration, phosphorus, bacteria, and dissolved oxygen at sites located on different tributaries, including Big Creek, and the Little Salmon River in the meadows area (between New Meadows and Round Valley Creek). Results from these data show a trend of elevated phosphorus and bacteria levels during the summer months which promote low levels of

dissolved oxygen in the Little Salmon River. These data do not indicate any water quality concerns from suspended sediment concentrations. For more detailed information on the ISDA's water quality monitoring data please refer to the Little Salmon River Meadows Area Water Quality Monitoring Reports, available at http://www.idahoag.us/Categories/Environment/water/swReports.php.

A similar water quality monitoring effort was conducted in the meadows area of the Little Salmon River and its tributaries from 1980 – 1983 by the Soil Conservation Service (now NRCS), Idaho Department of Health and Welfare, and the Department of Community and Environmental Health and Boise State University in an effort to document baseline water quality characteristics in the watershed before expanding the irrigation season to its current length. This study measured the following water quality indicators: ammonia, nitrite, nitrate-nitrogen, total phosphorus, bacteria, dissolved oxygen, pH, turbidity, temperature, suspended sediment, flow, and hardness. This study found samples with water that failed to meet state water quality criteria for fecal coliform bacteria, dissolved oxygen, total phosphorous, and temperature; however, the author found that fecal coliform bacteria was the only significant pollutant in the upper LSR during the period of this study. Stream flows measured in the LSR during this study ranged from less than 20 cubic feet per second (cfs) to 820 cfs at the lower end of the meadow section (above Round Valley Creek) to a minimum of less than 0.1 cfs during the summer near New Meadows below irrigation diversions (Edmondson, 1985).

Agricultural Water Quality Inventory and Evaluation

Riparian

Staff from the ISCC and IASCD conducted agricultural riparian area assessments in the Upper Little Salmon River and Big Creek subwatersheds between 2001 and 2007. A photo point inventory with a visual assessment of stream channel characteristics was conducted on the Upper Little Salmon River and Big Creek in July of 2001. A more complete and quantitative riparian assessment was completed on Big Creek between May and August of 2006 and on the Little Salmon River in October of 2007. These later riparian assessments used a modified NRCS Stream Visual Assessment Protocol (SVAP) and included the collection of solar pathfinder data to determine the amount of existing shade on the water bodies. Where SVAP data was missing, photo interpretation was used to estimate results. Results from these assessments are summarized below.

Upper Little Salmon River

A summary of stream channel conditions found the primary adjacent land use to be grazing and pasture (Ferguson, 2001a). Most areas viewed in the assessment had a limited amount of woody vegetation. Grazing impacts included the removal of woody vegetation and slowing of woody species regeneration. Channel stability was poor throughout the area viewed (waypoint 064 to 082) except at waypoint 067, and at waypoint 071 where woody species were recovering (Figure 9). The channel appeared over-widened throughout the area viewed; however, channel sinuosity was appropriate for the stream and valley morphology (Ferguson, 2001a).

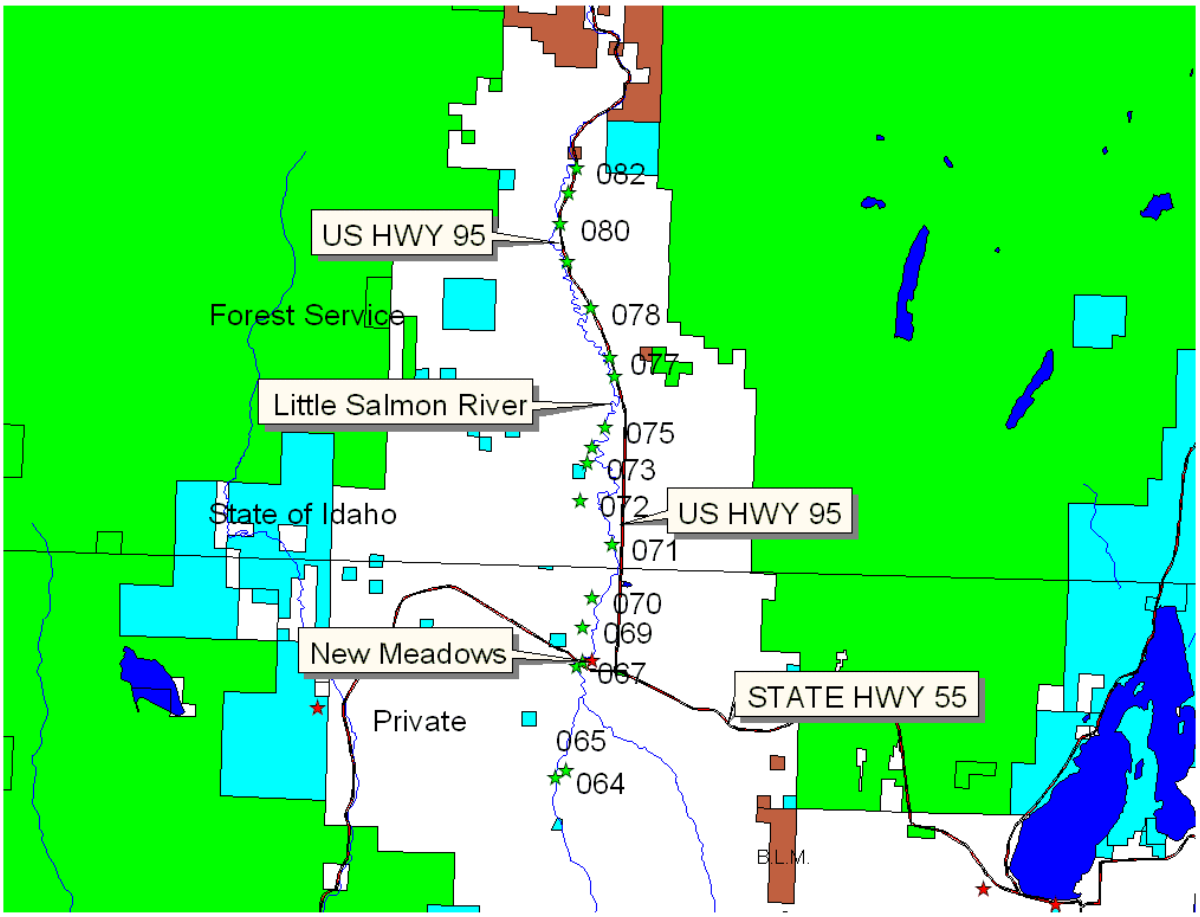

Figure 7. Waypoints marking points visually assessed in the 2001 Little Salmon River Physical Characterization of Riparian Area.

In October of 2007, ISCC staff performed SVAP assessements on five reaches of the LSR including solar pathfinder readings (Table 9), stream erosion condition inventory, and photo documentation. The reaches were defined by previous water quality monitoring sites that had landowner-approved access. Results from the 2007 SVAP assessment of the LSR (Table 10) show Upper LSR in overall fair to good condition. Reaches 3 and 4 (Figure 10) were in conditions that were close to natural/excellent due to a Wetland Reserve Program (WRP) that has been in place since 2000. Within this WRP corridor of the LSR, NRCS and its partners restored the river with BMPs that allow the river to act naturally by accessing the flood plain. Through this action alone, the WRP corridor acts as a filter to settle out sediment and bind nutrients originating upstream. The condition of reaches 2-0 was considerably impacted by grazing activities to the point that the solar load was significant, the riparian areas were lacking woody vegetation, and banks were unstable. Solar loading information was gathered by taking Solar Pathfinder readings within each of the five reaches. The solar pathfinder results are skewed to show loading during the 6- month period of April through September which coincides with less water volume and greater likelihood of thermal loading.

Table 8. Summary of Solar Pathfinder results for the Little Salmon River.[a]

LSR Reach	Percent Shaded (from ISCC[b] field data)	Percent Shaded (from DEQ Aerial Photo Interpretation)
LSR 4	25.1 %	20%
LSR 3	6.2%	0%
LSR 2	6.17%	0%
LSR 1	5.6%	0%
LSR 0	8.06%	10%

a. Solar readings were taken in October after most deciduous species had shed foliage.
b. ISCC - Idaho Soil Conservation Commission

Table 9. Summary of stream visual assessment protocol (SVAP) results for the Little Salmon River.

Total stream miles assessed	18.4
Average condition for all reaches assessed	Fair
Percent of stream in poor condition	10%
Percent of stream in fair condition	39%
Percent of stream in good condition	51%
Percent of stream in excellent condition	0%

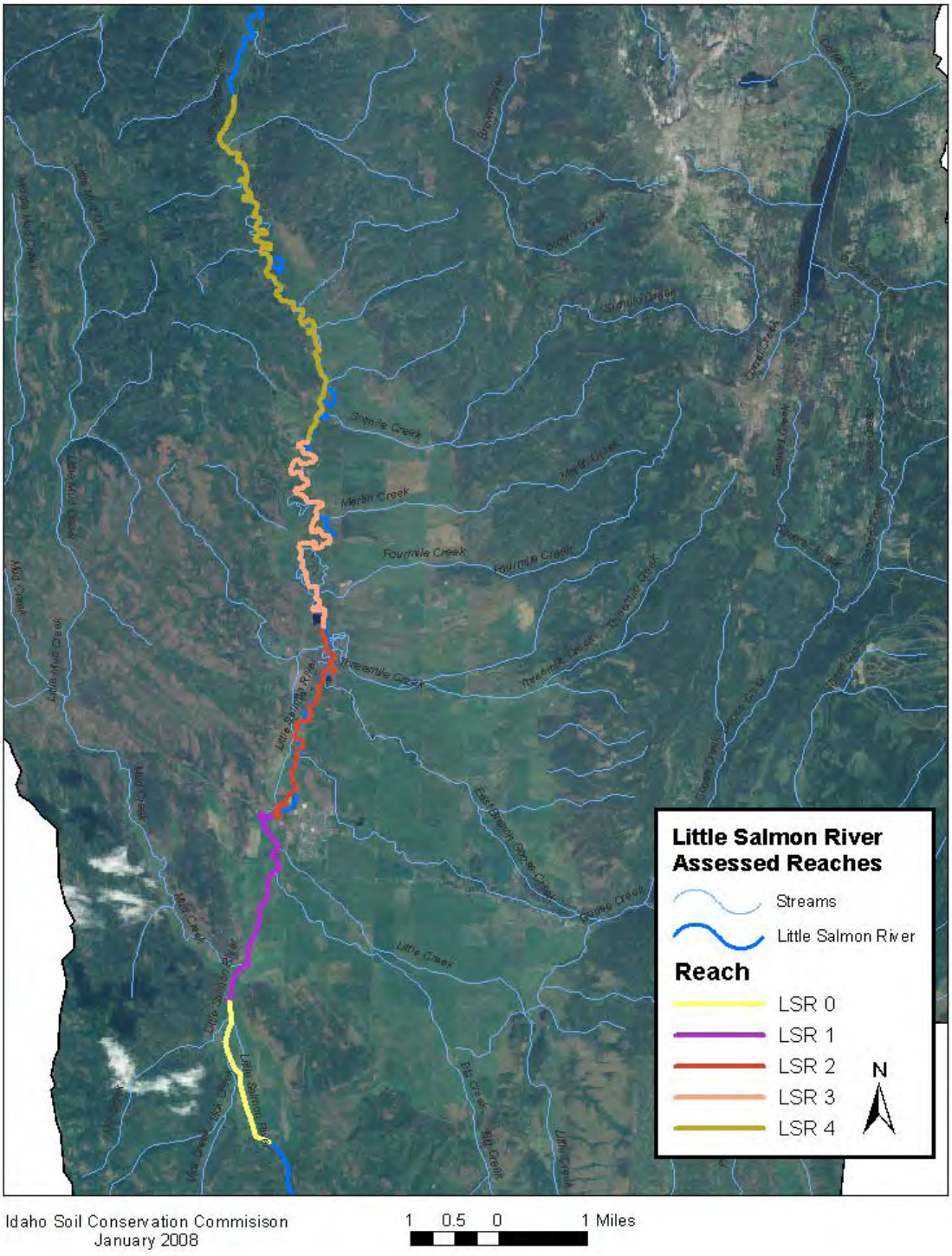

Figure 8. Reaches on the Little Salmon River assessed with stream visual assessment protocol (SVAP).

Big Creek

Results from the Big Creek of Adams County, Idaho Physical Characterization of Riparian Area report found a primary adjacent land use of grazing and pastureland with grazing impacts varying from moderate to severe in the areas viewed. Above waypoint 062 (Figure 7), a fair amount of woody vegetation existed with limited regeneration. Below waypoint 062, woody vegetation occurrence and regeneration was limited, influencing channel stability and morphology (Ferguson, 2001b).

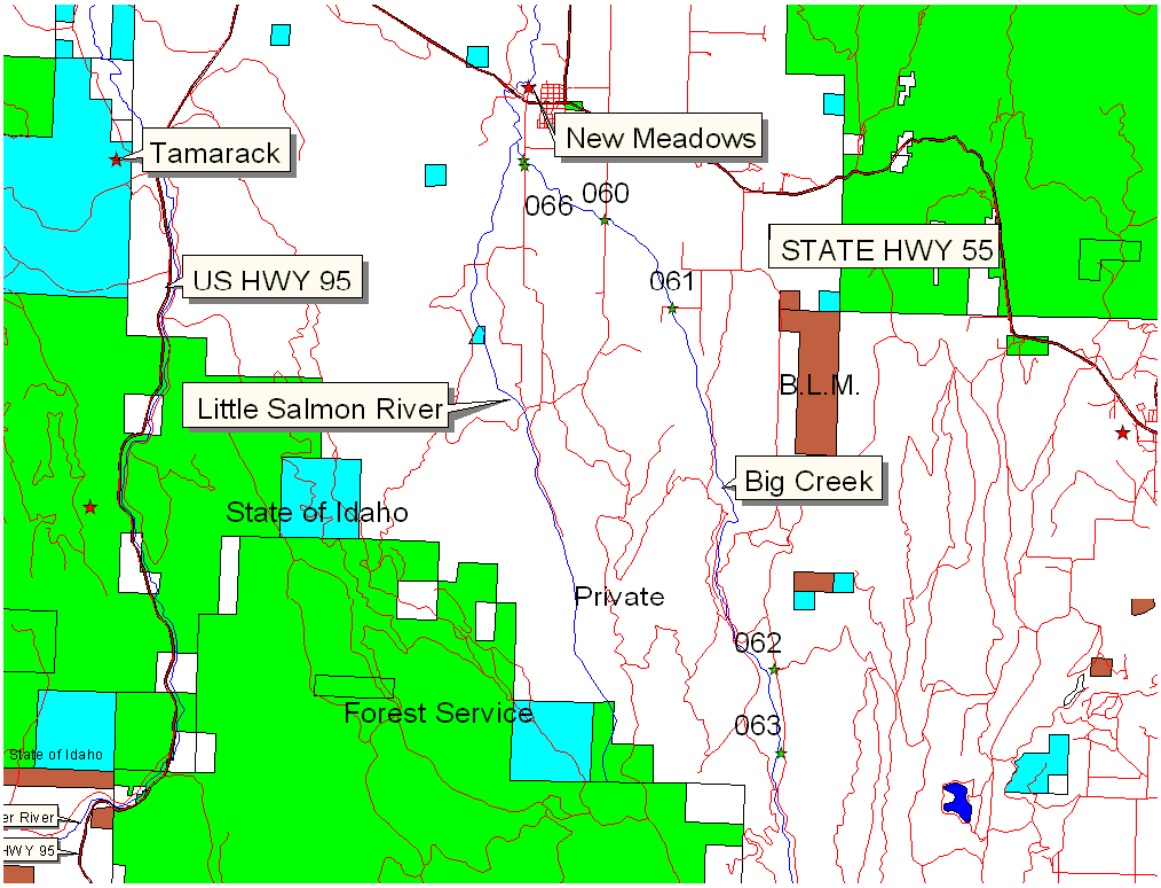

Figure 9. Waypoints marking points visually assessed in the 2001 Big Creek Physical Characterization of Riparian Area.

Results from the 2006 SVAP assessment of Big Creek are summarized in Table 8. In general, the SVAP data show the stream in excellent or good condition on private lands in the timbered section of the watershed. As Big Creek nears the valley bottom land near New Meadows, impacts from irrigation withdrawals and agricultural uses increase and the data show the stream in fair to poor condition (Figure 8).

Table 10. Summary of stream visual assessment protocol results for Big Creek.

Total stream miles assessed	~9 miles
Average for all reaches assessed	Fair
Percent of stream in poor condition	6%
Percent of stream in fair condition	19%
Percent of stream in good condition	31%
Percent of stream in excellent condition	43%
Agricultural stream miles unassessed	~ 3 miles

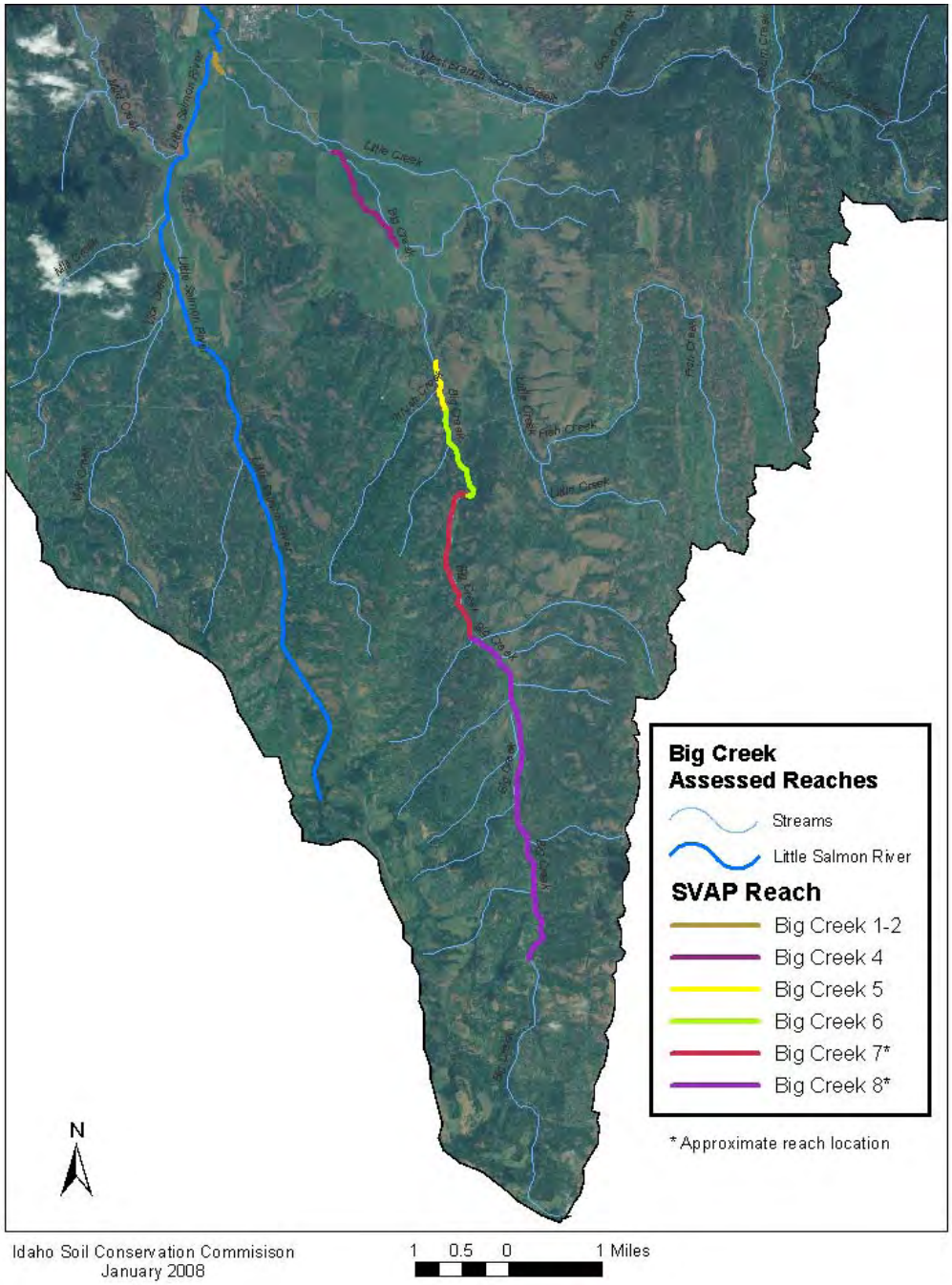

Figure 10. Reaches on Big Creek assessed with stream visual assessment protocol (SVAP).

Pasture

NRCS staff conducted pasture condition inventories on select pastures in the subbasin in May of 2005. Both irrigated and non-irrigated pastures in the Upper Little Salmon River and Big Creek subwatersheds were inventoried. The NRCS Idaho pasture condition score sheet was used to rate pasture condition based on the visual evaluation of 10 indicators (% desirable plants, plant cover, plant diversity, plant residue, plant vigor, % legume/forbs, uniformity of use, livestock concentration areas, soil compaction, and erosion). Each indicator has five levels of conditions ranging from lowest (1) to highest (5). A pasture is given an overall condition score based on the sum of the individual indicator scores. The highest possible score is 50. Table 11 below shows the results for pastures inventoried. Average pasture condition scores in each of the subwatersheds fall in the 35 to 45 category indicating overall good pasture conditions needing only minor management changes to enhance resource conditions. According to NRCS staff, the results from the six pasture inventories summarized in Table 11 are representative of overall pasture conditions in the watershed (email communication with Ron Brooks 12/17/07).

Table 11. Results from Natural Resources Conservation Service 2005 pasture condition score sheets in the Little Salmon River subbasin.

Subwatershed	Tributary	Total Acres	Average Score
Big Creek	Big Creek	395	40.8
	Big Creek	286	42.5
Upper Little Salmon River	Four Mile Creek	613.8	42.0
	Goose Creek	783.6	40.2
	Goose Creek	375	40.7
	Martin Creek	160	41.5

Threatened and Endangered Species

In accordance with the federal Endangered Species Act (ESA), any on-the-ground installation of agricultural BMPs receiving federal or state support must include an assessment of impacts to species listed as threatened or endangered (T&E) in the project area. Threatened and endangered species with potential habitat in the Upper Little Salmon River and Big Creek subwatersheds are listed below in Table 12. None of these species are likely to occur in agricultural lowlands; however, any BMP implementation that may affect a T&E species or its habitat will follow ESA consultation requirements. Note that a waterfall acts as a barrier at river mile 24 (Figure 11) stopping the migration of T&E-listed species from the lower part of the subbasin into the upper part above Round Valley Creek. Agricultural conservation planning for the installation of BMPs recommended in this plan will be coordinated with other species recovery and protection efforts in the subbasin to improve listed species' habitats and address any potential impacts to T&E species from BMP implementation. When applicable, individual conservation plans will include consultation with agency biologists to identify BMPs that maximize benefits to listed species. Improvements in water quality achieved from the BMPs recommended in this plan are not expected to adversely affect listed species and should, in general, improve or enhance their habitat.

Table 12. Species listed on the Endangered Species Act-that are present in Adams County, Idaho.[a]

Threatened and Endangered Species	Status	Distribution
gray wolf (Canis lupus)	experimental/nonessential population	wide range of possible habitats in Adams County, including forest, mountains, and grasslands
Canada lynx (Lynx canadensis)	threatened	very sparse population densities in high mountain spruce/fir forests
northern Idaho ground squirrel (Spermophilus brunneus brunneus)	threatened	dry meadows surrounded by ponderosa pine and Douglas fir forests; found only in Adams and Valley County
steelhead (Oncorhynchus mykiss)	threatened (proposed critical habitat)	mainstem LSR and lower tributaries below RM 24[b]
spring/summer chinook salmon (Oncorhynchus tshawytscha)	threatened	mainstem LSR and lower tributaries below RM 24
fall chinook salmon (Oncorhynchus tshawytscha)	threatened	possible below RM 24
bull trout (Salvelinus confluentus)	threatened (proposed critical habitat)	mainstem LSR below RM 24, Rapid River, Boulder Creek, lower Hazard, Hard Creek

a. Sources: http://www.fws.gov/idaho/agencies/COlists/Adams%20County.pdf , http://www.fws.gov/idaho/species/IdahoT&E.htm, http://library.fws.gov/Pubs/lynx.pdf, http://species.idaho.gov/list/groundsquirrels.html, and DEQ, 2006.

b. RM (river mile) 24 is the location of a natural falls that serves as a physical barrier to the migration of fish in the Little Salmon River.

Animal Feeding Operations and Dairies

According to the ISDA Division of Animal Industries there are no known animal feeding operations (AFOs) or dairies located in the Little Salmon River subbasin.

Figure 11. Location of the barrier to fish migration between the upper meadows area and the lower canyon area of the Little Salmon River.

Treatment

Critical Areas

Areas of agricultural lands that contribute pollutants to water bodies are defined as critical areas for BMP implementation. Critical areas are prioritized for treatment based on their location relative to a water body of concern and the potential for pollutant transport and delivery to the receiving water body. Critical areas are those areas in which treatment is considered necessary or useful to address resource concerns affecting water quality. Critical areas in the LSR subbasin designated in this TMDL implementation plan include agricultural lands within the Upper Little Salmon River and Big Creek subwatersheds below tree line. Generally, these areas can be divided into riparian areas (TU 1) and the pasture/hay fields they flow through (TU 2). Agricultural lands that are documented to be in good condition are excluded from the critical area estimates.

Treatment Units (TU)

The following treatment units (TUs) describe areas in the LSR subbasin with similar land uses, soils, productivity, resource concerns, and treatment needs (Table 13 and Figure 12). 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. Critical acres are the critical areas where BMP implementation would positively affect water quality within each treatment unit.

Table 13. Treatment units in the Little Salmon River subbasin.

<table>
<tr><th colspan="4">Treatment Unit 1 - Riparian Areas</th></tr>
<tr><th>Total Acres</th><th>Critical Areas, Acres (number)</th><th>Critical Areas, Stream Length (miles)</th><th>Common Resource Problems</th></tr>
<tr><td rowspan="3">615</td><td>Big Creek
32</td><td>23,134</td><td rowspan="3">• Lack of woody vegetation and regeneration
• Lack of deep-rooted riparian plant species
• Unstable stream banks
• Diminished stream flows from irrigation withdrawals
• Altered channel morphology (lack of pools, over-widened)</td></tr>
<tr><td>Little Salmon River
246</td><td>75,716</td></tr>
<tr><td>Unlisted tributaries
126</td><td>NA</td></tr>
<tr><th colspan="4">Treatment Unit 2 – Pasture/Hay Lands</th></tr>
<tr><th>Total Acres</th><th>Critical Acres</th><th colspan="2">Common Resource Problems</th></tr>
<tr><td>15,206</td><td>11,690</td><td colspan="2">Potential for nutrient runoff/leaching</td></tr>
</table>

The riparian treatment unit (TU 1) was delineated as three times an average channel width (to approximate a buffer of one channel width on each side of the stream), based on the recommendation of local NRCS field staff. The treatment area was calculated with standard geographic information system (GIS) software (ArcGIS), using the USGS 1:24,000 DLG stream layer clipped to private lands below tree line. Average channel width was estimated from measurements taken from NAIP aerial imagery. The riparian treatment unit (TU 1) width for the LSR is 42 meters; for Big Creek and all unlisted tributaries, it is 18 meters. Riparian areas known to be in good functional condition were excluded from the estimate of critical riparian acres. These excluded areas included the LSR from the WRP (see the Conservation Accomplishments section above) downstream to the mouth of Round Valley Creek and treated portions of Fourmile Creek, East Branch Goose Creek, and Big Creek.

The pasture/hay lands treatment unit (TU 2) was estimated in Arc GIS by digitizing pasture/hay fields below tree line in the Upper Little Salmon River and Big Creek subwatersheds. The USDA Farm Service Agency's crop land unit (CLU) layer was used as a guide where appropriate. Areas of urban/residential development around the town of New Meadows were excluded from TU 2. In addition, pasture/hay lands enrolled in the NRCS's Conservation Security Program (CSP) and the WRP and CRP projects (see the Conservation Accomplishments section above) are known to be in good condition and were therefore excluded from the estimate of critical pasture/hay lands acres.

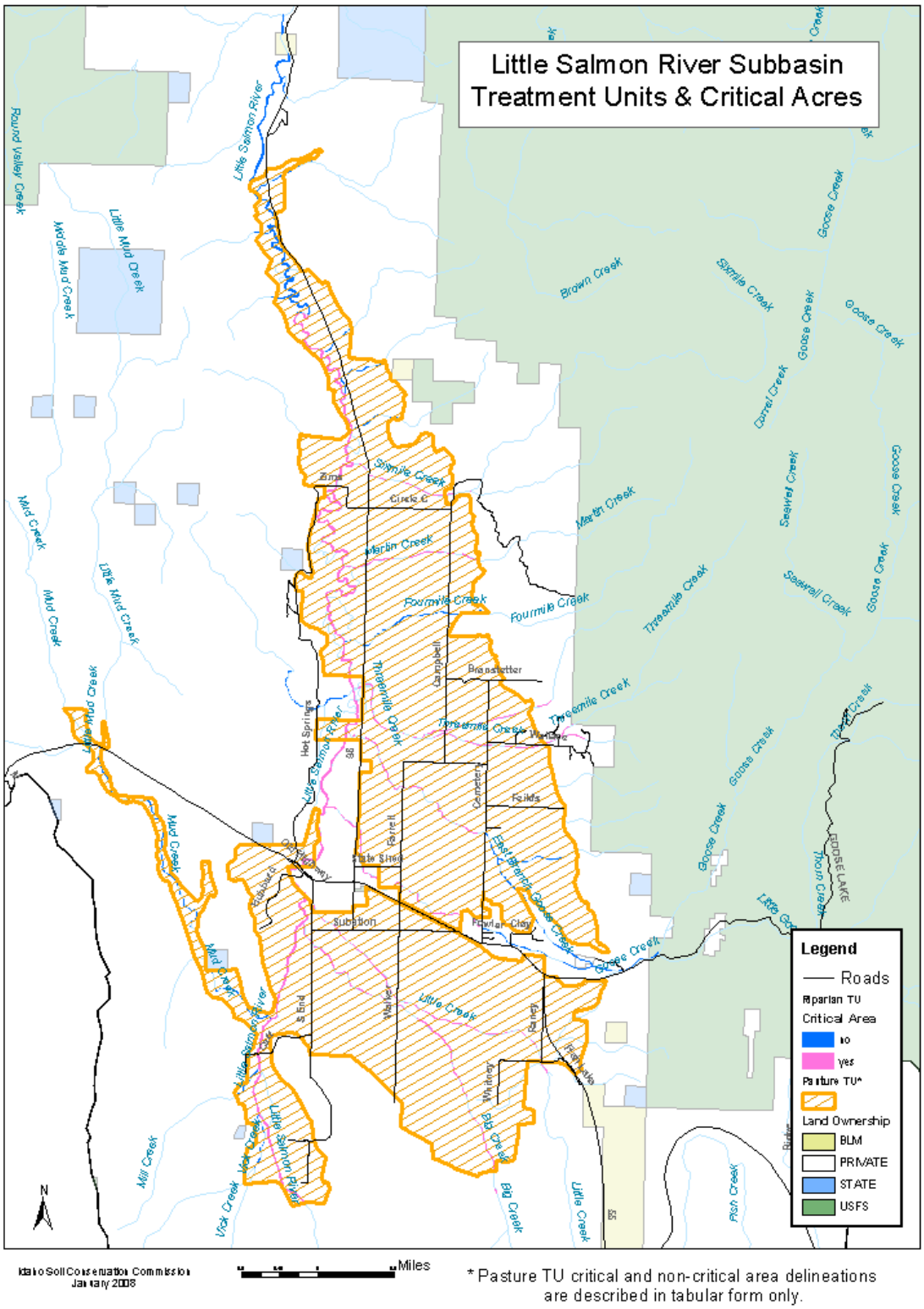

Figure 12. Little Salmon River subbasin treatment units and critical areas.

Recommended BMPs and Estimated Costs

BMPs and their installation costs are listed below in Table 14. Individual conservation planning for willing landowners will determine the most appropriate BMPs to install on a case by case basis. The quantities of each BMP recommended to install will depend on these plans. The information included in Table 14 provides an estimate only of the BMPs recommended for TU 1 and TU2 in the subbasin and their approximate costs.

Table 14. Recommended best management practices (BMPs) and estimated costs, Little Salmon River subbasin.

Treatment Unit 1 - Riparian Areas		
Recommended BMPs	***NRCS[a] Practice Code***	***Estimated Total Cost[b]***
Channel bank vegetation – willow cutting pole planting	322	$2.73/ft
Fence – barbed wire	382	$2.31/ft
Fence – jack/wood rail	382	$6.51/ft
Spring development	574	$2,400.00 each
Use exclusion	472	$34.00/acre
Watering facility	614	$866.67 each
Treatment Unit - 2 Pasture/Hay Lands		
Recommended BMPs	***NRCS Practice Code***	***Estimated Total Cost***
Irrigation water management – low intensity	449	$5.00/acre
Prescribed grazing – pasture site	528	$5.00/acre
Structure for water control	587	$1,266.67/each
Irrigation water conveyance, pipeline – type and size of pipe will vary based on individual site needs	430DD	Varies based on site needs
Above-ground multi-outlet pipeline (gated pipe) – 12 inch	431	$12.40/foot

a. Natural Resources Conservation Service

b. Estimated costs based on the October 2007 Idaho NRCS payment schedule. Estimated total cost includes landowner and cost share contributions.

Additional Field Assessments and Planning

In order to further define treatment needs in the Big Creek and Upper Little Salmon River subwatersheds, additional agricultural water quality inventory and evaluation is recommended. Specific field assessment priorities include conducting SVAP inventories and pasture condition assessments on the portions of Big Creek unassessed in 2006 and unlisted tributaries to the Upper Little Salmon River including Sixmile, Martin, Fourmile, Threemile, Goose, Little, and Mud Creeks.

Recommended Priorities for BMP implementation

The implementation of agricultural BMPs in the LSR basin are prioritized based on their potential to help meet the water quality goals stated in the LSR TMDL. Priorities for treatment

are based on the information and data described in this plan with oversight from the Adams SWCD board of supervisors. Implementation priorities are coordinated with the Adams SWCD Annual Work Plan. Table 15 lists priorities for BMP implementation for the improvement of water quality. The Adams SWCD's main objective is to meet the requirements of Section 319 of the 1987 Water Quality Act, the 1986 Safe Drinking Water Act, and the 1972 Clean Water Act. This plan also has the goal of identifying and prioritizing conservation and water quality projects found by the district to be appropriate for impacted waters.

Table 15. Priorities for agricultural BMP implementation in the Little Salmon River subbasin.

Priority Ranking	Treatment Units	Rationale
1	Riparian areas on Big Creek and Little Salmon River	Treating the riparian areas adjacent to the 303(d)-listed water bodies will have the most effect on improving water quality in those reaches.
2	Riparian areas on tributaries	Water quality of the tributaries to the 303(d) stream reaches influences the water quality of the listed reaches; therefore, improving resource conditions on these tributaries will positively affect meeting TMDL water quality criteria in the subbasin. Additional stream and pasture assessment is recommended for these areas.
3	All pasture/hay lands	With adequate riparian buffers and good riparian conditions, upland pasture/hay land conditions will have a lesser influence on water quality in the subbasin.

Funding

Financial and technical assistance for installation of BMPs is needed to ensure success of this implementation plan. The Adams SWCD 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.

Potential funding 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 Nonpoint 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 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 Little Salmon River subbasin including the Adams SWCD, NRCS, ISCC, IASCD, WAG, and DEQ will use their combined resources to provide information about BMPs to improve water quality to agricultural landowners and operators within the subbasin. A local outreach plan may be developed. Newspaper articles, district newsletters, watershed and project tours, landowner meetings and one-on-one personal contact may be used as outreach tools.

Outreach efforts will:

- Provide information about the TMDL process to the public
- Distribute water quality monitoring reports
- Accelerate the development of conservation plans and program participation
- Enhance technology transfer related to BMP implementation
- Increase public understanding of agriculture's contribution to conserve and enhance natural resources and agriculture's commitment to meeting the TMDL challenge

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 Idaho Agriculture Pollution Abatement Plan (ISCC and DEQ, 2003) and the ISCC Field Guide for Evaluating BMP Effectiveness.

The Revised Universal Soil Loss Equation (RUSLE) and Surface Irrigation Soil Loss (SISL) Equation are used to predict sheet and rill erosion on non-irrigated and irrigated lands. The Alutin Method, Imhoff Cones, and direct-volume measurements are used to determine sheet and rill irrigation-induced and gully erosion. Stream Visual Assessment Protocol (SVAP) and Streambank Erosion Condition Inventory (SECI) are used to assess aquatic habitat, stream bank erosion, and lateral recession rates. The Idaho One Plan'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. DEQ uses Beneficial Use Reconnaissance Program (BURP) protocols to collect and measure key water quality variables that aid in determining the beneficial use support status of Idaho's water bodies. The determination tell whether a water body is in compliance with water quality standards and criteria. In addition, DEQ will be conducting five-year TMDL reviews.

Annual reviews for funded projects will be conducted to insure the project is kept on schedule. With many projects being implemented across the state, ISCC developed a software program to track the costs and other details of each BMP installed. This program can show what has been installed by project, by watershed, by subbasin, and for the entire state. 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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CHAPTER II. FORESTRY IMPLEMENTATION PLAN

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Introduction

The Little Salmon River Watershed Total Maximum Daily Load (TMDL) Implementation Plan was drafted by land management agencies that affect water quality in this area. The forestry implementation plan portion was developed by the Department of Lands (IDL) in coordination with the United States Forest Service (USFS), private timber interests, and the Idaho Department of Environmental Quality (DEQ).

The Little Salmon River Watershed Advisory Group (WAG) and the designated agencies played a significant role in developing this TMDL. The WAG and the designated agencies were involved in developing the allocation processes and their continued participation will be critical while implementing the TMDL.

Purpose, Goals, and Objectives

The purpose of this overall implementation plan is to identify best management practices (BMPs) that are needed to reduce surface water pollutant loads and help restore the chemical, physical, and biological functions in the upper Little Salmon River watershed. These BMPs are generally applicable throughout the watershed. The goal of this plan is to assist and/or complement other efforts to restore beneficial uses for the streams within the Little Salmon River watershed that are listed as having impaired water quality according to section 303(d) of the Clean Water Act.

The purpose of the forestry portion of the plan is to provide specific management options for reducing nutrient, bacteria, and heat loading to the specified 303(d)-listed streams in the Little Salmon River watershed and prevent any further degradation. While the forested sections are generally much smaller sources of nutrients, bacteria, and heat than the non-forested sections, this plan summarizes the current activities taking place in the watershed that could contribute pollutants downstream to streams with TMDLs in place. This plan also addresses activities that are occurring or could occur in the drainages to reduce pollutant loading.

Little Salmon River Subwatershed and TMDL Summary

The Little Salmon River watershed (Figure 1, page 5) lies entirely in central Idaho and comprises about 576 square miles. The Little Salmon River originates at about 6,280 feet off of Blue Bunch Ridge. The watershed is 45 miles long and ranges from 0.5 to 22 miles wide. Located at the 45th parallel, the watershed is about 500 miles inland from the Pacific Ocean. The river flows north for 51 miles to its confluence with the Salmon River at river mile 86.7 at Riggins (IDWR 2001). US Highway 95 parallels most of the Little Salmon River.

This watershed lies within the subbasin identified by the hydrologic unit code (HUC) 17060210. Table 16 shows the assessment units (AUs) for which TMDLs were developed. The Forestry group, a technical advisory group to the WAG, examined the tributaries to the Little Salmon River and the Little Salmon River itself from the headwaters to Round Valley Creek (the upper

Little Salmon River watershed) in order to assess opportunities for pollutant reduction. Even if the water bodies themselves were determined not to be impaired by specific pollutants (i.e. temperature, bacteria, nutrients), the opportunity to reduce loading of that pollutant to the Little Salmon River was investigated. If information was available regarding nutrient or bacteria sources, this information was listed. Generally, the forested sections of the Little Salmon River tributaries and the forested section of the Little Salmon River itself are not significant sources of nutrients or bacteria.

It is important to prioritize projects for implementation based on the potential to reduce pollution and the relationship between costs and benefits for any given project. In areas where tributaries are not significant sources of heat, bacteria, or nutrients to the Little Salmon River or Big Creek, this has been documented. These areas would be of lower priority for implementing projects since the cost incurred to implement a project may not result in an appreciable decrease in pollutant loading. Water quality improvement projects, separate from mitigation efforts for grazing or timber harvest, are listed in watersheds where they are occurring.

Table 16. Streams and pollutants for which TMDLs were developed.

Stream/Assessment Unit (AU)	Pollutant(s)
Little Salmon River (5th Order–Big Creek to Round Valley Creek)	Temperature, bacteria, nutrients
Little Salmon River (4th Order–Vicks Creek to Big Creek)	Temperature
Big Creek	Bacteria, nutrients

Implementation Plans

The most effective means for controlling the generation of nonpoint source pollution is to apply preventative and restorative watershed management practices. Nonpoint source pollution control is accomplished through the voluntary application of technology-based BMPs. Using a feedback loop style of management, agriculture and forestry stakeholders will apply a BMP, then monitor, evaluate, adapt, and determine if the practices are effectively reducing pollutant loading.

Designated Agencies

The Idaho Water Quality Standards and Wastewater Treatment Requirements list designated agencies responsible for reviewing and revising nonpoint source BMPs based on water quality monitoring data that is generated through the state's water quality monitoring program.

Designated state agencies are:

- Idaho Department of Lands (IDL) for timber harvest activities, oil and gas exploration and development, and mining activities;
- Idaho Soil Conservation Commission (ISCC) for grazing and agricultural activities;
- Idaho Transportation Department (ITD) for public road construction;
- Idaho State Department of Agriculture (ISDA) for aquaculture;

- Department of Environmental Quality (DEQ) for all other activities.

As designated land management agencies, both the USDA Forest Service (USFS) and the United States Department of the Interior Bureau of Land Management (BLM) entered into a memorandum of understanding (MOU) between the United States Environmental Protection Agency (EPA) and various State of Idaho agency departments. Within the Forestry Practices Appendix to this MOU, the federal agencies agreed to comply with the water quality protection provisions of the Idaho Forest Practices Act Rules and Regulations.

Idaho Department of Lands (IDL)

In accordance with Idaho's Nonpoint Source Management Plan, the Idaho Department of Lands (IDL) is the designated lead agency for Forest Practices activities on all forest lands in the state of Idaho, including federal lands. As the lead agency, IDL is responsible for soliciting input from affected landowners and technical specialists to help develop practices that will fully restore the beneficial uses of an impaired surface water.

The IDL is responsible for managing endowment trust lands for numerous Idaho institutions as well as public trust lands; administering forestry and mining best management practices on private and state lands; consulting and cooperating with federal land managers; and overseeing timber harvest activities, oil and gas exploration and development, and mining activities in Idaho.

Under Idaho's Antidegradation Policy, IDL is designated as the lead agency for managing surface mining, dredge and placer mining, and forest practices on all lands within the state. IDL works closely with DEQ to conduct Forest Practices Act audits, which form the basis for achieving state and federal consistency for nonpoint source activities on forestlands.

The IDL also works extensively with DEQ, BLM and USFS on the use of the Forest Practices Cumulative Watershed Effects process (CWE) for watershed evaluation input to the TMDL process. The Forest Practices CWE Process provides a direct linkage for developing TMDLs and implementation plans for the forested portions of watersheds on the §303(d) list.

Forestry Pollution Control Strategies

The Forest Practices Act (FPA) is designed to assure the continuous growing and harvesting of forest tree species and to protect and maintain the forest soil, air, water resources, wildlife, and aquatic habitat. FPA rules address timber harvesting practices, forest road construction and maintenance, forest tree residual stocking and reforestation, use of chemicals/management and prescribed fire. The Idaho Water Quality Standards and Wastewater Treatment Requirements, Title 39, Chapter 1, Idaho Code references the FPA rules as the approved BMPs for silvicultural, harvesting, and forestry road activities. As mentioned above, IDL is the designated state agency responsible for administering and enforcing the FPA on all forest lands in Idaho.

The FPA requires forest practices rules for state and private lands to protect, maintain, and enhance our natural resources. Federal land practices must meet or exceed the requirements of the state rules.

When an operation is found in violation of the rules and corrective measures are not taken in a reasonable time, the IDL will take enforcement action against the responsible operator. Forest

Practice Advisors, located statewide, also provide technical assistance to forest owners and operators who wish to learn about proper forest practices.

The Forest Practices Act as implemented has resulted in the reduction of off-site impacts due to timber management. However, recreational activities within the watershed, which may utilize the same roads network, are unregulated. As such, the following types of management activities may need to occur as they relate to recreational activities and include:

- reconstruction of existing roads to meet current standards;
- water bars, grass seeding, and improvement of drainage structures;
- relocation of roads;
- resurfacing of roads;
- temporary or permanent closure of high risk road segments.

General Forestry Mitigation/Implementation

State Endowment Trust Forest Lands

State endowment trust forested lands are specifically managed to secure maximum long-term financial return to the endowment trusts. These lands have been harvested using refined management practices contained in the Forest Practices Act and little sediment is produced by the actual harvest and processing of trees into logs. Thus, any contribution of phosphorus associated with sediment is also minimal.

National Forest Lands

Prior to any timber sales and subsequent harvest, the USFS adheres to the National Environmental Policy Act (NEPA) guidelines and prepares the appropriate environmental documentation to describe the proposal, receive public comment, and describe the effects. These NEPA documents are in accordance with the Idaho Forest Practices Act. Within these statements, the potential effects on fisheries and water quality is investigated and mitigation efforts proposed to minimize or prevent any adverse effects to these resources. Table 17 describes the typical mitigation measures used in the timber harvest activities and Table 18 describes the current management requirements used to achieve protection of water resources.

Table 17. Mitigation Measures.

Mitigation Measure	Objective	Enforcement Mechanism	Enforcement Responsibility	Effectiveness Rating Basis
Areas disturbed by skyline yarding will be stabilized by constructing water bars or placement of slash, whichever is more appropriate.	Reduce accelerated surface erosion and prevent rill or gully formations in disturbed areas of skyline corridors	Timber sale contract	Contract administrator	Moderate (experience)
Construct slash filter windrows at the toe of fill slopes on newly constructed landings and roads within contributing areas concurrent with construction. Limit the height of windrows to three feet; dispose of excess material as necessary. Provide breaks and limit length of windrows to allow easy passage of wildlife and recreational enthusiasts.	Minimize the extent of sediment routing to stream channels	Timber sale contract and transportation plan	Contract administrator and engineering representative	Moderate
Seed, mulch, and fertilize on fill and cut slopes of newly constructed roads and landings that are within 300 feet of a stream and that will be kept for future use. This may be accomplished through hydromulching. Apply slash to achieve 50% ground cover on fill slopes and on cut slopes where slash material will not create a safety hazard. Where slash material is not available, apply erosion control matting.	Reestablish vegetation on exposed soils and prevent soil erosion and loss	Transportation plan and timber sale contract	Engineering representative and contract administrator	Moderate
Divert flow from stream courses around project activities such as culvert installation or extraction. Use appropriate sediment control methods such as straw bales or silt.	Minimize direct input of sediment to stream channels during road-related work	Transportation plan and timber sale contract	Engineering representative and contract administrator	Moderate
Rehabilitate stream crossings on temporary roads prior to the end of the normal operating season, unless specifically designed to meet Forest Plan requirements for passing stream flows and debris. Otherwise, remove crossing and rehabilitate after use of road is no longer needed.	Reduce sediment input to streams	Timber sale contract	Contract administrator	Moderate
Locate and approve water diversion sites prior to use. The project fisheries biologist or hydrologist will approve the sites. No vehicles will be allowed in stream courses at any time for the purpose of withdrawing water.	Minimize impacts to stream banks and potential sediment delivery to streams	Timber sale contract	Contract administrator	Moderate

Mitigation Measure	Objective	Enforcement Mechanism	Enforcement Responsibility	Effectiveness Rating Basis
Apply a high level of mitigation where land-disturbing activities may deliver sediment to stream channels or riparian conservation areas (RCAs) or where activities increase detrimental disturbance or total soil resource commitment. These measures can include but are not limited to water control devices such as silt fence or straw bales, erosion control matting, seed hydromulch, fertilizer placement of woody debris, and breaking up of compacted soils. Maintain or modify mitigation structures to keep them in fully functioning condition. Remove silt fence and stabilize disturbed areas with seed, mulch, and fertilizer as soon as work is complete.	Minimize sediment delivery	Contract administrator will cover during pre-work	Contract administrator and engineering representative	Low to Moderate
Prior to log hauling, gravel the road stream crossings and armor the ditch lines on haul routes, where necessary, to inhibit erosion. Gravel the road sections for the full extent of the contributing road surface or within the RCA, whichever is greater. Apply mitigation measures to haul route roads that are identified as delivering sediment. Mitigation measures may include but are not limited to graveling of road prism, armoring ditch lines with pit run, and placing obstructions or constructing catch basins below culverts. Remove silt fencing or other non-biodegradable material after hauling is complete.	Reduce sediment input to streams	Timber sale contract	Contract administrator, engineering representative, fisheries biologist	Moderate (Burroughs And King 1989)
For broadcast burning, avoid ignition in RCAs, construct no mechanical fire line in RCAs, and minimize handling in RCAs. Fire may be allowed to burn down into RCAs. Pile burning within the first site potential would be allowed.	Minimize impact to RCA vegetation and reduce risk of accelerated erosion and sedimentation	Forest Service Soil and Water Conservation Practices (FSH 2509.22.18.03)		High
No storage of fuels or other toxicants within RCAs. Fuel storage of more than 200 gallons will be located within a containment area lined with material sufficiently impervious to contain spilled fuel.	Reduce potential for fuel spill that could affect fish or fish habitat	Timber sale contract, 40 CF 112	Contract administrator	Moderate

Table 18. Management requirements for timber projects.

Management Requirements	Objective	Implementation Mechanism
Fish passage shall be provided at all proposed and reconstructed stream crossings of existing and potential fish-bearing streams (Forest Plan p.III-22, SWST08).	Protect habitat for resident fish	Road package within timber sale contract
Trees that are felled within riparian conservation areas (RCAs) must be left unless determined not to be necessary for achieving soil, water, riparian, and aquatic desired conditions. Felled trees or snags left in RCAs shall be left intact unless resource protection or public safety requires bucking them into smaller pieces (Forest Plan p. III-22, SWST10).	Retain large wood in riparian areas to be available for sediment filtering, recruitment in streams, and for soil needs	Project design
Do not authorize storage of fuels and other toxicants or refueling within RCAs unless there are no other alternatives.	Reduce potential for fuel spills that could affect fish or habitat	Project design, contract specifications
Conduct field verification to delineate perennial and intermittent streams, seeps, springs, and bogs for riparian and wetland buffers.	Ensure protection of riparian areas and wetlands	Project design, timber sale layout
Conduct site-specific analysis or field verification of landslide-prone models to identify landslide-prone areas in proposed management areas that may alter soil-hydrologic processes. Design management actions to avoid the potential for triggering landslides.	Provide for stream channel integrity, channel processes, and the sediment regime under which the riparian and aquatic ecosystems evolved	Project design, mitigation measures
Within legal authorities, ensure that new proposed management activities within watersheds containing 303(d)-listed waters improve or maintain overall progress toward beneficial use attainment for pollutants that led to the listing.	Manage water quality to meet requirements under the Clean Water Act with special emphasis on de-listing water quality limited waters under section 303(d) and supporting stated development and implementation of TMDLs	Project design, contract specifications, mitigation measures
Proposed actions within RCAs that are associated with valid existing rights such as water diversions shall be coordinated with licensees, permittees, or claimants in an effort to maintain or restore beneficial uses and desired habitat conditions for native and desired non-native fish.	Provide water quality for stable and productive riparian and aquatic ecosystems while fully supporting appropriate beneficial uses	Project design
Management actions shall be designed to maintain or restore water quality to fully support beneficial uses and native and desired non-native fish species and their habitat.	Design and implement management programs and plans that will restore water quality and watershed function to support beneficial uses	Project design
Apply best management practices as described in Soil and Water Conservation Practices to all ground disturbing activities.	Reduce or minimize effects of management activities on soil and water resources	Contract specifications, mitigation measures

Management Requirements	Objective	Implementation Mechanism
Apply mitigation and restoration measures within the activity area so that total soil resource commitment levels are moved back toward 5 % or less following completion of the activities.	Limit the extent of soil committed to non-productive land uses, such as roads and landings, to the minimum necessary for forest management. Maintain soil productivity and ecological processes where functioning properly, and restore where currently degraded.	Contract specifications, proposed mitigation actions (i.e., road obliterations) as funds become available
Neither degrade nor retard attainment of properly functioning soil, water, riparian, and aquatic desired conditions except where outweighed by demonstrable short- or long-term benefits to watershed resource conditions or where the Forest Service has limited authority.	Maintain surface and ground water in streams, lakes, wetlands, and meadows to support healthy riparian and aquatic habitats, the stability and effective function of stream channels, and downstream uses. Restore and maintain flow regimes sufficient to create and sustain soil-hydrologic and water quality conditions. Restore or maintain riparian, aquatic, and wetland habitat to achieve patterns of sediment, nutrient, and large woody debris routing within their inherent range of capability.	Project design, contract specifications, mitigation measures

Mitigation Measures for Grazing

Required mitigations on National Forest lands also include adjusting grazing practices as necessary to avoid adversely affecting listed fish species. Required mitigation levels in the Little Salmon River watershed include:

- Not more than 30% riparian utilization,
- Not more than 40% upland utilization,
- Less than 10% stream bank trampling
- Use restrictions for shipping, bedding, watering, salting, site, and allotment-specific protection measures for sensitive areas. USFS 2001.

Allotment monitoring data collected on National Forest land in this subwatershed indicate these mitigation levels are being met. With the proper level of annual allotment oversight and monitoring, required mitigations — particularly the ability to adjust grazing practices causing adverse impacts — would be expected to result in a negligible risk of grazing impacts on habitat or fish species.

Mitigation Measures for Temperature

Activities that promote healthy diverse riparian areas throughout the watershed should be encouraged. These include but are not limited to:

- grazing management plans (see the Agriculture Implementation Plan, page 1, for more information),
- riparian management plans,
- riparian planting,
- riparian fencing,
- ensuring that roads do not impinge upon riparian area,
- Stream Protection Zone designation, and
- harvest guidelines that ensure that shade targets are met.

The potential natural vegetation (PNV) approach was used to develop the Little Salmon River Meadows Valley temperature TMDL, based on percent effective shade, which is the most common surrogate for in-stream temperature. The height and density of the PNV is compared against the width of the stream to gauge the percent effective shade achievable for a given stream. Below is a map (Figure 13) showing the difference between the target shade and existing shade, or more simply, areas that need improved shading.

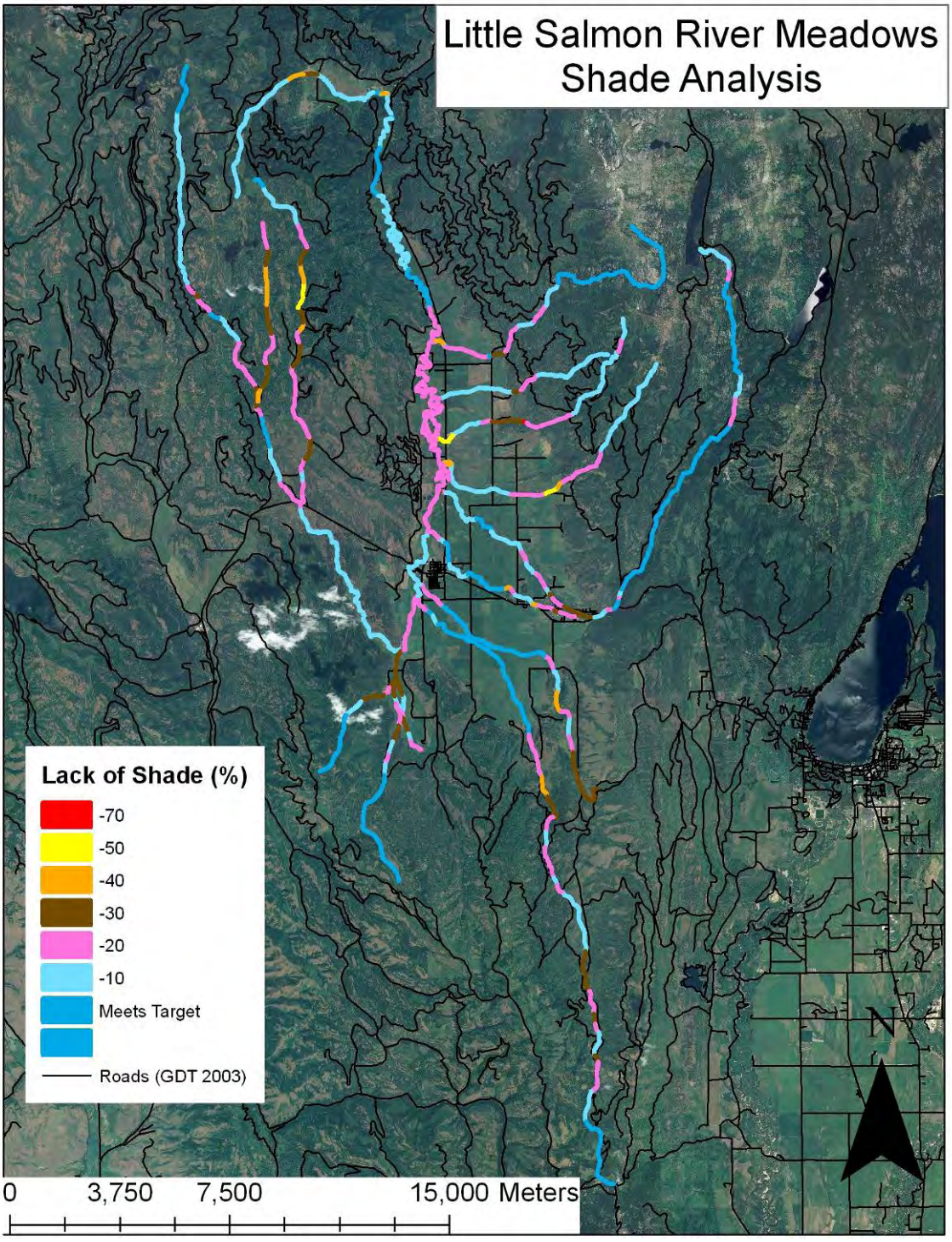

Figure 13. Little Salmon River shade analysis.

Forestry Implementation for Specific Subwatersheds

Mud Creek (Mud, Little Mud. and Middle Mud Creeks)

A general description of Mud Creek, as well as water quality data, can be found in the Little Salmon River TMDL (DEQ, 2006).

Mud Creek is used for grazing and agriculture, and is being developed residentially in its lower reaches. The upper reaches have been managed for grazing and timber harvest.

Mud Creek is not 303(d)-listed as an impaired water.

Priority for implementation is low for nutrients/bacteria; moderate for temperature.

The following sections describe ongoing activities, current conditions. and water quality improvement projects in the Mud Creek watershed.

Recreation

Current Condition: Mud Creek currently has many undeveloped dispersed camping sites on both USFS managed land and Potlatch Corporation land, throughout the watershed.

Improvement Projects: None current or scheduled.

Grazing

Current Condition: Cattle grazing occurs in the Mud Creek watershed on Potlatch Corporation lands. Mud Creek is within the USFS Price Valley S&G grazing allotment. In 2004, the grazing permit was approved for two bands of 950 ewe/lamb pairs to graze between June 6 and July 10.

The section of Mud Creek above the USFS boundary was subject to cattle trespass which resulted in a decrease in riparian vegetation and widening of the stream in places.

Improvement Projects: A fence was repaired and a cattle guard installed, minimizing the trespass problem so that stream-shading improvement should occur.

Timber Harvest

Current Condition: The IDL and WP Timber both actively harvested in 2007. Potlatch Corporation purchased the WP Timber land in fall of 2007. Currently, the IDL has one active sale within the Middle Mud Creek drainage. This sale involves salvage logging on all the 40-acre parcels in the drainage.

Improvement Projects: To prevent excess pollutant delivery to Mud Creek, IDL has done and is doing the following:

- Adhering to the Forest Practices Act
- Road closures/obliteration: barricaded one spur road in the NW ¼ Sec 34 T20N R1E.
- Moved a portion of the road outside the stream protection zone in the SW of the SE corner of Section 20, T 20N Range 1 E. Also barricaded the old road in the stream protection zone.

The USFS will be harvesting 3.6 million board feet (MMBF) on 1,858 acres as part of the Muddy Squirrel project which is an effort to improve Northern Idaho ground squirrel

habitat. Tables 17 and 18 outline the general measures that are being taken to protect water quality. The USFS is also specifically doing the following:

- Adhering to the Forest Practices Act
- Road closures/obliteration: 0.8 miles of unclassified road were obliterated and approximately 0.5 miles of unclassified roads will be converted to system roads.
- Gravelling roads where there are stream crossings
- Potlatch Corporation adheres to the Forest Practices Act during their harvest activities.

Roads

Current Condition: Road densities within Mud Creek are 6.24 mile road/mile^2 in the upper area and 5.46 mile road/mile^2 in the lower areas. Thirty-three percent of the upper Mud Creek roads are within riparian conservation areas (RCAs), and 39% of the lower Mud Creek roads are within RCAs.

Improvement Projects: As part of a timber sale within the Middle Mud Creek drainage, the IDL moved a portion of a road out of the stream protection zone (see Timber Harvest section for more detail).

Temperature

Beneficial uses appear to be supported in the upper reaches of Mud Creek. The most recent data suggests that the temperature standard is met through the mainstem of Mud Creek from the headwaters to the mouth. The status of beneficial use support in Little Mud Creek and Middle Mud Creek are not known. Mud Creek should continue to be monitored for temperature to keep track of trends in the temperature regime.

Stream shading information from the potential natural vegetation TMDL (see Figure13) indicates that there are areas in the lower forested reaches of Mud Creek, particularly Middle Mud Creek, which could have increased riparian cover. Increased shading would help cool the water entering the Little Salmon River, which has a TMDL for temperature.

Potential management actions to improve stream shading are listed beginning on page 47.

Nutrients/Bacteria

Mud Creek was not found to be a significant contributor of nutrients or bacteria to the Little Salmon River.

Six Mile, Three Mile, Four Mile, and Martin Creeks

General descriptions of Six Mile, Three Mile, Four Mile, and Martin Creeks, as well as water quality data, can be found in the Little Salmon River TMDL (DEQ, 2006).

Six Mile Creek, Four Mile Creek, Three Mile Creek, and Martin Creek, are separate tributaries to the Little Salmon River. The headwaters of these creeks are within Forest Service lands, and the lower reaches are in private ownership. Timber harvest exists on both public and private lands.

These creeks are not 303(d)-listed as impaired waters.

Priority for Implementation is low for nutrients/bacteria, moderate for temperature.

The following sections describe ongoing activities current conditions and water quality improvement projects in these watersheds.

Recreation

Current Condition: Recreation mainly consists of hunting in the late fall and all-terrain vehicle (ATV) use on the roads.

Improvement Projects: None current or scheduled

Grazing

Current Condition: Cattle grazing occurs on both private and public lands. The USFS Meadows Valley C&H grazing allotment extends from Six Mile Creek down to Goose Creek. In 2004, 445 cow/calf pairs were permitted to graze public land between June 6 and September 30. The USFS Brown Creek grazing allotment is within the Six Mile watershed and allowed 235 cow/calf pairs to graze between August 7 and September 30.

Improvement Projects: The section on USFS grazing mitigation on page 47 covers the mitigation measures used to protect water quality.

Timber Harvest

Current Condition: Potlatch Corporation has timber harvest activities in the Six Mile drainage. The USFS Meadows Slope project will take place in 2010 in the area where the USFS-managed land borders the meadow area. This is a fuel thinning project for fire safety and will involve 1,119 acres.

Improvement Projects: Table 17 shows specific mitigation measures and Table 18 shows management objectives for the USFS Meadows Slope project.

As part of this project, Road 502981200 is proposed for closure.

Potlatch Corporation adheres to the Forest Practices Act in their harvest activities.

Roads

Current Condition: Roads within these subwatersheds are at a density of 3.58 mi road/mile^2, and 20% of these roads are within riparian conservation areas. Within the Three Mile Creek watershed, old log skid roads are parallel to and within the stream bed. Road/stream crossings within the steep gradient sections have created possible fish passage barriers. The culvert at the crossing of Forest Service Road 303 is a significant fish barrier at low flows.

Improvement Projects: The culvert at the crossing of Forest Service Road 303 was repaired in Fall 2007.

Temperature

Generally, percent shade values in the riparian areas of Six Mile, Three Mile, Four Mile, and Martin Creeks are close to target levels except in the lower portions of the forested reaches. Potential management actions to improve stream shading are listed beginning on page 47.

Nutrients/Bacteria

The forested sections of these streams are not significant sources of nutrient or bacteria.

Big Creek

A general description of Big Creek as well as water quality data can be found in the Little Salmon River TMDL (DEQ, 2006).

The upper part of the watershed is entirely forested and is actively managed for timber harvest (approximately 13,000 acres). In the middle to lower parts of the watershed, livestock grazing, irrigated pastures, and hayfields, are the predominant land uses. Rural residential development also occurs in the lower watershed.

Big Creek is 303(d)-listed as impaired by nutrients and bacteria.

Priority for implementation is low.

The following sections describe ongoing activities, current conditions, and water quality improvements in the Big Creek watershed.

Recreation

Current Conditions: Primitive recreation occurs on Potlatch Corporation and Payette National Forest land.

Improvement Projects: None current or scheduled.

Grazing

Current Conditions: Sheep grazing occurs on Potlatch Corporation lands. The BLM Big Creek allotment allows 81 animal unit months (AUMs) of sheep to graze on BLM lands from June through October.

Improvement Projects: None current or scheduled.

Timber Harvest

Current Conditions: Potlatch Corporation has logging activity in this area. Idaho Department of Lands and USFS also manage land in this area but there is no current logging activity.

Improvement Projects: Potlatch Corporation adheres to the Forest Practices Act in their timber harvest activities.

Roads

Current Conditions: A road sediment delivery analysis indicated that sediment delivery from Forest Service roads was low even though road density for the Big Creek area is high (IDL 2002). The road density is 5.96 miles road/mile^2, 28% of which are within riparian conservation areas (RCAs).

Improvement Projects: None current or scheduled.

Temperature

Both instantaneous and average daily temperature measurements show that the water quality temperature criteria for cold water aquatic life are not violated in Big Creek. Percent shade values in the riparian area are close to target conditions.

Improvements in temperature can be obtained through the measures listed on page 47.

Nutrients/Bacteria

Low nutrient and bacteria levels, below water quality criteria and TMDL target levels, were found in Big Creek during the 2004 Idaho Department of Agriculture study in the forested portion of the watershed.

Goose Creek

A general description of Goose Creek, as well as water quality data, can be found in the Little Salmon River TMDL (DEQ, 2006).

The headwaters of Goose Creek are on Forest Service-managed public lands, while the lower sections are on private land, flowing through the town of Meadows and agricultural lands before entering the Little Salmon River.

Goose Creek is not 303(d)-listed as an impaired water.

Priority for implementation is low.

The following sections describe ongoing activities current conditions and water quality improvements in the Goose Creek watershed.

Grazing

Current Conditions: The USFS Brundage S&G, Slab Butte S&G, and Meadows Valley C&H grazing allotments are within the Goose Creek watershed. The Brundage permit is split into a north unit and a south unit that joins with the Slab Butte permit. In 2004, the south Brundage and Slab Butte permit allowed 930 ewe/lamb pairs to graze between July 10 and September 21, while the north Brundage permit allowed 1,700 dry ewes to graze between September 22 and October 15. The Meadows Valley permit allowed a total of 445 cow/calf pairs to graze between June 1 and September 30.

Improvement Projects: The section on USFS grazing mitigation, page 47, covers the mitigation methods used by the USFS to protect water quality.

Timber Harvest

Current Conditions: Logging occurs extensively along the upper ridges of this area. Historic logging appeared to occur within riparian areas while more recent logging occurs high up the steep slopes. Many roads exist in the drainage from past logging. Some are still heavily used by ATVs, off-road vehicles (ORVs), and motorbikes.

Improvement Projects: The Meadows Slope Wildland Fire Protection project will result in thinning in the area around lower Little Goose and Goose Creeks (Forest Road 50453) during 2009.

2.6 miles of road will be obliterated/decommissioned.

420 acres will be harvested in Upper Goose Creek,

560 acres will be harvested in Lower Goose Creek and

350 acres will be harvested in Little Goose Creek.

Roads

Current Conditions: Road densities are high within the watershed at 2.6 mi road/mile^2. Twenty-two percent of the roads are within riparian conservation areas (RCAs) on USFS managed land. Little Goose Creek is a tributary to Goose Creek and has a road density of 6.83, and 18% of roads are within RCAs.

Improvement Projects: None current or scheduled.

Temperature

Upper Goose Creek stream shade conditions are very close to its target shade conditions. The upper forested reaches of East Fork and West Fork Goose Creeks shows that there are areas where shade could be increased. Potential management actions to improve stream shading are listed on page 47.

Little Creek

A general description of Little Creek, as well as water quality data, can be found in the Little Salmon River TMDL (DEQ, 2006).

Priority for implementation is low.

Little Creek is not 303(d)-listed as an impaired water

The following sections describe ongoing activities, current conditions, and water quality improvement projects in the Little Creek watershed.

Recreation

Current Conditions: Primitive recreation occurs on land.

Improvement Projects: None current or scheduled.

Grazing

Current Conditions: Sheep grazing occurs on Potlatch Corporation lands in the Little Creek watershed.

Improvement Projects: None current or scheduled.

Timber Harvest

Current Conditions: Potlatch Corporation has timber harvest activity in this drainage. The Meadows Slope Wildland Fire Protection project will result in thinning in the area of about 628 acres located near housing.

Improvement Projects: None current or scheduled. Potlatch Corporation adheres to the Forest Practices Act.

Temperature

The forested areas of Little Creek include areas in which stream shade could be increased. Potential management actions to improve stream shading are listed on page 47.

Nutrients/Bacteria

The forested section of Little Creek is not a significant contributor of nutrients/bacteria to the Little Salmon River.

Little Salmon River Headwaters and Tributaries downstream to Vicks Creek

A general description of this area of the Little Salmon River, as well as water quality data, can be found in the Little Salmon River TMDL (DEQ, 2006).

This are is not 303(d)-listed as impaired.

Priority for implementation is low.

The following sections describe ongoing activities, current conditions, and water quality improvement projects in the Little Salmon River watershed from the headwaters to Vicks Creek.

Recreation

Current Conditions: Primitive recreation occurs on Potlatch Corporation and Payette National Forest lands.

Improvement Projects: None current or scheduled.

Grazing

Current Conditions: Sheep grazing occurs on Potlatch Corporation lands in Little Salmon Headwaters and on Vicks Creek.

Improvement Projects: None current or scheduled.

Roads

Improvement Projects: Road improvements by Potlatch Corporation are ongoing as funds are available.

Temperature

Potential management actions to improve stream shading are listed on page 47.

Nutrients/Bacteria

The forested section of the Little Salmon River is not a significant contributor of nutrients or bacteria to the downstream section of the Little Salmon River.

Summary Schedule of Actions

Table 19 lists the forestry-related TMDL implementation activities that are planned in the Little Salmon River watershed. No activities are currently planned for Martin Creek, Big Creek, or the Little Salmon River headwaters area.

Table 19. Summary of current and planned implementation activities.

Water Body	Protection Activity	Goal Date
Mud Creek		
USFS (Muddy Squirrel Project)	Road closures/obliteration (0.8 miles of unclassified road obliterated and approximately 0.5 miles of unclassified roads will be converted to system roads).	Not scheduled
Six Mile, Three Mile, Four Mile		
USFS Meadows Slope Wildland Fire Protection Project	The USFS Meadows Slope projects is a fuel thinning project for fire safety and will involve 1,119 acres. As part of this project, Road 502981200 is proposed for closure.	Scheduled for 2010
USFS Fisheries Improvement Project	The culvert at the crossing of Forest Service Road 303 is slated to be repaired by the fall of 2007.	December 2007
Goose Creek		
USFS Meadows Slope Wildland Fire Protection Project	The Meadows Slope Wildland Fire Protection Project will result in thinning in the area around lower Little Goose and Goose Creeks (Forest Road 50453). • 2.6 miles of road will be obliterated/decommissioned. • 420 acres will be harvested in Upper Goose Creek. • 560 acres will be harvested in Lower Goose Creek. • 350 acres will be harvested in Little Goose Creek.	Scheduled to occur between 2009 and 2012
Little Creek		
USFS Meadows Slope Wildland Fire Protection Project	The Meadows Slope Wildland Fire Protection Project will result in thinning in the area of about 628 acres located near housing.	Scheduled to occur between 2009 and 2012.

Monitoring Plan, Feedback Loop, and Tracking

Two processes are currently in place to evaluate forestry BMP implementation and effectiveness. These are: 1) annual Forest Practices Act audit inspections conducted by IDL to determine if BMPs are being implemented on federal, state and private lands and 2) BMP effectiveness evaluations conducted by DEQ every 5 years in association with the scheduled TMDL five-year review.

Forest practices in the watershed may be inspected yearly for compliance with FPA. If any unsatisfactory conditions are identified, they will be corrected using standard IDL enforcement procedures. The IDL district office in McCall will be the office of record for all FPA inspection reports in the Little Salmon River watershed.

In addition to the regular FPA inspection program conducted by IDL, the Forest Practices Water Quality Management Plan calls for a statewide audit of the application and effectiveness of Idaho Forest Practices Rules. This interagency independent audit is conducted every four years. The 1996 Forest Practice audit found that FPA rules were implemented 97% of the time. The audit also determined that when the FPA rules were properly implemented and maintained, the rules were effective 99% of the time. The audit process is one key component of the feedback loop mechanism used by the Forest Practices Act Advisory Committee and the Idaho State Board of Land Commissioners to evaluate the effectiveness of Idaho forestry BMPs.

The USFS also has performed monitoring of timber sale activities including road construction. This includes project level monitoring for BMP implementation and effectiveness of the FPA. Monitoring has also been conducted on grazing allotments.

Forest landowners will also monitor implementation and effectiveness of activities conducted to reduce sediment/phosphorus loading. Potential indicators may be quantitative or qualitative depending upon the BMP implemented. Activities funded with section 319 grants, as well as funds from many other grant programs, require effectiveness monitoring

The Idaho CWE process will be reinitiated in 2012 to help monitor progress in meeting beneficial use attainment goals.

Implementation Tracking

In 2004, the IDL created a geographic information system-based (GIS) tracking system, with associated database, to track management problems identified in CWE reports on a statewide basis. This data resides on a server at the IDL private forestry bureau in Coeur d' Alene and is available for generating reports at any supervisory area office. Data collected includes the location and type of problem, digital image, date observed and repairs initiated. Local supervisory area personnel complete updates to this system. Information in this database is not restricted to just state endowment properties, although updating reports of problems on non-state land requires voluntary reporting and coordination through the local IDL forest practices act advisor.

Each IDL supervisory area also maintains a GIS-based road inventory layer with specific information on engineering standards, drainage structures and closures on those roads maintained by the IDL and/or cooperators. Idaho Forest Practices (IFP) terms voluntarily adopted by the local IDL unit include completing a detailed inventory of drainage structures, stream crossing

conditions, and management problems prior to the fall of 2009. Large industrial private road cooperators plan to combine inventory information with IDL and produce one data set.

The vast majority of projects undertaken by large industrial landowners and the IDL are completed by independent contractors and sale purchasers. All parties routinely inspect operations for compliance with contract terms before accepting results for payment or releasing performance bonds. Internal audits verify compliance.

In addition, the DEQ will annually track the progress that Designated Management Agencies have made in improving water quality. The DEQ, USFS, and IDL have agreed to meet each year to document projects that occurred during the previous field season. Private landowner participation will also be solicited.

Funding

Under the FPA, logging operators are responsible for meeting the rules. Therefore, the cost of complying with the FPA is born solely by the operator or forest landowner depending on any contractual agreements that may be in existence. At present, private forest landowners are assessed $.05 per acre for all forest lands and $.08 per thousand board feet harvested to help fund the IDL administration of the FPA. Since this funding is not totally adequate to support the FPA administrative program, funds for the initiation of additional protection measures beyond the requirements of the FPA are not available. IDL also has authority to expend funds out of the FPA rehabilitation account but is limited to only those costs associated with the repair of unsatisfactory practices identified in the notice of violation (NOV) process. The natural resource conservation income tax credit, forest landowner stewardship program, and grants are other possible sources of limited funding for additional volunteer site-specific forest BMPs.

IDL Funds for implementation come from revenue associated with harvest of forest products. Major improvements (i.e. bridges, graveling, surfacing, etc.) are appraised directly against the value of the timber harvested

Maintenance projects are prioritized on an annual basis and accomplished as funds are available. Since the IDL has maintenance responsibilities outside the Little Salmon River watershed in any given year, all or none of the available funds may be exhausted elsewhere.

Additional Funding of Best Management Practices

Chapter Four of the Idaho Nonpoint Source Management Plan contains a substantial list of potential funding sources and cooperating agencies for use in the implementation of best management practices. Appendix A contains a list of potential funding sources.

Reasonable Assurance

The Clean Water Act provides for control through enforcement of point sources, but leaves nonpoint source control to states through largely incentive-based mechanisms.

Idaho has an EPA-approved Nonpoint Source Management Plan which includes certification by the attorney general that adequate authorities exist to implement the plan. Idaho's water quality rules (IDAPA 16.01.02.350) state that current best management practices will be evaluated and if found to be inadequate to protect water quality, modified by the appropriate designated agencies. In addition, if necessary, injunctive or other judicial relief may be sought against the operator of a nonpoint source activity in accordance with the DEQ Director's authorities provided by Idaho Code 39-108.

The DEQ believes these provide all the assurance that is reasonable and necessary to protect water quality and restore full support of beneficial uses in the watershed.

Through the development of this plan, DEQ and the other cooperating agencies believe that this plan includes the necessary provisions to meet the reasonable assurance needs and, provided that funding is available, these actions can be implemented. In particular, the plan has described:

- The actions that will be implemented to achieve the TMDL;
- The responsible party(ies) who must undertake the management measures or control actions;
- The variety of actions that may be taken to meet the load allocation;
- When those actions will be implemented;
- The schedule for completion of milestones;
- The monitoring necessary to ensure the goals and objectives of the plan are met.

Funding Opportunities

§104(b)(3)...Tribal and State Wetland Protection Grant, EPA

This program provides financial assistance to state, tribal, and local government agencies to develop new wetland protection programs or refine and improve existing programs. All projects must clearly demonstrate a direct link to improving an applicant's ability to protect, restore or manage its wetland resources.

§319 (h)...Nonpoint Source Grants, EPA/DEQ

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

Aquatic Ecosystem Restoration, CoE

Section 206 of the Water Resources Development Act of 1996, provides financial assistance for aquatic and associated riparian and wetland ecosystem restoration and protection projects that will improve the quality of the environment. There is no requirement for an aquatic ecosystem project to be linked to a Corp of Engineers project. The program does require that a non-federal interest provide 35% of construction costs, including all lands, easements, right-of-ways, and

necessary relocations. The program also requires that 100% of the operation, maintenance, replacement, and rehabilitation be borne by the non-federal interest. The program limits the amount of federal assistance to $5 million for any single project.

Conservation Operations Program (CO-01), NRCS

The CO-01 program provides technical assistance to individuals and groups of landowners for the purpose of establishing a link between water quality and the implementation of conservation practices. The NRCS technical assistance program provides farmers and ranchers with information and detailed plans necessary to conserve their natural resources and improve water quality.

Conservation Reserve Program (CRP), Farm Service Agency

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

Conservation Technical Assistance (CTA), NRCS

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

Environmental Quality Incentives Program (EQIP), NRCS

EQIP offers technical assistance, and cost share monies, to landowners for the establishment of a five- to ten-year conservation agreement activities such as manure management, pest management, and erosion control. This program gives special consideration to contracts in those areas where agricultural improvements will help meet water quality objectives.

Farm Services Agency Direct Loan Program, FSA

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

Fish America Foundation (www.fishamerica.org)

The Fish America Foundation provides matching funds for restoration projects that involve the improvement of sport fisheries.

Hydrologic Unit Areas (HUAs), NRCS

The NRCS is responsible for the HUA water quality projects. The purpose of these projects is to accelerate technical and cost-share assistance to farmers and ranchers in addressing agricultural nonpoint source pollution.

Idaho Water Resources Board Financial Programs, IDWR

The Idaho Water Resources Board Financial Program assists local governments, water and homeowner associations, non-profit water companies, and canal and irrigation companies with funding for water system infrastructure projects. The various types of projects that can be funded include: public drinking water systems, irrigation systems, drainage or flood control, ground water recharge, and water project engineering, planning and design. Funds are made available through loans, grants, bonds, and a revolving development account.

National Conservation Buffer Initiative, NRCS

The National Conservation Buffer Initiative program provides cost-share funds in an effort to use grasses and trees as conservation buffers to protect and enhance riparian resources on farms.

Planning Assistance, CoE

Section 22 of the Water Resources Development Act of 1974 authorizes the Corp of Engineers to assist local governments and agencies, including Indian Tribes, in preparing comprehensive plans for the development, utilization, and conservation of water and related resources. Total costs for projects cannot exceed $1 million in a single year and are cost-shared at a 50% federal and 50% non-federal rate.

Small Watersheds (PL-566), NRCS

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

Partners for Wildlife (Partners), USFWS

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

Pheasants Forever

Pheasants Forever can provide up to 100% cost-share for pheasant and other upland game projects that establish, maintain, or enhance wildlife habitat.

Resource Conservation and Development (RC&D), NRCS

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

Resource Conservation and Rangeland Development Program (RCRDP), SCC

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

Trout Unlimited, Embrace A Stream Program

Trout Unlimited provides funding to landowners for small scale stream restoration projects. These projects have significant TU volunteer involvement.

Wetlands Reserve Program (WRP), NRCS

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

Wildlife Habitat Incentive Program (WHIP), NRCS

The WHIP was established to help landowners improve habitat on private lands by providing cost-share monies for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife. Cost-share agreements developed under WHIP require a minimum 5 year contract.

References

Idaho Department of Lands. 2002. Big Creek Cumulative Watershed Effects Assessment. CWE Assessment NO. 17060210. Coeur D'Alene, Idaho.

U.S. Forest Service. 2001. Biological Assessment for the Potential Effects of Managing the Payette National Forest in the Little Salmon River Section 7 Watershed on Snake River Spring/Summer and Fall Chinook salmon, Snake River Steelhead and Columbia River Bull Trout and Biological Evaluation for Westslope Cutthroat Trout. Payette National Forest.

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CHAPTER III. URBAN/SUBURBAN IMPLEMENTATION PLAN

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Introduction

In February 2006, TMDLs for temperature, nutrients, and bacteria were developed for the Little Salmon River from Big Creek to Round Valley Creek. TMDLs were also developed for nutrients and bacteria on Big Creek. For communities downstream of Round Valley Creek, the preventive measures described herein can be used to protect the water quality they currently enjoy from the impacts of urbanization.

Education, on the ground actions, and preventive maintenance will all play a significant role in protecting and improving the Little Salmon River watershed from pollution caused by urbanization and the associated stormwater runoff accumulated on impervious surfaces.

Impacts from development that are of particular concern in the watershed are riparian zone and floodplain disturbances. Development in these areas can cause increased upland surface runoff and transport of contaminants, increased stream bank erosion, unstable stream channels, and impaired aquatic habitat and riparian vegetation.

The following sections of this document provide an overview of several measures that can be taken in urban and suburban areas to prevent pollutants from entering the surface waters in the Little Salmon River watershed. These measures are largely prevention and improvement activities, and all actions are voluntary. Responsible parties include the city of New Meadows, Adams County, the city of Riggins, Idaho County and private landowners in the watershed.

Urban/Suburban Area Determination

In this plan, urban/suburban areas are acreages that are not assessed with an agricultural exemption by Adams County and are also not considered under the Forestry Implementation Plan. Both the agriculture and forestry implementation efforts are concentrated in areas that have received a pollutant loading allocation. In the Little Salmon River watershed, the growth and development around the City of New Meadows will be the primary focus of protection efforts to prevent and reduce pollution caused by urbanization and stormwater runoff. However, attention should be paid to areas in both Adams and Idaho Counties, where population increases have occurred in recreational areas. Seasonal or occasional housing is an important characteristic of the watershed and distinguishes it from the state as a whole. Although the Little Salmon River basin is growing in population, the largest towns in the basin have not gained in population. The implication is that more homes are being constructed in the outlying areas. It is recognized that the general management practices discussed in this document can be applied in any area within the watershed experiencing development.

The future area of impact proposed by the City of New Meadows will affect parts of Mud Creek Goose Creek, Little Goose Creek, Little Creek, Big Creek and the Little Salmon River. There are several developments around the city that also have the potential to influence water quality in the watershed.

The recent completion of a land exchange between the USFS and Brundage Mountain Resort will produce new development at the ski area in the coming years. The 388 acres that are now privately owned will likely contain primarily residential development at urban or near-urban densities in localized portions of the base area. This area is located in the Goose Creek drainage.

As lands in Adams and Idaho Counties continue to be developed, it is likely more acreage will fall into the Urban/Suburban category.

Urban/Stormwater Runoff Characteristics

As lands are developed, impervious surfaces are created such as city streets, driveways, roofs and parking lots. Stormwater runoff from impervious surfaces can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, or wetland. The pollutants collected are many and can include sediment, pet waste/bacteria, fertilizers/nutrients (e.g., nitrogen and phosphorus), leaves and grass clippings/oxygen-demanding substances, heavy metals, road salts, viruses, chemicals such as oil and grease, and pesticides.

In addition to water quality impacts, land development impacts the hydrology and geomorphology of the receiving water, and affects aquatic and riparian habitats. Development results in impervious surfaces that eliminate the natural retention provided by vegetation and soil in an undeveloped area. Increasing impervious surfaces within the city limits increases the quantity of water delivered to the water body during storms. This results in increased runoff with more rapid peak discharges. Changes in the volume and timing of runoff can result in stream widening and erosion, decreased channel stability, embeddedness, and decreased substrate quality.

Stormwater is unavoidable, but its effects can be reduced by keeping pollutants out of the runoff. The Lake-a-Syst program was developed for the Cascade Reservoir Area and is applicable to development along creeks and rivers as well as lakes. This educational program provides information to homeowners in booklet form regarding appropriate construction, landscaping, and household techniques for reducing stormwater runoff from their properties. Materials are available from DEQ at the McCall Satellite Office or on the web at www.deq.idaho.gov. In addition, various stormwater BMPs that can be applied in the watershed are summarized at: http://www.epa.gov/npdes/pubs/owm0307.pdf

Examples of Stormwater Pollution Solutions

The following information comes from a Web version of the "After the Storm" flyer ("After the Storm," January 2003, EPA 833-B-03-002). This flyer can be printed from the EPA Weather Channel page or a free copy may be ordered from National Service Center for Environmental Publications http://www.epa.gov/ncepihom/ordering.htm .

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local water body.

Figure 14. Graphic illustration used to mark storm drains in the Little Salmon River watershed.

Lawn Care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Do not over water your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Do not leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic Systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby water bodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto Care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.

- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet Waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local water bodies.

RV Parks / Recreation

Recreation and tourism are often accompanied by extensive damage to the environment. Aquatic ecosystems are particularly vulnerable to the effects of an increased tourist activity and the resultant sewage disposal, roads, car parks and landing jetties on banks.

- Minimize disturbance to the vegetation and braiding of tracks.
- Contain fires to prevent wildfire.
- Minimize effluent and grey water disposal that threatens public health and water quality. Dump in sanitary facilities provided for the disposal of such waste.
- For areas without toilet facilities, it is recommended to take in a portable self-contained toilet.

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Do not pour them onto the ground or into storm drains.

Residential Landscaping

- Permeable Pavement—Traditional concrete and asphalt do not allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.
- Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.
- Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.
- Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local water bodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

Construction

Erosion controls that are not maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local water bodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Obtain NPDES / Construction General Permit for sites larger than 1 acre.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

Urbanization and Construction

Suspended sediments constitute the largest mass of pollutant loadings to receiving waters from urban areas. Construction is a major source of sediment erosion. While sediment is not identified as a pollutant in the Little Salmon River Watershed, the link between sediment and sediment-bound nutrients is important when dealing with nutrient enrichment problems in aquatic systems. Phosphorus is typically bound to particulate matter in aquatic systems and, thus, sediment can be a major source of phosphorus to rooted macrophytes and the water column.

Best Management Practices (BMPs) for Construction and Urbanization

Riparian Zone Management

Financial incentives, educational opportunities, and technical assistance provided to landowners enable them to better manage their riparian zones for stream ecosystem improvement. Landowner implementation of riparian zone recommendations is voluntary. Therefore, a coordinated effort to inform and assist them is needed to implement recommendations. Riparian zones in urban/suburban areas should be established or managed to have a buffer between cultivated fields, pastures, and street and lawn runoff. Working with private landowners to increase awareness of watershed issues, water quality, improvement opportunities and any related permit requirements would help prevent further degradation. Education on properly managing small acreages would also lead to decreases in surface runoff and streambank erosion. Assistance can be found through the Idaho Department of Agriculture's Home A Syst Program which is intended to provide general information and recommendations to rural residents regarding riparian management.
http://homeasyst.idahoag.us/Water/quiz10/quiz10_information.pdf

Roads

Roadside erosion contributes to sedimentation in the basin. Although much of the erosion in the watershed comes from streambanks, roadside erosion sites are also a sediment source.

Regular road maintenance would help to prevent sediment delivery due to roads. There are some privately maintained roads that serve residences. Some of these receive very minimal maintenance. A road condition assessment throughout the watershed would help identify where roads are currently impacting the watershed. Corrective actions could then be identified. Vehicle crossings over stream channels on private land should be assessed and upgraded where appropriate. The Idaho Department of Water Resources and the Army Corps of Engineers (COE) should be consulted on new crossings and improvements.

Coordination between public road maintenance employees, landowners, and land management agencies regarding road construction and repair could help reduce effects such as increased peak flows, sediment delivery to streams, fish barriers, and channel alterations. Avoiding road construction near streams and in unstable areas would help reduce the fine sediment problem in the watershed.

Construction Site Discharge Control

Construction site BMPs can be categorized as erosion control practices, which prevent or minimize erosion; sediment control practices, which attempt to capture soil released through erosion; and source controls.

Potential exists for local government to mitigate pollution. County and city governments have an opportunity to develop ordinances requiring more detailed construction standards for

subdivisions, and to control stormwater runoff. Application processes already in place can be amended to require specific details of construction work before planning and zoning approval.

Federal stormwater regulations require National Pollutant Discharge Elimination System (NPDES) Permits, issued by EPA, for construction sites greater than one acre. A Stormwater Pollution Prevention Plan must be prepared and implemented to control stormwater discharges from the construction site. Further information on the permit requirements is available on the EPA website. http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

Erosion control represents various practices designed to keep water from coming in contact with bare soil or controlling its velocity if it does. Preventive erosion controls include limiting disturbance to land and vegetation; scheduling; and phasing construction. Phasing construction is a practice in which clearing operations are performed in stages to take advantage of cover that exists on the site before construction. Erosion control practices also include drains for surface and subsurface water, dikes and swales placed across slopes to interrupt runoff, and roughness created on the surface to reduce velocity. Trapping sediments once they are released requires slowing the transport velocity sufficiently for soil particles to settle. The two basic types of sediment trapping techniques in use are sediment barriers and settling ponds. Sediment barriers include the commonly used filter fabric and straw bale fences as well as brush fences and barriers constructed of gravel. Both types trap sediments in the same way, by ponding water.

Temporary cover practices are used on portions of construction sites that remain unworked for months, during which time very large amounts of erosion can occur unless these areas are stabilized. Stabilization can be achieved with temporary seeding or various kinds of slope coverings, or both. Slope coverings include both mulches and commercial mats and blankets. Fugitive dust can be controlled through these practices or through the application of water or tackifiers.

Other stabilization practices include a stabilized construction entrance and permanent stabilization through vegetation establishment as soon as possible after all construction is completed in each segment of the site. The construction entrance at the most important access route is important to stabilize, since it is the last point at which tracking sediment off site can be stopped. If equipment travels extensively on unstabilized roads on the site, a tire and vehicle undercarriage wash near the entrance will be needed. Wash water will require treatment in a sediment pond or trap.

Structural and non-structural BMPs are effective for reducing sediment pollution to surface water. Structural controls include infiltration devices, detention and retention basins, vegetated swales, water quality inlets, screens and filters, channel stabilization, riparian habitat enhancement efforts, and wetland restoration projects.

Non-structural controls include planning, procedures, and site-based local controls. Runoff problems can be addressed efficiently with sound planning procedures. Master plans, comprehensive plans, and zoning ordinances can promote improved water quality by guiding the growth of a community away from sensitive areas and by restricting certain types of growth to areas that can support it without compromising water quality. Site-based local controls can include buffer strips and riparian zone preservation, minimization of disturbance and imperviousness, and maximization of open space.

Stormwater BMPs can be found in the Stormwater Catalog of BMPs for Cities and Counties on DEQ's website: http://www.deq.idaho.gov/water/data_reports/storm_water/catalog/index.cfm

The information in this manual is largely applicable to Adams County. For additional information on where there may need to be modifications to account for climate, soils and water table conditions that are unique to the Adams County area, please contact the Adams County Commissioners at (208) 253-4561.

Implementation Strategies

The strategy for protecting surface waters is an important component of any TMDL implementation plan. Table 20 outlines implementation strategies and schedule. This schedule is designed to implement protection activities that will help reduce the potential for pollutants caused by urbanization and stormwater to enter the surface waters of the Little Salmon River watershed.

Table 20. Implementation strategies.

	Protection Activity	Goal Date
City of New Meadows	Develop city ordinances making the cost of adding new subdivisions to the city's system the responsibility of the developer.	2008
City of New Meadows	Analyze population growth projections for the coming years as part of the city's annual budget process to expanding city services.	Annually
City of New Meadows	Develop city stormwater runoff ordinance.	2008
City of New Meadows	Provide information on the EPA General Construction permit (required if more than 1 acre will be disturbed) through the city planning and zoning office as other permits are obtained.	2008
City of New Meadows, coordinated with Adams County	Partner with Adams County planning and zoning to develop subdivision ordinances for areas outside of the New Meadows Area of Impact that will help address regional growth and support the New Meadows Comprehensive Plan.	2008 / 09
City of New Meadows, coordinated with Adams County	Consult with Adams County Planning and Zoning specifically regarding development south of the New Meadows area of impact to find out how the county is addressing stormwater runoff.	2008
City of New Meadows, coordinated with Adams County	Consider creating a staff position to monitor compliance with the plans approved by planning and zoning. (Funding could come from the levy of fees through the planning and zoning permit process.)	2008 / 09
City of New Meadows, coordinated with Adams County	Work with Adams County regarding the development of road construction standards.	2008 / 09
City of New Meadows	Work with NRCS[a], COE[b], and DEQ on city stormwater collection and treatment options.	2008 / 09
City of New Meadows	Obtain information from DEQ regarding wastewater facilities planning grants and low interest construction loans.	2008
City of New Meadows	Identify landowners that might consider partnering with the city to reuse (land–apply) municipal wastewater.	2008
City of New Meadows	Seek funding to update existing stormwater drain engineering plans and specifications.	2009
City of New Meadows	Provide information to Adams County regarding EPA's Construction General Permit.	2008
City of New Meadows & Adams County	Share implementation plan with Idaho and County Commissioners and the City of Riggins.	2008
City of New Meadows & Adams County	Invite Idaho County Commissioners and the City of Riggins to participate in implementation activities for the watershed.	2008

	Protection Activity	Goal Date
Brundage Mountain Resort	Include in planning processes: • limit impervious surfaces as much as practical, • plan large areas of native landscaping and limited areas of lawn, • limit development on steep slopes to prevent erosion, • design roads appropriately, with stormwater treatment to prevent erosion and to capture any additional nutrient or sediment loading caused by development, • design riparian zone buffers to minimize in-stream loading from nearby development, • design and maintain centralized wastewater treatment that meets current DEQ standards, • establish educational materials for homeowners explaining the environmental sensitivity of the area and appropriate mitigation measures for residents to use.	2008
Brundage Mountain Resort	During construction: • implement construction best management practices, • follow NPDES[c] regulations, • establish and follow a Storm Water Pollution Prevention Plan, • manage construction in phases to limit widespread impacts and simplify monitoring, • implement Firewise strategies within the development, and • work with the U.S. Forest Service to ensure forest health in areas adjacent to development in order to limit potential wildfires.	2009 through end of construction

a. NRCS – Natural Resources Conservation Service
b. COE – U.S. Army Corps of Engineers
c. NPDES - National Pollution Discharge Elimination System

References

EPA Construction General Permit: http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

Managing Small Acreages: University of Idaho Cooperative Extension: http://www.ag.uidaho.edu/sustag/living_on_the_land.htm

Pasture and Riparian Management: http://homeasyst.idahoag.us/Water/quiz10/quiz10_information.pdf

Protecting the Watershed: Lake A Syst, Idaho Soil Conservation Commission and DEQ

Stormwater: Catalog of Stormwater BMPs for Idaho Cities and Counties (DEQ): http://www.deq.idaho.gov/water/data_reports/storm_water/catalog/index.cfm

Wetlands: http://www.nrcs.usda.gov/programs/wrp/