Little Salmon River Subbasin Assessment and Total Maximum Daily Load

Five-Year Review

State of Idaho
Department of Environmental Quality
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Table of Contents

List of Tables

List of Figures

Executive Summary

This document presents a 5-year review of the Little Salmon River subbasin total maximum daily load (TMDL) (hydraulic unit code 17060210). The review describes current water quality status, pollutant sources, and recent pollution control efforts in the Little Salmon River subbasin, located in southwest Idaho (Figure A).

This report also addresses assessment units (AUs) listed as impaired in Category 5 of *Idaho's 2010 Integrated Report* (Table A) (DEQ 2011). More detailed information on the subbasin can be found in the *Little Salmon River Subbasin Assessment and TMDL* (DEQ 2006). Table A also summarizes the existing TMDLs.

Overall conditions are static or improving in the subbasin, and no changes to existing TMDLs are recommended. There are recommendations for a bacteria TMDL in East Branch Goose Creek and for a sediment TMDL in Mud Creek. East Branch Goose Creek and West Branch Goose Creek are recommended for Section 303(d) listing in category 4c for flow alteration and delisting from Category 5 for combined biota/habitat assessments. Big Creek (17060210SL009_02a) is recommended for Section 303(d) listing in category 4c for flow alteration.

Subbasin At A Glance

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

The subbasin at a glance is shown in Table A.

Table A. Subbasin at a glance.

<table>
<tr><td colspan="2">Approved TMDLs (pollutants)
Little Salmon River 17060210SL007_04 (temperature)
Little Salmon River 17060210SL007_05 (temperature/total phosphorus/bacteria)
Big Creek 17060210SL009_02a (total phosphorus/bacteria)</td><td>Assessment Units Going From Category 4a of the 2010 Integrated Report to Category 2 (from an AU with a TMDL that does not support beneficial uses to an AU that supports beneficial uses)
None</td></tr>
<tr><td>Implementation Plans
2008 Agriculture, Forestry, Urban/Suburban (DEQ 2008)</td><td>Assessment Units Recommended for Category 5 in Next Integrated Report
None</td><td>Assessment Units in Category 5 AU (listing basis)
West Branch Goose Creek 17060210SL007_04a (combined biota/habitat bioassessments)
Mud Creek 17060210SL008_03 (benthic macroinvertebrate bioassessments)
East Branch Goose Creek 17060210SL010_04 (combined biota/habitat bioassessments)</td></tr>
</table>

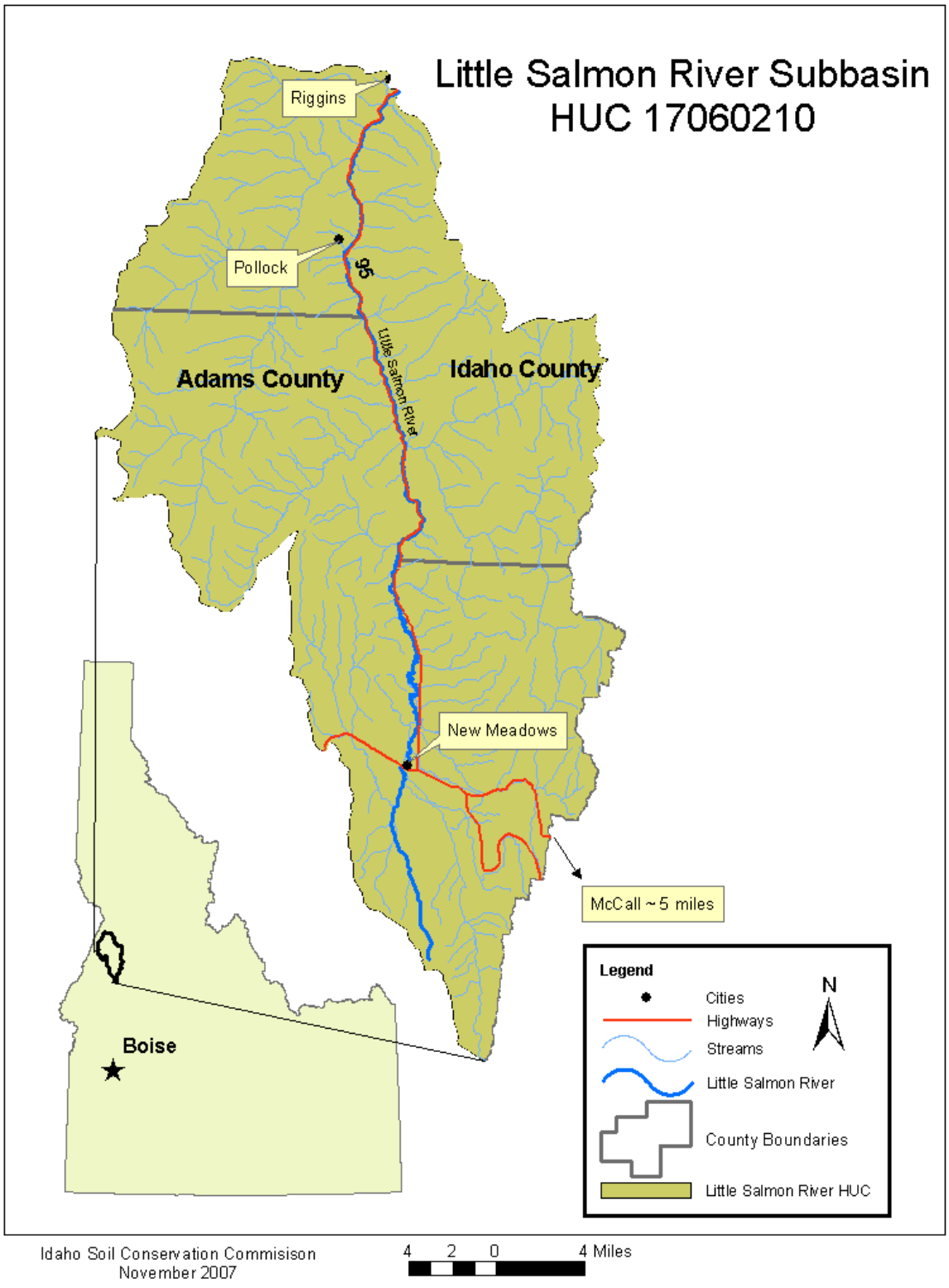

Figure A. Little Salmon River subbasin.

Section 1. Introduction

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to CWA Section 303, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the nation's waters whenever possible.

CWA Section 303(d) establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list (a §303(d) list) of impaired waters. This list is currently published every 2 years as the list of Category 5 waters in the Integrated Report. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants set at a level to achieve water quality standards.

Idaho Code 39-3611(7) requires a 5-year cyclic review process for Idaho TMDLs:

> The director shall review and reevaluate each TMDL, supporting subbasin assessment, implementation plan(s) and all available data periodically at intervals of no greater than five (5) years. Such reviews shall include the assessments required by section 39-3607, Idaho Code, and an evaluation of the water quality criteria, instream targets, pollutant allocations, assumptions and analyses upon which the TMDL and subbasin assessment were based. If the members of the watershed advisory group, with the concurrence of the basin advisory group, advise the director that the water quality standards, the subbasin assessment, or the implementation plan(s) are not attainable or are inappropriate based upon supporting data, the director shall initiate the process or processes to determine whether to make recommended modifications. The director shall report to the legislature annually the results of such reviews.

This report is intended to meet the intent and purpose of Idaho Code 39-3611(7). The report documents the review of approved Idaho TMDLs and implementation plans in the Little Salmon River subbasin by considering the most current and applicable information in conformance with Idaho Code 39-3607; evaluating the appropriateness of the TMDL to current subbasin conditions; evaluating the implementation plan; and consulting with the watershed advisory group (WAG).

Final decisions and recommendations for TMDL modifications are made by the Idaho Department of Environmental Quality (DEQ) director.

Approval of TMDL modifications is decided by the United States Environmental Protection Agency (EPA), with consultation by DEQ.

Section 2. Review and Status

TMDLs were developed in the *Little Salmon River Subbasin Assessment and TMDL* (DEQ 2006) as shown in Table 1. Figure 1 shows the assessment units (AUs) that are in Category 5 of the 2010 Integrated Report.

Table 1. Total maximum daily load summary.

Assessment Unit	Total Maximum Daily Load	Load Capacity	Total Maximum Daily Load Target	Pollutant Reduction Required (%)
Little Salmon River (Vicks Creek to Big Creek) (17060210SL007_04)	Temperature	—	Potential natural vegetation conditions (see TMDL)	13
Little Salmon River (Big Creek to Round Valley Creek) (17060210SL007_05)	Temperature	2,034,631 kWh/day	Potential natural vegetation conditions (see TMDL)	13
	Bacteria	1.02 E11 cfu/day (average)	<126 cfu/100 mL geometric mean ≤406 cfu/100 mL single sample	71
	Total phosphorus	12.3 kg/day	≤0.075 mg/L	12
Big Creek (17060210SL009_2a)	Bacteria	3.58 E10 cfu/day	<126 cfu/100 mL geometric mean ≤406 cfu/100 mL single sample	94
	Total phosphorus	1.84 kg/day	≤0.075 mg/L	41

Notes: Kilowatt hour (kWh); colony-forming unit (cfu); kilogram (kg); milliliter (mL); milligram per liter (mg/L).

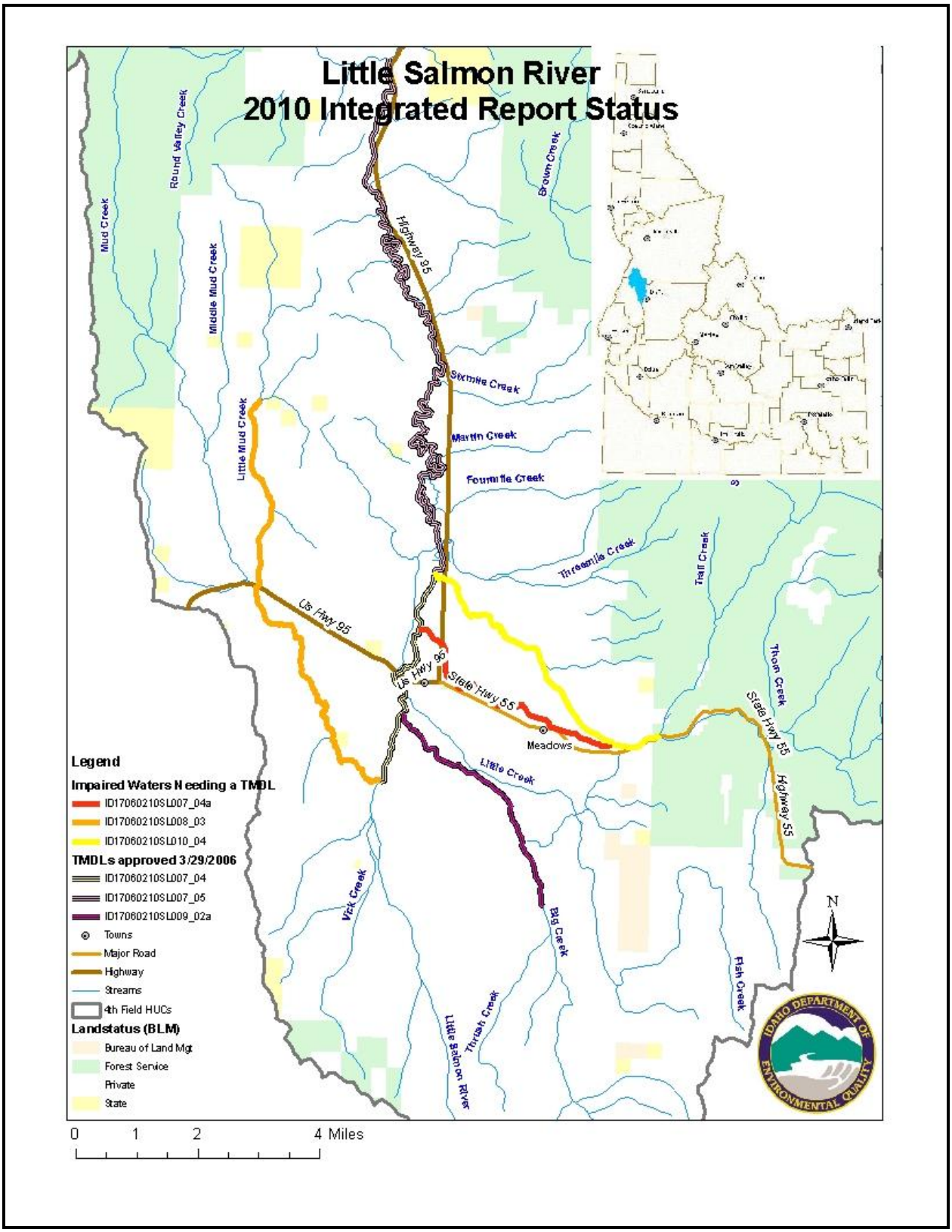

Figure 1. Status of TMDLs in the Little Salmon River subbasin (2010 Integrated Report).

Section 3. Beneficial Use Status

Idaho water quality standards require that surface waters of the state be protected for beneficial uses, wherever attainable (IDAPA 58.01.02.050.02). These beneficial uses are interpreted as existing, designated, and presumed uses. The *Water Body Assessment Guidance* (Grafe et al. 2002) gives a detailed description of beneficial use identification for use assessment purposes.

3.1 Changes to Subbasin Characteristics

No significant changes in land use have occurred in the subbasin since the *Little Salmon River Subbasin Assessment and TMDL* was approved by EPA in 2006.

Overall in the subbasin, there are fewer cattle seasonally and throughout the year, while the amount of people living and recreating in the subbasin has increased. An area resident commented that logging practices have changed in certain areas in the subbasin, leading to greater tree removal. In the past several years, large amounts of gravel were transported downstream during high water events in the Little Salmon River headwaters that resulted in the landowners getting permits to remove the gravel from the stream. The landowner attributed the excess gravel to logging practices.

The Idaho Department of Lands ensures that logging practices on private ground meet the "Rules Pertaining to the Idaho Forest Practices Act" requirements (IDAPA 20.02.01). Both United States Forest Service contractors and the Potlatch Corporation have been logging in the subbasin with a focus on fuel management near the wildland-urban interface. Potlatch may have removed larger amounts of timber than in previous years in the Little Salmon River headwaters area to reduce the amount of grand fir in the stands. Grand fir is a climax species, and slight changes in the climate affect them more than seral species like ponderosa pine and Douglas-fir. Timber removal can result in water quality changes due to greater runoff from the logged areas until replanting efforts take hold. According to the Idaho Department of Lands, Potlatch has met the IDAPA 20.02.01, "Rules Pertaining to the Idaho Forest Practices Act" requirements.

Further observations of the erosion in this area may be warranted to determine the relationship of sediment transport to flow events and land use practices.

3.2 Beneficial Uses

The beneficial uses of the §303(d) listed AUs are shown in Table 2.

Table 2. Beneficial uses of 2010 §303(d) listed water bodies.

Assessment Unit	Beneficial Uses	Type of Use (Designated, Existing, Presumed)
West Branch Goose Creek (17060210SL007_04a)	Cold water aquatic life, contact recreation	Presumed
Mud Creek (17060210SL008_03)	Cold water aquatic life, contact recreation	Presumed
East Branch Goose Creek (17060210SL010_04)	Cold water aquatic life, contact recreation	Presumed

Beneficial uses are protected by a set of criteria, which include narrative criteria for pollutants such as sediment and nutrients and numeric criteria for pollutants such as bacteria, dissolved oxygen, pH, ammonia, temperature, and turbidity (IDAPA 58.01.02.250). Table 3 includes the most common numeric criteria used in TMDL development.

Table 3. Common numeric criteria supporting designated beneficial uses in Idaho water quality standards.

Designated and Existing Beneficial Uses				
Water quality parameter	**Primary contact recreation**	**Secondary contact recreation**	**Cold water aquatic life**	**Salmonid spawning (during spawning and incubation periods for inhabiting species)**
Water Quality Standards: IDAPA 58.01.02.250				
Bacteria, pH, and dissolved oxygen	Less than 126 *E. coli* /100 mL[a] as a geometric mean of five samples over 30 days; no sample greater than 406 *E. coli* organisms/ 100 mL	Less than 126 *E. coli* /100 mL as a geometric mean of five samples over 30 days; no sample greater than 576 *E. coli* /100 mL	● pH between 6.5 and 9.0 ● DO[b] exceeds 6.0 mg/L[c]	● pH between 6.5 and 9.5 ● Water column DO exceeds 6.0 mg/L or 90% saturation, whichever is greater ● Intergravel DO exceeds 5.0 mg/L for a 1-day minimum and exceeds 6.0 mg/L for a 7-day average
Temperature[d]	—	—	22 °C or less daily maximum; 19 °C or less daily average	● 13 °C or less daily maximum; 9 °C or less daily average ● Bull trout not to exceed 13 °C maximum weekly maximum temperature over warmest 7-day period, June–August; not to exceed 9 °C daily average in September and October

a. *Escherichia coli* organisms per 100 milliliters
b. Dissolved oxygen
c. Milligram per liter
d. Temperature exemption—Exceeding the temperature criteria will not be considered a water quality standard violation when the air temperature exceeds the 90th percentile of the 7-day average daily maximum air temperature calculated in yearly series over the historic record measured at the nearest weather reporting station.

3.3 Stream Visual Assessment Protocol

Stream visual assessment protocol (SVAP) was used by DEQ and Idaho Soil and Water Conservation Commission staff to assess changes in streams with TMDLs as well as evaluate streams on the 2010 §303(d) list of impaired water bodies.

The SVAP was developed by the United States Department of Agriculture and describes a method to evaluate stream health based on physical parameters such as channel modifications, riparian condition, bank stability, water appearance, benthic macroinvertebrate habitat, hydrologic alterations, and stream shading. The protocol uses a ranking scale from 1 to 10 (1 being most impaired to 10 being least impaired). This method is qualitative and requires training using consistent assessment techniques.

The Idaho Natural Resources Conservation Service (NRCS) Stream Erosion Condition Inventory (SECI) was added to the SVAP to provide a way of identifying eroding banks within inventoried reaches and estimate the sediment load from eroding banks. While the SECI is qualitative, the Idaho SECI adds a quantitative component by measuring eroding bank length and height. Field staff georeferenced eroding sections of bank, allowing staff to easily pinpoint areas for landowner implementation projects at a later date. Bank instability areas were recorded, and data needed for calculating a sediment TMDL were collected.

At three transects per reach, Wolman pebble counts to assess stream substrate and width and depth measurements were taken to further identify baseline conditions.

A vegetation inventory was conducted for each reach, which listed the abundance of plants present within a reach. This inventory provided a record of riparian vegetation observed that could be used with DEQ's potential natural vegetation (PNV) approach. Vegetation types, such as trees, shrubs, and grasses, present in a reach can be compared to types of riparian vegetation expected to exist on site to determine restoration strategies.

PNV methodology not only allowed assessment of current stream shade conditions but also for implementation planning efforts at a later date for areas that show significant lack of shade relative to estimated natural background conditions.

The SVAP results presented here are from the quantitative portions of the protocol.

3.3.1 Sampling Times

The SVAP protocol is used when streams are wadeable and vegetation is in leaf, which is typically in the summer. Bacteria are sampled during times when people are expected to be recreating in the subbasin, which is also typically summer. Bacteria is sampled conservatively because the water quality standard is designed to protect public health, particularly of sensitive populations like children, who may be wading or swimming in local waters (i.e., the Little Salmon River). Since the water quality criteria are based on protecting public health, sampling at the most conservative times when water is lowest and temperatures are high is appropriate. The bacteria sampling completed does not determine what the source of *Escherichia coli* (*E. coli)* bacteria are (i.e., whether wildlife, humans, or livestock) only whether there are concentrations that exceed state water quality criteria.

3.4 New Data for Assessment Units (Streams) with TMDLs or Listed as Impaired in Category 5 of the Integrated Report

New data for AUs with TMDLs or those listed as impaired in Category 5 of the 2010 Integrated Report are shown in this section.

3.4.1 Mud Creek

The 3rd-order AU of Mud Creek (17060210SL008_03) is on DEQ's §303(d) list forbenthic macroinvertebrate bioassessments based on 2005 DEQ stream inventory scores that showed low habitat and macroinvertebrate metric scores (electrofishing was not done so a fisheries score is unavailable) as shown in Section 3.9 "Current Stream Inventory Data."

3.4.1.1 Stream Visual Assessment Protocol Results

DEQ and Idaho Soil and Water Conservation Commission staff investigated possible pollutant sources in summer 2010 using a modified SVAP protocol that included a bank erosion inventory and PNV study. DEQ staff also collected total phosphorus water quality samples. In 2011, bacteria samples were collected. Table 4 shows the SVAP results, and Table 5 and Table 6 show water quality monitoring results.

Table 4. Mud Creek 2010 stream visual assessment protocol results.

Assessment Unit	Percent Fines (%)	Eroding Bank (%)
Little Mud Creek (17060210SL008_02a)	51	11
Mud Creek (17060210SL008_03)	61	29

3.4.1.2 Nutrients

The nutrient data for Mud Creek (17060210SL008_03) show levels of nutrients that are lower than the TMDL target of 0.075 milligrams per liter (mg/L) total phosphorus, although levels measured in 2010 were higher than those measured in 2005 (Table 6). The SVAP survey did not note excess algal growth. Nutrients are not a pollutant of concern.

Table 5. Water quality 2005 data for Mud Creek (17060210SL008_03).

Date	Dissolved Oxygen (mg/L)	Temperature (°C)	pH	Suspended Sediment Concentration (mg/L)	Total Phosphorus (mg/L)	*E. coli* (cfu/100 mL)
4/6/05	12.31	2.7	7.73	3	0.031	10
4/14/05	12.18	3.4	7.65	3.2	0.029	5
4/26/05	11.51	5.7	7.36	2.8	0.026	9
5/10/05	11.07	5.7	7.5	2.2	0.024	26
5/24/05	11.3	7.6	7.35	1.8	0.053	22
6/7/05	11.11	7.8	7.62	0.4	0.019	100
6/21/05	10.05	14.7	7.72	0.4	0.019	80
6/29/05	9.83	13.3	7.81	<0.3	0.022	150
7/7/05	ND*	ND	ND	ND	ND	440
7/12/05	9.32	16.8	7.74	0.7	0.019	200
7/18/05	ND	ND	ND	ND	ND	160
7/21/05	ND	ND	ND	ND	ND	200
7/26/05	9.2	14.9	7.77	1.1	0.019	70
8/10/05	8.08	16.9	7.71	1.1	0.019	120
8/24/05	10.64	13.1	7.79	1.4	0.017	42
9/6/05	10.12	12	7.77	4	0.017	220

Notes: Milligrams per liter (mg/L); colony-forming unit (cfu); milliliter (mL); no data (ND)

Table 6. Mud Creek (17060210SL008_03) 2010 nutrient data.

Date	Total Phosphorus (mg/L)
7/27/10	0.039
8/7/10	0.032
9/20/10	0.072
10/12/10	0.029

Note: Milligram per liter (mg/L)

3.4.1.3 Bacteria

The *E. coli* geometric mean based on five samples collected 3–7 days apart over 30 days was calculated from July 7 to July 26 for the 2005 data (Table 5). The geometric mean was 181 colony-forming units (cfu), which is greater than the water quality threshold criteria of 126 cfu, meaning that it exceeds Idaho's water quality criteria. More current bacteria data were collected in August 2011 to see if conditions had changed (Table 7). The geometric mean was 27.7 cfu, which is below the 126 cfu criterion. Bacteria is not a pollutant of concern for Mud Creek (17060210SL008_03); however, additional sampling is recommended in July 2012 to ensure that bacteria standards are met during similar flow and temperature conditions from 2005 when bacteria exceeded the standard.

Table 7. Mud Creek (17060210SL008_03) 2011 *E. coli* data.

Date	*E. coli* (cfu)
8/3/11	44.8
8/10/11	81.3
8/16/11	18.5
8/19/11	18
8/22/11	13.5

Note: Colony-forming unit (cfu)

3.4.1.4 Sediment

Wolman pebble count data for the lower reach of Mud Creek (17060210SL008_03) showed that approximately 61% of the instream substrate from all reaches consisted of fine particles, such as silt and clay, which corresponds to the soil types described above. Support of cold water aquatic species is generally found at percent fine levels of 28% or less.

Mud Creek (17060210SL008_03) showed that banks were, on average, 71% stable, but as shown in Table 8, there were areas of severely eroding banks. In general, 80% or greater bank stability represents conditions that do not contribute excess sediment to the stream. A sediment TMDL is recommended for this AU.

Table 8. Stream visual assessment protocol and stream erosion condition inventory rating by sampled reach.

Stream Reach (corresponds to those shown in Figure 2)	Stream Erosion Condition Inventory Rating
Mud Creek 1	Severe
Mud Creek 2	Severe
Little Mud Creek 1	Severe
Little Mud Creek 2	Slight
Little Mud Creek 3	Not eroding
Little Mud Creek 4	Not eroding
Middle Mud Creek 1	Slight

3.4.1.5 Temperature

Temperature data for Mud Creek (17060210SL008_03), including data from 2008, indicate that it meets Idaho's water quality criteria for temperature. Shading data show that, overall, there is a positive trend in increased shade on the creek (Table 9 and Figure 2). Temperature is not a pollutant of concern.

Table 9. Mud Creek shade changes since original total maximum daily load.

Reach Name	Original Lack of Shade (%)	Target Shade (%)	Existing Shade (%)	Current Lack of Shade (%)
Mud Creek 1	-10	30	21	-9
Mud Creek 2	-10	30	21	-9
Little Mud Creek 1	-30/-20	50/40	11	-39/-29
Little Mud Creek 2	-20	50	39	-11
Little Mud Creek 3	-40	80	42	-38
Little Mud Creek 4	-30	80	60	-20
Middle Mud Creek	-40	70	50	-20

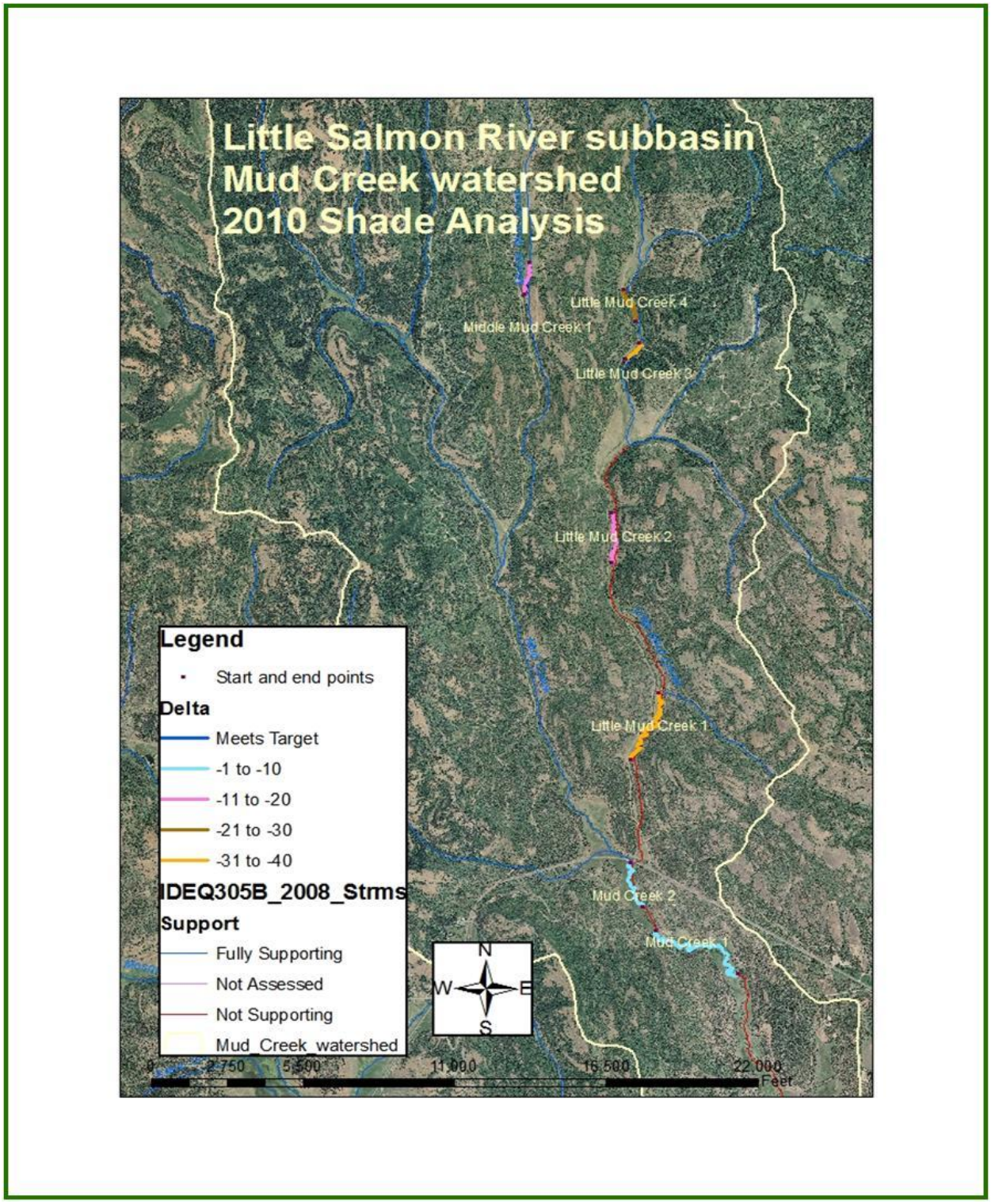

Figure 2. Mud Creek shade analysis.

3.4.1.6 Conclusion

Mud Creek (17060210SL008_03) is recommended for a TMDL for sediment based on instream bank erosion. Temperature, nutrients, and bacteria are not pollutants of concern based on SVAP and water quality monitoring results. Additional bacteria sampling is recommended to confirm that bacteria is not a pollutant of concern.

3.4.2 Goose Creek

East Branch Goose Creek (17060210SL010_04) is listed on the 2010 Integrated Report as impaired due to biota and habitat bioassessments, which means that the creek received low rating scores in a DEQ stream inventory. The creek has several diversions that lead to dewatering near the mouth. This lack of water appears to be the most significant factor impacting beneficial uses, particularly cold water aquatic life. While there is nuisance periphyton and macrophyte growth in the lowermost sections, these growths occurred in slack water areas and are exacerbated by low flows. Farther up in the subbasin, there is little nuisance periphyton or macrophyte growth.

West Branch Goose Greek (17060210SL007_04a) is also listed on the 2010 Integrated Report as impaired due to biota and habitat bioassessments. The stream conditions in West Branch Goose Creek are similar to those in East Branch Goose Creek.

3.4.2.1 Stream Visual Assessment Protocol Results

West Branch Goose Creek (17060210SL007_04a) and East Branch Goose Creek (17060210SL010_04) had stable streambanks as shown in Table 10. Table 11 and Table 12 show water quality monitoring results. Dewatering in the lower section of West Branch Goose Creek appears to be a significant factor impacting beneficial uses, particularly cold water aquatic life. Above the diversions, East Branch Goose Creek rated good to excellent whereas below it related poor. Land management practices were similar above and below diversions. Results were similar for West Branch Goose Creek. As part of the SVAP survey, personnel noted low flow conditions including areas that were completely dewatered. Overall, shading results are showing an improvement. Some areas in the subbasin are in good condition, while other areas could be targeted for improvement projects.

Table 10. West Branch Goose Creek and East Branch Goose Creek 2010 stream visual assessment protocol ratings.

Assessment Unit	Stable Banks (%)
West Branch Goose Creek (17060210SL007_04a)	89
East Branch Goose Creek (17060210SL010_04)	98

3.4.2.2 Nutrients

Overall, nutrient levels are lower than other tributary streams in the subbasin, although 2006 results were slightly over the TMDL nutrient target; 2010–2011 results were below the TMDL target of 0.075 mg/L (Table 11 and Table 12). Since SVAP monitoring was not previously done in this watershed , pinpointing what contributed to the decline in nutrient concentrations is not

possible. Nutrients do not appear to be a pollutant of concern, and the nuisance algae growth found mainly in slackwater areas in the lowermost sections is attributed to low flows rather than excess nutrients.

Table 11. West Branch Goose Creek and East Branch Goose Creek 2006 nutrient results.

Assessment Unit	Mean Total Phosphorus (mg/L)	Median Total Phosphorus (mg/L)	Range (mg/L)	Reduction Needed based on Mean Total Phosphorus (%) (Target = 0.075 mg/L)
West Branch Goose Creek (17060210SL007_04a)	0.063	0.072	0.024–0.094	0
East Branch Goose Creek (17060210SL010_04)	0.08	0.081	0.04–0.132	6

Note: Milligram per liter (mg/L)

Table 12. East Branch Goose Creek (17060210SL010_04) 2010–2011 nutrient data.

Date	Total Phosphorus (mg/L)
7/27/10	0.047
10/12/10	0.024
4/27/11	0.032
5/16/11	0.044
6/8/11	0.046
7/18/11	0.029

Note: Milligram per liter (mg/L)

3.4.2.3 Bacteria

The 2006 *E. coli* results for East Branch Goose Creek (17060210SL010_04) were high, so sampling was conducted in mid-summer 2011 to determine if a TMDL is warranted (Table 13). The results in Table 14 show that the geometric mean of 264 cfu exceeds the bacteria water quality criteria of 126 cfu, and a TMDL is recommended (Table 14).

Table 13. West Branch Goose Creek and East Branch Goose Creek 2006 *E. coli* results.

Date	West Branch Goose Creek (17060210SL007_04a) (cfu)	East Branch Goose Creek (17060210SL010_04) (cfu)
5/10/06	No data	13
5/23/06	260	130
5/31/06	51	370
6/13/06	52	240
6/27/06	1,600	820
7/11/06	310	610
7/27/06	140	2,000
8/3/06	220	1,100
8/22/06	180	2,400
9/6/06	460	490
9/18/06	74	120
10/13/06	59	140
10/17/06	160	260

Note: Colony-forming unit (cfu)

Table 14. East Branch Goose Creek (17060210SL010_04) 2011 *E. coli* results.

Date	*E. coli* (cfu)
8/30/11	146.7
9/5/11	290.9
9/11/11	387.3
9/18/11	117.8
9/22/11	663
GEOMEAN	264

Note: Colony-forming unit (cfu)

3.4.2.4 Temperature

The shade targets for East Branch Goose Creek (17060210SL010_04) from the original TMDL were re-evaluated to ensure that they were correct because while the initial SVAP shading results for East Branch Goose Creek showed several areas not meeting shade targets, the riparian area in those reaches appeared vigorous. DEQ determined that a Geyer willow/sedge community was more appropriate for lowermost East Branch Goose Creek, and a warm, dry Douglas fir and moist ponderosa pine community was more appropriate for the upper regions of this stream reach. The revised shade results are shown in Table 15 indicating an overall improvement in shading (Figure 3).

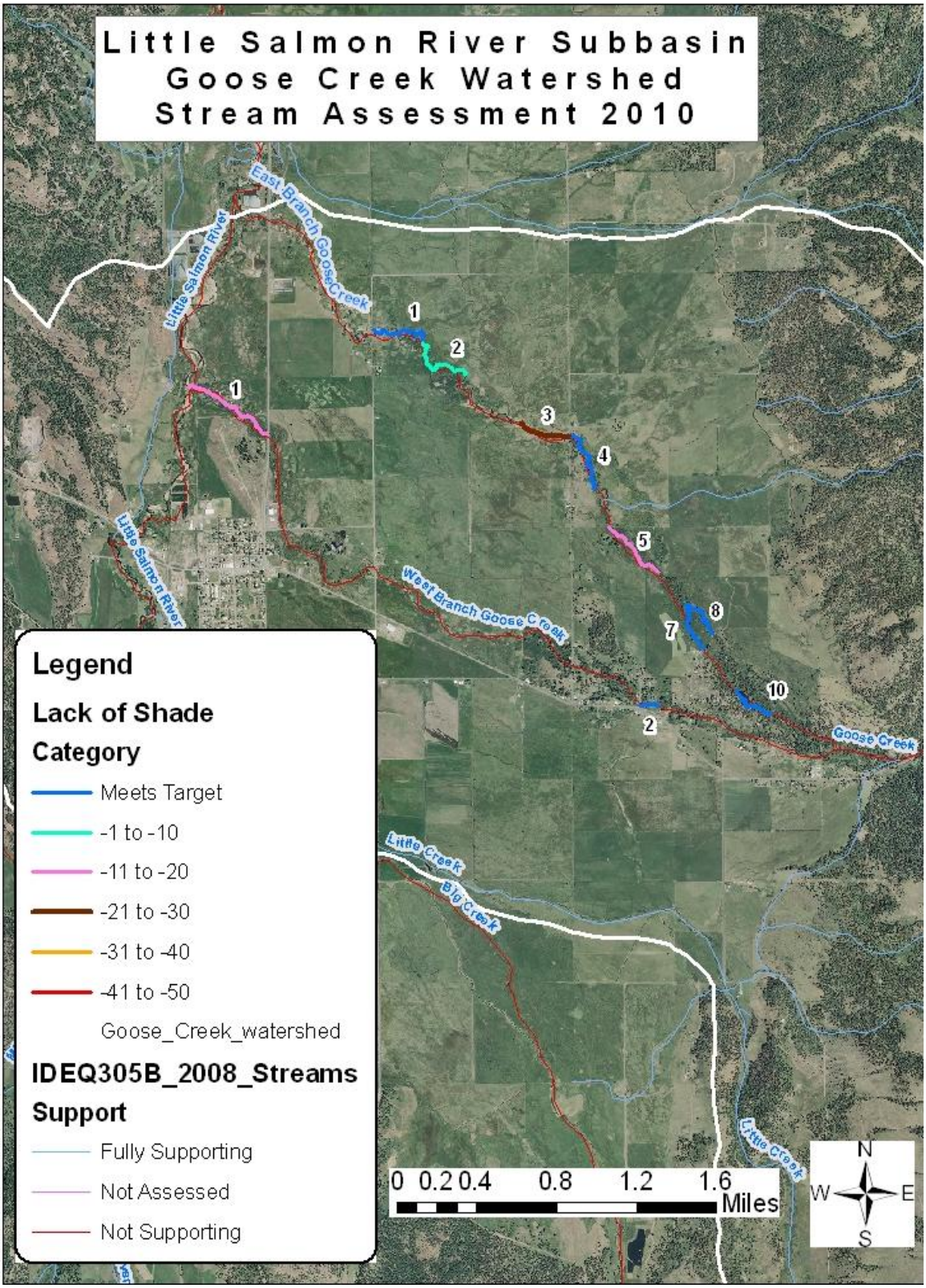

Figure 3. East Branch and West Branch Goose Creek shade analysis.

Table 15. Solar Pathfinder results for East Branch Goose Creek (17060210SL010_04) and West Branch Goose Creek (17060210SL007_04a) using a revised shade curve.

Reach Name	Original Lack of Shade (%)	Target Shade (%)	Existing Shade (%)	Current Lack of Shade (%) (Negative Numbers)
East Branch Goose Creek 1	-10/10	22	22	0
East Branch Goose Creek 2	0	22	18	-4
East Branch Goose Creek 3	-10	22	1	-21
East Branch Goose Creek 4	-10	22	22	0
East Branch Goose Creek 5	-10	22	4	-18
East Branch Goose Creek 7	-20	33	58	25
East Branch Goose Creek 8	-20	33	68	35
East Branch Goose Creek 10	-20	33	43	10
West Branch Goose Creek 1	-20/-10	33	21	-12
West Branch Goose Creek 2	-40	33	61	28

3.4.2.5 Conclusion

Nutrients are not a significant pollutant of concern in either East Branch Goose Creek or West Branch Goose Creek. The bacteria geometric mean of 264 cfu is above the water quality standard of 126 cfu, and East Branch Goose Creek is recommended for listing in Category 5 of the 2012 Integrated Report for bacteria and a bacteria TMDL recommended. Both West Branch Goose Creek and East Branch Goose Creek are recommended for listing for flow alteration in the next integrated report cycle. A listing for flow alteration does not mean that changes in irrigation management need to be made but means that a stream is not meeting its beneficial uses due to flow alteration, not a specific pollutant such as sediment or nutrients.

3.4.3 Big Creek

Big Creek (17060210SL009_02a) has existing TMDLs for bacteria and nutrients, which should remain in place until data show that TMDL targets are met. DEQ sampled for bacteria in 2011, and results exceeded the state geometric mean standard.

3.4.3.1 Bacteria

DEQ sampled for bacteria to see if concentrations exceeded the state water quality criteria for bacteria. Bacteria is sampled in summer to coincide with the times that water recreation is most likely to occur in the Little Salmon River subbasin. It is important to sample for bacteria during this time because the water quality standards are in place to protect human health, so sampling at the most conservative times when water is lowest and temperatures are high is appropriate. As shown in Table 16, concentrations were above the geometric mean standard of 126 cfu. The geometric mean of 1,857.9 cfu means that the TMDL will remain in place. The sources of bacteria have not been determined. Sampling by the Idaho State Department of Agriculture in 2004 did not show violations of the bacteria standard at the sampling site on the border between the forest and meadow areas.

Table 16. Big Creek (17060210SL009_02a) 2011 *E. coli* results.

Date	*E. coli* (cfu)
8/19/11	2,400
8/22/11	2,419
8/26/11	2,400
8/29/11	4,105
9/5/11	387
GEOMEAN	1857.9

Note: Colony-forming unit (cfu)

3.4.3.2 Conclusion

Big Creek (17060210SL009_02a) conditions remain relatively static since the TMDLs were developed. The TMDLs for bacteria and nutrients should stay in place. The meadow portion of Big Creek (17060210SL009_02a) should be listed for flow alteration to account for channel conditions that are affected by flow issues not attributable to a specific pollutant. Irrigation diversions mean that flows fluctuate. At times more water is present than would be present if the system was unmanaged while conversely flows can also be lower than would occur naturally.

3.4.4 Fourmile Creek

Figure 4 shows the Fourmile Creek (17060210SL007_02) reaches sampled for the SVAP process. Table 17 provides SECI results. Sections of Fourmile Creek have undergone riparian plantings and protection projects in the last 5 years. The oldest of the planting projects has resulted in significant improvement, and the current shade is greater than the target shade projections (Figure 5 and Figure 6). The SVAP results for that section also indicate that the reach is in good condition. These improvements ensure that incoming water into the Little Salmon River is cooled and that nutrient concentrations are reduced. Table 18 shows the changes in shade since Fourmile Creek was analyzed for the Little Salmon River TMDL in 2005.

3.4.4.1 Stream Visual Assessment Protocol Results

Table 17 shows the SECI results for Fourmile Creek (17060210SL007_02).

Table 17. Bank erosion (stream erosion condition inventory) results for Fourmile Creek (17060210SL007_02).

Stream Reach	Stream Erosion Condition Inventory Rating
Fourmile Creek 1	Slight
Fourmile Creek 2	Slight
Fourmile Creek 3	Moderate
Fourmile Creek 4	Slight
Fourmile Creek 5	Slight
Fourmile Creek 6	Not eroding

3.4.4.2 Temperature

A Solar Pathfinder is used to determine the amount of shade received at a particular point based on canopy cover, topography, and aspect. The following Solar Pathfinder data were collected in summer 2010 (Table 18 and Figure 4).

Table 18. Shade changes in Fourmile Creek (17060210SL007_02) since original total maximum daily load.

Reach Name	Original Lack of Shade (%)	Target Shade (%)	Existing Shade (%)	Current Lack of Shade (%)
Fourmile Creek 1	-50	50	4	-46
Fourmile Creek 2	-50	50	10	-40
Fourmile Creek 3	-10	20	37	17
Fourmile Creek 4	-20	20	37	17
Fourmile Creek 5	-30	50	51	1
Fourmile Creek 6	-20/-10	80	97	17

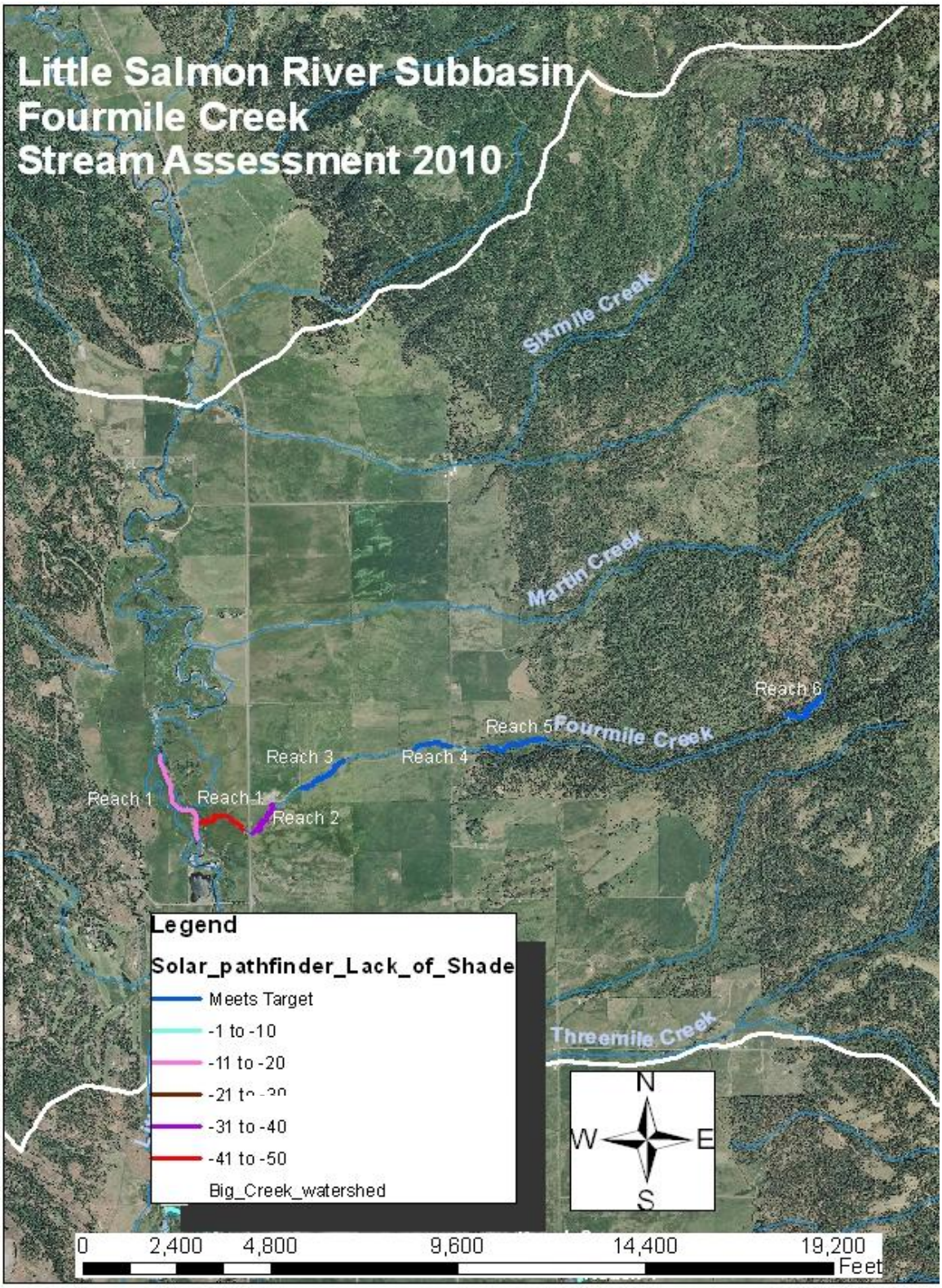

Figure 4. Fourmile Creek shade analysis.

Figure 5. Fourmile Creek riparian planting project, 2005.

Figure 6. Fourmile Creek 5 years after planting project, 2010.

3.4.4.3 Conclusion

Fourmile Creek is not on the §303(d) list nor does it have an existing TMDL, but it was included in this report to provide baseline information on changes due to implementation projects. As a tributary to the Little Salmon River, improvements made on Fourmile Creek help meet the TMDL load allocations in the Little Salmon River.

3.4.5 Little Salmon River

New SVAP data were collected on the Little Salmon River (Big Creek to Round Valley Creek, 17060210SL007_05), and nutrient data were collected at the TMDL compliance point.

3.4.5.1 Stream Visual Assessment Protocol Results

SVAP data were only collected on 1.5 miles of the stream in three locations. Wolman pebble counts ranged from 30% to 46% fine sediment. Bank stability ranged from 64% to 97% stable. SVAP data were previously collected in fall 2007 after leaves had fallen from shrubs and trees. DEQ decided that it is not appropriate to compare the results from 2007 to the results from 2010 because the 2007 data may not accurately reflect riparian conditions.

3.4.5.2 Nutrients

As shown in Table 19, nutrient data were collected for the period between June and September over a 2-year period (2010–2011). The average concentration was calculated for sampling done between June 21 and September 21 because that was defined as the critical period in the TMDL. The average concentration for those months is 0.082 mg/L, which is above the TMDL target of 0.075 mg/L.

Table 19. Little Salmon River (17060210SL007_05) at Circle C subdivision 2010–2011 total phosphorus data.

Date	Total Phosphorus (mg/L)
8/4/10	0.11
8/18/10	0.1
9/20/10	0.035
7/21/11	0.082

Note: Milligram per liter (mg/L)

3.4.5.3 Bacteria

Bacteria concentrations exceeded the TMDL target geometric mean sample of 126 cfu in 2011 monitoring, so the TMDL is recommended to remain in place (Table 20). The geometric mean was 134 cfu. Bacteria concentrations measured during July 2004 exceeded the state standard, which is why a TMDL target was developed. Table 21 shows 2005 bacteria data. The 2004 bacteria data from the Idaho State Department of Agriculture did not show violations of water quality criteria at the Highway 95 bridge in New Meadows but showed violations at the Meadow Creek bridge and at the Circle C subdivision bridge.

Table 20. Little Salmon River (17060210SL007_05) 2011*E. coli* concentrations.

Date	*E. coli* (cfu)
8/4/11	86.2
8/11/11	101.2
8/16/11	325.5
8/19/11	93
8/22/11	167
GEOMEAN	134

Note: Colony-forming unit (cfu)

Table 21. Little Salmon River (17060210SL007_05) 2005 *E. coli* data.

Date	*E. coli* (cfu)
5/10/05	350
5/24/05	43
6/7/05	300
6/21/05	980
6/29/05	1700
7/7/05	150
7/12/05	250
7/18/05	57
7/21/05	52
7/26/05	62
8/10/05	44
8/24/05	93
9/6/05	1,200

Note: Colony-forming unit (cfu)

3.4.5.4 Temperature

Overall, in the areas sampled, a slight improvement in shading occurred as shown in Table 22 and Figure 7.

Table 22. Little Salmon River subbasin (17060210SL007_05) Big Creek to Round Valley Creek) shade analysis.

Reach Name	Original Lack of Shade (%)	Target Shade (%)	Existing Shade (%)	Current Lack of Shade (%)
Little Salmon River 3	-10	10	8	-2
Little Salmon River 2	-20	20	1	-19
Little Salmon River 1	-20	20	10	-10

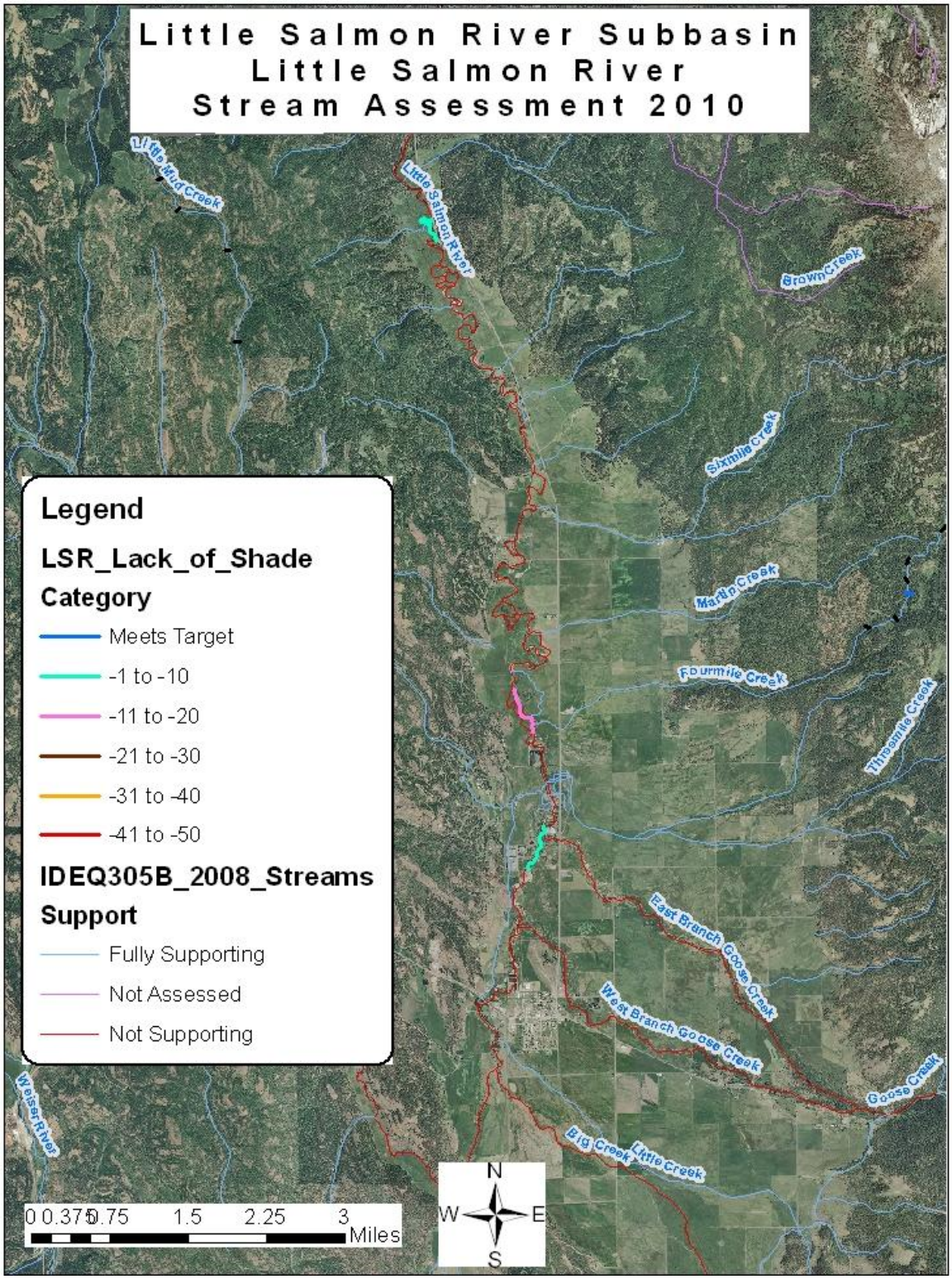

Figure 7. Little Salmon River shade analysis.

3.4.5.5 New Meadows Wastewater Treatment Plant and Stormwater Update

New Meadows is currently undergoing an addendum to their facility planning study to look at TMDL issues and National Pollutant Discharge Elimination System (NPDES) permit noncompliance for the Little Salmon River related to phosphorous discharge from the wastewater treatment plant. As part of this study, the lagoons will be seepage tested. The study will address available treatment options for phosphorous removal and land application alternatives for disposal options.

Irrigation ditches that originate outside of town run through New Meadows. The city has altered drains slightly to slow stormwater flow and encourage dissipation of runoff before the water enters the Little Salmon River (Figure 8). Emergency measures for flood control were taken in March 2012 after a rain-on-snow event.

Table 23 shows bacteria and nutrient data from the irrigation drains that run through New Meadows. While these drains do not always flow and typically are under 1 cubic foot per second when they do flow, they can transport high concentrations of bacteria and nutrients into the Little Salmon River, particularly during spring runoff. This runoff captures bacteria and nutrients from both outside and inside the city limits.

Figure 8. New Meadows drain monitoring locations.

Table 23. Total phosphorus and *E. coli* monitoring results for New Meadows drains.

Date	Drain 1		Drain 2		Drain 3	
	Total Phosphorus (mg/L)	*E. coli* (cfu)	Total Phosphorus (mg/L)	*E. coli* (cfu)	Total Phosphorus (mg/L)	*E. coli* (cfu)
4/7/08	ND	<1	0.161	<1	ND	ND
4/28/08	0.14	2	0.154	<1	0.126	4.1
5/21/08	0.149	14.8	0.327	2	0.184	461
6/3/08	0.896	>2,420	0.391	980	0.067	>2,420
8/5/08	0.13	75.4	0.13	68.2	0.12	46.2
9/11/08	Dry	Dry	0.11	27.2	0.066	179

Notes: Milligram per liter (mg/L); colony-forming unit (cfu); no data (ND)

3.4.5.6 Conclusion

Although implementation projects have occurred in the Little Salmon River subbasin, temperature, bacteria, and nutrient conditions remain above TMDL targets. These TMDLs should remain in place. The implementation projects summarized in section 4 show progress in meeting the TMDL pollutant reductions and improving water quality.

3.5 Current Stream Inventory Data

DEQ collected aquatic data through its Beneficial Use Reconnaissance Program (BURP) to determine beneficial use support in the Little Salmon River subbasin (Table 24). BURP data evaluations are based primarily on three facets of wadeable streams: (1) macroinvertebrate community, (2) stream habitat, and (3) fish community. Individual metrics within each category are combined to create a multimetric index score called the stream macroinvertebrate index (SMI), stream habitat index (SHI), and stream fish index (SFI). From those scores, a condition ranking of 1, 2, or 3 is assigned to the site based on percentile categories of reference conditions. At least two scores are needed to evaluate a stream's support status, and those scores must average 2 or greater (on a scale of 0 to 3) for beneficial uses to be considered supported. DEQ's *Water Body Assessment Guidance* (Grafe et al. 2002) outlines the methodology behind SMI, SFI, and SHI development. A *full support* status means that the stream received an assessment score of 2 or higher, indicating beneficial use support.

Little Salmon River 1st- and 2nd-order tributaries below Round Valley Creek (AU17060210SL001_02) were previously listed on the 2010 Integrated Report for sediment, but new BURP information for Rattlesnake Creek showed full support of beneficial uses. AU 17060210SL001_02 was delisted in the 2010 Integrated Report.

Big Creek (17060210SL009_02a) did not show full support of beneficial uses and has TMDLs for bacteria and nutrients. Mud Creek (17060210SL008_03) showed low BURP scores and is addressed in section 3.4.1.

Table 24. Little Salmon River subbasin stream inventory data.

Year	Stream Name	Assessment Unit	SMI	SHI	SFI	Score	Beneficial Use Support
2008	Rapid River	17060210SL002_03	3	1	ND	2.00	FS
2008	West Fork Rapid River (lower)	17060210SL003_02	2	3	ND	2.50	FS
2008	West Fork Rapid River (upper)	17060210SL003_03	3	3	ND	3.00	FS
2008	Bridge Creek	17060210SL003_03	3	3	ND	3.00	FS
2008	Round Valley Creek	17060210SL006_03	3	1	ND	2.00	FS
2008	Mud Creek	17060210SL008_02	3	2	ND	2.50	FS
2008	Big Creek	17060210SL009_02a	1	1	ND	1.00	NFS
2008	Hard Creek	17060210SL015_03	3	3	ND	3.00	FS
2008	Rattlesnake Creek	17060210SL001_02	3	3	3	3.00	FS
2007	Hazard Creek	17060210SL014_04	3	3	ND	3.00	FS
2007	Fourmile Creek	17060210SL007_02	ND	ND	ND	ND	Dry
2007	Shingle Creek	17060210SL002_02a	3	3	0	2.00	FS
2007	North Fork Squaw Creek	17060210SL001_02	3	3	2	2.67	FS
2007	Elk Creek	17060210SL016_03	3	3	2	2.67	FS
2007	Little Elk Creek	17060210SL016_02	3	3	3	3.00	FS
2006	Goose Creek above Brundage Reservoir	17060210SL011_02	3	3	3	3.00	FS
2006	Goose Creek	17060210SL012_02	3	3	0	2.00	FS
2006	Hazard Creek	17060210SL014_02	3	3	1	2.30	FS
2006	Corral Creek	17060210SL015_02	3	3	1	2.30	FS
2005	Squaw Creek	17060210SL001_03	3	3	3	3.00	FS
2005	Mud Creek	17060210SL008_03	1	1	ND	1.00	NFS

Notes: Stream macroinvertebrate index (SMI); stream habitat index (SHI); stream fish index (SFI); not determined (ND); full support (FS); not full support (NFS).

3.5.1 Beneficial Uses

Overall, conditions in the subbasin remain static or are improving.

Table 25 summarizes the recommended changes for the AU's listed in Category 5 of the 2010 Integrated Report (§303(d) list). East Branch Goose Creek (17060210SL010_04) and West Branch Goose Creek (17060210SL007_04a) are recommended for listing for flow alteration. Flow alteration is not a pollutant, but it does contribute to beneficial use impairment in the lowermost reaches. East Branch Goose Creek is recommended for bacteria TMDL development.

The Little Salmon River nutrient concentrations at the compliance monitoring point in the Circle C subdivision remain above the TMDL target concentration. Thus, no changes are recommended at this time to the 2012 Integrated Report for the Little Salmon River, meaning the TMDL remains in place.

Big Creek (17060210SL009_02a) SVAP results indicate that conditions in the stream remain similar to pre-TMDL conditions.

Mud Creek (17060210SL008_03) has low nutrient levels and meets DEQ temperature standards. A TMDL for sediment is recommended to restore full beneficial use support. The SVAP study targeted areas where riparian improvements will help stabilize streambanks.

Table 25. Summary of recommended changes for assessment units listed in 2010 Integrated Report, Category 5.

Assessment Unit (2010 Integrated Report)	Stream Segment Description	Pollutant	Recommended Changes to Next Integrated Report	Justification
17060210SL007_04a	West Branch Goose Creek	Not applicable	Move to Category 4c for flow alteration.	Flow alteration, not pollutants, appear to impair beneficial uses.
17060210SL008_03	Mud Creek 3rd order	Sediment	Develop TMDL and move to Category 4a.	Sediment is impairing beneficial uses based on BURP and SVAP data.
17060210SL009_02a	Big Creek	Not applicable	Move to Category 4c. Keep in Category 4a for bacteria and nutrients.	Flow alteration affects stream habitat in lowermost section.
17060210SL010_04	East Branch Goose Creek	Bacteria	Develop bacteria TMDL and move to Category 4a Move to Category 4c for flow alteration	Bacteria exceeds water quality criteria. Flow alteration, not pollutants, appear to impair beneficial uses.

Section 4. Review of Implementation Plan and Activities

The 2008 implementation plans for forestry, agriculture, and urban and suburban activities listed various objectives, which are summarized below (DEQ 2008). This section updates the accomplished activities in each of these land use categories.

4.1 Agriculture

The 2008 agricultural implementation plan identified critical riparian and pasture/hayland acreage in the Big Creek and Little Salmon River subbasins in the Meadows Valley area. This acreage included tributaries to the Little Salmon River in Meadows Valley because these tributaries influence water quality in the Little Salmon River. The most common resource problem identified was the need for a more vigorous riparian area to stabilize banks and filter runoff. Various best management practices, such as channel bank vegetation, fencing, and offsite watering, were suggested. For the lower priority pastureland, irrigation water management and prescribed grazing best management practices were suggested for decreasing nutrient leaching to the stream.

The Idaho Department of Fish and Game volunteer crew, in partnership with local landowners, is active in riparian restoration projects throughout the subbasin. These projects are outlined in Table 26. Idaho Fish and Game's 5-year projected activity is 4–5 miles of stream restoration on Fourmile Creek and the Little Salmon River.

Table 26. Adams Soil and Water District and Idaho Soil and Water Conservation Commission priorities for agricultural best management practices implementation in the Little Salmon River subbasin.

Priority Ranking	Treatment Units	Completed Since 2006
1	Riparian areas on Big Creek and Little Salmon River	● Little Salmon River near Fourmile Creek—riparian plantings, willow weavings (1.5 miles) ● Little Salmon River on Conservation Reserve Program (0.5 mile)
2	Riparian area on tributaries	● Fourmile Creek—fencing, riparian plantings, willow weavings (2.6 miles) ● Mile shelter belt (0.2 mile) ● Round Valley Creek riparian plantings (1.5 miles)
3	All pasture/haylands	None reported

Additional activities completed by private landowners are summarized in Table 27. This information was provided by the Idaho Soil and Water Conservation Commission. Additional information regarding location and the specific practices is unavailable due to privacy restrictions protected by federal law.

Table 27. Additional agricultural implementation activities.

Federal Fiscal Year	Practice Name	Practice Number	Amount	Unit
2007	Fence	382	3,505	feet
2007	Structure for water control	587	2	—
2007	Forest stand improvement	666	35	acre
2008	Enhancement pest management (EPM)	EPM	308.5	acre
2008	Enhancement soil management (ESM)	ESM	308.5	acre
2008	Fence	383	9,145	feet
2008	Nutrient management	590	1	acre
2008	Pest management	596	200	acre
2008	Prescribed grazing	528	588.2	acre
2009	Brush management	314	6	acre
2009	Critical area planting	342	4	acre
2010	Fence	382	800	feet
2010	Pipeline	516	600	feet
2010	Prescribed grazing	528	34.5	acre
2010	Watering facility	614	8	—
2011	Integrated pest management (IPM)	IPM	60	acre

Federal Fiscal Year	Practice Name	Practice Number	Amount	Unit
2011	Irrigation water conveyance, pipeline, high pressure, underground, plastic	430DD	660	feet
2011	Pipeline	516	3,980	feet
2011	Watering facility	614	7	—

4.2 Forestry

A summary of activities accomplished in forestry is provided in Table 28.

Table 28. Forestry implementation activities.

Water Body	Protection Activity	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)	Scheduled to be completed 2012
Boulder Creek culvert replacement	Improved fish passage through culvert replacement on Star Creek and one other tributary	Completed 2010
Sixmile, Threemile, Fourmile Creeks: USFS Meadows Slope Wildland Fire Protection Project	USFS Meadows Slope project is a fuel-thinning project for fire safety and involves 1,119 acres. As part of this project, Forest Service Road 502981200 was closed.	Completed 2010
USFS fisheries improvement project	Culvert repair at the Forest Service Road 303 crossing.	Completed December 2007
Goose Creek: USFS Meadows Slope Wildland Fire Protection Project	Meadows Slope Wildland Fire Protection Project will result in thinning in the area around lower Little Goose and Goose Creeks (Forest Service 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 be completed by 2012
Riparian exclosure project	Riparian exclosure project completed to allow revegetation of riparian area near Goose Lake	Completed 2010
Little Creek: USFS Meadows Slope Wildland Fire Protection Project	Meadows Slope Wildland Fire Protection Project will result in thinning of about 628 acres located near housing.	Scheduled to be completed by 2012

Note: United States Forest Service (USFS)

4.3 Urban and Suburban

A summary of activities accomplished in urban and surburban areas is provided in Table 29.

Table 29. Urban and suburban implementation activities.

Responsible Party	Protection Activity	Goal Date	Notes
City of New Meadows	Develop city ordinances making the cost of adding new subdivisions to the city's sewer system the responsibility of the developer.	2008	Completed
City of New Meadows	Analyze population growth as part of city's budgeting process.	Annually	Ongoing
City of New Meadows	Develop city stormwater runoff ordinance.	2008	New subdivisions are required to retain stormwater onsite with overflow capability.
City of New Meadows	Provide information on EPA NPDES Construction General Permit.	2008	Ongoing—information is provided to developers.
City of New Meadows	Partner with Adams County on developing subdivision ordinances for areas outside of the New Meadows area of impact that will address regional growth and support the New Meadows Comprehensive Plan.	2008–2009	Determined not to be a priority.
City of New Meadows	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	Some retention areas have been installed in the roadside ditches to allow some water to accumulate and dissipate.
City of New Meadows	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 process.	2008–2009	Not feasible. Funding is too short and building activity too slow to justify this type of position.
City of New Meadows	Work with Adams County regarding the development of road construction standards.		Incomplete
City of New Meadows	Work with NRCS and DEQ on city stormwater collection and treatment options.	2008–2009	Completed. Have met and discussed feasibility of constructed wetland (not feasible).
City of New Meadows	Obtain information from DEQ regarding wastewater facilities planning grants and low interest construction loans.	2008	Received a planning grant, and engineering consultants are working now to address the TMDL requirements and possible land application.

Responsible Party	Protection Activity	Goal Date	Notes
City of New Meadows	Identify landowners that might consider partnering with the city to reuse municipal wastewater.	2008	Have spoken to the landowner adjacent to the treatment plant about possible land application.
City of New Meadows	Seek funding to update existing stormwater drain engineering plans and specifications.	2008	Incomplete
City of New Meadows	Provide information to Adams County regarding EPA's Construction General Permit.	2008	Completed
City of New Meadows	Share implementation plan with Idaho County commissioners and the City of Riggins.	2008	Incomplete
City of New Meadows and Adams County	Invite Idaho County commissioners and the City of Riggins to participate in implementation activities for the subbasin.	2008	Incomplete

In the urban and suburban implementation plan, goals were listed for Brundage Resort and its planned development. To date, thinning has occurred, but no construction has started.

Section 5. Summary of Five-Year Review

5.1 Changes in Subbasin

No major changes have occurred in the subbasin.

5.2 Review of Beneficial Uses

Designated beneficial uses are appropriate, and no changes are recommended at this time. Overall, beneficial uses are attained in the subbasin, except for those AU's with TMDLs or those slated for TMDL development.

5.3 Water Quality Criteria

To look at beneficial use impairment in Category 5 listed AUs, DEQ and the Idaho Soil and Water Conservation Commission used SVAP, including the SECI and PNV protocols, to determine pollutant sources and evaluate streambanks and riparian shading.

5.4 Recommendations for Further Action

Some implementation has occurred in the Little Salmon River subbasin, which is resulting in stream habitat and water quality improvements. Additional subbasin improvement projects are recommended to provide reasonable assurance that TMDL goals for the subbasin will be met.

It is recommended that TMDLs are developed for sediment in Mud Creek (17060210SL008_03), based on streambank erosion, and for bacteria in East Branch Goose Creek (17060210SL010_04). In addition Big Creek ((17060210SL009_02a), East Branch Goose Creek (17060210SL010_04) and West Branch Goose Creek (17060210Sl010_04a) should be listed for flow alteration to account for the affect that flow conditions have on beneficial uses.

Overall conditions in the subbasin are either static or improving. Under current economic conditions, it is unlikely that substantial new developments that affect water quality will occur. Pursuing available activities to improve water quality is recommended, but no immediate actions are required.

5.5 WAG Consultation and Coordination

The WAG approved the *Little Salmon River Subbasin Assessment and Total Maximum Daily Load Five-Year Review* on March 19, 2012.

Future WAG consultation will include, but is not limited to, an annual meeting and tour to review progress made toward TMDL goals and provide WAG members and other interested parties the opportunity to see implementation projects firsthand.

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