

Big Wood River Watershed Management Plan

TMDL Five-Year Review



Final



**State of Idaho
Department of Environmental Quality**

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TMDL Five-Year Review

Final

December 2017

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Executive Summary

This 5-year review of the Big Wood River subbasin assessment and total maximum daily loads (TMDLs) addresses the water bodies in the Big Wood River subbasin (hydrologic unit code 17040219) that are in Category 4a of the most recent Integrated Report (DEQ 2014a). This 5-year review complies with Idaho Code §39-3611(7) and describes current water quality status, pollutant sources, and recent pollution control efforts in the Big Wood River subbasin, located in southern Idaho.

The water body assessment units and their associated TMDL pollutants subject to 5-year review are shown in Table A. Water bodies identified in Category 4a of the most recent Integrated Report (DEQ 2014) have approved TMDLs for various pollutants including total phosphorus (TP), bacteria (*Escherichia coli*), sediment (sedimentation/siltation), total suspended solids (TSS), and temperature.

Table A
Existing TMDLs and associated Integrated Report status

| Assessment Unit Name | Assessment Unit Number | Pollutant | Integrated Report Status |
|---|------------------------|------------------------------------|--------------------------|
| Malad River—confluence of Black Canyon Creek and Big Wood River | ID17040219SK001_06 | TP, <i>E. coli</i> , sediment, TSS | Category 4a |
| Big Wood River—Magic Reservoir Dam to mouth | ID17040219SK002_06 | TP, <i>E. coli</i> , sediment | Category 4a |
| Big Wood River—Seamans Creek to Magic Reservoir | ID17040219SK004_05 | TP, <i>E. coli</i> , sediment | Category 4a |
| Big Wood River—Seamans Creek to Magic Reservoir | ID17040219SK004_05 | Q alt | Category 4c |
| Seamans Creek—Slaughterhouse Creek to mouth | ID17040219SK005_05 | TP, <i>E. coli</i> , sediment | Category 4a |
| Seamans Creek—source to and including Slaughterhouse Creek | ID17040219SK006_02 | TP, sediment | Category 4a |
| Seamans Creek—source to and including Slaughterhouse Creek | ID17040219SK006_03 | TP, sediment | Category 4a |
| Seamans Creek—source to and including Slaughterhouse Creek | ID17040219SK006_05 | TP, sediment | Category 4a |
| Big Wood River—North Fork Big Wood River to Seamans Creek | ID17040219SK007_05 | Q alt | Category 4c |
| Quigley Creek—source to mouth | ID17040219SK008_02 | TP, sediment, temperature | Category 4a |
| Quigley Creek | ID17040219SK008_02A | Q alt | Category 4c |
| East Fork Wood River—source to Hyndman Creek | ID17040219SK011_02 | TP, sediment | Category 4a |
| East Fork Wood River—source to Hyndman Creek | ID17040219SK011_03 | TP, sediment | Category 4a |
| Lake Creek—source to mouth | ID17040219SK015_03 | TP | Category 4a |
| Eagle Creek—source to mouth | ID17040219SK016_02 | TP, sediment | Category 4a |
| Eagle Creek—source to mouth | ID17040219SK016_03 | TP, sediment | Category 4a |
| Warm Springs—source to and including Thompson Creek | ID17040219SK024_02 | TP | Category 4a |
| Warm Springs—source to and including Thompson Creek | ID17040219SK024_03 | TP | Category 4a |
| Greenhorn Creek—source to USFS boundary | ID17040219SK025_02 | TP, sediment | Category 4a |
| Greenhorn Creek—source to mouth | ID17040219SK025_03 | TP, sediment | Category 4a |
| Croy Creek—source to mouth | ID17040219SK027_02 | Sediment | Category 4a |

| Assessment Unit Name | Assessment Unit Number | Pollutant | Integrated Report Status |
|------------------------------------|-------------------------------|--|---------------------------------|
| Croy Creek—source to mouth | ID17040219SK027_03 | TP, TSS, sediment | Category 4a |
| Croy Creek—source to mouth | ID17040219SK027_03 | Q alt | Category 4c |
| Rock Creek—source to mouth | ID17040219SK028_02 | TP, sediment, <i>E. coli</i> , temperature | Category 4a |
| Rock Creek—source to mouth | ID17040219SK028_03 | TP, sediment, <i>E. coli</i> | Category 4a |
| Thorn Creek—source to mouth | ID17040219SK029_02 | TP, sediment | Category 4a |
| Black Canyon Creek—source to mouth | ID17040219SK030_02 | Temperature, TSS, unknown | Category 5 |
| Black Canyon Creek—source to mouth | ID17040219SK030_03 | TSS, unknown | Category 5 |
| Black Canyon Creek—source to mouth | ID17040219SK030_03 | Q alt | Category 4c |

Notes: total phosphorus (TP), *Escherichia coli* (*E. coli*), flow alteration (Q alt), total suspended solids (TSS), United States Forest Service (USFS)

Watershed at a Glance

The Big Wood River subbasin is located in southcentral Idaho and is made up of three distinct geographical areas or elevation-ecological areas in Blaine, Gooding, Lincoln, and Camas Counties. These areas include (1) the northern half of the subbasin where the majority of the headwaters occur in the Sawtooth National Forest (above 5,800 feet in elevation), (2) the central Wood River Valley (4,800–5,800 feet in elevation) from Ketchum to Magic Reservoir, and (3) the rangeland/agricultural area (below 4,800 feet elevation). All three areas have distinct geographic, ecological, and development characteristics that create waters with differing conditions. All physical and biological characteristics of the Big Wood River subbasin are related to these elevation-ecological areas (Figure A).

The majority of waters listed with water quality problems (shown in red on Figure A) are located in either the drier hills surrounding the central Wood River Valley (above Hailey and Bellevue) or are associated with lower rangelands and the lower agricultural valley. Water quality problems in rangelands and drier foothills are often associated with land use and lack of water. These systems are often already ecologically marginal because of dry conditions, and further use by livestock or recreational activities pushes them over steady state thresholds. The Big Wood River itself is impacted in two areas—the central valley where suburban development has put constraints on the system and the lower agricultural valley where irrigation diversion and return flow can exacerbate sediment and nutrient conditions.

Each assessment unit identified in Table A is evaluated in an effort to determine present water quality conditions and progress towards meeting TMDL goals.

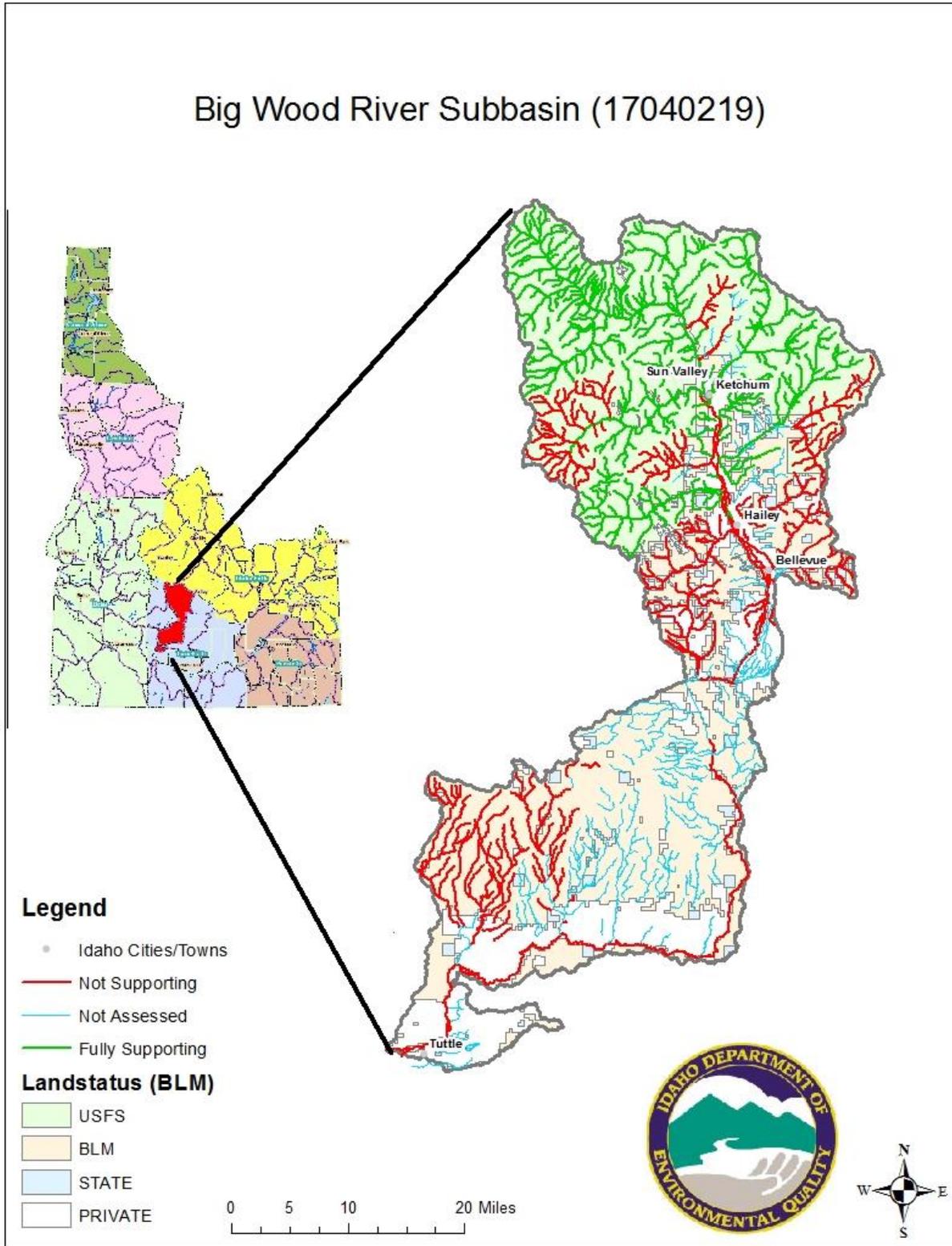


Figure A
Watershed at a glance

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 Section 303 of the CWA, 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. Section 303(d) of the CWA 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. 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.

To meet the intent and purpose of Idaho Code §39-3611(7), this report documents the review of the *Big Wood River Watershed Management Plan* and addendum (DEQ 2001, 2013) and the *Big Wood River Watershed Total Maximum Daily Load: Implementation Plan for Agriculture* (ISCC, 2006) and considers the most current and applicable information in conformance with Idaho Code §39-3607, evaluation of the appropriateness of the TMDL to current watershed conditions, implementation plan evaluation, and consultation with the Watershed Advisory Group (WAG). An evaluation of the recommendations presented is provided. Final decisions for TMDL modifications are decided 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.

Assessment Units

Assessment units (AUs) are groups of similar streams that have similar land use practices, ownership, or land management. Stream order is the main basis for determining AUs—even if ownership and land use change significantly, the AU usually remains the same for the same stream order.

Using AUs to describe water bodies offers many benefits primarily that all waters of the state are defined consistently. AUs are a subset of water body identification numbers, which allows them to relate directly to the water quality standards.

2 TMDL Review and Status

Water quality in the Big Wood River subbasin, hydrologic unit code 17040219, (HUC4 17040219) has been addressed in two documents; *The Big Wood River Watershed Management Plan* (DEQ 2001) and the *Big Wood River Tributaries Temperature Total Maximum Daily Loads* addendum (DEQ 2013). DEQ (2001) addressed sediment, nutrient, and bacterial sources of pollution in eight river segments (Figure 1) and 15 tributaries (Figure 2). The 2001 Management Plan was previous to development of DEQ's AUs and described water bodies as named tributaries or river segments.

Figure 3 shows the current AUs. Water quality targets and load allocations were developed for total suspended solids (TSS as mg/L), substrate sediment (as % fines), total phosphorus (TP as mg/L), and *Escherichia coli* (*E. coli* as CFU/100mL) in each water body. Table 1 provides the targets for the Big Wood River watershed. Tributary targets were consistent with their location above or below Magic Reservoir. The "above Magic Reservoir" targets apply to all tributaries except Thorn Creek, the only tributary below Magic Reservoir.

In the 2013 TMDL addendum, a temperature TMDL was developed for both the Quigley and Rock Creek watersheds. Since these TMDLs were only recently produced, no new information is anticipated at this time, and 5-year reviews will take place during the next review cycle.

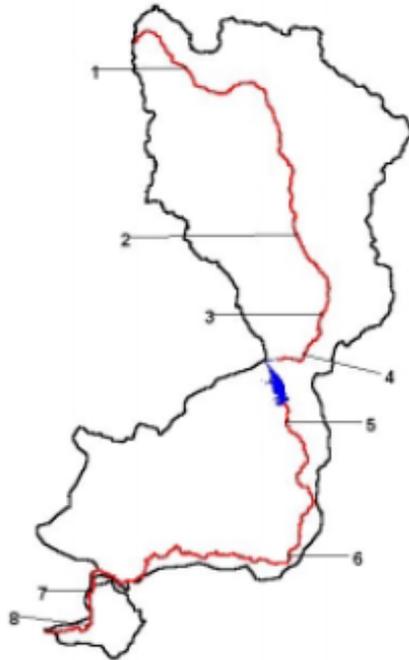


Figure C. Mainstem Big Wood River segments

- BWR-1: Segment 1: Headwaters to Trail Creek
- BWR-2: Segment 2: Trail Creek to Glendale Diversion
- BWR-3: Segment 3: Glendale Diversion to Base Line
- BWR-4: Segment 4: Base Line to Magic Reservoir
- BWR-5: Segment 5: Magic Reservoir to Highway 75
- BWR-6: Segment 6: Highway 75 to Little Wood River confluence
- BWR-7: Segment 7: Little Wood River confluence to Interstate 84
- BWR-8: Segment 8: Interstate 84 to Middle Snake River

Figure 1
Big Wood River segments previous to development of AUs (DEQ 2001)

Big Wood River Subbasin 1998 303(d) Listed Streams

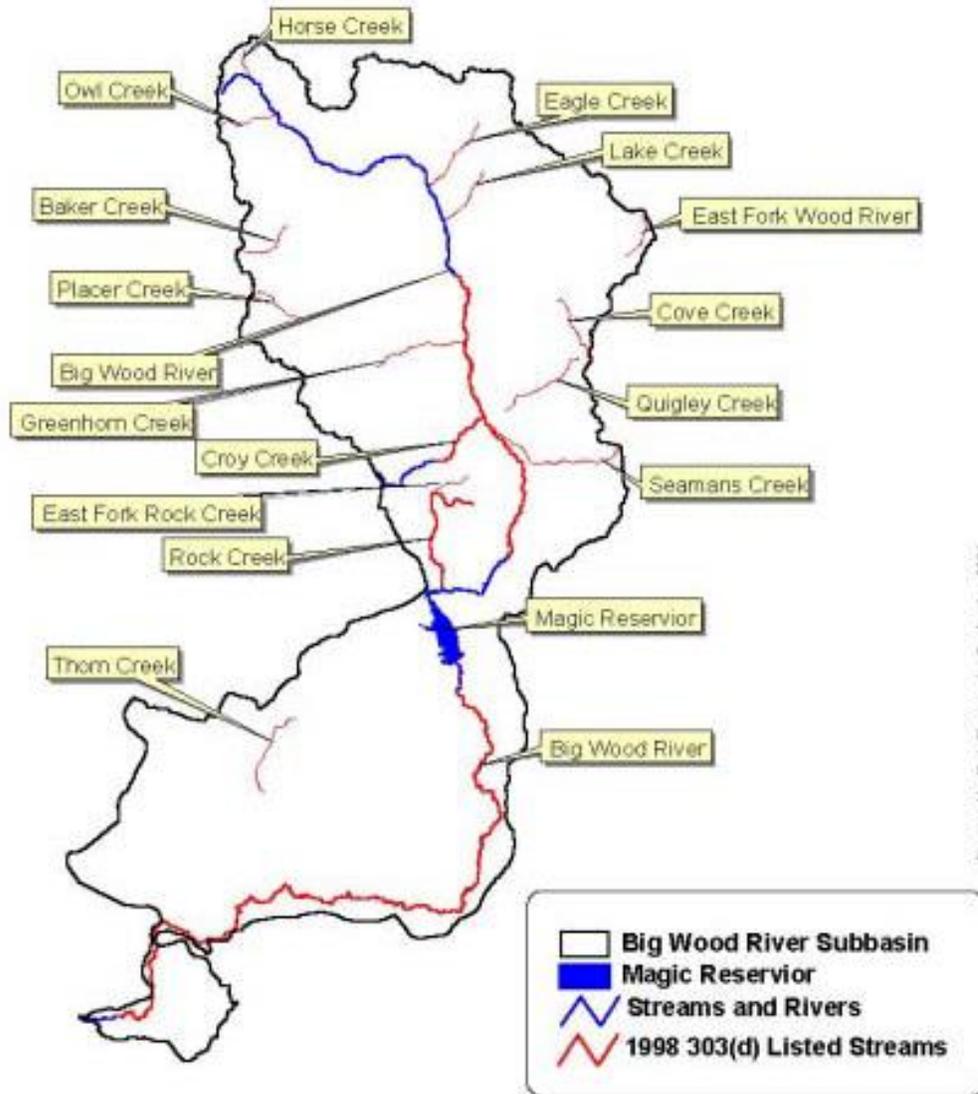


Figure 2
Tributary waters within the Watershed Management Plan (DEQ 2001)

Table 1
Instream targets for the Big Wood River (DEQ 2001)

| Numeric Instream Targets | Average Monthly | Daily Maximum |
|--|------------------------|----------------------|
| Above Magic Reservoir | | |
| Total suspended solids (TSS) | < 25 mg/L | < 40 mg/L |
| Substrate sediments (Sub) | < 35 % Fines | - |
| Total phosphorus (TP) | < 0.050 mg/L | < 0.080 mg/L |
| <i>E. coli</i> , geometric mean | < 126 cfu/100 mL | < 200 cfu/100 mL |
| Below Magic Reservoir | | |
| Total suspended solids (TSS) | < 50 mg/L | < 80 mg/L |
| Substrate sediments (Sub) | < 40 % Fines | - |
| Total phosphorus (TP) | < 0.100 mg/L | < 0.160 mg/L |
| <i>E. coli</i> , geometric mean | < 126 cfu/100 mL | < 200 cfu/100 mL |
| Prepared by IDEQ-TFRO. The targets are dependent on whether the streams discharge above or below the Magic Reservoir. Where water bodies are canalways, compliance will be at the point where the canal discharges to a natural waterbody. | | |

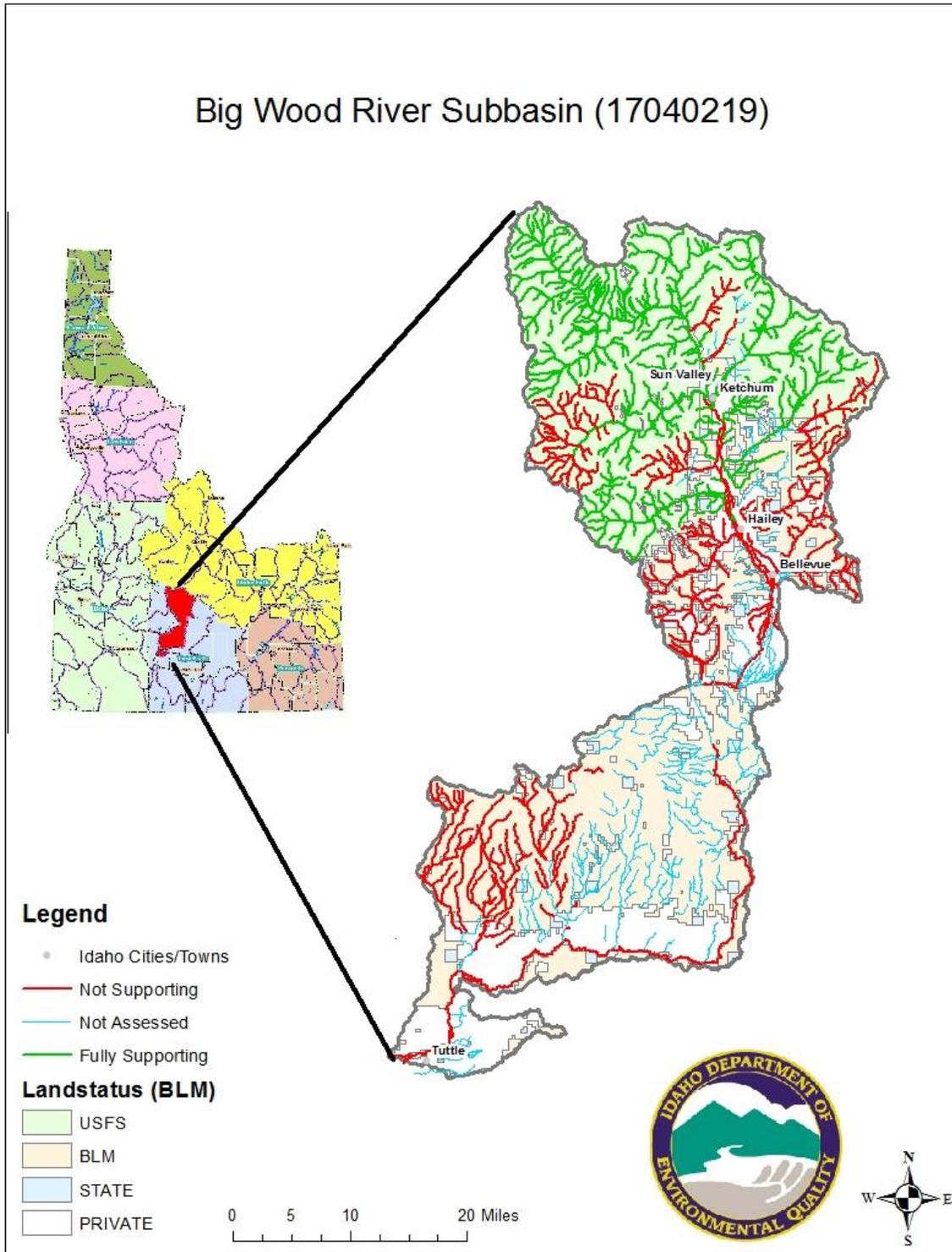


Figure 3
Subbasin location and land ownership status

Assessment Unit Review

The following review addresses water quality information recently collected in the various AUs within the Big Wood River subbasin. Beneficial Use Reconnaissance Program (BURP) scores from sites monitored since 1999 were generated using the water body assessment guidance (DEQ 2016) and may not reflect scores generated under the previous edition (Grafe et al. 2002). Subsection names here are more accurate descriptions of the AU water bodies, not necessarily the names of the AU from Table A. Additionally; TSS has often been sampled in waters listed for sediment/siltation as an indicator of sediment transport. Only a few AUs are actually listed for TSS, most waters are specifically listed for sediment. Table A provides guidance on listed pollutants.

2.1 Malad River (ID17040219SK001_06)–Confluence of Dry Creek and Big Wood River to the Snake River

The Malad River 6th-order AU (ID17040219SK001_06) begins at the confluence of the Big Wood River (ID17040219SK002_06) and Dry Creek (ID17040219SK030_04), and continues to the Snake River north of Hagerman. The river passes through irrigated crop production lands, dry rangeland (Figure 4), and supports two hydropower facilities within this segment of the perennial river. The last 10 kilometers (km) of the AU are in a deep, narrow basalt canyon (partially seen in Figure 5). The Malad River AU has several small “face” drainages in AU ID17040219SK001_02, including a portion of the South Gooding Main Canal. The Malad River AU tends to be irrigation return flow dominated during the irrigation season.

Water Quality Data

The Malad River AU (ID17040219SK001_06) is currently listed in Category 4a of the 2014 Integrated Report with approved (TMDL ID: 2239) TMDLs for *E. coli*, TP, TSS, and substrate sediment. Downstream of the Malad River, the Snake River also has an approved (DEQ, 2005) TMDL for TSS. Sediment targets for the Malad River AU from the approved TMDL include a TSS value of 50 milligrams per liter (50mg/L) and substrate fines of 40%. The TP target is 0.1 mg/L, and the *E. coli* target is the water quality standard of 126 colony forming units per 100 milliliters (CFU/100mL) as a 30-day geometric mean.

Water quality sampling data collected during 2015 at the locations (Figure 4 and Figure 5) in the Malad River AU are presented in Table 2. The TP target of 0.1 mg/L was exceeded once in 2015 at the river mouth location and once at the Highway 26 location. Both exceedances were late in the year (October–November). The TSS target of 50 mg/L was never exceeded in 2015 at either monitoring location. However, the upstream location at Highway 26 had values an order of magnitude higher than at the mouth of Malad River. There is apparently considerable settling of particles out of the water column within the length of this AU.

Like TSS, *E. coli* numbers were higher at the upstream Highway 26 monitoring location than at the mouth of Malad River. The geometric mean calculated for five samples within a 30-day period at the Highway 26 location (Table 3) exceeded the target of 126 CFU/100mL suggesting the location has problems with bacterial contamination. The geometric mean calculated for the mouth location was considerably lower and did not exceed the target.

BURP monitoring (1996STWFB057, 1996STWFB058, and 1996STWFB059) is generally not feasible within the Malad River AU because deep, swift water makes it unwadeable for BURP Technicians.

Assessment Status

The water quality data suggest that the Malad River AU is generally improving. Exceedance of TP targets occurred only once, and TSS targets were never exceeded. Data show that the upstream portion has higher concentrations of TSS and TP, but these pollutants appear to settle out before reaching the mouth of the river. *E. coli* data are also higher at the upstream location and exceed standards at that location. These data suggest that pollutant problems still exist in the upper portion of the AU, and more work needs to be done before the TMDLs can be declared successful.



Figure 4
Monitoring site on the Malad River at Highway 26 crossing west of Gooding (August 11, 2015)



Figure 5
Monitoring site on the Malad River near the mouth (August 11, 2015).

Table 2
Malad River (ID17040219SK001_06) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100mL) |
|----------------------------------|-------------------------|-------------------------------|----------------------------|
| Malad River at mouth | | | |
| 5/6/2015 | QBRV | QBRV | 32 |
| 5/27/2015 | 0.024 | QBRV | 19 |
| 6/9/2015 | 0.017 | QBRV | 20 |
| 6/25/2015 | 0.023 | QBRV | — |
| 7/1/2015 | — | — | 27 |
| 7/8/2015 | — | — | 24 |
| 7/13/2015 | — | — | 54 |
| 7/16/2015 | 0.025 | QBRV | — |
| 7/30/2015 | — | — | 40 |
| 8/11/2015 | — | — | 12 |
| 8/28/2015 | 0.028 | QBRV | — |
| 9/14/2015 | 0.033 | QBRV | — |
| 9/22/2015 | 0.027 | QBRV | — |
| 10/6/2015 | QBRV | QBRV | — |
| 11/4/2015 | 0.032 | QBRV | — |
| Malad River at Highway 26 | | | |
| 5/6/2015 | 0.033 | 34 | — |
| 5/27/2015 | 0.026 | — | 67 |
| 6/9/2015 | 0.052 | 21 | 261 |
| 6/25/2015 | 0.063 | 19 | 105 |

| | | | |
|-----------|-------|----|-----|
| 7/1/2015 | — | — | 135 |
| 7/8/2015 | — | — | 187 |
| 7/13/2015 | — | — | 125 |
| 7/16/2015 | — | — | 147 |
| 7/30/2015 | 0.075 | 28 | — |
| 8/11/2015 | 0.08 | 28 | — |
| 8/28/2015 | 0.074 | 16 | — |
| 9/14/2015 | 0.066 | 25 | — |
| 9/22/2015 | 0.067 | 27 | — |
| 10/6/2015 | 0.067 | 24 | — |
| 11/4/2015 | 0.222 | 5 | — |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN is the most probable number a lab estimates for coliform forming unit (CFU) per 100mL.

Table 3
Malad River (ID17040219SK001_06) *E. coli* sampling results

| Sample Date | <i>E. coli</i> (MPN/100mL) |
|--|----------------------------|
| Malad River at mouth^a | |
| 5/6/2015 | 32 |
| 5/27/2015 | 19 |
| 6/9/2015 | 20 |
| 7/1/2015 | 27 |
| 7/8/2012 | 24 |
| 7/13/2015 | 54 |
| 7/30/2015 | 40 |
| 8/11/2015 | 12 |
| Geometric mean | 27.86 |
| Malad River at Highway 26^b | |
| 5/27/2015 | 67 |
| 6/9/2015 | 261 |
| 6/25/2015 | 105 |
| 7/1/2012 | 135 |
| 7/8/2015 | 187 |
| 7/13/2015 | 125 |
| 7/16/2015 | 147 |
| Geometric mean | 137.25 |

Note: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (indicated by shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

a. Data from this site indicate bacteria levels are below the established target. However, due to elevated levels on the Malad at highway 26 site, this AU should remain on the §303(d) list for *E. coli*.

b. Data indicate bacteria levels are above the target, and this AU should remain on the §303(d) list for *E. coli*.

2.2 Big Wood River (ID17040219SK002_06)—Magic Reservoir Dam to Mouth

The Big Wood River 6th-order AU (ID17040219SK002_06) begins at the outlet of Magic Reservoir (ID17040219SK003L_0L) and continues to Dry Creek (ID17040219SK030_04) above the Malad River. The river passes through basalt lava flow dominated dry range and irrigated crop production lands. The majority of the river water is diverted out of the original river channel into the Richfield and Lincoln Bypass/North Shoshone Canals. The original channel remains dry for the most part during the irrigation season. Sporadic return flow occurs in the agricultural region upstream of Thorn Creek. Thorn Creek (ID17040219SK029_04) is a major agricultural return flow to this Big Wood River AU so the last 23 km of river tends to be perennial. The AU tends to be irrigation return flow dominated during the irrigation season.

Water Quality Data

The Big Wood River AU (ID17040219SK002_06) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for *E. coli*, TP, TSS, and substrate sediment. Sediment targets for this Big Wood River AU from the approved TMDL include a TSS value of 50 mg/L and substrate fines of 40%. The TP target is 0.1 mg/L, and the *E. coli* target is the water quality standard of 126 CFU/100mL as a 30-day geometric mean.

Water quality sampling data collected at the two locations (**Error! Reference source not found.** and Figure 6) in the Big Wood River AU are presented in

Table 4. The TP target of 0.1 mg/L was exceeded once in July 2015 at the Magic Reservoir location but not exceeded downstream of the northwest Gooding location. The TSS target of 50 mg/L was never exceeded in 2015 at the Magic Reservoir monitoring location. However, the downstream location near Gooding had values an order of magnitude higher than at the upstream location, and exceeded the 50 mg/L TSS target once in May 2015. These data seem contrary to each other as there appears to be no connection between TSS concentrations and TP concentrations as might be expected. Suspended particles in this reach do not appear to contain more attached phosphorus. However, phosphorus concentrations are higher in July coming out of Magic Reservoir suggesting an accumulation of dissolved phosphorus in the summertime.

Like TSS, *E. coli* numbers were higher at the downstream Gooding monitoring location than at the Magic Reservoir site. The geometric mean calculated for five samples within a 30-day period at the northwest Gooding location (Table 5) exceeded the target of 126 CFU/100mL suggesting the location has problems with bacterial contamination. The geometric mean calculated for the Magic Reservoir location was considerably lower and did not exceed the target.

BURP monitoring (1997RTWFP005, 1996RTWFB056, 1996STWFB055, 1996STWFB046, 1995STWFA070, and 1995STWFA069) is generally not feasible within this Big Wood River AU because deep, swift water makes it unwadeable in return flow areas. The majority of the AU does not contain water during the sampling protocol time period.

Assessment Status

The water quality data suggest that this Big Wood River AU is improving. Exceedance of TP and TSS targets occurred only once in the 2015 monitoring. Data show that the upstream portion has higher concentrations of TP but lower TSS, suggesting dissolved phosphorus not an edaphic phosphorus discharge from the reservoir. TSS was higher at the downstream sampling location consistent with an accumulation of agricultural return flow. *E. coli* counts were also higher at the downstream location and exceed standards at that location. These data suggest that pollutant problems, although relatively minor, still exist in the AU, and more work needs to be done before the TMDLs can be declared successful.



Figure 6
Monitoring site on the Big Wood River below Magic Reservoir (July 8, 2015)

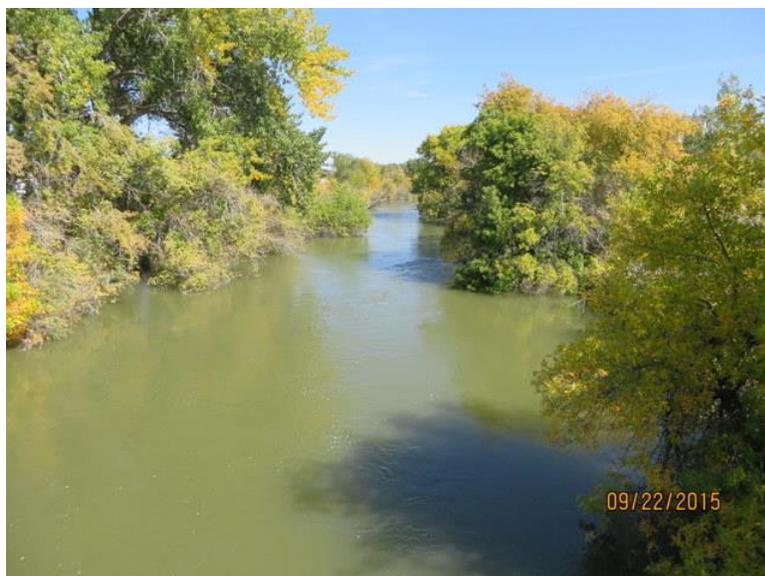


Figure 6
Monitoring site on the Big Wood River northwest of Gooding (September 22, 2015)

Table 4
Big Wood River (ID17040219SK002_06) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) |
|---|-------------------------|-------------------------------|-----------------------------|
| Big Wood River below Magic Reservoir^a | | | |
| 5/6/2015 | 0.009 | QBRV | 5 |
| 5/27/2015 | 0.06 | 6 | 6 |
| 6/25/2015 | 0.097 | QBRV | 84 |
| 7/1/2015 | — | — | 42 |
| 7/8/2015 | — | — | 56 |
| 7/13/2015 | — | — | 23 |
| 7/15/2015 | 0.111 | QBRV | — |
| 7/16/2015 | — | — | 30 |
| 7/30/2015 | 0.1 | 6 | — |
| Big Wood River northwest of Gooding | | | |
| 5/6/2015 | 0.059 | 62 | 225 |
| 5/27/2015 | QBRV | 16 | 84 |
| 6/9/2015 | 0.043 | 24 | 163 |
| 6/25/2015 | 0.061 | 22 | 135 |
| 7/1/2015 | — | — | 127 |
| 7/8/2015 | — | — | 93 |
| 7/13/2015 | — | — | 124 |
| 7/15/2015 | 0.084 | 50 | 205 |
| 7/30/2015 | 0.077 | 33 | — |
| 8/11/2015 | 0.071 | 23 | — |
| 8/28/2015 | 0.081 | 22 | — |
| 9/14/2015 | 0.066 | 16 | — |

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) |
|-------------|-------------------------|-------------------------------|-----------------------------|
| 9/22/2015 | 0.075 | 5 | — |
| 10/6/2015 | 0.079 | 33 | — |
| 11/4/2015 | 0.023 | QBRV | — |

a. Samples were not taken after July 30 due to dry channel.

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 5
Big Wood River (ID17040219SK002_06) *E.coli* sampling results

| Sample Date | <i>E. coli</i> (MPN/100 mL) |
|---|-----------------------------|
| Big Wood River below Magic Reservoir^a | |
| 5/5/2015 | 5 |
| 5/27/2015 | 6 |
| 6/25/2015 | 84 |
| 7/1/2015 | 42 |
| 7/8/2012 | 56 |
| 7/13/2015 | 23 |
| Geometric Mean | 42.36 |
| Big Wood River northwest of Gooding^b | |
| 5/6/2015 | 225 |
| 5/27/2015 | 84 |
| 6/9/2015 | 163 |
| 6/25/2015 | 135 |
| 7/1/2015 | 127 |
| 7/8/2012 | 93 |
| 7/13/2015 | 124 |
| 7/15/2015 | 205 |
| Geometric Mean | 132.30 |

Notes: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (indicated by shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

a. Data from this site indicate bacteria levels are below the established target. However due to elevated levels on the northwest Gooding site, this AU should remain on the §303(d) list for *E. coli*.

b. Data indicate bacteria levels are above the target, and this AU should remain on the §303(d) list for *E. coli*.

2.3 Magic Reservoir (ID17040219SK003L_0L)

A Category 4a listing for the sediment TMDL was erroneously applied to Magic Reservoir. Magic Reservoir has never been listed for sediment, nor was it given allocations for sediment in

the Big Wood River TMDL, approved May 15, 2002. The stream reaches above and below Magic Reservoir received TSS and percent fines targets as they were listed as impaired (1994 §303(d) list). Until conclusive water quality monitoring data determine the support status of Magic Reservoir, DEQ is delisting sediment from Category 4a and moving Magic Reservoir into Category 3—unassessed (N. Deinarowicz pers. comm.).

Magic Reservoir was not included in this 5-year review monitoring effort (Figure 7).



Figure 7
Magic Reservoir (October 12, 2016)

2.4 Big Wood River (ID17040219SK004_05)—Seamans Creek to Magic Reservoir

The Big Wood River 5th order AU (ID17040219SK004_05) begins at the confluence of Seamans Creek/Cove Canal (ID17040219SK005_05) just south of the city of Hailey and continues to Magic Reservoir (ID17040219SK003L_0L). The river passes through urban development, the city of Bellevue and irrigated crop production lands. Numerous side-channels, tributary streams, and springs occur in this valley. A major diversion (Glendale) just south of Bellevue can send all the river water into adjacent canals and dry up the river bed during the irrigation season. Water returns to the river reach downstream as a result of spring seeps and spring fed creeks, resulting in perennial flow at Stanton Crossing (Highway 20) and into Magic Reservoir.

Water Quality Data

The Big Wood River AU (ID17040219SK004_05) is currently listed in Category 4a (and 4c for flow alteration) of the 2014 Integrated Report with approved (2002) TMDLs for *E. coli*, TP and substrate sediment. Sediment targets for this Big Wood River AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L, and the *E. coli* target is the water quality standard of 126 CFU/100mL as a 30-day geometric mean.

Water quality sampling data collected at the two locations (Figure 8 and Figure 9) in this Big Wood River AU are presented in Table 6. The TP target of 0.05 mg/L was exceeded four times in 2015 at the upper Glendale sampling location and four times downstream at the Stanton Crossing sampling location. Most exceedances occurred in May and June. The TSS target of 25 mg/L was exceeded five times at the Glendale monitoring location, and three times at the Stanton Crossing location. Again, most TSS exceedances occurred in May and June during the spring runoff season. These data show connection between TSS concentrations and TP concentrations which might be expected. An increase in the November TP and TSS concentrations at Stanton Crossing may have resulted from increased runoff during fall precipitation.

E. coli numbers were higher at the downstream Stanton Crossing monitoring location than at the Glendale site (Table 7). The geometric mean was calculated for five samples within a 30-day period at the Stanton Crossing location and exceeded the target of 126 CFU/100mL, suggesting the location has problems with bacterial contamination. The geometric mean calculated for the upstream Glendale location was considerably lower and did not exceed the target.

BURP monitoring in 2014 showed the AU with passing BURP scores due to good fish scores and average macroinvertebrate and habitat scores (Table 8). The BURP site 2014STWFA022 was located in the lower portion of the AU just above Magic Reservoir. The channel is relatively wide (approximately 20 meters), low gradient, and gravel depositional at the beginning of the basalt canyon reach where Magic Reservoir is located.

Wolman pebble counts conducted in 2015 at the two sampling locations (Glendale and Stanton Crossing) in this AU showed low surface fines (Table 9). Springs, which provide the bulk of the flow to this AU during the nonpeak flow season, apparently contribute little fine sediment for deposition.

Assessment Status

The water quality data suggest that this Big Wood River AU is still impacted by TP, sediment, and bacteria. Exceedance of TP and TSS targets occurred primarily following the spring runoff. *E. coli* data are higher at the downstream location and exceed standards at that location. These data suggest that pollutant problems, although relatively minor, still exist in the AU, and more work needs to be done before the TMDLs can be declared successful.



Figure 8
Big Wood River near Glendale diversion (June 9, 2015)



Figure 9
Big Wood River at Stanton Crossing (Highway 20) (August 28, 2015)

Table 6
Big Wood River (ID17040219SK004_05) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) |
|---|-------------------------|-------------------------------|-----------------------------|
| Big Wood River at Glendale Road | | | |
| 5/5/2015 | 0.034 | 5 | 0.5 |
| 5/6/2015 | 0.156 | 89 | 1 |
| 5/27/2015 | 0.095 | 83 | 44 |
| 6/9/2015 | 0.141 | 75 | 66 |
| 6/24/2015 | 0.028 | QBRV | — |
| 6/25/2015 | — | — | 61 |
| 7/1/2015 | — | — | 36 |
| 7/8/2015 | — | — | 86 |
| 7/13/2015 | — | — | 31 |
| 7/15/2015 | QBRV | QBRV | — |
| 7/16/2015 | — | — | 19 |
| 7/30/2015 | 0.016 | QBRV | — |
| 8/11/2015 | 0.032 | 8.5 | — |
| 8/28/2015 | 0.116 | 51 | — |
| 9/14/2015 | 0.007 | QBRV | — |
| 9/22/2015 | QBRV | QBRV | — |
| 10/6/2015 | 0.015 | 6 | — |
| Big Wood River at Stanton Crossing | | | |
| 5/6/2015 | 0.123 | 78 | 141 |
| 5/27/2015 | 0.117 | 90 | 44 |
| 6/9/2015 | 0.311 | 142 | 345 |
| 6/24/2015 | 0.023 | — | — |
| 6/25/2015 | — | QBRV | 154 |
| 7/1/2015 | — | — | 128 |
| 7/8/2015 | — | — | 866 |
| 7/13/2015 | — | — | 62 |
| 7/15/2015 | QBRV | QBRV | — |
| 7/16/2015 | — | — | 99 |
| 7/30/2015 | 0.019 | QBRV | — |
| 8/11/2015 | 0.022 | QBRV | — |
| 8/28/2015 | 0.022 | QBRV | — |
| 9/14/2015 | QBRV | QBRV | — |
| 9/22/2015 | 0.011 | QBRV | — |
| 10/6/2015 | QBRV | QBRV | — |
| 11/4/2015 | 0.127 | 24 | — |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 7
Big Wood River (ID17040219SK004_05) *E. coli* sampling results

| Sample Date | <i>E. coli</i> (MPN/100 mL) |
|---|-----------------------------|
| Big Wood River at Glendale Road^a | |
| 5/5/2015 | 0.5 |
| 5/6/2015 | 1 |
| 5/27/2015 | 44 |
| 6/9/2015 | 66 |
| 6/25/2015 | 61 |
| 7/1/2015 | 36 |
| 7/8/2015 | 86 |
| 7/13/2015 | 31 |
| 7/16/2015 | 19 |
| Geometric Mean | 40.67 |
| Big Wood River at Stanton Crossing^b | |
| 5/6/2015 | 141 |
| 5/27/2015 | 44 |
| 6/9/2015 | 345 |
| 6/25/2015 | 154 |
| 7/1/2015 | 128 |
| 7/8/2015 | 866 |
| 7/13/2015 | 62 |
| 7/16/2015 | 99 |
| Geometric Mean | 153.44 |

Note: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (indicated by shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

a. Data from this site indicate bacteria levels are below the established target. However due to elevated levels on the Stanton Crossing site, this AU should remain on the §303(d) list for *E. coli*.

b. Data indicate bacteria levels are above the target, and this AU should remain on the §303(d) list for *E. coli*.

Table 8
Big Wood River (ID17040219SK004_05) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|----------------|-----------|------------|-----------|--------------|-----------|------------|---------|
| 2007STWFA016 | Unnamed Stream | | | | Inaccessible | | | |
| 2008STWFA039 | Big Wood River | | | | Inaccessible | | | |
| 2014STWFA022 | Big Wood River | 68 | 2.00 | 92 | 3.00 | 48 | 2.00 | 2.33 |

Table 9
2015 Wolman pebble count results

| AU# | Stream | wetted fines | total fines |
|--------------------|-------------------------------|--------------|-------------|
| ID17040219SK004_05 | Big Wood River @ Glendale | 5% | 19% |
| ID17040219SK004_05 | Big Wood River @ Stanton Xing | 9% | 12% |
| ID17040219SK006_02 | Slaughterhouse Creek | 32% | 53% |
| ID17040219SK008_02 | Quigley Creek | 22% | 31% |
| ID17040219SK011_02 | EF Wood River | 12% | 21% |
| ID17040219SK011_03 | Cove Creek | 4% | 16% |
| ID17040219SK016_02 | Eagle Creek | 2% | 17% |
| ID17040219SK016_03 | Eagle Creek | 12% | 24% |
| ID17040219SK025_03 | Greenhorn Creek | 2% | 5% |
| ID17040219SK027_02 | Croy Creek | 50% | 75% |
| ID17040219SK028_02 | EF Rock Creek | 58% | 66% |

2.5 Seamans Creek (ID17040219SK005_05)—Slaughterhouse Creek to Mouth

The AU ID17040219SK005_05 is often labeled as Seamans Creek but is actually the Cove Canal that originally extended from the Big Wood River near the base of Della Mountain to Slaughterhouse Creek. The canal no longer reaches Slaughterhouse Creek (Figure 10) but ends in a field near the Hailey Woodside Wastewater Treatment Plant (WWTP). The canal is ponded and pumped to a pivot sprinkler system. The DEQ hydrography data set draws the Canal to connect with Seamans Creek/Cove Canal (ID17040219SK006_05) but that assumption cannot be confirmed and indeed a subdivision exists where the channel is superimposed. The waterway was dry in 2007 when DEQ mistakenly attempted to establish a BURP site (2007STWFA118) in the middle of the AU.

Water Quality Data

No additional ambient monitoring was conducted in this AU by DEQ.

Assessment Status

This section has been included in Category 4a as having a completed TMDL (2002). The water body itself has never been monitored or assessed and DEQ will petition to remove it from the AU.



Figure 10
Seamans Creek AU location near Slaughterhouse Creek (channel nonexistent) (May 7, 2015)

2.6 Seamans Creek (ID17040219SK006_02)—Slaughterhouse Creek and Tributaries to Third Order Seamans Creek

The AU ID17040219SK006_02 includes Slaughterhouse Creek and the 1st- and 2nd-order ephemeral tributaries to the 3rd order of Seamans Creek (ID17040219SK006_03). This entire AU is mostly intermittent or ephemeral with some perennial portions such as the reach where water quality data was collected (Figure 12). The Slaughterhouse Creek channel disappears before reaching the base of its apparent drainage and ending at an irrigation dam/pond constructed to capture the creeks flow at a location approximately 3.5 km above the urban boundary. The 1st and 2nd order tributaries to Seamans Creek are mostly ephemeral with only one successful BURP visit (1995STWFA056).

Note: The National Hydrography Database (NHD) draws Slaughterhouse Creek to connect with Seamans Creek/Cove Canal (ID17040219SK005_05 and ID17040219SK006_05), which as stated in 2.5 does not exist as listed.

Water Quality Data

The Seamans Creek AU (ID17040219SK006_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment. Sediment targets for this AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L, and the *E. coli* target is the water quality standard of 126 CFU/100mL as a 30-day geometric mean. Water quality sampling data was collected at the Slaughterhouse Creek location (Figure 11) in this AU. The TP target of 0.05 mg/L was exceeded twice in 2015, once in May and again in July. The TSS target of 25 mg/L was exceeded once in May 2015 (Table 10). These data show connection between TSS and TP concentrations as might be expected. An increase in July TP concentrations but not in TSS suggests an increase in dissolved TP later in summer.

There were not enough *E. coli* sampling events to produce a geometric mean; however, two sampling events showed very low counts.

BURP monitoring attempts in Seamans Creek in 1995 and 2014 were not possible due to dry conditions. At the Slaughterhouse Creek location, sampling occurred in 1995 and 2013. Although the 2013 site had average macroinvertebrate and habitat scores, it had low fish scores because only nonnative Brook Trout were detected. Conditions were apparently similar in 1995. Wolman pebble counts in 2015 (Table 9) showed high surface fines (32%–53%) in Slaughterhouse Creek, suggesting that the creek may still be impacted by excess sediment.

Assessment Status

The AU shows a slight intrusion of sediment and phosphorus in spring consistent with spring runoff from the surrounding landscape. Although brief, the pollutants do exceed targets suggesting that possible source loading exists within the watershed. BURP results are difficult to interpret. Fisheries in these small, land-locked streams do not tend to be diverse; however, surface fine data suggest the AU is still impacted by sediment. There are no connections to other waters within the subbasin.



Figure 11
AU and BURP monitoring site on Slaughterhouse Creek above the irrigation pond with more persistent flows (June 9, 2015)

Table 10
Seamans Creek (ID17040219SK006_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|-----------------------------|------------|
| 5/7/2015 | QBRV | 5 | 4 | 0.45905 |
| 5/27/2015 | 0.238 | 94 | — | 0.4948 |
| 6/9/2015 | 0.014 | QBRV | 27 | 0.424475 |
| 6/23/2015 | 0.036 | QBRV | — | 0.2189 |
| 7/14/2015 | 0.034 | 9 | — | 0.30315 |
| 7/29/2015 | 0.13 | QBRV | — | 0.24585 |
| 8/10/2015 | 0.027 | QBRV | — | 0.2274 |
| 8/28/2015 | 0.035 | QBRV | — | 0.3703 |
| 9/14/2015 | 0.031 | QBRV | — | 0.2776 |
| 9/22/2015 | QBRV | 5 | — | 0.3142 |
| 10/6/2015 | QBRV | 5 | — | 0.28085 |
| 10/19/2015 | 0.037 | 9 | — | 0.4405 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU)

Table 11
Seamans Creek (ID17040219SK006_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|----------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1995STWFB022 | Slaughterhouse Creek | 36.45 | 1 | 43.82 | 1 | 65 | 3 | 1.67 |
| 2013STWFA029 | Slaughterhouse Creek | 62 | 2 | 67 | 1 | 56 | 2 | 1.67 |
| 2014STWFA084 | Seamans Creek | | | | Dry | | | |
| 2014STWFA125 | Italian Creek | | | | Dry | | | |

2.7 Seamans Creek (ID17040219SK006_03), (ID17040219SK006_05), and (ID17040219SK004_02) —Big Dry Canyon to Second Diversion Pond and Below

The Seamans Creek 3rd-order AU (ID17040219SK006_03) (Figure 12) extends from the confluence of two 2nd-order channels of ID17040219SK006_02 to ID17040219SK004_02 an incorrectly identified AU and non-existent channel of Seamans Creek then on to ID17040219SK006_05.

Two diversion ponds, with perennially ponded water, exist in ID17040219SK006_03 on private agricultural ground. All flow appears to stop at the second diversion pond but there is a dry historic channel below it. During normal water years these flow alterations (diversion ponds) prevent Seamans Creek from making a surface connection to any AU below it. The northern and western “reaches” of the Seamans Creek drainage identified in Figure 14 as AU ID17040219SK004_02, do not exist. All Seaman Creek water would remain in AU

ID17040219SK006_03 (Figure 13), as there is no adjoining stream to make it a fifth order stream. These streams (ID17040219SK004_02 and ID17040219SK006_05) appear only in the DEQ data set and not in the NHD data set. AU ID17040219SK004_02 appears to be below ID17040219SK006_03 and connect to ID 17040219006_05. However, the one historic channel appears only on the S side of the alluvial plain and turns SW at the end of the alluvial plain and its historic termination is unclear. AU labelled ID17040219SK006_05 was apparently drawn to connect Seamans Creek to Slaughterhouse Creek. The channel does not exist (Figure 11), and the AU should be eliminated.

Water Quality Data

No water quality data have been collected in ID 17040219SK006_03 in recent years because it is on private ground and tends to be ephemeral in nature. Water that passes through the channel during normal spring runoff is collected in the two diversion ponds. Subsequent efforts to monitor the BURP site establish in 1995 (1995STWFA054) at a location between the two ponds, have found a dry stream bed. No assessments of this AU can be made at this time. This section could also be category 4c. It should also be noted that this may have been historically connected to the Little Wood HUC 17040221.



Figure 12
AU is the 3rd order of Seamans Creek from Big Dry Canyon to an incorrectly identified AU



Figure 13
AU may have connected Slaughterhouse to Seamans Creek, but this area is now filled in with housing and no channel remains

2.8 Big Wood River (ID17040219SK007_05)—Warm Springs Creek to Seamans Creek/Cove Canal

The AU ID17040219SK007_05 is a major portion of the Big Wood River from its confluence with Warm Springs Creek in the city of Ketchum to Seamans Creek/Cove Canal below the city of Hailey. The AU is often multi-channeled and a popular location for fly fishing. Several large tributaries drain into the Big Wood River within this AU, including Trail Creek, East Fork Wood River, Greenhorn Creek, Deer Creek, and Croy Creek. The Ketchum and Mid-Valley Sewer Company WWTPs discharge to the Big Wood River within this AU. This AU is part of the BWR-2 section of the 2001 Big Wood River TMDL.

Water Quality Data

The Big Wood River AU (ID17040219SK007_05) is currently listed in Category 4c of the 2014 Integrated Report for flow alteration. It also belongs in Category 4a but has not been listed. The AU is currently sampled for *E. coli*, TP, TSS, and substrate sediment. Sediment targets for other Big Wood River AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L, and the *E. coli* target is the water quality standard of 126 CFU/100mL as a 30-day geometric mean.

Water quality sampling data collected at one location (Figure 14) in this Big Wood River AU. The TP target of 0.05 mg/L was exceeded three times in 2015, twice during spring months (May and June) and then again in late August. The TSS target of 25 mg/L was exceeded three times at the railroad trestle monitoring location, all in May and early June (Table 12). These data show a connection between TSS and TP concentrations as might be expected with spring runoff. The increase in August TP is not coincident with increased TSS concentrations.

E. coli numbers were generally low and did not exceed criteria. The geometric mean calculated for five samples within a 30-day period at the railroad trestle location did not exceed the target of 126 CFU/100mL (Table 13).

Assessment Status

The sampling data from previous BURP monitoring (2004STWFA056, 2004STWFA081, and 2010DEQA172) suggest this AU is affected by pollutants similar to other river AUs. Unfortunately BURP monitoring has not continued within this AU due to high water and private property access issues. Extra effort is needed to obtain permission from landowners to BURP this AU and establish an assessment site. The AU needs to be added to Category 4a for TP, sediment and *E. coli*.



Figure 14
Big Wood River at the railroad truss (below Ketchum) is located within the upper reach of AU ID17040219SK007_05 (July 30, 2015)

Table 12
Big Wood River (ID17040219SK007_05) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) |
|-------------|-------------------------|-------------------------------|-----------------------------|
| 5/6/2015 | 0.175 | 73 | 2 |
| 5/27/2015 | 0.042 | 55 | — |
| 6/9/2015 | 0.073 | 48 | 55 |
| 6/24/2015 | 0.015 | QBRV | 25 |
| 7/1/2015 | — | — | 41 |
| 7/8/2015 | — | — | 60 |
| 7/13/2015 | — | — | 27 |
| 7/15/2015 | 0.028 | 6 | — |
| 7/16/2015 | — | — | 10 |
| 7/30/2015 | 0.024 | QBRV | — |
| 8/11/2105 | 0.042 | 7.5 | — |
| 8/28/2015 | 0.136 | 10 | — |
| 9/14/2015 | 0.018 | QBRV | — |
| 9/22/2015 | QBRV | QBRV | — |
| 10/6/2015 | 0.029 | QBRV | — |
| 11/4/2015 | 0.017 | 9 | — |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 13
Big Wood River (ID17040219SK007_05) *E. coli* sampling results

| Sample Date | <i>E. coli</i> (MPN/100 mL) |
|----------------|-----------------------------|
| 5/6/2015 | 2 |
| 6/9/2015 | 55 |
| 6/24/2015 | 25 |
| 7/1/2015 | 41 |
| 7/8/2015 | 60 |
| 7/13/2015 | 27 |
| 7/16/2015 | 10 |
| Geometric Mean | 27.08 |

Note: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (indicated by shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

2.9 Quigley Creek (ID17040219SK008_02)—Source to Deadman Gulch

The Quigley Creek drainage is a relatively small watershed (



Figure 15) on the east side of the city of Hailey, just north of the Slaughterhouse Creek watershed. AU ID17040219SK008_02 includes 1st- and 2nd-order reaches and tributaries of Quigley Creek from headwaters to Deadman Gulch. The AU includes an irrigation diversion pond near the confluence of Deadman Gulch and approximately 2.8 km above the urban

boundary.

Water Quality Data

The Quigley Creek AU (ID17040219SK008_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for *E. coli*, TP sediment. Sediment targets for this AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L, and the *E. coli* target is the water quality standard of 126 CFU/100mL as a 30-day geometric mean.

Water quality sampling data collected at one location in this AU are presented in Table 14. The TP target of 0.05 mg/L was never exceeded in 2015. The TSS target of 25 mg/L was not exceeded at any sampling time. These data suggest that the AU is meeting its TMDL target goals, at least at the sampling location.

E. coli was not monitored in this AU.

BURP monitoring has occurred periodically within this AU since 1998 (Table 15). BURP scores have generally been average over the 17-year time period. One fish score was low due to a ratio of nonnative Brook Trout to native fish; however, fish composition has changed little over the years. Wolman pebble counts in 2015 (Table 9) show surface fines are just within target levels at 22%–31%.

Assessment Status

The AU shows no sediment or phosphorus exceedances and generally has a passing assessment score. It is reasonable to assume that this AU of Quigley Creek is meeting TMDL targets and is fully supporting its beneficial uses.



Figure 15
Quigley Creek (May 27, 2015)

Table 14
Quigley Creek (ID17040219SK008_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/4/2015 | QBRV | 11 | 0.55005 |
| 5/27/2015 | 0.007 | 4 | 2.04 |
| 6/9/2015 | QBRV | QBRV | 1.8293 |
| 6/23/2015 | 0.029 | QBRV | 1.32435 |
| 7/14/2015 | 0.025 | QBRV | 1.41835 |
| 7/27/2012 | 0.03 | 5.5 | 1.57235 |
| 8/5/2105 | 0.025 | QBRV | 1.19555 |
| 8/27/2015 | QBRV | 5 | 1.05985 |
| 9/8/2015 | 0.024 | QBRV | 1.1467 |
| 9/21/2015 | QBRV | QBRV | — |
| 10/5/2015 | 0.016 | QBRV | 1.267 |
| 10/19/2015 | QBRV | QBRV | 1.3345 |
| 10/21/2015 | — | — | 1.084325 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 15
Quigley Creek (ID17040219SK008_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|---------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1998STWFA051 | Quigley Creek | 54 | 2 | — | — | 64 | 3 | 2.50 |
| 2002STWFA050 | Quigley Creek | | | | Dry | | | |
| 2002STWFA051 | Quigley Creek | 54 | 2 | — | — | 52 | 2 | 2.00 |
| 2005 TWFA023 | Quigley Creek | 59 | 2 | 66 | 1 | 52 | 2 | 1.67 |
| 2012STWFA033 | Quigley Creek | 69 | 3 | 71 | 2 | 53 | 2 | 2.33 |
| 2015SDEQA558 | Quigley Creek | 78 | 3 | 69 | 2 | 62 | 3 | 2.67 |

2.10 Quigley Creek (ID17040219SK008_02A)—Deadman Gulch to Urban Boundary

The Quigley Creek AU (ID17040219SK008_02A) includes the lower end of Quigley Creek from Deadman Gulch to the city of Hailey urban boundary, as well as several adjacent drainages to the north of Quigley Creek (Figure 16). These drainages appear to be ephemeral draws with periodic runoff captured in a canal at the urban fringe. It is not clear where this water and where Quigley Creek water ends up going beyond this AU. It may enter the city's stormwater system and is routed to the Big Wood River, or it may subsurface.

The AU is currently listed in Category 4c for flow alteration. No water quality sampling or BURP monitoring has occurred within this AU due to a lack of water.



Figure 16

AU starts at Deadman Gulch and continues to the mouth of the canyon, including Hyndman Gulch and two unnamed drainages. No connections to other waters are visible

2.11 East Fork Wood River (ID17040219SK011_02)—Source to Hyndman Creek

The East Fork Wood River AU (ID17040219SK011_02) includes 1st- and 2nd-order drainages to Cove Creek (Figure 17) and East Fork Wood River. This AU includes 17 drainages: Cabin Creek, Moran Creek, Big Witch Creek, Fowler Gulch, Finley Creek, Driveway Gulch, Hook Draw, Spring Canyon, Sawmill Gulch, Federal Gulch, Timber Draw, Paymaster Gulch, Blind Canyon, and others) with the majority in primitive and backcountry status of the 2008 Idaho Roadless Rule. Roads extend up Cove Creek and the East Fork Wood River where access to the mouths of these drainages is possible.

Water Quality Data

The East Fork Wood River AU (ID17040219SK011_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for *E. coli*, TP, TSS, and substrate sediment. Sediment targets for this AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L, and the *E. coli* target is the water quality standard of 126 CFU/100mL as a 30-day geometric mean.

Water quality sampling data collected at one location, Cove Creek, in this AU are presented in Table 16. The TP target of 0.05 mg/L was exceeded once in June 2015. The TSS target of 25 mg/L was not exceeded on any sampling date. However, no TSS data were collected on the date that TP target was exceeded. These data suggest that in general the AU is meeting its TMDL target goals at the sampling location, although some runoff may have generated sediment and phosphorus for a short time in late spring and early summer.

E. coli was not monitored in this AU.

BURP monitoring has occurred periodically within this AU since 1995 (Table 17). BURP scores have generally been averaged over the 20-year time period. One East Fork Wood River site in 1995 was in poor quality, and one Federal Gulch site in 2012 had poor fish scores. Recent BURP sampling in smaller streams over the last several years has shown continuous dry conditions. Wolman pebble counts during 2015 in East Fork Wood River show low surface fines (Table 9).

Assessment Status

The AU shows no sediment or phosphorus exceedances and generally has passing assessment scores, although dry conditions may be hampering assessments. It is reasonable to assume that this AU of the East Fork Wood River is meeting TMDL targets and would likely fully support its beneficial uses if not for dry conditions.



Figure 17
Water quality samples were collected on upper Cove Creek for this AU (September 21, 2015)

Table 16
East Fork Wood River (ID17040219SK011_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | 7 | 0.5297 |
| 5/27/2015 | 0.014 | QBRV | 1.4498 |
| 6/9/2015 | 0.025 | QBRV | 1.22155 |
| 6/23/2015 | 0.118 | — | 0.35075 |
| 7/14/2015 | 0.034 | 8 | 0.2947 |
| 7/27/2015 | 0.045 | QBRV | 0.3189 |
| 8/5/2015 | 0.042 | QBRV | 0.25 |
| 8/27/2015 | 0.014 | QBRV | 0.335875 |
| 9/8/2015 | 0.034 | QBRV | 0.1246 |
| 9/21/2015 | 0.045 | QBRV | 0.1247 |
| 10/5/2015 | 0.027 | — | 0.13605 |
| 10/19/2015 | 0.021 | QBRV | 0.2978 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 17
East Fork Wood River (ID17040219SK011_02) BURP scores.

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-----------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1995STWFB021 | EF Wood River | 70.02 | 3.00 | — | — | 67.00 | 3.00 | 3.00 |
| 1995STWFB046 | EF Wood River | 40.86 | 1.00 | — | — | 48.00 | 1.00 | 1.00 |
| 1995STWFB063 | Federal Gulch | 70.81 | 3.00 | — | — | 64.00 | 3.00 | 3.00 |
| 1998STWFA050 | Big Witch Creek | 66.61 | 3.00 | — | — | 62.00 | 2.00 | 2.50 |
| 2005STWFA016 | EF Wood River | 82.24 | 3.00 | 62.45 | 1.00 | 75.00 | 3.00 | 2.33 |
| 2007STWFA095 | Finley Creek | | | | Dry | | | |
| 2011STWFA024 | Big Witch Creek | 67.54 | 3.00 | 83.81 | 3.00 | 68.00 | 3.00 | 3.00 |
| 2012STWFA050 | Federal Gulch | 76.53 | 3.00 | 25.44 | 0.00 | 71.00 | 3.00 | 0.00 |
| 2012STWFA053 | Paymaster Gulch | | | | Dry | | | |
| 2014STWFA090 | Driveway Gulch | | | | Dry | | | |
| 2014STWFA091 | Finley Creek | | | | Dry | | | |
| 2014STWFA092 | Big Witch Creek | | | | Dry | | | |
| 2014STWFA093 | Fowler Creek | | | | Dry | | | |
| 2014STWFA094 | Moran Creek | | | | Dry | | | |
| 2014STWFA095 | Cabin Creek | | | | Dry | | | |
| 2015STWFA059 | EF Wood River | 72 | 3.00 | 56 | 1.00 | 78 | 3.00 | 2.33 |

2.12 East Fork Wood River (ID17040219SK011_03)—Source to Hyndman Creek

AU ID17040219SK011_03 includes 3rd-order segments of the East Fork Wood River and Cove Creek. This AU includes both the East Fork from Federal Gulch to Cove Creek and Cove Creek from Moran Creek to the confluence with the East Fork Wood River. The majority of the drainages are in rangelands; the East Fork is primarily private ownership whereas Cove Creek is primarily United States Forest Service (USFS) and United States Bureau of Land Management (BLM) ground. Roads extend up Cove Creek and the East Fork Wood River where access to the entire AU is possible.

Water Quality Data

The East Fork Wood River AU (ID17040219SK011_03) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment. Sediment targets for this AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

Water quality sampling data collected at one location (below Paymaster Gulch) (Figure 18) in this AU are presented in Table 18. Neither the TSS nor the TP targets were exceeded in 2015 sampling at a variety of flow levels. Wolman pebble counts on Cove Creek in 2015 show very low surface fines (Table 9). These data suggest that the AU is meeting its TMDL target goals at the sampling locations.

E. coli was not monitored in this AU.

BURP monitoring has occurred periodically within this AU since 1993 (Table 19). BURP scores have generally been average over the 23-year time period. One East Fork Wood River site in 1993 and one Cove Creek site were reflecting poor quality. Recent BURP sampling in Cove Creek over the last several years has shown consistently dry conditions.

Assessment Status

The AU shows no sediment or phosphorus exceedances and generally has passing assessment scores, although dry conditions may be hampering assessments. It is reasonable to assume that this AU of the East Fork Wood River is meeting TMDL targets and would likely fully support its beneficial uses if not for dry conditions.



Figure 18
Samples were collected from the East Fork Wood River below Paymaster Gulch (June 23, 2015)

Table 18
East Fork Wood River (ID17040219SK011_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 36.7878 |
| 5/27/2015 | QBRV | QBRV | 36.0884 |
| 6/9/2015 | QBRV | QBRV | 57.1092 |
| 6/23/2015 | 0.025 | QBRV | 20.8165 |
| 7/14/2015 | QBRV | QBRV | 10.9066 |
| 7/27/2012 | 0.011 | QBRV | 11.19085 |
| 8/5/2105 | 0.013 | QBRV | 6.2758 |
| 8/27/2015 | QBRV | QBRV | 7.142 |
| 9/8/2015 | 0.018 | QBRV | 6.0884 |
| 9/21/2015 | QBRV | QBRV | 7.8227 |
| 10/5/2015 | 0.011 | QBRV | 6.66 |
| 10/19/2015 | QBRV | QBRV | 6.6166 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 19
East Fork Wood River (ID17040219SK011_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|---------------|---------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1998STWFA049 | Cove Creek | 46 | 1.00 | — | — | 46 | 1.00 | 1.00 |
| 2010SDEQA2027 | Cove Creek | | | | Dry | | | |
| 2012STWFA036 | Cove Creek | | | | Dry | | | |
| 2012STWFA051 | EF Wood River | 73 | 3.00 | 64 | 1.00 | 68.00 | 2.00 | 2.00 |
| 2014STWFA089 | Cove Creek | | | | Dry | | | |

2.13 Trail Creek (ID17040219SK014_02)

This AU (ID17040219SK014_02) includes the 2nd-order segment of Trail Creek with its tributaries, Antelope Creek, and the 2nd-order segment of Corral Creek and its tributaries. The Trail Creek watershed is on the east side of the Big Wood River valley and runs through Sun Valley and Ketchum. Water quality samples were collected from Wilson Creek, a tributary to Trail Creek at the junction between the 2nd- and 3rd-order AUs.

Water Quality Data

The Trail Creek AU (ID17040219SK014_02) is currently listed in Category 2 of the 2014 Integrated Report with fully supported aquatic life and recreation uses. Failing scores occurred for a Trail Creek BURP site in 2014 prompting the need for additional monitoring. Sediment targets for this AU would likely be similar to tributaries in the approved TMDL and would include a TSS value of 25 mg/L, substrate fines of 35%, and a TP target is 0.05 mg/L.

Water quality sampling data collected at one location (Wilson Creek) (Figure 19) in this AU are presented in Table 20. Neither the TSS nor the TP targets were exceeded in the 2015 sampling at a variety of flow levels. Wolman pebble counts on Cove Creek in this AU during 2015 show very low surface fines (Table 9). These data suggest that the AU would meet target goals at the sampling location.

E. coli was not monitored in this AU.

BURP monitoring has occurred periodically within this AU since 1993 (Table 21). BURP scores have generally been average or better between 1993 and 2012. The 2014 BURP site on Trail Creek failed due to poor fish scores; only one Brook Trout was observed during electrofishing. In 2015, four BURP sites within the AU were not sampled due to dry conditions suggesting changing conditions within the watershed.

Assessment Status

The AU shows no sediment or phosphorus exceedances and generally has passing assessment scores, although dry conditions may be hampering assessments. It is reasonable to assume that this AU of Trail Creek has been fully supporting its beneficial uses up to now, but that may be changing due to drying conditions.



Figure 19
Samples were collected on Wilson Creek (August 10, 2015).

Table 20
Wilson Creek (ID17040219SK014_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 7.2161 |
| 5/26/2015 | 0.021 | — | 14.1512 |
| 6/8/2015 | 0.02 | QBRV | 13.558 |
| 6/22/2015 | QBRV | QBRV | 8.9995 |
| 7/14/2015 | 0.029 | QBRV | 4.9582 |
| 7/29/2012 | 0.02 | QBRV | 3.1565 |
| 8/10/2105 | 0.027 | QBRV | 3.1994 |
| 8/27/2015 | QBRV | QBRV | 3.9883 |
| 9/8/2015 | 0.006 | QBRV | 2.99835 |
| 9/21/2015 | QBRV | QBRV | 2.6165 |
| 10/5/2015 | 0.011 | QBRV | 6.66 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 21
Trail Creek (ID17040219SK014_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1998STWFA042 | Uncle Johns Gulch | 43 | 1.00 | — | — | 63 | 1.00 | 1.00 |
| 1998STWFA053 | Corral Creek | 58 | 2.00 | — | — | 84 | 3.00 | 2.50 |
| 1998STWFA054 | Wilson Creek | 68 | 2.00 | — | — | 68 | 2.00 | 2.00 |
| 2007STWFA096 | Rock Roll Canyon | Dry | — | — | — | — | — | — |
| 2012STWFA028 | Uncle Johns Gulch | 57 | 2.00 | — | — | 47 | 1.00 | 1.50 |
| 2012STWFA030 | Wilson Creek | 62 | 2.00 | — | — | 61 | 1.00 | 1.50 |
| 2014STWFA019 | Trail Creek | 73 | 3.00 | 44 | 1.00 | 63 | 1.00 | 1.67 |
| 2015STWFA060 | Corral Creek | 63 | 2.00 | 49 | 1.00 | 85 | 3.00 | 2.00 |
| 2015STWFA061 | Unnamed | 58 | 2.00 | — | — | 78 | 3.00 | 2.50 |
| 2015STWFA076 | Wilson Creek | Dry | — | — | — | — | — | — |
| 2015STWFA078 | Wilson Creek | Dry | — | — | — | — | — | — |

2.14 Lake Creek (ID17040219SK015_03)—Source to Mouth

The 3rd-order AU of Lake Creek includes the stream from the 6,900-foot elevation to its confluence with the Big Wood River north of Ketchum.

Water Quality Data

The Lake Creek AU (ID17040219SK015_03) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP. The TP target is 0.05 mg/L.

Water quality sampling data collected at one location (above Sawmill Gulch) (Figure 20) in this AU are presented in Table 22. The TP target was exceeded once in July 2015 sampling. Wolman pebble counts on Lake Creek from 1995–2015 show generally low surface fines (Table 23). These data suggest that the AU is meeting its TMDL target goals at the sampling location.

E. coli was not monitored in this AU.

BURP monitoring has occurred periodically within this AU since 1995 (Table 24). BURP scores have generally been poor over the 20-year time period. One Lake Creek site in 1995 reflected good quality.

Assessment Status

Despite the appearance of good water quality and little information on potential causality, the stream continues to score poorly with regard to bio-assessment parameters. These data suggest that some other pollutant or causative factor may be at work. Historic mining activity possibly released potential contaminants that are inhibiting biological activity. It would be worth exploring stressor identification techniques within this watershed in the future.



Figure 20
Samples were collected in Lake Creek above Sawmill Gulch (July 15, 2015)

Table 22
Lake Creek (ID17040219SK015_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 1.957 |
| 5/26/2015 | QBRV | — | 2.9713 |
| 6/8/2015 | 0.006 | — | 2.64495 |
| 6/22/2015 | QBRV | — | 3.3125 |
| 7/15/2015 | QBRV | — | 2.3032 |
| 7/29/2012 | 0.12 | — | 2.17685 |
| 8/10/2105 | 0.012 | — | 3.455 |
| 8/28/2015 | 0.017 | — | 2.2854 |
| 9/14/2015 | 0.006 | — | 2.0984 |
| 9/22/2015 | QBRV | — | 2.0943 |
| 10/6/2015 | QBRV | QBRV | 1.784375 |
| 11/4/2015 | QBRV | — | 1.6535 |

Note: VBDL replaces values below detection levels.

Table 23
Wolman pebble count results for ID17040219SK015_03 BURP sites

| BURP ID | Wet Fines (%) | Total Fines (%) |
|--------------|---------------|-----------------|
| 1995STWFB019 | 18.3 | — |
| 2011STWFA025 | 23.7 | 32 |
| 2013STWFA054 | 19.2 | 27 |
| 2015STWFA057 | 15.9 | 22.7 |

Table 24
Lake Creek (ID17040219SK015_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 2011STWFA025 | Lake Creek | 39 | 1.00 | 62 | 1.00 | 55 | 1.00 | 1.00 |
| 2013STWFA054 | Lake Creek | 10 | 1.00 | 62 | 1.00 | 46 | 1.00 | 1.00 |
| 2015STWFA057 | Lake Creek | 37 | 1.00 | 92 | 3.00 | 57 | 1.00 | 1.67 |

2.15 Eagle Creek (ID17040219SK016_02)—Source to 3rd Order

This AU includes the 2nd-order segment of Eagle Creek including its tributaries. The Eagle Creek watershed is on the east side of the Big Wood River valley between Lake Creek and the North Fork Big Wood River. The AU is entirely within lands administrated by the USFS.

Water Quality Data

The Eagle Creek AU (ID17040219SK016_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment, including a TSS target of 25 mg/L, substrate fines of 35%, and a TP target is 0.05 mg/L.

Water quality sampling data collected at one location (above USFS boundary) (Figure 21) in this AU are presented in Table 25. The TSS and TP target was not exceeded during the 2015 sampling. Wolman pebble counts on Eagle Creek taken in 2015 show generally low surface fines; however, BURP site Wolman pebble counts show somewhat higher fines in 2011 and 2014 (Table 26). These data suggest that the AU is generally meeting its TMDL target goals at the sampling locations.

E. coli was not monitored in this AU.

BURP monitoring has occurred periodically within this AU since 1995 (

Table 27). BURP scores have generally been moderate to poor over the last 15 years. One Eagle Creek site in 2011 reflected moderately good quality.

Assessment Status

Despite the appearance of good water quality and little information on potential causality, the stream continues to score poorly with regard to bio-assessment parameters. These data suggest that some other pollutant or causative factor may be at work. Stream temperatures or historic mining activity may be inhibiting biological activity. It may be worth exploring stressor identification techniques within this watershed in the future.



Figure 21
Samples were collected in Eagle Creek just above USFS boundary (July 15, 2015)

Table 25
Eagle Creek (ID17040219SK016_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 2.6161 |
| 5/26/2015 | 0.01 | QBRV | 4.324 |
| 6/8/2015 | 0.009 | QBRV | 6.0358 |
| 6/22/2015 | 0.02 | QBRV | 5.737 |
| 7/15/2015 | QBRV | QBRV | 4.4662 |
| 7/29/2015 | 0.022 | QBRV | 3.2024 |
| 8/10/2015 | 0.019 | QBRV | 3.0453 |
| 8/28/2015 | 0.024 | QBRV | 2.8827 |
| 9/14/2015 | 0.009 | QBRV | 2.5206 |
| 9/22/2015 | 0.019 | QBRV | 1.9368 |
| 10/6/2015 | 0.007 | QBRV | 1.565725 |
| 11/4/2015 | 0.006 | QBRV | 1.51 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 26
Wolman pebble count results for ID17040219SK016_02 BURP sites.

| BURP ID | Wet Fines (%) | Total Fines (%) |
|--------------|---------------|-----------------|
| 1995STWFB017 | 16.5 | — |
| 1995STWFB042 | 17.7 | — |
| 2001STWFA025 | 14.9 | — |
| 2011STWFA026 | 32.4 | 39.8 |
| 2014STWFA020 | 25.8 | 32.7 |

Table 27
Eagle Creek (ID17040219SK016_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|--------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 2001STWFA025 | Eagle Creek | 68 | 2.00 | — | — | 60 | 1.00 | 1.50 |
| 2011STWFA026 | Eagle Creek | 61 | 2.00 | 89 | 3.00 | 49 | 1.00 | 2.00 |
| 2013SDEQA529 | UNT to Eagle Creek | — | — | — | — | — | — | — |
| 2014STWFA020 | Eagle Creek | 65 | 2.00 | 86 | 2.00 | 55 | 1.00 | 1.67 |

2.16 Eagle Creek (ID17040219SK016_03)—Source to Mouth

This AU includes the 3rd-order segment of Eagle Creek from the 2nd order to the confluence with the Big Wood River. The Eagle Creek watershed is on the east side of the Big Wood River valley between Lake Creek and the North Fork Big Wood River. The AU is primarily in private lands (suburban development) with a small portion within lands administrated by the USFS.

Water Quality Data

The Eagle Creek AU (ID17040219SK016_03) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment, including a TSS target of 25 mg/L, substrate fines of 35%, and a TP target is 0.05 mg/L.

Water quality sampling data collected at one location (above Highway 75) (Figure 22) in this AU are presented in Table 28. The TSS and TP targets were not exceeded during the 2015 sampling. The Wolman pebble counts taken on Eagle Creek in 2015, show generally low-to-moderate surface fines (Table 9). Wolman pebble counts from one 2007 BURP site showed similar fines with 22.3% wet and 28.1% total fines. These data suggest that the AU is generally meeting its TMDL target goals at the sampling locations.

E. coli was not monitored in this AU.

BURP monitoring has occurred only once within this AU in 2007 (Table 29). A second attempt to BURP monitor in 2013 resulted in dry conditions. The 2007 site reflected moderately poor quality.

Assessment Status

Despite the appearance of good water quality and little information on potential causality, the stream continues to score poorly with regard to bio-assessment parameters. These data suggest that some other pollutant or causative factor may be at work. Stream temperatures, historic mining activity, or suburban development may be inhibiting biological activity. It would be worth exploring stressor identification techniques within this watershed in the future.



Figure 22
Samples were collected in Eagle Creek upstream of Highway 75 (October 6, 2015)

Table 28
Eagle Creek (ID17040219SK016_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 0.752 |
| 5/26/2015 | 0.007 | 6 | 1.3704 |
| 6/8/2015 | 0.009 | QBRV | 3.2638 |
| 6/22/2015 | 0.024 | QBRV | 3.7525 |
| 7/15/2015 | QBRV | QBRV | 3.00105 |
| 7/29/2015 | 0.022 | QBRV | 1.5684 |
| 8/10/2015 | 0.026 | QBRV | 1.0236 |
| 8/28/2015 | 0.02 | QBRV | 1.2027 |
| 9/14/2015 | 0.008 | QBRV | 0.6489 |
| 9/22/2015 | 0.01 | QBRV | 0.685 |
| 10/6/2015 | 0.006 | QBRV | 0.6099 |
| 11/4/2015 | 0.006 | QBRV | 1.0049 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 29
Eagle Creek (ID17040219SK016_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 2007STWFA006 | Eagle Creek | 65 | 2.00 | 85 | 2.00 | 63 | 1.00 | 1.67 |
| 2013STWFA055 | Eagle Creek | | | | Dry | | | |

2.17 Horse Creek (ID17040219SK018_02)

The Horse Creek AU (ID17040219SK018_02) is large with approximately 43 1st- and 2nd-order tributaries to the headwaters region of the Big Wood River. Horse Creek is the northern most tributary, but there are many others including Gladiator, Titus, Senate, Cherry, Coyote, Spring, Owl, King, Dooley, Anderson, Butterfield, Silver, Snow, Easley, Goat, and Konrad Creeks. Water quality sampling in 2015 took place on Horse Creek near Galena Summit (Figure 23).

Water Quality Data

The Horse Creek AU (ID17040219SK018_02) is currently listed in Category 2 of the 2014 Integrated Report with fully supported aquatic life and recreation uses.

Water quality sampling data collected at one location (Horse Creek) (Figure 23) in this AU are presented in Table 30. The TSS and TP samples taken in 2015 are generally low.

E. coli was not monitored in this AU.

BURP monitoring has occurred throughout the AU at many different locations since 1995. Most sites reflect moderate-to-good water quality. The Horse Creek watershed has exhibited poor scores periodically since 1999 (Table 31), including poor scores in 2014 and 2015.

Assessment Status

Horse Creek proper is a part of larger AU with many other streams that are in good condition. Horse Creek itself may not be in such good condition. Sampling on Horse Creek in 2015 does not show high TP or TSS; however, the stream continues to score poorly with regard to bio-assessment parameters. These data suggest some other pollutant or causative factor may be at work. Stream temperatures, historic mining activity, or low water conditions may be inhibiting biological activity. It may be worth exploring stressor identification techniques within this watershed in the future.



Figure 23
Samples were collected in Horse Creek west of Highway 75 (June 22, 2015)

Table 30
Horse Creek (ID17040219SK018_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 5.81168 |
| 5/26/2015 | 0.017 | QBRV | 5.4117 |
| 6/8/2015 | 0.011 | QBRV | 3.9561 |
| 6/22/2015 | 0.024 | QBRV | 2.5512 |
| 7/15/2015 | 0.01 | QBRV | 2.037775 |
| 7/30/2015 | 0.024 | QBRV | 2.154875 |
| 8/11/2015 | 0.019 | QBRV | 1.6466 |
| 8/28/2015 | 0.022 | QBRV | 1.4796 |
| 9/14/2015 | 0.015 | QBRV | 1.3486 |
| 9/22/2015 | 0.012 | QBRV | 1.357 |
| 10/6/2015 | 0.01 | QBRV | 0.927 |
| 11/4/2015 | 0.02 | QBRV | 1.1758 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 31
Horse Creek (ID17040219SK018_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|--------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1998STWFA058 | Senate Creek | 75 | 3 | — | — | 62 | 1 | 2.00 |
| 1998STWFA059 | Gladiator Creek | 83 | 3 | 70 | 1 | 66 | 2 | 2.00 |
| 1998STWFA060 | Gladiator Creek | 81 | 3 | — | — | 66 | 2 | 2.50 |
| 1998STWFA061 | Titus Creek | 80 | 3 | — | — | 79 | 3 | 3.00 |
| 1998STWFA062 | Owl Creek | 65 | 2 | — | — | 85 | 3 | 2.50 |
| 1998STWFA063 | Coyote Creek | 78 | 3 | — | — | 84 | 3 | 3.00 |
| 1999STWFA022 | Silver Creek | 65 | 2 | 89 | 3 | 69 | 2 | 2.33 |
| 1999STWFA023 | Goat Creek | 72 | 3 | 76 | 2 | 63 | 1 | 2.00 |
| 1999STWFA025 | Konrad Creek | 55 | 2 | 70 | 1 | 87 | 3 | 2.00 |
| 1999STWFA035 | Spring Creek | 72 | 3 | 90 | 3 | 59 | 1 | 2.33 |
| 1999STWFA036 | North Cherry Creek | 57 | 2 | 71 | 1 | 54 | 1 | 1.33 |
| 1999STWFA037 | Cherry Creek | 76 | 3 | — | — | 70 | 2 | 2.50 |
| 1999STWFA038 | UNT to Horse Creek | 39 | 1 | — | — | 47 | 1 | 1.00 |
| 1999STWFA039 | Horse Creek | 69 | 2 | 62 | 1 | 73 | 2 | 1.67 |
| 1999STWFA045 | King Creek | 58 | 2 | — | — | 71 | 2 | 2.00 |
| 1999STWFA046 | Big Wood River | 64 | 2 | — | — | 82 | 3 | 2.50 |
| 1999STWFA047 | Horse Creek | 70 | 3 | — | — | 73 | 2 | 2.50 |
| 2007STWFA004 | Silver Creek | 51 | 1 | 97 | 3 | 77 | 2 | 2.00 |
| 2007STWFA034 | Gladiator Creek | 67 | 2 | 71 | 1 | 67 | 2 | 1.67 |
| 2007STWFA035 | Gladiator Creek | 59 | 2 | — | — | 73 | 2 | 2.00 |
| 2007STWFA036 | Westernhome Creek | 67 | 2 | 83 | 2 | 67 | 2 | 2.00 |
| 2007STWFA037 | Horse Creek | 61 | 2 | 72 | 2 | 73 | 2 | 2.00 |
| 2007STWFA038 | UNT to Horse Creek | 26 | 1 | 74 | 2 | 63 | 1 | 1.33 |
| 2007STWFA039 | Emma Gulch | Marsh | Nonwade | — | — | — | — | — |
| 2007STWFA040 | Enid Gulch Creek | 75 | 3 | 62 | 1 | 70 | 2 | 2.00 |
| 2007STWFA041 | Big Wood River | 76 | 3 | 83 | 2 | 70 | 2 | 2.33 |
| 2007STWFA042 | Titus Creek | 44 | 1 | — | — | 67 | 2 | 1.50 |
| 2007STWFA074 | Silver Creek | 51 | 1 | 97 | 3 | 75 | 2 | 2.00 |
| 2010SDEQA047 | Unnamed stream | Dry | — | — | — | — | — | — |
| 2010SDEQA100 | Unnamed stream | Dry | — | — | — | — | — | — |
| 2010SDEQA117 | Unnamed stream | Dry | — | — | — | — | — | — |
| 2012STWFA019 | Horse Creek | 72 | 3 | 73 | 2 | 72 | 2 | 2.33 |
| 2012STWFA052 | Owl Creek | 76 | 3 | 97 | 3 | 66 | 2 | 2.67 |
| 2012STWFA054 | Big Wood River | 78 | 3 | 90 | 3 | 70 | 2 | 2.67 |
| 2012STWFA055 | Titus Creek | 82 | 3 | 65 | 1 | 75 | 2 | 2.00 |

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|--------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 2014STWFA008 | Senate Creek | 59 | 2 | 93 | 3 | 61 | 1 | 2.00 |
| 2014STWFA009 | Cherry Creek | 54 | 2 | 94 | 3 | 67 | 2 | 2.33 |
| 2014STWFA010 | Coyote Creek | 58 | 2 | 89 | 3 | 64 | 2 | 2.33 |
| 2014STWFA011 | Gladiator Creek | 56 | 2 | 80 | 2 | 65 | 2 | 2.00 |
| 2014STWFA012 | Horse Creek | 61 | 2 | 75 | 2 | 63 | 1 | 1.67 |
| 2015STWFA052 | Spring Creek | — | — | 91 | 3 | 60 | 1 | 2.00 |
| 2015STWFA053 | Silver Creek | 55 | 2 | 88 | 3 | 69 | 2 | 2.33 |
| 2015STWFA064 | UNT to Horse Creek | 46 | 1 | 78 | 2 | 60 | 1 | 1.33 |
| 2015STWFA065 | Horse Creek | 61 | 2 | 67 | 1 | 70 | 2 | 1.67 |
| 2015STWFA073 | Horse Creek | — | — | — | — | — | — | — |
| 2015STWFA074 | Gladiator Creek | — | — | — | — | — | — | — |
| 2015STWFA079 | Owl Creek | — | — | — | — | — | — | - |
| 2015STWFA080 | Coyote Creek | — | — | — | — | — | — | - |

2.18 Big Wood River (ID17040219SK018_04)—Source to North Fork Big Wood River

The AU ID17040219SK018_04 includes the Big Wood River from Prairie Creek to the North Fork Big Wood River. The AU includes approximately 21 km of river in the Sawtooth National Forest.

Water Quality Data

The Big Wood River AU (ID17040219SK018_04) is currently listed in Category 2 of the 2014 Integrated Report with fully supported aquatic life and recreation uses.

Water quality sampling data collected at one location (near Silver Creek campground) (Figure 24) in this AU are presented in Table 32. The TSS and TP samples taken in 2015 are generally very low.

E. coli was only monitored three times in this AU, with very low values (Table 32).

BURP monitoring has occurred at three different locations since 1995 (Table 33). These sites reflect moderate-to-good water quality. These scores were generated using the 2nd edition of the water body assessment guidance (Grafe et al. 2002) because 2004 scores cannot be processed with the 3rd edition (DEQ 2016).

Assessment Status

The condition of this AU appears to be consistent with its present listing as a fully supporting stream.



Figure 24
Samples were collected in Big Wood River upstream of Silver Creek campground (August 11, 2004)

Table 32
Source to North Fork Big Wood River (ID17040219SK018_04) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|-----------------------------|------------|
| 5/27/2015 | 0.009 | 8 | 27 | — |
| 6/9/2015 | QBRV | QBRV | 0.5 | — |
| 6/24/2015 | QBRV | QBRV | 1 | — |
| 7/15/2015 | 0.009 | QBRV | — | — |
| 7/30/2015 | 0.01 | QBRV | — | 39.8826 |
| 8/11/2015 | 0.014 | QBRV | — | 60.4672 |
| 8/28/2015 | 0.017 | QBRV | — | 45.9756 |
| 9/14/2015 | 0.007 | QBRV | — | 45.3944 |
| 9/22/2015 | QBRV | QBRV | — | 39.5256 |
| 10/6/2015 | QBRV | QBRV | — | 39.3173 |
| 11/4/2015 | 0.009 | QBRV | — | 45.9588 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 33 Source to North Fork Big Wood River (ID17040219SK018_04) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|----------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1995STWFB051 | Big Wood River | 67.09 | 3 | — | — | 42 | 1.0 | 2.0 |
| 2004STWFA053 | Big Wood River | 75.78 | 3 | 60.18 | 1 | 69 | 3.0 | 2.33 |
| 2004STWFA054 | Big Wood River | 61.82 | 3 | 93.75 | 3 | 63 | 2.0 | 2.67 |

2.19 Warm Springs (ID17040219SK024_02)—Source to and including Thompson Creek

The Warm Springs Creek AU (ID17040219SK024_02) includes 1st- and 2nd-order tributaries to Warm Springs, Placer, Castle, and Thompson Creeks. This is a large AU with many tributaries in four watersheds. Water quality sampling took place on Left Fork Placer Creek in 2015.

The Warm Springs Creek watershed occurs on the west side of the Big Wood River valley, just west of the city of Ketchum.

Water Quality Data

The Warm Springs Creek AU (ID17040219SK024_02) is currently listed in Category 4a of the 2014 Integrated Report with an approved TMDL for TP, including a target of 0.05 mg/L.

Water quality sampling data collected at one location (Left Fork Placer Creek) (Figure 25) in this AU are presented in Table 34. The TP samples taken in 2015 are relatively high with exceedances of the target occurring six times throughout the sampling period.

E. coli was not monitored in this AU.

BURP monitoring has occurred throughout the AU at many different locations since 1998 (Table 35). Most sites reflect moderate-to-good water quality. The Warm Springs Creek watershed has exhibited poor scores periodically since 2013.

Assessment Status

The Left Fork Placer Creek sampling in 2015 shows high TP; however, that particular stream did score well in 2014 with regard to bio-assessment parameters. It is not clear what causes high TP in these streams. An investigation into the chemical specific nature of phosphorus may shed some light on potential sources. Streams in this AU have been exposed to recent wildfire that may in turn affect the release of phosphorus from soils and ash. Periodic low assessment scores in the AU, especially in Warm Springs Creek, may have resulted from fire, low water, or both. More work is needed in these watersheds; a division of the AU into four AUs, one for each sub-watershed, may help with future screening of water quality concerns.



Figure 25
Samples were collected in Left Fork Placer Creek upstream of road crossing (June 8, 2015)

Table 34
Left Fork Placer Creek (ID17040219SK024_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Flow (cfs) |
|-------------|-------------------------|------------|
| 5/26/2015 | 0.078 | 5.9174 |
| 6/8/2015 | 0.022 | 2.76885 |
| 6/23/2015 | 0.034 | 1.53535 |
| 7/14/2015 | 0.032 | 0.64385 |
| 7/29/2015 | 0.062 | 0.7158 |
| 8/10/2015 | 0.085 | 0.4834 |
| 8/27/2015 | 0.067 | 0.35685 |
| 9/8/2015 | 0.036 | 0.2145 |
| 9/21/2015 | 0.061 | 0.3085 |
| 10/5/2015 | 0.057 | 0.3032 |
| 10/19/2015 | 0.046 | 0.5317 |

Table 35
Warm Springs Creek (ID17040219SK024_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-----------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1998STWFA069 | Warm Spring Creek | 65 | 2 | — | — | 66 | 2 | 2.00 |
| 1999STWFA026 | Spruce Creek | — | — | 100 | 3 | 76 | 2 | 2.50 |
| 1999STWFA027 | Elk Creek | 65 | 2 | 100 | 3 | 70 | 2 | 2.33 |
| 1999STWFA044 | Bar Gulch | 82 | 3 | 94 | 3 | 69 | 2 | 2.67 |
| 2005STWFA012 | SF Warm Springs Creek | 77 | 3 | 88 | 3 | 63 | 1 | 2.33 |
| 2013STWFA006 | Rough Canyon | 62 | 2 | 96 | 3 | 61 | 1 | 2.00 |
| 2013STWFA010 | SF Warm Springs Creek | 51 | 1 | 68 | 1 | 57 | 1 | 1.00 |
| 2013STWFA011 | Meadow Creek | 58 | 2 | 86 | 2 | 69 | 2 | 2.00 |
| 2013STWFA012 | MF Warm Springs Creek | 62 | 2 | — | — | 71 | 2 | 2.00 |
| 2014STWFA002 | EF Castle Creek | 40 | 1 | 98 | 3 | 58 | 1 | 1.67 |
| 2014STWFA003 | LF Placer Creek | 56 | 2 | — | — | 81 | 3 | 2.50 |
| 2014STWFA005 | Warm Springs Creek | 41 | 1 | — | — | 61 | 1 | 1.00 |
| 2014STWFA006 | Warm Springs Creek | 34 | 1 | — | — | 65 | 2 | 1.50 |
| 2014STWFA007 | Castle Creek | 47 | 1 | 85 | 2 | 78 | 3 | 2.00 |

2.20 Warm Springs (ID17040219SK024_03)—Source to and including Thompson Creek

The Warm Springs Creek AU (ID17040219SK024_03) includes 3rd-order segments of Warm Springs, Placer, Castle, and Thompson Creeks. This AU includes the 3rd-order reaches in the four watersheds. Water quality sampling took place near the mouth of Placer Creek in 2015.

Water Quality Data

The Warm Springs Creek AU (ID17040219SK024_03) is currently listed in Category 4a of the 2014 Integrated Report with an approved TMDL for TP with a target of 0.05 mg/L.

Water quality sampling data collected at one location (Placer Creek) (Figure 26) in this AU are presented in Table 36. The TP samples taken in 2015 exceeded the target twice in 11 samples, once in May and again in August.

E. coli was not monitored in this AU.

BURP monitoring has occurred throughout the AU at many different locations since 1998 (Table 37). The 2004 BURP sites could not be processed through the new water body assessment guidance (DEQ 2016) protocol because of data errors. Most sites reflect moderate-to-good water quality, except for a site on Warm Springs Creek in 2013, which had poor scores similar to occurrences in the 2nd-order AU above it.

Assessment Status

The Placer Creek sampling in 2015 shows occasional high TP; however, that particular stream did score reasonably well with regard to bio-assessment parameters in 2013 and 2014. It is not clear what causes high TP in these streams. An investigation into the chemical-specific nature of phosphorus may shed some light on potential sources. Streams in this AU have been exposed to recent wildfire that may affect the release of phosphorus from soils and ash. Periodic low assessment scores in the AU, especially in Warm Springs Creek, may have resulted from wildfire, low water, or both. More work is needed in these watersheds; a division of the AU into four AUs, one for each sub-watershed, may help with future screening of water quality concerns.



Figure 26
Samples were collected in Placer Creek above the confluence with Warm Springs Creek (August 27, 2015)

Table 36
Placer Creek (ID17040219SK024_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Flow (cfs) |
|-------------|-------------------------|------------|
| 5/26/2015 | 0.141 | 30.9812 |
| 6/8/2015 | 0.022 | 23.9103 |
| 6/23/2015 | 0.022 | 10.6532 |
| 7/14/2015 | 0.021 | 6.1707 |
| 7/29/2015 | 0.047 | 5.2879 |
| 8/10/2015 | 0.069 | 4.2405 |
| 8/27/2015 | 0.045 | 2.5235 |
| 9/8/2015 | 0.031 | 3.00475 |
| 9/21/2015 | 0.03 | 2.2835 |
| 10/5/2015 | 0.046 | 2.68 |
| 10/19/2015 | 0.024 | 4.7185 |

Table 37
Warm Springs Creek (ID17040219SK024_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-----------------------|-----------|------------|-----------|-------------|-----------|------------|---------|
| 1998STWFA068 | SF Warm Springs Creek | 81 | 3 | — | — | 70 | 2 | 2.50 |
| 1998STWFA079 | Placer Creek | 69 | 2 | — | — | 67 | 2 | 2.00 |
| 1998STWFA080 | Placer Creek | 80 | 3 | — | — | 82 | 3 | 3.00 |
| 1999STWFA060 | Castle Creek | 73 | 3 | — | — | 84 | 3 | 3.00 |
| 2004DEQA027 | SF Warm Springs Creek | | | | Data errors | | | |
| 2004STWFA006 | Thompson Creek | | | | Data errors | | | |
| 2004STWFA007 | Castle Creek | | | | Data errors | | | |
| 2004STWFA008 | SF Warm Springs Creek | | | | Data errors | | | |
| 2004STWFA009 | Placer Creek | | | | Data errors | | | |
| 2004STWFA010 | SF Warm Springs Creek | | | | Data errors | | | |
| 2013STWFA003 | Thompson Creek | 74 | 3 | 96 | 3 | 65 | 2 | 2.67 |
| 2013STWFA005 | Castle Creek | 68 | 2 | 96 | 3 | 66 | 2 | 2.33 |
| 2013STWFA007 | Placer Creek | 75 | 3 | 87 | 2 | 56 | 1 | 2.00 |
| 2013STWFA009 | SF Warm Springs Creek | 61 | 2 | 62 | 1 | 60 | 1 | 1.33 |
| 2014STWFA001 | Placer Creek | 59 | 2 | 85 | 2 | 68 | 2 | 2.00 |

2.21 Greenhorn Creek (ID17040219SK025_02)—Source to USFS Boundary

The Greenhorn Creek AU (ID17040219SK025_02) includes 1st- and 2nd-order tributaries to Greenhorn Creek, a watershed on the west side of the Big Wood River north of the city of Hailey. In addition to Greenhorn Creek, the AU includes Sawmill Creek, Mahoney Creek, Lodge pole Gulch, Cow Creek, Limekiln Gulch, and several unnamed tributaries. No water quality sampling occurred within this AU in 2015.

Water Quality Data

The Greenhorn Creek AU (ID17040219SK025_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment. Sediment targets for this AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

No water quality sampling data have been collected in this AU. A number of large beaver complexes have developed along the lower portion of the AU making access and representative sampling questionable (Figure 27). Wolman pebble counts on the 3rd-order segment of Greenhorn Creek in 2015 show very low surface fines (Table 9), suggesting that the beaver ponding activity may be trapping substantial fine sediment above it.

BURP monitoring has occurred sporadically within this AU since 1996 (Table 38). Most visitations resulted in dry conditions during the sampling time period (July–September). The 2002 BURP site resulted in low scores. Surface fines at that site were 27.1% (wet) and 37.4% (total), suggesting moderately high surface fines. During the 2002 visit flow was low at 0.1 cubic feet per second (cfs), suggesting that the stream is largely impacted by low flow conditions.

Assessment Status

The Greenhorn Creek watershed is likely affected by low flow conditions. It is not clear to what extent low flow or beaver activity affect sampling results. Further work needs to be done in the AU to determine if the TP and sediment TMDLs are appropriate.



Figure 27
Greenhorn Creek (May 5, 2015)

Table 38
Greenhorn Creek (ID17040219SK025_02) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|------------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 1996STWFB006 | Greenhorn Creek | 64.13 | 3.00 | — | — | 61.00 | 3.00 | 3.00 |
| 2002STWFA047 | Mahoney Creek | | | | Dry | | | |
| 2002STWFA048 | Greenhorn Creek | 63 | 2.00 | — | — | 62 | 1.00 | 1.50 |
| 2011STWFA050 | UNT to Greenhorn Creek | | | | Dry | | | |
| 2014STWFA126 | Cow Creek | | | | Dry | | | |

2.22 Greenhorn Creek (ID17040219SK025_03)—Mahoney Creek to Mouth

The Greenhorn Creek AU (ID17040219SK025_03) includes 3rd order of Greenhorn Creek, a watershed on the west side of the Big Wood River north of the city of Hailey. The AU includes Greenhorn Creek from Mahoney Creek to the confluence with the Big Wood River. Water quality sampling occurred within this AU in 2015 near the Mahoney Creek confluence.

Water Quality Data

The Greenhorn Creek AU (ID17040219SK025_03) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment. Sediment targets for this

AU from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

Water quality sampling data collected near the top of this AU (**Error! Reference source not found.**) show exceedances of the TP target throughout the sampling period (Table 39). A number of large beaver complexes have developed in the AU above making representative sampling questionable. Beaver complexes may be a sink for organic matter, especially wildfire ash that may release phosphorus throughout the year to the reaches below. This watershed, similar to other west-side watersheds has been affected by recent wildfire activity. Low TSS values (Table 39) and Wolman pebble counts in this section of Greenhorn Creek in 2015 show very low surface fines (Table 9), suggesting that the beaver ponding activity may be trapping substantial fine sediment above it.

E. coli was not monitored in this AU.

BURP monitoring has occurred twice within this AU since 2002 (Table 40). The first visitation in 2002 resulted in dry conditions during the sampling time period (July–September). The 2013 BURP site resulted in low scores. Surface fines at that site were 31.8% (wet) and 38.6% (total), suggesting relatively high surface fines.

Assessment Status

The Greenhorn Creek watershed is likely affected by wildfire and low flow conditions. It is not clear to what extent low flow or beaver activity affect sampling results. Further work needs to be done in the AU to determine if the TP and sediment TMDLs are appropriate.



Figure 29

Samples were collected in Greenhorn Creek immediately above the USFS boundary (August 27, 2015).

Table 39
Greenhorn Creek (ID17040219SK025_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/5/2015 | QBRV | QBRV | 4.2201 |
| 5/26/2015 | 0.077 | 12 | 7.29365 |
| 6/8/2015 | 0.064 | QBRV | 3.62385 |
| 6/22/2015 | 0.068 | QBRV | 1.56685 |
| 7/14/2015 | 0.11 | QBRV | 0.65805 |
| 7/27/2015 | 0.14 | QBRV | 0.6409 |
| 8/10/2015 | 0.18 | QBRV | 0.0251 |
| 8/27/2015 | 0.109 | QBRV | 0.15515 |
| 9/8/2015 | 0.086 | QBRV | 0.2796 |
| 9/21/2015 | 0.129 | QBRV | 0.28185 |
| 10/5/2015 | 0.089 | QBRV | 0.476075 |
| 10/19/2015 | 0.081 | QBRV | 0.6068 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 40
Greenhorn Creek (ID17040219SK025_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-----------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 2002STWFA046 | Greenhorn Creek | | | | Dry | | | |
| 2013STWFA032 | Greenhorn Creek | 51 | 1.00 | 69 | 1.00 | 59 | 1.00 | 1.00 |

2.23 Croy Creek (ID17040219SK027_02 and ID17040219SK027_03)— Source to Mouth

The Croy Creek AU (ID17040219SK027_02) includes the 1st- and 2nd-order tributaries of Croy Creek, a watershed on the west side of the Big Wood River adjacent to the city of Hailey. The AU includes the 1st- and 2nd-order reaches of Croy Creek, as well as Kelly Gulch, Elk Creek, Bullion Gulch, Croesus Gulch, Wilson Gulch, Hot Springs Gulch, Democratic Gulch, Lambs Gulch, and Vorberg Gulch, all tributaries to Croy Creek. Water quality sampling occurred within this 2nd-order AU in 2015.

The 3rd-order segment of the Croy Creek AU (ID17040219SK027_03) includes Croy Creek from Elk Creek to the confluence with the Big Wood River.

Water Quality Data

The Croy Creek AUs (ID17040219SK027_02 and ID17040219SK027_03) are currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs. The 2nd-order AU is only listed for sediment. The 3rd-order AU is listed for *E. coli*, TP, TSS, and substrate sediment and is also in Category 4c for flow alteration. Sediment targets for these AUs from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

Water quality sampling data collected in the 2nd-order AU (Figure 28) show two minor exceedances of the TP target in July and September, and no exceedances of TSS during the sampling period (Table 41). *E. coli* was also monitored in this AU, which resulted in substantial exceedance of the water quality standards (Table 42).

BURP monitoring in the 2nd-order AU has occurred periodically throughout the watershed since 1999 (Table 43). Scores have generally been poor, with the exception of Bullion Gulch. Surface fines measured in 2015 in this AU (Table 9) were very high and are consistent with BURP sites throughout the watershed over the years. BURP monitoring has occurred once within the 3rd-order AU 1999 (Table 43). Subsequent visits in 2002, 2010, and 2012 all resulted in dry conditions during the sampling period. The 1999 BURP site resulted in moderate scores; however, surface fines at that site were 60.7% (wet) and 72.6% (total), suggesting high surface fines.

Assessment Status

The Croy Creek watershed is likely affected by wildfire and low flow conditions. The watershed is clearly impacted by excess fine sediment and *E. coli*. The watershed is partially within BLM grounds and substantially private. Suburban development and livestock grazing are likely major components and contributors to sediment and *E. coli*. Further work needs to be done in these AUs to achieve the objectives of *E. coli* and sediment TMDLs.



Figure 28
Samples were collected in the 2nd-order segment of Croy Creek at the confluence with Kelly Gulch (June 10, 2015)

Table 41
Croy Creek (ID17040219SK027_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|-----------------------------|------------|
| 5/4/2015 | QBRV | 36 | — | 0.11215 |
| 5/28/2015 | — | 12 | — | 0.43205 |
| 6/10/2015 | 0.033 | 8 | 125 | 0.3929 |
| 6/24/2015 | 0.048 | 5 | — | 0.2284 |
| 6/25/2015 | — | — | 1990 | — |
| 7/1/2015 | — | — | 411 | 0.2586 |
| 7/8/2015 | — | — | 687 | 0.2433 |
| 7/13/2015 | — | — | 365 | 0.316 |
| 7/15/2015 | 0.034 | — | — | 0.2808 |
| 7/16/2015 | — | — | 276 | 0.2409 |
| 7/27/2015 | 0.061 | 7 | — | 0.3 |
| 8/5/2015 | 0.046 | QBRV | — | 0.0941 |
| 8/27/2015 | 0.043 | QBRV | — | 0.07538 |
| 9/8/2015 | 0.052 | 5 | — | 0.066 |
| 9/21/2015 | QBRV | 8 | — | 0.06635 |
| 10/5/2015 | 0.03 | QBRV | — | 0.1632 |
| 10/19/2015 | 0.01 | QBRV | — | 0.123 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 42
Croy Creek (ID17040219SK027_02) E.coli sampling results

| Sample Date | E. coli (MPN/100 mL) | Flow (cfs) |
|----------------|----------------------|------------|
| 6/10/2015 | 125 | 0.3929 |
| 6/24/2015 | — | 0.2284 |
| 6/25/2015 | 1990 | — |
| 7/1/2015 | 411 | 0.2586 |
| 7/8/2015 | 687 | 0.2433 |
| 7/13/2015 | 365 | 0.316 |
| 7/16/2015 | 276 | 0.2409 |
| Geometric Mean | 563.08 | — |

Note: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 43
Croy Creek (ID17040219SK027_02 and ID17040219SK027_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|---------------------------|---------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| ID17040219SK027_02 | | | | | | | | |
| 1999STWFA049 | Elk Creek | 70 | 3 | 38 | 1 | 36 | 1 | 1.67 |
| 2002STWFA052 | Bullion Gulch Creek | 73 | 3 | — | — | 55 | 2 | 2.50 |
| 2002STWFA054 | Croesus Gulch Creek | | | | Dry | | | |
| 2004STWFA002 | Elk Creek | | | | Incomplete | | | |
| 2012STWFA035 | Elk Creek | 65 | 2 | 35 | 1 | 51 | 2 | 1.67 |
| 2012STWFA037 | Kelly Gulch | 65 | 2 | 43 | 1 | 41 | 1 | 1.33 |
| 2013STWFA053 | Croy Creek | Dry | — | — | — | — | — | — |
| ID17040219SK027_03 | | | | | | | | |
| 1999STWFA043 | Croy Creek | 61 | 2.00 | — | — | 56 | 2.00 | 2.00 |
| 2002STWFA053 | Croy Creek | | | | Dry | | | |
| 2010SDEQA076 | Unnamed stream | | | | Dry | | | |
| 2012STWFA034 | Croy Creek | | | | Dry | | | |

2.24 Rock Creek (ID17040219SK028_02)—Source to Mouth

This AU (ID17040219SK028_02) includes the 1st- and 2nd-order tributaries of Rock Creek, a watershed on the north side of the Big Wood River near Magic Reservoir. The AU includes the 1st- and 2nd-order reaches of Rock Creek, as well as Little Rock Creek, Little Poison Creek,

Guy Canyon, Smith Creek, Dry Gulch, Hatty Gulch, Kent Canyon, West Fork Rock Creek, East Fork Rock Creek, and Long Gulch, all tributaries to Rock Creek. Water quality sampling took place on Rock Creek near its confluence of East Fork Rock Creek in 2015.

Water Quality Data

The Rock Creek AU (ID17040219SK028_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for *E. coli*, TP, TSS, substrate sediment, and temperature. Sediment targets for these AUs from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

Water quality sampling data collected in the AU (Figure 29) show no exceedances of the TP or TSS targets during the sampling period (Table 44). However, Wolman pebble counts in the East Fork Rock Creek were very high in 2015 (Table 9).

E. coli was also monitored in this AU, which showed no tendency to exceed the water quality standard (Table 45).

BURP monitoring in the 2nd-order AU has not occurred in the AU since 1995. Although visited in 2007, 2008 and 2014, all sample locations (2007STWFA085, 2008STWFA042, and 2014STWFA023) were found dry. The 1995 BURP site resulted surface fines that were 82.7% (wet), suggesting high surface fines.

Assessment Status

The Rock Creek watershed is likely affected by low flow conditions. The watershed also tends to be low gradient and depositional by nature. Land use has also likely impacted excess fine sediment, and deposition likely remains in the system, although it does not seem to be distributing in the water column. The watershed is partially within BLM grounds and substantially private. Livestock grazing was likely a major component and contributor to sediment in the past. Substantial work has taken place in this AU to achieve the objectives of the TMDLs. It is likely to take some time for bedload sediment to move out of the system and to restabilize. Some streams will likely remain sediment depositional because of low gradient and low flow. The temperature TMDL also looks forward to a return of riparian cover in headwater streams.



Figure 29
Samples were collected in Rock Creek above the confluence with East Fork Rock Creek (July 8, 2015)

Table 44
Rock Creek (ID17040219SK028_02) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|-----------------------------|------------|
| 5/4/2015 | 0.012 | 10 | 0.5 | 0.0484 |
| 5/28/2015 | 0.034 | QBRV | 1 | 0.2607 |
| 6/10/2015 | 0.09 | 7 | 32 | 0.5 |
| 6/24/2015 | 0.019 | 6 | — | 2.4362 |
| 6/25/2015 | — | — | 14 | — |
| 7/1/2015 | — | — | 27 | 2.171025 |
| 7/8/2015 | — | — | 133 | 3.32495 |
| 7/13/2015 | — | — | 39 | 3.575475 |
| 7/15/2015 | QBRV | QBRV | — | 3.05275 |
| 7/16/2015 | — | — | 27 | 3.041 |
| 7/27/2015 | 0.027 | QBRV | — | 3.13035 |
| 8/5/2015 | 0.025 | QBRV | — | 2.6097 |
| 8/27/2015 | 0.027 | QBRV | — | 1.6235 |
| 9/8/2015 | 0.07 | QBRV | — | 1.1161 |
| 9/21/2015 | QBRV | QBRV | — | 2.4137 |
| 10/5/2015 | 0.029 | QBRV | — | 0.9279 |
| 10/19/2015 | QBRV | QBRV | — | 2.5833 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 45
Rock Creek (ID17040219SK028_02) *E. coli* sampling results

| Sample Date | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|----------------|--------------------------------|------------|
| 5/4/2015 | 0.5 | 0.0484 |
| 5/28/2015 | 1 | 0.2607 |
| 6/10/2015 | 32 | 0.5 |
| 6/25/2015 | 14 | 2.4362 |
| 7/1/2015 | 27 | 2.171025 |
| 7/8/2015 | 133 | 3.32495 |
| 7/13/2015 | 39 | 3.575475 |
| 7/16/2015 | 27 | 3.041 |
| Geometric Mean | 35.06 | — |

Note: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

2.25 Rock Creek (ID17040219SK028_03)—Source to Mouth

This AU (ID17040219SK028_03) includes the 3rd-order segment of Rock Creek from the East Fork Rock Creek to Magic Reservoir backfill at Highway 20/26. The stream is largely low gradient range and pastureland. Water quality sampling took place on Rock Creek near its mouth above Highway 20/26 in 2015.

Water Quality Data

The Rock Creek AU (ID17040219SK028_03) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for *E. coli*, TP, and sediment. Sediment targets for these AUs from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

Water quality sampling data collected in the AU (Figure 30) show a number of TP target exceedances, but no TSS target exceedance during the sampling period (Table 46). Wolman pebble counts in Rock Creek BURP sites were high throughout most of the time period between 1999 and 2015 but were lower in 2014 (Table 47). However, the 2014 BURP site is downstream of the Highway 20/26 culvert and is technically in the Magic Reservoir AU (

Table 48).

E. coli was also monitored in this AU, which showed no tendency to exceed the water quality standards (

Table 49).

Assessment Status

The Rock Creek watershed is likely affected by low flow conditions. The watershed also tends to be low gradient and depositional by nature. Land use has also likely impacted excess fine sediment and deposition likely remains in the system, although it does not seem to be distributing in the water column. TP also is high within this AU and is likely tied to the excess depositional sediment that remains in the system. The watershed is partially within BLM grounds and substantially private. Livestock grazing was likely a major component and contributor to sediment and TP in the past. Substantial work has taken place in this AU to achieve the objectives of the TMDLs. It is likely to take some time for bedload sediment to move out of the system and to stabilize. Some portions of the stream will likely remain sediment depositional because of low gradient and low flow.



Figure 30
Samples were collected in Rock Creek immediately north of Highway 20 (July 8, 2015)

Table 46
Rock Creek (ID17040219SK028_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|------------|
| 5/4/2015 | 0.018 | QBRV | 1.1037 |
| 5/28/2015 | 0.067 | QBRV | 2.9533 |
| 6/10/2015 | 0.118 | QBRV | 0.99205 |
| 6/24/2015 | 0.111 | QBRV | 1.7699 |
| 7/15/2015 | 0.106 | QBRV | 2.4856 |
| 7/27/2015 | 0.13 | QBRV | 1.5973 |
| 8/5/2015 | 0.13 | QBRV | 1.04795 |
| 8/27/2015 | 0.127 | 12 | 0.68604 |
| 9/8/2015 | 0.0158 | QBRV | 0.8004 |

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | Flow (cfs) |
|--------------------|--------------------------------|--------------------------------------|-------------------|
| 9/21/2015 | QBRV | QBRV | 1.2266 |
| 10/5/2015 | 0.141 | 12 | 1.6954 |
| 10/19/2015 | 0.045 | QBRV | 4.5547 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L.

Table 47
Wolman pebble counts from Rock Creek (ID17040219SK028_03) BURP sites

| BURP Sites | Wet Fines (%) | Total Fines (%) |
|---------------|---------------|-----------------|
| 1999STWFA050 | 42.3 | 49.3 |
| 1999STWFA051 | 36.2 | 52.3 |
| 2010SDEQA0215 | 52.6 | 60.7 |
| 2014STWFA024 | 19.9 | 27.2 |
| 2015STWFA017 | 64.6 | 64.1 |

Table 48
Rock Creek (ID17040219SK028_03) BURP scores

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|------------|-----------|------------|-----------|----------------|-----------|------------|---------|
| 1999STWFA050 | Rock Creek | 63 | 2 | — | — | 56 | 2 | 2.00 |
| 1999STWFA051 | Rock Creek | 65 | 2 | — | — | 59 | 2 | 2.00 |
| 2010SDEQA215 | Rock Creek | 70 | 3 | 60 | 1 | 35 | 1 | 1.67 |
| 2010SDEQA200 | Rock Creek | | | | No access | | | |
| 2011STWFA049 | Rock Creek | | | | Fish only | | | |
| 2012STWFA038 | Rock Creek | | | | Beaver complex | | | |
| 2014STWFA024 | Rock Creek | 65 | 2 | 86 | 2 | 58 | 2 | 2.00 |
| 2015STWFA017 | Rock Creek | 5 | 1 | 77 | 2 | 47 | 2 | 1.67 |

Table 49
Rock Creek (ID17040219SK028_03) *E. coli* sampling results

| Sample Date | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|----------------|-----------------------------|------------|
| 5/4/2015 | 4 | 1.1037 |
| 5/28/2015 | 16 | 2.9533 |
| 6/10/2015 | 93 | 0.99205 |
| 6/24/2015 | 118 | 1.7699 |
| 7/1/2015 | 133 | 1.39315 |
| 7/8/2015 | 157 | 1.95125 |
| 7/13/2015 | 112 | 2.6938 |
| 7/16/2015 | 48 | 2.01295 |
| Geometric Mean | 105.78 | — |

Note: The target development for bacteria impairment is a geometric mean concentration of 126 CFU/100mL. This mean is calculated from five samples (shaded area) taken 5–7 days apart over a 30-day period (IDAPA 58.01.02.251.01). MPN = most probable number, a lab estimate for coliform forming unit (CFU).

2.26 Thorn Creek (ID17040219SK029_02)—Source to Mouth

The Thorn Creek AU (ID17040219SK029_02) includes the 1st- and 2nd-order segments of the Thorn Creek watershed, including Schooler Creek, Rattlesnake Canyon, and a number of unnamed tributaries. The stream is largely low gradient range and pastureland. A small earthen bound reservoir structure exists at the headwaters of Thorn Creek. Water quality sampling did not take place in this AU in 2015 due to dry conditions.

Water Quality Data

The Thorn Creek AU (ID17040219SK029_02) is currently listed in Category 4a of the 2014 Integrated Report with approved (2002) TMDLs for TP and sediment. Sediment targets for these AUs from the approved TMDL include a TSS value of 25 mg/L and substrate fines of 35%. The TP target is 0.05 mg/L.

Water quality sampling data have not been collected in the AU (Figure 31) due to dry conditions, nor have there been any successful BURP sites (2003STWFA019, 2003STWFA064, 2003STWFA065, and 2010SDEQA057) since 1995.

Assessment Status

The Thorn Creek watershed is likely affected by low flow conditions. It is not clear why the AU was included in the approved TMDL as it appears the waters cannot be assessed. Since the pollutants of concern cannot be assessed, the AU should be assigned to Category 4c for flow alteration.



Figure 31
Thorn Creek, below Thorn Creek Reservoir (May 4, 2015)

2.27 Black Canyon Creek (ID17040219SK030_02)—Source to Mouth

The Black Canyon Creek AU (ID17040219SK030_02) includes the 1st- and 2nd-order segments of the Dry Creek watershed, including a number of tributaries to Dry Creek such as Hot, Coyote, Black Canyon, and East Black Canyon Creeks. The AU was evaluated during the development of the 2013 temperature TMDLs and found to have insufficient water to be assessed.

The tributaries and a small portion of the headwaters of Dry Creek are in the 2nd-order AU, and Dry Creek itself forms most of the 3rd-order AU. The watershed exists entirely on lava flows that occur below the Bennett Hills. Over millennia flowing water has cut deep canyons through the lava rock. Dry Creek exists in one such canyon where the 3rd-order AU likely encounters ground water base flow deep within the canyon. The smaller tributaries often exist in lesser canyons or on lava surfaces where no ground water is intercepted and periodic flows are typically related to brief snowmelt and rainstorms. The 2nd-order AU is entirely ephemeral or episodic in nature (Figure 32).

Water Quality Data

Most BURP site (2003STWFA006, 2003STWFA007, 2003STWFA008, and 2003STWFA009) visits during the summer sampling period resulted in un-sampled dry conditions. The 2nd-order AU is currently listed for temperature, TSS, and unknown pollutants. No TSS or unknown pollutant information is available. No sources or pathways for pollutants were observed. The AU was likely inadvertently listed and should be delisted for these pollutants. Because little or no water is available in this 2nd-order AU during critical time periods for beneficial uses, the AU should be identified in Category 4c for flow alteration. Eventually, the AU needs to receive use designations consistent with its ephemeral nature.

Hot and Dry Creeks (ID17040219SK030_02) were monitored in 1997, and both sites failed due to low macroinvertebrate and habitat scores. In 2003 Coyote, Fourmile and Black Canyon Creeks were found dry and not surveyed by BURP. Most BURP visits in the 2nd-order AU resulted in un-sampled, dry conditions.

Assessment Status

No water chemistry data were collected due to the ephemeral or episodic nature of the AU. The listings in Category 5 of the Integrated Report for this AU should be changed to either Category 4c for flow alteration or unassessed until such time that these waters can be evaluated with a low water protocol.



Figure 32

Fourmile Creek represents the ephemeral/episodic tributaries of the 2nd-order AU (June 6, 2011)

2.28 Black Canyon Creek (ID17040219SK030_03)—Source to Mouth

The Black Canyon Creek AU (ID17040219SK030_03) includes the 3rd-order segment of the Dry Creek watershed, including Dry Creek from an unnamed tributary below Hot Creek to Black Canyon Creek and the lower portion of East Fork Black Canyon Creek. Water quality sampling took place on Dry Creek above the confluence with Coyote Creek in 2015 (Figure 33).

Water Quality Data

The 3rd-order AU includes Dry Creek from its headwaters below Hot Creek to the agricultural lands north of Gooding, Idaho. Two main diversions exist on Dry Creek in this AU, the first occurring below Coyote Creek where an 8-cfs water right diverts water down a canal to Bray Lake. The second water right occurs at the mouth of the canyon near the bottom of the AU. Above the first diversion, Dry Creek exists in a 9-km narrow, deep canyon where riparian vegetation is very thick resulting in near 100% shade based on aerial observations. Below the

first diversion is an open valley for about 2.7 km where beaver activity has resulted in ponding. DEQ performed an erosion inventory in this area to determine if sediment impacts may be occurring. The inventory resulted in only 5% bank erosion, less than the 20% target allowed for natural systems, and newly forming beaver ponds appeared to have gravel bottoms suggesting little deposition. Below the open valley, Dry Creek enters a second narrow canyon (6 km) where riparian vegetation provides significant shade. Near the mouth of this lower canyon is the second diversion where an 8-cfs water right removes the last remaining flow from Dry Creek for delivery to agricultural fields. The remaining 4 km of Dry Creek are typically dry to the end of the 3rd-order AU.

The Black Canyon Creek AUs are currently listed for TSS, unknown and flow alteration (4c). The AUs were not included in the original 2001 TMDL, thus TP, sediment, or *E. coli* targets were not identified. A limited amount of sampling was conducted in 2015 and levels of these pollutants were not alarming (Table 50).

Assessment Status

Six BURP sites were completed successfully in the 3rd-order AU since 2003 (Table 51). Of those, only two sites had failing scores due to low habitat score. These scores are consistent with low water rangeland conditions where water levels can vary seasonally and from year to year.

No water chemistry data were collected on the lowest reach of the AU as it is located on private lands. Flows are regulated by use for irrigation and the creek channelized through private property up to the point where the AU connects with the North Gooding Main Canal. The reach is ponded in sections and may be dewatered in others. It is recommended that future monitoring be coordinated with the private property owner. This monitoring should be done to verify if sediment is a pollutant of concern for this reach and to identify the cause for the “unknown” listing in Category 5 of the Integrated Report.



Figure 33
Samples were collected in Dry Creek above Coyote Creek confluence (May 4, 2015)

Table 50
Dry Creek (ID17040219SK030_03) water quality sampling results

| Sample Date | Total Phosphorus (mg/L) | Total Suspended Solids (mg/L) | <i>E. coli</i> (MPN/100 mL) | Flow (cfs) |
|-------------|-------------------------|-------------------------------|-----------------------------|------------|
| 5/4/2015 | QBRV | QBRV | 9 | 0.6361 |
| 5/28/2015 | 0.037 | 6 | 22 | 1.39645 |
| 6/10/2015 | 0.05 | QBRV | 68 | 1.05485 |

Note: QBRV replaces quantities below reportable values. Standard Method SM2540D for TSS has a reportable value to 5mg/L or greater; EPA Method 365.1 for TP has a reportable value to greater than 0.005 mg/L. MPN = most probable number, a lab estimate for coliform forming unit (CFU).

Table 51. Black Canyon Creek (ID17040219SK030_03) BURP scores.

| BURP ID | Stream | SMI Score | SMI Rating | SFI Score | SFI Rating | SHI Score | SHI Rating | Average |
|--------------|-------------------------|-----------|------------|-----------|------------|-----------|------------|---------|
| 2003STWFA004 | Dry Creek | 70 | 3 | 85 | 2 | 36 | 1 | 2.00 |
| 2003STWFA010 | Dry Creek | 71 | 3 | 64 | 1 | 51 | 2 | 2.00 |
| 2003STWFA011 | Dry Creek | 61 | 2 | – | – | 41 | 1 | 1.50 |
| 2005STWFA003 | Dry Creek | 66 | 2 | 87 | 2 | 44 | 1 | 1.67 |
| 2005STWFA040 | Dry Creek | 77 | 3 | – | – | 47 | 2 | 2.50 |
| 2005STWFA053 | Dry Creek | | | | Dry | | | |
| 2005STWFA058 | Dry Creek | | | | Dry | | | |
| 2007STWFA113 | East Black Canyon Creek | | | | Dry | | | |
| 2008STWFA056 | Bostrum Canal | | | | Dry | | | |
| 2010SDEQA019 | Dry Creek | | | | Dry | | | |
| 2011STWFA033 | Dry Creek | 67 | 2 | 56 | 1 | 70 | 3 | 2.00 |

3 Designated Management Agency Report of Implementation Activities and Effectiveness

Stakeholders with management responsibility for the Big Wood River Watershed Management Plan include the following:

- Idaho Department of Environmental Quality (DEQ)
- US Forest Service (USFS), Sawtooth National Forest and Sawtooth National Recreation Area (SNRA)
- US Bureau of Land Management (BLM)
- Idaho Department of Lands (IDL)
- Idaho Soil and Water Conservation Commission (ISWCC)

Idaho Department of Environmental Quality

DEQ is responsible for the regulatory oversight for the water quality of the Big Wood River and its tributaries. In 1994, DEQ also took responsibility for the Triumph Mine remediation and discharge and continues to monitor the discharge out of the mine and the treatment pond. A second plug was installed in the mine in May 2016 to reduce the chance of catastrophic failure and the resultant discharge to the East Fork Big Wood River.

USDA Forest Service

Approximately 71% of the lands in the Big Wood River Watershed are managed by federal agencies (BLM & USFS). The USFS manages the SNRA and Sawtooth National Forest. In general, most of the tributaries on public lands north of Hailey fall under the management of the USFS. Listed streams include Horse, Owl, Baker, Eagle, Lake, and Cove Creeks, and East Fork Big Wood River. The USFS implemented several projects on various tributaries.

The Baker Creek stream restoration project introduced large woody debris (LWD) in 2003–2004. Designated dispersed campsites were implemented to reduce impacts on the riparian zone.

Impacts in the drainage caused by the 2013 Beaver Creek Fire resulted in upland Burned Area Emergency Response (BAER) work (aerial seeding and mulching) in the Alden Gulch and Badger Creek drainages.

Eagle Creek has had no major instream restoration, but work was done in July 2009 on USFS road 144 to reduce runoff into the stream.

In the Lake Creek LWD project, wood was added to 1 mile of channel above the Lake Creek Homeowners diversion in 2014. A riparian planting project (approximately 1 acre) in fall 2015 and a riparian grazing exclosure (approximately 1/2 acre) in summer 2016 were also completed.

Cove Creek had a non-system route decommissioning and a realignment of 2 miles of road, moving it out of the riparian zone and relocating it to the uplands, which were completed fall 2005. Changes were made to the grazing permit conditions to improve riparian and stream habitat.

Work was completed to arrest headcuts to the Johnson Creek/Bear Gulch tributaries to Hyndman Creek.

US Bureau of Land Management

The BLM manages public lands around and south of Hailey. Listed tributaries at least partially under BLM management include Croy, Seamans, Quigley, Thorn, and Rock Creeks.

BLM noted three approved livestock grazing permit renewals on allotments for their contribution to improving riparian health on the South East Fork and Elkhorn allotments.

Idaho Department of Lands

The IDL manages several parcels in the Big Wood River watershed, but they are dispersed and several are not directly associated with a Big Wood River tributary currently listed.

Idaho Soil and Water Conservation Commission

The ISWCC does not directly manage any lands in the Big Wood River watershed. The ISWCC, in cooperation with local conservation districts, is an advisory agency that helps agricultural producers manage their lands sustainably using best management practices (BMPs). Through the use of financial incentives and education, ISWCC along with the Natural Resource Conservation Service and University of Idaho, encourages BMPs for healthy ecosystems and sustainable farming and ranching. ISWCC wrote the *Big Wood River Watershed Total Maximum Daily Load: Implementation Plan for Agriculture* (DEQ 2014b) with the goal of reducing or eliminating nonpoint source pollution from agricultural lands into the Big Wood River and its tributaries (Table 52). The Big Wood River agricultural implementation plan was created by the ISWCC in cooperation with Blaine County Soil Conservation District, Wood River Soil and Water Conservation District, Camas Soil Conservation District, Gooding Soil and Water Conservation District, Natural Resources Conservation Service, Idaho Soil and Water Conservation Commission, and Idaho Association of Soil Conservation Districts.

ISWCC has not reported on TMDL implementation. Because of the privacy laws surrounding BMP installation activities, it is problematic to tie improvements or degradation to stream monitoring results.

Table 52
Tasks and outputs from the agriculture TMDL implementation plan (DEQ 2014b)

| Task | Output | Year |
|--|---|-----------|
| Evaluate potential project area/identify participant readiness | Districts priority plan for implementation | 2007 |
| Develop conservation plans and contracts | Complete plans and contracts | 2007–2012 |
| Design and install approved BMPs | Certify BMP installations | 2007–2020 |
| Evaluate BMP and project effectiveness | Project report, BMP effectiveness evaluations, report to districts, DEQ | 2008–2025 |

Other Activities

Biota Research and Consulting, Inc. was retained by Trout Unlimited, BLM, and Wood River Land Trust to complete a geomorphic assessment of the Big Wood River from the confluence with the North Fork Big Wood River downstream to Magic Reservoir in Blaine County, Idaho. The assessment effort was an attempt to quantitatively describe river system conditions and to develop restoration guidelines and management objectives for the watershed (Biota 2015). The final report from this project (Biota 2016) is included in Appendix A.

The Wood River Land Trust and the University of Idaho purchased the Rock Creek Ranch. They have restored much of the riparian area in the lower pastures using native *Salix* and other woody plants and by grazing BMPs. This will remain an experimental ranch into the foreseeable future with plans to restore the incised reaches of the stream, utilize off stream watering, and meander some channelized sections.

4 Summary of the Big Wood River Subbasin Review

Water quality conditions, in the affected AUs of the Big Wood River subbasin, have improved in some areas, stayed the same in other areas, and have degraded in a limited area. Improvement limitations have also been exacerbated by recent wildfire activity (Table 53). TSS and TP levels remain high in spring months in the Big Wood River AUs, as well as in several tributary watersheds. Most notable are watersheds affected by recent wildfire activity including Warm Springs, Greenhorn, and Croy Creeks. Eagle Creek and Lake Creek watersheds appear to have water quality problems unrelated to the TMDL pollutants of sediment and phosphorus. These watersheds have low levels of these pollutants, yet also have failing bio-assessment scores. Further investigation is needed to determine if the problem is related to other pollutants or simply a lack of water for sufficient stream biology. Additionally, the AUs that make up the Seamans Creek watershed need to be investigated further. The hydrography of these AUs appears to be inaccurate in several locations. Hydrologic connections are either lacking or need to be redrawn to show where water flows presently.

Table 53
Summary of recommendations

| Stream Name | Assessment Unit Number | Pollutant | Recommended Changes to Next Integrated Report | Assessment Review |
|--|------------------------|--------------------------------------|---|---|
| Malad River | ID17040219SK001_06 | TP, <i>E. coli</i> sediment, TSS | Remain in Category 4a | Water quality improving, <i>E. coli</i> still high |
| Big Wood River | ID17040219SK002_06 | TP, <i>E. coli</i> , sediment | Remain in Category 4a | Water quality improving, <i>E. coli</i> still high, dissolved TP from reservoir in summer |
| Big Wood River | ID17040219SK004_05 | TP, <i>E. coli</i> , sediment, Q alt | Remain in Category 4a, 4c | TSS, TP, and <i>E. coli</i> still high |
| Seamans Creek | ID17040219SK005_05 | TP, <i>E. coli</i> , sediment | Eliminate AU | Waterbody Is a canal and does not receive water from any tributary to the BWR |
| Seamans Creek | ID17040219SK006_02 | TP, sediment | Remain in Category 4a | TSS, TP high in spring months, AU connection unknown |
| Seamans Creek | ID17040219SK004_02 | Not Assessed | Eliminate from this AU at this location | This Au is mislabeled and the channel does not exist |
| Seamans Creek | ID17040219SK006_03 | TP, sediment | Remain in Category 4a and add to category 4c | AU should be extended to the ending of the historic channel |
| Seamans Creek | ID17040219SK006_05 | TP, sediment | Eliminate AU | AU does not exist |
| Big Wood River | ID17040219SK007_05 | TP, <i>E. coli</i> , sediment, Q alt | Remain in Category 4c, add to Category 4a | Part of original TMDL, TSS, TP high in spring months |
| Quigley Creek | ID17040219SK008_02 | TP, sediment, temperature | Move to Category 2 for TP, sediment | Meeting targets |
| Quigley Creek | ID17040219SK008_02A | Q alt | Remain in Category 4c | Dry |
| East Fork Wood River—source to Hyndman Creek | ID17040219SK011_02 | TP, sediment | Remain in Category 4a | Water quality improving, dry conditions hamper assessment |
| East Fork Wood River | ID17040219SK011_03 | TP, sediment | Remain in Category 4a | Meeting pollutant targets, but dry conditions hamper assessment scores |
| Trail Creek (Uncle Johns Creek) | ID17040219SK014_02 | TP, sediment | Remain in Category 2 | Water quality good, dry conditions hamper assessment |
| Lake Creek | ID17040219SK015_03 | TP | Remain in Category 4a | Some other cause affecting BURP scores |
| Eagle Creek | ID17040219SK016_02 | TP, sediment | Remain in Category 4a | Some other cause affecting BURP scores |
| Eagle Creek | ID17040219SK016_03 | TP, sediment | Remain in Category 4a | Some other cause affecting BURP scores |
| Horse Creek | ID17040219SK018_02 | TP, sediment | Remain in Category 2 | Water quality good except for Horse Creek |

| Stream Name | Assessment Unit Number | Pollutant | Recommended Changes to Next Integrated Report | Assessment Review |
|--------------------|------------------------|--|--|---|
| | | | | itself |
| Big Wood River | ID17040219SK018_04 | TP, <i>E. coli</i> , sediment | Remain in Category 2 | Water quality good |
| Warm Springs | ID17040219SK024_02 | TP | Remain in Category 4a | High TP maybe from wildfire |
| Warm Springs | ID17040219SK024_03 | TP | Remain in Category 4a | High TP maybe from wildfire |
| Greenhorn Creek | ID17040219SK025_02 | TP, sediment | Remain in Category 4a | Beaver activity, low flow |
| Greenhorn Creek | ID17040219SK025_03 | TP, sediment | Remain in Category 4a | High TP maybe from wildfire; low flow |
| Croy Creek | ID17040219SK027_02 | TP, <i>E. coli</i> , sediment | In Category 4a for sediment and Category 5 for <i>E. coli</i> . Should be in Category 4a for TP and <i>E. coli</i> also. | Water quality impacted by high TP and <i>E. coli</i> , original TMDL included these pollutants. |
| Croy Creek | ID17040219SK027_03 | TP, TSS, Q alt, sediment | Remain in Category 4a, 4c | Water quality impacted by high sediment and <i>E. coli</i> |
| Rock Creek | ID17040219SK028_02 | TP, <i>E. coli</i> , sediment, temperature | Remain in Category 4a | Water quality impacted by high sediment |
| Rock Creek | ID17040219SK028_03 | TP, <i>E. coli</i> , sediment | Remain in Category 4a | Water quality impacted by high sediment and TP |
| Thorn Creek | ID17040219SK029_02 | TP, sediment | Move to Category 4c | Dry conditions |
| Black Canyon Creek | ID17040219SK030_02 | Temperature, TSS, unknown | Move to Category 4c | Low flow conditions hamper assessment |
| Black Canyon Creek | ID17040219SK030_03 | TSS, unknown, Q alt | Remain in Category 5, 4c | Needs further assessment, low flow conditions hamper assessment |

4.1 Watershed Advisory Group Consultation

The Big Wood River WAG was informed of the start of the 5 year review for the Big Wood River at the February 24th 2015 WAG Meeting. Updates followed at each WAG meeting through 2015 and 2016. Doreen McCoy of USGS and Chad Chorney of Trout Unlimited also presented information to the WAG that was included in this Review.

4.2 Recommendations for Further Action

DEQ will continue to monitor the Big Wood River and its Tributaries for trend analysis. Further study is recommended for Croy Creek for *E. coli* and TP, Rock Creek for trend analysis, and Eagle, Lake, and Horse Creeks for impairment causation.

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Appendix A. Final Geomorphic Assessment Report Big Wood River Blaine County, Idaho

