Executive Summary

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 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 of impaired waters, currently every two years. 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.

This document addresses water bodies in the North Fork and Main Stem Payette River Subbasins that have been placed on what is known as the "§303(d) list."

This subbasin assessment and TMDL analysis has been developed to comply with Idaho's TMDL schedule. This assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions in the North Fork Payette River Subbasin located in southwestern Idaho. The first part of this document, the subbasin assessment, is an important first step in leading to the TMDL. The starting point for this assessment was Idaho's current §303(d) list of water quality limited water bodies.

The subbasin assessment portion of this document examines the current status of §303(d) listed waters and defines the extent of impairment and causes of water quality limitation throughout the subbasin (Table A). The loading analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return listed waters to a condition of meeting water quality standards.

Subbasin at a Glance

The Payette River Watershed (Figures A and B) lies entirely in southwestern Idaho and comprises about 3,240 square miles. Its headwaters originate in the Sawtooth and Salmon River mountains at elevations over 10,000 feet. The drainage flows in a southwesterly direction for over 175 miles where it empties into the Snake River near Payette at an elevation of 2,125 feet.

This TMDL lies within parts of two Hydrologic Unit Codes (HUCS) (17050122 and 17050123) and actually encompasses several geographically distinct subwatersheds (Figure A). This TMDL addresses 303(d) listed tributaries to the North Fork Payette River above Payette Lake and to Payette Lake itself; the North Fork Payette River and tributaries from Cascade Dam to the confluence with the South Fork Payette River; and, finally, the Main Payette River up to and including Black Canyon Reservoir (Figure C). This TMDL refers collectively to these sections as the *North Fork Payette River TMDL*.

Table A. Idaho 1998 §303(d) listed Water Bodies, Water Body Description, Miles of Impaired Water Bodies, and Pollutant of Concern, North Fork Payette River Watershed.

Water Body	Assessment Units	1998 §303(d)[1] Boundaries	Basis for Listing	Pollutant(s)	Miles/Acres of Impaired Water Bodies
Payette River (HUC 17050122)					
Black Canyon Reservoir	SW002-06	Black Canyon Reservoir	305(b), Append. D	Nutrients, Oil/Grease and Sediment	6
Soldier Creek	SW012-02	Headwaters to Squaw Creek	Boise Nat. Forest Plan	Sediment	8.96
North Fork Payette River (HUC 17050123)					
North Fork Payette River	SW001-06	Clear Creek to Smith's Ferry	305(b), Append. D	Flow alteration, Habitat alteration, Nutrients, Sediment and Temperature	9.53
Round Valley Creek	SW002-03	Headwaters to North Fork Payette River	305(b), Append. D	Sediment	5.66
Clear Creek	SW003-03	Headwaters to North Fork Payette River	Salmonid Spawning, Nat. Forest Service	Sediment	17.78
Big Creek	SW004-03	Horsethief Creek to North Fork Payette River	US Forest Service	Sediment	6.50
Tripod Creek	SW001-02	Headwaters to North Fork Payette River	BURP	Unknown	5.40
North Fork Payette River (at or above Big Payette Lake) (HUC 17050123)					
Box Creek	SW018-02	Headwaters to North Fork Payette River	Added by EPA, April 2000	Temperature	4.5
Brown's Pond	SW014-02	Brown's Pond	305(b), Append. D	Habitat Alteration	<1
Brush Creek	SW018-02	Headwaters to North Fork Payette River	Salmonid Spawning, Nat. Forest Service	Unknown	5.06
Elip Creek	SW017-02	Headwaters to Lemah Creek	Salmonid Spawning, Nat. Forest Service	Unknown	3.00
Fall Creek	SW017-03	Headwaters to Big Payette Lake	Added by EPA, April 2000	Temperature	4.8
Landing Creek	SW017-02	Headwaters to Deadhorse Creek	BURP	Unknown	2.42

[1]Refers to a list created in 1998 of water bodies in Idaho that did not fully support at least one beneficial use. This list is required under Section 303 subsection "d" of the Clean Water Act.

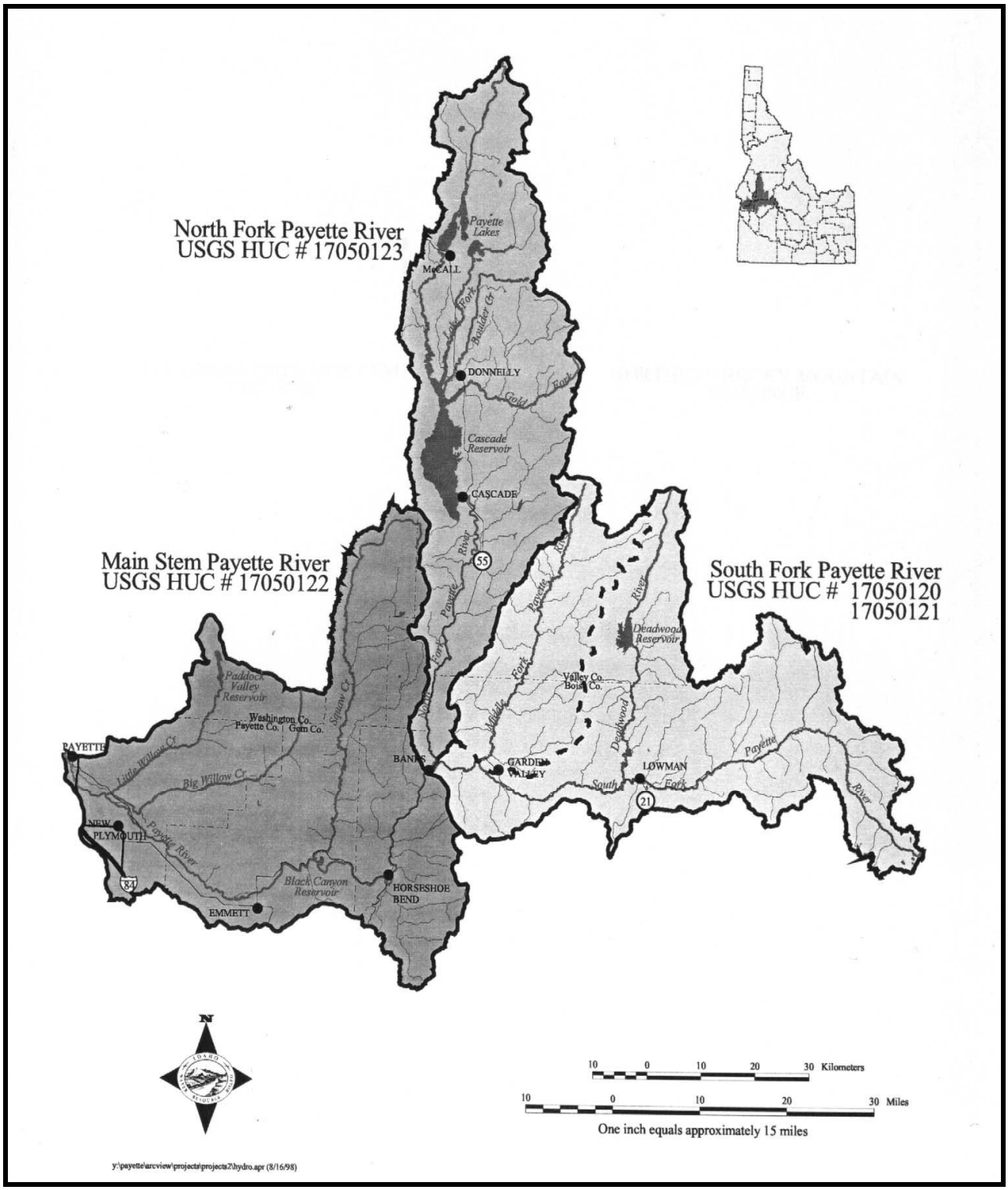

Figure A. Location of the North Fork Payette River and Payette River Subbasins. Figure appears courtesy of Idaho Department of Water Resources (IDWR), Comprehensive State Water Plan, Payette River Basin, 1998.

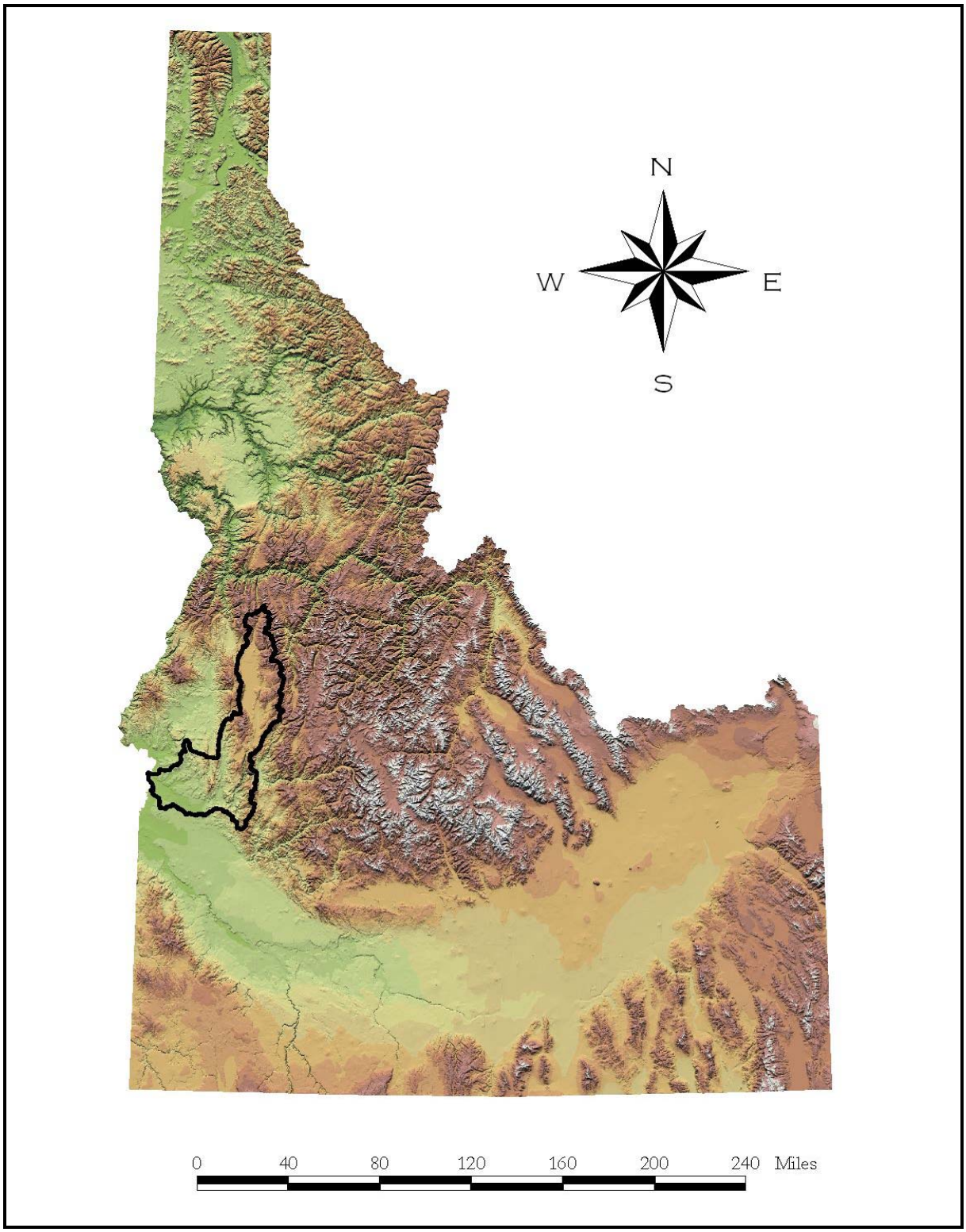

Figure B. Location of North Fork Payette River Watershed and Main Stem Payette River Watershed Relative to the state of Idaho.

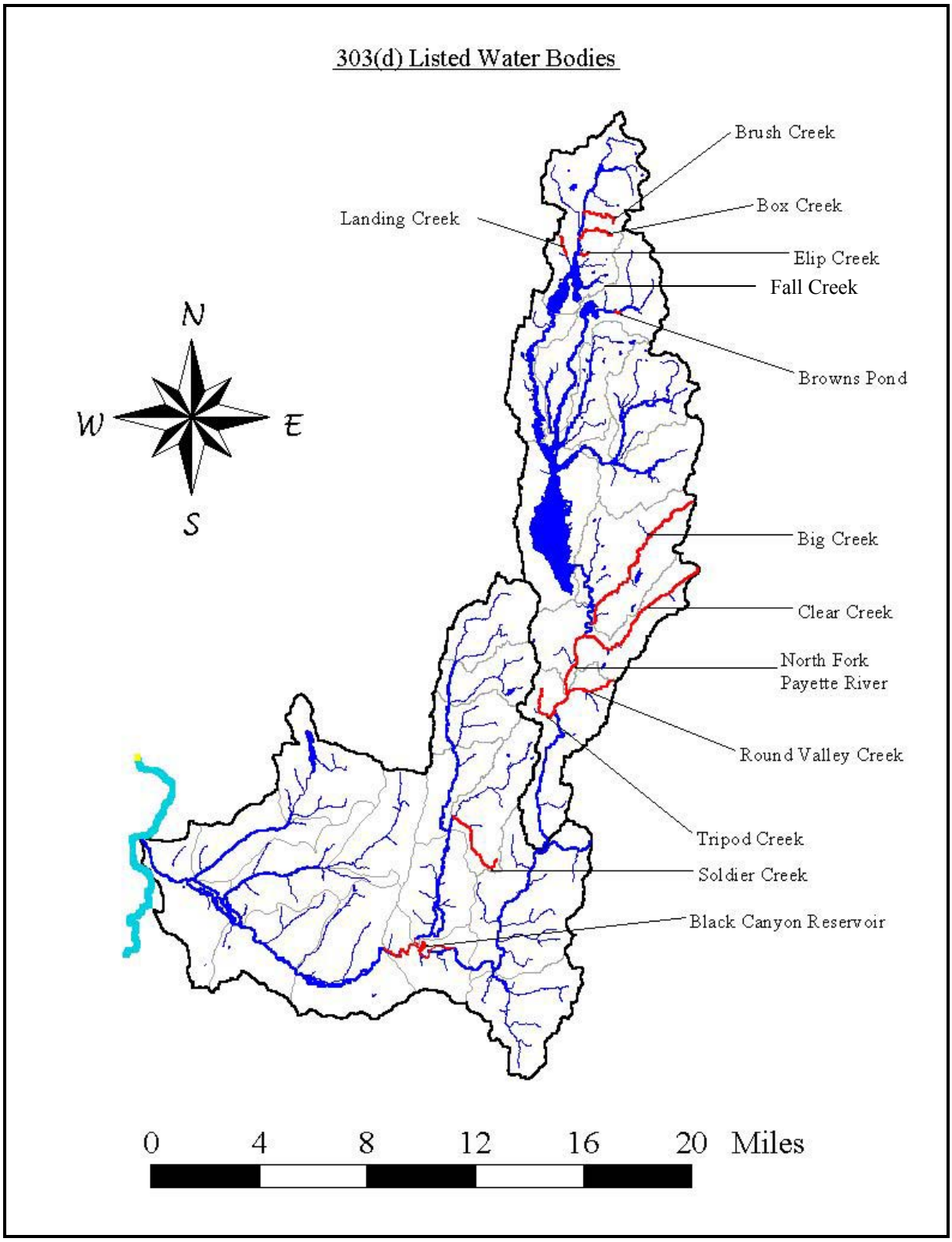

Figure C. 303(d) Listed Streams in the North Fork Payette River TMDL Watershed

Key Findings

This section discusses the outcomes for the 303(d) listed water bodies shown in Figure C. TMDLs were developed for six 303(d) listed streams/rivers: Big Creek, Box Creek, Clear Creek, Fall Creek, North Fork Payette River, and Round Valley Creek (Table B). Other subbasin assessment outcomes are shown in Table C. Squaw Creek, which is not on the 303(d) list, is also discussed.

Nutrients, oil/grease and sediment were investigated as possible pollutants impairing beneficial uses in **Black Canyon Reservoir**. In-reservoir oil and grease concentrations were below the 5 mg/L target set for oil/grease and this pollutant is recommended for delisting from the 303(d) list. Nutrient concentrations in the reservoir met TMDL targets and no algal blooms or excessive macrophyte growths were detected during sampling. Nutrients are recommended for de-listing. Black Canyon Reservoir acts as a sediment trap due to its shape. Sediment is filling up the upper end of the reservoir and has changed the morphology of the North Fork Payette River near Montour. However, sediment from the North Fork Payette River and Main Payette River (Banks to Montour) are not contributing sediment at high levels. The bulk of sediment loading is from the South Fork Payette River and the majority of that load occurs naturally from *mass wasting* events. A sediment TMDL is not recommended.

The **North Fork Payette River** from Clear Creek to Smiths Ferry is listed for nutrients, sediment and temperature. Beneficial uses are not impaired by nutrients, and nutrients are recommended for delisting from the 303(d) list. Temperatures do exceed the temperature standard, but this is primarily due to warm water exiting Cascade Reservoir. Canopy cover in the listed stream segment meets target levels and thus, a TMDL is not recommended. Suspended sediment is not impairing beneficial uses, but the effects of *bedload* sediment entering that reach from the Cascade to Clear Creek reach is impairing beneficial uses. A TMDL for sediment with an allocation based on bank erosion was determined for this reach.

Big Creek is listed as impaired by sediment. DEQ water body assessment data showed that beneficial uses were impaired. Banks are stable in some sections but actively eroding in others. Bank erosion surveys were conducted in the Big Creek watershed and used to determine a TMDL to restore beneficial uses. A load allocation was developed based an 80% bank stability target. Since implementation of water quality objectives in the lower reach will rely upon riparian improvements, water quality objectives may take from 5-15 years to achieve.

Brush Creek is proposed for de-listing from the 303(d) list. The stream's beneficial uses were impacted as a result of the Blackwell Fire in 1994 but beneficial uses are not impaired. Temperature TMDLs were developed for **Box Creek** and **Fall Creek** in order to achieve salmonid spawning criteria. All three subwatersheds were affected by the 1994 Blackwell Fire. Recovery has occurred over the last ten years and the streams support beneficial uses. However, Box and Fall Creeks which are both listed for temperature, meet the cold water aquatic life standard during the summer but not the salmonid spawning standard.

Browns Pond is listed as impaired by 'habitat alteration,' which is not a pollutant. TMDLs are only developed for pollutants. Since Browns Pond supports a coldwater fishery, and the incoming waters from Lake Fork Creek fully support beneficial uses, a TMDL is not necessary.

In **Clear Creek**, beneficial uses are not supported in the lower reach due to excess sediment delivery from upstream as well in-stream channel erosion. In the upper reaches of Clear Creek, beneficial uses are presently fully supported but are vulnerable to not being supported due to excess sediment. An allocation was set for the upper watershed to improve habitat in the lower reaches. The middle and upper reaches of Clear Creek were evaluated using the BOISED model, and a sediment TMDL was established to ensure protection of beneficial uses. For sediment from in-stream channel erosion, a load allocation was developed based an 80% bank stability target. Since implementation of water quality objectives in the lower reach will rely upon riparian improvements, water quality objectives may take from 5-15 years to achieve.

Elip Creek, an *intermittent* stream, does not have impaired beneficial uses when there is water in the creek. A TMDL is not necessary for Elip Creek because lack of water rather than a specific pollutant precludes the support of beneficial uses at certain times of the year.

Landing Creek showed impairment due to excess sediment in the mid-90s, possibly as a result of timber harvest and associated skid trail and road building activity. Since then recovery has occurred and Landing Creek does not have impaired beneficial uses. Landing Creek is proposed for de-listing for an unknown pollutant.

In **Round Valley Creek**, beneficial uses are impaired due to excess sediment from instream channel erosion. The creek exhibits high percent fines and low bank stability as well as water body assessment scores that indicate that beneficial uses are not supported. A TMDL was developed for sediment based on channel erosion rates. A sediment load was developed using an 80% bank stability target. Implementation will probably hinge upon riparian improvements rather than structural stabilization and thus achievement of water quality objectives may take from 5-15 years to achieve.

Soldier Creek was listed for sediment on the 303(d) list. Bank erosion surveys were conducted and the upper and middle reaches of Soldier Creek are proposed for delisting. Soldier Creek is intermittent and beneficial use impairment in these sections is likely due to lack of water not a pollutant. DEQ was unable to evaluate the 3rd order section of Soldier Creek and proposes that this section remains on the 303(d)list until an assessment can be made.

Squaw Creek violates the state standard for bacteria near the mouth and also has elevated nutrient concentrations at the mouth. Squaw Creek is proposed for listing for bacteria and nutrients on the 303(d) list.

Tripod Creek was found to be unimpaired and a TMDL is not recommended at this time. In-stream channel erosion was ruled out as a causal factor in habitat impairment.

Table B. Streams and Pollutants for Which TMDLs Were Developed

Stream	Pollutant(s)
Big Creek	Sediment
Box Creek	Temperature
Clear Creek	Sediment
Fall Creek	Temperature
Round Valley Creek	Sediment
North Fork Payette River	Sediment

Table C. Summary of Assessment Outcomes

Water Body Segment (assessment unit)	Pollutant	TMDL(s) Completed	Recommended Changes to §303(d) List
Black Canyon Reservoir (SW002-06)	Nutrients, sediment, oil/grease	None	Delist nutrients, oil/grease List for habitat alteration
Big Creek (SW012-02)	Sediment	Sediment	None
Box Creek (SW018-02)	Temperature	Temperature: Salmonid Spawning	None
Browns Pond (SW014-02)	Habitat alteration	None	None
Brush Creek (SW018-02)	Unknown	None	Delist for an unknown pollutant
Elip Creek (SW017-02)	Unknown	None	Delist for an unknown pollutant
Fall Creek (SW017-03)	Temperature	Temperature: Salmonid Spawning	None
Landing Creek (SW017-02)	Unknown	None	Delist for an unknown pollutant
North Fork Payette River (Cascade Dam to Clear Creek)	Sediment	Sediment	Delist temperature
Round Valley Creek (SW002-003)	Sediment	TMDL for sediment	None
Soldier Creek (SW012-02)	Sediment	None	Delist sediment from Upper/Middle Soldier Creek; sediment remains on 303(d) list for SW012-03
Squaw Creek (SW010-05)	Bacteria	None	List bacteria and nutrients in 5th order assessment unit (2006 303(d) list)
Tripod Creek (SW01-02)	Unknown	None	Delist for an unknown pollutant

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