

# North and Middle Fork Owyhee River

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TMDL Five-Year Review



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## Executive Summary

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This document presents a five-year review of the Sub-Basin Assessment and Total Maximum Daily Load (TMDL) for the North and Middle Fork Owyhee River drainage. Many streams in the watershed were found not to be meeting their beneficial uses, and temperature was identified as the primary pollutant. The TMDL established the maximum capacity of the streams to absorb thermal pollution and still meet water quality standards, and then allocated that level of pollution to sources in the watershed.

This review has been developed to comply with Idaho Statute 39-3611(7), and addresses the streams of the North and Middle Fork Owyhee River sub-basins that are in section 4(a) of Idaho's Integrated Report. It describes current water quality status, pollutant sources, and recent pollution control efforts in the sub-basin. It also examines the assumptions, targets, and methods used in developing the TMDL.

Assessment units subject to five-year review are shown in Table 1. Generally, water quality seems to be static or improving, thanks in part to an implementation plan that covers all the impaired streams. Unstable banks and lack of riparian shade are still the main sources of pollution.

During the course of this review, the assumptions and method of the TMDL were found to be sound. However, the temperature targets (based on Idaho's Water Quality Standards) were found to be unattainable. This was one of the first temperature TMDLs developed in Idaho and very little guidance existed at the time. It is recommended that the temperature TMDL be re-written using the new 'potential natural vegetation' approach.

**Table 1. Status of Assessment Units with Temperature TMDLs.**

<b>Assessment Unit Name</b>	<b>Assessment Unit</b>	<b>Implementation Activities</b>	<b>Water Quality Trend*</b>
NF Owyhee River – 5 <sup>th</sup> order section	ID17050107SW008_05	None known	Static
NF Owyhee River & Juniper Creek - 4th order sections	ID17050107SW008_04	None known	Improving
NF Owyhee River - 3rd order section	ID17050107SW008_03	None known	Unknown
NF Owyhee River & Tributaries - 1st and 2nd order sections	ID17050107SW008_02	None known	Unknown
MF Owyhee River - 3rd order section	ID17050107SW004_03	None known	Unknown
MF Owyhee River & Tributaries - 1st and 2nd order sections	ID17050107SW004_02	None known	Unknown
Juniper Creek - 3rd order section	ID17050107SW012_03	Diversion replaced	Improving
Juniper Creek & Tributaries - 1st & 2nd order sections	ID17050107SW012_02	Diversion replaced	Unknown
Cabin & Corral Creeks - 3rd order	ID17050107SW011_03	None known	Improving

Assessment Unit Name	Assessment Unit	Implementation Activities	Water Quality Trend*
sections			
Cabin & Corral Creeks & Tributaries - 1st & 2nd order sections	ID17050107SW011_02	None known	Improving
Noon Creek - entire watershed	ID17050107SW010_02	None known	Unknown
Pleasant Valley Creek – 3 <sup>rd</sup> order section	ID17050107SW009_03	Riparian fencing Watering Troughs	Unknown
Pleasant Valley Creek & Tributaries - 1st & 2nd order sections	ID17050107SW009_02	Riparian fencing Watering Troughs	Unknown

\* as determined by BURP and Riparian PFC monitoring

## Watershed at a Glance

Table 2. Summary of Watershed

Approved TMDLs	Pollutants Within Watershed	Assessment Units Going From 4a to 2
Temperature (13 AUs)	Temperature	ID17050107SW011_03 (Cabin and Corral Creeks) for secondary contact recreation
Implementation Plans	Implementation Actions	Assessment Units Going from 3 to 5
One, completed February 2002	Riparian Fencing	ID17050107SW010_02 (Noon Creek) for recreational use
	Watering Troughs	
	Diversions	<b>Estimated Percent of Watershed in 4a or 5</b>
		53%

## **Section 1: Introduction – Legal Authority**

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The federal Clean Water Act 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 Act, 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 Act establishes requirements for states and tribes to identify and prioritize water bodies that have impaired water quality. 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 Statute 39-3611(7) requires a quinquennial cyclic review process for Idaho TMDLs:

The director shall review and reevaluate each TMDL, supporting sub-basin assessment, implementation plan, 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 sub-basin 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 sub-basin assessment, or the implementation plan(s) are not attainable or are inappropriate based upon supporting data, the director shall initiate the process or processes to determine whether to make recommended modifications. The director shall report to the legislature annually the results of such reviews.

This report is intended to meet the intent and purpose of Idaho Statute 39-3611(7). It documents the review of an approved Idaho TMDL and implementation plan and provides consideration of the most current and applicable information in conformance with Idaho Statute 39-3607. The review also provides an evaluation of the appropriateness of the TMDL to current watershed conditions, an evaluation of the implementation plan, and consultation with the Watershed Advisory Group. Final decisions for TMDL modifications are decided by DEQ's Director. Approval of TMDL modifications is decided by the U.S. Environmental Protection Agency, with consultation by DEQ.

### **About Assessment Units – An Accounting Change**

Prior to 2002, impaired waters were defined as stream segments with geographical descriptive boundaries, for example 'Juniper Creek – headwaters to mouth'. These stream segments tended to be non-uniform, and to miss many headwater streams, and so in 2002, DEQ started identifying stream segments by Assessment Units (AUs) instead.

AUs are groups of similar streams, with the same stream order, that have similar land use practices, ownership, or land management. They now define all the waters of the state of Idaho, and are referenced by an alphanumeric code, and a written description. For example, 'ID17050107SW012\_02: First and second order forested tributaries to Juniper Creek' might be a typical AU.

This review focuses on the AU listings, rather than the older stream segments. Although these are broadly the same, the result has been that many unnamed tributaries to impaired waters have themselves become listed as impaired. A copy of the ‘crosswalk’ between the 1998 303 (d) list and the 2002 Section 5 “impaired waters” category in the Integrated Report is available from the DEQ website at [www.deq.state.id.us/water/data\\_reports/surface\\_water/monitoring/2002.cfm#2002final](http://www.deq.state.id.us/water/data_reports/surface_water/monitoring/2002.cfm#2002final)

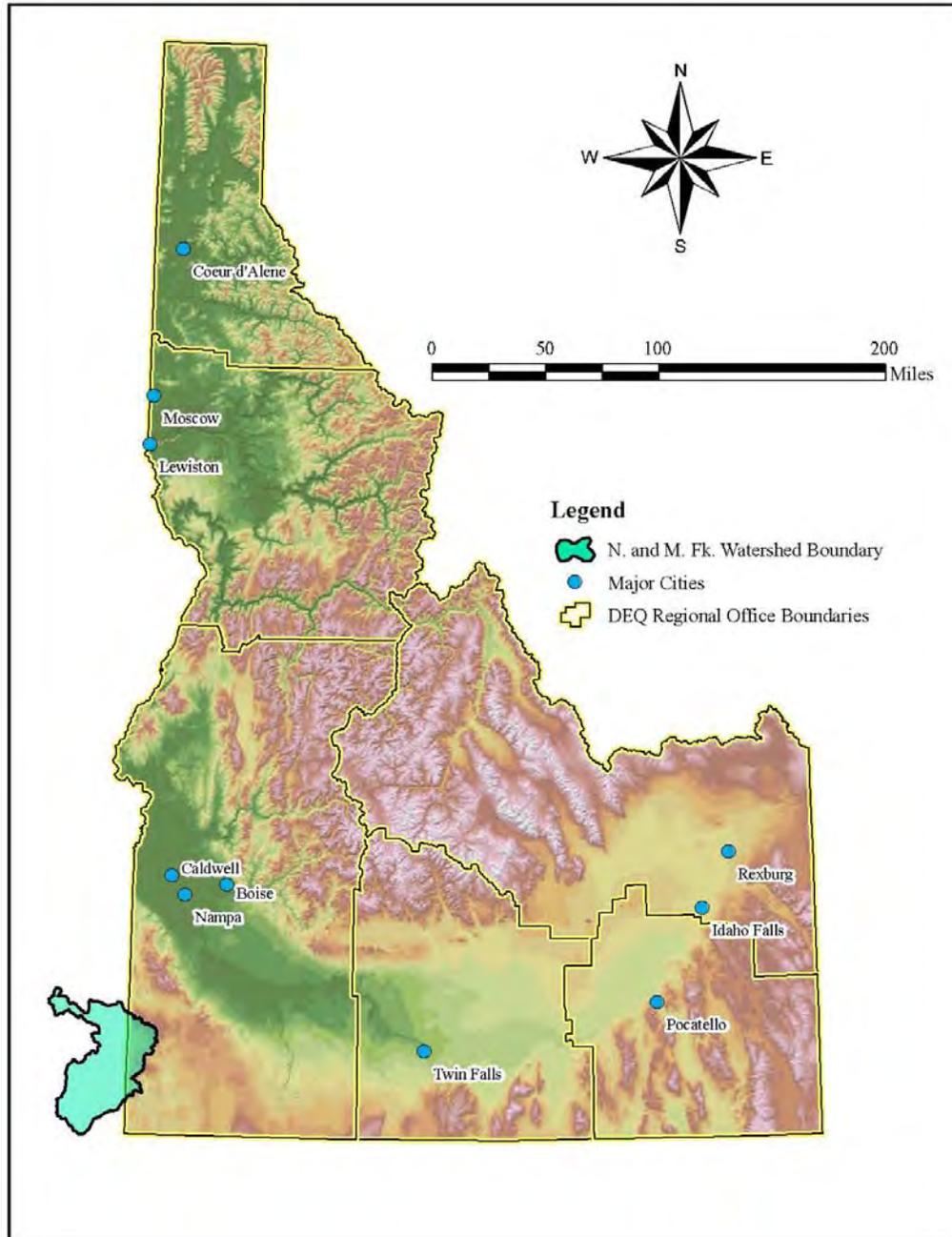


Figure 1. Location of Sub-basin.

## Section 2: TMDL Review and Status

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The North and Middle Fork Owyhee River drainages are located within one fourth-field hydrologic unit in southwest Idaho. The streams drain the western slopes of South and Juniper Mountains, and flow westwards from Idaho into Oregon. These drainages are located approximately 90 miles south of Boise, Idaho in the southwestern part of Owyhee County. Land ownership consists of privately owned ranches (14%) surrounded by a sea of public lands managed by the Idaho Department of Lands (11%) and the Bureau of Land Management (75%).

The area lies within the intermountain sagebrush steppe ecosystem. Agricultural land uses include grazing with irrigated hay production by private landowners. Recreational land uses include day hiking, backpacking, fishing, and hunting. No urban areas or permitted point source dischargers are located within the North and Middle Fork hydrologic unit. Aquatic life includes redband trout, sculpin, dace, river otter, and beaver.

Temperature TMDLs for the Middle and North Forks of the Owyhee River, as well as Big Spring, Cabin, Corral, Juniper, Noon, and Pleasant Valley Creeks were approved by EPA in February 2000. The original North and Middle Fork Owyhee TMDL document is not available electronically, but copies may be obtained from DEQ's Boise Regional Office.

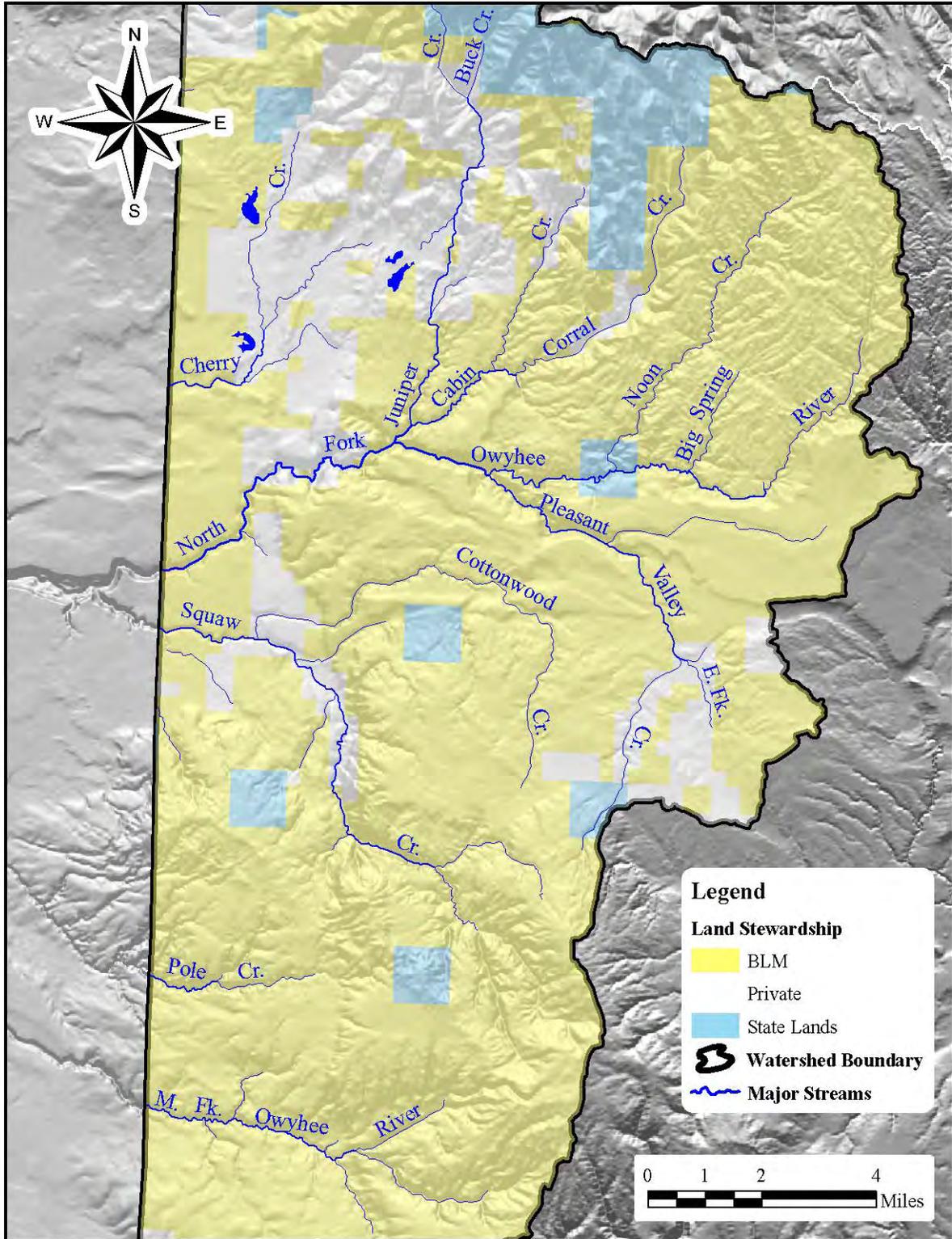


Figure 2. Watershed Map

## Pollutant Targets

The numeric temperature targets used in the TMDL were the water quality criteria for salmonid spawning and cold water biota:

- Idaho Salmonid Spawning: Must not exceed 13°C at any time, or 9°C for the daily average, during spawning period only (March 1 – July 15)
- Idaho Cold Water Biota: Must not exceed 22°C at any time or 19°C for the daily average.

In a 1999 field survey mentioned in the TMDL, young of the year redband trout were found in all but one (Pleasant Valley Creek) of the listed streams. This indicates that the Salmonid Spawning beneficial use is *functionally* met, even though its corresponding temperature criterion is violated. Similarly, the stream macroinvertebrate communities indicate that the Cold Water Aquatic Life beneficial use is often functionally met, even though its corresponding temperature criterion is violated.

## Evaluation of Target Selection.

The impaired stream reaches were not compared to reference streams, but rather to statewide temperature criteria. Unfortunately, the hot, dry summers and low water levels of many Owyhee County streams mean that it is likely that even a reference-condition stream would violate these criteria. For example, DEQ uses Little Jacks Creek as a desert reference site for its Beneficial Use Reconnaissance Program (BURP) monitoring, and yet temperatures exceed criteria for the entire summer (Idaho Fish and Game, 2001).

This implies that the water quality standards may not be well correlated with the support of beneficial uses in this watershed. The water quality criteria targets were used in the TMDL because DEQ had not yet developed its Potential Natural Vegetation approach, which uses the ‘natural background’ clause of the standards. That method is explained towards the end of this review.

## Evaluation of Critical Periods

The salmonid spawning critical period in the TMDL is March 1 – July 15. These dates were specified in the Water Quality Standards at the time the document was written. This section of the standards has been updated, and now says that the critical period is to be determined on a watershed basis by “knowledge of local fisheries biologists, published literature, records of the Idaho Department of Fish and Game, and other appropriate records” (250.02f). Idaho Fish and Game have not provided any information to suggest that this critical period is not appropriate.

The cold water aquatic life critical period in the TMDL is July 1 – August 31. This is the hottest part of the year, and if the streams were to meet the standard during this time, they would certainly meet it year round.

## Control and Monitoring Points

The temperature was measured using data logging devices installed throughout the watershed.

The TMDL gives exact locations for most of the monitoring sites. Two sites are not defined: Upper Juniper Creek and Upper Squaw Creek. It is hypothesized that the locations are high in the watershed, by Buck Creek and on Juniper Mountain (Bedstead Ridge Road) respectively.

In most cases, there is only one practical place to access each creek: at the sole road crossing. In most cases, this monitoring site adequately represents the activities in the watershed. One exception is the Pleasant Valley Creek site, which was located immediately next to most of the agricultural land in the watershed. It would have been preferable to place the monitoring device further downstream, at the mouth of the creek. However, this would involve a steep hike and would be inaccessible during the winter and spring.

## **Evaluation of Monitoring Plan**

DEQ monitoring is limited to sporadic Beneficial Use Reconnaissance Program (BURP) visits. The Bureau of Land Management (BLM) gathers riparian Proper Functioning Condition (PFC) data every few years. Given the long timeframes of many implementation activities, and the high cost of monitoring, infrequent BURP and PFC visits are appropriate to detect gross changes in water quality.

## **Load Capacity**

The load capacity for temperature was set at the Idaho water quality standards, as described in the section entitled 'Pollutant Targets' above.

No allocations were made to specific sources. Instead, a general percentage reduction for each watershed was used.

The period for salmonid spawning was assumed to be March 1 to July 15, in the absence of more detailed information. Given the high summer temperatures and low discharges, this time period roughly correlates with high water, and so is a reasonable assumption.

## **Load Allocations**

There are no point sources of thermal pollution in the watershed, and therefore the load allocations were the load capacities, plus a margin of safety (see below). Loads were not allocated through the watershed; just a general percentage reduction was specified.

The following tables (tables 5 and 6) are taken from the TMDL, and indicate the reductions required to attain cold water biota and salmonid spawning load allocations. The tables account for the load capacity and margin of safety. In some instances, the "percent reduction from average" thermal load is greater than 100 percent. It is not entirely clear how this would be possible, but the load reduction is a required element of the TMDL, and illustrates the reductions necessary to achieve state standards. The attainability of these values will be examined further in this document.

Stream	Percent Reduction from Average	Percent Reduction from Maximum	Percent Reduction for 7-day Average.
NF Owyhee	40%	42%	58%
MF Owyhee	19%	34%	54%
Juniper – Upper	18%	25%	--
Juniper – Lower	24%	28%	--
Cabin	27%	34%	--
Corral	27%	25%	--
Noon	0%	0%	--
Big Spring	16%	30%	--
Pleasant Valley	0%	38%	--
Squaw – Lower	0%	0%	--
Squaw – Upper	0%	0%	--

Table 3. Reductions Required to Attain Cold Water Biota Load Allocations (Implementation Plan, page 13)

Stream	Percent Reduction from Average	Percent Reduction from Maximum	Percent Reduction for 7-day Average.
NF Owyhee	97%	80%	78%
MF Owyhee	95%	80%	76%
Juniper – Upper	90%	72%	--
Juniper – Lower	93%	72%	--
Cabin	100%+	79%	--
Corral	100%+	78%	--
Noon	95%	69%	--
Big Spring	M	M	--
Pleasant Valley	100%+	80%	--
Squaw – Lower	M	M	--
Squaw – Upper	M	M	--
M – Missing Data			

Table 4. Reductions Required to Attain Salmonid Spawning Load Allocations (Implementation Plan, page 13)

Current temperature data are very sparse. A single temperature logger installed on the Middle Fork Owyhee River indicates little to no change in water temperatures between 1998 and 2004.

## Margin of Safety

A margin of safety is included in the load allocations to ensure that water quality goals will be met even though there is uncertainty in the loading capacities. Margins of safety can be implicit, based on conservative study assumptions, or they can be explicit percentages.

In this case, the assumptions used in the study were not sufficiently conservative, and so, a five percent margin of safety was added to the load capacities. This translates into a three or four degree increase of the current stream temperature.

The TMDL used the maximum stream temperatures, which is a conservative assumption. However, it also only used a 2-year air-temperature return interval. Given the uncertainties of measuring and modeling temperature, the 5% margin of safety was probably appropriate to this TMDL.

## **Seasonal Variation**

Although not specifically stated, the intention of the TMDL was to apply the load allocations during each beneficial use's critical period. Salmonid Spawning has seasonal applicability, and so the temperature reductions specified should apply between March 1 and July 15. Cold Water Aquatic Life persists year-round, but if the load allocation were met on the hottest day of the year, then the stream would certainly meet criteria for every other day also.

## **Reserve**

No reserve for future growth was made in the TMDL, because pollution was not allocated to specific sources.

## Section 3: Beneficial Use Status

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

Existing uses under the Clean Water Act are “those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.”

Designated uses are specifically listed for water bodies in Idaho in tables in the Idaho water quality standards (see IDAPA 58.01.02.003.27 and .02.109-.02.160 in addition to citations for existing and presumed uses).

Absent information on existing uses, DEQ presumes that most waters in the state will support cold water aquatic life and either primary or secondary contact recreation (IDAPA 58.01.02.101.01). To protect these so-called “presumed uses,” DEQ applies the numeric cold water aquatic life criteria and primary or secondary contact recreation criteria to undesignated waters.

The following table lists the beneficial uses of the water bodies included in the TMDL. All information was taken from EPA’s Assessment Database in November 2008.

**Table 5. Beneficial Uses of TMDL Water Bodies.**

Assessment Unit (all begin ID17050107SW...)		Beneficial Uses	Use Type	Use Support
NF Owyhee River – 5 <sup>th</sup> order section	008_05	PCR CWAL SS	Designated Designated Designated	FS NFS NFS
NF Owyhee River & Juniper Creek - 4th order sections	008_04	PCR CWAL SS	Designated Designated Designated	FS NFS NFS
NF Owyhee River - 3rd order section	008_03	PCR CWAL SS	Designated Designated Designated	FS NFS NFS
NF Owyhee River & Tributaries - 1st and 2nd order sections	008_02	PCR CWAL SS	Designated Designated Designated	FS NFS NFS
MF Owyhee River - 3rd order section	004_03	SS CWAL	Designated Designated	NFS NFS
MF Owyhee River & Tributaries - 1st and 2nd order sections	004_02	SS CWAL	Designated Designated	NFS NFS
Juniper Creek - 3rd order section	012_03	SCR CWAL SS	Presumed Presumed Existing	FS NFS NFS
Juniper Creek & Tributaries - 1st & 2nd order sections	012_02	SCR CWAL SS	Presumed Presumed Existing	FS NFS NFS

Assessment Unit (all begin ID17050107SW...)		Beneficial Uses	Use Type	Use Support
Cabin & Corral Creeks - 3rd order sections	011_03	SCR CWAL SS	Presumed Presumed Existing	NFS* NFS NFS
Cabin & Corral Creeks & Tributaries - 1st & 2nd order sections	011_02	SCR CWAL SS	Presumed Presumed Existing	FS NFS NFS
Noon Creek - entire watershed	010_02	CWAL SS	Designated Existing	FS NFS
Pleasant Valley Creek – 3 <sup>rd</sup> order section	009_03	SS CWAL	Existing Presumed	NFS NFS
Pleasant Valley Creek & Tributaries - 1st & 2nd order sections	009_02	SS CWAL	Existing Presumed	NFS NFS

Legend: PCR/SCR = Primary/Secondary Contact Recreation. CWAL = Cold Water Aquatic Life. SS = Salmonid Spawning. (N)FS = (Not) Full Support. \* Incorrect information

## Errors in Beneficial Uses

These beneficial use status calls accurately mirror those made in the TMDL, except for some of the recreational uses. The TMDL recommended placing Cabin, Squaw, and Big Spring Creeks on the 303(d) list for bacterial pollution. However, each of the samples taken to justify those listings was insufficient under Idaho's water quality standards. In every case, a single water sample was collected, whereas listing requires that the geometric mean of five samples be used. Additionally, bacteria samples taken since have not indicated any impairment. Hence, recreational uses on Cabin, Squaw, and Big Spring Creeks should remain as 'fully supporting'.

Cabin, Juniper and Squaw Creeks are mentioned in the Water Quality Standards as having a Primary (not Secondary) Recreational Use. As such, the use should be changed to reflect the language in the Standards.

The third order section of Cabin and Corral Creeks (ID17050107SW011\_03) is incorrectly listed as 'not fully supporting' secondary contact recreation. Prior to 2006, no bacteria data had ever been received for this assessment unit, because it is very hard to get to. In 2006, DEQ's BURP crew hiked down a steep canyon wall, and took a bacteria sample, which indicated 8.5 CFU of E. coli bacteria were present, far less than the 576 CFU required for follow-up sampling.

It is unknown why the Middle Fork Owyhee River, Pleasant Valley, and Noon Creeks do not have an associated contact recreation use. Despite their remoteness, these streams certainly receive some recreational use by hikers, hunters, and anglers. In addition, the Water Quality Standards list all three streams as having a Primary Contact Recreation use. Noon Creek fully supports this use (based on the 2006 BURP monitoring), and further monitoring will confirm whether the use is met on the other two streams.

## Beneficial Use Assessment

Beneficial uses are protected by a set of criteria, which include *narrative* criteria for pollutants such as sediment and nutrients and *numeric* criteria for pollutants such as bacteria, dissolved oxygen, pH, ammonia, temperature, and turbidity (IDAPA 58.01.02.250). Figure 3 provides an outline of the stream assessment process for determining support status of the beneficial uses of cold water

aquatic life, salmonid spawning, and contact recreation. It is taken directly from the Water Body Assessment Guidance, Second Addition (Grafe et al. 2002).

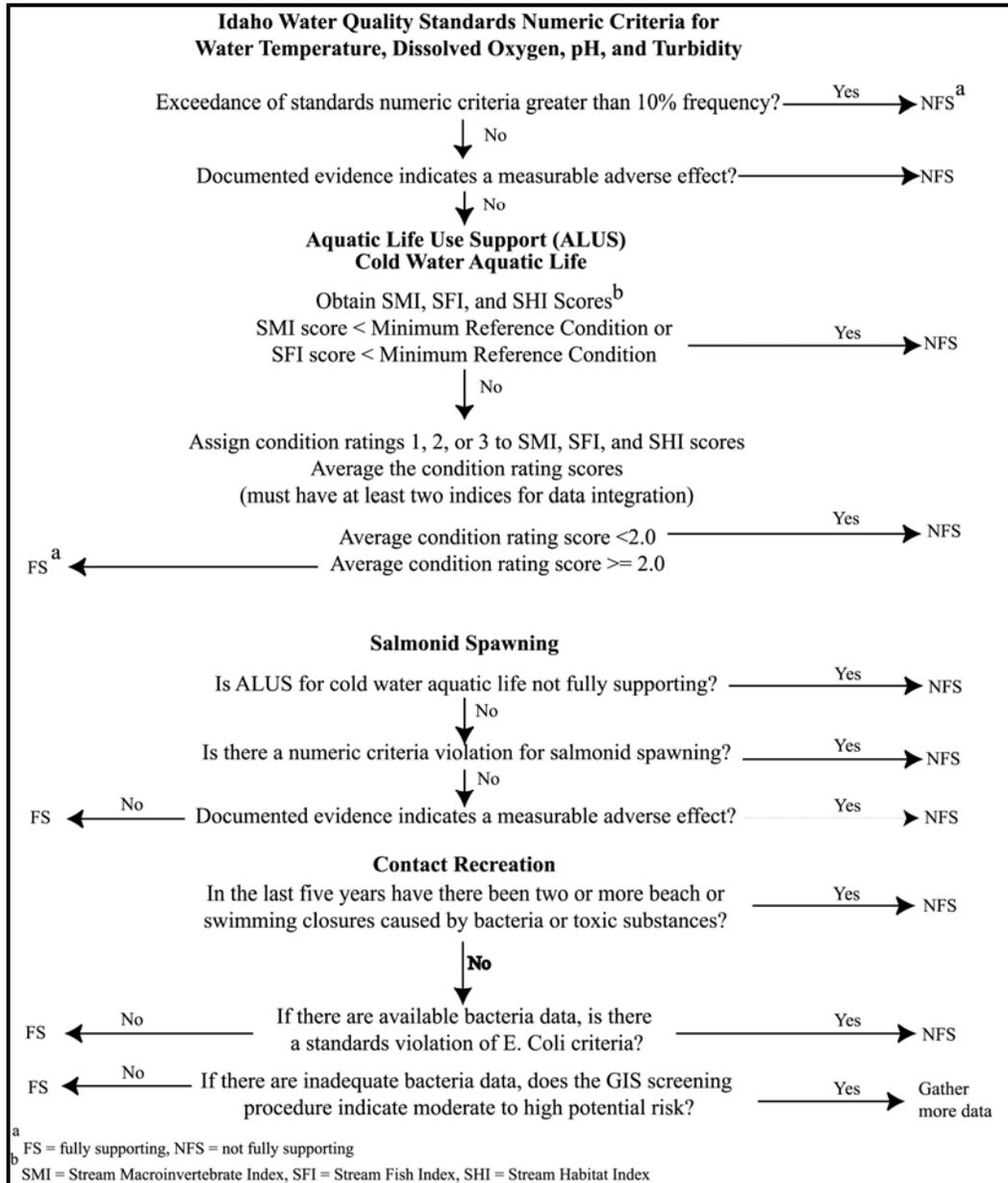


Figure 3. Steps for Determining Support Status of Beneficial Uses in Wadeable Streams

## Appropriateness of Beneficial Uses

All assessment units in the TMDL have cold water aquatic life and salmonid spawning as uses (as listed on the Assessment Database). This is appropriate, because BURP and other monitoring have indicated that these uses occur, and therefore must be protected.

Primary Contact or Secondary Contact Recreation uses apply to many of the assessment units. Although they are remote, water-based secondary contact recreation (camping, hiking, wading, and fishing) does occur on most of the streams. The North Fork Owyhee River is a larger stream, and is

suitable for primary contact recreation. The only designated campsite in the watershed is on the banks of the North Fork, and swimming certainly occurs there.

Further assessments are not necessary until the North and Middle Fork Owyhee Potential Natural Vegetation TMDL is completed.

## Changes to Sub-basin Characteristics

The sub-basin has experienced little change since the original TMDL was written.

### Wilderness

On March 30, 2009, the Owyhee Public Lands Management Act (“Owyhee Initiative”) was signed into law. Senator Mike Crapo’s website enumerates many of the

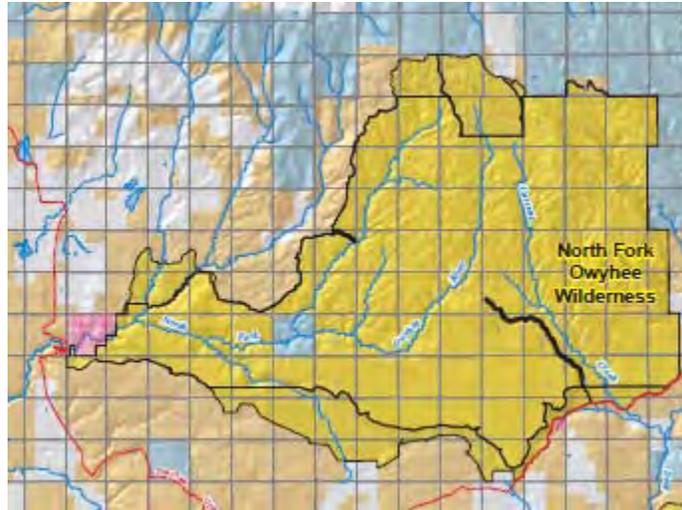
“Benefits of the Owyhee Public Lands Management Act:

- Resolution of decades-old public lands conflicts and certainty for various user groups.
- Better enforcement and prevention of indiscriminate off-road/off-trail travel by motorized vehicles.
- Designation of over 517,000 acres of wilderness, including 55,000 acres of cow-free wilderness.
- Designation of nearly 315 miles of wild and scenic rivers.
- Establishment of a coordinated Science Review to address management issues affecting public and private rangelands in Owyhee County.
- Establishment of a Research and Conservation Center in Owyhee County for collaborative research projects.
- Preservation of outstanding recreational opportunities.”

*Source: <http://crapo.senate.gov/issues/documents/Summary.4.14.08.doc>*

In the North and Middle Fork Owyhee subbasin particularly, the following changes have been made as a result of the Act:

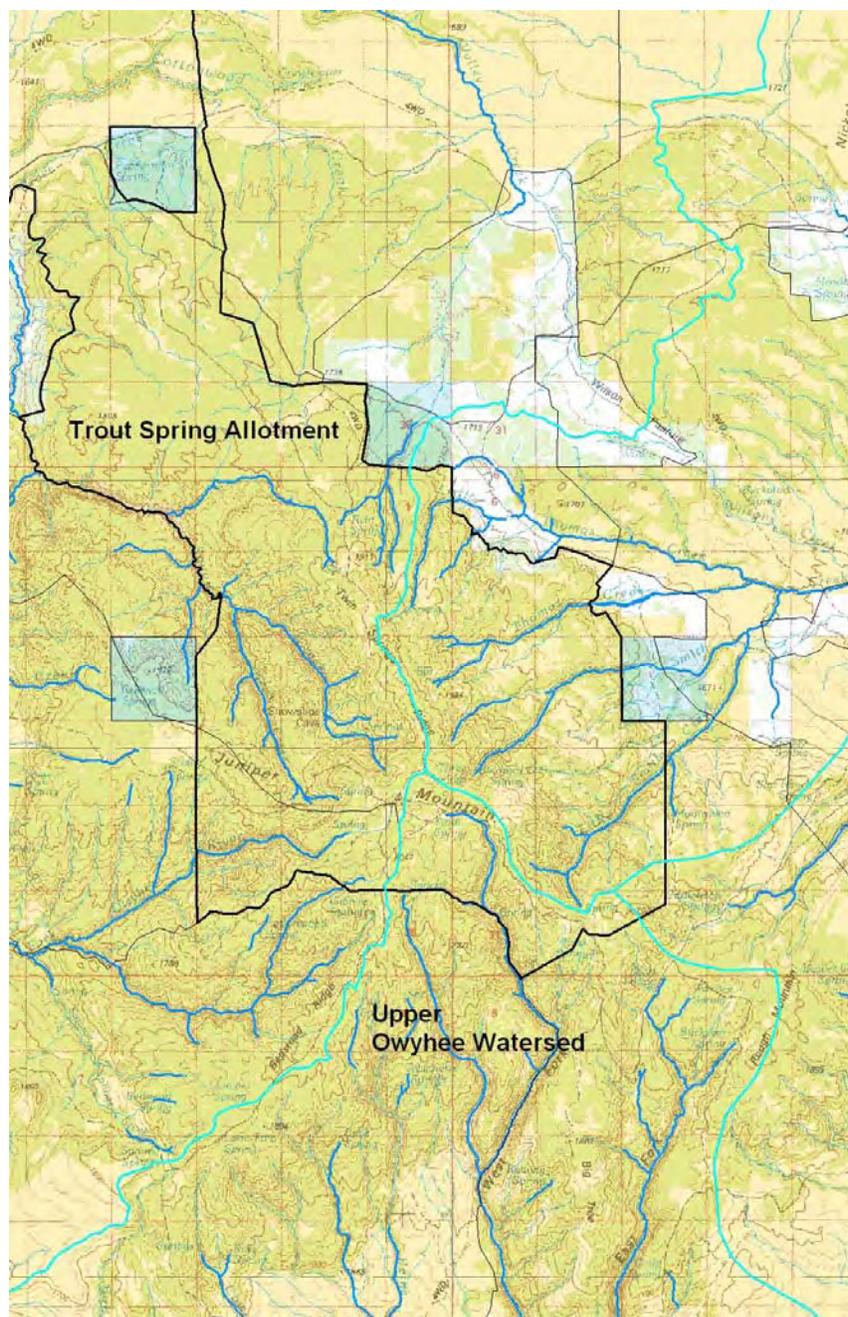
- The North Fork Owyhee River will now be a Recreational River from the state line to Juniper Mountain Road, and a Wild River for 15 miles upstream of Juniper Mountain Road. The watershed will become largely wilderness, from about one mile upstream of Mud Flat Road crossing, almost to the very headwaters. Additionally, the north side of the river will be mostly ungrazed. The Indian Meadows area will be released from Wilderness Study Area (WSA) status.
- The entire Noon Creek watershed and Big Spring watersheds will be encompassed by the new Wilderness, and will be ungrazed.
- The lower part of Pleasant Valley Creek will be included in the wilderness, whilst the upper part will be released from WSA status.
- Most of the Juniper, Cabin, and Corral Creek watersheds will be released from WSA status, as will the entire Middle Fork Owyhee River watershed.



**Figure 4: North Fork Owyhee Wilderness**

Land Use

No major land use changes have occurred in either of the two sub basins. There was a management action of 2 year non-grazing use on the Trout Springs Allotment, shown in figure 5 (Rich Jackson, BLM).



**Figure 5: Trout Springs Allotment**

### Fire

In 2008 BLM initiated a prescribed fire on the south end of the Indian Meadows Allotment, shown in figure 6. From the 4300 acre fire, approximately 30% burnt. No seeding was initiated, but livestock grazing was removed for 2 growing seasons. (Rich Jackson, BLM, personal communication 2009)

Two wildfires (Crutcher and Bald Mountain) composed a portion of the Crutcher Complex Fire that occurred in 2007. The Crutcher fire occurred in the Castlehead-Lambert Allotment and in the east side of Bull Basin Allotment (figure 7). Approximately 39,500 acres were affected. Bald Mountain

fire occurred in the south east portion of Bull Basin Allotment. No seeding was initiated on either fires, but livestock grazing was removed for 2 growing seasons. The 2008 monitoring data for both areas identified 96% successful natural recovery. (Rich Jackson, BLM)

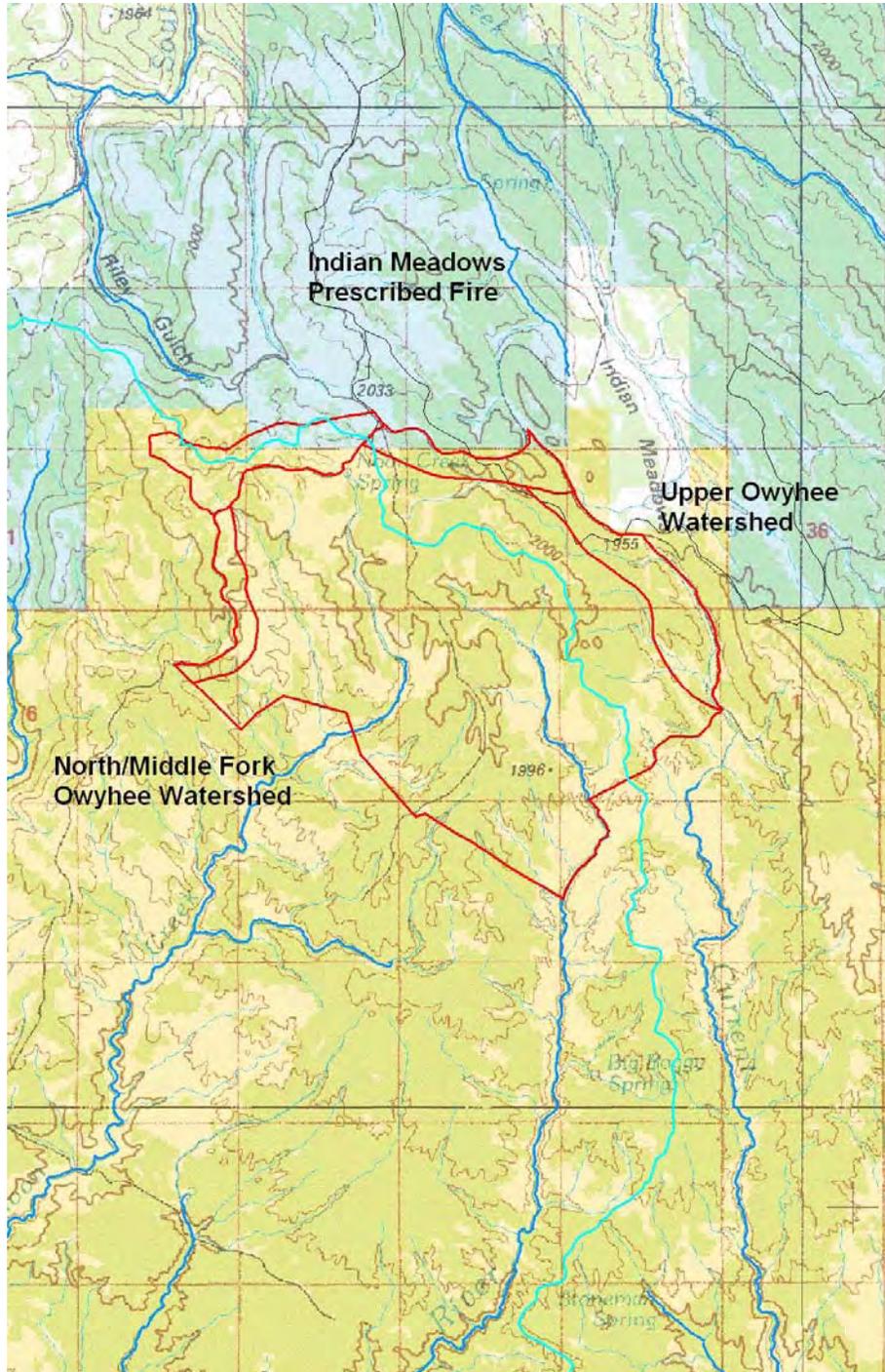


Figure 6: Indian Meadows Prescribed Fire

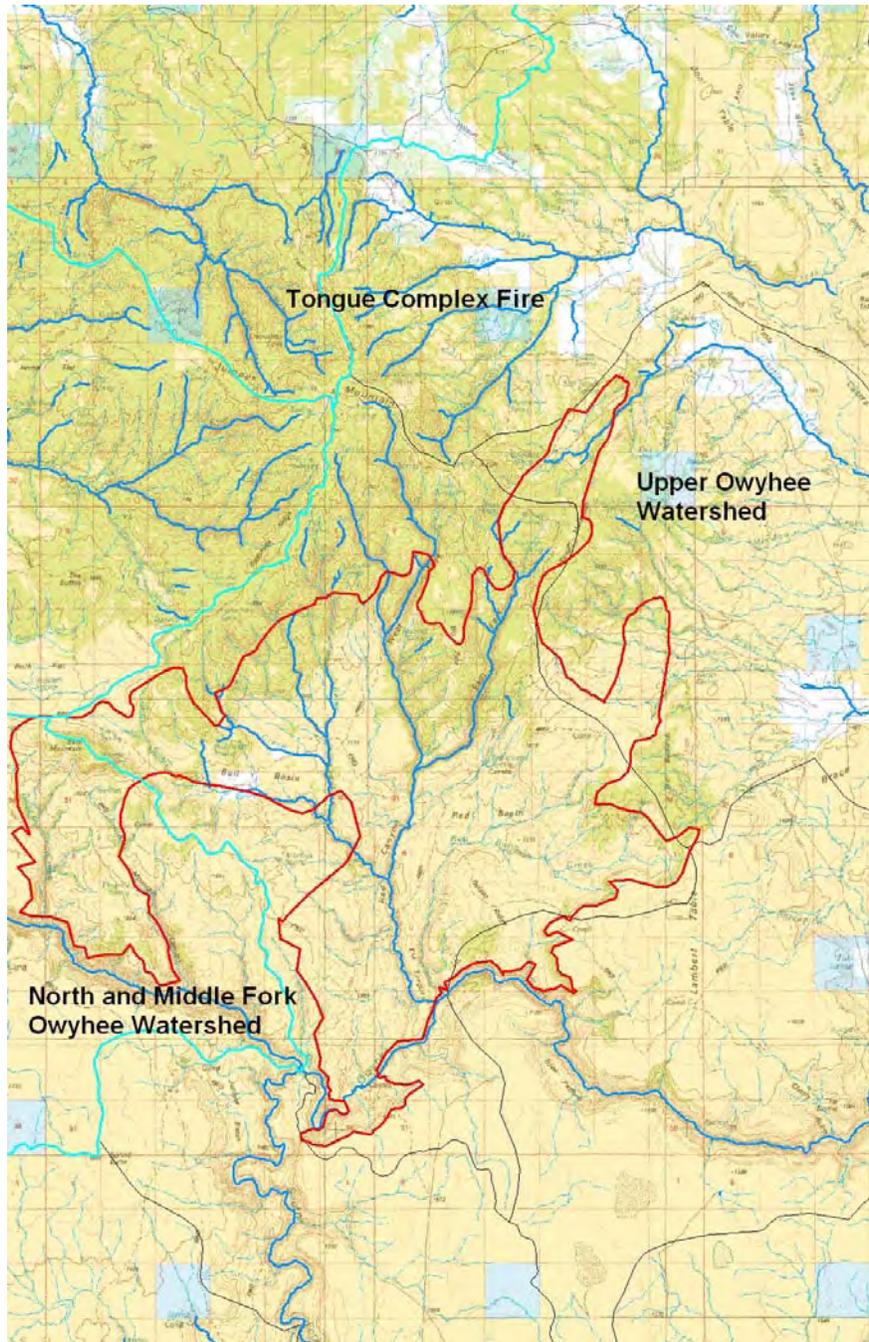


Figure 7: Crutcher Fire

## Synopsis of Current Water Quality Data

### BURP

DEQ monitored several of the streams in 2006, using its Beneficial Use Reconnaissance Program (BURP) method.

**Table 6. BURP Results**

Site ID	Stream	SMI <sup>1</sup> Result (Score)	SHI <sup>2</sup> Result (Score)	Interpretation
2006SBOIA060	Juniper Cr.	71.66 (3)	49 (1)	Supporting use, poor habitat
2006SBOIA061	Cabin Cr.	77.5 (3)	49 (1)	Supporting use, poor habitat
2006SBOIA062	NF Owyhee R.	79.3 (3)	62 (2)	Supporting use, good habitat
2006SBOIA063	Cabin Cr.	74.8 (3)	68 (3)	Supporting use, excellent habitat
2006SBOIA064	NF Owyhee R.	60.7 (3)	61 (2)	Supporting use, good habitat
2006SBOIA066	Noon Cr.	50 (2)*	57 (2)	Unclear. Good habitat.

<sup>1</sup> Stream Macroinvertebrate Index, <sup>2</sup> Stream Habitat Index

\* Only a small number of insects (63) were collected here, and so it is hard to say exactly what the condition of Noon Creek is.

By comparing the 2006 BURP scores with those gathered in 1996-2000, it is possible to ascertain trends in water quality. Although the in-stream habitat remains poor in many locations, the North Fork Owyhee River, Juniper Creek, Cabin Creek and Corral Creek all appear to be improving. Bank stability (and consequently, sediment) and poor shading are the chief factors in the low habitat scores.

### Fish

No DEQ fish scores were available at the time of printing.

The Idaho Department of Fish and Game did not have any fish data for this basin.

### Riparian PFC

BLM established a series of Proper Functioning Condition sites in 2006 and 2007:

**Table 7. Riparian PFC Results**

Stream	Location	Conclusion
MF Owyhee	MFOwy 001, just up from Oregon state line	Functioning-at-risk. Low vegetation. Wide & shallow, good variety of plants. Heavy utilization. Active cut banks.
MF Owyhee	MF Owy 002, moving upstream	Functioning-at-risk. Active cut banks, wide and shallow, no young willows, heavy browsing,
MF Owyhee	MF Owy 003, moving upstream	Functioning-at-risk. Not many young willows, a bit wide.
MF Owyhee	MF Owy 004, at Summit	Functioning-at-risk. Cut banks, heavy use, lacking

Stream	Location	Conclusion
	Springs Creek	woody material
MF Owyhee	MF Owy 005, moving upstream	Functioning-at-risk. Wide and shallow. Dry segments, Heavy browsing, trampling. Not actively eroding
MF Owyhee	MFOwy 006, moving upstream	Functioning-at-risk. Wide and shallow, good plant mix, active cut banks,
Cabin Creek	Very high in the watershed	Functioning-at-risk. Eroding. Some willows
Noon Creek	2 miles, Indian Meadows	Proper F.C. Not many plants (intermittent)
NF Owyhee	2.5 miles, Indian Meadows	Proper functioning condition, little erosion, little grazing, good riparian

### Temperature Loggers

BLM also installed a temperature logger on the Middle Fork Owyhee River in 2004. The average temperatures show very little change from the temperatures observed in 1998. In both cases, temperature criteria were violated for almost the entire month of July.

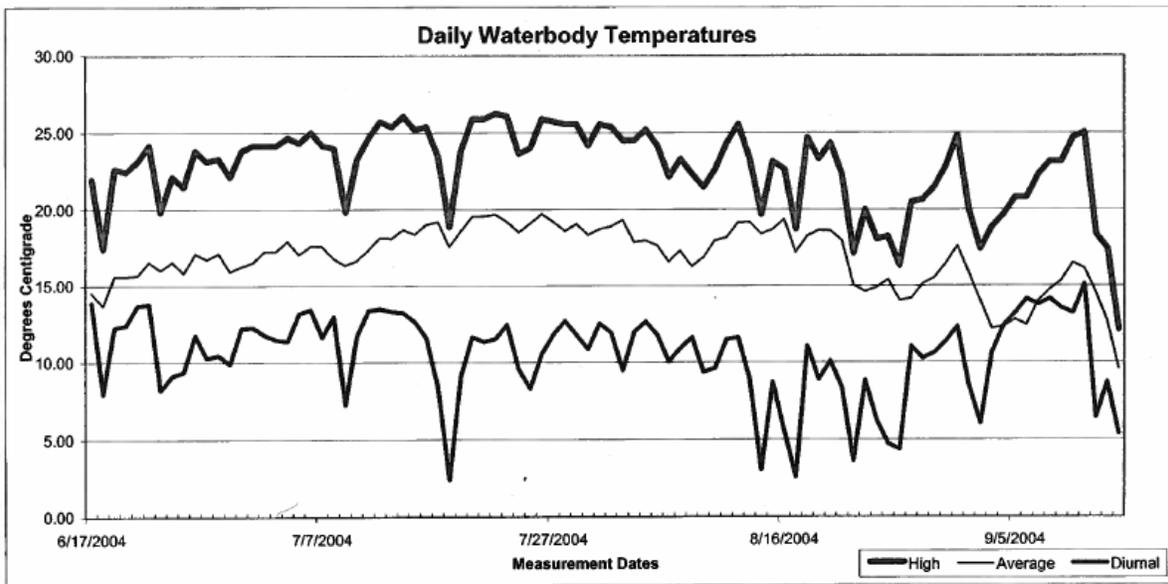


Figure 8. Middle Fork Owyhee River Temperature Logger, BLM 2004

### Summary

The BURP data above indicate that the impaired streams may be functionally meeting their beneficial uses. However, the TMDL is written in terms of water quality criteria for temperature, which are still exceeded much of the time. Temperatures exceed the criteria more than 10% of the time, and so the streams are still classified as impaired (see figure 2).

If it were to violate the temperature criteria, the only circumstance in which a stream could be said to attain its beneficial uses would be if it were at its 'natural background' condition. A Potential Natural Vegetation analysis (see later) may demonstrate that some parts of these creeks are indeed at

background levels, and then these assessment units could be delisted. However, the Riparian PFC data indicate that much of the watershed is probably not at its vegetative potential.

The headwaters of the North Fork Owyhee River appear to be in the best condition. For the time being, all listed assessment units should remain classified as 'impaired'.

## Section 4: Review of Implementation Plan and Activities

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The implementation plan was created by DEQ, in association with BLM, the Idaho Department of Lands (IDL), the Idaho Soil Conservation Commission (ISCC), the Natural Resources Conservation Service (NRCS), and the WAG. It was finalized in February 2002, and has been the guiding document by which improvements in the watershed were made.

The following activities were supposed to happen:

- ISCC, NRCS: Riparian PFC on all 303(d) streams.
- ISCC, NRCS: Develop and Implement water quality plans and contracts on private agricultural lands.
- ISCC, Owyhee SCD: Perform annual status reviews on Best Management Practices (BMPs) installed on private agricultural land.
- BLM: Allotment Assessments for grazing allotments in N and MF watersheds.
- BLM: Prepare water quality restoration plans for 303(d) streams
- BLM: Issue new grazing permits that include BMPs identified to improve/restore water quality.
- BLM: Monitor livestock use of riparian herbaceous vegetation on 303(d) streams.
- BLM: Monitor effectiveness of BMPs on 303(d) streams on public lands
- BLM, DEQ: Evaluate compliance with Idaho water quality criteria on public land streams.
- IDL: Prepare and implement grazing management plans on state allotments
- IDL: Perform BMP and Grazing review of state allotments.
- IDL: Develop and implement site-specific monitoring of state allotments.
- DEQ, IDL, ISCC, BLM, OWC: Develop field trip to showcase proper BMPs
- DEQ, IDL, ISCC, BLM, WAG: Review of implementation plan to determine if changes are needed

### Activities So Far

Since the implementation plan was written, two water quality improvement projects have occurred:

Pleasant Valley Creek: 16,896 feet of riparian fencing have been installed, along with 3 off-site watering troughs.

Juniper Creek: one permanent diversion has been installed, in place of a temporary diversion that had to be removed and reinstalled each year.

Results of these activities are unknown.

## Responsible Parties

**Table 8. Parties Responsible for TMDL Implementation**

Designated Management Agency	Resource Responsibility	Type of Involvement (regulatory, funding, assistance etc.)
Idaho Department of Lands	Grazing on State land allotments	Regulatory
Bureau of Land Management	Grazing on Federal land allotments	Regulatory
Idaho Soil Conservation Commission, Natural Resources Conservation Service	Private agricultural lands	Assistance
Idaho Department of Environmental Quality	Water quality	Funding, monitoring

## Section 5: Summary of Five Year Review

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Data were requested from the BLM, IDFG, and IASCD in December 2008. BLM and IDFG data were received in January 2009. WAG input was requested in January 2009, and data will be incorporated as they become available. Relevant data might include temperature and riparian ‘proper functioning condition’ information, as well as updates on implementation activities.

### Changes in Sub-basin

The main change to the subbasin has been the passage of the Owyhee Initiative. It is too early to tell what the effect on water quality will be. At a minimum, it is reasonable to assume that water quality will improve in the non-grazed areas of the wilderness.

### TMDL Analysis

The assumptions used in the TMDL are generally valid, but the original TMDL analysis is not appropriate to this watershed. Originally, the targets for full support of beneficial uses were the temperature criteria in the water quality standards. These criteria are not appropriate for the sparsely flowing desert streams of the North and Middle Fork Owyhee Rivers. A pristine stream in this area would probably still violate water quality criteria at certain times of the year.

The targets chosen were the only ones available at the time, but DEQ has developed a better approach, called ‘Potential Natural Vegetation’, which compares a stream to its own potential, instead of an inflexible criterion.

The load allocations are not appropriate, because they are based upon the attempt of a computer model to meet an impossible target. For example, Cabin and Corral Creeks required a temperature decrease of more than 100% to meet their target. These streams could certainly use some more shade in many parts, but BURP surveys indicate that the beneficial uses are functionally met. This would hardly be expected of a stream that was so far from its target.

### Review of Beneficial Uses

- The beneficial uses in this watershed are appropriate. Cold water aquatic life, salmonid spawning, and contact recreation uses apply to all assessment units.
- No changes to beneficial uses are recommended, except adding secondary contact recreation as a fully supported use to Noon Creek, and changing Cabin Creek to ‘fully supporting’ its recreational use.
- Beneficial uses are generally functionally met, as evidenced by the BURP scores. However, temperatures exceed Idaho’s water quality standards, requiring the State to declare the streams as not fully supporting their uses.

### Water Quality Criteria

- The relevant water quality criteria have not changed since the TMDL was written. Although the temperature criteria are problematic when applied to this watershed, they are statewide, and as such, unlikely to be altered.

- The streams do seem to show a slight improving trend, although BURP monitoring is a coarse instrument, ill-suited to detecting small changes.

## Watershed Advisory Group Consultation

Members of the original WAG were contacted (where possible) and offered an opportunity to continue their service. DEQ is grateful for the assistance of the following individuals who agreed to serve on the WAG:

Mr. John Crum, Shoshone-Paiute Tribe

Mr. Peter Jackson Jr., Rancher/Landowner

Mr. Rich Jackson, BLM

Mr. Duane LaFayette, Idaho Association of Soil Conservation Districts

Mr. Larry Meredith, Recreational Industry

Ms. Brenda Richards, Owyhee County

Mr. Dick Rogers, Environmental Representative

In addition to reviewing a draft of this document, several members of the WAG met in Murphy in April.

## Recommendations for Further Action

BURP Monitoring should continue every five years on the impaired streams.

A BURP site should be established on the Middle Fork Owyhee River.

## Potential Natural Vegetation – A New Method

Since this TMDL was written, DEQ has developed a new way of analyzing thermal pollution, which relies on the ‘Natural Background’ clause of the Water Quality Standards:

**‘09. Natural Background Conditions as Criteria.** When natural background conditions exceed any applicable water quality criteria set forth in Sections 210, 250, 251, 252, or 253, the applicable water quality criteria shall not apply; instead, there shall be no lowering of water quality from natural background conditions...’

The method, known as ‘potential natural vegetation’ is applicable to watersheds where the main excess thermal load is caused by removal of riparian shading, as is the case in the North and Middle Forks of the Owyhee River. It uses ‘shading’ as a surrogate for temperature, and the TMDL target would be the level of shading expected in a reference stream with similar vegetative potential.

PNV has several stages:

- 1) The existing shading of the stream is estimated using aerial photography.

- a. These estimates are ground-checked using a solar pathfinder.
  - b. These shade measurements are converted into ‘incident solar radiation’, measured in kWh/m<sup>2</sup>/day.
- 2) The target shade (the reference, or ‘natural background’ condition) is derived from ‘effective shade curves’ developed for similar vegetation types in Idaho.
- a. The effective shade curves are developed using knowledge of local plants, riparian conditions, and similar systems.
  - b. The incident solar radiation for this reference condition is calculated.
- 3) The existing and target conditions are compared.
- a. Where the existing shade is less than the target shade, it means that the excess incident solar radiation is heating the water above natural background levels.
  - b. The difference between the existing and target shade indicates the increase in shading needed to meet the target.
  - c. Implementation efforts can be directed to areas with the biggest difference between existing and target shade.
  - d. A new assessment of riparian coverage can be made every time a new aerial photograph is taken.

It is recommended that the temperature TMDLs be re-written using the PNV approach. This will more closely reflect the local natural conditions, and help pinpoint implementation activities, thereby ensuring the greatest improvement in water quality.

The existing, criteria-based TMDL would remain in place until EPA approves any new version. A PNV temperature TMDL could be completed by December 2009.

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