

Implementation Plan for the North and Middle Fork of the Owyhee River

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Compiled by the Idaho Department of Environmental Quality
in association with the Bureau of Land Management,
Idaho Department of Lands, Idaho Soil Conservation Commission,
and the North & Middle Fork Owyhee Watershed Advisory Group



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¹ Participation in the Middle and North Fork Owyhee Watershed Advisory Group or the submittal of comments on the Middle and North Fork Owyhee TMDL Implementation Plan does not constitute endorsement or agreement with the document or its content.

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Introduction

In 1998, seven water bodies within the North and Middle Fork Owyhee River basins were classified as water quality limited due to excessive sediment, temperature exceedances, and flow modification under §303(d) of the Clean Water Act. These water bodies include North Fork Owyhee River; Middle Fork Owyhee River; Squaw Creek; Noon Creek; Juniper Creek; Cabin Creek; Corral Creek; and Pleasant Valley Creek. However, a review of the available data for the North and Middle Fork Owyhee hydrologic unit found no violations of applicable water quality standards for sediment and further shows no impairments to the current biological community due to sediment according to the 1996 Water Body Assessment Guidance developed by the Idaho Department of Environmental Quality (IDEQ). Additionally, assessments completed by IDEQ indicate that many of the waterbodies within the North and Middle Fork Owyhee subbasin are presently meeting their beneficial uses. The North and Middle Fork Owyhee Subbasin Total Maximum Daily Load (IDEQ 1999b) (TMDL) was developed by IDEQ and approved by the U.S. Environmental Protection Agency (EPA) in late 1999 in relationship to temperature. The TMDL is available from the IDEQ for reference and review.

Designated Agencies

Idaho Code Title 39 Chapter 36 designates those agencies responsible for various activities within the state of Idaho. As such, 39-3602 designates the Idaho Department of Lands for timber harvest activities, for oil and gas exploration and development and for mining activities; the Soil Conservation Commission for grazing activities and for agricultural activities; the Idaho Transportation Department for public road construction; the Idaho State Department of Agriculture for aquaculture; and the Idaho Department of Environmental Quality for all other activities.

While not designated under Idaho Code, Section 313 of the Federal Clean Water Act requires that “each department, agency, or instrumentality of the Federal Government having jurisdiction over any property or facility, or engaged in any activity resulting, or which may result, in the discharge or runoff of pollutants shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions in a like manner as any non governmental entity.” As such, the Bureau of Land Management who acts as the overseer for federal lands within the Middle and North Fork Owyhee River must ensure that all land management activities comply with the Clean Water Act regulations and both Idaho and Oregon water quality standards.

The IDEQ is responsible for implementing the Clean Water Act (CWA) in Idaho and has promulgated state water quality rules to meet this responsibility in IDAPA 58.01.02-Water Quality Standards and Wastewater Treatment Requirements (IDEQ 1996a). These rules establish both the designated uses and appropriate criteria; designated uses are those beneficial uses specified for given water bodies and criteria are conditions presumed to support or protect the designated uses (IDEQ 1996b). Prior to determining appropriate water quality criteria for a given water body, designated beneficial uses are assigned. Within the context of the TMDL process, the beneficial use designations directly affect the determination of appropriate endpoints for parameters such as temperature. If the

appropriate beneficial uses are not correctly identified, appropriate water quality criteria are not used.

According to IDAPA 58.01.02, Idaho surface water use designations include:

- Aquatic Life:
 - Coldwater biota
 - Salmonid Spawning
 - Seasonal coldwater biota
 - Warmwater biota
 - Modified cold or warmwater biota
- Recreation
 - Primary contact recreation
 - Secondary contact recreation
- Water Supply
 - Domestic
 - Agricultural
 - Industrial
- Wildlife habitats
- Aesthetics.

The most important primary use designations fall under the aquatic life and recreational categories because agricultural/industrial water supply, wildlife habitats, and aesthetics uses are designated beneficial uses for all water bodies in the state. The aquatic life category is used to protect and maintain a viable aquatic life community of cold or warmwater species, as appropriate. Salmonid spawning conditions apply to waters that provide for active, self-propagating populations of salmonid fishes. Finally, modified cold or warmwater biota uses may be appropriate when the aquatic community is limited due to one or more of the following conditions as adapted from 40 CFR 131.10(g):

1. Naturally occurring pollutant concentrations prevent the attainment of the use; or
2. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
3. Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct that to leave in place; or
4. Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modifications in a way that would result in the attainment of the use; or
5. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
6. Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

Because the conditions in the Middle and North Fork of the Owyhee River may preclude the attainment of reference stream or conditions, attainable site-specific aquatic life criteria that are protective of the modified community may be established and incorporated into the rule-making process. Additionally, there are three types of non-designated waters in IDAPA 58.01.02:

1. Undesignated surface waters – IDEQ presumes that these water bodies can support cold water biota and primary and secondary recreational beneficial uses unless proven otherwise;
2. Man-made waterways – These drainages are to be protected for the uses for which they were developed; and
3. Private waters – These water bodies must be wholly located upon a person’s land and are not protected specifically for any beneficial uses.

In addition to these categories, IDAPA 58.01.003 defines an intermittent waterbody, which has a period of zero flow for at least 1 week during most years and a 7Q2 of less than 0.1cfs (if available). Also streams with natural perennial pools containing significant aquatic life are not intermittent. Water quality standards (including both beneficial use designations and water quality criteria) apply to intermittent waters during optimum flow periods, which are defined as 5cfs for recreation and water supply uses and 1cfs for aquatic life. There is no ephemeral waterbody category included in the IDAPA 58 regulations.

It is also important to distinguish between designated, existing, and attainable uses. Designated uses are those formally specified in IDAPA 58.01.02.110-160 that have been established through the rule making process. Existing beneficial uses are those uses that exist in a given water body any time after November 28, 1975, whether or not the use is formally designated for the water body. Attainable uses are those uses that would be expected to be present if all point and non-point sources were controlled. While a designated use can be downgraded to a use requiring less stringent criteria, an existing use can only be upgraded to a use requiring more stringent criteria (EPA 1994). Furthermore, designated uses can be removed only if they are neither existing nor attainable, due to at least one of the 40 CFR 131.10(g) conditions (i.e., designated uses may not be removed if the uses could be attained by implementing effluent limits and by implementing BMPs for non-point sources). When designated uses are different than attainable uses, standards can be revised to reflect uses actually being attained through a use attainability analysis (UAA).

It is also important to comment on the use of the terms “impaired” and “degraded.” Throughout this document, these terms are used to describe conditions in the subject reaches. These descriptions do not imply that the water bodies were once pristine and have since been impaired and degraded.

The IDEQ is required to develop an implementation plan (Plan) which when implemented will control future and existing temperature exceedances. This Plan deals specifically with information outlined in the TMDL, related to temperature exceedances. The Plan lists activities or best management practices, which are to be implemented as appropriate by state and federal land managers and which may be voluntarily implemented by private landowners within the subbasins to enhance the water quality of the North and Middle Fork Owyhee

hydrologic unit. The best management practices for private landowners will be developed on a site-specific basis and tailored to meet the operations of each landowner. These activities as implemented and maintained over the long-term (>20-years) are expected to increase canopy cover thus lowering stream temperatures in the affected waters and meeting applicable state (Idaho and Oregon) water quality standards (IDEQ, 1996a). The Plan will include specific actions to meet the TMDL targets and a schedule for implementation of each activity.

Important elements of this Plan will be:

- A description of pollutant control actions (Best Management Practices);
- A schedule of actions with interim milestones;
- A discussion of reasonable assurance;
- A description of legal authorities for control actions;
- An estimate of when water quality standards will be attained;
- A monitoring plan and/or modeling to determine effectiveness of controls;
- Measurable interim milestones for water quality; and
- A description of the process for revising TMDL if milestones are not being met.

Similar work in an arid environment has been underway in the Bear Creek (Elmore, 1998) drainage of central Oregon since 1977. Important lessons from the success of that project can and should be incorporated into the work being planned in the North and Middle Fork Owyhee drainages. These lessons include:

Commitment by the operator is the most important factor in success of the project;
Timing, intensity, and duration of grazing are more important than the numbers of animals;
One grazing strategy does not fit all streams;
Present riparian conditions are important in setting goals and objectives;
Upland conditions must be included in any restoration program;
Climatic cycles dramatically affect restoration rates;
Droughts are just as important as floods to riparian recovery; and
Restoration and the sustainability of riparian resources only occurs when the interest produced in riparian systems and not just capital is utilized.

Background

The North and Middle Fork Owyhee River drainages (Figure 1) are located within one fourth-field hydrologic unit in southwest Idaho (HUC 17050107). The North and Middle Fork Owyhee Rivers generally drain west from Idaho into Oregon from the South Mountain and Juniper Mountain areas of the Owyhee mountain range. These drainages are located approximately 90 miles south of Boise, Idaho. Landowners (Figure 2) include privately owned ranches and lands managed by the Idaho Department of Lands (IDL) and the Bureau of Land Management (BLM). Table 1 illustrates the inventory of private lands within the North and Middle Fork Owyhee River subbasins.

Table 1. Private Agricultural Lands Inventory

Inventory - Farms and Cropland	North and Middle Fork Owyhee River Subbasins
Number of Farms	8
Acres of Farm Land	33,688
Average Size of Farm Land	4,211

Subbasins Description

The North and Middle Fork Owyhee River subbasins are located within the northern portion of the Owyhee Mountains in southwest Idaho (Figure 3). This area lies within the Columbia Plateau, an elevated plateau with mountains separated by canyons draining generally northwest via the Snake and Columbia Rivers. This broad regional landform and vegetative classification is known as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem.

Agricultural land uses include grazing with irrigated hay production by a private landowners. Recreation land uses include, but are not limited to day hiking, backpacking, fishing, and hunting. No urban areas or permitted point source dischargers are located within the North and Middle Fork hydrologic unit. No major urban areas and no permitted point source dischargers are located within the North and Middle Fork subbasins. Aquatic life includes redband trout, suckers, sculpin, redband shiners, dace, river otter, and beaver.

Climate Description

The climate within the North and Middle Fork Owyhee River drainages is characteristic of the Columbia Plateau, an elevated plateau classified as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem. This area is relatively arid with cool, moist winters and hot, dry summers. Mean annual precipitation estimates for the North Fork Owyhee drainage range from 12 inches (30.5 cm) at the Oregon border to 25 inches (63.5 cm) on South Mountain.

Most of the precipitation falls during November, December, and January. During the wetter months the higher elevations receive more moisture than the lower elevations. Snow typically accumulates at the higher elevations during this period and melts during the spring months of March, April, and May. July and August are the hottest months with a mean maximum air temperature typically reaching the high nineties.

Recreational Uses

The Owyhee county region provides a variety of recreational uses including, but not limited to hiking, fishing, hunting, off-road activities and winter sports as noted in the approved North and Middle Fork Owyhee Subbasin Assessment and Total Maximum Daily Load. Data collected by IDEQ during the beneficial use reconnaissance program also includes a category for indicating whether recreational uses are having an impact to water quality. Based on the data collected by IDEQ, no significant impacts to water quality were noted during the data collection efforts in the North and Middle Fork Owyhee sampling efforts.

However, any impacts due to recreation will be assessed during reviews of individual lease allotments.

Juniper Encroachment

The Middle and North Fork Owyhee River Subbasin communities and land management agencies are concerned about the encroachment of Junipers within various watersheds. Effects of encroachment of western juniper on rangeland health, forage production, and wildlife habitat values has been studied throughout the West but little is known specifically about effects relating to the expansion of juniper woodlands in the Owyhee Uplands. Currently, the USDA Agricultural Research Service is initiating research projects in the South Mountain/Cliff's, and Reynolds Creek areas to evaluate the influence that western juniper have on watersheds.

Fire suppression and the reduction in herbaceous "carrying" fuels by livestock grazing over the last 100 years has altered fire regimes and resulted in a three to ten-fold increases in acreage and stand densities of western juniper since the late 1800's. As juniper stands increase in density, understory that provides forage for livestock and wildlife declines (UCRB EIS, 2000, Miller and Angell, 1987).

Relatively open Western juniper stands can be one of the most biologically diverse plant communities. However, as juniper stands become denser, understory vascular plants markedly decrease as a result of competition for moisture and light, and the effects of certain allelopathic properties of western juniper. Hydrologic budgets of juniper stands have been characterized as being dominated by interception and evapotranspirational water losses with little water available for runoff or deep drainage. Rangeland sites occupied by western juniper exhibit lower volumes of water in the soil profiles than similar site where junipers have been removed (Jeppson, 1978). Eddleman and Miller (1991) reported interception of precipitation by mature trees exceeds 60% of precipitation, and transpiration of soil moisture potentially exceeds 1.5mm per day. As soil moisture is depleted, high rates of transpiration can be expected to continue through moisture accessed by deep taproots. Though studies in western juniper dominated zones are limited, streamflow may be altered by encroachment of junipers in to sagebrush-grass and riparian zones. Reduced recovery rates of deteriorated riparian areas could be expected as well.

Low infiltration rates associated with large, bare, interstices may become major pathways for runoff and sources of sediment. Buckhouse and Mattison (1980) reported erosion was 2-3 times greater on juniper dominated lands than on lands dominated by sagebrush-grass. Though surface erosion may not be expected to be significantly higher during average precipitation events, short, intense events common during summer convection storms, or periods of snowmelt, have the potential to produce large amounts of sediment from the unprotected soil surfaces. With this in mind it may be necessary to address the encroachment of western juniper into sagebrush-grass sites within various grazing allotments or as part of larger watershed recovery efforts and will be done on a site-specific basis as necessary.

STATE OF IDAHO DEPARTMENT OF WATER RESOURCES

WATER RESOURCES DIVISION



Figure 1. North and Middle Fork Owyhee Fourth Field Hydrologic Unit Location

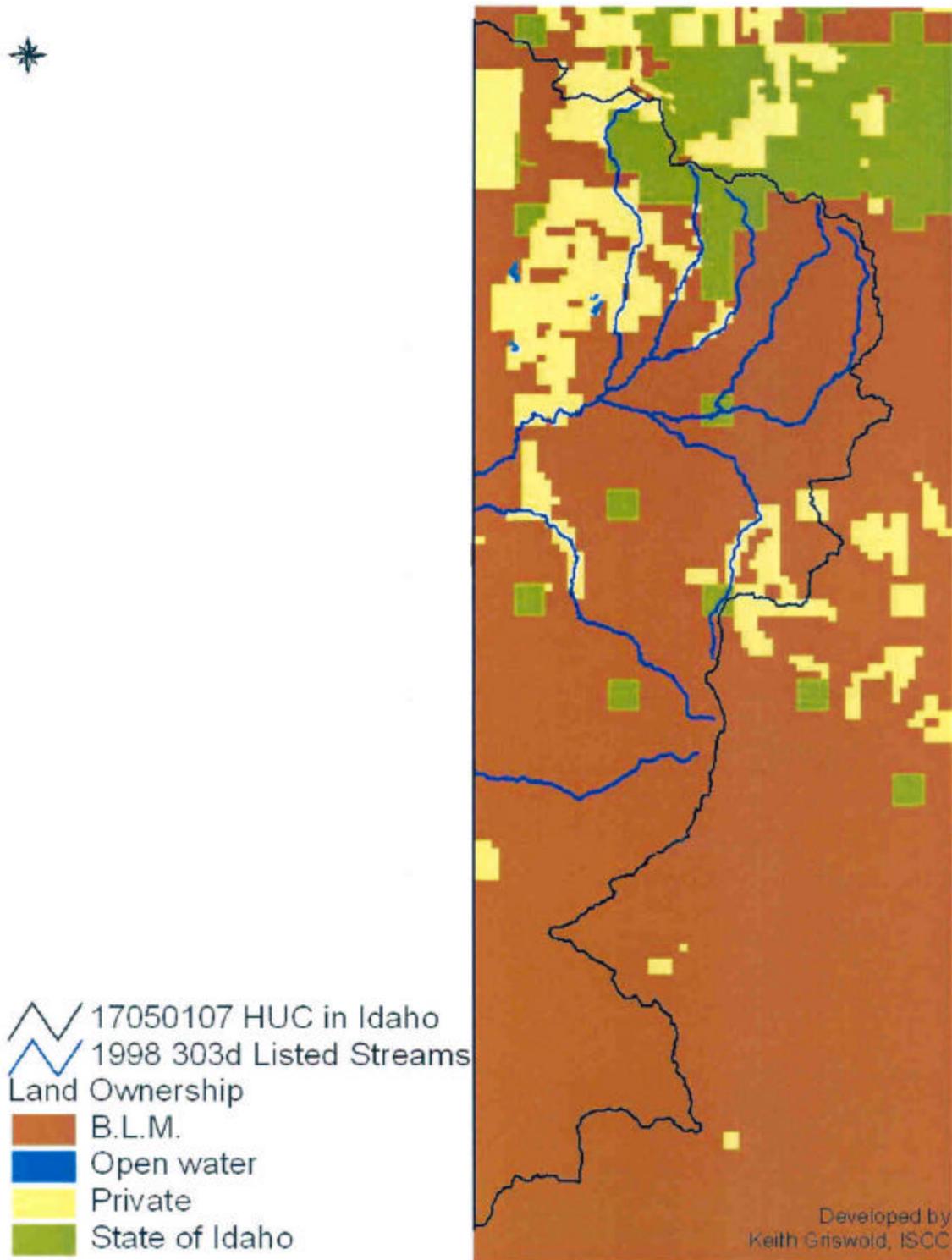


Figure 2. North and Middle Fork Owyhee Land Ownership

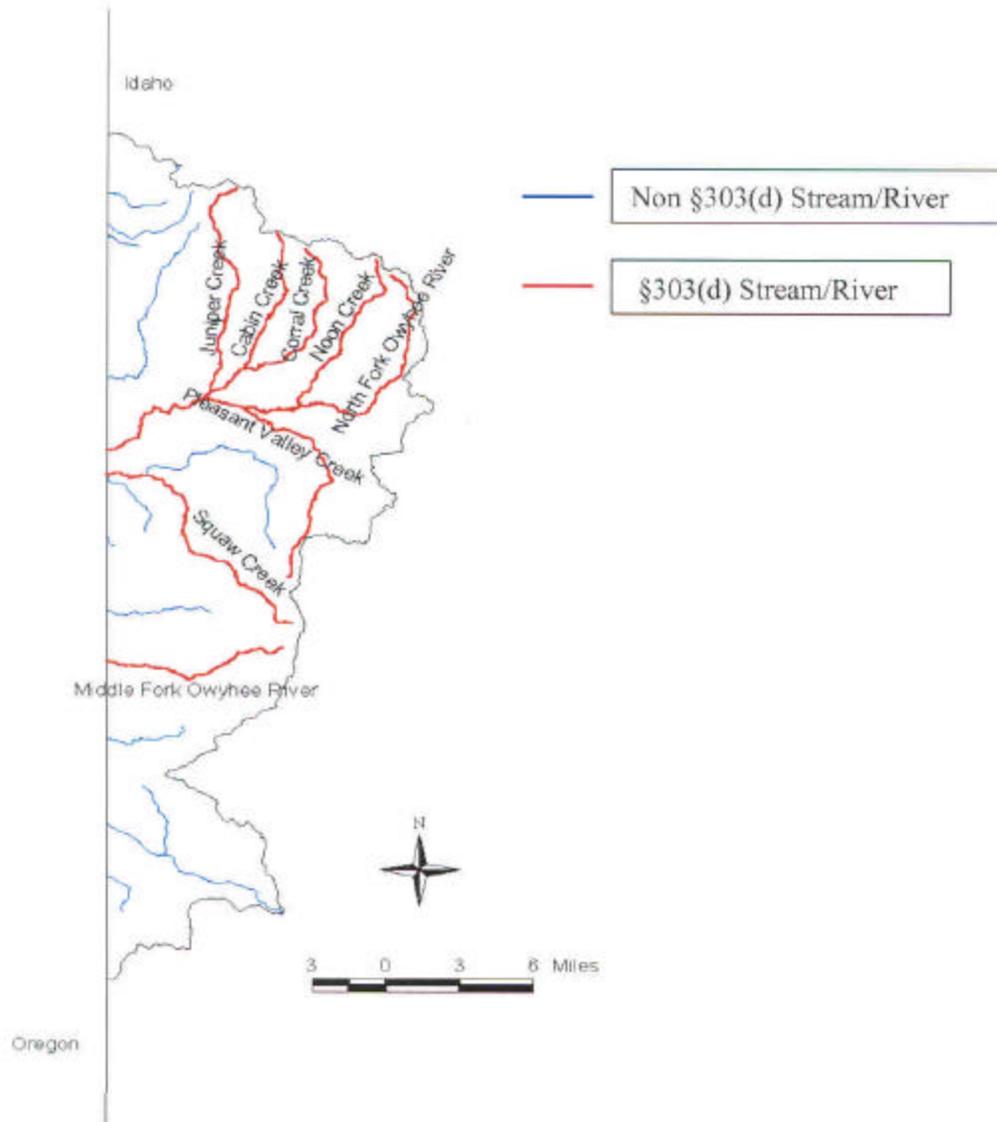


Figure 3. Water Bodies included on the 1998 §303(d) list within the North and Middle Fork Owyhee Hydrologic Unit

Land Use and Ownership

Land uses include grazing with irrigated hay production by private landowners. Recreation uses include, but are not limited to day hiking, backpacking, fishing, and hunting. Prior to 1970, both sheep and cattle grazed the North Fork Owyhee drainage. Presently, cattle graze within the combined State, Federal and private lands located in Owyhee County. No urban areas are located within the North and Middle Fork subbasins.

Present day landowners within the North and Middle Fork Owyhee hydrologic unit include privately owned ranches, Federal lands managed by the BLM, and state lands managed by the Idaho Department of Lands (IDL). Table 2 provides a breakdown of land ownership. Since some of the state, private and federal lands are intermingled and unfenced, the management of these intermingled lands and the implementation of best management practices where necessary may require additional cooperation and coordination by land managers.

Table 2. Ownership for Listed Water Body Drainages

	Area (acres)	BLM (%)	IDL (%)	Private (%)
Total	247,315	75%	11%	14%

Temperature Data, Standard Attainment, and Impacts to Beneficial Uses

Idaho and Oregon stream temperature requirements for cold-water biota, salmonid spawning and salmonid rearing are presented in Table 3. It should also be noted that the TMDL states that “In the case of the water bodies located within the North and Middle Fork Owyhee hydrologic unit, salmonid spawning and rearing occurs in each water body examined. Also, all of the recent and historical macro invertebrate data for each listed stream segment meet or exceed the State of Idaho’s 1996 Water Body Assessment Guidance for macro invertebrates (i.e., a score greater than 3.5).”

Table 3. Stream Temperature Criteria for Idaho and Oregon

Aquatic Use ¹	State ²	Standard
Cold Water Biota	Idaho	Must not exceed 72 ⁰ F (22 ⁰ C) at any time or 66 ⁰ F (19 ⁰ C) for the daily average.
Salmonid Spawning	Idaho	Must not exceed 55 ⁰ F (13 ⁰ C) at any time, or 48 ⁰ F (9 ⁰ C) for the daily average.
Salmonid Rearing	Oregon	The seven-day average maximum stream temperature must not exceed 64 ⁰ F (17 ⁰ C) at any time.
Salmonid Spawning	Oregon	The seven-day average maximum stream temperature must not exceed 55 ⁰ (13 ⁰ C) at any time during the identified spawning period.

¹Salmonid spawning criteria apply during the spawning period only.
²When stream temperatures are above these standards the State of Oregon specifies that “on measurable surface water temperature increase resulting from anthropogenic activities is allowed.” (OAC 340-04100845)

The TMDL listed the predominant anthropogenic (i.e., human) cause of the stream temperature above standards as inadequate riparian shade. Increases in riparian shade along these water bodies are expected to reduce stream temperatures. While the beneficial use(s) are being met as indicated in the TMDL, in order for a water body to be listed as “Full Support” both the beneficial use and water quality criteria must be met. Table 4 summarizes the support status of the waters in the North and Middle Fork Owyhee hydrologic unit as listed in the North and Middle Fork Owyhee Subbasin Assessment and Total Maximum Daily Load (IDEQ, 1999b).

Table 4. Water Body Assessments for the North and Middle Fork Owyhee Hydrologic Unit¹

Waterbody	Cold Water Biota	Salmonid Spawning ²	Salmonid Rearing ³
NF Owyhee ⁴	NFS	NFS	NFS
MF Owyhee	NFS	NFS	NFS
Juniper Creek	NFS	NFS	--
Cabin Creek	NFS	NFS	--
Corral Creek	NFS	NFS	--
Noon Creek	FS	NFS	--
Big Spring	NFS	NA	--
Pleasant Valley	NFS	NFS	--
Squaw Creek	FS	NA	--

¹NFS = Not Full Support; FS = Full Support; NA = Not Assessed
²Based on available data for the salmonid spawning period, March 1 – July 15
³Based on the Oregon temperature water quality standards for salmonid rearing
⁴The NF Owyhee was the only water body listed and assessed for recreation standard attainment

The percent reductions required to attain either cold water biota, salmonid spawning load allocations or temperature standards as determined in the North and Middle Fork Owyhee

Subbasin Assessment and Total Maximum Daily Load (IDEQ, 1999b) are summarized in Tables 5 and 6. In some instances the “percent reduction from average” thermal load reduction in order to achieve the standards is greater than 100 percent and in certain circumstances may not be achievable. However, the load reduction is a required element of the TMDL to illustrate the reductions necessary to achieve state standards.

Table 5. Reductions Required to Attain Cold Water Biota Load Allocations

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 6. Reductions Required to Attain Salmonid Load Allocations

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

Implementation Point Sources

There are no point sources in the North and Middle Fork Owyhee subbasin.

Nonpoint Sources

Under §319 of the Clean Water Act, each state is required to develop and submit a nonpoint source management plan. The Idaho §319 Nonpoint Source Management Program Plan (IDEQ, 1999a):

- Identifies programs to achieve implementation of best management practices (BMPs);
- Includes a schedule for program milestones;
- Certified by the State Attorney General;
- Identifies available funding sources; and
- Describes non-regulatory and regulatory approaches the state will take to abate nonpoint pollution sources.

The State of Idaho's §319 Nonpoint Source Management Program Plan (IDEQ, 1999a) was revised and approved by the Environmental Protection Agency (EPA) in December 1999 and included the nine-key elements as outlined by the EPA. These included:

1. Explicit short and long-term goals, objectives and strategies to protect surface and ground water.
2. Strong working partnerships and collaboration with appropriate state, tribal, regional, and local entities, private sector groups, citizen groups, and Federal agencies.
3. A balanced approach that emphasized both statewide nonpoint source programs and on-the-ground management of individual watersheds where waters are impaired or threatened.
4. The State program (a) abates known water quality impairments resulting from nonpoint source pollution, and (b) prevents significant threats to water quality from present and future activities.
5. An identification of waters and watersheds impaired or threatened by nonpoint source pollution and a process to progressively address these waters.
6. The State reviews, upgrades, and implements all program components required by §319 of the Clean Water Act and establishes flexible, targeted, interactive approaches to achieve and maintain beneficial uses of waters as expeditiously as practicable.
7. Identification of Federal lands and objectives which are not managed consistently with State program objectives.
8. Efficient and effective management and implementation of the State's nonpoint source program, including necessary financial management.
9. A feedback loop whereby the State reviews, evaluates, and revises its nonpoint source assessment and its management program at least every five years.

For further information on the nonpoint source management program a copy of the State of Idaho §319 Nonpoint Source Management Program Plan (IDEQ, 1999a) can be obtained from the IDEQ.

The State of Idaho uses a non-regulatory approach to control agricultural nonpoint sources. However, regulatory authority can be found in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.350.01 through 58.01.02.350.03). IDAPA 58.01.02.054.07 refers to the Idaho Agricultural Pollution Abatement Plan (IDEQ, IDL, SCC, 1991), which provides direction to the agricultural community and includes a list

of approved BMPs. A portion of the Idaho Agricultural Pollution Abatement Plan (IDEQ, IDL, SCC, 1991) outlines responsible agencies or elected groups, such as the soil conservation districts, necessary to address nonpoint source pollution problems. For agricultural activity, the Owyhee Soil Conservation District in cooperation with the Soil Conservation Commission will assist landowners in developing and implementing BMPs to abate nonpoint pollution. This effort to reduce stream temperatures toward the water quality standards is expected to continue for the long-term and may take as much as 20-years or more to complete.

The Idaho Water Quality Standards and Wastewater Treatment Requirements specify that if water quality standards are not being met, even with the use of BMPs, the state may request that the designated agency evaluate and/or modify the BMPs to protect beneficial uses. The Idaho Water Quality Standards and Wastewater Treatment Requirements also provides that the state may seek injunctive relief for those situations that may be determined to be an imminent and substantial danger to public health or environment (IDAPA 58.01.02.350.02(a)).

The Bureau of Land Management (BLM) has responsibility for the administration, management and protection of approximately 76% (185,222 acres) of the land in the subbasin. The BLM has authority to regulate, license and enforce land use activities based on:

- Federal Clean Water Act;
- Taylor Grazing Act;
- Federal Land and Policy Management Act;
- Public Rangelands Improvement Act;
- National Environmental Policy Act;
- Emergency Wetlands Resource Act;
- Agricultural Credit Act;
- Land and Water Conservation Act; and
- Executive Orders for Floodplain Management and Protection of Wetlands.

Past management activities by the BLM along with the appropriate rancher/permittee in this subbasin include, but are not limited to, livestock exclusion from riparian areas, pasture management with planned grazing systems, reservoir development, spring or water development in uplands, juniper management and streambank protection through the use of tree revetments. Federal grazing regulations require that the BLM determine if grazing related management practices are achieving the Idaho Standards for Rangeland Health and Guidelines for Grazing Management (USDI, 1997) or are making significant progress toward their achievement and conform with the guidelines. This document was developed in 1997 to address BLM related grazing issues. The Idaho Standards for Rangeland Health and Guidelines for Grazing Management (USDI, 1997) was specifically designed to provide the resource measures and guidance needed to ensure healthy, functional rangeland. The Idaho Standards for Rangeland Health and Guidelines for Grazing Management (USDI 1997), as applied in the State of Idaho states that this document is “to be used as the Bureau of Land Management’s management goals for the betterment of the environment, protection of cultural resources, and sustained productivity of the range.” The Idaho Standards for

Rangeland Health and Guidelines for Grazing Management (USDI, 1997) states that it “directs the selection of grazing management practices, and where appropriate, livestock management facilities to promote significant progress toward, or the attainment and maintenance of, the standards.” The Idaho Standards for Rangeland Health and Guidelines for Grazing Management (USDI, 1997) also state that “livestock grazing management practices and guidelines will be consistent with the Idaho Agricultural Pollution Abatement Plan (IDEQ, IDL, SCC, 1991).” It further states that “The BLM will identify and document within the local watershed all impacts that affect the ability to meet the standards. If the standard is not being met due to livestock grazing, then allotment management will be adjusted unless it can be demonstrated that significant progress toward the standard is being achieved.” A copy of the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management is available from the BLM. Additionally, the implementation of BMPs in many areas is done in cooperation with the area permittee.

Temperature Loading Analysis

The current stream temperatures in the North and Middle Fork Owyhee hydrologic unit were determined through continuous stream temperature measurements collected periodically over the past five years. As mentioned, the data showed exceedances of the Idaho and Oregon water quality standards for cold water biota, salmonid rearing, and salmonid spawning.

The North and Middle Fork Owyhee Subbasin Assessment and Total Maximum Daily Load (IDEQ, 1999b) noted that the critical period of the year for cold water biota and salmonid rearing uses is during base flow and high ambient air temperature periods. It also noted that the critical period of the year for salmonid spawning is between March 1 and July 15.

Goals and Objectives for Private Agriculture/Grazing

The purpose of the agricultural/grazing goals and objectives is to protect and enhance the quality of the surface water in the North and Middle Fork Owyhee River subbasins related to private agricultural lands (Table 7). Actions taken as part of the agricultural/grazing goals and objectives can also have a positive affect on ground water quality in the area, which provides base flow for many of the streams and rivers.

Table 7. Private Agricultural Land Use

Land Use	Acres	Percent of watershed
Surface Irrigated Pasture	345	.1%
Rangeland	33,343	13.9%
Total Private Acres	33,688	14%
Total Watershed Acres	247,315	100%

The Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.054.07) refers to the Idaho Agricultural Pollution Abatement Plan (APAP) (IDEQ, IDL, SCC, 1991), which provides direction to the agricultural community on approved best management practices. The Owyhee Soil Conservation District will act as the lead for implementing best management practices related to agricultural activities. Proposed component practices include, but are not limited to filter strips, critical area plantings,

hardened rock crossings, off-site watering facilities, spring development, fencing, irrigation water management, livestock grazing management, and riparian buffers. These component practices, and other not listed in this document, are outlined in the APAP and a copy can be obtained from the Idaho Soil Conservation Commission. Once a component practice or series of component practices has been identified for a site-specific application the practice is hence referred to as a best management practice or BMP. Not all BMPs will be required for each level of management or on all acres under control of the participant. Only those combinations of BMPs necessary for water quality improvements, which are feasible to the participant, will be voluntarily implemented. The Owyhee Soil Conservation District and the Idaho Soil Conservation Commission will work with each operator that voluntarily chooses to develop a water quality plan best suited to their operation. These plans when tied to district or other cost-share programs are called water quality plans. A water quality plan is a plan developed cooperatively by the participant, technical agency, and the Soil Conservation Commission or project sponsor which identifies the critical areas and nonpoint sources of water pollution on the participant's operation and sets forth BMPs that may reduce water quality pollution from these critical areas and sources.

Critical areas are identified by the Soil Conservation Commission based on recommendations from local entities producing significant nonpoint source pollution impacts or areas deemed necessary for protection or improvement for the attainment or support of beneficial uses. A project sponsor is a conservation district, irrigation district, canal company or other agriculture or grazing interest as determined appropriate by the Soil Conservation Commission that enters into a water quality project agreement with the commission. This plan is realized through the use of a water quality contract. The water quality contract is a legal document executed by the Soil Conservation Commission or the project sponsor identifying terms and conditions between the Soil Conservation Commission or the project sponsor and an individual cost-share participant.

The estimated costs to install BMPs on agricultural lands in this plan are provided to the local community, government agencies, and watershed stakeholders to allow for some perspective on the economic demands of meeting the TMDL goals on private agricultural lands which make-up approximately 14 percent of the watershed. Availability of cost-share funds to agricultural producers will be necessary for the success of this plan and the final reduction of pollutants necessary to meet the TMDL requirements. Sources of available funding and technical assistance for the installation of BMPs on private agricultural land are outlined in Chapter Four of the Idaho Nonpoint Source Management Plan (IDEQ, 1999a). A copy of the Idaho Nonpoint Source Management Plan (IDEQ, 1999a) can be obtained from IDEQ or found at <http://www.deq.state.id.us/water/water1.htm>.

Landowners within North and Middle Fork Owyhee watershed should contact the Owyhee Soil Conservation District (Owyhee SCD), the Natural Resources Conservation Service (NRCS), or the Idaho Soil Conservation Commission (ISCC) to help determine the need to address water quality and other natural resource concerns on their land. This plan is not intended to identify which specific BMPs are appropriate for specific properties, but rather provides a subwatershed approach for addressing water quality problems attributed to agricultural lands.

Stream Priority Rating

Proper Function Condition (PFC) Assessments be completed on a voluntary basis with each private landowner. The PFC will be assessed by the landowner, technicians from the Idaho Soil Conservation Commission and Natural Resources Conservation Service, and any other person(s) of the landowner's choosing. Until investigation of functioning condition has been accurately determined for the stream segments listed in Table 8, priority for approval of projects will be determined by application date. After determination of functioning condition, priority will be determined based upon condition.

In July 2001, a PFC analysis was completed by the Idaho Soil Conservation Commission on privately held lands within the Squaw Creek drainage. The result of that analysis indicates that the stream is at proper functioning condition at a high to mid range with shrubby vegetation increasing throughout the stream. Listed concerns also included juniper encroachment in the upper watershed.

Table 8. Stream Miles Located on Private Agricultural Lands

Stream Name	Perennial Miles
Juniper Creek	5.9
Squaw Creek	4.1
Pleasant Valley Creek	2.9
North Fork Owyhee River	2.5
Cabin Creek	2.4
Corral Creek	1.6
Total Private Stream Miles	19.4

Final Implementation Plan

Draft Final Implementation Plan

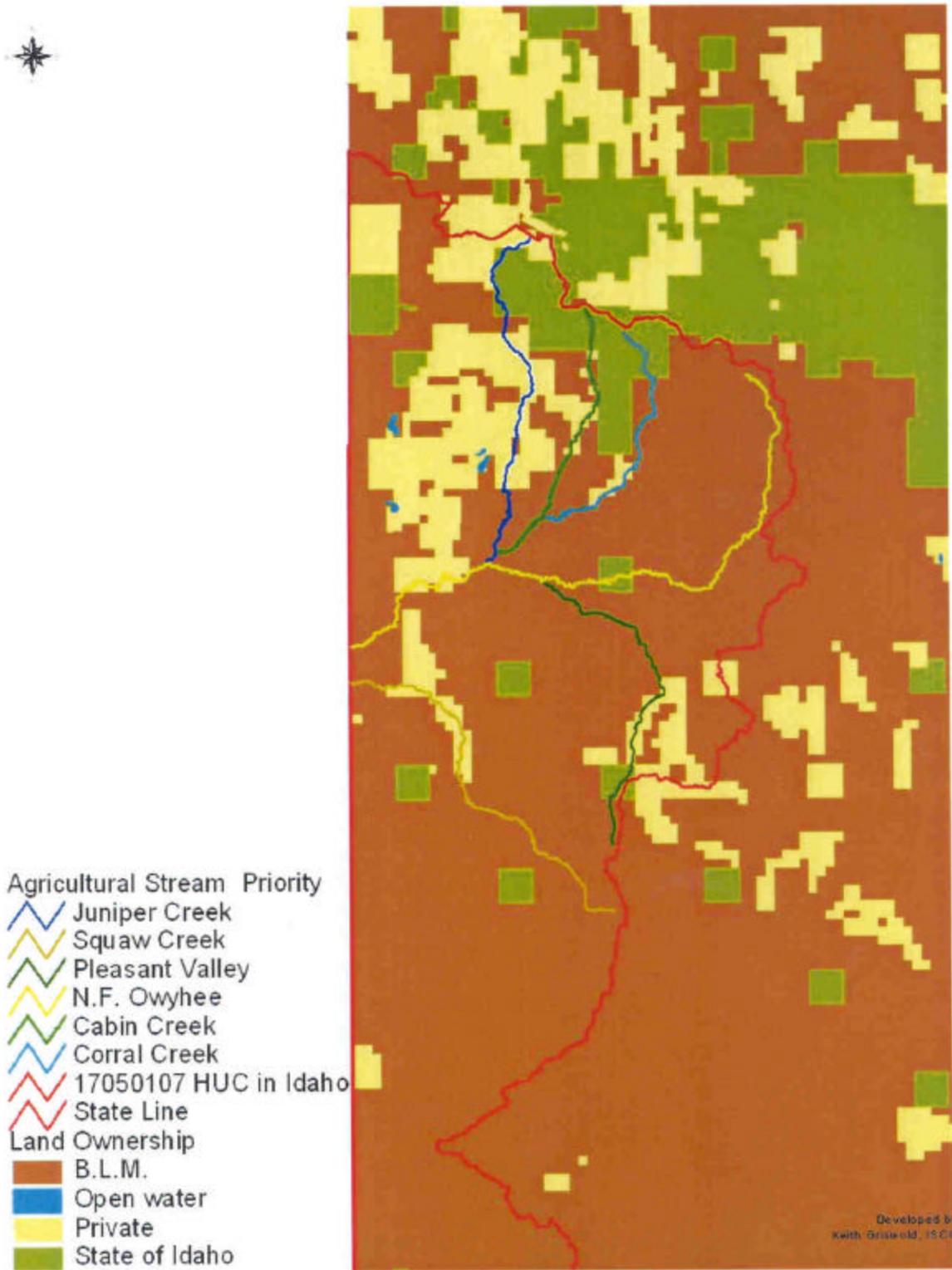


Figure 4. North and Middle Fork Owyhee Watershed Stream Priorities

Treatment Units

This section presents information on the individual agricultural land uses within the watershed. Each land use is divided into one or more Treatment Units (TUs) (Figure 5). The TUs describe areas with similar use, management, soils, productivity, resource concerns, and treatment needs. The TUs not only provide a method for delineating and describing land use but are also used in evaluating land use impacts to water quality and in the formulation of alternatives for solving the identified problems.

The descriptions in this section are intended to provide a general overview of the TUs.

- Treatment Unit #1 – Surface Irrigated Pasture/Hayland, 345 acres.
Surface irrigated pasture and hayland is present on Juniper Creek, Squaw Creek, and Pleasant Valley Creek. The water is diverted out of a waterbody and applied through ditches and surface irrigation.
- Treatment Unit #2 -- Rangeland, 33,343 acres
Rangeland pasture occurs on private lands throughout the watershed. The pastures and riparian areas vary in grass and forb health and juniper encroachment.

Implementation Plan BMPs

Agricultural conservation and soil erosion practices are typically referred to as Best Management Practices (BMPs). These practices are nationally derived systems which have been locally adapted to control, reduce, or prevent soil erosion and sedimentation and stream temperatures on agricultural landuses (APAP, 1991). The BMPs or component practices planned under this alternative are included on Tables 9 and 10. Tables 11 and 12 illustrate the types of voluntary BMPs that might be implemented based on costs and the estimated average cost of installing each site specific BMP. Not all BMPs will be required for each level of management or on all acres under the control of the participant. Only those combinations of BMPs necessary for water quality improvements, which are feasible to the participant, will be voluntarily implemented. Cost estimates shown in Table 13– 14 are based on average statewide costs as established by the ISCC/NRCS. Due to the variability in agriculture throughout the state of Idaho, the price per acre for lands within Owyhee County may vary. It should be further noted that the development of a water quality plan is site-specific to an operator or operation and must be compatible with the operation of the private lands.

In the event, that these voluntarily implemented best management practices do not restore beneficial uses or meet State of Idaho water quality standards, the SCC and the Owyhee Soil Conservation District rely on the feedback loop process described in the APAP. The feedback loop process calls for:

1. Onsite implementation of BMPs or modification of land management practices;
2. Water quality monitoring to determine BMP effectiveness;
3. Evaluation of BMP effectiveness against original criteria; and
4. Repeat steps 1-3 until beneficial uses are restored or water quality standards met.

However, if it is found that water quality standards cannot be or are not met, site-specific water quality standards may need to be developed as set forth in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.275.01).

The Owyhee SCD recognizes that private agricultural lands only constitute 14% of the watershed. Private agricultural improvements will have limited affects on reducing stream temperatures on North Fork Owyhee River, Cabin Creek and Corral Creek.

BMPs/Component Practices include, but are not limited to the following:

Table 9. Treatment Unit 1 – BMPs/Component Practices for Irrigated Hayland/Pasture

Fencing	Stream Channel Stabilization
Heavy Use Area Protection	Offsite Watering
Filter Strips	Spring Water Development
Irrigation Systems	Pasture and Hayland Planting
Planned Grazing System	Livestock Watering Facility
Pasture and Hayland Management	Riparian Buffer

Table 10. Treatment Unit 2 – BMPs/Component Practices for Rangeland Areas

Fencing	Stream Channel Stabilization
Heavy Use Area Protection	Offsite Watering
Filter Strips	Spring Water Development
Rangeland Seeding	Planned Grazing System
Livestock Watering Facility	Rangeland Management
Riparian Buffer	Brush Management

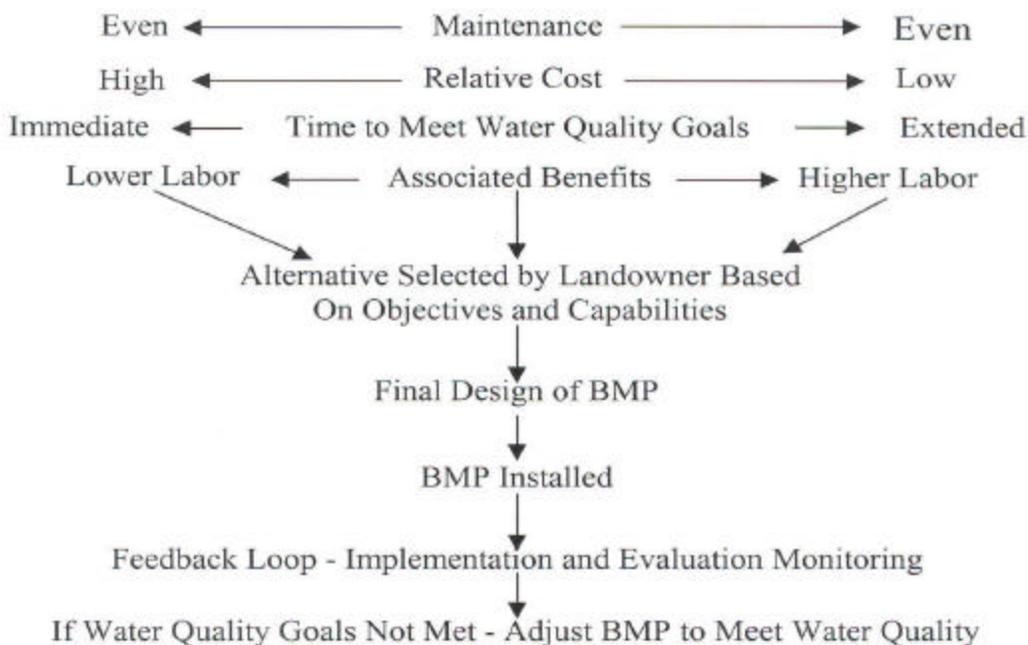
The following example illustrates a description of example alternatives for surface irrigated hayland/pasture areas under the following scenario:

Example 1 Situation: Pollutant---Temperature
 Land Use---Hayland/pasture

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

Table 11. Example of BMPs for Surface Irrigated Hayland/Pasture

Estimated High Cost BMPs/Component Practices (\$500/ acre)	Estimated Medium Cost BMPs/Component Practices (\$400/ acre)	Estimated Low Cost BMPs/Component Practices (\$325/acre)
Fencing	Fencing	Fencing
Planned Grazing System	Planned Grazing System	Nutrient Management
Nutrient Management	Nutrient Management	Filter Strip
Watering Facility	Watering Facility	Watering Facility
Irrigation Water Management	Irrigation Water Management	Irrigation Water Management
Gated Pipe	Gated Pipe	
Heavy Use Area Protection		



The following example illustrates a description of example alternatives for rangeland areas under the following scenario:

Example 3 Situation: Pollutant---Temperature
Landuse----Grazing

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

Table 12. Example of BMPs/Component Practices for Rangeland Areas

Estimated High Cost BMPs/Component Practices (\$60/ acre)	Estimated Medium Cost BMPs/Component Practices (\$45/ acre)	Estimated Low Cost BMPs/Component Practices (\$25/ acre)
Fencing	Fencing	Fencing
Brush Management	Grazing Management System	Grazing Management System
Rangeland Seeding	Livestock Watering Facility	Livestock Watering Facility
Livestock Watering Facility	Brush Management	
Grazing Management System		

Land treatment through the voluntary application of a combination of structural, nutrient and sediment control systems, and management practices where necessary will reduce water quality degradation of North and Middle Fork Owyhee watershed.

Alternative Elements

The state of Idaho has adopted the non-regulatory approach of getting nonpoint source landowners to help meet water quality goals. If a non-regulatory approach does not succeed in abating the pollutant problem, the state may seek injunctive relief for those situations that may be determined to be an imminent and substantial danger to public health or environment (IDAPA 16.01.01.350.02(a)).

BMP application to the critical acres will be variable, depending on the need for water quality improvements. The BMPs needed for any resource and water quality improvements will be presented to the participant with an incentive to adopt higher management level BMPs above what is required to participate.

However, if it is found that water quality standards cannot be or are not met, site-specific water quality standards may need to be developed as set forth in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.275.01).

Installation and Financing

Landowners can enter into voluntary water quality contracts with the Owyhee SCD to reduce out of pocket expenses to implement water quality related BMPs that will address the North and Middle Fork Owyhee TMDL Implementation Plan’s voluntary participation. The USDA Natural Resources Conservation Service (NRCS) is the technical agency that will assist the Idaho Soil Conservation Commission (ISCC) and Owyhee SCD in developing voluntary water quality plans and designs that meet NRCS standards and specifications contained in the NRCS Field Office Technical Guide (USDA, 1999). These plans when tied to district or other cost-share programs are called water quality plans. A water quality plan is a timeline that describes when BMPs will be installed, within the voluntary water quality contract developed by the Owyhee SCD. However, the NRCS and ISCC will provide the same level of technical assistance in the development of a resource management plan or “water quality plan” to landowners regardless of their intent to pursue or not pursue cost-share. NRCS and

ISCC will assist Owyhee SCD with certification of installed BMPs, filing payment applications, completion of annual status reviews on water quality contracts, annual development of an average cost list, and will provide any needed follow-up assistance such as that required for water quality contract modification.

Each participant or project sponsor will be responsible for installing the BMPs scheduled within their water quality contract as planned in the water quality plan. Any needed land rights, easements or permits necessary for construction and inspection will be the sole responsibility of the participant. Each participant will also be required to make their own arrangements for financing their share of installation costs. Tables 13 and through 14 illustrate the estimated costs associated with implementing each alternative.

Table 13. Estimated BMP Costs for Treatment Unit 1

Alternative	Acres	Total Costs
High Cost BMPs - \$500/Acre	345	\$172,500
Medium Cost BMPs - \$400/Acre	345	\$138,000
Low Cost BMPs - \$325/Acre	345	\$112,125

Table 14. Estimated BMP Cost for Treatment Unit 2

Alternative	Acres	Total Costs
High Cost BMPs - \$60/Acre	33,114	\$2,000,580
Medium Cost BMPs - \$45/Acre	33,114	\$1,500,435
Low Cost BMPs - \$25 Acres	33,114	\$833,575

Operation, Maintenance, and Replacement

Participants will be required to maintain the installed BMPs for the life of their voluntary water quality contract. The water quality contract will outline the responsibility of the participant regarding operation and maintenance (O&M) for each BMP. The NRCS and ISCC will provide technical assistance for the installation of BMPs.

Inspections of installed BMPs will be made on an annual basis by Owyhee SCD, NRCS, ISCC and the participant during the life of the water quality contract. The intent is to develop a system of BMPs that will protect water quality and is socially and economically feasible to the participant. By accomplishing this objective, it is intended that the BMPs will become a part of the participant's farming operation and will continue to be operated and maintained after the water quality contract expires.

Private Agricultural - Tasks

Task 1: Contact private landowners in relationship to completion of Proper Functioning Condition Assessment on all agricultural lands on §303(d) listed streams.

Milestone 1: October 2001

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 2: Complete Proper Functioning Condition Assessment on all agricultural lands on §303(d) listed streams.

Milestone 2: October 2003

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 3: Develop water quality plan and water quality contracts on 66% of Treatment Unit 1 Lands and 50% of Treatment Unit 2 Lands for private agriculture lands

Milestone 3: October 2003

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources
Conservation Service

Task 4: Start implementing water quality contracts on private agriculture lands

Milestone 4: October 2004

Responsible Agency: Private land Owners

Task 5: Develop water quality plan and water quality contracts on remainder
of Treatment Unit 1 Lands and Treatment Unit 2 Lands for private
agriculture lands

Milestone 5: October 2005

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources
Conservation Service

Task 6: Continue implementing water quality contracts on private agriculture
lands

Milestone 6: October 2006

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources
Conservation Service

Task 7: Perform annual status review on BMPs installed on private agricultural
land

Milestone 7: In association with individual water quality contracts

Responsible Agency: Idaho Soil Conservation Commission & Owyhee Soil Conservation
District

Goals and Objectives for Federal Lands

To comply with the Clean Water Act and protect and enhance the quality of the surface and ground water in the North and Middle Fork Owyhee River subbasins, BLM is responsible for developing detailed range management plans that authorize livestock grazing on Federal lands, while meeting State Water Quality Standards criteria in the North and Middle Fork Owyhee River.

Federal grazing regulations require that the BLM determine if grazing related management practices are achieving Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing (USDI, 1997) or are making significant progress toward their achievement, and conform with the Guidelines for Livestock Grazing Management (Code of Federal Regulations, Section 4180). Standards for Rangeland Health for Idaho include a standard for Water Quality (Standard 7), which states surface and ground water on public lands comply with the State of Idaho Water Quality Standards and Wastewater Treatment Requirements IDEQ, 1996a. BLM policy states that assessments for standards of rangeland health (Assessments) will be completed for all grazing allotments on Federal lands over the next 7 years.

BLM authorizes livestock grazing on Federal lands encompassing 19 grazing allotments in the North Fork Owyhee River watershed. However, only 8 of these allotments include

substantial amounts of Federal land (Table 15). BLM authorizes livestock grazing on three large grazing allotments within the Middle Fork Watershed (Table 15). Livestock grazing may have the potential to impact water quality on Federal lands where BLM authorizes livestock grazing (Table 15).

The assessments for Standards of Rangeland Health are scheduled to be completed by 2002 for all Federal-grazing allotments within the Middle and North Fork of the Owyhee River subbasins (Table 15). Assessments have already been completed for 2 grazing allotments located in the North Fork Owyhee watershed: Cliffs, and Anderson FFR (USDI, 1999b and 2000a). The Assessments scheduled for 2001-02 will include evaluations of current water quality conditions and compliance with State of Idaho water quality criteria. Grazing on BLM allotments will be revised based on the findings of the Rangeland Health Assessments. The Environmental Assessments (EAs) (USDI, 1999 and 2000b) analyzing alternatives to modifying the grazing permits will include Water Quality Restoration Plans (WQRP) that outline the Best Management Practices that will be used to address nonpoint source pollution. The WQRPs also specify monitoring that will be conducted to evaluate the effectiveness of prescribed BMPs in improving water quality. Any changes to range management on allotments in the subbasins (ie. implementation of BMPs) will be formalized through the issuance of proposed and final decisions that modify the existing permits authorizing livestock grazing on Federal lands. BLM will also review the encroachment of western juniper into sagebrush-grass sites within various grazing allotments or as part of larger watershed recovery efforts and will implement management strategies related to western juniper encroachment on a site-specific basis as necessary. Additionally, the BLM has recently hired a fuel specialist to identify areas within the subbasins for potential western juniper eradication using prescribed fire and is in the process of developing such plans.

Table 15. Grazing allotments in the North Fork and Middle Fork Owyhee River Subbasins where BLM authorizes livestock grazing and scheduled date for completion of Assessment for Standards of Rangeland Health.

Allotment Number	Allotment Name	Federal Land Acreage ¹	Potential to Impact Water Quality	Year Assessment to be Completed
North Fork Watershed				
0453	Hanley FFR	63	Low	2001
0454	Anderson FFR	524	Low	Completed
0455	Payne FFR	97	Low	2001
0456	Dougal FFR	873	Low	2002
0457	McKay FFR	26	Low	2002
0470	Stanford FFR	40	Low	2002

Allotment Number	Allotment Name	Federal Land Acreage ¹	Potential to Impact Water Quality	Year Assessment to be Completed
0473	Lequerica FFR	129	Moderate	2002
0501	Cliffs	20,978	High	Completed
0520	Indian Meadows	1,600	High	2002
0536	South Dougal	4,194	Moderate	2002
0537	Wilson Creek FFR	810	Moderate	2002
0543	Stanford FFR	93	Low	2002
0548	Nickel Creek	3,200	High	2002
0559	Sheep Creek	614	Moderate	2002
0561	South Mountain Area	6,083	High	2002
0591	Corta	6,957	Moderate	2002
0546	Pleasant Valley	12,073	High	2001
0547	Pleasant Valley FFR	1,771	Moderate	2001
0611	Squaw Creek FFR	602	Moderate	2001
Middle Fork Watershed				
0539	Trout Springs ²	29,690	High	2001
0540	Bull Basin	49,994	High	2001
0635	Pole Creek	23,395	High	2001

¹ Portion of the allotment that is located within the North Fork or Middle Fork Owyhee River watershed.

² The headwaters of the Middle Fork Owyhee are located within the Trout Springs allotment, but the majority of the allotment is within the North Fork subbasin.

BMPs and/or component practices that typically have been applied to address impacts to water quality resulting from BLM authorized livestock grazing include, but are not limited to:

- Development of offsite water;
- Limiting of livestock utilization of streamside and floodplain vegetation;
- Fencing to modify or exclude livestock use of riparian and aquatic habitats;
- Development of detailed range management plans that change seasons of use, or

- Prescribed rest or deferment for pastures that contains riparian/aquatic habitat (IDEQ-IDL-ISCC, 1991).

In general, emphasis is placed on range management plans that modify grazing practices to conform to Guidelines for Livestock Grazing Management, while not requiring large expenditures on projects such as fencing, and/or water developments. The extensive amount of stream mileage and rugged terrain where these allotments are located may make certain projects cost prohibitive. An additional management constraint is that significant portions of the subbasins encompass Wilderness Study Areas, which can limit the type and extent of management projects on Federal lands.

Recent examples of grazing management plans written by BLM to address water quality concerns include the issuance of the Cliffs Allotment Grazing Permit (Environmental Assessment [EA] No. ID-015-00024) and the Northwest Allotment Grazing Permit (EA No. ID-096-01-015). Both of these Environmental Assessments include detailed Water Quality Restoration Plans (USDI, 2000a, 2000b) for addressing non-point source pollution impacts resulting from BLM authorized livestock grazing.

Monitoring Plan

Water Quality Restoration Plans prepared as part of the issuance of each grazing permit include monitoring plans for evaluating the success of management actions in improving water quality of listed §303(d) streams. As part of the best management practice's feedback-loop process, stream temperatures will be monitored at 5-year intervals, or as deemed necessary, to evaluate changes in water temperature with improved stream shading and channel morphology.

The BLM will also conduct greenline plant community composition studies to evaluate the change in the plant community composition along the greenline of the stream. The greenline is the first continuous band of perennial vegetation located up from the stable low water level of the stream (Cowley, 1992). Greenline plant community composition and cover will be monitored every 5 years to evaluate the trend in streamside vegetation. Bacteria levels (E. coli concentrations) will be monitored periodically to evaluate changes in bacteria levels with improved streambank and channel conditions (resulting in reduced sediment and bacteria inputs).

Additionally, if it is found that water quality standards cannot be or are not met, site-specific water quality standards may need to be developed as set forth in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.275.01).

Federal Land Management - Tasks

- Task 1: Complete Allotment Assessments for grazing allotments located in the N. Fork and M. Fork watersheds on or before the schedule developed to comply with the BLM policy and regulations (see Table 15).
- Milestones: December 2000 for 2 allotments in the North Fork watershed
December 2001 for 8 allotments (5 in the N. Fork, 3 in the M. Fork)
December 2002 for the remaining 12 allotments in the N. Fork subbasin

Responsible Agency: U.S. Bureau of Land Management

Task 2: Prepare Water Quality Restoration Plans for §303(d) listed streams on all grazing allotments within the N. Fork and M. Fork watersheds

Milestones: December 2000 for 2 allotments in the North Fork watershed
December 2001 for 8 allotments (5 in the N. Fork, 3 in the M. Fork)
December 2002 for the remaining 12 allotments in the N. Fork subbasin

Responsible Agency: U.S. Bureau of Land Management

Task 3. Issue new grazing permits that include Best Management Practices (BMPs) identified to improve/restore water quality of streams within grazing allotments where BLM authorizes livestock grazing on public lands

Milestones: December 2000 for 2 allotments in the North Fork watershed
December 2001 for 8 allotments (5 in the N. Fork, 3 in the M. Fork)
March 2003 for the remaining 12 allotments in the N. Fork subbasin

Responsible Agency: U.S. Bureau of Land Management

Task 4. Monitor livestock use levels of riparian herbaceous vegetation and woody shrubs on §303(d) listed streams on public lands where BLM authorizes livestock grazing

Milestones: Annually, generally at the end of the grazing or growing season

Responsible Agency: U.S. Bureau of Land Management

Task 5. Monitor effectiveness of Best Management Practices (BMPs) implemented to improve/restore water quality of §303(d) listed streams on public lands managed by BLM in the N. Fork and M. Fork subbasins

Milestones: Every 5 years following the issuance of new grazing permits that include BMPs examine trend in streamside plant community composition, and plant density and vigor

Responsible Agency: U.S. Bureau of Land Management

Task 6. Evaluate compliance with State of Idaho Water Quality Criteria in streams on public lands where BLM authorizes livestock grazing

Milestones: Minimally every 5 years, or more often as deemed necessary

Responsible Agency: U.S. Bureau of Land Management, Idaho Division of Environmental Quality

Goals and Objectives for State Lands

To protect and enhance both the quality of the surface and ground water in the North and Middle Fork Owyhee River subbasins by developing detailed grazing implementation plans to meet State Water Quality Standards on the North and Middle Fork Owyhee River. Additionally, the State lands are to be administered to maximize revenues overtime to the State Endowment Fund for the beneficiary institutions consistent with sound long-term management practices on land capabilities. The IDL is responsible for developing detailed grazing management plans that address water quality issues on State lands pursuant to the

State Endowment Fund and provide for protection or restoration of beneficial uses and which meet State Water Quality Standards and Wastewater Treatment Requirements (IDEQ, 1996a) criteria.

The IDL has completed assessments for State lands within the subbasins (Table 16). Based on the findings of the IDL assessments, the IDL will develop water quality restoration plans for all state lands in the impaired watershed. The water quality restoration plans will analyze alternatives to modifying the leases such that water quality standards will be achieved. The IDL shall use the BMPs outlined in the Idaho Agricultural Pollution Abatement Plan (IDEQ, IDL, SCC, 1991) to address nonpoint pollution. The completed water quality restoration plan will also include specific monitoring requirements to be completed by IDL to evaluate the effectiveness of prescribed component practices or BMPs in improving water quality as defined in the Idaho Nonpoint Source Management Plan (IDEQ, 1999a) feedback loop process.

Table 16. State Grazing allotments in the North Fork and Middle Fork Owyhee River Subbasins where IDL authorizes livestock grazing and review schedule.

Allotment No.	Allotment Name	Acres	Review Schedule (State Land)
0501	Cliffs	390	Completed
0561	South Mountain	7,498	Completed
0546	Pleasant Valley	1,530	Completed
0635	Pole Creek	640	Completed
0629	45 Allotment	1,280	Completed
006	Tent Creek	640	Completed
0456	Dougal	520	Completed
0591	South Mountain Grazing Cooperative	1,259	Completed
0520	Indian Meadows	212	2001
0559	Sheep Creek	8	2001
0536	South Dougal	8	2001

State Lands - Tasks

Task 1: Prepare grazing management plans on State Allotments so that water quality standards will be met within a reasonable length of time.

Milestones: 90-days following the completion Review Schedule listed in Table 16.

Responsible Agency: Idaho Department of Lands

Task 2. Implement grazing management plans on State grazing allotments

Milestones: Next grazing year following development of conservation plan of operation

Responsible Agency: Idaho Department of Lands

Task 3. Perform BMP/Grazing review of State grazing allotments

Milestones: Annually in September.

Responsible Agency: Idaho Department of Lands

Task 4. Develop and implement site specific monitoring of State grazing allotments

Milestones: Annually

Responsible Agency: Idaho Department of Lands

Miscellaneous Goals and Objectives

As best management practices are implemented and grazing practices revised which should lead to improved water quality on listed §303(d) water bodies the participants within the subbasin should take the opportunity to showcase these efforts. One of the most effective ways to do this is to provide for watershed level fieldtrips on an annual or biennial basis.

These fieldtrips give the private landowner as well as the designated agencies the opportunity to demonstrate how revised land use practices are improving water quality. As such it is recommended that the Middle Fork Owyhee Watershed in conjunction with the designated agencies take the opportunity to plan such outings.

Task 1: Develop fieldtrip to showcase the proper installation and maintenance of best management practices.

Milestone 1: Biennially

Responsible Agency or Entity: Middle Fork Owyhee Watershed, Idaho Department of Environmental Quality, Idaho Department of Lands, Idaho Soil Conservation Commission, Bureau of Land Management

Output 1: Documentation of BMPs necessary to improve water quality.

Task 2: Triennial review of the Implementation Plan to determine if changes or modification are needed to the implementation schedule or activities until water quality standards have been achieved.

Milestone 2: Triennially

Responsible Agency or Entity: Idaho Department of Environmental Quality, Idaho Department of Lands, Idaho Soil Conservation Commission, Bureau of Land Management, and North and Middle Fork Owyhee WAG

Output 2: Published report.

Monitoring

Under Idaho Code §39-3621, the designated agencies, in cooperation with the appropriate land management agency and the Department of Environmental Quality shall ensure that best management practices are monitored for their effect on water quality. Whenever possible and to the extent practical the designated land management agencies should coordinate monitoring efforts to minimize individual expenses and maximize data collection. This effort should include the adoption and use of the same monitoring protocols whenever possible.

As the state designated agency for water quality, the IDEQ will continue to utilize the BURP monitoring and Waterbody Assessment process to determine overall improvements to the subbasins and to determine when all beneficial uses and water quality standards are being fully attained. All monitoring should follow documents procedures in the monitoring feedback loop process. This process calls for:

1. Onsite implementation of BMPs or modification of land management practices;
2. Water quality monitoring to determine BMP effectiveness;

3. Evaluation of BMP effectiveness against original criteria; and
4. Repeat steps 1-3 until beneficial uses are restored or water quality standards met.

Funding for effectiveness monitoring can be both time consuming and expensive with the cost of the monitoring in some cases exceeding the best management practice implementation cost. While IDEQ will continue to fund its BURP monitoring program, IDEQ does not have available funding for individual best management effectiveness monitoring. As such, the Idaho Soil Conservation Commission in conjunction with the Idaho State Department of Agriculture will be responsible for developing, funding and implementing a best management practices monitoring plan for North and Middle Fork Owyhee watershed as outlined in the Agricultural Pollution Abatement Plan (IDEQ, IDL, SCC, 1991) monitoring feedback loop process. Coincidentally, the Bureau of Land Management and the Idaho Department of Lands will also need to develop, fund and implement monitoring plans to ensure that installed best management practices or revisions to resource uses will be able to achieve the desired water quality benefits.

Private Monitoring

Data are the foundation of the IDEQ assessment processes as outlined in the Waterbody Assessment Guidance. This process was designed primarily to assess BURP data, but IDEQ also considers existing and readily available data from other sources. The data used in the assessment process may be from other agencies, institutions, commercial interests, interest groups, or individuals and may relate to the existence, support status, or associated criteria for the beneficial uses in a water body.

IDEQ uses a multi-layered approach to provide consistent weighting and consideration of various types of data. The data must pass scientific rigor concerning the extent that scientific methods are used to collect and analyze data and encompass quality assurance, quality control, training, level of expertise, and other protocols. In certain instances, staff from IDEQ is available to provide training in relation to data collection and equipment calibration.

IDEQ categorizes data into three levels of scientific rigor with more weight given to data with a higher level of scientific rigor. Data must be relevant as well as scientifically rigorous to be incorporated into the assessment process. Data relevance concerns data type and the data's association with beneficial uses, water quality criteria, or causes of impairment. Additionally, IDEQ considers data representation information, such as when and where sampling occurred. If predictive modeling is used, IDEQ also examines calibration factors. The description, examples, and incorporation of data tiers are listed in Table 17.

Table 17. Tiered Data Collection

Level	Scientific Rigor	Relevance	Example	How Used
I	<ul style="list-style-type: none"> Quantitative. Parameters measured. In-stream focus. Established monitoring plan with QA/QC and defined protocols. >30 hours of supervised training. Samples processed in EPA-certified lab or by professional taxonomist. 	<ul style="list-style-type: none"> Data relates to either water quality standard(s) or beneficial use. 5 years old. Data relates to a named water body (GIS, latitude and longitude or map location provided). 	<ul style="list-style-type: none"> Ph.D. or masters thesis. Published or printed studies or reports. Published predictive models. U.S. EPA EMAP. 	<ul style="list-style-type: none"> Data may be used in 303(d) listing or de-listing, 305(b) reports, subbasin assessments, or TMDLs.
II	<ul style="list-style-type: none"> Qualitative or semi-quantitative in nature. May have a monitoring plan. No QA/QC provided for within plan. Protocols may or may not be defined. Parameters rated. Field staff may not be trained: Lab may not be certified. Taxonomist may not be a professional. 	<ul style="list-style-type: none"> Data may relate to a watershed. Not water body specific. Data >5 years old. Data may relate to other agency guidelines or objectives. 	<ul style="list-style-type: none"> Environmental assessments. PFC. IDL CWE. Most citizen monitoring. Models with documentation. 	<ul style="list-style-type: none"> 305(b) reports. May be used for subbasin assessments or TMDLs when data adds to overall assessment quality.
III	<ul style="list-style-type: none"> May be qualitative in nature. Parameters evaluated. Field staff have little to no training. No documented monitoring plan. No QA/QC. Anecdotal in nature. 	<ul style="list-style-type: none"> Not specific to water quality standards or beneficial uses. Location not specific. Data 10 years old. 	<ul style="list-style-type: none"> Non-specific reports or studies. Newspaper articles. Simple models without any documentation. 	<ul style="list-style-type: none"> Planning for future monitoring. Hold for further investigations.

In any event, when data is collected, it shall be collected using standard protocols and technical references such as, but not limited to the following documents:

- IDEQ Beneficial Use Reconnaissance Manual;
- Bureau of Land Management - A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas; and
- Standard Methods for the Examination of Water and Wastewater.

Funding of Best Management Practices

Costs estimates relative to each of the designated agency responsibilities need to be estimated as individual water quality plan for private agricultural lands, grazing management plans for state lands, or water quality restoration plans for federal land are completed. As always,

funding issues and the availability of funding to implement best management practices is of concern. Much of the available funds that can be used to implement this plan are available annually on a first-come first-serve basis or through a competitive review and ranking process. Chapter Four of the Idaho Nonpoint Source Management Plan (IDEQ, 1999a) contains a fairly substantial listing of potentially available funding sources and cooperating agencies for use in the implementation of best management practices and includes several of the programs which could possibly be used as potential implementation funding sources:

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

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

- *§319 (h)...Nonpoint Source Grants, EPA/IDEQ*

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

- *Aquatic Ecosystem Restoration, CoE*

Section 206 of the Water Resources Development Act of 1996, provides financial assistance for aquatic and associated riparian and wetland ecosystem restoration and protection projects that will improve the quality of the environment. There is no requirement for an aquatic ecosystem project to be linked to a Corp of Engineers project. The program does require that a non-federal interest provide 35% of construction costs, including all lands, easements, right-of-ways and necessary relocations. The program also requires that 100% of the operation, maintenance, replacement, and rehabilitation be borne by the non-federal interest. The program limits the amount of federal assistance to \$5 million for any single project.

- *Challenge Cost-share Program, BLM*

This program provides 50% cost-share monies on fish, wildlife, and riparian enhancement projects to non-federal entities.

- *Conservation Operations Program (CO-01), NRCS*

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

- *Conservation Research and Education, NRCS*

The Conservation Research and Education program was created through the 1996 Farm Bill and is administered by the National Natural Resources Conservation Foundation. The purpose of the program is to fund research and educational activities related to conservation on private lands through public-private partnerships.

- *Conservation Reserve Program (CRP), NRCS*

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

- *Conservation Technical Assistance (CTA), NRCS*

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

- *Environmental Quality Incentives Program (EQIP), NRCS*

EQIP is a program based on the 1996 Farm Bill legislation and combines the functions of the Agricultural Conservation Program, Water Quality Incentives Programs, Great Plains Conservation Program, and the Colorado River Basin Salinity Control Program. EQIP offers technical assistance, and cost share monies to landowners for the establishment of a five to ten year conservation agreement activities such as manure management, pest management, and erosion control. This program gives special consideration to contracts in those areas where agricultural improvements will help meet water quality objectives.

- *Environmental Restoration, CoE*

Section 1135 of the Water Resources Development Act of 1986 provides for modifying the structure, operation, or connected influences or impacts from a Corp of Engineer project to restore fish and wildlife habitat. The project must result in the implementation or change from existing conditions, and the project benefits must be associated primarily with restoring historic fish and wildlife resources. Though recreation cannot be the primary reason for the modification, an increase in recreation may be one measure of value in the improvement to fish and wildlife resources. The program requires a non-federal sponsor which can include public agencies, private interest groups, and large national nonprofit organizations such as Ducks Unlimited or the Nature Conservancy. Operation and maintenance associated with the project modifications are the responsibility of the non-federal sponsor. Planning studies, detailed design, and construction are cost shared at a 75% federal and 25% non-federal rate. No more than \$5 million in federal funds may be spent at a single location.

- *Farm Services Agency Direct Loan Program, FSA*

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

- *Hydrologic Unit Areas (HUAs), NRCS*

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

- *Idaho Riparian Tax Credit (RTC) (Idaho Code § 63-3024B), Interagency State Tax Commission*

The purpose of RTC program is to provide a public and private partnership for the improvement, repair, and rehabilitation of forest, range, and farm lands. Through tax incentives, landowners are encouraged to fence, set aside, or otherwise improve lands to enhance riparian health.

- *Idaho Water Resources Board Financial Programs, IDWR*

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

- *National Conservation Buffer Initiative, NRCS*

The National Conservation Buffer Initiative program provides cost-share funds in an effort to use grasses and trees as conservation buffers to protect and enhance riparian resources on farms. This program will be an integral part of TMDL/WRAS implementation planning to ensure land management practices are moved away from streams and riparian areas.

- *Planning Assistance, CoE*

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

- *Range Improvement Fund - 8100, BLM*

This program focuses on improving rangeland management conditions, including the implementation of best management practices. A portion of the money to operate the program comes from the grazing fees paid by permittees.

- *Small Watersheds (PL-566), NRCS*

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

- *Partners for Wildlife (Partners), USFWS*

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

- *Pheasants Forever*

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

- *Resource Conservation and Development (RC&D), NRCS*

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

- *Resource Conservation and Rangeland Development Program (RCRDP), SCC*

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

- *State Agricultural Water Quality Program (SAWQP), (1980-1999); Water Quality Cost-Share Program for Agriculture, SCC/ISDA*

SAWQP was the primary state planning and implementation program from 1980 through 1999. The state replaced SAWQP in 1999 with a new agricultural water quality incentive program, under the direction of the SCC as the designated agency for agriculture and grazing, which focuses more directly on implementation of agricultural TMDL plans. Where appropriate, state and federal incentive programs are integrated through the scoping process in the planning phase to maximize nonpoint source water quality protection for agricultural activities (see Introduction-Historical and Chapter 2).

- *State Revolving Fund (SRF), IDEQ*

The IDEQ Grant and Loan Program administers the State Revolving Fund. The purpose of the program is to provide a perpetually revolving source of low interest loans to municipalities for design and construction of sewage collection and treatment facilities to correct public health hazards or abate pollution. State Revolving Loan funds are also used to support the Source Water Assessment Program. The Grant and Loan Program uses a priority rating form to rank all projects primarily on the basis of public health, compliance, and affordability. Additional points are awarded to projects that have completed a source water assessment and are maintaining a protection area around their source.

At this time, IDEQ is reviewing the SRF program for its ability to provide for an expanded role in addressing NPS pollution.

- *Stewardship Incentives Program (SIP), IDL*
SIP provides technical and financial assistance to encourage non-industrial private landowners to keep their lands and natural resources productive and healthy. Qualifying land includes rural lands with existing tree cover or land suitable for growing trees. Eligible landowners must have an approved Forest Stewardship Plan and own less than 1,000 acres.
- *Wetlands Reserve Program (WRP), NRCS*
WRP was established to help landowners work toward the goal of "no net loss" of wetlands. This program provides landowners the opportunity to establish 30-year or permanent conservation easements, and cost-share agreements for landowners willing to provide wetlands restoration.
- *Wildlife Habitat Incentive Program (WHIP), NRCS*
WHIP was established to help landowners improve habitat on private lands by providing cost-share monies for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife. Additionally, cost share agreements developed under WHIP require a minimum 10-year contract.

Reasonable Assurance

The IDEQ developed a TMDL guidance document (IDEQ, 1999c) for the preparation of TMDLs. In the document IDEQ addresses the need for reasonable assurance and the document states that

“EPA coined the phrase reasonable assurance in its April 1991 guidance document on TMDLs: Guidance for Water Quality-based Decisions: The TMDL Process. Reasonable assurance applies only to situations in which load reductions necessary to meet the load capacity for a particular pollutant are split among both point and non-point sources. The Clean Water Act provides for certain control through enforcement of point sources, but leaves non-point source control to states through largely incentive based mechanisms. Therefore EPA feels assured point source load reductions will happen, and are inclined, in mixed source situations, to require all necessary reduction in a pollutants load come from the point sources alone, unless there are reasonable assurances that the non-point sources reduction will indeed be achieved.

Idaho has an EPA approved Nonpoint Source Management Plan which includes certification by the attorney general that adequate authorities exist to implement the plan. Idaho’s water quality rules (IDAPA 16.01.02.350) state that current best management practices will be evaluated and modified by the appropriate designated agencies if found to be inadequate to protect water quality. In addition, if necessary, injunctive or other judicial relief may be sought against the operator of a nonpoint source activity in accordance with the DEQ Director’s authorities provided by Idaho Code 39-108. The DEQ believes these provide all the assurance that is reasonable and necessary for any mixed source TMDL.” Additionally, if it is found that water quality standards cannot be or are not met, site-specific water quality standards may need to be developed as set forth in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.275.01).

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

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

The revised Idaho Nonpoint Source Management Program Plan provides that best management practices should be reviewed via the nonpoint source feedback loop process. Since the expected long-term results based on the application of best management practices related to temperature have not been widely studied in Idaho it is difficult to predict when all applicable water quality standards and beneficial uses will be met. However, a project in a similar arid environment located in the Bear Creek drainage of central Oregon has been in place for approximately twenty-four years. To date, the Bear Creek project has made the following improvements:

- Improvements in water quality;
- Increased stream sinuosity;
- Increased storage of water from 500,000 to 4,000,000 gallons per mile;
- Return of trout to the affected reach;
- Improved the production of forage along the riparian zone by 30-fold; and
- Increased availability for cattle grazing from 75 to 354 animal unit months.

Using the Bear Creek project (Elmore, 1998) as an example, it is estimated that full restoration may not occur in the North and Middle Fork Owyhee drainages for at least 20 years, if not longer. However, if after the application of all knowledgeable and reasonable best management practices and a reasonable period of time for the best management practices to become fully established it is found that water quality standards cannot be or are not met, site-specific water quality standards may need to be developed as set forth in the Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.275.01).

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Glossary of Terms and Acronyms

Aquifer - A water-bearing bed or stratum of permeable rock, sand, or gravel capable of yielding considerable quantities of water to wells or springs.

Antidegradation - A Federal regulation requiring the States to protect high quality waters. Water Quality Standards may be lowered to allow important social or economic development only after adequate public participation. In all instances, the existing beneficial uses must be maintained.

Aquatic - Growing, living, or frequenting water.

Assimilative Capacity - An estimate of the amount of pollutants that can be discharged to a water body and still meet the state water quality standards. It is the equivalent of the Loading Capacity, which is the equivalent of the TMDL for the water body.

Bedload - Sand, silt, gravel, or soil and rock detritus carried by a stream on or immediately above (3") its bed.

Beneficial Use - Any of the various uses which may be made of the water of an area, including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics.

Best Management Practice (BMP) - A measure determined to be the most effective, practical means of preventing or reducing pollution inputs from point or nonpoint sources in order to achieve water quality goals.

Biomass - The weight of biological matter. Standing crop is the amount of biomass (e.g., fish or algae) in a body of water at a given time. Often measured in terms of grams per square meter of surface.

Biota - All plant and animal species occurring in a specified area.

Coliform bacteria - A group of bacteria predominantly inhabiting the intestines of man and animal but also found in soil. While harmless themselves, coliform bacteria are commonly used as indicators of the possible presence of pathogenic organisms.

Critical Areas - Areas identified by the commission based on recommendations from local entities producing significant nonpoint source pollution impacts or areas deemed necessary for protection or improvement for the attainment or support of beneficial uses.

Designated Beneficial Use or Designated Use - Those beneficial uses assigned to identified waters in Idaho Department of Health and Welfare Rules, Title 1, Chapter 2, "Water Quality Standards and Wastewater Treatment Requirements:", Sections 110. through 160. and 299., whether or not the uses are being attained.

Erosion - The wearing away of areas of the earth's surface by water, wind, ice, and other forces.

Existing Beneficial Use or Existing Use - Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58).

Exotic Species - Non-native or introduced species.

Feedback Loop - A component of a watershed management plan strategy that provides for accountability on targeted watershed goals.

Flow - The water that passes a given point in some time increment.

Groundwater - Water found beneath the soil's surface; saturates the stratum at which it is located; often connected to surface water.

Habitat - A specific type of place that is occupied by an organism, a population or a community.

Headwater - The origin or beginning of a stream.

Hydrologic basin - The area of land drained by a river system, a reach of a river and its tributaries in that reach, a closed basin, or a group of streams forming a drainage area. There are six basins described in the Nutrient management Act (NMA) for Idaho -- Panhandle, Clearwater, Salmon, Southwest, Upper Snake, and the Bear Basins.

Hydrologic cycle - The circular flow or cycling of water from the atmosphere to the earth (precipitation) and back to the atmosphere (evaporation and plant transpiration). Runoff, surface water, groundwater, and water infiltrated in soils are all part of the hydrologic cycle.

Intermittent Waters – A stream, reach, or waterbody which has a period of zero (0) flow for at least one (1) week during most years. Where flow records are available, a stream with a 7Q2 hydrologically-based flow of less than one-tenth (0.1) cfs is considered intermittent. Streams with natural perennial pools containing significant aquatic life uses are not intermittent.

Irrigation Water Management (IWM) - IWM involves providing the correct amount of water at the right times to optimize crop yields, while at the same time protecting the environment from excess surface runoff. Irrigation water management includes techniques to manage irrigation system hardware for peak uniformity and efficiency as well as irrigation scheduling and soil moisture-monitoring methods.

LA - Load Allocation for nonpoint sources.

Limiting - A chemical or physical condition that determines the growth potential of an organism, can result in less than maximum or complete inhibition of growth, typically results in less than maximum growth rates.

Load Allocation - The amount of pollutant that nonpoint sources can release to a water body.

Loading - The quantity of a substance entering a receiving stream, usually expressed in pounds (kilograms) per day or tons per month. Loading is calculated from flow (discharge) and concentration.

Loading Capacity - A mechanism for determining how much pollutant a water body can safely assimilate without violating state water quality standards. It is also the equivalent of a TMDL.

Macro invertebrates - Aquatic insects, worms, clams, snails, and other animals visible without aid of a microscope, that may be associated with or live on substrates such as sediments and macrophytes. They supply a major portion of fish diets and consume detritus and algae.

Macrophytes - Rooted and floating aquatic plants, commonly referred to as water weeds. These plants may flower and bear seed. Some forms, such as duckweed and coontail (*Ceratophyllum*), are free-floating forms without roots in the sediment.

Margin of safety (MOS) - An implicit or explicit component of water quality modeling that accounts for the uncertainty about the relationship between the pollutant loads and the quality of the receiving water body. This accounts for any lack of knowledge concerning the relationship between pollutant loads and the water quality of the receiving water body. It is a required component of a TMDL and is normally incorporated into the conservative assumptions used to develop the TMDL (generally within the calculations or models) and is approved by the EPA either individually or in State/EPA agreements. Thus, the $TMDL = LC = WLA + LA + MOS$.

National Pollution Discharge Elimination System (NPDES) - A national program from the Clean Water Act for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcement permits, and imposing and enforcing pretreatment requirements.

Nonpoint Source - A geographical area on which pollutants are deposited or dissolved or suspended in water applied to or incident on that area, the resultant mixture being discharged into the waters of the state. Nonpoint source activities include, but are not limited to irrigated and nonirrigated lands used for grazing, crop production and silviculture; log storage or rafting; construction sites; recreation sites; and septic tank disposal fields.

Participant - Individual agricultural owner, operator, partnership, private corporation, conservation district, irrigation district, canal company, or other agricultural or grazing interest approved by the commission for cost-sharing in an eligible project area; or an

individual agriculture owner or operator, partnership, or private corporation approved by a project sponsor in an eligible project area.

Project Sponsor - A conservation district, irrigation district, canal company or other agriculture or grazing interest as determined appropriate by the commission that enters into a water quality project agreement with the commission.

Reach - A continuous unbroken stretch of river.

Riparian vegetation - Vegetation that is associated with aquatic (streams, rivers, lakes) habitats.

Runoff - The portion of rainfall, melted snow, or irrigation water that flows across the surface or through underground zones and eventually runs into streams.

Sediment - Bottom material in a body of water that has been deposited after the formation of the basin. It originates from remains of aquatic organism, chemical precipitation of dissolved minerals, and erosion of surrounding lands.

Sub-watershed - Smaller geographic management areas within a watershed delineated for purposes of addressing site specific situations.

Threatened species - A species, determined by the U.S. Fish and Wildlife Service, which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

TMDL - Total Maximum Daily Load. $TMDL = LA + WLA + MOS$. A TMDL is the equivalent of the Loading Capacity which is the equivalent of the assimilative capacity of a water body.

Total suspended solids (TSS) - The material retained on a 45 micron filter after filtration

Tributary - A stream feeding into a larger stream or lake.

Waste Load Allocation - The portion of receiving water's loading capacity that is allocated to one of its existing or further point sources of pollution. It specifies how much pollutant each point source can release to a water body.

Water Pollution - Any alteration of the physical, thermal, chemical, biological, or radioactive properties of any waters of the state, or the discharge of any pollutant into the waters of the state, which will or is likely to create a nuisance or to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to fish and wildlife, or to domestic, commercial, industrial, recreational, aesthetic, or other beneficial uses.

Water Quality Contract - The legal document executed by the commission or the project sponsor identifying terms and conditions between the commission or the project sponsor and an individual cost-share participant.

Water Quality Management Plan - A state or area-wide waste treatment plan developed and updated in accordance with the provisions of the Clean Water Act.

Water Quality Limited Segment (WQLS) - Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards.

Water Quality Plan - The plan developed cooperatively by the participant, technical agency and the commission or project sponsor which identifies the critical areas and nonpoint sources of water pollution on the participant's operation and sets forth BMPs that may reduce water quality pollution from these critical areas and sources.

Water table - The upper surface of groundwater; below this point, the soil is saturated with water.

Watershed - A drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation. The whole geographic region contributing to a water body.

WLA - Wasteload Allocation for point sources.

Useful Conversion Factors

1 meter = 3.281 feet

1 hectare = 2.471 acres

$^{\circ}\text{C} = (^{\circ}\text{F} - 32)/1.8$
