Final Total Maximum Daily Load Implementation Plan for the Middle Fork Payette River and Addendum to the Sub-basin Assessment and Total Maximum Daily Load for the Middle Fork Payette River

Compiled by the Idaho Department of Environmental Quality with assistance from the U.S. Forest Service, Idaho Soil Conservation Commission, Natural Resources Conservation Service, Idaho Department of Lands, and the Squaw Creek Soil Conservation District

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Table of Contents

List of Figures

List of Tables

Executive Summary

The Middle Fork Payette River (HUC 17050121) is a fifth order tributary of the Payette River in the northern part of Boise County, and the southern part of Valley County, Idaho (Figure 1). The Middle Fork Payette River originates approximately 46 miles north-northeast of the town of Crouch, Idaho. The Middle Fork Payette River flows from an elevation of 6,860 to 3,208 feet, at its confluence with the South Fork Payette River downstream of Crouch, Idaho. The river drains a 292 square-mile basin managed predominately by the USDA Boise National Forest. Land uses in the watershed consist of timber management in most of the basin, some grazing and small agriculture operations along the lower reaches, and a small urban area at the town of Crouch.

In 1994, and again in 1996, numerous segments within the Middle Fork Payette River were classified as water quality limited due to sediment under Section 303(d) of the Federal Clean Water Act (CWA). Unlisted segments within the Middle Fork Payette River watershed also contribute sediment to the listed segment. Subsequent to the Section 303(d) requirements a Total Maximum Daily Load (TMDL) management plan was developed and approved by the Environmental Protection Agency (EPA). A copy of the final TMDL (Sub-Basin Assessment and Total Maximum Daily Load for the Middle Fork Payette River, DEQ – 1998) can be obtained from the Idaho Department of Environmental Quality's (DEQ) Boise Regional Office.

Idaho Code §39-3615 states that "The director, … may name watershed advisory groups which generally advise the department on the development and implementation of TMDLs and … including those specific actions needed to control point and nonpoint sources of pollution …" In January 2001 and again in June 2001, the DEQ attempted to carry out this mission by holding a series of public information meetings in an effort to develop a Middle Fork Payette River Watershed Advisory Group. While the DEQ received positive response from all the designated land management agencies to this call, DEQ was unable to bolster support from area landowners and interested parties within the Middle Fork Payette River watershed to assist in the development of this plan. As such, in an effort to complete the implementation plan within the 18-month time frame following the approval of the TMDL, the DEQ began communications with each of the designated agencies in an effort to develop an implementation plan for the Middle Fork Payette River watershed. Remedial actions will be necessary throughout the listed and unlisted waterbodies to address the water quality limitations in the §303(d) listed segment. This document represents the cumulative technical efforts of the U.S. Forest Service, Idaho Department of Lands, Soil Conservation Commission, Natural Resources Conservation Service, Squaw Creek Soil and Water Conservation District, and the DEQ to develop an implementation plan, which when funded and implemented may lead to the full restoration of designated beneficial uses in the watershed.

The Middle Fork Payette River TMDL implementation plan is based on the following premises:

- Natural background levels of sedimentation are assumed to be fully supportive of the beneficial uses;
- The river system has some finite yet un-quantified ability to process (attenuate through export and/or deposition) a sedimentation rate greater than background rates: and
- Beneficial uses are not likely to be met without addressing the hydrologic modification of the

system associated with loss of sinuosity, entrenchment of the channel, and loss of flood plain connectivity.

In order to achieve the goals of the TMDL, best management practices (BMPs) will need to be implemented within the Middle Fork Payette watershed to reduce the Load Allocations from nonpoint source pollution. Full implementation of this plan should lead to the reduction of excessive sediment loads from land management activities, riparian vegetation losses, and bank destabilization. An increase to the 2-meter pool frequency within these lower reaches has been identified as the primary interim target that will be used to support the identified beneficial uses. Additionally, work completed by Borden, 2001 indicates that sediment within the Middle Fork of the Payette River will need to be reduced by 76% in order for beneficial uses to be obtained. A 76 percent reduction in anthropogenic loads was subsequently chosen as the numeric target for the implementation plan.

The DEQ has developed a TMDL implementation tracking database for use in the Middle Fork Payette River based on work completed for Cascade Reservoir TMDL Implementation Plan. Hydrologic conditions are similar to work completed within the Cascade area. As such, BMP effectiveness from projects implemented within the Cascade watershed will be applied to the Middle Fork Payette watershed.

This document represents the implementation plan and specifies the controls necessary to improve the Middle Fork Payette River water quality to meet the 76% reduction as outlined in "A Comparison of Sediment Monitoring to Sediment Facies Mapping in the Middle Fork Payette River, Central Idaho" (Borden 2001) and the interim targets of the TMDL.

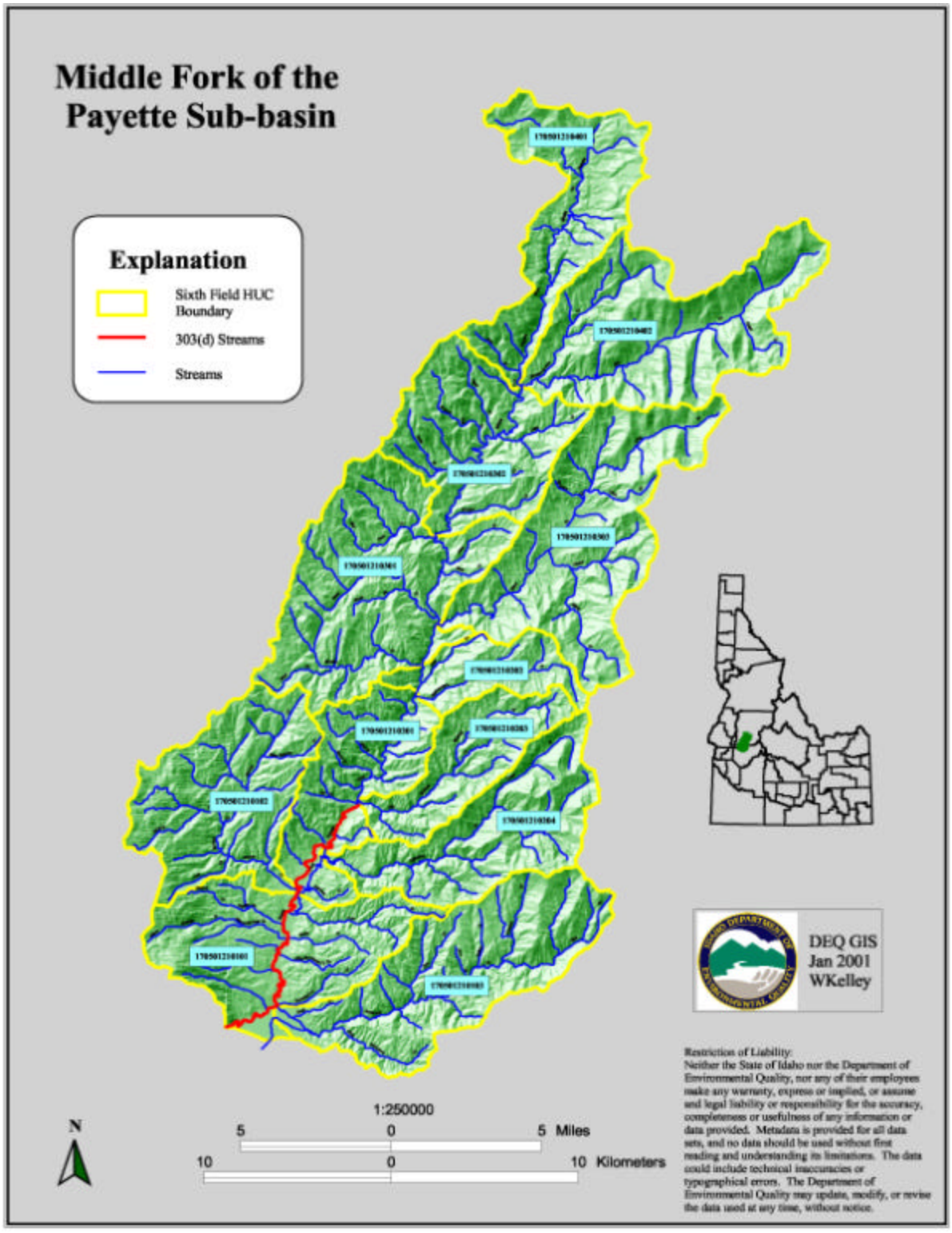


Figure 1. Middle Fork Payette Watershed Location Map

Middle Fork Payette River Water Quality at a Glance

General Characteristics

The Middle Fork Payette River is located in central Idaho, about 40 miles north of Boise (Figure 1). The Middle Fork Payette River generally flows south, southwest, through the town of Crouch, Idaho. The South Fork Payette joins the Middle Fork downstream of the town of Crouch to form the main stem of the Payette River.

Physical and Biological Characteristics

The Middle Fork Payette River basin is located in the Northern Rocky Mountain physiographic province at the western edge of the Salmon River Mountains. The annual weather cycle consists of cold winters and warm summers where gradual changes of season are marked by rapid changes in weather. During the winter and early spring months rain-on-snow events, occur periodically and can trigger large and/or numerous landslides. A large rain-on-snow event during the winter of 1964 and 1965, and again in 1997, resulted in numerous landslides within much of the Middle Fork Payette River basin, which has greatly influenced the current sediment load within the basin.

Hydrography

The Middle Fork Payette River watershed has predominantly a southerly aspect with side drainages facing generally east and west. The Middle Fork Payette River drains 292 square miles. The river is nearly 46 miles long, excluding numerous tributaries within the subbasin.

The valley cross sections within the Middle Fork Payette are usually deep, V-shaped in the mountainous upper elevation, shallow and rounded at mid-elevations, and become very wide within the lower valley near Crouch where depositional processes dominate.

Eighty-five percent of the stream flow within the Middle Fork is the result of subsurface charging and deep seepage. Springs and seeps in the subbasin vary in size, source, and location. Constant flowing springs and intermittent seeps occur in areas of well-fractured bedrock commonly found on north facing toe slopes. Seeps are common at mouths of secondary drainage ways where surface waters flow intermittently in spring. Hot springs are usually in the bottoms of major drainages and associated with fault zones.

Geology, Soils, and Landforms

The Middle Fork Payette River basin is located within the southern Idaho Batholith and is dominated by forest vegetation. The terrain within the subbasin varies from wide valley bottoms to steep hillsides with elevations ranging from 3,200 feet to 8,700 feet.

The Middle Fork Payette River subbasin is near the western boundary of the Idaho Batholith (Figure 2). The Idaho Batholith is a granitic intrusive body that extends 300 miles in a north-south direction and ranges from 80 miles to 120 miles wide. The steep, dissected mountainous lands have slopes ranging from 20 to 65 percent (Figure 3). The primary geomorphic processes that have shaped the landscape include faulting, fluvial actions, frost churning, and glaciation. Broad valley bottoms were created as alluvial material accumulated behind fault blocks that

obstructed major streams. The canyons were formed after streams became deeply incised and breached the fault blocks. These same geomorphic processes combined with the development and maintenance of a local road network have, in some cases, increased the potential for mass failures. Table one illustrates road density and the erosion hazard for each subwatershed.

Vegetation
The subbasin is dominated by steep to moderately steep mountainous terrain covered by coniferous forests in the mountainous areas and by pasturelands in the relatively flat valley floors. The lower elevation flat and benched areas along the lower Middle Fork Payette River are composed of pasture grasses, bunch grass, sagebrush, and bitter brush with scattered clumps of ponderosa pine. Ponderosa pine is the principal tree species in the lower elevation with Douglas-fir and grand fir at mid elevations and on north-facing slopes. Sub-alpine fir dominates the higher elevation areas with Douglas fir, lodgepole pine, spruce, larch and white bark pine present.

Aquatic Fauna
Various anadromous fish historically occurred in the Middle Fork Payette River and have included pacific lamprey, Snake River "spring" and "summer" Chinook salmon, and steelhead trout. The Black Canyon Dam effectively blocked migration of these fishes in 1924.

Resident fish, include suckers, sculpins, mountain whitefish, interior redband trout, bull trout, rainbow trout, and brook trout. Bridgelip suckers have been collected at the confluence of the Middle Fork and South Fork of the Payette rivers and also observed in Anderson Creek. The upper portions of Bull Creek and Upper Middle Fork Payette are the only segments currently being used for bull trout spawning and rearing.

Many of the Middle Fork Payette River subbasin fishes are of concern because of their reduced numbers. Bull trout were listed as threatened by the US Fish and Wildlife Service spring of 1998 and the State of Idaho has identified the Middle Fork Payette River watershed as a bull trout key watershed. Additionally, interior redband trout are a federal candidate species and a state Species of Special Concern.

Sub-watershed and Stream Characteristics
The valley cross sections within tributaries to the Middle Fork Payette are deep, V-shaped in the mountainous upper elevation, shallow and rounded at mid-elevations, and become very wide within the lower valley of the Middle Fork Payette near Crouch. The stream channel varies from Rosgen AB≅ type in the upper watershed to a AC≅ type in the lower watershed. The AB≅ channels are generally dominated by particles of a bimodal distribution with particles of boulder and large cobble size and the second group composed primarily of sand or smaller sized particles. The AC≅ channels are generally deposition reaches dominated by sand sized or smaller sized particles.

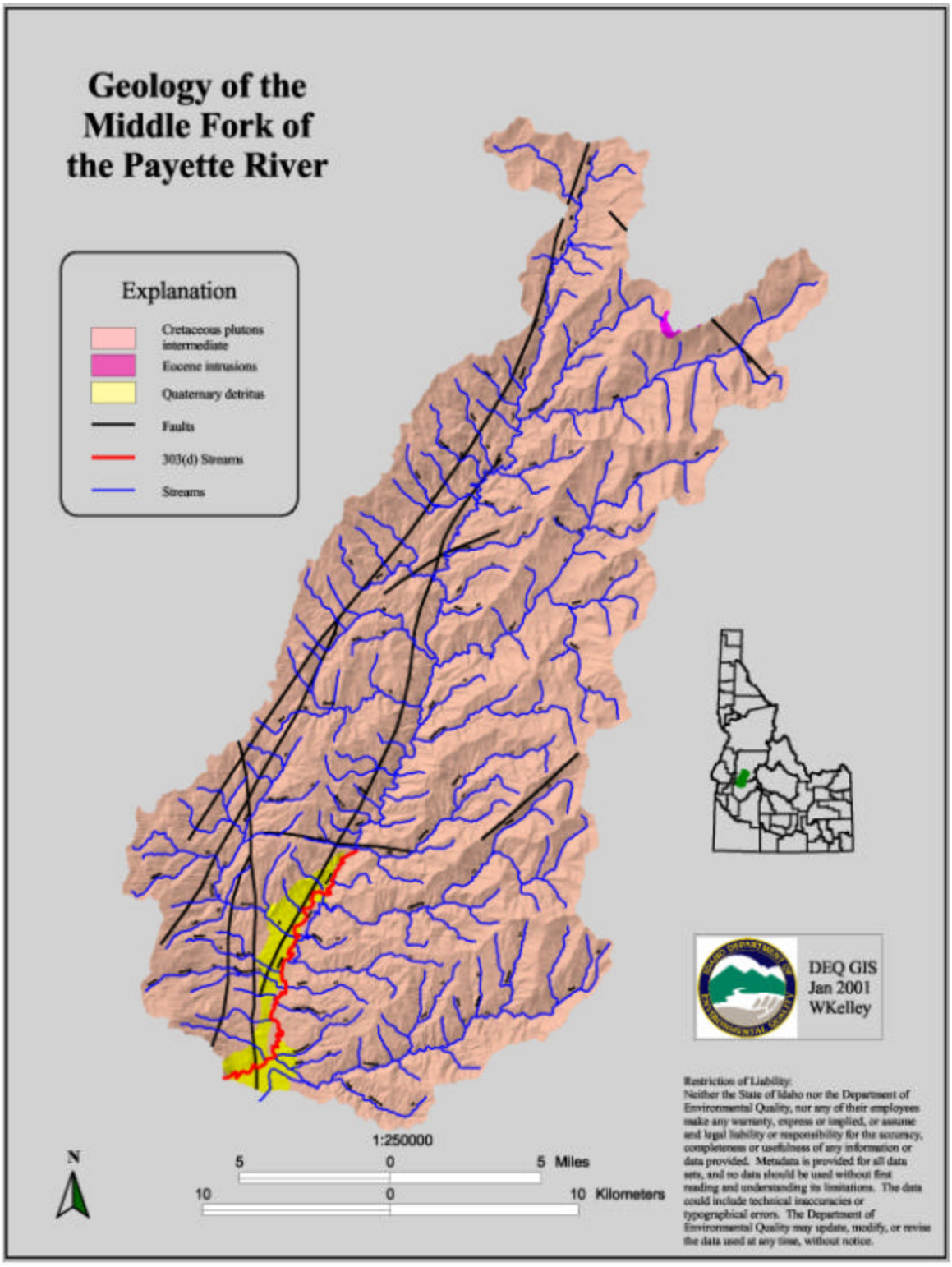


Figure 2. Geology of the Middle Fork Payette

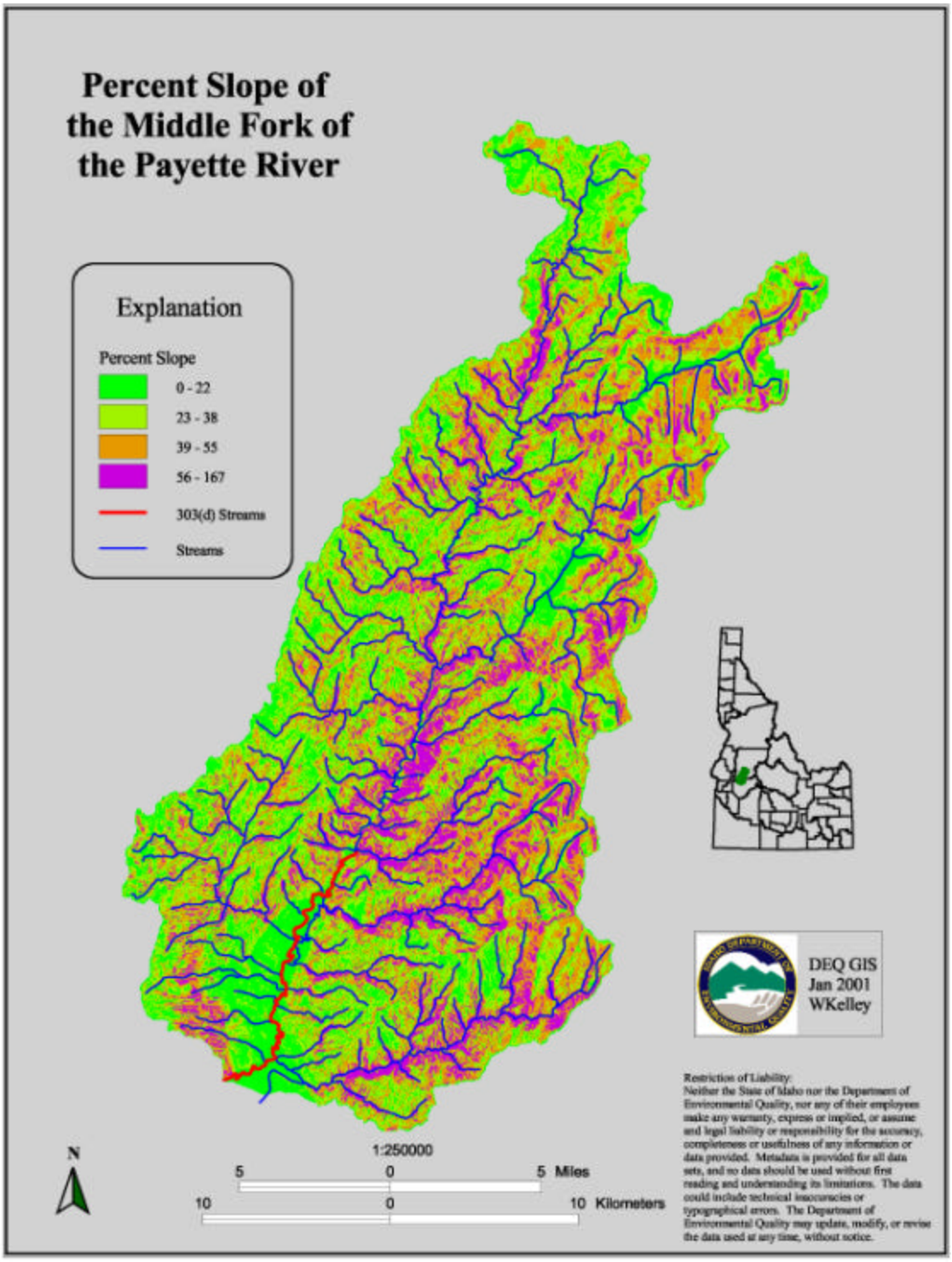


Figure 3. Slope Map of the Middle Fork Payette Watershed

Land Use and Ownership
The Middle Fork Payette River basin is located in Valley and Boise counties where 97% of the basin is managed by the USDA United States Forest Service, Idaho Department of Lands, and the Boise Cascade Corporation. The remaining 3% are composed of the town of Crouch and small agriculture operations, and recreational homes within the lower portions of the basin (Figure 4). The Idaho Department of Lands is the designated agency for non-federal forestlands within the state of Idaho.

Cultural Characteristics
A major road network extends up the Middle Fork Payette River to Boiling Springs, a popular hot springs, with other roads extending up tributaries such as Anderson Creek, Scriver Creek, Lightning Creek, Sixmile Creek, West Fork Creek, and Silver Creek. A hot spring resort is located along Silver Creek and there are numerous undeveloped hot springs north of Boiling Springs. The City of Crouch is the main urbanized area within the subbasin, however, there are also several rural subdivisions (summer and year-around residences) located along the lower river and its tributaries. The largest subdivision is Terrace Lakes located on benches along Warm Springs Creek.

Agriculture is conducted on a limited basis within the Middle Fork Payette basin. Pasture is present within the flatter side drainages around Crouch and hay is grown along the very flat portions closer to the Middle Fork Payette River. These activities are exclusively located within the Pyle sub-watershed near Crouch.

Forestry
Disturbance activities are mostly wildfires and road construction associated with timber harvesting. There have been four wildfires larger than 2,000 acres and numerous small fires, generally less than one acre, since the mid-1980s. Roads are in poor condition in much of the watershed and road densities can exceed 1.7 miles per square mile.

Many of the riparian areas show disturbance from timber harvest, road construction, grazing, and dispersed recreation camping. Many of the primary access roads were built within or adjacent to the Middle Fork Payette River and tributary riparian areas.

The density of roads can be an indicator of disturbance activities and possible sources of sediment (Figure 5) and a ranking of road density is displayed in Table 4. Wildfires are another possible source of sediment, especially since larger fires expose soil to the effects of climate.

In the spring of 2002, the DEQ and USFS reviewed the existing roads inventory for the Middle Fork Payette Drainages against recently completed aerial photography. It was evident from that comparison that the existing roads inventory was significantly out of date. As such, work was completed by the DEQ and USFS to digitize the road segments not shown on the existing USFS GIS coverages and then to reanalyze the sediment loading by rerunning BOISED. This work was completed in July 2002. Additionally, the USFS has hired interns to complete a detailed roads analysis and inventory using GPS technologies of the Middle Fork Payette watersheds.

This work, pending continued funding is to include but is not limited to grade, hazards, parent material, percent slope, cover, failures, etc.

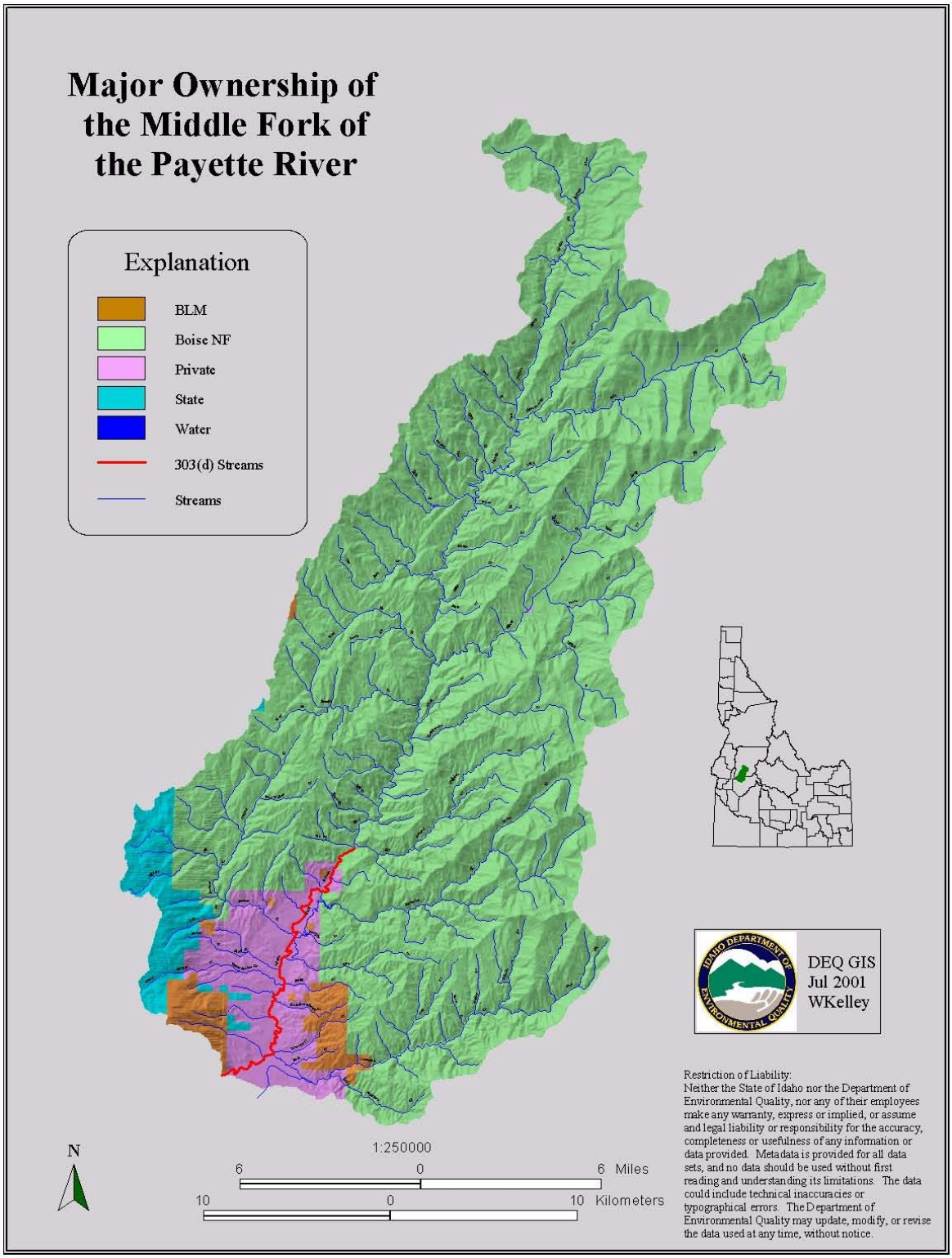


Figure 4. Land Ownership in the Middle Fork Payette Watershed

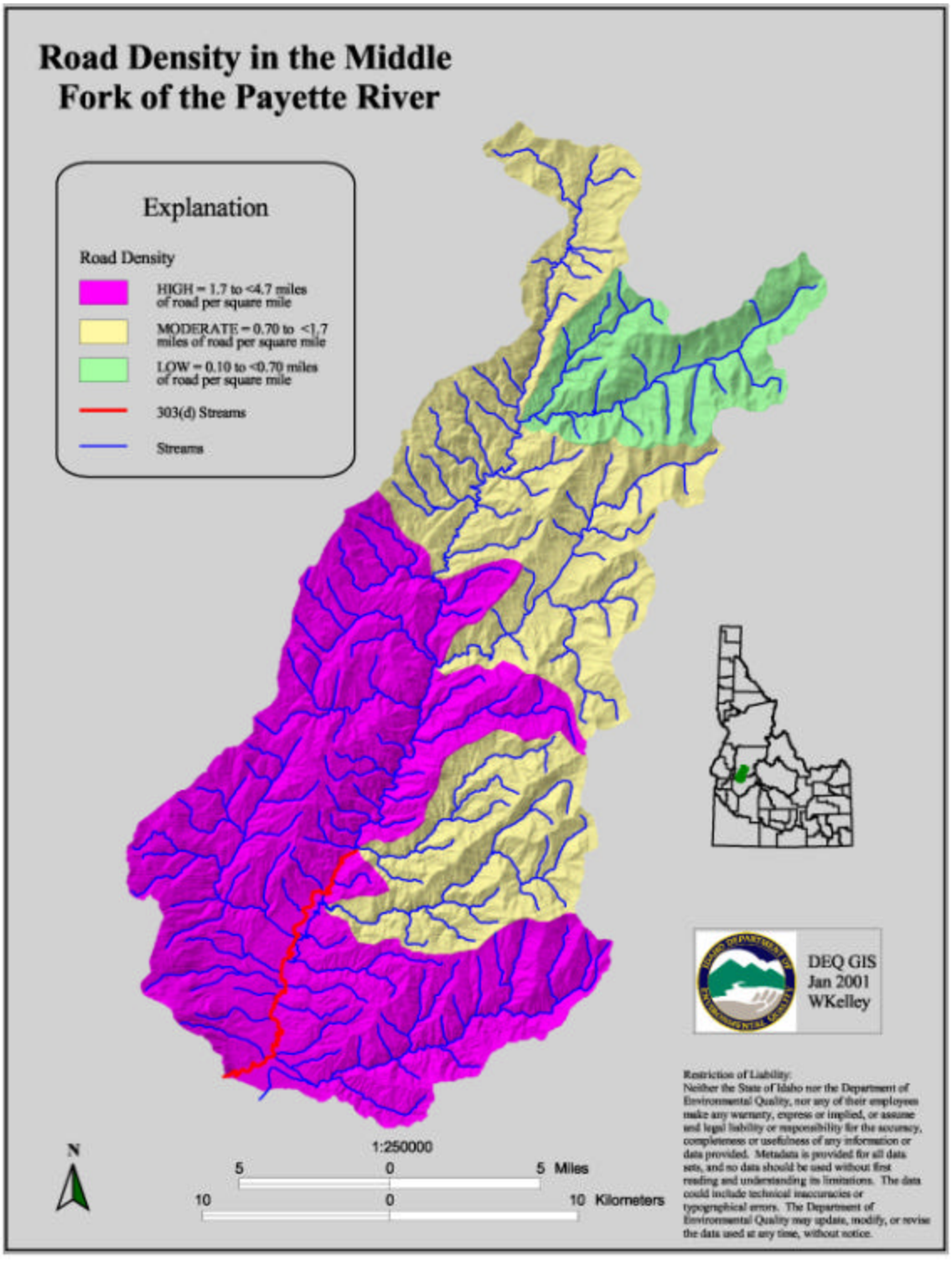


Figure 5. Road Density within the Middle Fork Payette Watershed

Table 1. Road Density and Erosion Hazard rating by Sub-Watershed

Sub-Watershed	Road	Surface	Slumping	Avalanche
Pyle	M	L	L	L
Scriver	H	L	L	L
Anderson	M	L	L	L
Rocky Canyon	M	L	L	L
Lightning	L	L	L	L
Big Bulldog	L	L	L	L
Rattlesnake	L	L	L	L
Sixmile	H	L	L	L
Silver	L	L	L	L
Bridge-Bryon	M	L	L	L
Bull	L	L	H	H
Upper Payette	L	L	H	H

Agriculture/Grazing
Cattle, sheep, horse and domestic elk grazing occurs within the Pyle sub-watershed and within the lower portions of Lightning and Easley Creek. Cattle grazing is concentrated in the lower elevations and sheep grazing generally at the mid to high elevations. Pasturelands are primarily irrigated by gravity flow and other areas are irrigated by sprinklers or depend upon precipitation. Hay is the typical crop within this area. However, the area has primarily been converted over to small ranchettes adjacent to the low-lying areas of the Middle Fork of the Payette River.

Much of the area once used for intense cattle grazing has been converted to pasture for horses, which are typically fenced above the banks of the river. Bank trampling along the Middle Fork Payette River is evident in those areas where cattle graze and it is difficult to estimate the impacts of past grazing activities. The lower Middle Fork Payette River channel is slightly entrenched and as such waters seldomly accesses the flood plain.

Mining
There are no known precious metals mining activities in the Middle Fork Payette River subbasin. Past and present aggregate mining is limited to the lower section of the watershed.

Urban
The Middle Fork Payette River subbasin has a rural setting with the population areas, primarily centered near the city of Crouch and in numerous rural subdivisions north of the city. The businesses and homes in the areas are on separate or community septic tank systems. Many of the homes in the area maintain lawns and a golf course at Terrace Lakes also has vast areas of manicured landscaping. The effluent from properly functioning septic tank systems and the proper use of herbicides, fertilizers, and pesticides used in landscaping are unlikely to be negatively affecting the beneficial uses, although monitoring has not been performed targeting these parameters.

Understandably, property protection has negatively affected the Middle Fork Payette River. One of the actions a stream like the Middle Fork Payette River naturally performs, is meandering. A common practice for protecting ones property from erosion related to meanders is to armor the outside of the meander. Armoring of the stream banks has the ability to change or upset the natural hydrology of the system related to spring flood events and the thus the subsequent deposition of sediments carried by floodwaters.

Additionally, roads that were initially built for forest product extraction are now being used as the primary road system network for many of the subdivisions and homes built or being built in the foothills in the Crouch valley. A few roads were built as supply routes for mining activities in the late 1800s. As such, many of the roads were never designed for year round use and in many area subdivisions now account for more roads per square mile than managed timberlands.

Federal Regulatory Requirements

The Middle Fork Payette River from Bulldog Creek to the mouth has been classified as water quality limited due to sediment under Section 303(d) of the Clean Water Act. As such the CWA requires States to develop a TMDL management plan for water quality limited water bodies. A TMDL was developed for the area and approved by EPA in July 2000. This document addresses the next phase of the CWA by development of an implementation plan to address the pollutants of concern in the TMDL.

State Requirements

The State of Idaho adopted Idaho Code sections 39-3601 et seq. In response to a 1995 lawsuit which established state water quality law. The laws requires the State of Idaho to:

- X Protect the existing instream beneficial uses of each waterbody;
- X Provide for the designation of instream beneficial uses;
- X Identify reference stream or water bodies for use in determining full support of beneficial uses;
- X Requires the monitoring be conducted to determine full support of beneficial uses
- X Requires the state to develop a TMDLs for waters which do not comply with Idaho Water Quality Standards and Wastewater Treatment Requirements; and
- X Establishes the development of citizen advisory groups to advise DEQ on prioritizing impaired water bodies, how to properly manage impaired watersheds, and recommended pollution control activities in impaired watersheds.

Applicable Water Quality Standards

Idaho has developed the Idaho Water Quality Standards and Wastewater Treatment Requirements to protect its waters. Idaho's water quality standards include; surface water classifications, beneficial use designations for surface waters, and water quality criteria. Sediment production was the primary concern addressed in the TMDL. As such, IDAPA 58.01.02.200.08 specifically states that "Sediment shall not exceed quantities specified in

Section 250 and 252, or, in the absence of specific sediment criteria, quantities which impair designated beneficial uses."

Designated Beneficial Uses
Beneficial uses for many water bodies are listed in the Water Quality Standards and Wastewater Treatment Requirements. The Middle Fork Payette River, source to mouth, have the following designated beneficial uses: domestic water supply, agriculture water supply, cold water biota, salmonid spawning, primary and secondary contact recreation, and as a special resource water. A complete description of the beneficial uses can be found in the "Sub-basin Assessment and Total Maximum Daily Load for the Middle Fork Payette River" (DEQ-1998).

Aquatic Life
Cold-water biota represents the life forms that inhabit cold water. These life forms include, game and non-game fish, aquatic macroinvertebrate, and aquatic periphyton.

Changes to stream morphology within the lower reaches of the Middle Fork Payette stem from land clearing and riparian vegetation losses and bank destabilization. An increase to an average of two pools >1.3 meters in depth per km and a minimum of no less than three pools in any three km stretch within these lower reaches has been identified as the primary interim target within the TMDL necessary to support the identified beneficial uses.

Sediment Source Inventory
Sediment is a water constituent naturally yielded by their watershed to water bodies. Excess sedimentation in a primarily forested watershed such as the Middle Fork Payette drainage is primarily associated with road development, access to the watershed, and mass failures associated with rain on snow events. Roads may yield sediment directly from their surfaces or bed through mass wasting or the location of the road may cause the adjacent stream to begin bank cutting. Numerous individuals and agencies have studied the natural and management induced sediment sources in the Middle Fork Payette River. There are four land use categories in the watershed that have the potential to increase sedimentation of the Middle Fork Payette River: 1) timber management; 2) agriculture including grazing; 3) recreation; and 4) urban development.

Erosion is also a naturally occurring process, which can be accelerated by changes in land use, fires, floods, agricultural activities, timber harvest, urban/suburban development and recreational activities. In the Middle Fork Payette River, natural sources of sediment that results from bank erosion and channel degradation are assumed to be low relative to hillslope erosion rates.

Recent Work

In the spring of 2001, John Carter Borden completed work on a master's thesis entitled "A Comparison of Sediment Monitoring to Sediment Facies Mapping in the Middle Fork Payette River, Central Idaho." The thesis monitored bedload, suspended sediment and discharge in an effort to quantify the sediment budget for the Lower Middle Fork of the Payette River and how the Middle Fork of the Payette River could process sediment. This budget was then compared to

sand storage derived from sediment facies mapping within two reaches of the river. Both approaches were then compared to determine the quantity of sediment, which would need to be removed in order to meet beneficial uses. The facies mapping yielded a required 76 ± 30% reduction in the sediment stored in the lower reach, while the sediment monitoring yielded a required 68 ± 16% reduction in supply. These two figures were considered nearly statistically identical in the Borden thesis. In an effort to produce a conservative approach for implementation the 76% reduction was utilized in the development of a sediment reduction target which would yield a ±8% margin of safety over the actual sediment monitoring.

Additional work was completed in the summer of 2002 by the USFS to quantify the sediment loading associated with the roads system in the Middle Fork Payette River watersheds. The USFS utilized the BOISED model to determine which of the 12 watersheds would yield the greatest sediment input into the system. It should also be noted that the BOISED modeling calculated an estimated 10,532 tons of sediment to be delivered to the mouth of their respective streams. An additional 1,373 tons are estimated to be from anthropogenic sources and represents approximately 12% of the total sediment (11,905 total tons) expected to be delivered to the mouth of each respective stream.

Borden recognized that total sediment rates must be reduced by 76%, which would calculate to a 9,048 tons per year reduction in the total (natural + induced) sediment delivered to the listed reach of the Middle Fork Payette River. Monitoring of various road projects in a similar geologic province indicates that a 76% effectiveness rate should not be uncommon (Tables 2 and 2a). Considering that the TMDL implementation plan can only address that portion of the load related to anthropogenic causes, the 76% sediment reduction is only expected to yield a 1,043 tons per year reduction. However, if the removal of 76% of the total sediment (natural + induced) being delivered to the mouth is warranted, then approximately 9,048 tons per year of sediment would need to be removed. This means that an additional 8,005 tons per year of naturally derived sediment would need to be removed through various projects including channel modification in the listed reach. It is important to realize that the reduction of 76% of the anthropogenic load is a goal. In some watersheds (example – Sixshooter) this goal may not be feasibly reached without the advent of massive paving projects which in all likelihood would prove uneconomical both in the short-term and in the long-term due to increased maintenance issues.

The Middle Fork Payette River TMDL implementation plan is based on the following premises:

- Natural background levels of sedimentation are assumed to be fully supportive of the beneficial uses;
- The river system has some finite yet unquantified ability to process (attenuate through export and/or deposition) a sedimentation rate greater than background rates: and
- Beneficial uses are not likely to be met or obtained without addressing the hydrologic modification of the system associated with loss of sinuosity, entrenchment of the channel, and loss of flood plain connectivity which results in the inability of the river to naturally process sediment loads.

Table 2. Estimated Percent Anthropogenic Sediment and Total Phosphorus Reductions from Implementation of Forest Best Management Practices (BMPs) 1994 through 2002

Watershed	Sediment Reduction	Total Phosphorus Reduction
Boulder/Willow	84%	84%
Gold Fork	81%	81%
North Fork Payette	80%	80%
West Mountain	87%	86%
Average Reduction	**82%**	**82%**

Table 2a. Summary of Estimated Phosphorus Loads and Reductions from Nonpoint Sources within the Cascade Reservoir Watershed, 1994 through 2002

	Total Load (kg/yr)	Projected Reduction (kg/yr)[1]	Reduction Achieved to Date (kg)	Percent of Reduction Achieved to Date
Forestry[2]	8,840			
Roadways		1,454	1,579	109%
Grazing/Bank stabilization		1,198	1,096	92%
Total	8,840	2,652	2,675	101%
Agriculture	11,740			
Tier 1		849	100	12%
Tier 2		2,512	645	27%
Tier 3		124	0	0%
Total	11,740	3,485	745	21%
Urban/Suburban	4,423			
Roadways		754	200	27%
Stormwater		445	55	12%
Subdivision stormwater		160	?	?
Total	4,423	1,359	255	19%
Other				
Septic systems	2,205	1,544	838[4,5]	38%
Unidentified NFPR	5,118	1,535	0	0%
Natural and background sources	3,390	599	80[6]	13%
Nonpoint Source Total	35,716	11,174	4,593	41%

1. Contains management, natural and background loading.
2. Implementation monitoring will continue to review applied BMPs. Additional road segments will continue to be treated as part of timber harvest activities or independently.

BOISED Modeling

The results from the BOISED program modeling should be used as a tool to aid in the prediction of cumulative sediment yields from road construction, road management, silvicultural activities, and fire within small-forested watersheds (approximately 1 to 50 square miles). The model results are expressed as average annual yields of total sediment from an individual watershed. The units are tons per year with the yields predicting average annual natural yield and average annual management-induced yield. It should be noted that it would be inappropriate to use the results of the BOISED analysis as a precise prediction of absolute sediment quantities. The appropriate use of the modeling is in the development of a quantitative index of cumulative sediment yield from different activities within a given watershed.

Natural levels of sediment are believed to be significant to the Middle Fork Payette due to the erosive nature of the granites associated with the Idaho Batholith. Inputs to the system are highly variable both seasonally and between years. In years of major storm events, background levels of sediment are going to be higher and will be lower in years of mild climate. Drought cycles also affect the natural sediment levels and inputs since less sediment will be delivered to the channel system from upslope areas, and in-channel sediments will tend to remain in place. Sediment inputs from management activities will also be highly variable since these too, are affected by daily, seasonal, and annual variations in climate. Given the magnitude of variability in the Middle Fork Payette River, the precision and reliability of the estimates for sediment are more than plus or minus 100 percent of actual sediment at the 95 percent confidence interval. A major long-term investment of time and money would be required to increase the likelihood of detecting the estimated sediment changes in the water column, channel morphology, or aquatic habitat.

Because the management of natural systems is highly variable both over time and space, the only scientifically defensible management strategy is one based on adaptive management with BMPs being the best tool. BMPs would be applied annually in the Middle Fork Payette River watershed and the application of site-specific BMPs would differ depending on the given site characteristics. However, if it is assumed that any BMPs applied are designed to reduce sediment delivery to the listed section, then the risk to sediment delivery should also be disclosed. The USFS recommends that BMPs be designed to withstand a 5-year, 24-hour rainfall amount of 2 inches with an estimated 2-year recovery period. Based on the model, this should result in a 60 percent chance of success and a 40 percent chance of failure for any 2-year period following initiation of recovery activities.

The BOISED modeling (Table 4) identified the following:

- Area in acres of the subwatershed
- Area in square miles of the watershed
- Total Land Type Natural Sediment – This number represents the modeled estimated cumulative sediment being generated within each watershed and is represented in tons per year.
- Natural Sediment at Critical Reach – This number represents that portion of the modeled

estimated Total Land Type Natural Sediment that will be delivered to the mouth of the individual stream and/or river. This number is represented in tons per year.

- Total Induced Sediment at Critical Reach - This represents the modeled load induced by anthropogenic sources and that is estimated to be delivered to the mouth of the individual stream and/or river. This number is represented in tons per year.
- % Sediment Over Natural Sediment at the Critical Reach – The number illustrates the modeled portion of the Induced Sediment in proportion to Natural Sediment at Critical Reach (i.e., Induced Sediment ÷ Natural Sediment at Critical Reach).
- % Reduction – 76% load reduction associated with the John Carter Borden thesis.
- Load Reduction – Illustrates the anticipated 76% reduction from the modeled Induced Sediment associated with anthropogenic sources.

Table 4 also provides the initial watershed implementation priority for nonpoint source related projects within the Middle Fork Payette River system. Initially, to attain the 76% sediment reduction in the induced sediment loading priority projects will specifically focus on high sediment yield road segments within the Sixmile, Pyle, Anderson, and Scriver subwatersheds and secondly on watersheds with a high road densities. It should be also noted that in some instances, the sediment yield from certain watersheds (example – Pyle Creek) is proportionally higher even though the projected sediment yield from individual road segments is relatively low. This is primarily due to the number of road miles within the watershed being higher and thus the cumulative impact results in a higher load to the Middle Fork Payette reach.

The USFS also produced a series of eleven maps, which summarizes expected sediment delivery from individual road segments throughout each of the watersheds. The maps (Figures 6 - 16) are divided up into 5 zones based on the following criteria in Table 3 in relationship to sediment delivery in tons per year (Table 3). These maps provide the operator/owner of a given road segment the opportunity to implement BMPs on those segments which are estimated to yield the greatest sediment load to nearby stream and the Middle Fork Payette River. However, this information must first be field verified before individual implementation projects can be developed and implemented.

Table 3. BOISED Road Segmentation

Segment Color	Estimated Sediment Delivery (Tons/Year)
Green	0 – 1
Purple	1 – 4
Yellow	4 – 10
Magenta	10 – 15
Red	15 – 1,000

Table 4. Estimated Sediment Reduction Per Watershed From Boised

Watershed	Area (Acres)	Area (Sq Mi)	Modeled Total Land Type Natural Sediment (Tons/Yr)	Modeled Natural Sediment @ Critical Reach (Tons/Yr)	% Induced Sediment Over Natural (Tons/Yr)	Modeled Total Induced + Natural @ Critical Reach (Tons/Yr)	Modeled Induced Sediment (Tons/Yr)	% Reduction	Modeled Load Reduction (Tons/Yr)1
Sixmile	25,578	39.97	2,722	1,401	28.3	1,798	396.9	76	301
Pyle	19,535	30.52	1,307	707	31.8	931	224.5	76	171
Anderson	22,514	35.18	2,263	1,192	18.2	1,409	216.9	76	165
Scriver	19,011	29.70	1,537	835	23.3	1,029	194.3	76	148
Bridge-Bryon	16,996	26.56	1,828	1,013	9.7	111	98.0	76	75
Rocky Canyon	13,685	21.38	1,571	905	7.1	969	64.2	76	49
Upper MF Payette	15,843	24.75	1,442	809	7.9	873	64.0	76	49
Lighting	16,506	25.79	1,481	825	5.6	871	45.9	76	35
Silver	25,573	39.96	2,244	1,155	3.6	1,197	41.5	76	32
Rattlesnake	6,782	10.60	543	355	3.9	369	13.8	76	11
Bulldog	10,156	15.87	933	567	1.9	578	10.7	76	8
Bull	24,247	37.89	1,476	767	0.3	770	2.3	76	2
Total			**19,347**	**10,532**	**11.5**	**11,906.0**	**1,373.0**		**1,044**

1 It should be noted that it would be inappropriate to use the results of the BOISED analysis as a high precise prediction of absolute sediment quantities. The appropriate use of the modeling is in the development of a quantitative index of cumulative sediment yield from different activities within a given watershed.

Figure 6 Anderson Creek Road Sediment Delivery

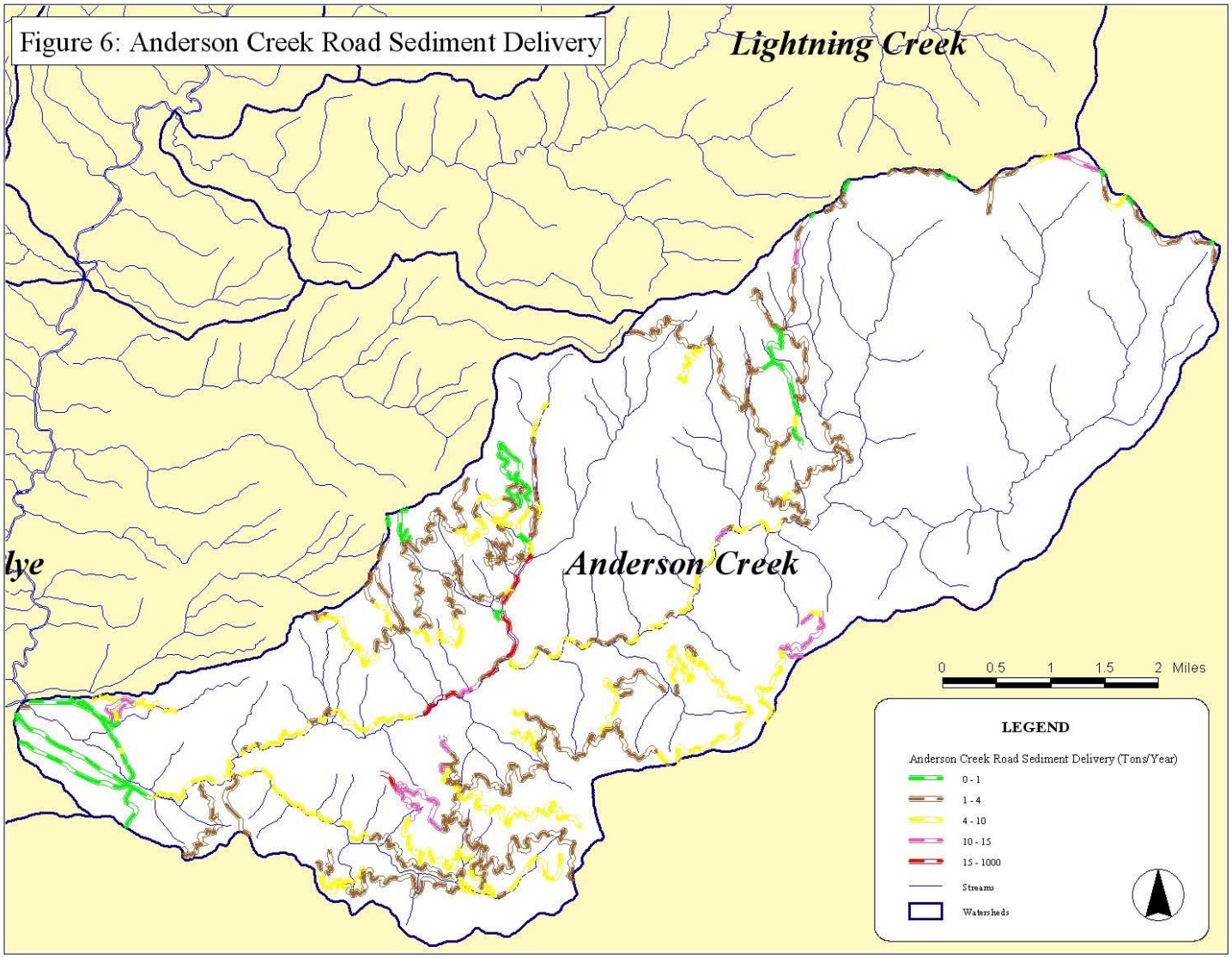


Figure 7 Bridge - Bryon Creeks Road Sediment Delivery

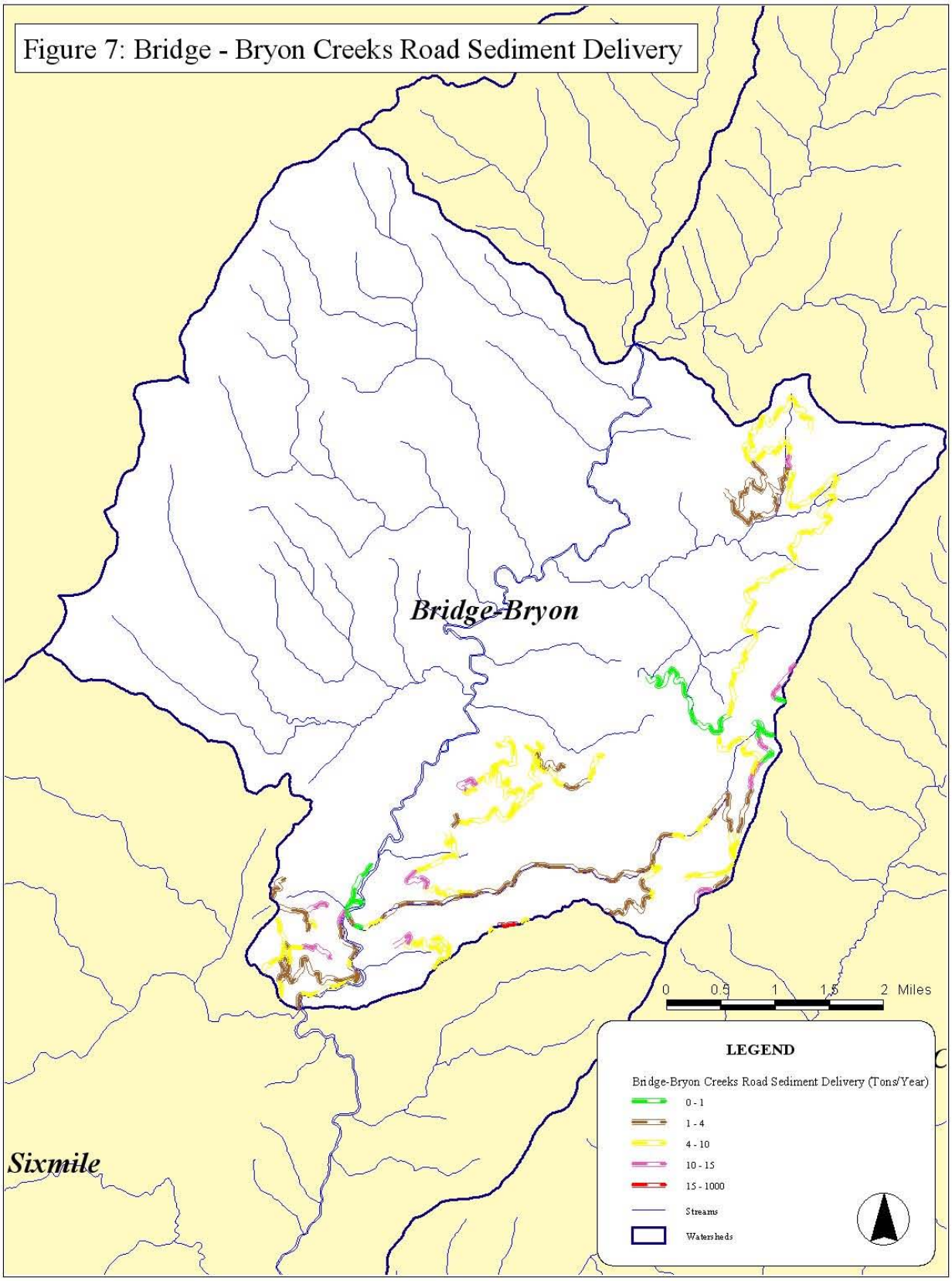


Figure 8 Bull Creek Road Sediment Delivery

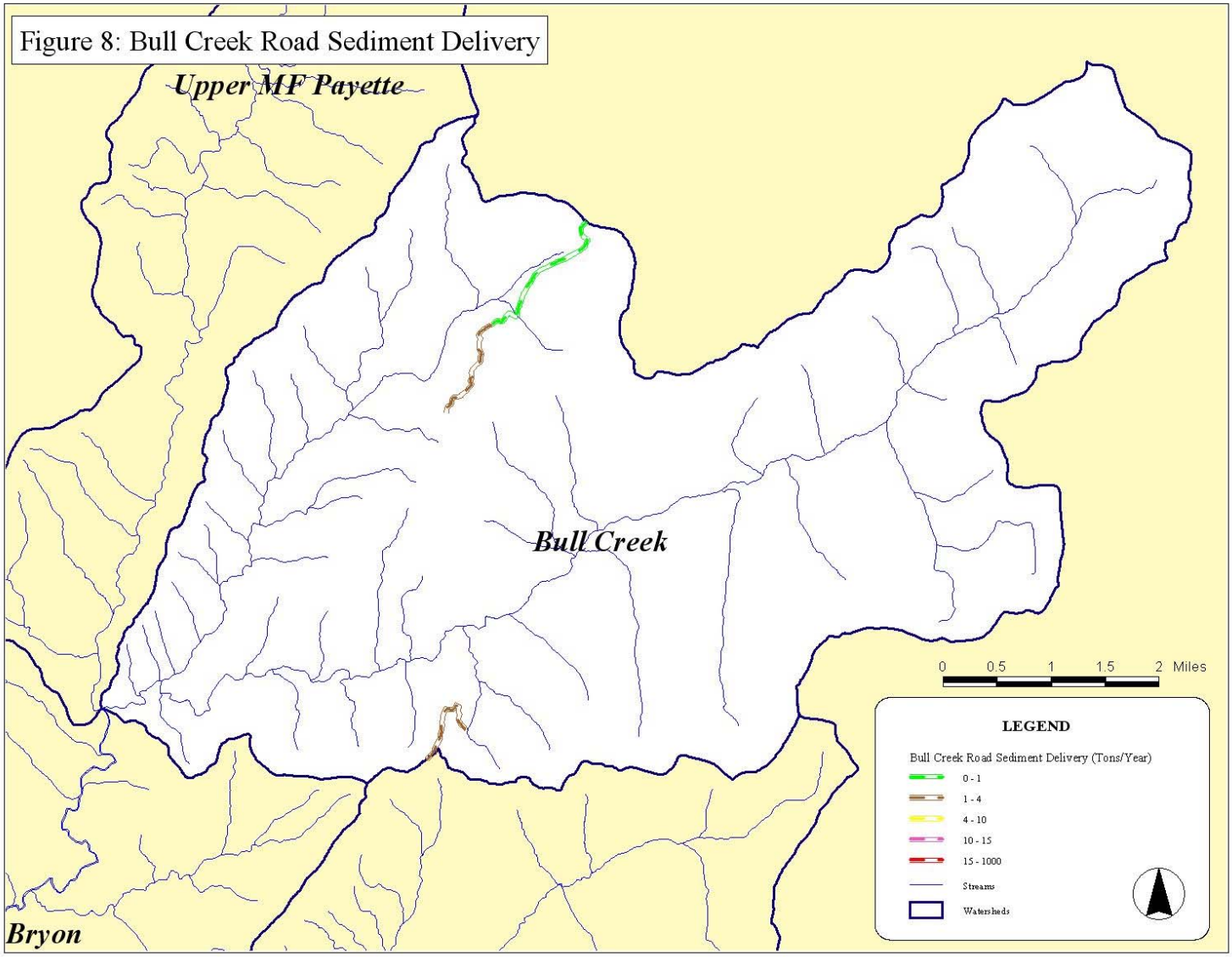


Figure 9 Bulldog Creek Road Sediment Delivery

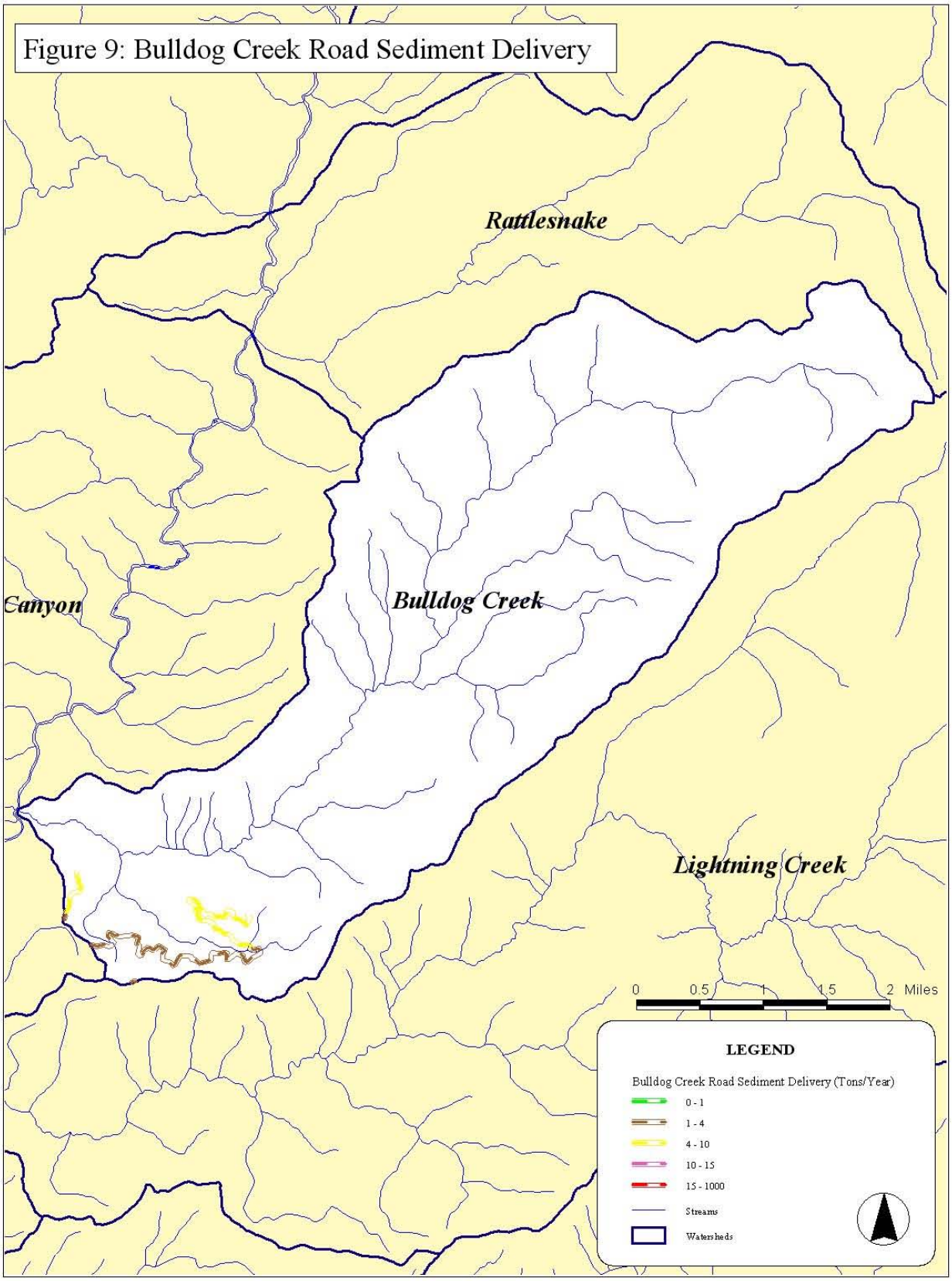


Figure 10 Lightning Creek Road Sediment Delivery

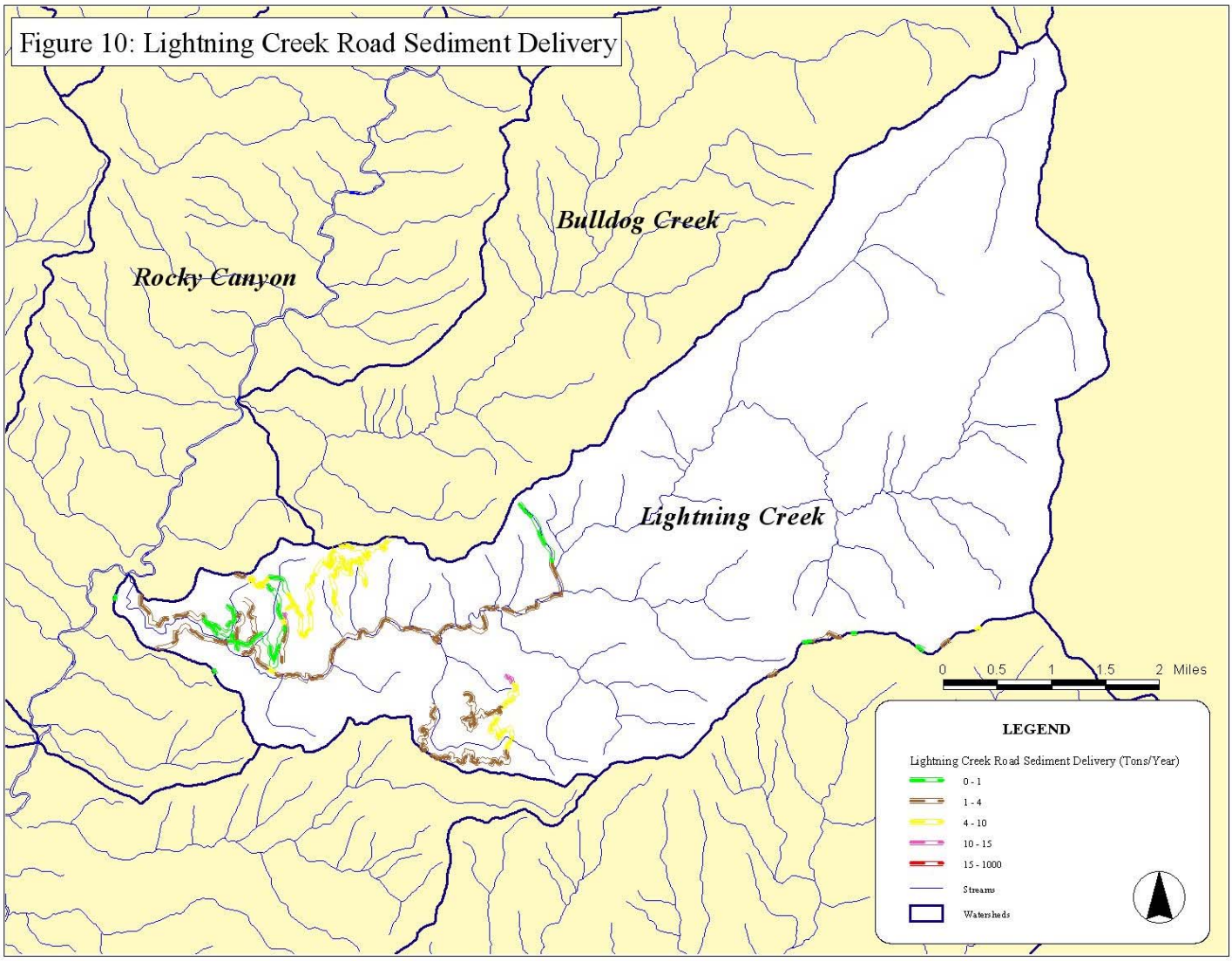


Figure 11 Pyle Creek Road Sediment Delivery

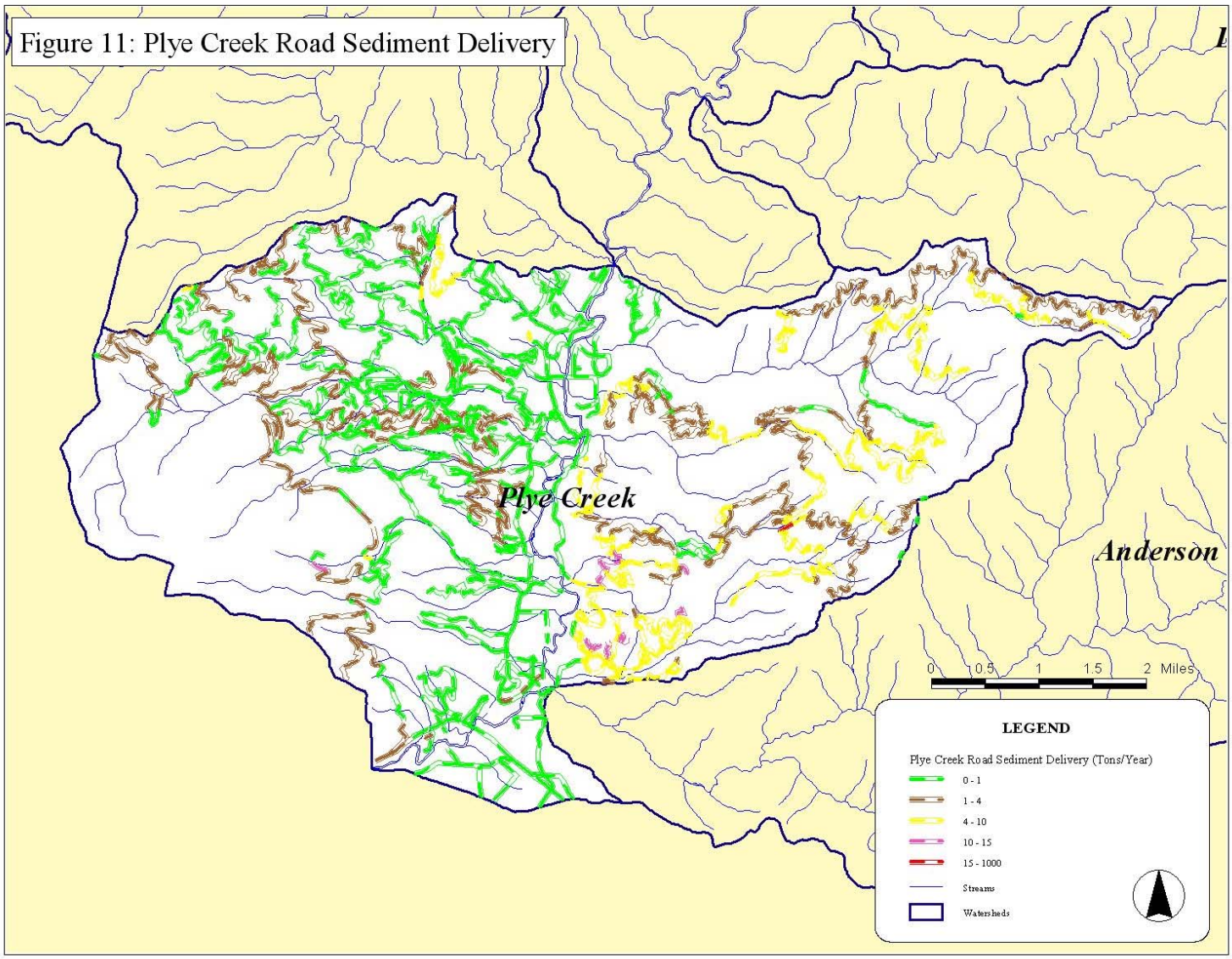


Figure 12 Rattlesnake Creek Road Sediment Delivery

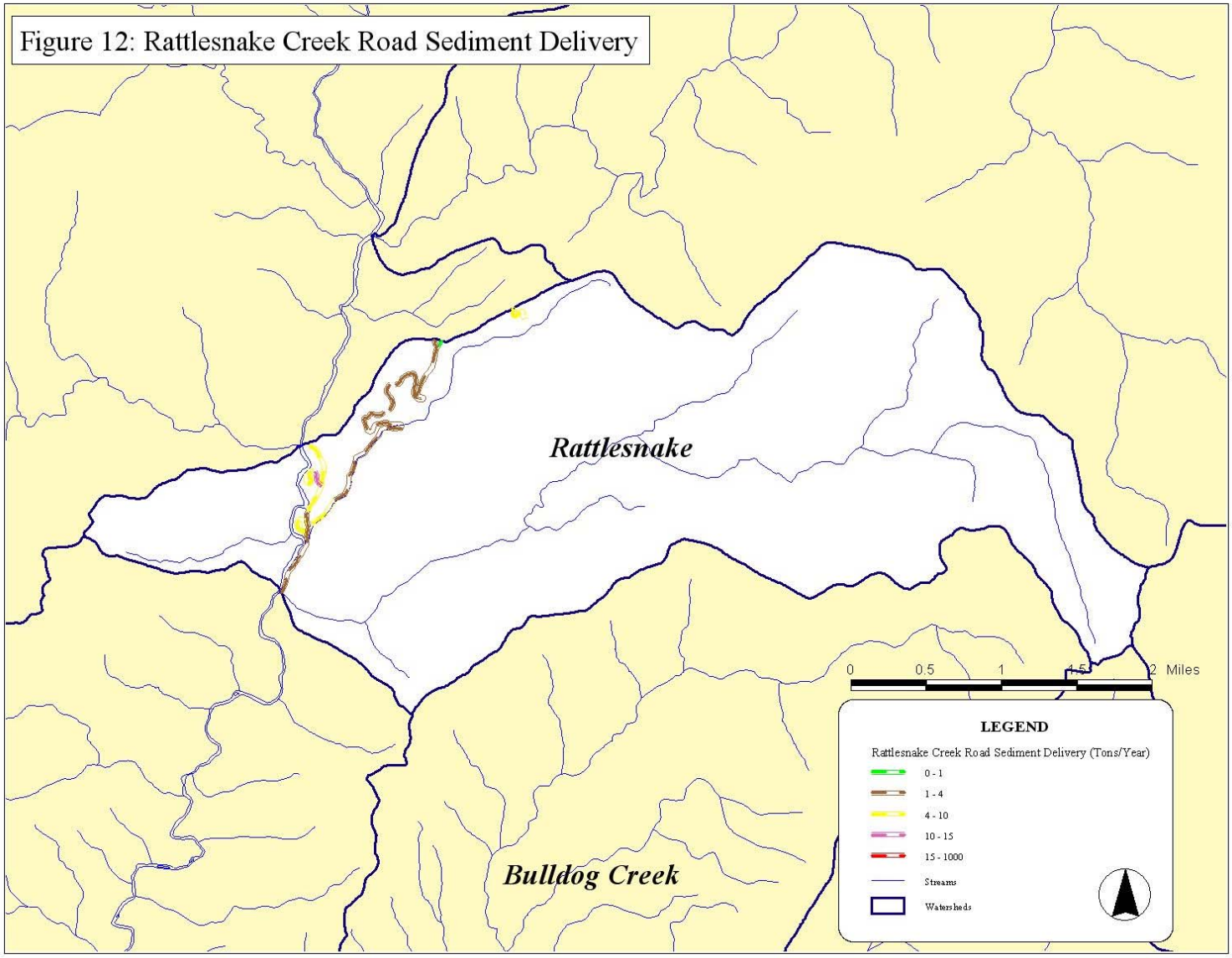


Figure 13 Rocky Canyon Creek Road Sediment Delivery

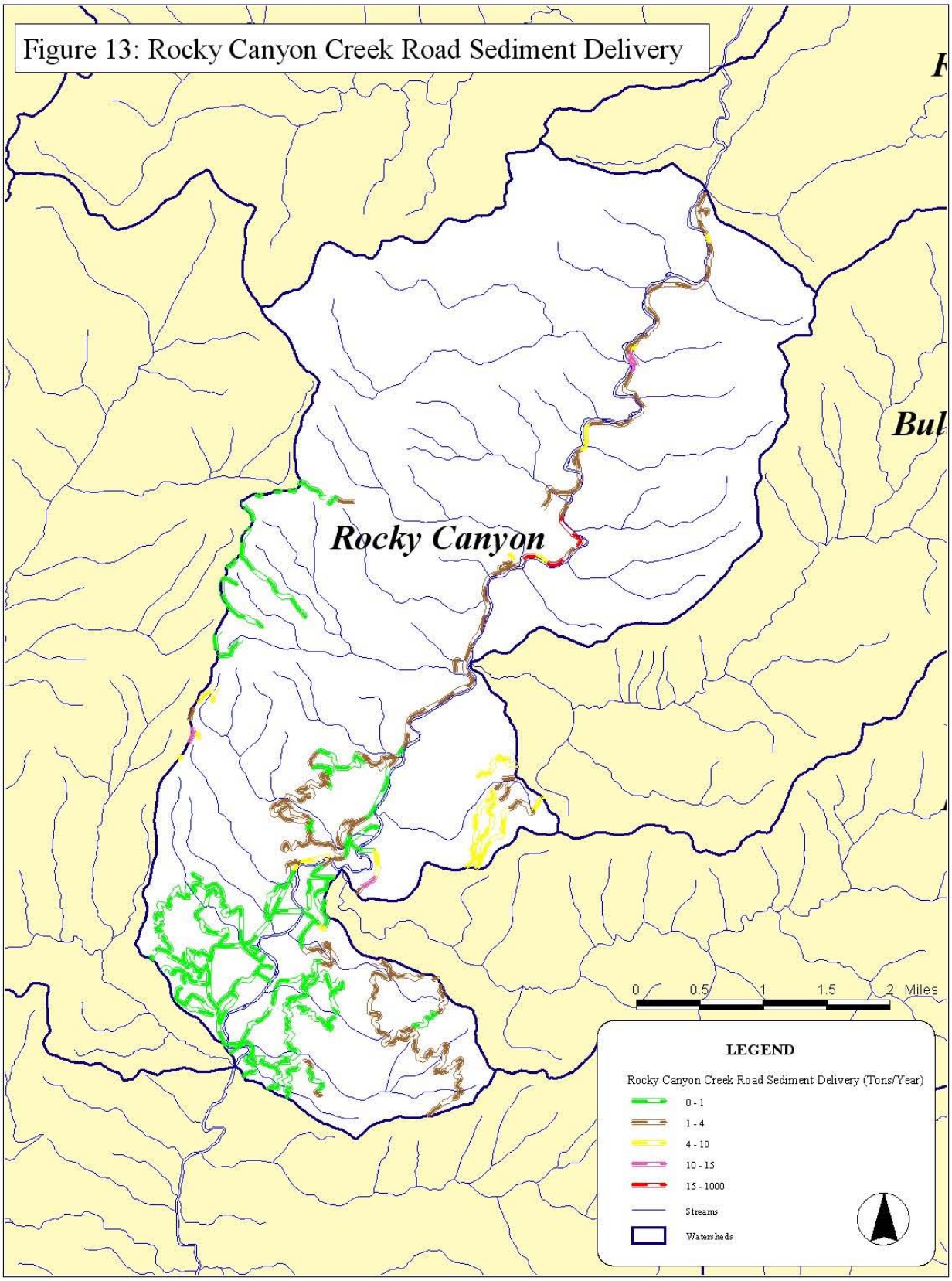


Figure 14 Scriver Creek Road Sediment Delivery

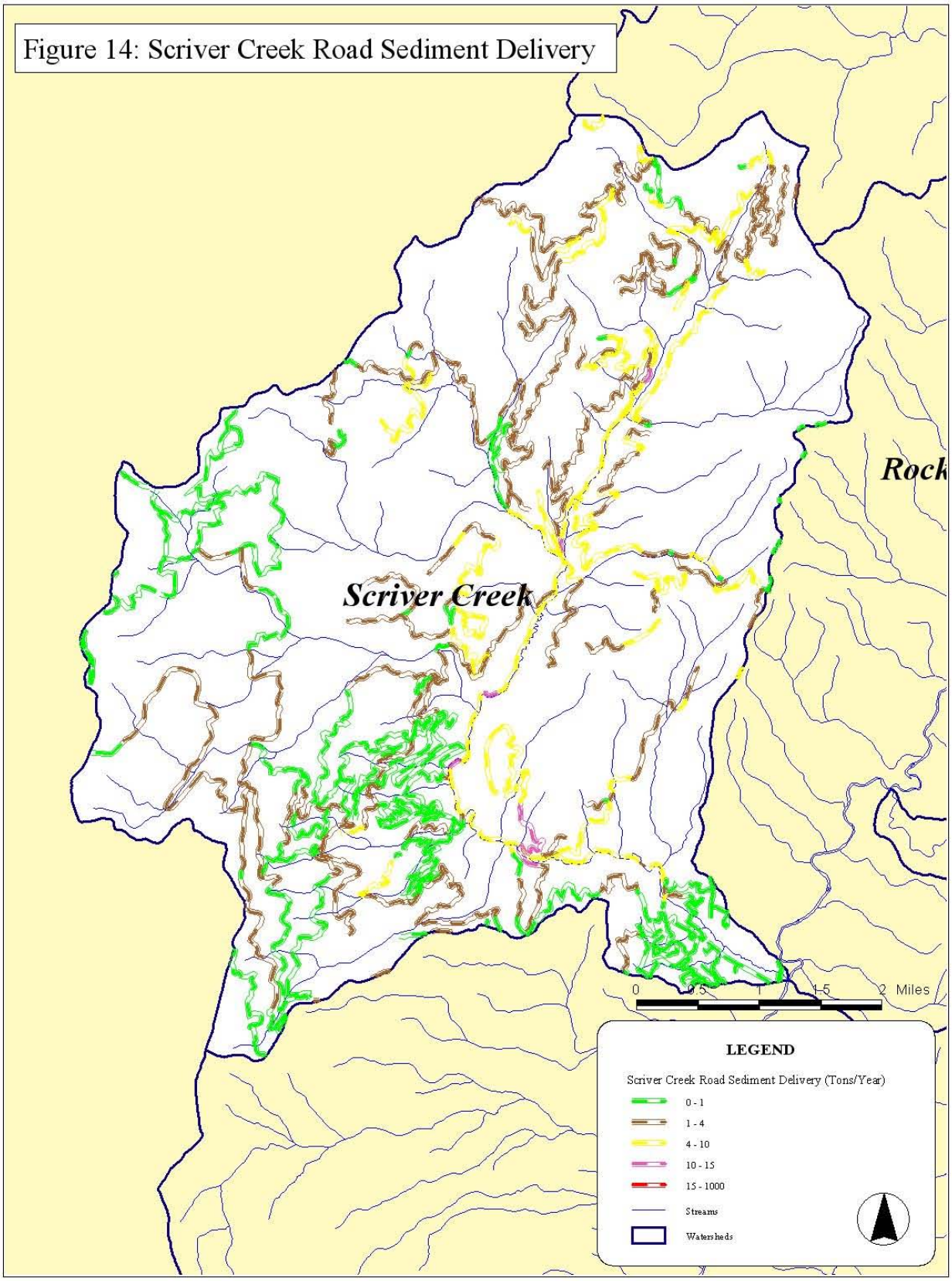


Figure 15 Sixmile Creek Road Sediment Delivery

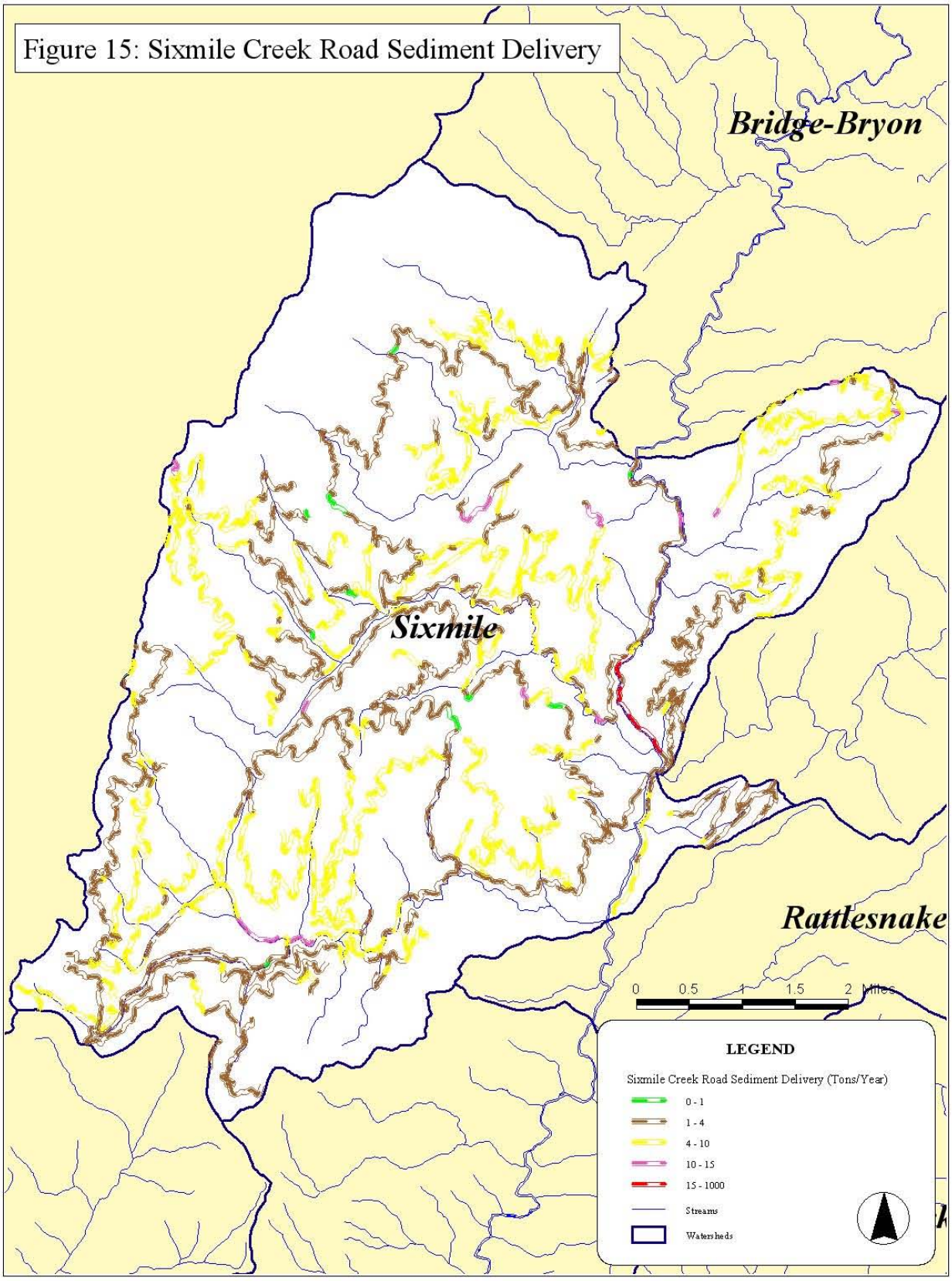


Figure 16 Upper MF Payette River Road Sediment Delivery

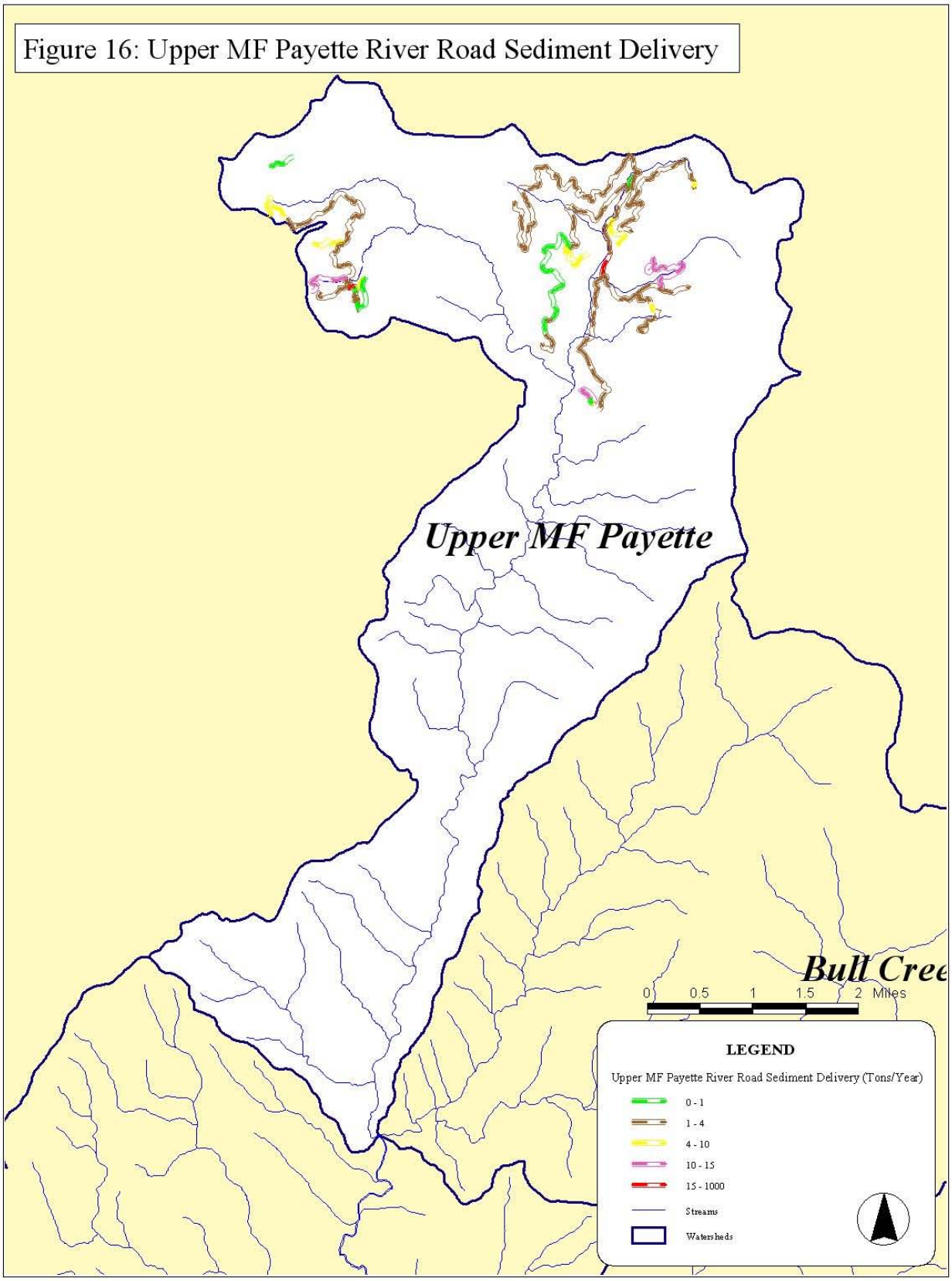
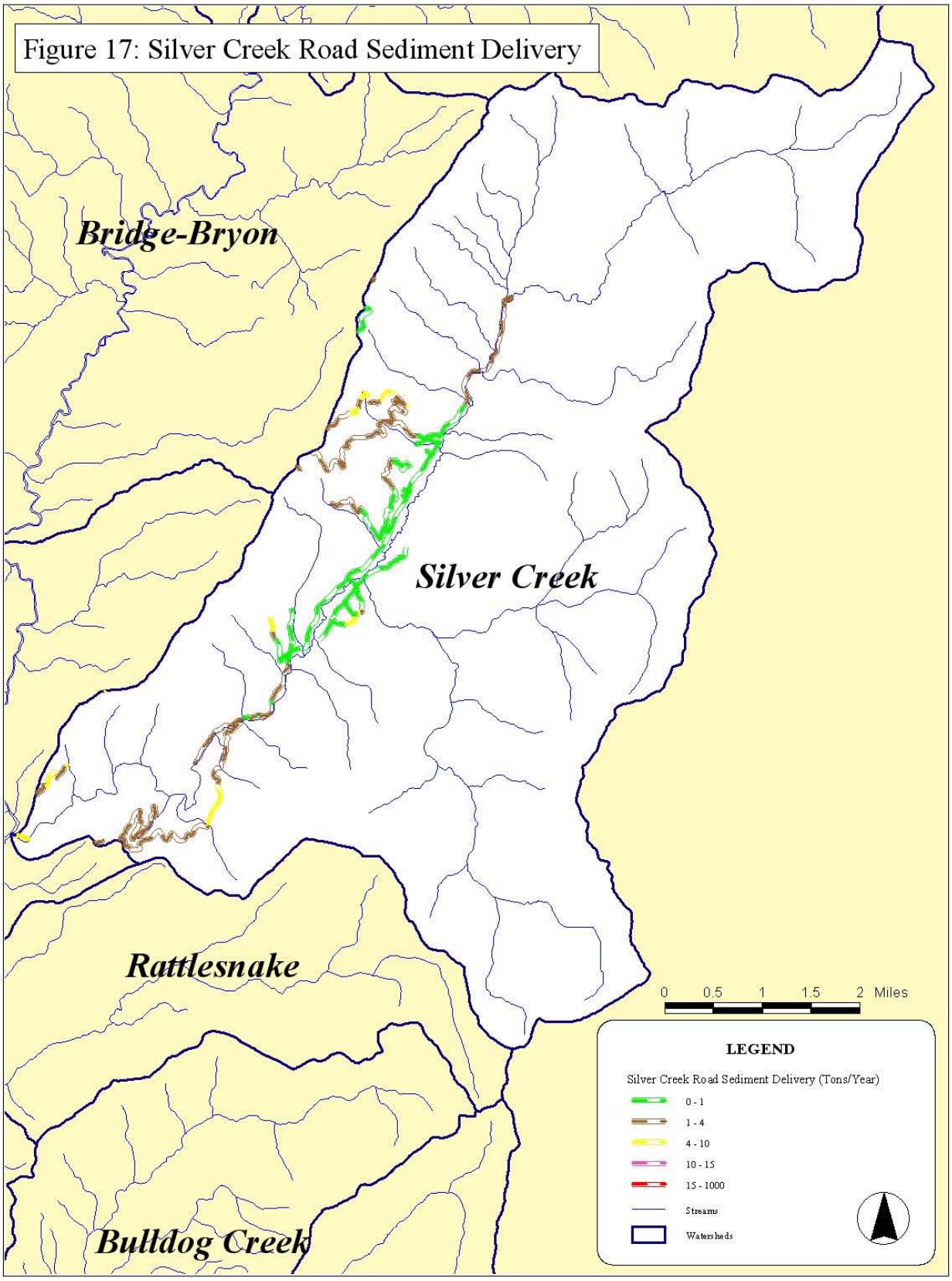


Figure 17. Silver Creek Road Sediment Delivery



IMPLEMENTATION

Point Sources

There are no point sources in the Middle Fork Payette.

Nonpoint Sources

The state has responsibility under Sections 401, 402 and 404 of the Clean Water Act to provide water quality certification. Under this authority, the state reviews dredge and fill, stream channel alteration and National Pollutant Discharge and Elimination System permits to ensure that the proposed actions will meet the Idaho Water Quality Standards and Wastewater Treatment Requirements.

Under §319 of the Clean Water Act, each state is required to develop and submit a nonpoint source management plan. Idaho's §319 nonpoint source management program has been revised and approved by EPA. The plan identifies programs to achieve implementation of best management practices (BMPs), includes a schedule for program milestones, is certified by the state attorney general to ensure that adequate authorities exist to implement the plan, and identifies available funding sources. Idaho's §319 nonpoint source management program also describes many of the voluntary and regulatory approaches the state will take to abate nonpoint pollution sources.

The State of Idaho uses a voluntary 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, which provides direction to the agricultural community and includes a list of approved BMPs. A portion of the Idaho Agricultural Pollution Abatement Plan outlines responsible agencies or elected groups, such as the soil conservation districts, necessary to address nonpoint source pollution problems. For agricultural activity, the Squaw Creek Soil Conservation District will assist landowners with developing and implementing BMPs to abate nonpoint pollution. If a voluntary 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 58.01.02.350.02(a)). 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. If necessary the state may seek injunctive or other judicial relief against the operator of a nonpoint source activity in accordance with Idaho Code (IDAPA 58.01.02.350).

Additionally, mass failures while generally associated with rain on snow events and typically covering small localized land areas are for the purposes of this implementation plan considered to be nonpoint source in nature.

Implementation of Pollution Control Efforts
The Federal and State governments have insufficient funding resources to adequately address the problems in the current budgetary climate. The current budget applied to work by the Forest Service will require many years to address. Grants from environmental or corporate foundations and federal programs will provide a portion of the funds needed. The Section 319 Clean Water Act program is the largest source of funds for nonpoint source water pollution improvement projects with approximately $2.4 million in grant funds each year. Average grants in the past several years have averaged $150,000 exclusive of the 40% local matching funds. As such, even with this nonpoint source pollution program it can only provide a marginal boost to the current Forest Service appropriations.

Pollution control efforts within the Middle Fork Payette River basin have been established for forestry, agriculture, and grazing. Forest practices are regulated through Idaho's Forest Practices Act and the Idaho Department of Lands is the lead agency for all forest-related activities in the state of Idaho. This Act sets standards to prevent degradation through sediment or any other forest practice pollutants. Agriculture and grazing follow voluntary "Best Management Practices" as outlined in the Idaho Agricultural Pollution Abatement Plan. Strategies to achieve the primary and secondary interim sediment targets and reasonable assurance of pollutant reductions are included in each section for Agriculture, Forestry, and Urban/Suburban.

Forestry
Throughout the Middle Fork Payette River basin awareness of forest and water-quality issues have increased as a result of the Boise National Forest Plan. Additionally, the Forest Practices Act as implemented has resulted in the reduction of off-site impacts due to timber management. Present timber harvests, road building and maintenance, and livestock grazing management have all shown an overall improvement in relation to water quality within the watershed.

Urban
The primary sediment source due to urban activities within the Middle Fork Payette is associated within and around the town of Crouch. Urban sources of sediment include runoff from roads and other impermeable surfaces, non-vegetated areas, and construction activities. Urban sources generally contribute sediment during stormwater runoff events. Many of these roads within the watershed are steeply sloped, improperly designed, inadequately maintained with and cuts and culverts in poor repair. The Catalog of Stormwater BMPs for Idaho Cities and Counties provides technical guidance for the selection and site design of stormwater best management practices. When properly implemented and maintained these BMPs minimize the effects of urban-residential related runoff. Table 5 lists a variety of permanent BMPs, which can help reduce water quality impairment, associated with sediment production, while Table 6 lists a variety of construction/temporary BMPs.

Table 5. Permanent Controls, Considerations, and Comparative Costs for Various Sediment BMPs

BMP	**Considerations**			**Comparative Cost & Applicability**			
Name	*Sediment Removal (>70% effective)*	*Area Required*	*Water Availability*	*Relative Capital Cost per Acre Served*	*Relative O & M Cost*		*Primary Treatment Mechanism(s)*
					Routine	*Non-Routine*	
Vegetated Swale	X	X	X	Low	Low	Moderate	Sedimentation / Filtration
Vegetative Filter Strip	X	X	X	Low	Low	Moderate	Sedimentation / Filtration
Sand Filter	X			Moderate	Moderate	Moderate	Sedimentation / Filtration
Infiltration Trench	X			Low to Moderate	Moderate	High	Infiltration
Infiltration Basin	X	X		Low to Moderate	Low	Moderate	Infiltration
Wet Pond	X		X	Moderate	Low	Moderate	Sedimentation
Wet Extended Detention Pond	X			Moderate	Low	Moderate	Sedimentation
Dry Extended Detention Pond		X		Moderate	Low	Moderate	Sedimentation
Constructed Wetland		X	X	Moderate to High	High	High	Sedimentation / Filtration
Oil/Water Separator				High	Low	High	Sedimentation / Filtration

Table 6. Temporary Controls, Considerations, and Comparative Costs for Various Sediment BMPs

BMP	Considerations			Comparative Cost & Applicability			
Name	*Sediment Removal (>70% effective)*	*Slope Protection*	*Sediment Collection / Runoff Diversion*	*Relative Capital Cost per Acre Served*	*Relative O & M Cost*		*Expected Life*
					Routine	*Non-Routine*	
Preserving Existing Vegetation	X	X	X	Low	Low	Low	Becomes Permanent
Mulching	X	X		Moderate	Moderate	Moderate	6-8 Months
Geotextiles & Mats	X	X		High	Moderate	Moderate	6-8 Months
Check Dams	X			Moderate	Low	Moderate	6 Months to 1 Year
Straw Bale Barrier	X		X	Low	High	High	3 Months
Silt Fence	X		X	Moderate	Moderate	Moderate	2-6 Months
Vegetative Buffer Strip	X		X	Low	Low	Low	50 Years
Sediment Trap	X		X	Low	Low	Low	6-18 Months
Earth Dike	X		X	Moderate	Moderate	Moderate	2-25 Years
Perimeter Dike / Swale	X		X	Moderate	Low	Low	18 Months

Recreation

Since the late 1970's, all federal, state, and private forestland managers have followed a strict set of harvesting guidelines specifically written to minimize or prevent erosion and sedimentation of which much is associated with the existing roads network. However, recreational activities within the Middle Fork Payette River watershed, which may utilize the same roads network, are unregulated. In a number of instances, the treatment of sediment for roads on city, county, state, and/or federal lands may alleviate much of the sediment derived from recreational uses within the watershed.

As such, the following types of management activities may need to occur within the Middle Fork Payette River basin as they relate to recreational activities and include:

- reconstruction of existing roads to meet current standards;
- improvement of drainage structures, water bars, grass seeding;
- relocation of roads;
- resurfacing of roads; or

- temporary and permanent closure of high risk road segments.

Agriculture and Grazing
Agriculture BMPs have been implemented in Boise and Valley Counties with great success. The no-till conservation farming of alfalfa reduces the sediment production from these lands greatly. Water and sediment control structures and grassed waterways reduce overland flow and subsequent gully erosion on cropland. Fencing, livestock access ramps, pasture and hay land management, and proper grazing uses are other BMPs used to improve livestock grazing and management.

Sediment reduction incentive programs available to landowners within the Middle Fork Payette River basin have included cost-share incentives through a number of State and Federally funded programs. Under various programs site specific Best Management Practices (BMPs) have been implemented to reduce livestock impacts to streams and other water bodies. These BMPs consisted of fencing, ponds, off-site watering systems, spring developments, and no-till farming practices.

Sediment Target
The Middle Fork Payette River typically receives sediments from landslides, forest roads, unstable stream banks, and exposed soil areas due to construction and agriculture activities during rainfall and snow melt. Additionally, naturally occurring events associated with the geomorphic properties of the area may also provide significant sediment inputs. However, these natural events not associated with any anthropogenic activity are considered to be part of the background sediment load in the watershed.

Gravel sized sediments (<8 mm) originating in the upper watershed and tributaries are routed down steep channels and are deposited in the flatter reaches in the lower portion of the basin. The primary nonpoint sources (NPS) of pollutants in the Middle Fork Payette River basin are forest management activities, grazing, small-scale agriculture operations, county road construction and management, urban runoff, and land development activities.

A primary interim target for sediment specifies an increase to an average of two pools >1.3 meters in depth per km and a minimum of no less than three pools in any three km stretch. Secondary interim targets were also established, which include construction of instream structures to promote pool development and a reduction in management induced sedimentation. Additionally, work completed by Borden, 2001 indicates that sediment within the Middle Fork of the Payette River will need to be reduced by 76% in order for beneficial uses to be obtained. The work completed by Borden, 2001 will be used as the initial target for sediment reduction throughout the various middle fork Payette watersheds. However, as previously mentioned it is impractical to reduce 76% of the entire sediment load, including natural background, being generated in the Middle Fork Payette watersheds. As such, projects will focus on reducing 76% of the anthropogenic load in each of the priority watersheds.

Project Implementation

The Middle Fork Payette River TMDL Implementation Plan recognizes that once a land owner or land manager has met the initial load reduction target on current operations, no further reductions will be required until all other landowners or managers have met the reduction target. New or modified activities within any given watershed will need to be designed from the beginning with the sediment target in mind and BMPs implemented accordingly. The implementation plan also recognizes that not every project within a given watershed may necessarily meet the 76% reduction, but that the overall 76% reduction within the watershed must be met.

Project Tracking

The DEQ has developed a TMDL implementation tracking database for use in the Middle Fork Payette River based on work completed for the Cascade Reservoir TMDL Implementation Plan. Hydrologic conditions are similar to work completed within the Cascade area. As such, BMP effectiveness from projects implemented within the Cascade watershed will be applied to the Middle Fork Payette watershed. The use of this database will allow DEQ and the other land management agencies to monitor the overall effectiveness of projects in meeting the 76% reduction in a given watershed.

Additional Work or Research

It has also recognized that a detailed hydrologic survey of the Middle Fork Payette watershed may be necessary prior to the development or installation of instream structures to promote pool development. This study would need to determine how best management practices installed on transport or high gradient reaches of the watershed could potentially impact the low gradient or depositional reaches of the Middle Fork of the Payette River. However, any developments of instream structures would need to meet the approval of the U.S. Army Corp of Engineers and may also require a stream alteration permit from the Idaho Department of Water Resources as specified in the Idaho Stream Protection Act and/or a §401 water quality certification for DEQ. Additionally, since work completed by the U.S. Army Corp of Engineers can require matching funds (in-kind or actual cash), any projects will need to be coordinated with local, private and state agencies.

Designated Agencies

The Idaho Water Quality Standards and Wastewater Treatment Requirements list designated agencies responsible for reviewing and revising nonpoint source BMPs based on water quality monitoring data as is generated through the state's water quality monitoring program. Designated state agencies are:

- Department of Lands for timber harvest activities, oil and gas exploration and development, and mining activities;
- Soil Conservation Commission for grazing and agricultural activities;
- Department of Transportation for public road construction;
- Department of Agriculture for aquaculture; and the
- Division of Environmental Quality for all other activities.

Existing authorities and programs for assuring implementation of BMPs to control nonpoint sources of pollution in Idaho are included in Table 7.

Table 7. Existing Authorities and Programs for Implementing BMPs

State Agricultural Water Quality Program	Nonpoint Source 319 Grant Program
Wetlands Reserve Program	Conservation Reserve Program
Environmental Quality Improvement Program	Resource Conservation and Development
Idaho Forest Practices Act	Agricultural Pollution Abatement Plan
Water Quality Certification For Dredge and Fill	Stream Channel Protection Act

As designated land management agencies, both the USDA Forest Service and the USDI Bureau of Land Management entered into a Memorandum of Understanding between the US-EPA and various State of Idaho agency departments. Within the Forestry Practices Appendix to this MOU, the federal agencies agreed to comply with the water quality protection provisions of the Idaho Forest Practices Act Rules and Regulations.

Goals and Objectives for Private Agriculture/Grazing

To protect and enhance both the quality of the surface and ground water in the Middle Fork Payette River watershed by developing a detailed agricultural implementation plan to meet State water quality criteria on the Middle Fork Payette River.

IDAPA 58.01.02.054.07 refers to the Idaho Agricultural Pollution Abatement Plan (Ag Plan), which provides direction to the agricultural community on approved best management practices. The Squaw Creek Soil Conservation District will act as the lead for implementing best management practices related to agricultural activities.

Sediment

Reduce sediment loading from agricultural sources to help accomplish the primary interim 2-meter pool target.

Identification of Critical Acres - Rationale and Process

A watershed inventory was completed to determine the land areas that affect the Middle Fork Payette River watershed. Aerial photos, topography maps and field investigations were utilized to determine the land areas that impact the water quality of the Middle Fork Payette River watershed.

Topography transitions and roads determine the route of the natural drainage related to the private agricultural lands. The associated land that directly impacts a waterbody, and that would likely go to the mouth of the Middle Fork Payette River watershed will be part of each individual Treatment Unit and will be prioritized based on the BMP and its relationship to minimizing erosion and sedimentation. Table 8 illustrates the acreage associated with each Treatment Unit. The estimated acres are based upon the most current Boise County land classification tax assessment of agricultural lands class codes 1 through 5. Ranchettes, those tracts classed as residence, and lands supporting livestock but failing to meet the conditions to qualify as agricultural land, will be addressed in the Urban and/or Recreation plans.

Table 8. Critical Acres within each Treatment Unit

Unit	Acres	Land Type	Class Code
Treatment Unit 1	650	Riparian/Meadows	4
Treatment Unit 2	1050	Irrigated Cropland/Hayland/Grazing	1, 2
Treatment Unit 3	1100	Non-irrigated Cropland/Hayland/Grazing	3,5

Agricultural - Grazing Tasks (Example Only)

Task 1: Develop contracts on 90% of Treatment Unit 1 Lands for private agriculture lands
Milestone 1: August 2007
Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 2: Implement contracts with cost-share on 90% of Treatment Unit 1 Lands for private agriculture
Milestone 2: August 2010
Responsible Agency: Private land Owners

Task 3: Develop contracts on 90% of Treatment Unit 2 Lands for private agriculture lands
Milestone 3: August 2007
Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 4: Implement contracts with cost-share on 90% of Treatment Unit 2 Lands for private agriculture
Milestone 4: August 2010
Responsible Agency: Private land Owners

Task 5:	Coordinate an annual BMP implementation tour of private agricultural lands
Milestone 5:	September (Annually)
Responsible Agency:	Squaw Creek Soil Conservation District

Task 6:	Develop photo point stations on private agricultural land
Milestone 6:	In association with individual contracts
Responsible Agency:	Idaho Soil Conservation Commission, Squaw Creek Soil Conservation District

Task 7:	Monitor photo point stations on private agricultural land
Milestone 7:	*Quarterly throughout the growing season* Annually
Responsible Agency:	Squaw Creek Soil Conservation District

Formulation of Alternatives

The formulation process of developing alternatives focused on the identified resource problems. The following alternatives that address these problems were considered during this process. The formulation process of developing alternatives focused in on the identified resource problems. The following alternatives, which address the problems, were considered during the process:

Alternative 1

No action (possible future without voluntary landowner participation).

This alternative consists of continuing with the present existing conservation programs. These programs would not adequately address the water quality problems in the Middle Fork Payette River watershed. Erosion and sedimentation rates would remain constant or increase, as would the delivery nutrients and bacteria to the Middle Fork Payette River watershed. These continuing problems could likely lead too greater detrimental impacts to the existing beneficial uses of these waters, which could lead to mandatory landowner participation.

Alternative 2

Land treatment with stream buffers, riparian fencing, riparian plantings, off-stream livestock watering, improved irrigation systems, sediment and nutrient control systems, and management practices (BMPs with voluntary landowner participation). This alternative was formulated to reduce stream temperature, reduce erosion, contain and filter sediment, improve riparian vegetation and wildlife habitat. This will improve the quality of surface waters in the project area and reduce pollutant loading to the Middle Fork Payette River watershed. The status of the beneficial uses for these waters will be improved with the implementation of this alternative.

Agricultural conservation and soil erosion practices are typically referred to as best management practices (BMPs). These practices are nationally derived systems to control, reduce, or prevent erosion and sedimentation from agricultural landuses. It is estimated that the full implementation of these alternatives would help restore beneficial uses. The best management practices planned under this alternative are included in the following tables (Tables 9 – 11).

Table 9. BMPs and Practice Codes for Treatment Unit 1 (Example - Riparian Pasture)

Fence (382)	Stream Channel Stabilization (584)
Heavy Use Area Protection (561)	Wetland Restoration (657)
Critical Area Planting (342)	Riparian Herbaceous Cover (390)
Pipeline (516)	Use Exclusion (472)
(Livestock) Watering Facility (614)	Prescribed Grazing (528A)
Filter Strips (393)	Pasture and Hayland Planting (510)
Streambank and Shoreline Protection (580)	Nutrient Management (590)
Field Border (386)	Pest Management (595)

Table 10. BMPs for Treatment Unit 2 (Example - Irrigated Cropland, Hayland or Pasture)

Irrigation System (442)	Irrigation Water Conveyance
Irrigation Water Management (449)	Structure for Water Control (587)
(Livestock) Watering Facility (614)	Pumping Plant for Water Control (533)
Pipeline (516)	Conservation Crop Rotation (328)
Fence (382)	Residue Management
Prescribed Grazing (528A))	Pasture and Hayland Planting (512)
Filter Strips (393)	
Heavy Use Area Protection (561)	Nutrient Management (590)
Critical Area Planting (342)	Pest Management (595

Table 11. BMPs for Treatment Unit 3 (Example – Dry Cropland, Pasture, or Rangeland)

Fence (382)	Heavy Use Area Protection (561)
Grazing Land Mechanical Treatment (548)	Upland & Wildlife Habitat Management (645)
Brush Management (314)	Spring Development (574)
Critical Area Planting (342)	Pipeline (516)
Prescribed Grazing (528A)	(Livestock) Watering Facility (614)
Prescribed Burning (338)	Pest Management (595)
Rangeland Planting (550)	Conservation Crop Rotation (328)
Pasture and Hayland Planting (512)	Residue Management

Program of Implementation - Alternative Selected

The Squaw Creek Soil Conservation District selected Alternative 2, land treatment through application of a combination of structural, nutrient and sediment control systems, and management practices. Alternative 2 will meet the District's objective by reducing water quality degradation of the Middle Fork Payette River watershed through protection and enhancement of the beneficial uses of these waters. Table 12 provides an estimated cost for implementation of the selected alternative.

The selected alternative is a combination of BMPs that will:

- Reduce on-site grazing-induced erosion;
- Reduce the erosion and sedimentation within Middle Fork Payette River watershed;
- Reduce the sedimentation of streams and rivers;
- Reduce surface water contamination by animal wastes;
- Improve riparian vegetation and wildlife habitat; and
- Improve the water quality of the Middle Fork Payette River watershed.

Squaw Creek SCD will apply for funding of the selected alternative through the Idaho Water Quality Program for Agriculture Cost-Share Program, §319 Program, Environmental Quality Incentives Program (EQIP) or other applicable programs. Squaw Creek SCD will request funding to treat approximately 650 acres of Riparian/Meadow land and 1050 acres of surface irrigated cropland. The project is expected to run from 2003 through 2010.

Alternative Elements

The state of Idaho utilizes a voluntary approach for agricultural lands for landowners to meet water quality goals. If a voluntary 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 58.01.01.350.02(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. Not all BMPs will be required in each treatment unit or on every

parcel of land within the treatment unit. Only those BMPs needed for water quality improvements, which are feasible to the participant, will be implemented and receive cost-share funds.

Installation and Financing

The USDA Natural Resources Conservation Service (NRCS) is the technical agency that will assist the Idaho Soil Conservation Commission (ISCC) and the Squaw Creek SCD in developing water quality plans and designs and assist with BMP installation, utilizing standards and specifications contained in the NRCS Field Office Technical Guide. NRCS and ISCC will assist the Squaw Creek SCD with certification of installed BMPs, submitting payment applications, completion of annual status reviews on contracts, annual development of an average cost list, and will provide any needed follow-up assistance such as that required for contract modification.

Each participant will be responsible for installing the BMPs scheduled within their contract as planned in the Conservation Plan of Operation. 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.

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Table 12. Treatment Unit 2 - BMP Cost, Cost-Share Rate (Example)

BMP	Life of BMP (Yrs)	Unit of Measure	Units Needed	Units Cost	Cost Share Rate	Cost Share Amount	Operator Cost
Conservation Crop Rotation	1	Acre	1,220	$ 13	0%	$ -	$ 15,860
Residue Manangement	1	Acre	1,220	$ 40	0%	$ -	$ 48,800
Fence	15	Acre	84,500	$ 2	75%	$ 126,750	$ 42,250
Filter Strips	10	Acre	100	$ 225	90%	$ 20,250	$ 2,250
Irrigation Land Leveling	15	Cubic Yard	1,500	$ 1	75%	$ 1,125	$ 375
Irrigation System, Gated Pipe	15	Acre	40	$ 400	75%	$ 12,000	$ 4,000
Irrigation System, Sprinkler	15	Acre	1,060	$ 800	75%	$ 636,000	$ 212,000
Irrigation System, Surge	10	Acre	3	$ 1,300	75%	$ 2,925	$ 975
Irrigation System, Tailwater Recovery	15	Each	1	$ 10,000	75%	$ 7,500	$ 2,500
Irrigation Water Management	1	Acre	1,100	$ 15	0%	$ -	$ 16,500
Nutrient Management	1	Acre	3,400	$ 5	0%	$ -	$ 17,000
Pest Management	1	Acre	3,400	$ 5	0%	$ -	$ 17,000
Stream Crossing/Ramp	15	No.	16	$ 1,400	75%	$ 16,800	$ 5,600
Structure for Water Control	20	No.	30	$ 3,000	75%	$ 67,500	$ 22,500
Use Exclusion (Riparian, 3 yr. Max)	1	Acre	300	$ 24	100%	$ 21,600	$ -
					TOTAL	**$ 912,450**	**$ 407,610**

The maximum cost-share that can be granted to each participant will be limited and will be based upon BMP cost-share rates as specified by specific cost-share programs. Participants will be encouraged to participate in each program available.

Operation, Maintenance, and Replacement
Participants will be required to maintain the installed BMPs for the life of the practice. The contract will outline the responsibility of the participant regarding operation and Maintenance (O&M) for each BMP. NRCS and ISCC will provide technical assistance for BMPs.

Inspections of installed BMPs will be made annually by the Squaw Creek SCD, NRCS, ISCC and the participant during the life of the contract. Contract life will not exceed ten (10) years. 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 contract expires.

Input Needs
The estimates based on the projected practice application and the final costs will be those actually incurred at the time of installation. Table 13 provides an example of the estimated costs for installation of BMPs within the watershed related to agricultural activities. Installation costs will be shared by the individual landowners and through other funding sources. Project administration includes all administration costs associated with the installation of the selected alternative. These costs include the review and approval of conservation plans (contracts), administration of the water quality contracts and supervision of BMP application.

Administrative Needs and Costs
In order to meet the previously identified objectives, the Squaw Creek SCD will serve as the administrative agency responsible for implementation of the selected alternative on private agricultural lands. Approximately 10% of the total cost-shared costs for BMP installation may be used to estimate the cost for administration. The following actions will be taken by the district to support the administrative responsibility:

- focus of technical and financial resources on the installation of BMPs in critical areas;
- balanced program which is technically feasible and socially and economically acceptable to the land users in the project area; and
- voluntary development of conservation plans for land owners operating on critical acres.

Technical Assistance Needs
The following technical assistance (TA) needs are based on implementing water quality BMPs throughout the entire watershed over 18 years. The TA staff years needed are based on a 1 staff year for the watershed. This allows for a full time planner with technical engineering abilities to develop contracts, administer contracts, monitor BMP implementation, and perform yearly reviews of BMPs in the field; a full time conservation or engineering technician to provide BMP design support.

Table 13. Estimated Total Costs for Agricultural-Grazing BMPs (Example)

Item	Cost Share	Operator Cost	Item Cost	Total Cost
Treatment Unit 2	$912,450	$407,610		$1,320,060
Treatment Unit 3	$1,880,531	$1,113,764		$2,994,295
Administrative			$132,000	$132,000
Technical			$832,000	$832,000
TOTALS	**$2,792,981**	**$1,521,374**	**$964,000**	**$5,278,355**

Goals and Objectives for Federal Lands

U.S. Forest Service (USFS)

To protect and enhance both the quality of the surface and ground water in the Middle Fork Payette River watershed by developing a detailed implementation plan to reduce sedimentation and meet the State of Idaho Water Quality Standards and Wastewater Treatment Requirements on the Middle Fork Payette River. The lands encompassed by national forest are administered through the Intermountain Region (Region 4) are based in Ogden, Utah.

USFS authority is embodied in numerous federal laws and regulations. The USFS is the designated management agency for nonpoint source pollution controls on all national forest lands and is governed by the following rules and regulations:

- Organic Act;
- Multiple Use Sustained Yield Act;
- Wilderness Act;
- Forest and Rangeland Renewable Resources Act;
- National Forest Management Act;
- National Environmental Policy Act;
- Wild and Scenic Rivers Act; and the
- Clean Water Act.

The USFS has the statutory authority to regulate and permit land use activities on national forest lands, which may affect water quality. As a designated management agency, the USFS is responsible for implementing nonpoint source pollution controls for land use activities such as silviculture, grazing permits, mining, and road construction. A MOU with the State of Idaho provides for State input and coordination with USFS activities, under the State of Idaho Nonpoint Source Management Plan.

Federal Forest Lands – General Tasks

Task 1: Crosswalk current roads inventory to BOISED and identify data gaps.
Milestone 1: August 2003
Responsible Agency: USFS

Task 2: Inventory all Middle Fork Payette River roads identified as data gaps in Task 1 using USFS protocols.
Milestone 2: August 2003
Responsible Agency: USFS

Task 3: Develop new sediment implementation projects based on field checked BOISED modeling.
Milestone 3: Ongoing
Responsible Agency: USFS, IDL, Boise County, ITD

Task 4: Annually complete baseline cross sections, pebble counts, and profile reach surveys
Milestone 4: 2003 through 2006
Responsible Agency: USFS

Task 5: Identify further stream channel restoration opportunities in tributary streams
Milestone 5: December 2003
Responsible Agency: USFS

Task 6: Implement Stream Channel Restoration opportunities identified in general Task 5
Milestone 6: 2003 through 2006
Responsible Agency: USFS

Task 7: Investigate sediment processing through the Middle Fork Payette watershed.
Milestone 7: 2004-2005
Responsible Agency: USCOE

Task 8: Develop management alternatives to increase sediment through put in the impacted reach of the Middle Fork Payette River.
Milestone 8: 2005-2006
Responsible Agency: USCOE

Task 9: Work with community leaders to develop sediment reduction projects based on USCOE design alternative.
Milestone 9: 2007-2008
Responsible Agency: USCOE, Boise & Valley Counties, IDL, Boise Cascade Corporation

Federal Forest Lands – Specific Tasks

Task 1: Completed Middle Fork Payette River Road gravelling.
Milestone 1: October 2000
Responsible Agency: USFS

Task 2: Completed Scriver Creek Road gravelling.
Milestone 2: October 2001
Responsible Agency: USFS

Task 3: Completed Various Silver Creek projects.
Task 3A: Stream Crossing Closure and Rehabilitation
Milestone 3A: Complete
Responsible Agency: USFS

Task 3B: Road Gravelling
Milestone 3A: Ongoing
Responsible Agency: USFS

Task 3C: User Road Obliteration
Milestone 3C: Complete
Responsible Agency: USFS

Task 3D: Dispersed Campsite Rehabilitation
Milestone 3D: Complete
Responsible Agency: USFS

Task 4: Complete Sixshooter Project.
Milestone 4: October 2004
Responsible Agency: USFS

Task 5: Complete Upper and Middle Fork Payette River Projects.
Milestone 5: December 2004
Responsible Agency: USFS

Task 6: Complete Wet Foot Projects.
Milestone 6: December 2006
Responsible Agency: USFS

Goals and Objectives for State Lands

To protect and enhance both the quality of the surface and ground water in the Middle Fork Payette River watershed by developing a detailed erosion control implementation plan on state and private forested lands based on the Cumulative Watershed Evaluation which will lead to the State of Idaho water quality standards being met on the Middle Fork Payette River.

Idaho Department of Lands (IDL)

The IDL is responsible for managing endowment trust lands for numerous Idaho institutions as well as public trust lands; administering forestry and mining best management practices on private and state lands; consulting and cooperating with federal land managers; and oversees

timber harvest activities, oil and gas exploration and development, and mining activities in Idaho.

The IDL has authority to administer the:

- Idaho Forest Practices Act;
- Dredge and Placer Mining Protection Act;
- Idaho Surface Mining Act; and the
- Idaho Lake Protection Act.

Under the Antidegradation Policy, IDL is designated as the lead agency for surface mining, dredge and placer mining, and forest practices on all lands within the state. IDL works closely with DEQ in conduction of the Forest Practices Act audits, which form the basis for achieving State/Federal consistency for nonpoint source activities on forestlands. They also work extensively with DEQ, BLM and FS on the use of the Forest Practices Cumulative Watershed Effect Process (CWE) for watershed evaluation input to the TMDL process.

The Forest Practices CWE Process provides a direct linkage for developing TMDLs and implementation plans for the forested portions of watersheds on the State §303(d) list. The use of CWE data in developing TMDL implementation plans for forested watersheds will identify problem areas within the Middle Fork Payette watershed and develop site specific BMPs for this TMDL implementation plan.

Forestry Pollution Control Strategies

Under the 1972 Clean Water Act (CWA), Congress authorized states to control non-point sources of pollution through the implementation of Best Management Practices (BMPs). A BMP is defined as a measure determined to be the most effective practical means of preventing or reducing pollution inputs from point or non-point sources in order to achieve water quality goals. Idaho's forestry BMPs are included in the Idaho Forest Practices Act (FPA), Title 38, Chapter 13, Idaho Code passed by the legislature in 1974. The FPA and associated administrative rules have been updated on several occasions since that time. The FPA is designed to assure the continuous growing and harvesting of forest tree species and to protect and maintain the forest soil, air, water resources, wildlife, and aquatic habitat. FPA rules address timber harvesting practices, forest road construction and maintenance, forest tree residual stocking and reforestation, use of chemicals/management and prescribed fire. The Idaho Water Quality Standards and Wastewater Treatment Requirements, Title 39, Chapter 1, Idaho Code references the FPA rules as the approved BMPs for silvicultural activities. IDL is the designated state agency responsible for administering and enforcing the FPA on all forestlands in the state.

Private Forestlands

Prior to the harvest of timber, a logging operator must notify the Department of Lands of planned timber harvest by filing a Certificate of Compliance & Notification of Forest Practices. This Compliance & Notification form lists the contractor responsible for slash management, operator responsible for FPA compliance, landowner, and log purchasers. Fire hazard and basic forest environmental information on streams, soils, and slopes are included in the form. IDL has the

authority to enter logging operations to inspect for compliance with the fire hazard reduction laws and the FPA. Any time department personnel inspect a logging operation a report of inspection may be completed that lists satisfactory practices and unsatisfactory rule violations.

Compliance inspections within the watershed were completed during 2001 for most of the logging operations by the IDL Forest Practices Advisor for compliance with the FPA. The majority of operations were found to be in compliance with the FPA.

When the department determines that an operator has violated any provision of the FPA, it shall be considered a violation. If the violation is minor, the operator may only receive an unsatisfactory inspection report. If the unsatisfactory items are corrected in a timely manner, no Notice of Violation (NOV) will be issued. A NOV will be issued for all major infractions where serious resource damage has occurred or will occur, when an operator has multiple minor infractions that are collectively significant, or when an operator fails to correct previously noted unsatisfactory conditions. The NOV will specify the reason for the violation, any damage or unsatisfactory condition, and required repair of mitigation. If the operator corrects the violation, no further action is taken. If an operator fails to correct the NOV, the department can complete the repair and take civil action to recover repair and legal costs. Provisions also exist to deny an operator the ability to obtain new Notifications if an operation is in current violation, or the operator can be required to post a bond if it is determined by the board that the operator is a repeat or habitual violator of the FPA.

As the IDL does not have the resources to inspect all logging operations in the state, IDL personnel work cooperatively with the University of Idaho, industry, environmental groups, and other agencies to assist and train private forest landowners and logging operators.

Provisions are also included within the FPA to address water quality impacts across drainages. In 1991, the FPA was amended to include provisions for minimizing watershed impacts resulting from cumulative effects of multiple forest practices. The Idaho Cumulative Watershed Effects process (CWE) includes assessing erosion hazards, canopy closure, stream temperature, hydrology, sediment delivery, channel stability, beneficial uses and nutrients. The CWE process provides a broad scale watershed assessment that determines if water quality problems exist and what should be done to mitigate those problems. This is done on a cooperative approach with affected landowners through development of site-specific forest BMPs.

State Endowment Trust Forestlands

The IDL manages endowment trust lands for maximum long-term return to the various beneficiaries of the Trusts. These beneficiaries are several Idaho institutions, including the Public School system and the University of Idaho.

Trust lands in the Middle Fork of the Payette River drainage are managed primarily for income from the growing and harvest of trees for timber. As most harvest activities have been refined by BMPs contained in the Forest Practices Act, little sediment is produced by the actual harvest and processing of trees into logs. The major impact of forest management activity on water quality in

the drainage results from the construction and use of forest roads. Impacts from these roads are to be limited in the following ways.

Task 1:	Complete Cumulative Watershed Effects (CWE) Analysis of all state and private forestlands.
Milestone 1:	Completed Fall 1998
Responsible Agency:	IDL
Task 2:	Prioritize §303(d) streams for BMP Installation based on CWE analysis
Milestone 2:	Completed January 1999
Responsible Agency:	IDL
Task 3:	Repair deficiencies found in the CWE analysis and install the primary BMPs for reduction of sediment delivery from Endowment Trust Lands.
Milestone 3:	Deficiencies (CWE assessment) repaired by November 30, 2000. Improvements: 0.9 miles of road surfaced in 1999, 3.4 miles of road surfaced in 2000, 2.6 miles of road stabilized and abandoned in 2001.
Responsible Agency:	IDL
Task 4:	Conduct inventories of minor road maintenance deficiencies and assess road abandonment opportunities.
Milestone 4:	Field inventories completed in September 2000. Analysis of data and final work plan anticipated in January 2002.
Responsible Agency:	IDL
Task 5:	Accomplish priorities for sediment reduction in the Scriver Creek drainage via joint 319 grant application and administration with Boise County and the USFS.
Milestone 5:	Surfacing of 2.6 miles of road on endowment lands accomplished in September 2001.
Responsible Agency:	Boise County
Task 6:	Complete maintenance and abandonment activities on all State lands in the Middle Fork of the Payette River drainage
Milestone 6:	October 2003
Responsible Agency:	IDL

Monitoring Plan

Forest practices in the Middle Fork Payette watershed may be inspected yearly for compliance with FPA. If any unsatisfactory conditions are identified, they will be corrected using standard IDL enforcement procedures. The IDL district office in Boise will be the office of record for all FPA inspection reports in this drainage. If needed, the Idaho Cumulative Watershed Effects process will be used to monitor the Middle Fork Payette forested watershed.

In addition to the regular FPA inspection program conducted by IDL, the Forest Practices Water Quality Management Plan calls for a statewide audit of the application and effectiveness of Idaho Forest Practices Rules. This interagency independent audit is conducted every four years. The 1996 Forest Practice audit found that FPA rules were implemented 97% of the time. The audit also determined that when the FPA rules were properly implemented and maintained, the rules were effective 99% of the time. The audit process is one key component of the feedback loop mechanism used by the Forest Practices Act Advisory Committee and the Idaho State Board of Land Commissioners to evaluate the effectiveness of Idaho forestry BMPs. With the next round of audits scheduled for the year 2004, it is recommended that at least one forest practice be audited in the Middle Fork Payette watershed at that time.

Forestry Implementation Plan Funding

Under the FPA, logging operators are responsible for meeting the rules. Therefore, the cost of complying with the FPA is born solely by the operator or forest landowner depending on any contractual agreements that may be in existence. At present, private forest landowners are assessed $.05 per acre for all forestlands and $.08 per thousand board feet harvested to help fund the IDL administration of the FPA. Since this funding is not totally adequate to support the FPA administrative program, funds for the initiation of additional protection measures beyond the requirements of the FPA are not available. IDL also has authority to expend funds out of the FPA rehabilitation account but is limited to only those costs associated with the repair of unsatisfactory practices identified in the NOV process. The natural resource conservation income tax credit, forest landowner stewardship program and grants are other possible sources of limited funding for additional volunteer site-specific forest BMPs.

Goals and Objectives for Urban Areas

To protect and enhance both the qualities of the surface and ground water in the Middle Fork Payette River watershed by implementing practices identified in the Catalog of Stormwater BMPs for Idaho Cities and Counties to meet water quality criteria on the Middle Fork Payette River. The *Handbook of Valley County Stormwater Best Management Practices*, 1997 and the *Catalog of Stormwater Best Management Practices for Idaho Cities and Counties* are recognized as the primary technical references for developers, contractors, design professional, local agency officials and staff responsible for the design, construction, maintenance or the review and approval of stormwater treatment facilities/devices. These BMPs contained in these two documents pertain to controlling pollution at the source and these source control measures focus on minimizing or eliminating the source of pollution so that the pollutants are prevented from contacting runoff or entering the drainage system. Additionally, permanent or treatment control measures listed in these two documents are designed to remove pollutants after being taken up by runoff.

Task 1: Review and potential adoption of the *Handbook of Valley County Stormwater Best Management Practices, Catalog of Stormwater Best Management Practices for Idaho Cities and Counties* or equivalent by local governments.

Milestone 1: December 2003
Responsible Agency: City of Crouch, Boise County

Task 2: Development of County Road Inventory for use in prioritizing BMP implementation.
Milestone 2: December 2004
Responsible Agency: Boise County

Task 3: Implementation of Road BMPs based on County Road Inventory.
Milestone 3: December 2005
Responsible Agency: Boise County

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 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: DEQ, SCC, IDL, USFS
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: DEQ, SCC, IDL, USFS
Output 2: Published report.

Monitoring Needs

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. As the state designated agency for water quality, the DEQ 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 documented 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.

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 DEQ will continue to fund its BURP monitoring program, DEQ 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 Middle Fork Payette River watershed as outlined in the Agricultural Pollution Abatement Plan (DEQ, IDL, SCC, 1991) monitoring feedback loop process. Coincidentally, the U.S. Forest Service 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.

Funding of Best Management Practices

Costs estimates relative to each of the designated agency responsibilities need to be estimated as individual Conservation Plan of Operations 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 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:

X *§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.

X *§319 (h)...Nonpoint Source Grants, EPA/DEQ*
This program provides financial assistance for the implementation of best management practices to abate nonpoint source pollution. The DEQ manages the NPS program. All projects must demonstrate the applicant's ability to abate NPS pollution through the implementation of BMPs.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

X *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.

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

X *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.

X *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.

X *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).

X *State Revolving Fund (SRF), DEQ*

The DEQ 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, DEQ is reviewing the SRF program for its ability to provide for an expanded role in addressing NPS pollution.

X *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.

X *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.

X *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 DEQ developed a TMDL guidance document (DEQ, 1999c) for the preparation of TMDLs. In the document DEQ 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 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 Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02.275.01).

Through the development of this Plan, the DEQ 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. Data should be entered into the Middle Fork Payette TMDL Tracking database for storage and analysis. 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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USFS Policy and Framework for Developing and Implementing Total Maximum Daily Loads (TMDL) in Forest and Range Land Environments

Valley County. The Handbook of Valley County Stormwater Best Management Practices

33 U.S.C.A §§1251 to 1387, Federal Water Pollution Control Act (Clean Water Act)

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.

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.

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 waterweeds. 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 non-irrigated lands used for grazing, crop production and silviculture; log storage or rafting; construction sites; recreation sites; and septic tank disposal fields.

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 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 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 = 3.821 feet 1 hectare = 0.4047 acre $^{o}C = (^{o}F - 32)/1.8$