Blackfoot River TMDL Implementation Plan

assembled by:

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“Take a good look Missus” came a heated tone from the drover! “This is the last big herd you’ll see commin’ through this country. And it’s all because of you (settlers)!” Hatasu Oleson heard the drovers message as she stood in her doorway watching the big herd of cattle move. She and her husband, Leo, had settled above the Blackfoot Marsh in 1919. Large herds of cattle had been trailed through Wyoming, Utah and Idaho for years to graze the open grass country. Settlers were establishing themselves in this new country and making changes to this tradition. Each year settlers grazed the early spring grass before the big herds came through and then put their livestock back out after the herds left. Drovers saw the open range being parceled and may have noticed the grass being depleted and so, changed their lifestyle. Living is changing! This is a story of changes in our watershed.

The Shoshones lived in and traveled this region early on with trappers joining to harvest the fur bearing wealth. Trappers tell of large beaver ponds, the dams stretching a mile long across a valley or several stair-stepped dams running down deep draws. In the 1930s through the 1950s beaver numbers dwindled seriously, enough so that the state hired staff to manage them. In the 1950’s, 10,000 muskrats were trapped from Greys Lake. These pelts were money makers and often the animals were considered pests by early settlers.

In 1834 by Nathaniel Wyeth established the Fort Hall fur trading post/way station, then sold it to the Hudson Bay Company in 1838 & used it until 1852. The Lander Trail, an alternate route for the Oregon Trail, passed South of Greys Lake, over Chub Flat, through Wilson’s Pass and across the Badger Knoll area, to the Fort Hall Way Station. In 1859 alone, 13,000 people in 3,000 wagons with 50,000 head of livestock used the Lander Trail. Settlers were establishing themselves along creeks and springs throughout the Blackfoot Mountains earning a living with small sawmills, through fur trapping, livestock grazing, haying meadow grass and farming.

In 1866 the Fort Hall Reservation was established, encouraging the Shoshones and Bannocks to change their culture of hunting and foraging to farming. The Reservation Canal, also known as the Government Canal, gave Fort Hall its first amount of irrigation water - not enough! Early treaty rights overlooked the amount of water needed to farm reservation acres, and in 1907 the “Winters Case” allotted an even distribution of water rights to tribes. This germinated the “Fort Hall Project” of an irrigation system for the reservation. The Blackfoot dam, completed in 1921, converted the Blackfoot marsh into the Blackfoot Reservoir, yet there still was insufficient water for all farmable acres on the reservation, and to fill other granted water rights. A canal, Clarks Cut, was made from Greys Lake to Meadow Creek to bring more water into the Blackfoot Reservoir, which then supplied sufficient amounts for everyone.

In 1905 the National Forest Service and State Land Departments were formed. Both agencies support multiple use of these lands. The world’s richest phosphate mines are in the Caribou National Forest.

As it became clear that the livestock routes to summer range, across the west, were being jeopardized by white settlement, in 1916 National Congress designated these as legal livestock trailways. Western Land Boards that managed grazing lands and trailways reformed into the Bureau of Land Management in 1946.

These new people in the west weren't aware of the western climate nor were they documenting this early landscape. They were awed and comforted by this land. Communities of people were growing and doing their best to take care of the land while practices were quietly changing the landscape. A holy man once said about America, "Each nation, like each individual, has a theme in this life, which is its center, the principle note found which every other note comes to form the harmony." In the United States the principle note was a mixture of enormous practicality and a belief that nothing is impossible. These settlers were magnifying this point.

Irrigation canals, pumps and school consolidation encouraged settlers to move from the hills to the Snake River Plains to make an easier living. Runoff water from the high country became more beneficial, with the development of reservoirs, to assure irrigation water and to stop flooding. People came to believe that spring water naturally "flushes" through a "watershed".

Notice was taken of water quality during these changes, and some began looking seriously at how it, and wildlife, and the regions water cycle were being affected by this changed scheme. Western folks became concerned with how streams were degrading. The spotlight focused on water quality and its effects on fisheries. New knowledge was generated on how to take better care of streams. Notice was made of "non-point source" pollution and the lands "water cycle".

Riparian plants and brush hold stream banks in place, keeping bank soil from polluting streams, filtering runoff and holding water to release back to the stream as the flows decrease in the later summer. A canopy of riparian brush keeps water cooler to deter moss growth and support fisheries. Plant density captures and holds rainfall while healthy root systems incorporate organic litter into the soil.

This region's folks are adjusting their management strategies to support this subtle change of knowledge about moisture. Some farmers are testing "direct seeding", where the ground is left untilled for planting or harvesting.

This changed practice keeps more organic litter in the topsoil to take advantage of any precipitation available. A 3 fold increase of organic litter has 4 times the water holding capacity or – 4% to 5% organic litter can hold up to 195 pounds of water in a three square foot of soil.

Many livestock producers are rotating livestock through their range to allow "recovery" of the grass plant for better "plant density". Folks along the Blackfoot River and tributaries are adjusting their practices to allow riparian areas to recover. Some folks are educating themselves and monitoring their land and streams to determine how best to

improve their landscape and its health. Much is being done through public land and agricultural agencies to reestablish a healthier water system throughout the watersheds. These actions hold moisture in soil creating a defined “watercatchment” as opposed to a “watershed”.

Wendell Berry, a farmer, Professor at U of Kentucky and author, states that;
“We and our country create one another, depend on one another, are literally part of one another; that our land passes in and out of our bodies as we pass in and out of our land; that as we and our land are part of one another, so all who are living as neighbors here, human, plant and animal are part of one another and cannot flourish alone. Our culture must be our response to our place.”

Living our desires is an ongoing process of learning and changing. This Blackfoot River TMDL is a part of this process of change. We use it as a part of our adjustment, neighbor to neighbor to continue to improve our living in this place.

by Charlotte Reid
Blackfoot River Watershed Council

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Introduction

Offered herein is the Blackfoot River Total Maximum Daily Load Implementation Plan. All sections were prepared by parties subject to implementation of the plan. These parties represent the major contributors to loads affecting beneficial uses in the Blackfoot River. Their plans are included as submitted except for changes explained below. No attempts were made to modify the plans in either content or grammar.

Please note that in copying the individually submitted plans, some changes were made to accommodate distribution of the plan. For example, any pages with color are now simply black and white. Figures that were presented on paper greater than letter size (e.g., 11 in by 17 in) were reduced to 8.5 in by 11 in.

Blackfoot River
Total Maximum Daily Load
Implementation Plan for Agriculture

Developed for the Idaho Department of Environmental Quality

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Introduction

The purpose of this document is to identify best management practices (BMPs) that are needed to meet Total Maximum Daily Load (TMDL) targets on the Blackfoot River and its tributaries. This implementation plan identifies BMPs to improve approximately 158 miles of §303d-listed rivers and creeks and 255,000 acres of private agricultural land within the subbasin. This plan outlines an adaptive management approach for developing conservation plans and implementing BMPs to meet the recommendations of the Blackfoot River TMDL.

TMDL Targets and Reductions

The TMDL was completed by IDEQ in December 2001 and approved by EPA in April 2002. The TMDL addresses 11 segments for sediment and 3 segments for nutrients. Sediment and nutrient concentrations appear to increase during runoff events (IASCD, 2002). The TMDL establishes sediment targets for turbidity (not to exceed 20.15 NTU) on Dry Valley Creek; a streambank stability target of 80% or more on all streams; and depth fine targets for streambeds (IDEQ, 2001). The TMDL identifies 25 reaches or 54% of assessed reaches are below the 80% streambank stability target. The TMDL estimates the sediment load reductions vary from 19% to 77% depending on the stream segment. The estimated TP reduction for the Blackfoot River at the Shelley USGS station is 35% and an 80% reduction of TP on Wolverine Creek (IDEQ, 2001).

Goal

The goal of the Blackfoot River TMDL Agricultural Implementation Plan is to restore the impaired beneficial uses such as cold water aquatic life and salmonid spawning.

Objectives

The objectives of this plan will reduce the amount of sediment, phosphorus, and nitrogen in the Blackfoot River and its tributaries from agricultural sources. Several technical, educational, and financial tasks will be needed to accomplish the objectives, which include:

- Reduce sediment from sheet/rill, gully, irrigation-induced, and streambank erosion on agricultural land
- Reduce nutrient runoff and leaching from fertilizer and animal waste applications on agricultural land
- Monitor implementation progress and BMP effectiveness

Installation costs for agricultural lands are estimated in this plan to provide landowners, local communities, government agencies, residents, and stakeholders some perspective on the technical and economic demands of meeting the TMDL goals. Sources of available funding and technical assistance for the installation of BMPs on private agricultural land are outlined in Table 22.

This plan recommends that agricultural landowners contact the Central Soil and Water Conservation District (CBSWCD), North Bingham Soil and Water Conservation District (NBSWCD), Caribou Soil Conservation District (CSCD), Natural Resources Conservation Service (NRCS), Blackfoot River Watershed Council (BRWC), Idaho Association of Soil Conservation Districts (IASCD), Idaho State Department of Agriculture (ISDA) or the Idaho Soil Conservation Commission (ISCC) for assistance. These agencies will help landowners determine the need to address water quality and other natural resource concerns on their property.

This plan is not intended to identify which specific BMPs are appropriate for specific agricultural fields, but rather provides a subbasin approach to address water quality problems on agricultural lands.

Background

Project Setting

The Blackfoot River subbasin is located in southeastern Idaho and covers parts of Bingham, Bonneville, and Caribou counties as shown in Figure 1. The subbasin covers 699,489 acres or 1,093 square miles.

Figure 1. Location of the Blackfoot River Subbasin

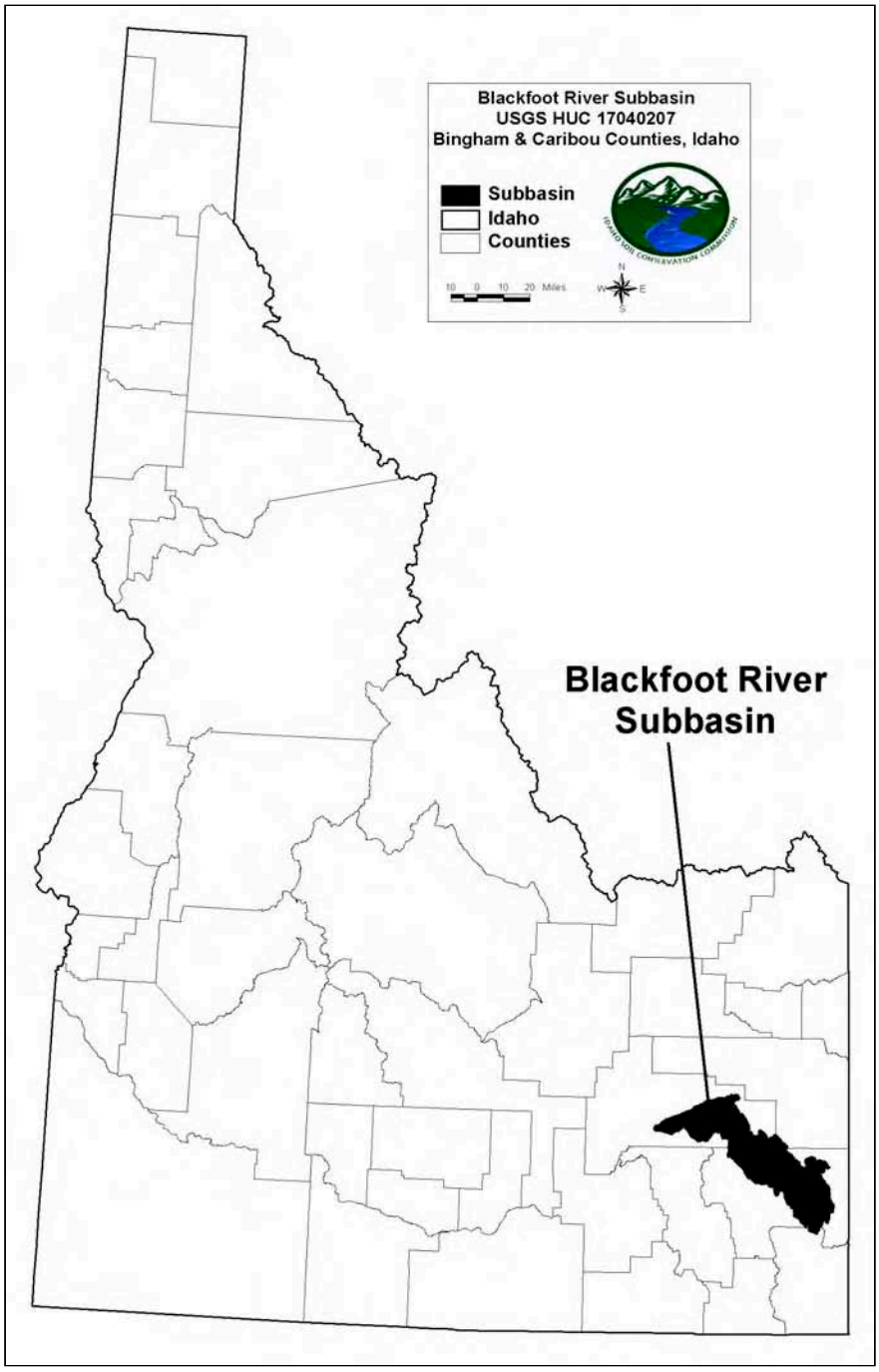
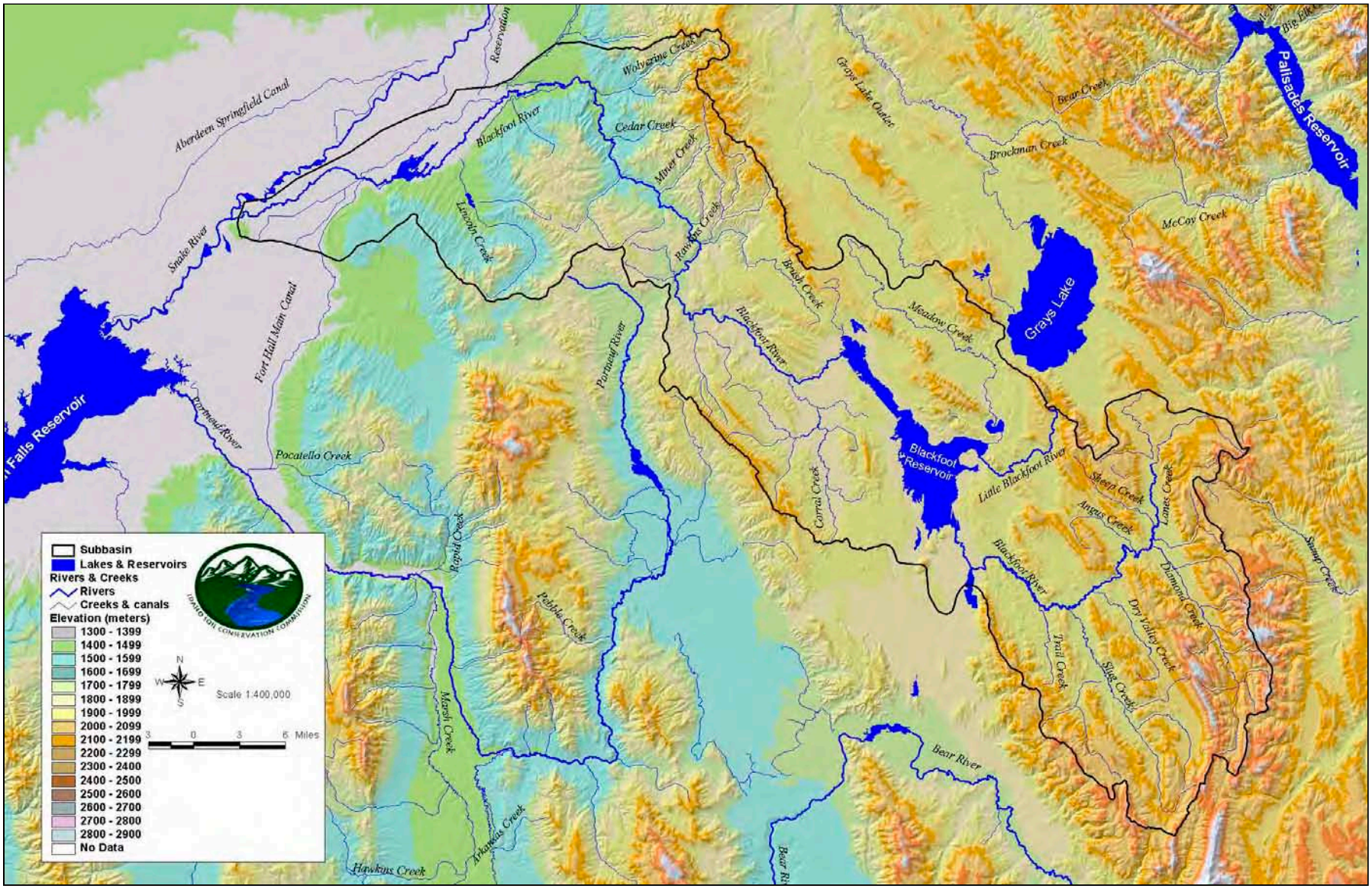


Figure 2. Area Map of the Blackfoot River Subbasin



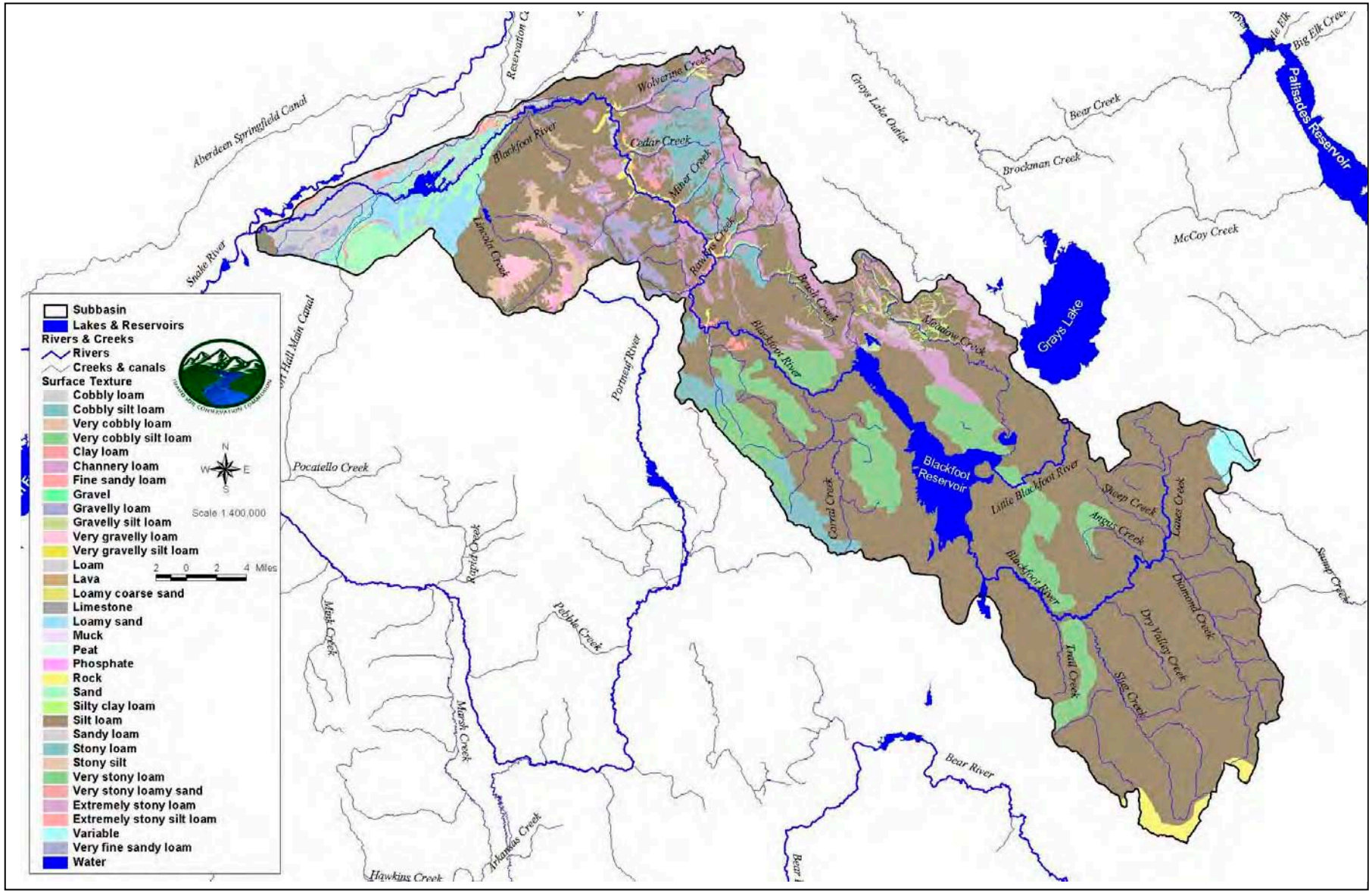
Soils

The Soil Survey of Bingham Area, Idaho was published in 1973 by the US Department of Agriculture (USDA) Soil Conservation Service (SCS) and covers about 23% of the subbasin. In addition to the Bingham Area survey, the SCS published the Soil Survey of Fort Hall Area in 1977 and covers 18% of the subbasin. There is no published soil survey in Caribou County. Soils in the subbasin are predominantly silt loams on 4 to 20% slopes, as shown in Table 1 and Figure 3.

Table 1. General Soil Associations in the Blackfoot River Subbasin

Soil Association	Description
Bannock-Bock	Nearly level to moderately sloping, well drained, deep, medium textured soils on alluvial terraces
Declo-Fingal	Nearly level to strongly sloping, well drained and moderately well drained, deep, medium textured and moderately coarse textured soils on lake terraces
Pancheri-Polatis	Nearly level to moderately sloping, well drained, deep and moderately deep, medium textured soils on basalt plains
Robin-Lanark	Nearly level to steep, well drained, deep, medium textured soils on loess covered uplands
Wolverine-Sasser-Stan	Nearly level to moderately steep, excessively drained and well drained, deep, coarse textured and moderately coarse textured soils on terraces
Newdale-Swanner-Tetonia	Nearly level to steep, well drained, deep and shallow, medium textured soils on uplands
Wahtigup-Ricrest-Hymas	Moderately sloping to very steep, somewhat excessively drained and well drained, deep and shallow, gravelly, stony and extremely stony, medium textured soils on mountain slopes and ridges
Dranyon-Sessions-Nielsen	Nearly level to steep, well drained, deep and shallow, medium textured soils on mountainous and foot slopes
Sheege-Pavohroo	Nearly level to steep, well drained, shallow and deep, medium textured soils on mountains
Bear Lake-Lago-Merkley	Very deep, moderately well to very poorly drained, soils formed in mixed alluvium
Rexburg-Ririe-Iphil	Deep and very deep, well drained soils formed in loess and silty alluvium from loess
Blacknoll-Sadorous	Moderately deep, well drained soils formed in eolian sands with some influence from silty loess and silty alluvium from loess
Bancroft-Paulson-Lanark	Very deep, well drained soils formed in loess and mixed alluvium
Ireland-Cedarhill-Pavohroo	Moderately deep to very deep, well drained soils formed in residuum and alluvium from limestone and dolomite
Lanark-Dranyon-Nielson	Shallow to very deep, well drained soils formed in loess and mixed alluvium
Yeate Hollow-Ant Flat-Frenchollow	Very deep, well drained and moderately well drained soils formed in residuum and alluvium from sandstone, conglomerate and quartzite

Figure 3. Soil Surface Texture in the Blackfoot River Subbasin



Climate

Annual precipitation, shown in Figure 4, averages 10 inches at Blackfoot to 20 inches at Henry (Abramovich et al., 1999). Mountainous regions above 7,000 feet receive 30 to 40 inches annually with the semi-arid regions receiving less than 11 inches per year.

Topography

The subbasin is 66 miles long and 20 miles wide with very mountainous terrain including mountain valleys, basalt and lava fields, alluvial fans, and valley plains. The Blackfoot Mountains, Caribou, Grays, and Webster ranges comprise the eastern boundary with tributaries flowing west into Upper Valley. The Chesterfield and Portneuf ranges comprise the western edge with tributaries flowing east towards the Blackfoot River. The Snake River Plain comprises the northern boundary, with tributaries flowing west along the Snake and Blackfoot rivers. The Blackfoot Lava Field, Aspen and Preuss ranges bound the subbasin on the south with tributaries flowing north into Lower Valley.

The subbasin is oblong, 66 miles wide and 20 miles long. The subbasin drains 699,489 acres or 1,093 square miles. Elevations range from 8,975 feet at an unnamed peak on Dry Ridge to 4,450 feet elevation where it enters the Snake River north of Ferry Butte. Almost 60% of the subbasin's elevations occur between 6,000 and 7,000 feet. About 21% of the subbasin is flat with slopes less than 2%. Thirty percent of its slopes are gentle, from 2% to 8%. The residual 49% has slopes greater than 8%, shown in Figure 5.

Surface Water

The subbasin is located in the Snake River basin. The Blackfoot River begins at the confluence of Lanes, Diamond, and Bacon creeks at an elevation of 6,420 feet and flows 108 miles descending to 4,450 feet elevation where it enters the Snake River north of Ferry Butte. The river originates on private land and runs west-northwest for 34 miles to the Blackfoot Reservoir. The river leaves the reservoir at Government Dam and flows north-northwest for 59 miles to the Equalizing Reservoir. From that reservoir the river flows northwest and enters the Snake River about three miles west of Blackfoot.

The subbasin has 419 miles of perennial streams, 101 miles of intermittent streams, and 96 miles of canals, shown in Figure 6. Major tributaries are the Little Blackfoot River, Angus, Brush, Corral, Diamond, Dry Valley, Lanes, Meadow, Trail, and Slug creeks. The watersheds are shown in Figure 7.

Water Quality

Water quality in the subbasin varies from poor to excellent and has been the subject of several studies summarized in the TMDL (IDEQ, 2001). The Idaho Department of Health and Welfare (IDHW) collected water samples from 1975 to 1976 on the Blackfoot River and concluded that the river is degraded by sediment during runoff and coliform bacteria during low flows in the summer (McSorley, 1977). Another study, (Perry, 1977) concluded the Blackfoot Reservoir has a short residence time; and is shallow with winds suspending sediment and aiding in the dissolution of nutrients in the sediments.

In 1986 and 1987, IDHW collected water samples and found that several tributaries to the lower Blackfoot River had high amounts of suspended sediment, nitrates and nitrites, total kjeldahl nitrogen, total phosphorus, orthophosphate, and bacteria (Drewes, 1987). USGS sampled water quality at several sites in the subbasin from 1965 until 2002. IASCD sampled water quality from 2000 to 2002 on tributaries and the Blackfoot River as shown in Figure 8. Results suggest sediment and nutrients increase during spring runoff, precipitation events, and downstream of the Reservation Canal (Fischer, 2002).

Water Quantity

Subbasin water yield averages 268,000 acre-feet annually with a high of 584,000 acre-feet in 1984 and a low of 103,000 acre-feet in 1925 (USGS, 2003). Discharge peaks in late April or early May. These peaks are regulated by storage reservoirs and irrigation diversions. During the rest of the year, the flows tend to be moderately high and constant. River discharge at the USGS gage near Shelley, Idaho from 1909 to 2002 averaged 371 cfs with a low of 27 cfs and peaked at 2,020 cfs. The average peak flow during that same period was 1,227 cfs and normally occurred in late May and June (USGS, 2003).

Blackfoot River flows from 1909 to 2002 at the Henry USGS gage, above the Blackfoot Reservoir, averaged 162 cfs, ranging between 5 cfs to 2,060 cfs. The average peak was 1,242 cfs and usually occurred mid-April to late May. The flow in the lower river is regulated by the BIA. BIA controls the Blackfoot Reservoir releases. The reservoir was completed in 1909, covers 18,000 acres, and stores 413,000 acre-feet. Consumptive uses of surface water include mining, livestock watering, and irrigation. An estimated 146 million gallons per day of surface water is used in the subbasin annually (USGS, 1995).

Table 2. USGS Gages in the Blackfoot River Subbasin

Agency	Site Number	Site Description	Period of Record
USGS	13063000	Blackfoot River above Reservoir near Henry	1914 to 2002
USGS	13063500	Little Blackfoot River at Henry	1914 to 1925
USGS	13064500	Meadow Creek near Henry	1914 to 1925
USGS	13065500	Blackfoot River near Henry	1908 to 1925
USGS	13065940	Wolverine Creek near Goshen	1979 to 1986
USGS	13066000	Blackfoot River near Shelley	1909-2002
USGS	13066500	Blackfoot River near Presto	1903 to 1909
USGS	13067500	Fort Hall Upper Canal near Blackfoot	1912 to 1924
USGS	13068000	Fort Hal Lower Canal near Blackfoot	1912 to 1924
USGS	13068495	Blackfoot River near Blackfoot	1964 to 2002
USGS	13068500	Blackfoot River near Blackfoot	1913 to 2002
USGS	13068501	Blackfoot River and Bypass Channel near Blackfoot	1913 to 2002

Table 3. IDWR Regulated Dams in the Blackfoot River Subbasin

IDWR Dam	Dam Name	County	River	Purpose	Capacity (acre feet)	Height (ft)
27-2007A1	Blackfoot	Caribou	Blackfoot River	L	350,000	35
27-2007A2	Blackfoot China Hat	Caribou		Auxiliary	0	20
27-2007B	Blackfoot Equalizing	Bingham	Blackfoot River	O	1,500	18
27-2009	Enders	Caribou	Cutoff Canyon Creek	L	60	11.4
27-7118	Indian Creek Upper	Caribou	Chicken Creek	I	48	12.5
27-7127	Indian Creek Lower	Caribou	Chicken Creek	I	15	11.7

Irrigation Diversions

There are approximately eight irrigation companies or districts in the subbasin that manage about 96 miles of canals and ditches. They supply water to over 32,000 irrigated acres. The largest is the Fort Hall Indian Irrigation Project, formed in 1907 by congressional act to supply water to approximately 31,000 acres on the reservation. Irrigation water is stored in the Blackfoot and Equalizing reservoirs conveyed by the river and diverted into the Fort Hall Main, Little Indian, and North canals, south and east of the city of Blackfoot (Shoshone-Bannock Tribes, 1990).

Figure 6. Annual Precipitation in the Blackfoot River Subbasin

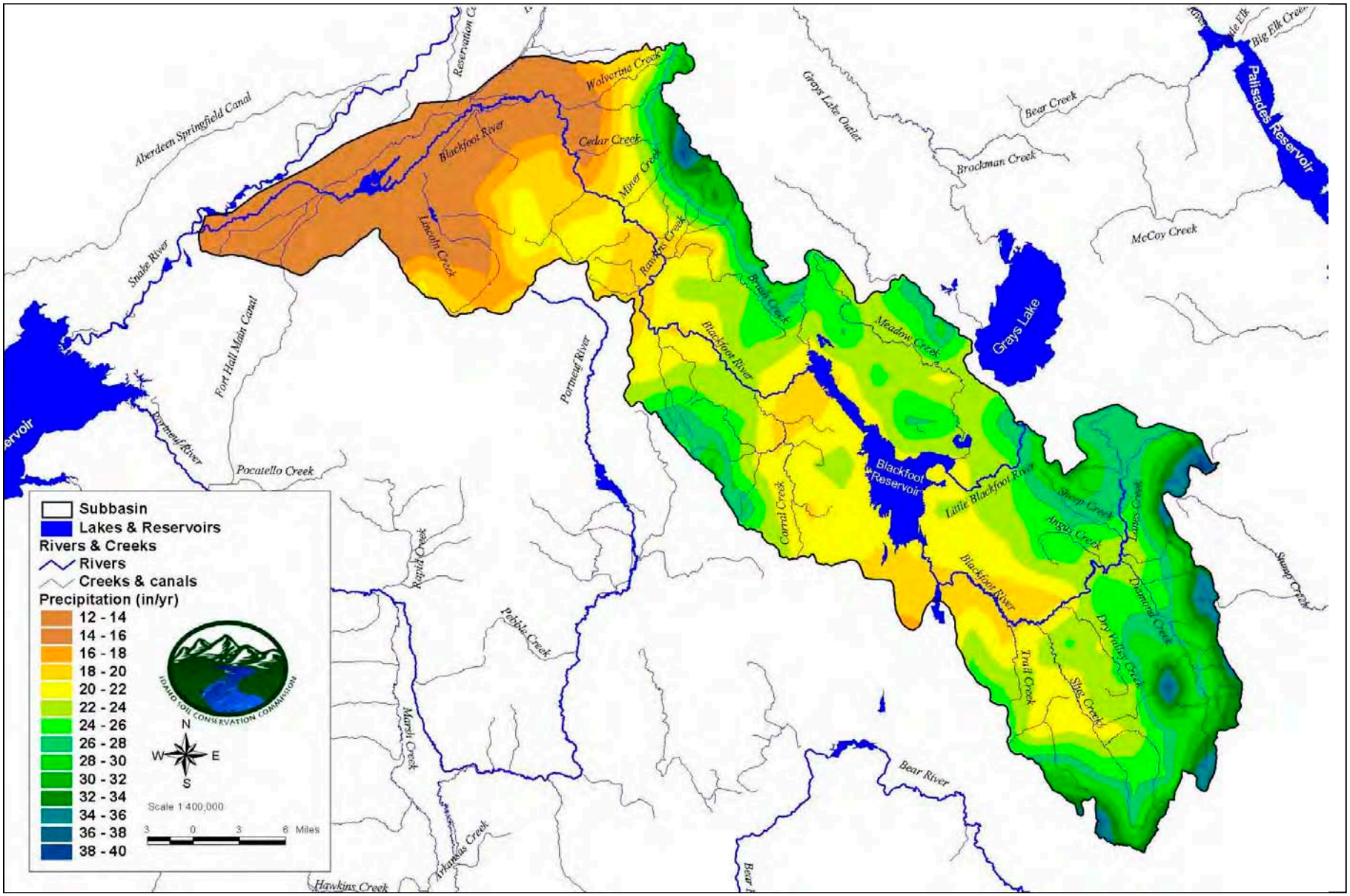


Figure 5. Slope Classes in the Blackfoot River Subbasin

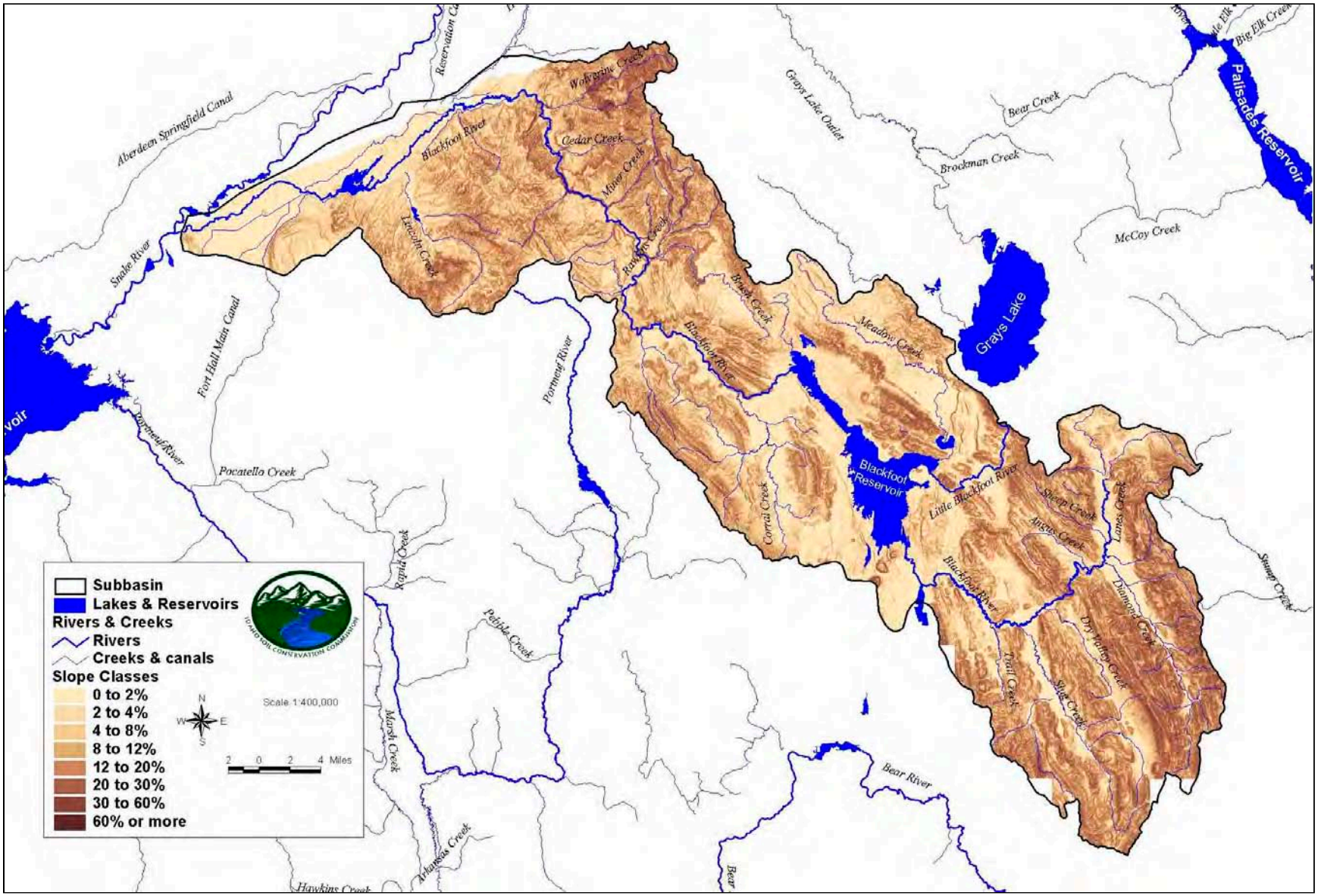


Figure 6. Surface Hydrology in the Blackfoot River Subbasin

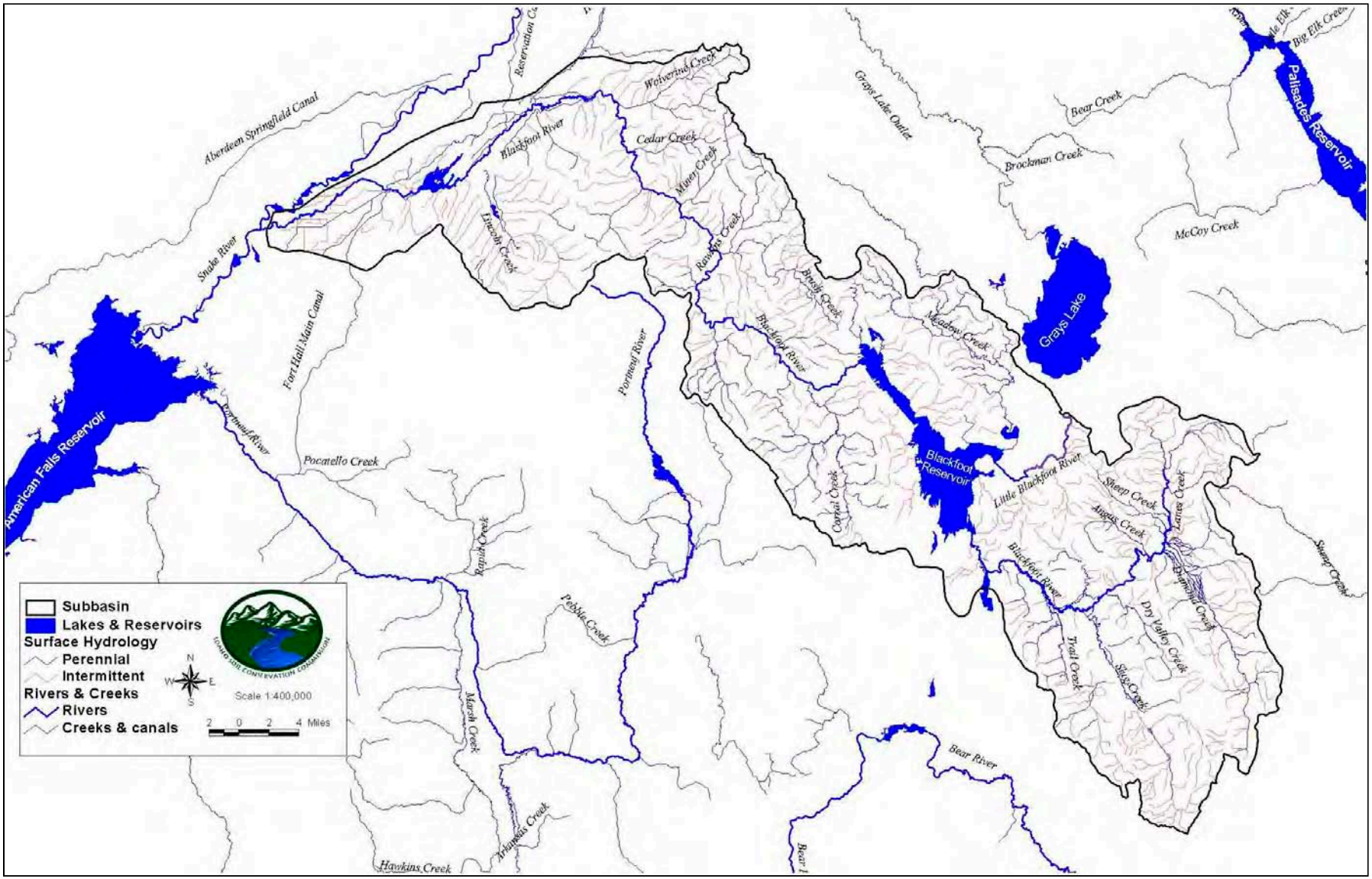


Figure 7. Watersheds in the Blackfoot River Subbasin

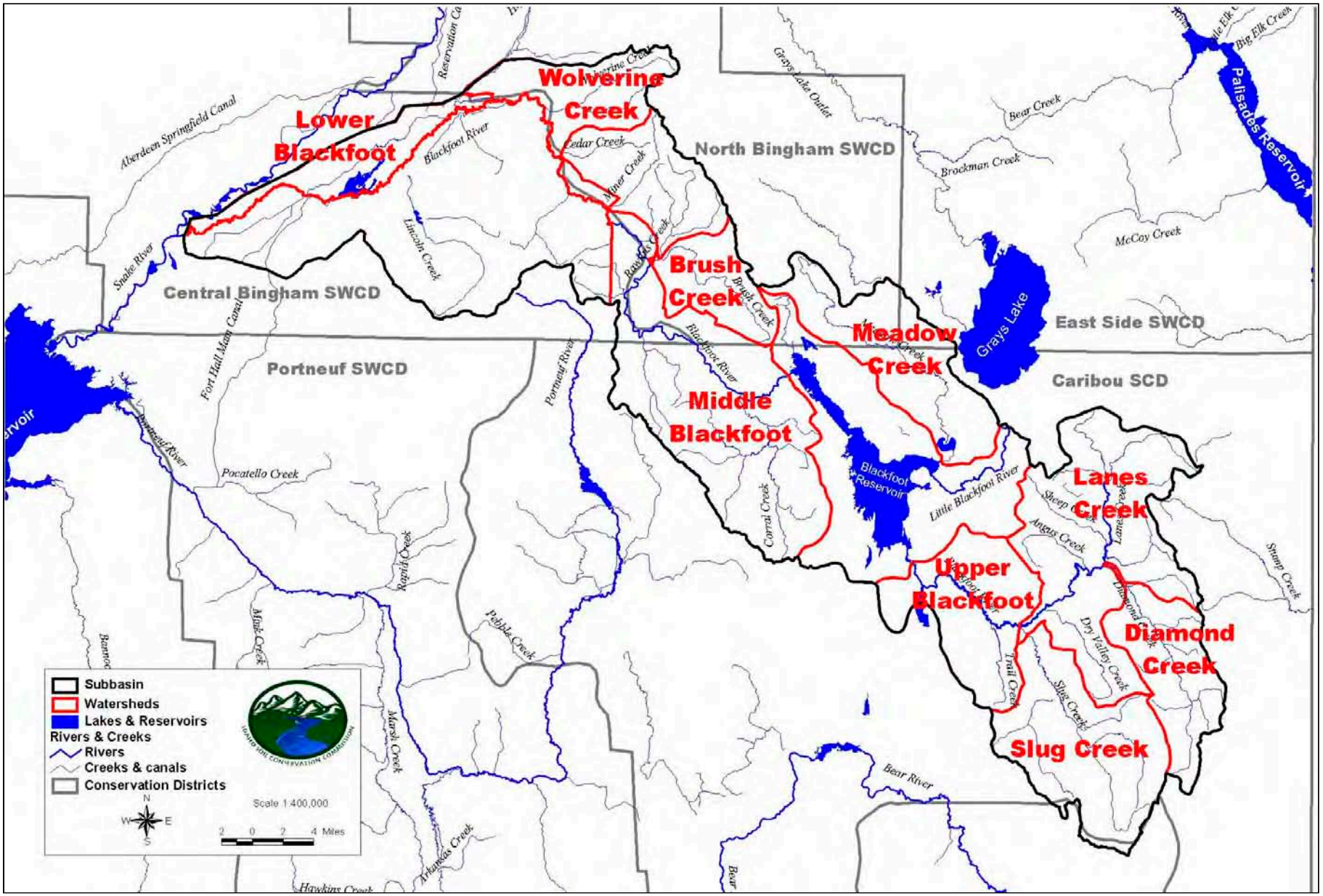
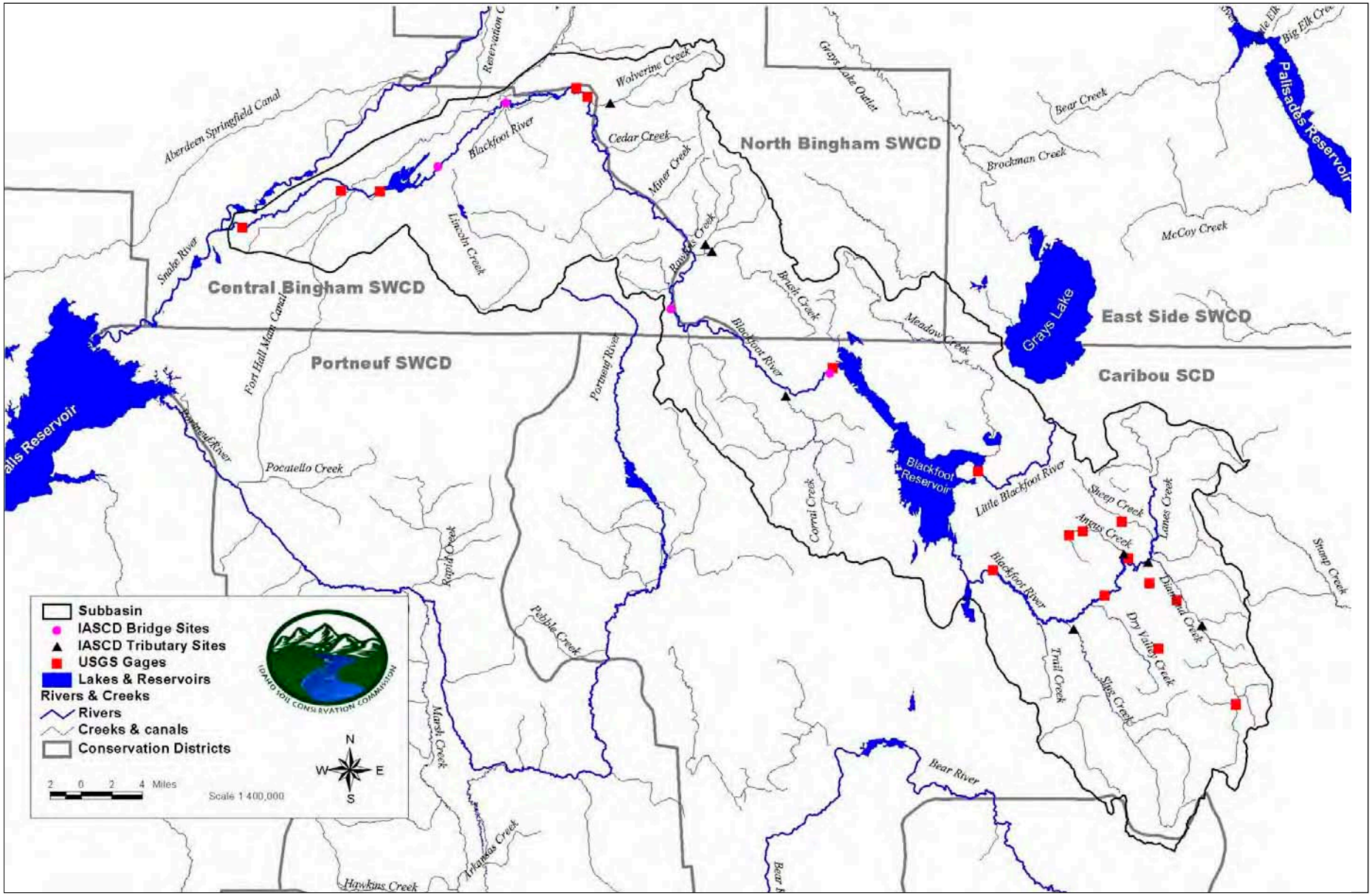


Figure 8. IASCD and USGS Monitoring Sites in the Blackfoot River Subbasin



Land Ownership

Private lands encompass 38% or 263,700 acres of the subbasin. In comparison the subbasin also consists of 289,000 acres or 41% of federal lands managed by the Bureau of Land Management (BLM), Bureau of Indian Affairs and Forest Service (FS). State lands are managed by the Idaho Department of Lands (IDL) and comprise 129,410 acres or 19% of the subbasin, as shown in Table 4 and Figure 9.

Table 4. Land Ownership in the Blackfoot River Subbasin

Land Ownership	Central Bingham SWCD	North Bingham SWCD	Caribou SCD	East Side SWCD	Total Acres	Percent of Total
Private	30,700	71,540	156,980	4,480	263,700	37.7%
BLM	3,970	10,920	26,380	20	41,290	5.9%
BIA	124,200	100	0	0	124,300	17.8%
IDL	790	38,410	90,210	0	129,410	18.5%
FS	0	0	123,140	0	123,140	17.6%
Water	280	0	17,300	0	17,580	2.5%
Total	**159,940**	**120,970**	**414,010**	**4,500**	**699,420**	**100.0%**

Land Use

Range land is the major land use with approximately 404,000 acres or 58% of the subbasin. In comparison, the subbasin also consists of 119,000 acres or 17% of crop and pasture lands, including non-irrigated and irrigated lands. Forest lands comprise 145,000 acres or 21% of the subbasin. They're shown in Table 5 and Figure 10.

Table 5. Land Use in the Blackfoot River Subbasin

Land Use	Central Bingham SWCD	North Bingham SWCD	Caribou SCD	East Side SWCD	Total Acres	Percent of Total
Range Land	107,200	83,500	210,600	2,590	403,890	57.7%
Irrigated Crop/Pasture	35,400	4,470	8,300	0	48,170	6.9%
Non-Irrigated Crop/Pasture	10,410	13,600	46,500	0	70,510	10.1%
Forest Land	5,050	19,400	118,300	1,910	144,660	20.7%
Urban & Industrial	1,260		5,050	0	6,310	0.9%
Wetlands	160	0	8,270	0	8,430	1.2%
Lakes & Reservoirs	460	0	16,990	0	17,450	2.5%
Total	**159,940**	**120,970**	**414,010**	**4,500**	**699,420**	**100.0%**

Private Land Use

The subbasin has approximately 262,190 acres of private land. Of these lands, range land is the predominant private land use with 136,864 acres or 52%. Private land also consists of 34% of crop and pasture lands, including non-irrigated and irrigated grain, hay, or pasture. Forest land comprises about 10%. Urban and industrial areas account for one percent of private land. These land uses are displayed in Table 6 and Figure 11.

For the purposes of this plan, a farm or ranch is defined as any place which produced and sold or normally would have produced or sold $1,000 worth of agricultural products during the year (IASS, 1998 and NASS, 2002). Agricultural statistics are shown in Table 7.

Table 6. Private Land Uses in the Blackfoot River Subbasin

Land Use	Central Bingham SWCD	North Bingham SWCD	Caribou SCD	East Side SWCD	Total Acres	Percent of Total
Range Land	5,945	45,336	83,015	2,568	136,864	52.2%
Irrigated Crop & Pasture	19,006	4,370	7,861	0	31,237	11.9%
Non-Irrigated Crop & Pasture	4,161	12,571	39,816	0	56,548	21.6%
Forest Land	179	8,906	15,536	1,913	26,534	10.1%
Urban & Industrial	943	0	1,547	0	2,490	1.0%
Wetlands	146	172	7,244	0	7,562	2.9%
Lakes & Reservoirs	232	0	723	0	955	0.3%
Total	**30,612**	**71,355**	**155,742**	**4,481**	**262,190**	**100.0%**

Table 7. Agricultural Inventory Data for Bingham and Caribou Counties

Agricultural Category	Bingham			Caribou		
	1987	1992	1997	1987	1992	1997
Total Number of Farms	1,466	1,282	1,168	428	384	427
Land in Farms (total acres)	1,406,990	1,371,605	796,065	587,384	587,693	469,381
Land in Farms (average size)	960	1,070	682	1,372	1,530	1,099
Land in Irrigated Farms (acres)	306,187	307,812	321,610	273,910	258,384	280,596
Commercial Fertilizer (acres applied)	265,934	275,342	279,812	102,072	104,763	107,446
Number of Farms (1 to 9 acres)	199	224	185	25	22	17
Number of Farms (10 to 49 acres)	374	345	336	39	33	48
Number of Farms (50 to 179 acres)	317	236	224	50	54	78
Number of Farms (180 to 499 acres)	252	184	156	100	83	85
Number of Farms (500 to 999 acres)	151	131	110	89	72	60
Number of Farms (1,000 acres or more)	173	162	157	125	120	139

Crop or Commodity	Bingham			Caribou			
	1987	1992	1997	1987	1992	1997	2002
Wheat (acres)	131,338	145,119	147,789	35,580	34,800	40,897	20,800
Barley (acres)	41,749	24,528	20,118	75,482	73,692	74,912	78,200
Alfalfa Hay (acres)	51,763	50,376	61,271	29,322	29,289	32,073	30,000
Potatoes (acres)	67,697	67,007	63,344	4,353	4,313	5,823	7,400*
Beef Cows (head)	32,102	29,376	25,876	13,791	15,284	14,254	12,400*
Dairy Cows (head)	8,703	8,996	8,484	2,311	2,011	1,346	1,100*
Sheep and Lambs	17,365	14,486	10,853	13,254	16,359	10,144	8,000*
Horses and Ponies	4,100	3,358	4,383	1,065	844	1,025	--

* 2001 data

Accomplishments

Several conservation practices have been implemented on thousands of acres in the Central Bingham, North Bingham, and Caribou conservation districts as shown in Table 9. The most recent BMP projects and the associated conservation programs are shown in Figure 11. Most of the projects have focused on sprinkler irrigation, residue management, conservation cover, terraces, sediment basins, and grazing. The estimated installation cost of these conservation practices was approximately $15 million.

In the subbasin, roughly 8,500 acres are enrolled in the Conservation Reserve Program (CRP). The Farm Service Agency (FSA) pays an annual rental rate of $34 per acre in Bingham County (Burgoyne, 2004) and $39 per acre in Caribou County (Christensen, 2002). FSA pays about $320,000 annually for these CRP acres.

Table 9. BMPs Completed in Caribou, Central and North Bingham Conservation Districts

Conservation Practice	NRCS Practice	Central Bingham SWCD Amount*	North Bingham SWCD Amount*	Caribou SCD Amount**	Total Amount
Brush Management (ac)	314	2,100	1,379	12,158	15,637
Conservation Cover CRP (ac)	327	7,862	380	68,373	76,615
Contour Farming (ac)	330	1,931	109	146,621	148,661
Fence (ft)	382	130,447	203,130	51,272	384,849
Forage Harvest Management (ft)	511	1,382	3,351	90,817	95,550
Irrigation System-Sprinkler (no)	442	5	87	8,198	8,290
Irrigation Water Management (ac)	449	712	6,746	15,735	23,193
Irrigation Water Conveyance (ft)	430	26,552	197,232	335,099	558,883
Pasture and Hay Planting (ac)	512	125	2,179	61,107	63,411
Pipeline (ft)	516	12,865	1,984	402,206	417,055
Prescribed Grazing (ac)	528A	30,817	14,960	139,834	185,611
Residue Management (ac)	329	675	3,740	200,159	204,574
Riparian Forest Buffer (ac)	391A	6	20	25	51
Spring Development (no)	574	6	2	34	42
Streambank Protection (ft)	580	8,535	9,586	5,000	23,121
Tree/Shrub Establishment (no)	612	5,575	0	2,000	7,575
Upland Wildlife Habitat Mgmt (ac)	645	5,335	1,372	12,053	18,760
Waste Storage Facility (no)	313	1	4	6	11
Watering Facility (no)	614	7	4	58	69
Windbreak/Shelterbelt (ft)	380	39,657	116,700	80,000	236,357

**BMP estimated amounts from 1991 to 2001* ***BMP estimated amounts from 1968 to 2001*

Figure 9. Ownership in the Blackfoot River Subbasin

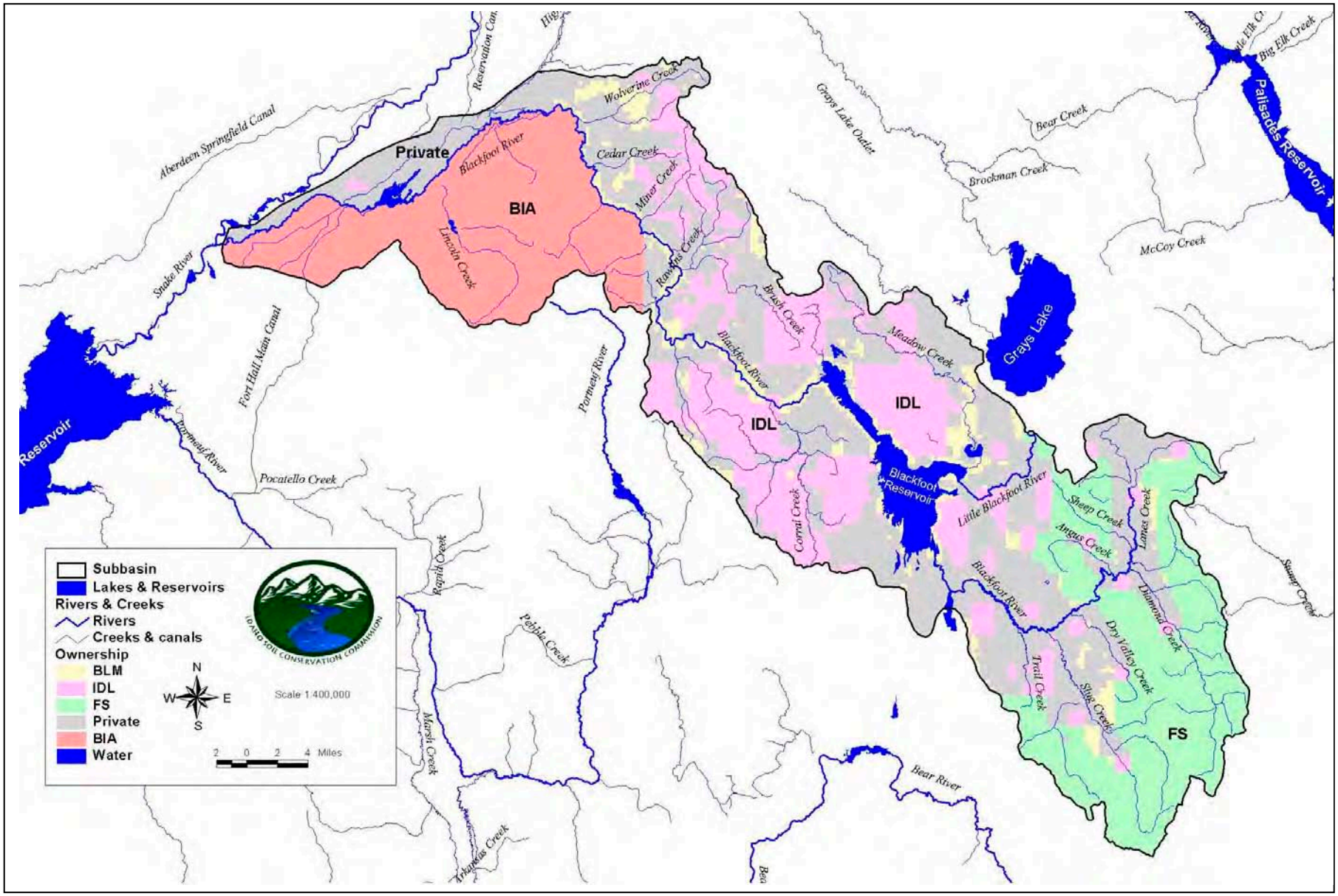


Figure 10. Land Use in the Blackfoot River Subbasin

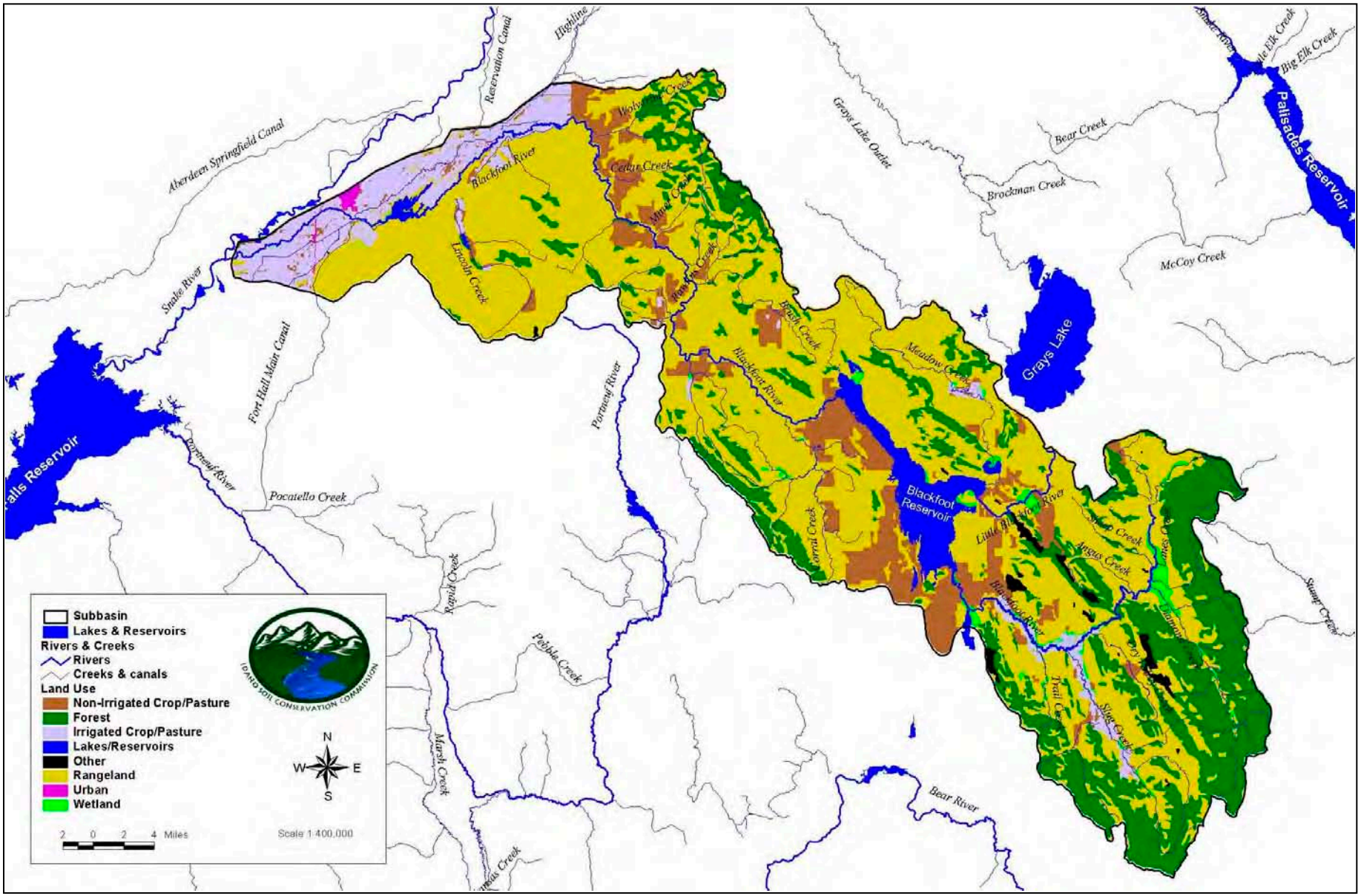


Figure 11. Private Land Use in the Blackfoot River Subbasin

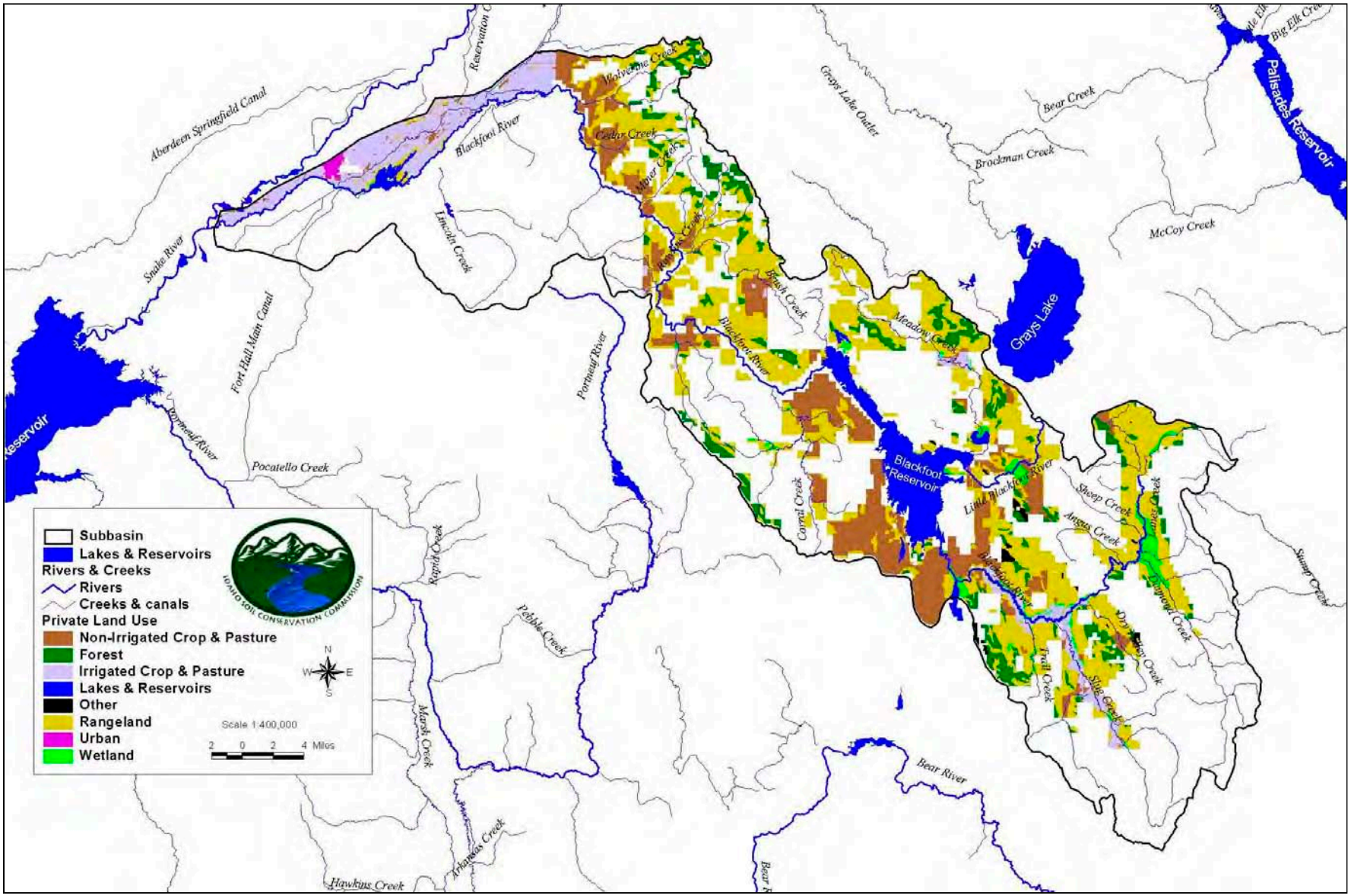
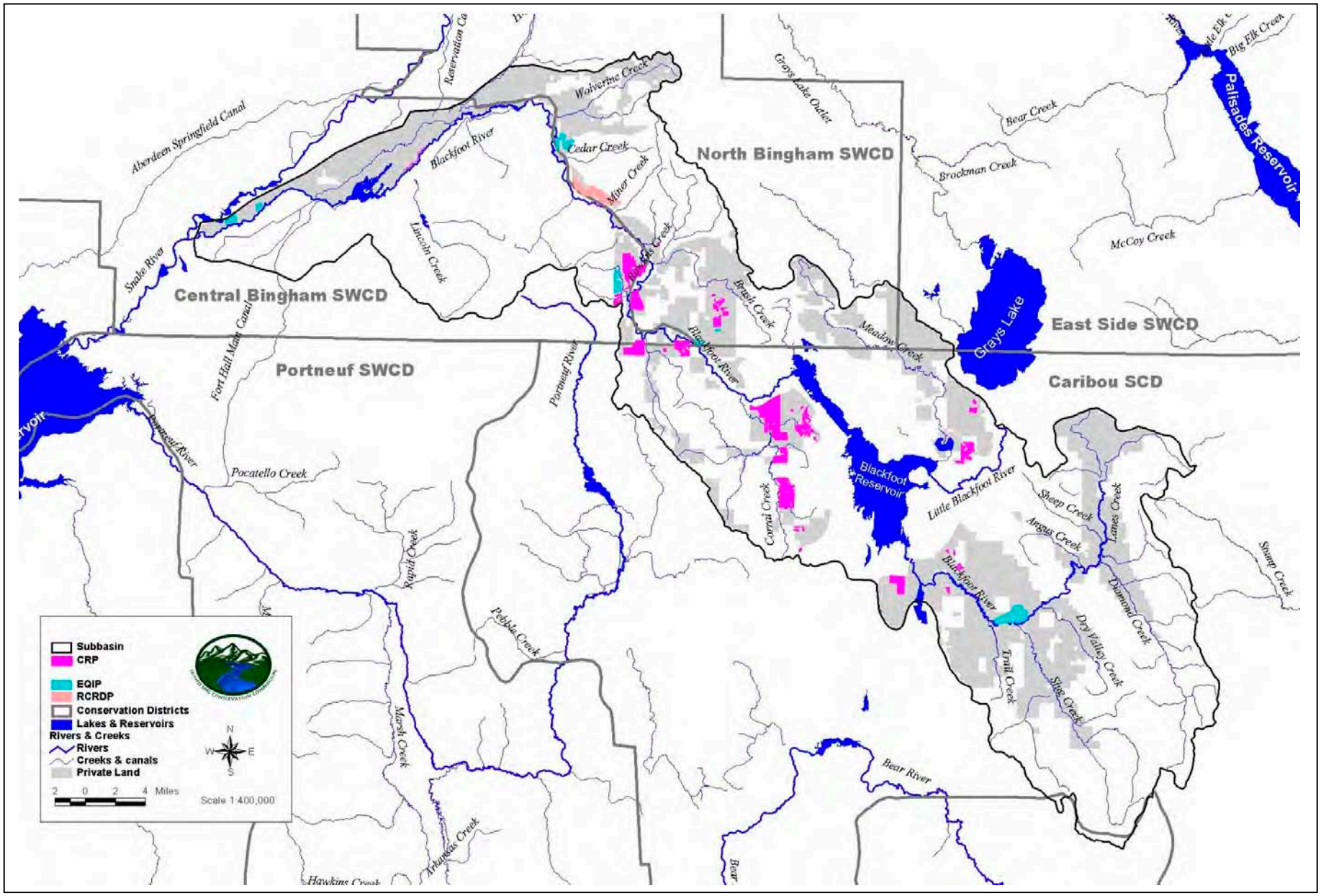


Figure 12. Conservation Program Projects in the Blackfoot River Subbasin



Riparian Assessment

Introduction

Over 85 miles of the Blackfoot River and its tributaries were assessed from 1997 to 2000. Teams made up of landowners, permittees, lessees, local volunteers, state and federal employees assessed these reaches. The teams evaluated direct and indirect impacts to creeks, rivers, and their riparian areas. The data was used to develop realistic goals for TMDL watershed improvement.

Past Efforts

IDEQ determined the Blackfoot River's beneficial uses are impaired by sediment, nutrients, organics, and unknown pollutants (IDEQ, 2001). In 1996, the North Bingham and Central Bingham SWCDs signed a memorandum of understanding (MOU) with the Shoshone-Bannock Tribes and Blackfoot River Watershed Council (BRWC) to initiate recovery efforts in the watershed (Weaver, 1996).

IDFG currently manages the Blackfoot River, its tributaries, and the Blackfoot Reservoir as a coldwater fishery with Rainbow trout, Mountain whitefish, Brook trout, and Yellowstone Cutthroat trout present (IDFG, 2001). From 1994 to 1997, IDEQ conducted BURP assessments on the Blackfoot River and several of its tributaries (IDEQ, 2001). From 1997 to 2000, 85 miles of river and creek reaches were assessed by BRWC, ISCC, IDEQ, IDL, BLM, IDFG, FS, and NRCS staff to determine proper functioning and erosion conditions in the subbasin (ISCC, 2000). In 2002, BLM finished their *Blackfoot River Wild and Scenic Eligibility Study and Tentative Classification* (BLM, 2002).

Assessment Methods

The assessment teams used: NRCS Technical Note ID-67; IDEQ Protocol #8; BLM PFC; NRCS SECI; and NRCS Technical Note ID-29 (SVAP). The streams were divided into reaches using soils, geology, slope, sinuosity, vegetation, hydrology, roads, drainage area, valley type, and land use. Elevations, slopes, stream order, and sinuosity were estimated from USGS 7.5' maps.

NRCS Tech Note ID-67

NRCS Riparian Appraisal and Aquatic Habitat Evaluation, Range Technical Note ID-67 is an evaluation system to determine the condition of the riparian zone and help develop management alternatives (NRCS, 1995). This evaluation integrated several other methods including PFC; Rosgen Stream Classification; COWFISH; Cold Water Stream Appraisal Guide for Wyoming; and prior IDHW Protocols 1 through 7.

IDHW-DEQ Protocol #8

IDHW-DEQ Protocols for Classifying, Monitoring, and Evaluating Stream/Riparian Vegetation on Idaho Rangeland and Streams, Protocol #8 describes the levels of data required for implementing the Idaho Antidegradation Policy; basic, reconnaissance, and intensive (IDHW, 1992). The monitoring strategy requires stratifying the stream into sub-areas based upon natural features, land use, and sampling recommendations. This protocol included; stream classification, green line, Solar Pathfinder, streambank stability, photo points, and channel cross sections.

Proper Functioning Condition (PFC)

The USDI-BLM Assessing Proper Functioning Condition consists of 17 factors to qualitatively assess stream function. Three categories include; proper functioning, functional at risk, or nonfunctional. PFC is used to assess riparian/wetland areas. PFC evaluates features that dissipate energy, reduce erosion, improve water quality, capture bedload, develop floodplains, improve flood-water retention, recharge groundwater, stabilize streambanks, provide habitat, and support greater biodiversity (BLM, 1998).

NRCS Tech Note ID-29 (SVAP)

The Stream Visual Assessment Protocol (SVAP) provides a simple procedure to evaluate stream conditions based on visual characteristics. SVAP includes 15 qualitative factors and corresponding numeric values, which are averaged to rate the reach's condition. Eleven ranking factors are required with three factors ranked when applicable. The protocol assesses riparian ecosystems condition; identifies opportunities to enhance biological value; conveys information on stream function; and stresses the need to protect or to restore riparian areas (NWCC, 1998). Currently, NRCS uses SVAP to assess aquatic habitat and recommends a "fair" rating as a minimum goal for conservation planning (NRCS, 2004).

Stream Classification

Rosgen offers a consistent method to describe and to measure stream characteristics (Rosgen 1996). The classification consists of four levels. This assessment used the first two levels. Level 1 is a geomorphic characterization that categorizes streams based on pattern, slope, and shape. Level 2 is the morphological description and requires measuring bankfull width and depth, floodplain width, channel materials, slope, and sinuosity. These factors are used to distinguish individual sub-categories for each stream type.

Estimating Streambank Erosion

Streambank Erosion Condition Inventory (SECI) is used to estimate long-term stream erosion rates. This method produces an index by ranking six factors; bank stability, bank condition, bank cover, channel shape, channel bottom and deposition. SECI is based on the direct volume method outlined in the Channel Evaluation Workshop (NRCS, 2000). The teams used SECI to estimate erosion on habitat units and the entire reach. Erosion is estimated by applying lateral recession rates (LRRs) to bank heights and lengths. SECI is used for comparison rather than erosion rates in a sediment budget (NRCS, 2000).

Assessment Results

From 1997 to 2000, seventy reaches were assessed on approximately 85 miles of rivers and creeks in the Blackfoot River subbasin, shown in Figure 13. BRWC, ISCC, IDEQ, IDL, BLM, IDFG, FS, and NRCS staff assessed where permission was granted by the landowners. The teams didn't assess where permission wasn't granted. They completed field sheets at each reach. Results are listed in Table 10.

PFC

The teams found 44% or 35 miles of the assessed reaches were at proper functioning condition (PFC). About 33% or 26 miles of reaches were found to be functional at risk (FAR). While 23% or 18 miles of reaches were rated as nonfunctional (N). Those results are shown in Figure 14.

Streambank Stability

Approximately 57% or 46 miles of the assessed reaches had streambank stability greater than or equal to the 80% TMDL target. About 43% or 34 miles of reaches had streambank stability less than the TMDL target, as shown in Figures 15 and 16.

SECI

SECI results show 54% or 24 miles of assessed reaches had slight erosion. While 26% or 11 miles rated in moderate erosion condition and 20% or 9 miles rated in the severe category. SECI reach conditions and total scores are shown in Figures 17 and 18.

Stream Classification

The stream classification of the assessed reaches found 37% or 28 miles were C channels; 24% or about 18 miles were B streams; 22% or 17 miles were E channels; 8% were F types; 5% were G type; and 4% were A channels. Stream types for assessed reaches are shown in Table 10.

Table 10. Riparian Assessment Reach Summary in the Blackfoot River Subbasin

Stream	Reach	Length (miles)	Bank Stability (%)	PFC Status	SECI Condition	Rosgen Type
Angus Creek	AC1	0.4	100%	PFC	Slight	E4
Blackfoot River	BR-C1	1.6	90%	PFC	Slight	B
Blackfoot River	BR-C2	1.3	70%	FAR	Slight	C3
Blackfoot River	BR-C3	0.9	35%	FAR	Slight	B3
Blackfoot River	BR-J1	2.1	50%	N	--	F5
Blackfoot River	BR-P1	3.7	35%	N	Severe	C5/C6
Blackfoot River	BR-R1	1.9	25%	N	Severe	B3
Brush Creek	BC4	1.3	10%	FAR	Severe	E5
Brush Creek	BC6	0.6	25%	FAR	Moderate	E6
Brush Creek	BC7	1.3	20%	FAR	Severe	B6
Brush Creek	BC10	1.0	90%	PFC	Moderate	C5
Brush Creek	BC11	1.7	97%	PFC	Moderate	E5
Corral Creek	CC1	1.5	100%	PFC	--	C2
Corral Creek	CC2	0.9	85%	FAR	--	C
Corral Creek	CC3	1.1	50%	PFC	--	F6
Corral Creek	CC4	0.5	50%	PFC	--	C
Corral Creek	CC5	1.3	90%	PFC	--	C
Corral Creek	CC6	1.2	80%	FAR	--	C
Corral Creek	CC7	1.3	100%	FAR	--	E
Corral Creek	CC8	2.6	100%	PFC	--	E
Corral Creek	CC9	0.8	100%	PFC	--	C
Corral Creek	CC10	0.8	95%	PFC	--	E
Corral Creek	CC11	1.4	95%	PFC	--	E
Corral Creek	CC12	1.2	100%	PFC	--	E
Corral Creek	CC12b	0.5	90%	FAR	--	E
Diamond Creek	DC1	1.6	30%	--	--	E4
Diamond Creek	DC2	2.6	75%	--	--	F/B3
Diamond Creek	DC3	2.1	70%	--	--	B3
Diamond Creek	DC4	2.9	70%	PFC	Slight	C4
Diamond Creek	DC5	1.7	100%	PFC	Slight	C4
Diamond Creek	DC6	1.2	100%	PFC	Slight	B3
Diamond Creek	DC7	0.3	70%	N	Severe	G
Diamond Creek	DC8	1.2	100%	FAR	Slight	B4
Diamond Creek	DC9	1.4	25%	PFC	Moderate	--
Dry Valley Creek	DVC1	2.0	100%	N	Moderate	--
Dry Valley Creek	DVC2	0.5	100%	PFC	Slight	E
Dry Valley Creek	DVC3	4.3	--	FAR	Slight	--
Dry Valley Creek	DVC4	1.9	100%	FAR	Moderate	C6
Dry Valley Creek	DVC5	0.8	100%	PFC	Slight	E
Dry Valley Creek	DVC6	0.9	85%	FAR	Moderate	C4
Dry Valley Creek	DVC7	0.5	100%	PFC	Slight	B6

Table 10. Riparian Assessment Reach Summary (continued)

Stream	Reach	Length (miles)	Bank Stability (%)	PFC Status	SECI Condition	Rosgen Type
Horse Creek	HC1	0.1	50%	N	--	F/G5
Horse Creek	HC2	0.3	35%	FAR	--	--
Horse Creek	HC3	0.1	100%	BC	--	B2
Horse Creek	HC4	0.1	100%	BC	--	--
Horse Creek	HC5	0.5	60%	FAR	--	C
Horse Creek	HC6	0.5	100%	FAR	--	--
Horse Creek	HC7	0.6	80%	FAR	--	C6
Lanes Creek	LC4	0.8	100%	FAR	Moderate	--
Lanes Creek	LC5	0.7	90%	FAR	Slight	B
Lanes Creek	LC6	1.2	--	N	Slight	C4
Lanes Creek	LC7	1.8	80%	PFC	Slight	C3
Lanes Creek	LC8	1.8	100%	PFC	Slight	C4
Maybe Creek	MC3	0.8	90%	PFC	--	B2
Poison Creek	PC1	0.3	100%	PFC	--	A3
Poison Creek	PC2	0.4	50%	FAR	--	B2
Poison Creek	PC3	0.8	80%	PFC	--	BC
Poison Creek	PC4	1.3	100%	PFC	--	A2/BC
Poison Creek	PC5	0.6	100%	PFC	--	E6/B2
Rawlins Creek	RC1	1.0	100%	FAR	--	B5
Rawlins Creek	RC2	1.4	100%	FAR	--	C4
Slug Creek	SC1	0.8	100%	PFC	Slight	E6
Slug Creek	SC2	0.9	100%	PFC	Moderate	E6
Wolverine Creek	WC1	0.6	95%	FAR	--	B5
Wolverine Creek	WC3	0.6	30%	N	--	C5
Wolverine Creek	WC4	1.1	100%	N	--	G
Wolverine Creek	WC5	0.4	100%	PFC	--	C5
Wolverine Creek	WC6	0.5	90%	PFC	--	B4
Wolverine Creek	WC7	2.0	50%	N	--	G
Wolverine Creek	WC8	1.4	15%	N	--	B4
Wolverine Creek	WC9	1.4	50%	FAR	--	B
Wolverine Creek	WC10	1.7	60%	N	--	A3
	Total	**85.3 Miles**				

Discussion

Over half of the reaches (57%) had greater streambank stability than IDEQ's TMDL target. About 44% of the assessed reaches were proper functioning and 54% of the reaches had only slight erosion. Overall, Corral Creek had proper function, stable streambanks, and slight erosion. Other reaches on Angus, Diamond, Dry Valley, Horse, Lanes, Poison, Rawlins, and Slug creeks also exhibit those same characteristics. Corral, Diamond, Dry Valley, Horse, Poison, Rawlins, and Slug creeks had several reaches with 80% of the banks covered and stable. Meadow, Sheep, and Trail creeks weren't assessed.

IDEQ (2001) concluded there were substantial, unstable segments on Brush, Corral, Diamond, Dry Valley, Lanes, and Wolverine creeks and the Blackfoot River. They also estimated load reductions

ranging from 38% to 77% needed on Angus, Brush, Diamond, Dry Valley, Lanes, and Slug creeks. Of these streams, Brush Creek has the largest sediment reductions, from 51% to 77% (IDEQ, 2001).

Reaches having unstable, active head cuts include; BR-R1, CC1, DC7, DVC6, HC5, LC8, RC1, WC1, WC4, and WC7. These reaches may continue to degrade and affect adjacent reaches.

Nonfunctional reaches include BR-J1, BR-P1, BR-R1, DC7, DVC1, HC1, LC6, WC3, WC4, WC7, WC8, and WC10. These reaches tended to have higher stream instability and moderate to severe erosion conditions. Unstable reaches (<50% stable) included; BC4, BC6, BC7, BR-R1, BR-P1, BR-C3, DC1, DC9, HC2, WC3, and WC8. Severely eroding reaches were BR-P1, BR-R1, BC4, BC7, and DC7.

Reaches rated as functional at risk include; BC4, BC6, BC7, BR-C2, BR-C3, CC2, CC6, CC7, CC12b, DC8, DVC6, DVC3, DVC4, HC2, HC5, HC6, HC7, LC4, LC5, PC2, RC1, RC2, WC1, and WC9. These reaches vary greatly in ranges of streambank stability, erosion condition, and stream types.

As shown in Figure 19, when PFC and streambank stability values are combined, the worst reaches occur on the lower Blackfoot River, Brush and Wolverine creeks. Figure 20 shows reaches in the Blackfoot subbasin in the middle grouping when comparing erosion categories to other eastern Idaho watersheds.

More characteristics were assessed, but these are the major items evaluated. Because grazing is the primary land use along streams, the teams carefully evaluated livestock impacts on these streams (Blew, 1999). In some cases, livestock caused problems and some they didn't. Several reaches were degraded by other factors and grazing hampered recovery efforts. Those other factors included: roads; droughts; floods; mass wasting; channelization; culverts; diversions; mining; farming; and beaver dynamics.

Recommendations

Those reaches on Brush, Corral, Diamond, Dry Valley, Horse, Lanes, Rawlins, and Wolverine creeks with active head cuts should be monitored and evaluated to determine if stabilization structures should be installed to prevent further degradation. Nonfunctional reaches on the lower Blackfoot River, Diamond, Dry Valley, Horse, Lanes, and Wolverine creeks should be surveyed to determine BMP alternatives, impacts on other reaches, and long term channel changes.

Functional at risk (FAR) reaches on the Blackfoot River and its tributaries should be high priorities because changing management with minor structural measures could improve these reaches substantially. The best opportunities for improvement occur on reaches along the upper and middle Blackfoot River, Brush, Corral, Dry Valley, Horse, Lanes, and Rawlins creeks.

When planning specific stabilization or restoration projects on the lower Blackfoot River, participants and planners must consider and address hydrologic modification and flow regulation from the Blackfoot Reservoir, and the Reservation, Just, and Little Indian canals. Those efforts should be in conjunction or consultation with the BIA and the Shoshone-Bannock Tribes. The reservation boundary is most often the other river bank. The MOU should be updated as the TMDL implementation plans are completed.

The ISCC and IASCD recognize the landowners, residents, operators, BRWC, SWCDs, BLM, FS, NRCS, and IDL are the entities working in the watershed to address problems on private and public lands. We can assist those entities in providing technical and financial assistance in developing and implementing conservation plans and best management practices.

Figure 13. Assessed Reaches in the Blackfoot River Subbasin

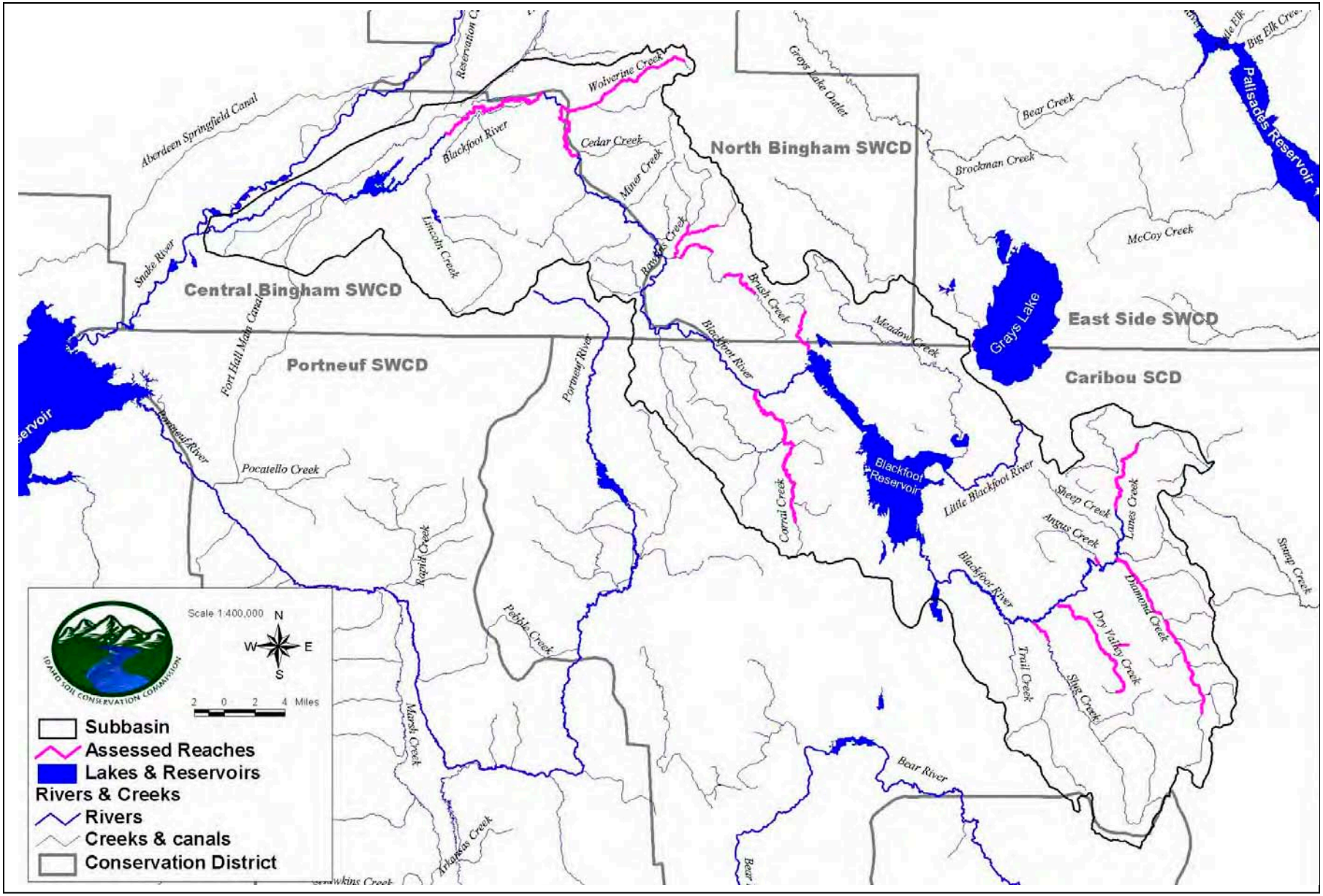


Figure 14. PFC Status of Assessed Reaches in the Blackfoot River Subbasin

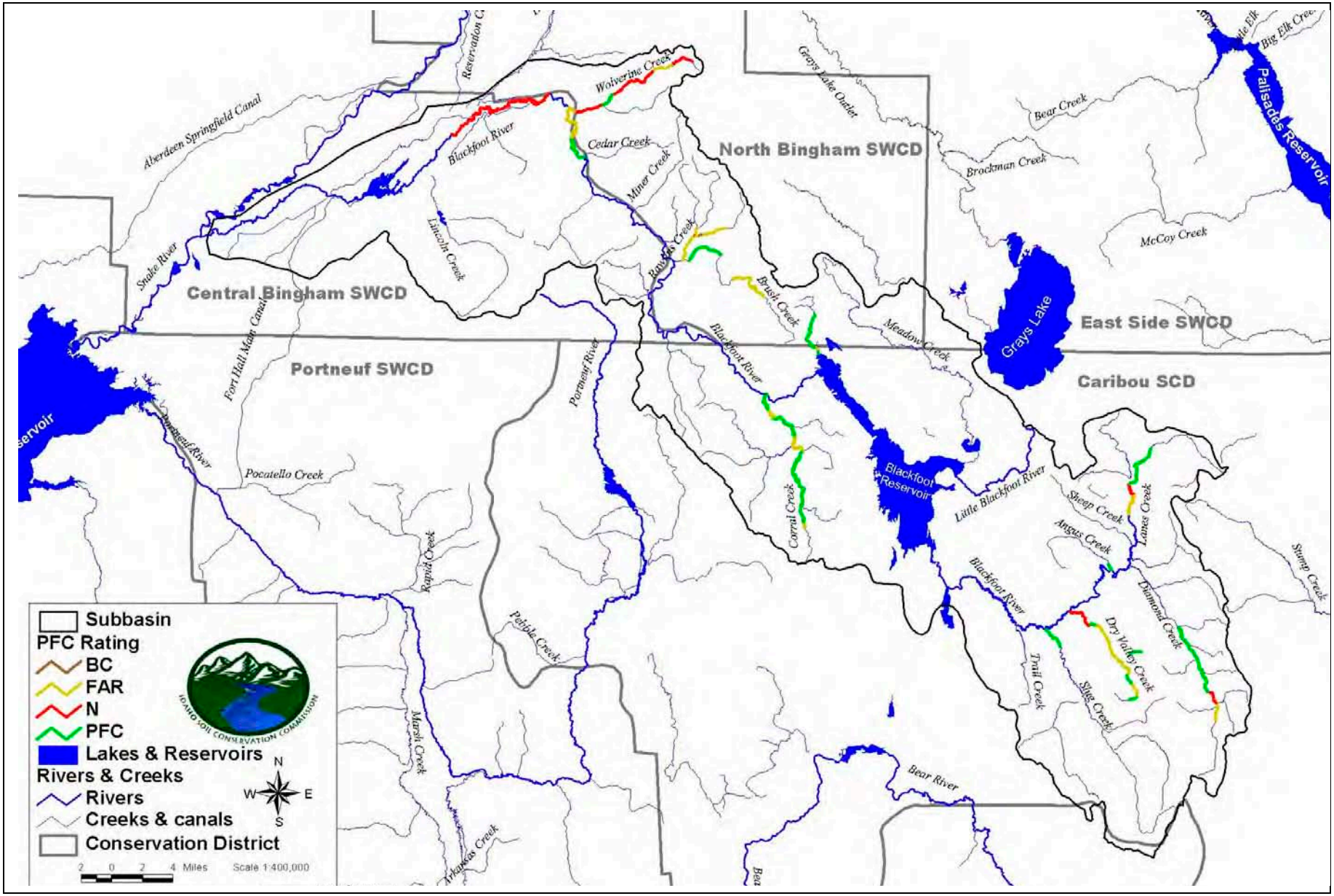


Figure 15. Streambank Stability of Assessed Reaches in the Blackfoot River Subbasin

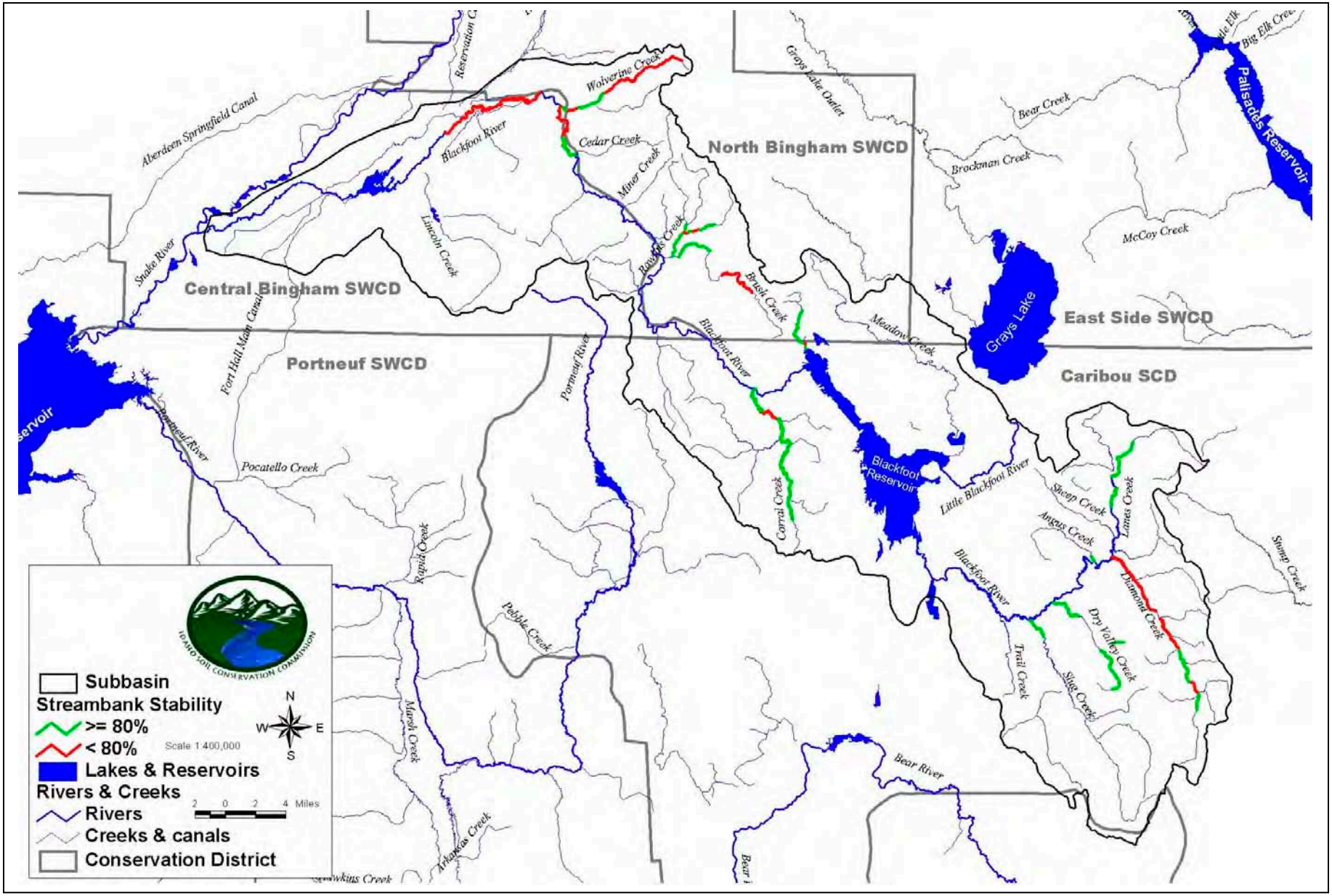


Figure 16. Percent Streambank Stability of Assessed Reaches in the Blackfoot River Subbasin

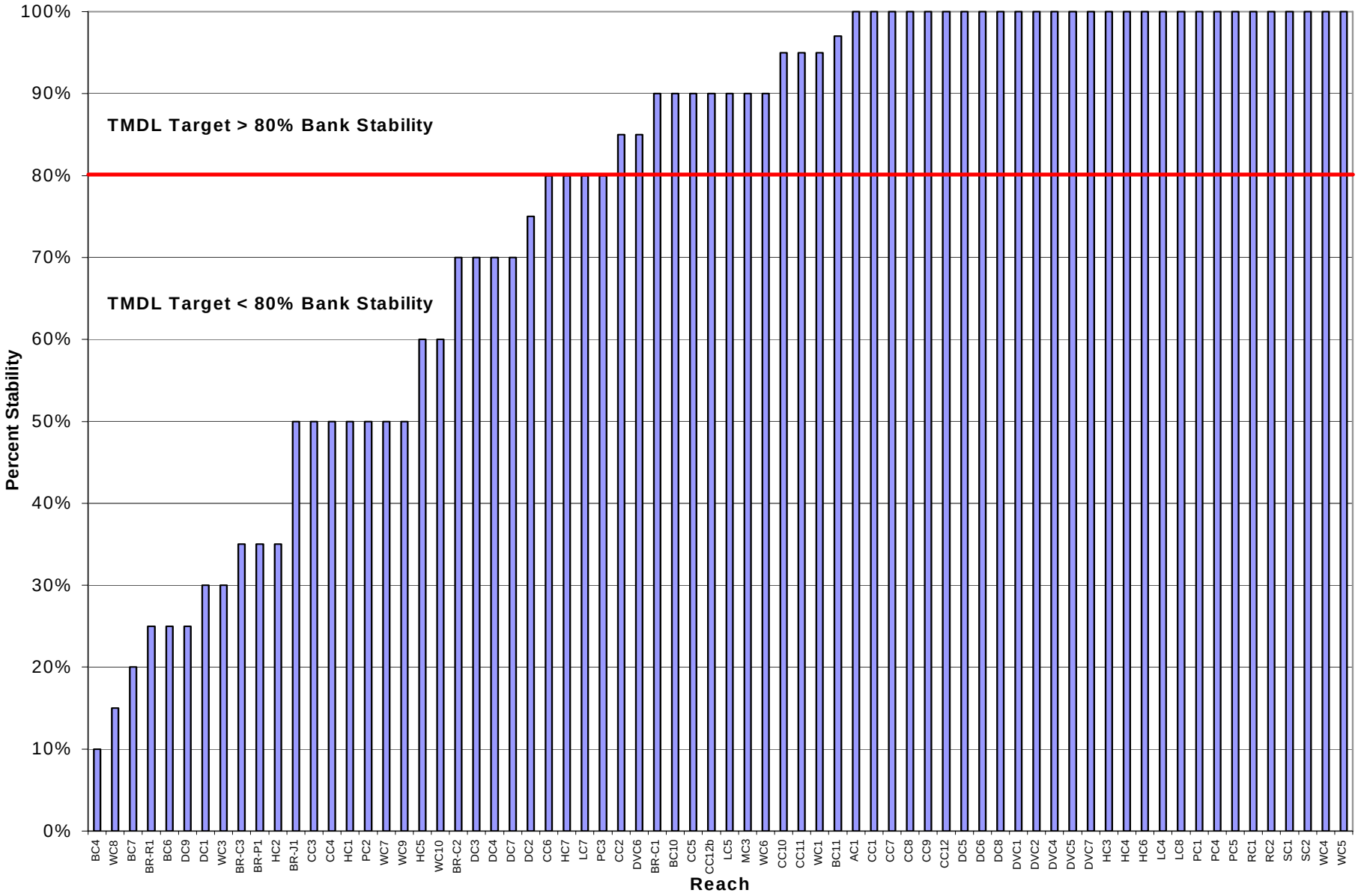


Figure 17. SECI Condition of Assessed Reaches in the Blackfoot River Subbasin

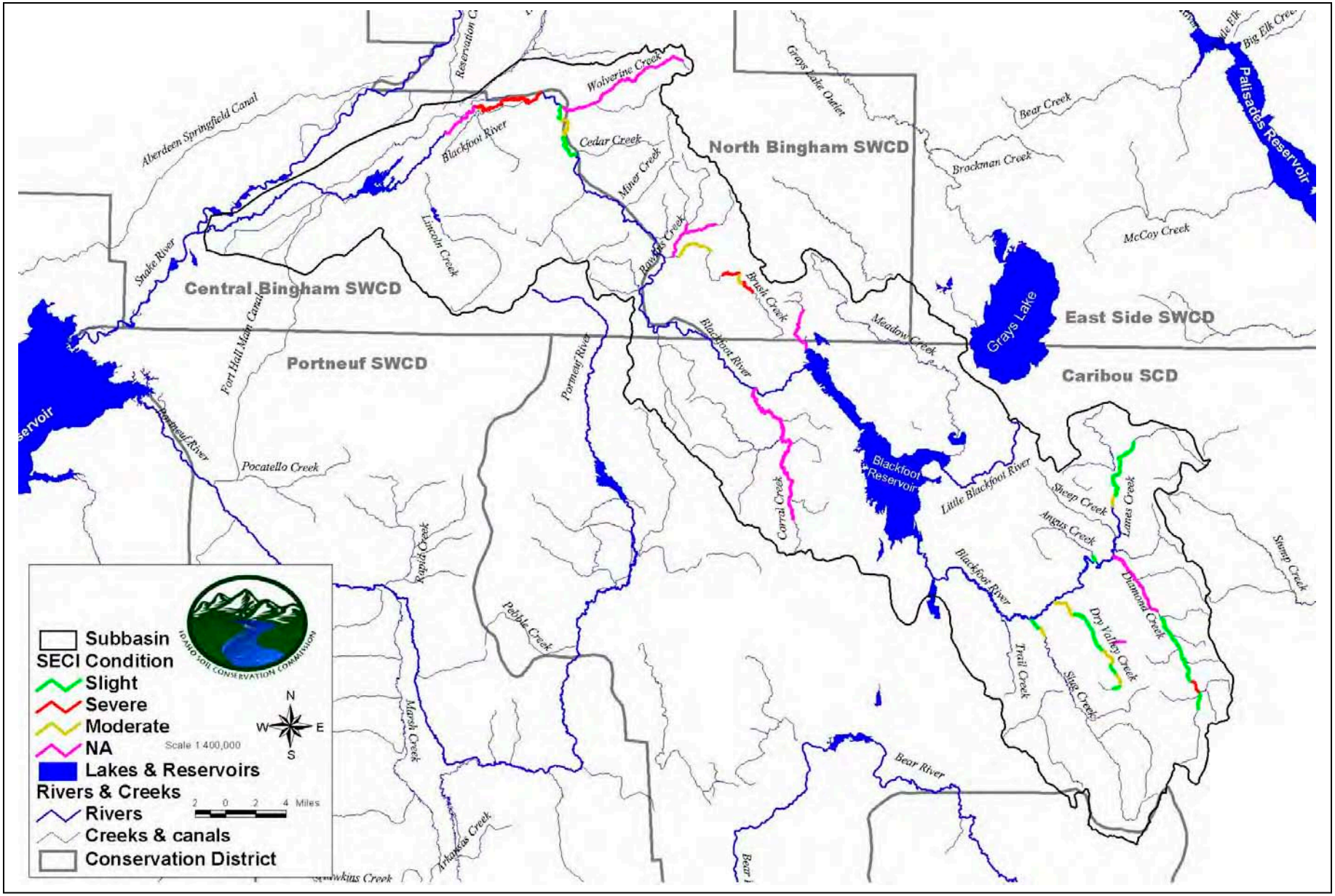


Figure 18. SECI Total Scores of Assessed Reaches in the Blackfoot River Subbasin

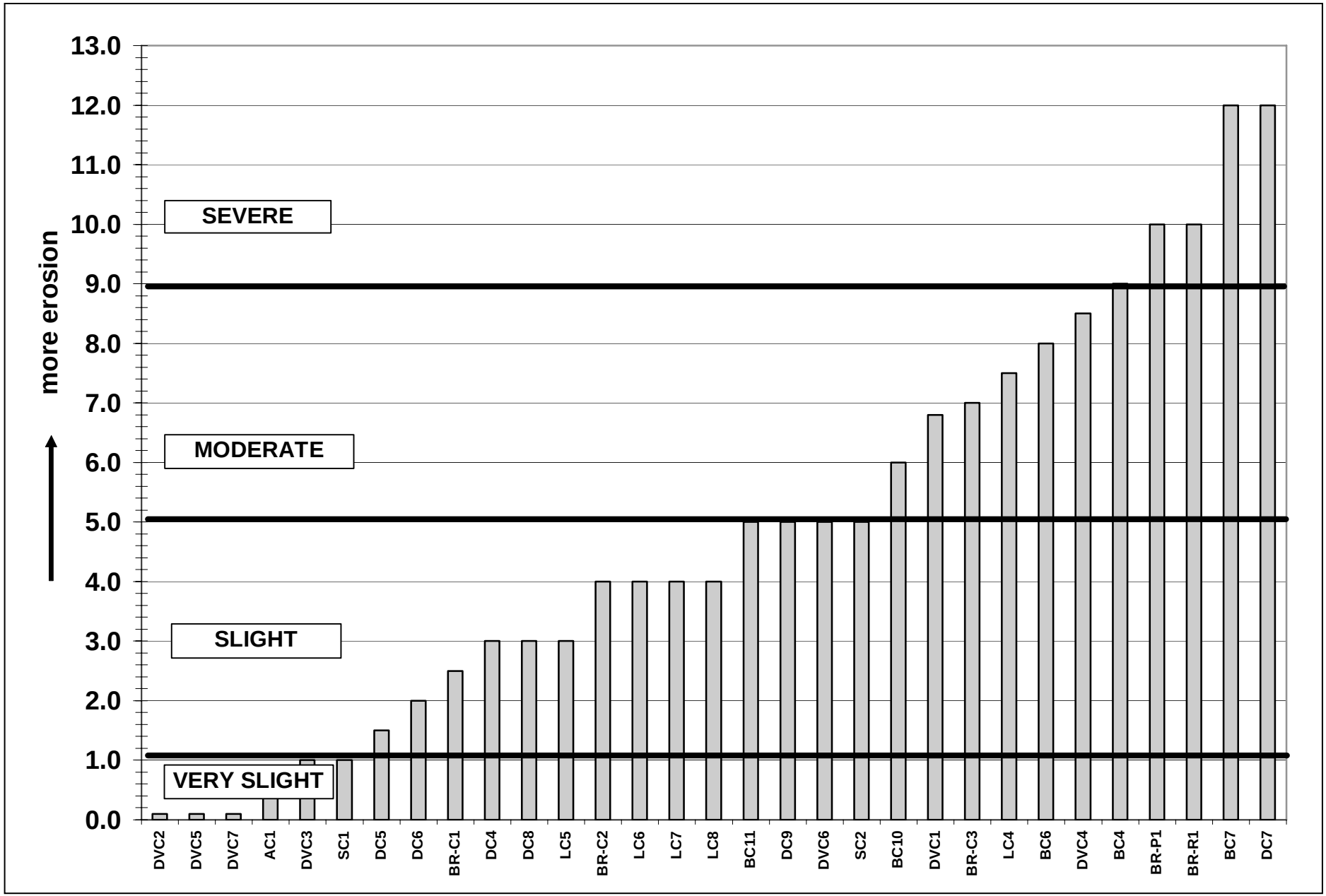


Figure 19. Streambank Stability and PFC Combined Scores of Assessed Reaches in the Blackfoot River Subbasin

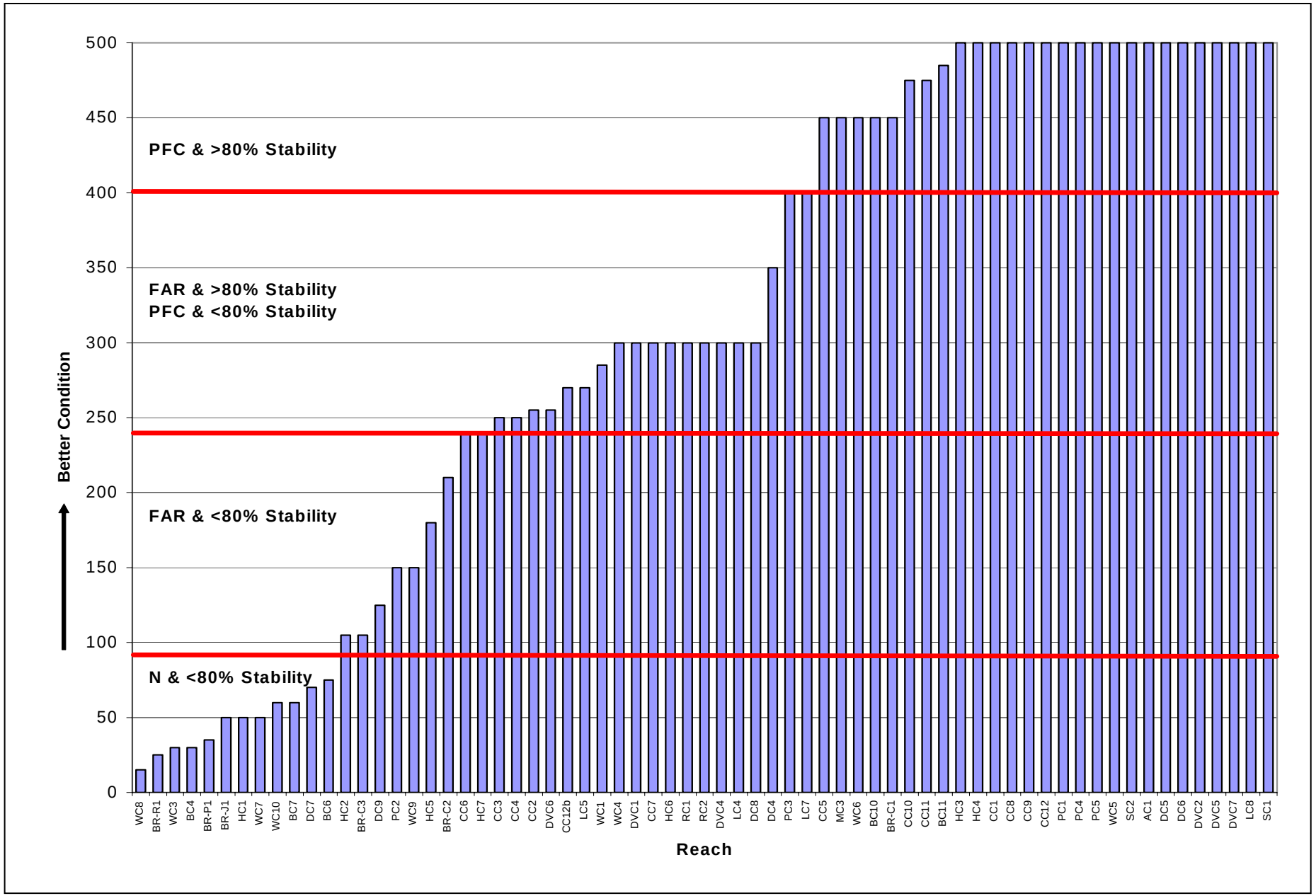
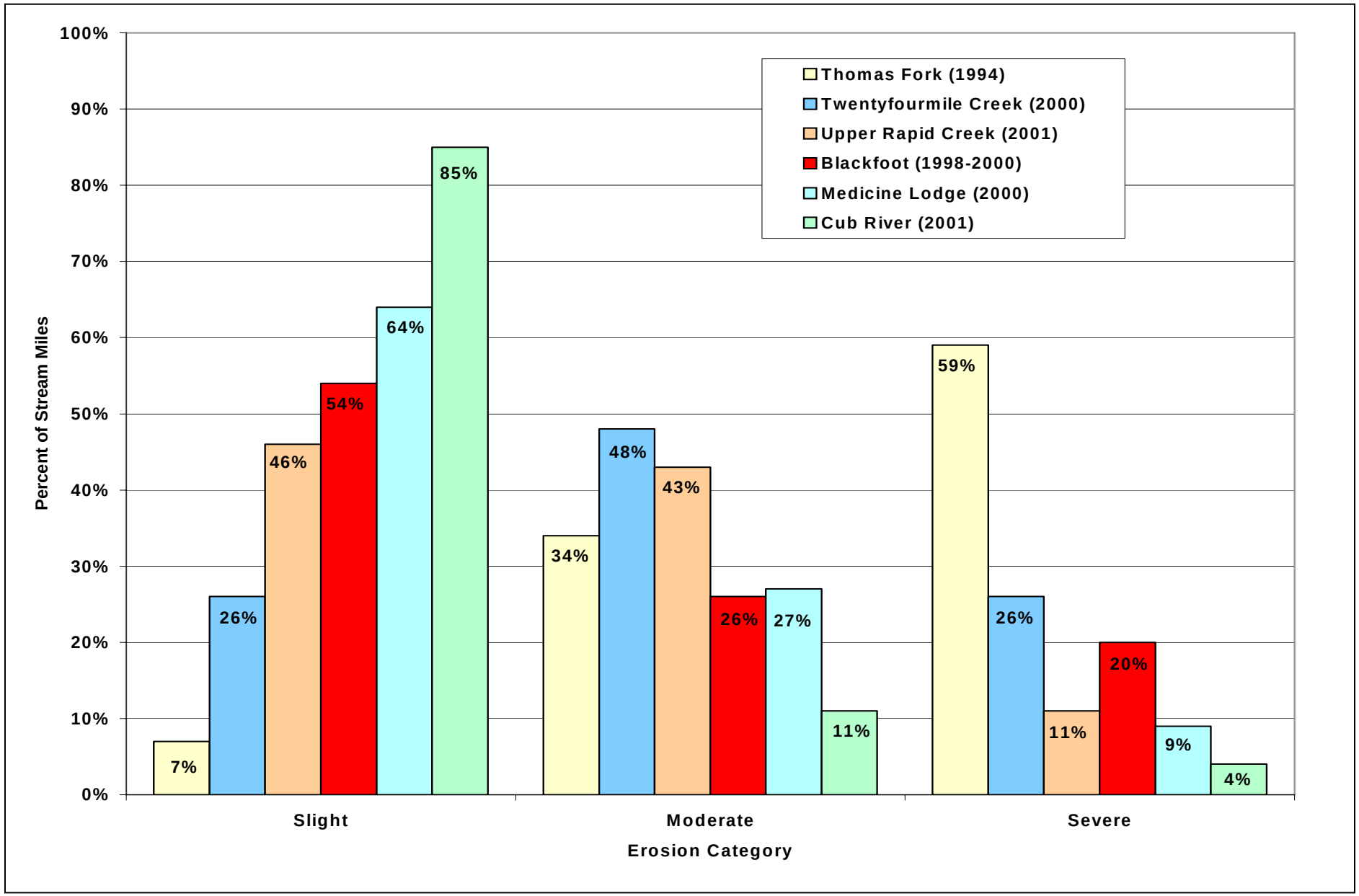


Figure 20. Comparison of Assessed Reaches in the Blackfoot River Subbasin and Eastern Idaho Watersheds



Problem Identification

Beneficial Use Status

The Blackfoot River's designated beneficial uses include cold water aquatic life, salmonid spawning, primary contact recreation, secondary contact recreation, domestic water supply, agricultural water supply, industrial water supply, wildlife habitat, and aesthetics. Current information suggests that some beneficial uses, such as cold water aquatic life and salmonid spawning are impaired and are not fully supported in several streams (IDEQ, 2001). The Blackfoot River has three segments listed from its headwaters to the Main Canal. Additionally there are 3 river segments and 14 tributaries on the state of Idaho's 1998 §303(d) list (IDEQ, 2001), shown in Figure 12. The Blackfoot River's cold water aquatic life and salmonid spawning beneficial uses are not supported due to sediment and nutrients (IDEQ, 2001).

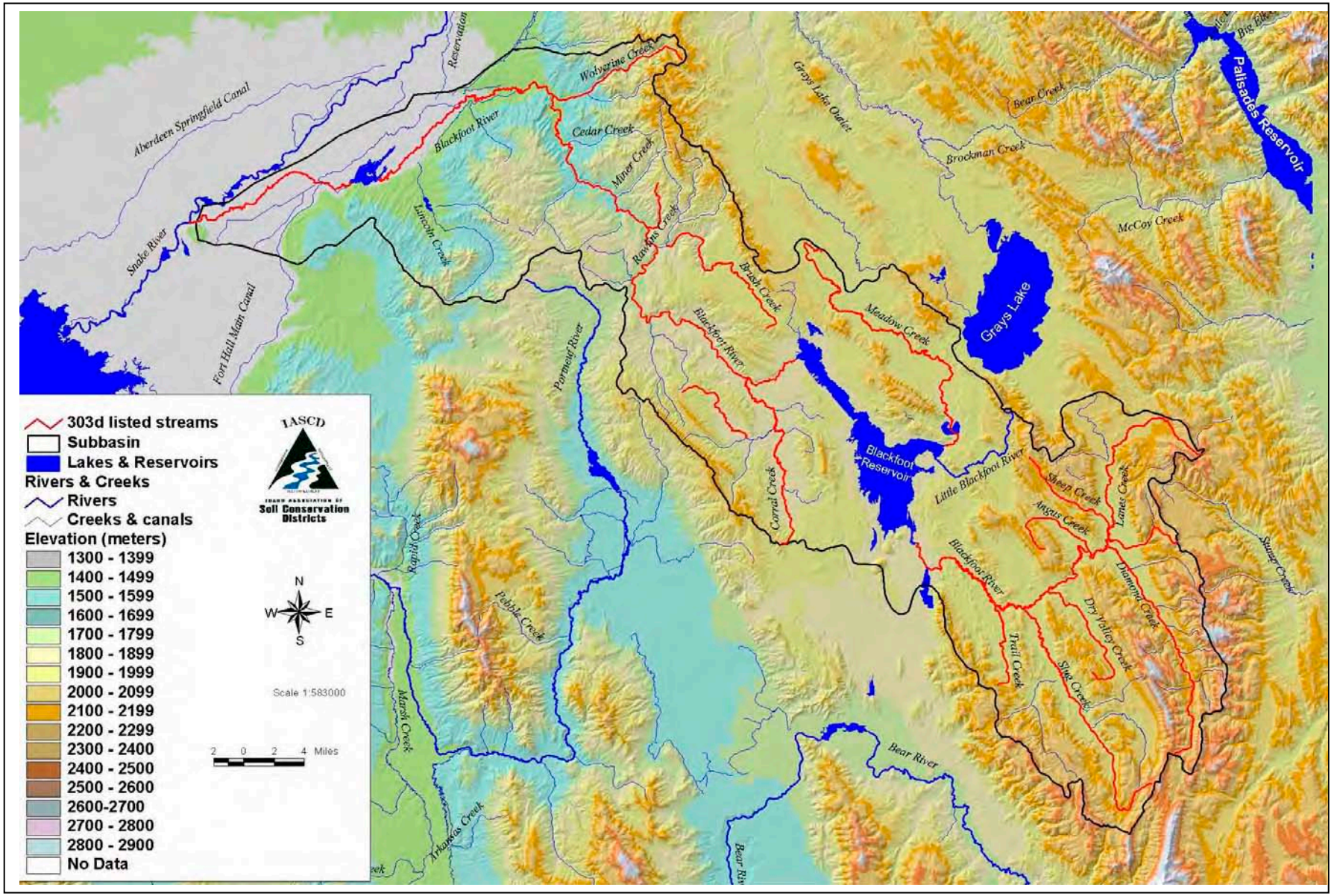
Table 11. 1998 State of Idaho's §303(d) Listed Segments in the Blackfoot River Subbasin

Waterbody	Segment Boundaries	Pollutants
Blackfoot River	Wolverine Creek to Main Canal	Sediment & nutrients
Blackfoot River	Blackfoot Dam to Wolverine Creek	Sediment, nutrients & flow alteration
Blackfoot River	Headwaters to Blackfoot Reservoir	Sediment & nutrients
Wolverine Creek	Headwaters to Blackfoot River	Sediment & nutrients
Corral Creek	Headwaters to Blackfoot River	Sediment
Meadow Creek	Headwaters to Blackfoot Reservoir	Sediment
Trail Creek	Headwaters to Blackfoot River	Sediment
Slug Creek	Headwaters to Blackfoot River	Sediment
Angus Creek	Headwaters to Blackfoot River	Sediment
Dry Valley Creek	Headwaters to Blackfoot River	Sediment
Diamond Creek	Headwaters to Blackfoot River	Sediment
Bacon Creek	Forest Service boundary to Lanes Creek	Sediment
Lanes Creek	Headwaters to Blackfoot River	Sediment
Sheep Creek	Headwaters to Lanes Creek	Sediment
Brush Creek	Headwaters to Blackfoot River	Unknown
Grizzly Creek	Headwaters to Corral Creek	Unknown
Maybe Creek	Maybe Canyon waste dump to Dry Valley Creek	Unknown

Table 12. Beneficial Uses for §303(d) Listed Waterbodies in the Blackfoot River Subbasin

Segment	Designated & Existing Uses
Blackfoot River, Wolverine Creek to Main Canal	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Primary Contact Recreation, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Blackfoot River, Blackfoot Dam to Wolverine Creek	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Primary Contact Recreation, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Blackfoot River, Headwaters to Blackfoot Reservoir	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Primary Contact Recreation, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Wolverine Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Corral Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Meadow Creek, Headwaters to Blackfoot Reservoir	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Trail Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Slug Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Angus Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Dry Valley Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Diamond Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Industrial Water Supply, Aesthetics and Wildlife Habitat
Bacon Creek, Forest Service Boundary to Lanes Creek	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Lanes Creek, Headwaters to Blackfoot River	Cold Water Aquatic life, Salmonid Spawning, Industrial Water Supply, Aesthetics and Wildlife Habitat
Sheep Creek, Headwaters to Lanes Creek	Agricultural Water Supply, Cold Water Aquatic life, Salmonid Spawning, Industrial Water Supply, Aesthetics and Wildlife Habitat
Brush Creek, Headwaters to Blackfoot River	Agricultural Water Supply, Cold Water Aquatic life, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Grizzly Creek, Headwaters to Corral Creek	Agricultural Water Supply, Cold Water Aquatic life, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat
Maybe Creek, Maybe Canyon Waste Dump to Dry Valley Creek	Agricultural Water Supply, Cold Water Aquatic life, Secondary Contact Recreation, Industrial Water Supply, Aesthetics and Wildlife Habitat

Figure 21. 1998 303(d) Listed Waterbodies in the Blackfoot River Subbasin



Pollutant Ranking

Sediment Priority Watersheds

Blackfoot River watersheds were ranked using TSS loads, percent reductions, TMDL target exceedance, PFC status, and percent streambank stability. Large contributors such as the lower and middle Blackfoot River segments and Wolverine Creek are considered high priority for BMPs. Sediment BMP priorities for the subbasin are presented in Table 13. The TMDL targets were applied to IASCD water quality data shown in Table 14.

Table 13. Sediment Priorities for Agricultural BMP Implementation

Priority	Watershed or Subwatershed	Segment	TSS Rank	Nonfunctional Rank	%Unstable Rank
HIGH	Lower Blackfoot	Blackfoot River from Little Indian Diversion to Snake River	1	3	1
	Wolverine Creek	Headwaters to the Blackfoot River Blackfoot River from Cedar Creek to Just	3	1	2
	Brush Creek	Headwaters to the Blackfoot River	5	5	3
MEDIUM	Middle Blackfoot	Blackfoot River from Government Dam to Cedar Creek	2	6	5
	Lanes Creek	Headwaters to Lanes Creek Blackfoot River from Diamond Creek to Slug	4	2	6
	Diamond Creek	Forest Service Boundary to Lanes Creek	8	4	4
LOW	Slug Creek	Headwaters to the Blackfoot River	6	7	7
	Meadow Creek	Headwaters to the Blackfoot Reservoir	7	8	8
	Upper Blackfoot	Blackfoot River from Slug Creek to the Blackfoot Reservoir	9	9	9

Table 14. TSS Loads and Exceedances for the Blackfoot River and Tributaries

Monitoring Site	Average TSS Load (tons/day)	Average TSS Load @ TSS^{50} Target (tons/day)	Average TSS Load Reduction	TSS^{50} Target Exceedance
Wolverine Creek*	0.40	0.34	15%	17%
Brush Creek*	0.13	0.11	15%	8%
Rawlins Creek*	0.20	0.20	0%	0%
Corral Creek*	0.18	0.16	11%	3%
Slug Creek*	0.02	0.02	0%	10%
Angus Creek*	0.03	0.03	0%	0%
Blackfoot River @ IDFG WMA*	0.91	0.87	3%	3%
Diamond Creek*	0.01	0.01	0%	0%
Blackfoot River @ Rich Lane Bridge*	65.6	52.3	20%	18%
Blackfoot River @ Little Indian Bridge *	29.9	24.2	19%	14%
Blackfoot River @ Morgan's Crossing Bridge*	18.1	18.1	0%	0%
Blackfoot River @ Government Dam Bridge*	11.1	8.5	23%	10%

* 2000-2003 water quality data from IASCD on the Blackfoot River and its tributaries

Nutrient Priority Watersheds

Segments and tributaries of the Blackfoot River were ranked based upon their TP loads, percent reduction, and TMDL target exceedance. The IASCD didn't test for ammonia but still used 0.30 mg/L target for nitrate+nitrite (Fischer, 2002).

The Blackfoot River at Henry and below Government Dam has significant TP loads and TP target exceedance. Rawlins, Brush, and Angus creeks have much smaller loads of TP but exceed the TP targets regularly. The Blackfoot River at Rich Lane Bridge and near Blackfoot has significant NNO3 loads.

Phosphorus and nitrogen runoff includes two processes, surface runoff and subsurface flow. The loss of phosphorus occurs in sediment bound and dissolved forms (Sharpley et al., 1999). Nitrogen doesn't readily bind to sediment, moves easily in the water column, and cycles continuously (FISRWG, 1998).

Nutrient BMP priorities are presented in Table 15. Water quality monitoring data collected by IASCD and USGS were compared to estimate these load reductions which are shown in Tables 16 and 17.

Table 15. Blackfoot River Nutrient Priorities for Agricultural BMP Implementation

Priority Category	Watershed or Subwatershed	TP Rank	NNO3 Rank	Segment
HIGH	Upper Blackfoot	1	1	Blackfoot River from Slug Creek to the Blackfoot Reservoir
	Brush Creek	2	2	Headwaters to the Blackfoot River
	Middle Blackfoot	3	3	Blackfoot River from Government Dam to Cedar Creek
MEDIUM	Lower Blackfoot	4	4	Blackfoot River from Little Indian Diversion to Snake River
	Lanes Creek	5	5	Headwaters to Lanes Creek Blackfoot River from Diamond Creek to Slug Creek
	Wolverine Creek	6	6	Headwaters to the Blackfoot River Blackfoot River from Cedar Creek to Just Canal Diversion
LOW	Diamond Creek	7	7	Forest Service Boundary to Lanes Creek
	Slug Creek	8	8	Headwaters to the Blackfoot River
	Meadow Creek	9	9	Headwaters to the Blackfoot Reservoir

Table 16. TP Loads and Exceedance for the Blackfoot River and Tributaries

Monitoring Site	Average TP Load (lbs/day)	Average TP Load @ TP Target (lbs/day)	Average TP Load Reduction	TP Target Exceedance
Wolverine Creek*	1.0	0.9	10%	9%
Brush Creek*	1.7	1.0	41%	25%
Rawlins Creek*	2.1	1.1	48%	15%
Corral Creek*	1.4	0.8	43%	8%
Slug Creek*	0.1	0.1	0%	40%
Angus Creek*	1.1	0.8	27%	59%
Blackfoot River @ IDFG WMA*	6.3	5.7	10%	3%
Diamond Creek*	0.1	0.1	0%	0%
Blackfoot River @ Rich Lane Bridge*	162.1	144.8	11%	18%
Blackfoot River @ Little Indian Bridge*	113.4	102.4	10%	14%
Blackfoot River @ Morgan's Crossing Bridge*	175.4	170.3	3%	25%
Blackfoot River @ Government Dam Bridge*	159.8	127.9	20%	50%
Blackfoot River nr Blackfoot (USGS 13068500)**	73.9	43.1	42%	22%
Blackfoot River nr Henry (USGS 13065500)***	442.5	146.6	67%	30%

* 2000-2003 water quality data from IASCD on tributaries to the Blackfoot River
** 1971-1997 water quality data on Blackfoot River USGS Gage Station near Blackfoot
*** 1970-1981 water quality data on Blackfoot River USGS Gage Station near Henry

Table 17. NNO3 Loads and Exceedance for the Blackfoot River and Tributaries

Monitoring Site	Average NNO3 Load (lbs/day)	Average NNO3 Load @ TIN Target (lbs/day)	Average NNO3 Load Reduction	NNO3 Target Exceedance
Wolverine Creek*	7.4	3.1	58%	31%
Brush Creek*	3.4	1.2	65%	18%
Rawlins Creek*	9.3	3.1	67%	28%
Corral Creek*	8.7	2.9	67%	24%
Slug Creek*	0.0	0.0	0%	10%
Angus Creek*	1.8	0.6	67%	3%
Blackfoot River @ IDFG WMA*	40.7	15.3	62%	11%
Diamond Creek*	9.2	3.3	64%	33%
Blackfoot River @ Rich Lane Bridge*	1,108.6	377.9	66%	59%
Blackfoot River @ Little Indian Bridge*	503.9	168.1	67%	21%
Blackfoot River @ Morgan's Crossing Bridge*	814.5	290.7	64%	25%
Blackfoot River @ Government Dam Bridge*	147.8	57.9	61%	30%
Blackfoot River nr Blackfoot (USGS 13068500) **	436.8	109.8	75%	26%
Blackfoot River nr Henry (USGS 13065500) ***	267.8	180.0	33%	22%

* 2000-2003 water quality data from IASCD on tributaries to the Blackfoot River
** 1971-1997 water quality data on Blackfoot River USGS Gage Station near Blackfoot
*** 1970-1981 water quality data on Blackfoot River USGS Gage Station near Henry

Critical Acres

Critical acres are those areas having the most significant impact on the quality of the receiving waters. These critical acres include pollutant source and transport areas. Private agricultural land accounts for 262,190 acres in the subbasin while the major private land use is range land with 403,890 acres.

Because the TMDL reductions are so substantial, it is estimated that 73% or 191,085 acres of private agricultural land would need BMPs implemented for sediment, phosphorus, and nitrogen. In order to allocate available resources effectively, implementation should be focused in high priority watersheds. Furthermore, BMP implementation efforts should be focused toward tiers as shown in Table 18.

Implementation Tiers

Critical areas adjacent to the Blackfoot River and its tributaries in Tier 1 are considered high priority for implementation due to the increased potential to directly impact surface water quality. Accordingly, the following is a general rule that applies to the priority of critical acres.

Tier 1 **Stream channels and riparian areas directly impacting beneficial uses**

Tier 2 **Fields indirectly, yet substantially altering water quality**

Tier 3 **Upland areas or fields indirectly affecting water quality**

Tier 4 **Animal facilities directly or indirectly influencing water quality**

Table 18. Critical Areas by Watershed or Subwatershed in the Blackfoot River Subbasin

Implementation Tiers		Tier 1	Tier 2	Tier 3	Tier 4
Priority	**Watershed or Subwatershed**	**Riparian Acres**	**Crop and Pasture Acres**	**Range Acres**	**Animal Facilities**
HIGH	Wolverine Creek	250	9,700	9,440	4
	Lower Blackfoot	843	18,599	1,835	5
	Brush Creek	81	2,114	10,094	2
MEDIUM	Middle Blackfoot	819	5,643	27,672	7
	Meadow Creek	845	1,593	24,861	2
	Lanes Creek	3,408	1,813	24,949	3
	Upper Blackfoot	1,676	9,206	20,175	15
LOW	Slug Creek	512	3,992	8,145	8
	Diamond Creek	508	0	2,312	2
	Total	**8,942**	**52,660**	**129,483**	**55**

Proposed Treatment

Each agricultural critical area is divided into one or more treatment units. These units describe critical areas with similar land uses, soils, productivity, resource concerns, and treatment needs.

Approximately 271 acres of riparian and wetlands; 11,489 acres of crop and pasture; 1,790 acres of range land; and 9 animal facilities, shown in Table 19, were removed from the critical area amounts in Table 18. These were removed because they meet NRCS resource quality criteria. The remaining treatment amounts, shown in Table 18, should be treated to NRCS resource quality criteria in order to meet the TMDL targets and pollutant reductions.

Table 19. Treated Acres by Watershed or Subwatershed in the Blackfoot River Subbasin

Implementation Tiers	Tier 1	Tier 2	Tier 3	Tier 4
Watershed or Subwatershed	**Riparian Acres**	**Crop and Pasture Acres**	**Range Acres**	**Animal Facilities**
Wolverine Creek	2	0	450	1
Lower Blackfoot	23	326	0	8
Brush Creek	0	342	0	0
Middle Blackfoot	30	8,668	1,290	0
Meadow Creek	0	606	0	0
Lanes Creek	0	0	0	0
Upper Blackfoot	216	1,547	0	0
Slug Creek	0	0	0	0
Diamond Creek	0	0	0	0
Total	**271**	**11,489**	**1,740**	**9**

Treatment Unit (TU1) Stream Channels and Riparian Areas

Acres	Soils	Resource Problems
8,942	**Bear Lake-Lago-Merkley or Downata-Bear Lake-Tendoy:** deep, moderately well to poorly drained soils that formed in silty alluvium on floodplains and low terraces with slopes ranging from 0 to 2 percent **Newdale-Swanner-Tetonia:** Nearly level to steep, well-drained, deep and shallow, medium-textured soils on uplands with 12 to 60 percent slopes	Unstable & erosive stream channels Lack of riparian vegetation Barriers to fish migration

Treatment Unit (TU2) Crop and Pasture Lands

Acres	Soils	Resource Problems
52,660	**Bannock-Bock:** Nearly level to moderately sloping, well-drained, deep, medium textured soils on alluvial terraces with slopes from 0 to 12 percent **Wolverine-Sasser-Stan:** Nearly level to moderately steep, excessively drained and well-drained, deep, coarse-textured and moderately coarse textured soils on terraces with 0 to 30 percent slopes **Rexburg-Ririe-Iphil or Bancroft-Paulson-Lanark or Lanark-Dranyon-Nielsen:** shallow to deep, well drained, soils formed in loess and silty alluvium, mixed alluvium, with slopes from 0 to 20 percent	Accelerated sheet & rill, gully, or irrigation-induced erosion, nutrient leaching & runoff

Treatment Unit (TU3) Range Lands

Acres	Soils	Resource Problems
129,483	**Newdale-Swanner-Tetonia:** Nearly level to steep, well-drained, deep and shallow, medium-textured soils on uplands with 12 to 60 percent slopes **Rexburg-Ririe-Iphil or Bancroft-Paulson-Lanark or Lanark-Dranyon-Nielson:** deep and very deep, well drained, soils formed in loess and silty alluvium, mixed alluvium, colluvium and residuum derived from limestone, dolomite and related rock with slopes from 0 to 60 percent **Sheege-Pavohroo:** Nearly level to steep, well-drained, shallow and deep, medium-textured soils on mountains with slopes from 0 to 60 percent **Wahtigrup-Ricrest-Hymas:** Moderately sloping to very steep, excessively drained and well drained, gravelly, stony, and extremely stony, medium textured soils on mountain slopes and ridges with 8 to 60 percent slopes	Accelerated gully erosion Lack of drinking water sources

Treatment Unit (TU4) Animal Facilities

Units	Soils	Resource Problems
55	**These facilities are found on all the soils described in (TU1) Stream Channel and Riparian Areas; (TU2) Crop and Pasture Lands; and (TU3) Range Lands**	Lack of drinking water sources Inadequate waste storage Bacteria & nutrient runoff from corrals or pens

Estimated Costs for TMDL Agricultural Implementation

The IASCD estimated the cost to implement the agricultural component of the Blackfoot River TMDL would be approximately $11 million (Koester, 1997). Currently, the estimated cost for the agricultural portion of the TMDL is approximately $16 million. This estimate is based on the proposed treatment unit amounts in Table 18 and then applied to BMP cost-share lists (NRCS, 2004). This figure was derived by summing the implementation, administrative, and technical costs for each watershed or subwatershed shown in Table 20. Sources of available assistance are listed in Table 22.

Table 20. Estimated Cost for TMDL Agricultural BMPs in the Blackfoot River Subbasin

Watershed or Subwatershed	Tier 1 Riparian Cost	Tier 2 Crop/Pasture Cost	Tier 3 Range/Forest Cost	Tier 4 Animal Facilities Cost	Watershed or Subwatershed Total Cost
Wolverine Creek	$520,100	$452,100	$502,800	$138,500	$1,613,500
Lower Blackfoot	$895,700	$870,400	$100,700	$173,100	$2,039,900
Brush Creek	$90,900	$31,700	$478,100	$69,300	$670,000
Middle Blackfoot	$129,500	$269,200	$1,441,400	$242,400	$2,082,500
Meadow Creek	$146,700	$86,000	$1,307,300	$69,300	$1,609,300
Lanes Creek	$349,800	$101,700	$1,307,300	$103,900	$1,862,700
Upper Blackfoot	$142,600	$482,600	$1,072,600	$519,500	$2,217,300
Slug Creek	$79,900	$178,900	$435,800	$33,900	$728,500
Diamond Creek	$58,700	$0	$112,800	$69,300	$240,800
BMP Subtotal	**$2,413,900**	**$2,472,600**	**$6,758,800**	**$1,419,200**	**$13,064,500**
Administration & Technical (20% of BMPs)	$482,800	$494,500	$1,351,800	$283,400	$2,612,900
Subbasin Total	**$2,896,700**	**$2,967,100**	**$8,110,600**	**$1,702,600**	**$15,677,400**

Implementation Alternatives

Implementation alternatives were developed that focused on the identified treatment units. The following alternatives were developed for consideration:

1. No action
2. Land treatment with structural and management BMPs
3. Riparian and stream channel restoration
4. Animal facility waste management

Description of Alternatives

Alternative 1 - No action

This alternative continues the existing conservation programs without additional project activities or voluntary landowner participation. The identified problems would continue to negatively impact beneficial uses in the subbasin and the Blackfoot River.

Alternative 2 - Land treatment with BMPs on crop, pasture & range lands

This alternative would reduce accelerated sheet and rill, gully, and irrigation-induced soil erosion. It would also reduce nutrient runoff from animal waste and fertilizer applications. This will improve water quality and reduce pollutant loading to the Blackfoot River. Beneficial uses would be sustained or improved with implementation of this alternative. This alternative includes voluntary participation.

Alternative 3 - Riparian and stream channel restoration

This alternative would reduce accelerated streambank and channel erosion. It would also reduce nutrient runoff from animal waste and fertilizer applications. This alternative would improve water quality, riparian vegetation, aquatic habitat, and fish passage and reduce pollutant loading to the Blackfoot River. Beneficial uses would be improved with implementation of this alternative. This alternative includes voluntary participation.

Alternative 4 - Animal facility waste management

This alternative would reduce sediment, nutrients, and bacteria from animal waste storage and application areas. This will improve water quality and reduce pollutant loading to the Blackfoot River. Beneficial uses will be sustained or improved with implementation of this alternative. This alternative includes voluntary and mandatory participation.

Alternative Selection

The CBSWCD, NBSWCD, and CSCD selected alternatives that combined Alternatives #, #, and # for the subbasin. These alternatives meet the objectives set forth in their resource conservation plans by improving water quality in the Blackfoot River. The timeline for implementation, shown in Table 21, can only occur if all actions are fully funded and all residents, landowners, and operators participate.

Table 21. Estimated Timeline for TMDL Agricultural Implementation

Task	Output	Milestone
Evaluate the project areas	Assessment reports	2008
Develop conservation plans and contracts	Completed plans and contracts	2010
Finalize BMP designs	Completed BMP plans and designs	2012
Design and install approved BMPs	Certify BMP installations	2015
Track BMP installations	Implementation progress reports	2017
Evaluate BMP & project effectiveness	Complete project effectiveness reports	2020

Table 22. Sources of Technical and Financial Assistance in the Blackfoot River Subbasin

Funding Program	Acronym	Agency
Water Quality Program for Agriculture	WQPA	ISCC
Resource Conservation & Development	RC&D	NRCS
Emergency Watershed Protection Program	EWP	NRCS
Small Watershed and Flood Prevention Program	PL-566	NRCS
Cooperative River Basin Studies Program	CRBS	NRCS
Rural Clean Water Program	RCWP	NRCS
Food Security Act of 1985	FSA	NRCS
Food, Agricultural, Conservation and Trade Act of 1990	FACTA	NRCS
Section 319 Nonpoint Source Management Program Grants	319	IDEQ
Resource Conservation and Rangeland Development Program	RCRDP	ISCC
Grazing Lands Conservation Initiative	GLCI	NRCS
Natural Resource Conservation Credit	--	ISCC
Environmental Quality Incentives Program	EQIP	NRCS
Soil and Water Conservation Assistance Program	SWCA	NRCS
FWS Partners Program	--	USFWS
Columbia Basin Fish and Wildlife Program	CBFWP	CBFWA
Conservation Reserve Program	CRP	FSA
Continuous Sign-Up Conservation Reserve Program	CCRP	FSA
Wetland Reserve Program	WRP	NRCS
Wildlife Habitat Incentives Program	WHIP	NRCS
Habitat Improvement Program	HIP	IDFG
State Revolving Fund	SRF	IDEQ &ISCC
Conservation Security Program	CSP	NRCS
Grasslands Reserve Program	GRP	FSA
Conservation Reserve Enhancement Program	CREP	FSA
Emergency Conservation Program	ECP	FSA
National Fish and Wildlife Foundation Grants Program	NFWFGP	NFWF
Fisheries Restoration and Irrigation Mitigation Program	FRIMA	USFWS
Water Conservation Field Services Program	WCFSP	BOR
Conservation of Private Grazing Land	CPGL	NRCS
Conservation Technical Assistance	CTA	NRCS
Farmland Protection Program	FPP	NRCS
Forestry Incentives Program	FIP	NRCS & FS
Aberdeen, Idaho Plant Materials Center	PMC	NRCS
National Cooperative Soil Survey Program	NCSS	NRCS
Stewardship Incentive Program	SIP	FS
Nutrient Management Program	NMP	ISDA
Floodplain Management Services Program	FPMS	USACE
Continuing Authorities Program, Sections 206 & 1135	CAP	USACE
Idaho Water Resource Board Financial Program	--	IDWR
Idaho Fish Screening & Passage Program	--	IDFG

Nonpoint Source Pollution Control Efforts

The Blackfoot River Watershed Council (BRWC), Caribou, North and Central Bingham conservation districts have held several public tours, meetings, workshops, and mini-courses to learn more about resource issues, TMDL inventories, conservation projects, and conservation programs.

The BRWC and its members are very active in the watershed. They cooperate with landowners, residents, government agencies, tribes, consultants, engineers, and schools. Charlotte Reid, BRWC provided the information on projects implemented since the council began working in the watershed (Reid, 2004).

They're most ambitious project was along the lower Blackfoot River above Rich Lane Bridge. The river bank is comprised of Blackfoot silt loam, about four feet deep with very fine sand and heavy clay layers. High river flows washed about eight feet of the bank away. Volunteers installed steel pilings with welded rebar and cable between them. They then tied cedar trees to the rebar and cable. Volunteers planted willow cuttings on the top and bottom of the bank. This effort reduced streambank erosion. The council monitors the project and noticed the trees didn't collect the expected amount of sediment. They think its because anchors weren't used on the trees and they fluctuate with river flows.

In the 1990s, a downcut on Wolverine Creek was blocking fish passage. Folks living upstream were concerned and asked the BRWC for assistance. After looking into several possibilities, a restoration company suggested the best alternative. The landowner paid for the company's restoration work. A series of pools made from native rock was built. Riparian shrubs were planted by volunteers. The project's total cost was less than $10,000 and was a great success.

The council helped fence riparian areas, install water gaps, and plant willows/dogwoods on an eroding river. They observed the project and found beavers were eating the plantings. So, Russian olive trees were cut down and placed over the planted cuttings thus discouraging the beavers. The tree revetments also captured sediment along the bank and more cuttings were planted.

They have found that Coyote willow cuttings are the most successful. Additionally, Elderberry roots have survived and grown. Dogwood cuttings have grown. Golden currant root balls were planted and survived. Red Western river birch rooted plants haven't survived. They recognized livestock won't linger on a streambank if they are crowded and will move away after watering.

Another project transplanted beaver into Jones Creek. Streambanks were beginning to heal but the beavers were becoming a nuisance to the neighbors and damaging landscape trees. Consequently, the beavers were trapped or shot. The BRWC hopes to try again, making the neighbors aware of their goal and prevent the beaver from damaging the trees.

Eastern Idaho Grazing Association move livestock daily and weekly through the range to improve upland and riparian areas. Annual vegetation monitoring shows improvement with this effort. Many monitoring points are established on streams and uplands to show management results. A CRP field was intensively grazed using portable fence and moving cattle closely across the field to improve resources. Grazing associations in the Blackfoot Mountains are fencing more rotational grazing while paying attention to streams and grazing pressure. Many ranchers are more aware of riparian health and feed cattle away from the stream. Chesterfield and Idaho Citizens associations are also monitoring streambanks.

BRWC mini-courses began in 2004. Numerous Bingham County High School students, landowners, and residents attended: macro invertebrate sampling and identification; riparian plants identification; streambank planting techniques; stream and riparian assessment; livestock herding; range land monitoring; and biological control of weeds.

TMDL Implementation Monitoring

Our goal is to evaluate the impact of crop, pasture, and range lands on the Blackfoot River and its tributaries. Water quality and discharge measurements collected are used to identify streams exceeding standards and to determine contributing areas of pollutant loading. This information was used to locate areas where BMPs should be implemented to reduce sediment and nutrient loads.

BMP Effectiveness

Monitoring provides evidence of changes in water quality and beneficial use status. BMP effectiveness monitoring is part of the conservation planning process. Assessment of a BMP's effectiveness involves three types of monitoring: evaluation of onsite practices; monitor pollutant source and transport; and evaluation of beneficial use status and water quality (RPU, 2003). Many methods evaluate resource condition before and after BMP implementation. Prior to implementation, resources are inventoried and their condition is assessed with specific tools.

RUSLE and SISL are used to predict sheet and rill erosion on non-irrigated and irrigated lands. The Alutin method, Imhoff Cones, and direct volume measurements are used to measure sheet and rill, irrigation-induced, and gully erosion. SVAP and SECI are used to assess aquatic habitat and streambank erosion, and lateral recession rates. Idaho OnePlan, CAFO/AFO assessment worksheet, and IDAWM are used to evaluate livestock waste, feeding, storage, and application areas. Water Quality Indicators Guide is utilized to assess nitrogen, phosphorus, sediment, and bacteria contamination from agricultural land.

These same methods determine BMP effectiveness and pollutant reductions. BMP effectiveness monitoring, evaluation worksheets, and project tracking will be completed by IASCD, ISCC, and ISDA.

Water Quality

IASCD and ISDA have recently completed a water quality monitoring project on the Blackfoot River and its tributaries. Twelve sites were monitored from 2000 to 2002. Four sites were on the river below Blackfoot Reservoir and eight sites were on tributaries to the Blackfoot River. Sampling occurred twice a month from April to October and monthly from November to March.

Water quality samples were collected using a depth integrated sampler when water depths were greater than one foot, otherwise grab samples were taken. Samples were analyzed for suspended solids, total phosphorus, orthophosphorus, nitrogen, fecal coliform bacteria, and *E. coli* bacteria. At each site, dissolved oxygen, specific conductance, pH, temperature, and total dissolved solids were measured.

The data can be compared to future data collected at these sites. Monitoring will be conducted to track changes in water quality of the river and its tributaries. This will occur after BMP implementation projects are completed in the subbasin or its watersheds. Monitoring will occur at the previously sampled sites for direct comparison of results over time.

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APPENDIX A

Idaho Soil Conservation Commission

Stream and Riparian Assessment Data

Table A-1. Riparian Reach and Site Summary in the Blackfoot Subbasin

Stream	Reach-Site	Reach Length (miles)	Site Length (feet)	Bank Stability	Sand -Silt	Site Type	PFC	SECI	ER (t/yr)	Rosgen Type
Angus Creek	AC1-1	0.4	31	100%	20%	RN	PFC	Slight	0	E4
Angus Creek	AC1-2	0.4	50	80%	10%	RF	PFC	Slight	0	E4
Angus Creek	AC1-3	0.4	37	75%	25%	PL	PFC	Slight	0	E4
Blackfoot River	BR-C1	1.6	--	90%	30%	--	PFC	Slight	95%	B
Blackfoot River	BR-C1	1.6	--	90%	30%	--	PFC	Severe	5%	B
Blackfoot River	BR-C2	1.3	--	70%	90%	RF	FAR	Slight	60%	C3
Blackfoot River	BR-C2	1.3	--	70%	90%	RF	FAR	Severe	40%	C3
Blackfoot River	BR-C3	0.9	--	35%	35%	--	FAR	Slight	50%	B3
Blackfoot River	BR-C3	0.9	--	35%	35%	--	FAR	Severe	50%	B3
Blackfoot River	BR-R1	1.9	--	25%	95%	--	N	Severe	50%	B3
Blackfoot River	BR-P1	3.7	--	35%	95%	--	N	Severe	50%	C5/C6
Blackfoot River	BR-P1	3.7	--	35%	95%	--	N	Slight	40%	C5/C6
Blackfoot River	BR-P1	3.7	--	35%	95%	--	N	Moderate	10%	C5/C6
Blackfoot River	BR-J1	2.1	--	50%	99%	--	N	--	--	F5
Brush Creek	BC10-1	1.0	7,593	90%	50%	RF	PFC	Moderate	82	C5
Brush Creek	BC11-1	1.7	13,772	97%	100%	BC	PFC	Moderate	108	E5
Brush Creek	BC4-1	1.3	9,017	10%	50%	RF	FAR	Severe	390	E5
Brush Creek	BC6-1	0.6	5,558	25%	80%	RF	FAR	Moderate	295	E6
Brush Creek	BC7-1	1.3	9,489	20%	86%	RF	FAR	Severe	675	B6
Corral Creek	C1-1	0.8	55	100%	10%	RN	PFC	--	--	C2
Corral Creek	C1-2	0.8	60	100%	20%	RF	PFC	--	--	C
Corral Creek	C10-1	0.8	--	95%	80%	GD	PFC	--	--	E
Corral Creek	C11-1	1.4	--	95%	65%	GD	PFC	--	--	E
Corral Creek	C12-1	1.2	--	100%	60%	GD	PFC	--	--	E
Corral Creek	C12-2	1.2	--	100%	50%	GD	PFC	--	--	E
Corral Creek	C12b-1	0.5	--	90%	70%	GD	FAR	--	--	E
Corral Creek	C12b-2	0.5	--	100%	80%	GD	FAR	--	--	E
Corral Creek	C1b-1	0.7	60	65%	25%	RF	FAR	--	--	G
Corral Creek	C1b-2	0.7	120	15%	75%	RN	FAR	--	--	F
Corral Creek	C2-1	0.9	--	85%	70%	GD	FAR	--	--	C
Corral Creek	C2-2	0.9	90	80%	70%	PL	FAR	--	--	C
Corral Creek	C2-3	0.9	--	65%	80%	GD	FAR	--	--	C
Corral Creek	C3-1	1.1	--	50%	100%	GD	PFC	--	--	F6
Corral Creek	C3-2	1.1	--	60%	70%	GD	PFC	--	--	F6
Corral Creek	C3-3	1.1	--	40%	70%	GD	PFC	--	--	F6
Corral Creek	C4-1	0.5	--	50%	75%	GD	PFC	--	--	C
Corral Creek	C4-2	0.5	--	75%	75%	GD	PFC	--	--	C
Corral Creek	C5-1	1.3	--	90%	70%	GD	PFC	--	--	C
Corral Creek	C5-2	1.3	--	100%	40%	GD	PFC	--	--	C
Corral Creek	C6-1	1.2	--	80%	80%	GD	FAR	--	--	C
Corral Creek	C6-2	1.2	--	30%	70%	GD	FAR	--	--	C
Corral Creek	C7-1	1.3	--	100%	40%	GD	FAR	--	--	E
Corral Creek	C7-2	1.3	--	95%	80%	GD	FAR	--	--	E
Corral Creek	C8-1	2.6	--	100%	100%	GD	PFC	--	--	E
Corral Creek	C8-2	2.6	--	100%	95%	--	PFC	--	--	E
Corral Creek	C9-1	0.8	--	100%	100%	GD	PFC	--	--	C
Diamond Creek	DC1-1	1.6	100	30%	40%	RN	--	--	--	E4
Diamond Creek	DC1-2	1.6	44	50%	100%	PL	--	--	--	E4
Diamond Creek	DC1-3	1.6	43	80%	30%	RN	--	--	--	E4
Diamond Creek	DC2-1	2.6	14	75%	35%	RF	--	--	--	F/B3
Diamond Creek	DC2-2	2.6	23	50%	90%	PL	--	--	--	F/B3
Diamond Creek	DC2-2	2.6	31	80%	30%	RF	--	--	--	F/B3
Diamond Creek	DC3-1	2.1	60	70%	25%	RN	--	--	--	B3
Diamond Creek	DC4-1	2.9	31	70%	100%	RF	PFC	Slight	106	C4
Diamond Creek	DC4-2	2.9	54	70%	20%	PL	PFC	Slight	106	C4
Diamond Creek	DC4-3	2.9	46	75%	20%	RF	PFC	Slight	106	C4
Diamond Creek	DC4-4	2.9	67	55%	20%	PL	PFC	Slight	106	C4
Diamond Creek	DC4-5	2.9	52	60%	20%	RF	PFC	Slight	106	C4
Diamond Creek	DC4-6	2.9	61	55%	--	PL	PFC	Slight	106	C4
Diamond Creek	DC4-7	2.9	--	100%	0%	BC	PFC	Slight	6	C4
Diamond Creek	DC5-1	1.7	19	100%	20%	RF	PFC	Slight	88	C4

Stream	Reach-Site	Reach Length (miles)	Site Length (feet)	Bank Stability	Sand -Silt	Site Type	PFC	SECI	ER (t/yr)	Rosgen Type
Diamond Creek	DC5-2	1.7	39	100%	100%	RN	PFC	Slight	88	C4
Diamond Creek	DC5-3	1.7	27	100%	25%	RF	PFC	Slight	88	C4
Diamond Creek	DC5-4	1.7	20	100%	25%	PL	PFC	Slight	88	C4
Diamond Creek	DC5-5	1.7	45	80%	25%	RN	PFC	Slight	88	C4
Diamond Creek	DC5-6	1.7	27	100%	50%	PL	PFC	Slight	88	C4
Diamond Creek	DC5-7	1.7	37	65%	10%	RF	PFC	Slight	88	C4
Diamond Creek	DC6.1-1	1.2	20	100%	10%	RF	PFC	Slight	6	B3
Diamond Creek	DC6.1-2	1.2	47	50%	10%	RN	PFC	Slight	6	C4
Diamond Creek	DC6.1-3	1.2	18	95%	10%	PL	PFC	Slight	6	C4
Diamond Creek	DC6.1-4	1.2	63	90%	15%	RN	PFC	Slight	6	B3
Diamond Creek	DC6.1-5	1.2	43	85%	10%	RF	PFC	Slight	6	B3
Diamond Creek	DC6.1-6	1.2	46	75%	10%	RN	PFC	Slight	6	C4
Diamond Creek	DC6.1-7	1.2	29	50%	20%	PL	PFC	Slight	6	C4
Diamond Creek	DC6.2-1	1.2	100	100%	10%	RF	PFC	Slight	18	C4
Diamond Creek	DC6.2-2	1.2	59	90%	10%	RN	PFC	Slight	18	C4
Diamond Creek	DC6.2-3	1.2	26	80%	20%	PL	PFC	Slight	18	C4
Diamond Creek	DC6.2-4	1.2	70	100%	10%	RN	PFC	Slight	18	B3
Diamond Creek	DC7-1	0.3	261	70%	15%	GD	N	Severe	11	G
Diamond Creek	DC7-2	0.9	--	25%	10%	RN	N	Severe	639	G
Diamond Creek	DC7-3	0.9	--	--	30%	RN	N	Slight	5	C
Diamond Creek	DC8.1-1	1.2	27	100%	40%	PL	FAR	Slight	0	B4
Diamond Creek	DC8.1-2	1.2	22	100%	10%	RF	FAR	Slight	0	B4
Diamond Creek	DC8.1-3	1.2	40	95%	40%	PL	FAR	Slight	0	C4
Diamond Creek	DC8.2-1	0.5	18	80%	55%	GD	FAR	Moderate	34	C5
Diamond Creek	DC8.2-2	0.5	25	100%	20%	PL	FAR	Moderate	34	C4
Diamond Creek	DC9-1	1.4	15	25%	50%	PL	--	Moderate	94	--
Diamond Creek	DC9-2	1.4	5	--	--	RF	--	Slight	5	--
Diamond Creek	DC9-3	1.4	55	80%	65%	PL	--	--	--	--
Diamond Creek	DC9-4	1.4	30	70%	15%	RF	--	--	--	--
Diamond Creek	DC9-5	1.4	20	30%	50%	RN	--	--	--	--
Diamond Creek	DC9-6	1.4	93	95%	5%	RF	--	--	--	--
Dry Valley Creek	DVC1-1	2.0	638	100%	1%	RN	N	Moderate	164	--
Dry Valley Creek	DVC2-1	0.5	2,587	100%	60%	GD	PFC	Slight	3	E
Dry Valley Creek	DVC3-1	3.3	7,681	50%	60%	RN	FAR	Moderate	345	--
Dry Valley Creek	DVC3-1	4.3	11,522	--	--	RN	FAR	Slight	0	--
Dry Valley Creek	DVC4-1	1.9	755	100%	100%	GD	FAR	Moderate	34	C6
Dry Valley Creek	DVC4-2	1.9	6,795	70%	65%	RN	FAR	Slight	0	E
Dry Valley Creek	DVC5-1	0.8	4,636	100%	100%	GD	PFC	Slight	0	E
Dry Valley Creek	DVC5-2	0.8	--	100%	--	BC	PFC	Slight	0	E
Dry Valley Creek	DVC6-1	0.9	1,972	85%	0%	RF	FAR	Moderate	38	C4
Dry Valley Creek	DVC6-2	0.9	1,972	95%	50%	RN	FAR	Slight	0	C4
Dry Valley Creek	DVC6-3	0.9	--	100%	0%	RF	FAR	Slight	0	C4
Dry Valley Creek	DVC7-1	0.5	2,883	100%	0%	RN	PFC	Slight	3	B6
Horse Creek	H1-1	0.1	1,093	50%	50%	RN	N	--	--	F/G5
Horse Creek	H2-1	0.3	408	35%	20%	RN	FAR	--	--	--
Horse Creek	H3-1	0.1	304	100%	0%	RN	BC	--	--	B2
Horse Creek	H4-1	0.1	626	100%	0%	BC	BC	--	--	--
Horse Creek	H5-1	0.5	2,772	60%	65%	RF	FAR	--	--	C
Horse Creek	H6-1	0.5	2,566	100%	0%	BC	FAR	--	--	--
Horse Creek	H7-1	0.6	--	80%	70%	RN	FAR	--	--	C6
Horse Creek	H7-2	0.6	--	60%	80%	GD	FAR	--	--	C6
Lanes Creek	LC 7.1-1	0.5	60	80%	33%	RN	PFC	Slight	1	C3
Lanes Creek	LC 7.1-2	0.5	45	100%	15%	RF	PFC	Severe	9	C3
Lanes Creek	LC 7.2-1	1.3	50	50%	70%	PL	N	Slight	2	C3
Lanes Creek	LC 7.2-2	1.3	150	80%	40%	GD	N	Severe	131	C3
Lanes Creek	LC 7.2-3	1.3	150	50%	75%	RN	N	Slight	0	C4
Lanes Creek	LC 8.1-1	0.3	65	100%	30%	RF	PFC	Slight	0	C4
Lanes Creek	LC 8.1-2	0.3	70	100%	30%	RN	PFC	Slight	0	C4
Lanes Creek	LC 8.1-3	0.3	65	100%	50%	PL	PFC	Slight	0	C4
Lanes Creek	LC 8.1-4	0.3	105	100%	15%	RN	PFC	Slight	0	C4
Lanes Creek	LC 8.2-1	0.2	293	30%	30%	RN	FAR	Slight	0	C4
Lanes Creek	LC 8.2-1	0.2	683	--	--	RN	N	Severe	56	C4

Stream	Reach-Site	Reach Length (miles)	Site Length (feet)	Bank Stability	Sand -Silt	Site Type	PFC	SECI	ER (t/yr)	Rosgen Type
Lanes Creek	LC 8.3-1	1.3	200	100%	20%	GD	PFC	Slight	55	C4
Lanes Creek	LC 8.3-2	1.3	200	85%	25%	RN	PFC	Slight	11	C4
Lanes Creek	LC4-1	0.8	18	100%	20%	RF	FAR	Moderate	40	--
Lanes Creek	LC4-2	0.8	90	50%	33%	PL	FAR	Slight	1	--
Lanes Creek	LC4-3	0.8	150	85%	20%	RN	FAR	Slight	1	--
Lanes Creek	LC4-4	0.8	26	80%	20%	RF	FAR	Slight	1	--
Lanes Creek	LC5-1	0.7	76	90%	2%	RF	FAR	Slight	26	B
Lanes Creek	LC5-2	0.7	125	95%	0%	RN	FAR	Slight	26	C
Lanes Creek	LC5-3	0.7	200	100%	0%	RF	FAR	Moderate	15	C
Lanes Creek	LC6-1	1.2	500	40%	10%	GD	N	Severe	147	C4
Lanes Creek	LC6-1	1.2	200	--	--	GD	N	Slight	0	C4
Maybe Creek	MC3-1	0.8	20	90%	0%	RF	PFC	--	--	B2
Maybe Creek	MC3-2	0.8	14	75%	10%	RN	PFC	--	--	B2
Maybe Creek	MC3-3	0.8	100	90%	0%	RF	PFC	--	--	B2
Poison Creek	P1-1	0.3	20	100%	10%	PL	PFC	--	--	A3
Poison Creek	P1-2	0.3	5	100%	0%	RF	PFC	--	--	A3
Poison Creek	P1-3	0.3	14	70%	20%	RN	PFC	--	--	A3
Poison Creek	P1-4	0.3	3	70%	10%	RF	PFC	--	--	A3
Poison Creek	P1-5	0.3	18	90%	20%	PL	PFC	--	--	A3
Poison Creek	P2-1	0.4	40	50%	40%	PL	FAR	--	--	B2
Poison Creek	P2-2	0.4	18	100%	10%	RF	FAR	--	--	B2
Poison Creek	P2-3	0.4	21	90%	60%	PL	FAR	--	--	B2
Poison Creek	P3-1	0.8	--	80%	60%	BC	PFC	--	--	BC
Poison Creek	P4-1	1.3	--	100%	0%	BC	PFC	--	--	A2/BC
Poison Creek	P5-1	0.6	--	100%	100%	BC	PFC	--	--	E6/B2
Rawlins Creek	RC1-1	1.0	--	100%	50%	RN	FAR	--	--	B5
Rawlins Creek	RC1-2	1.0	--	90%	30%	RN	FAR	--	--	B5
Rawlins Creek	RC2a-1	0.9	25	100%	50%	PL	FAR	--	--	C4
Rawlins Creek	RC2a-2	0.9	24	90%	40%	PL	FAR	--	--	C4
Rawlins Creek	RC2b-1	0.5	27	60%	5%	RN	FAR	--	--	C4
Rawlins Creek	RC2B-2	0.5	45	80%	--	PL	FAR			C4
Slug Creek	S1-1	0.8	3,938	100%	100%	RN	PFC	Slight		E6
Slug Creek	S1-2	0.8	--	90%	100%	GD	PFC	Slight		E6
Slug Creek	S1-3	0.8	--	100%	100%	GD	PFC	Slight		E6
Slug Creek	S2-1	0.9	202	100%	100%	RN	PFC	Moderate	2	E6
Slug Creek	S2-2	0.9	3,837	100%	100%	GD	PFC	Slight	4	E6
Wolverine Creek	W1-1	0.6	48	95%	40%	PL	FAR	--	--	B5
Wolverine Creek	W1-2	0.6	68	50%	7%	RN	FAR	--	--	B5
Wolverine Creek	W10-1	1.7	11	60%	80%	PL	N	--	--	A3
Wolverine Creek	W10-2	1.7	14	60%	25%	RN	N	--	--	G
Wolverine Creek	W3-1	0.6	70	30%	17%	RN	N	--	--	C5
Wolverine Creek	W4-1	1.1	29	100%	10%	PL	N	--	--	G
Wolverine Creek	W4-2	1.1	43	80%	15%	RN	N	--	--	G
Wolverine Creek	W5-1	0.4	60	100%	25%	RN	PFC	--	--	C5
Wolverine Creek	W6-1	0.5	21	90%	20%	RN	PFC	--	--	B4
Wolverine Creek	W6-2	0.5	5	100%	10%	RF	PFC	--	--	B4
Wolverine Creek	W6-3	0.5	13	100%	20%	PL	PFC	--	--	B4
Wolverine Creek	W7-1	2.0	30	50%	25%	RN	N	--	--	G
Wolverine Creek	W8-1	1.4	14	15%	40%	PL	N	--	--	B4
Wolverine Creek	W8-2	1.4	30	50%	25%	RN	N	--	--	B4
Wolverine Creek	W9-1	1.4	8	50%	10%	RF	FAR	--	--	B
Wolverine Creek	W9-2	1.4	16	50%	15%	RN	FAR	--	--	B
Wolverine Creek	W9-3	1.4	12	50%	65%	PL	FAR	--	--	B
Angus Creek	AC1-1	0.4	31	100%	20%	RN	PFC	Slight	0	E4
Angus Creek	AC1-2	0.4	50	80%	10%	RF	PFC	Slight	0	E4
Angus Creek	AC1-3	0.4	37	75%	25%	PL	PFC	Slight	0	E4
Blackfoot River	BR-C1	1.6	--	90%	30%	--	PFC	Slight	95%	B
Blackfoot River	BR-C1	1.6	--	90%	30%	--	PFC	Severe	5%	B
Blackfoot River	BR-C2	1.3	--	70%	90%	RF	FAR	Slight	60%	C3
Blackfoot River	BR-C2	1.3	--	70%	90%	RF	FAR	Severe	40%	C3
Blackfoot River	BR-C3	0.9	--	35%	35%	--	FAR	Slight	50%	B3
Blackfoot River	BR-C3	0.9	--	35%	35%	--	FAR	Severe	50%	B3

Stream	Reach-Site	Reach Length (miles)	Site Length (feet)	Bank Stability	Sand -Silt	Site Type	PFC	SECI	ER (t/yr)	Rosgen Type
Blackfoot River	BR-R1	1.9	--	25%	95%	--	N	Severe	50%	B3
Blackfoot River	BR-P1	3.7	--	35%	95%	--	N	Severe	50%	C5/C6
Blackfoot River	BR-P1	3.7	--	35%	95%	--	N	Slight	40%	C5/C6
Blackfoot River	BR-P1	3.7	--	35%	95%	--	N	Moderate	10%	C5/C6
Blackfoot River	BR-J1	2.1	--	50%	99%	--	N	--	--	F5
Brush Creek	BC10-1	1.0	7,593	90%	50%	RF	PFC	Moderate	82	C5
Brush Creek	BC11-1	1.7	13,772	97%	100%	BC	PFC	Moderate	108	E5
Brush Creek	BC4-1	1.3	9,017	10%	50%	RF	FAR	Severe	390	E5
Brush Creek	BC6-1	0.6	5,558	25%	80%	RF	FAR	Moderate	295	E6
Brush Creek	BC7-1	1.3	9,489	20%	86%	RF	FAR	Severe	675	B6
Corral Creek	C1-1	0.8	55	100%	10%	RN	PFC	--	--	C2
Corral Creek	C1-2	0.8	60	100%	20%	RF	PFC	--	--	C
Corral Creek	C10-1	0.8	--	95%	80%	GD	PFC	--	--	E
Corral Creek	C11-1	1.4	--	95%	65%	GD	PFC	--	--	E
Corral Creek	C12-1	1.2	--	100%	60%	GD	PFC	--	--	E
Corral Creek	C12-2	1.2	--	100%	50%	GD	PFC	--	--	E
Corral Creek	C12b-1	0.5	--	90%	70%	GD	FAR	--	--	E
Corral Creek	C12b-2	0.5	--	100%	80%	GD	FAR	--	--	E
Corral Creek	C1b-1	0.7	60	65%	25%	RF	FAR	--	--	G
Corral Creek	C1b-2	0.7	120	15%	75%	RN	FAR	--	--	F
Corral Creek	C2-1	0.9	--	85%	70%	GD	FAR	--	--	C
Corral Creek	C2-2	0.9	90	80%	70%	PL	FAR	--	--	C
Corral Creek	C2-3	0.9	--	65%	80%	GD	FAR	--	--	C
Corral Creek	C3-1	1.1	--	50%	100%	GD	PFC	--	--	F6
Corral Creek	C3-2	1.1	--	60%	70%	GD	PFC	--	--	F6
Corral Creek	C3-3	1.1	--	40%	70%	GD	PFC	--	--	F6
Corral Creek	C4-1	0.5	--	50%	75%	GD	PFC	--	--	C
Corral Creek	C4-2	0.5	--	75%	75%	GD	PFC	--	--	C
Corral Creek	C5-1	1.3	--	90%	70%	GD	PFC	--	--	C
Corral Creek	C5-2	1.3	--	100%	40%	GD	PFC	--	--	C
Corral Creek	C6-1	1.2	--	80%	80%	GD	FAR	--	--	C
Corral Creek	C6-2	1.2	--	30%	70%	GD	FAR	--	--	C
Corral Creek	C7-1	1.3	--	100%	40%	GD	FAR	--	--	E
Corral Creek	C7-2	1.3	--	95%	80%	GD	FAR	--	--	E
Corral Creek	C8-1	2.6	--	100%	100%	GD	PFC	--	--	E
Corral Creek	C8-2	2.6	--	100%	95%	--	PFC	--	--	E
Corral Creek	C9-1	0.8	--	100%	100%	GD	PFC	--	--	C
Diamond Creek	DC1-1	1.6	100	30%	40%	RN	--	--	--	E4
Diamond Creek	DC1-2	1.6	44	50%	100%	PL	--	--	--	E4
Diamond Creek	DC1-3	1.6	43	80%	30%	RN	--	--	--	E4
Diamond Creek	DC2-1	2.6	14	75%	35%	RF	--	--	--	F/B3
Diamond Creek	DC2-2	2.6	23	50%	90%	PL	--	--	--	F/B3
Diamond Creek	DC2-2	2.6	31	80%	30%	RF	--	--	--	F/B3
Diamond Creek	DC3-1	2.1	60	70%	25%	RN	--	--	--	B3
Diamond Creek	DC4-1	2.9	31	70%	100%	RF	PFC	Slight	106	C4
Diamond Creek	DC4-2	2.9	54	70%	20%	PL	PFC	Slight	106	C4
Diamond Creek	DC4-3	2.9	46	75%	20%	RF	PFC	Slight	106	C4
Diamond Creek	DC4-4	2.9	67	55%	20%	PL	PFC	Slight	106	C4
Diamond Creek	DC4-5	2.9	52	60%	20%	RF	PFC	Slight	106	C4
Diamond Creek	DC4-6	2.9	61	55%	--	PL	PFC	Slight	106	C4
Diamond Creek	DC4-7	2.9	--	100%	0%	BC	PFC	Slight	6	C4
Diamond Creek	DC5-1	1.7	19	100%	20%	RF	PFC	Slight	88	C4
Diamond Creek	DC5-2	1.7	39	100%	100%	RN	PFC	Slight	88	C4
Diamond Creek	DC5-3	1.7	27	100%	25%	RF	PFC	Slight	88	C4
Diamond Creek	DC5-4	1.7	20	100%	25%	PL	PFC	Slight	88	C4
Diamond Creek	DC5-5	1.7	45	80%	25%	RN	PFC	Slight	88	C4
Diamond Creek	DC5-6	1.7	27	100%	50%	PL	PFC	Slight	88	C4
Diamond Creek	DC5-7	1.7	37	65%	10%	RF	PFC	Slight	88	C4
Diamond Creek	DC6.1-1	1.2	20	100%	10%	RF	PFC	Slight	6	B3
Diamond Creek	DC6.1-2	1.2	47	50%	10%	RN	PFC	Slight	6	C4
Diamond Creek	DC6.1-3	1.2	18	95%	10%	PL	PFC	Slight	6	C4
Diamond Creek	DC6.1-4	1.2	63	90%	15%	RN	PFC	Slight	6	B3

Stream	Reach-Site	Reach Length (miles)	Site Length (feet)	Bank Stability	Sand -Silt	Site Type	PFC	SECI	ER (t/yr)	Rosgen Type
Diamond Creek	DC6.1-5	1.2	43	85%	10%	RF	PFC	Slight	6	B3
Diamond Creek	DC6.1-6	1.2	46	75%	10%	RN	PFC	Slight	6	C4
Diamond Creek	DC6.1-7	1.2	29	50%	20%	PL	PFC	Slight	6	C4
Diamond Creek	DC6.2-1	1.2	100	100%	10%	RF	PFC	Slight	18	C4
Diamond Creek	DC6.2-2	1.2	59	90%	10%	RN	PFC	Slight	18	C4
Diamond Creek	DC6.2-3	1.2	26	80%	20%	PL	PFC	Slight	18	C4
Diamond Creek	DC6.2-4	1.2	70	100%	10%	RN	PFC	Slight	18	B3
Diamond Creek	DC7-1	0.3	261	70%	15%	GD	N	Severe	11	G
Diamond Creek	DC7-2	0.9	--	25%	10%	RN	N	Severe	639	G
Diamond Creek	DC7-3	0.9	--	--	30%	RN	N	Slight	5	C
Diamond Creek	DC8.1-1	1.2	27	100%	40%	PL	FAR	Slight	0	B4
Diamond Creek	DC8.1-2	1.2	22	100%	10%	RF	FAR	Slight	0	B4
Diamond Creek	DC8.1-3	1.2	40	95%	40%	PL	FAR	Slight	0	C4
Diamond Creek	DC8.2-1	0.5	18	80%	55%	GD	FAR	Moderate	34	C5
Diamond Creek	DC8.2-2	0.5	25	100%	20%	PL	FAR	Moderate	34	C4
Diamond Creek	DC9-1	1.4	15	25%	50%	PL	--	Moderate	94	--
Diamond Creek	DC9-2	1.4	5	--	--	RF	--	Slight	5	--
Diamond Creek	DC9-3	1.4	55	80%	65%	PL	--	--	--	--
Diamond Creek	DC9-4	1.4	30	70%	15%	RF	--	--	--	--
Diamond Creek	DC9-5	1.4	20	30%	50%	RN	--	--	--	--
Diamond Creek	DC9-6	1.4	93	95%	5%	RF	--	--	--	--
Dry Valley Creek	DVC1-1	2.0	638	100%	1%	RN	N	Moderate	164	--
Dry Valley Creek	DVC2-1	0.5	2,587	100%	60%	GD	PFC	Slight	3	E
Dry Valley Creek	DVC3-1	3.3	7,681	50%	60%	RN	FAR	Moderate	345	--
Dry Valley Creek	DVC3-1	4.3	11,522	--	--	RN	FAR	Slight	0	--
Dry Valley Creek	DVC4-1	1.9	755	100%	100%	GD	FAR	Moderate	34	C6
Dry Valley Creek	DVC4-2	1.9	6,795	70%	65%	RN	FAR	Slight	0	E
Dry Valley Creek	DVC5-1	0.8	4,636	100%	100%	GD	PFC	Slight	0	E
Dry Valley Creek	DVC5-2	0.8	--	100%	--	BC	PFC	Slight	0	E
Dry Valley Creek	DVC6-1	0.9	1,972	85%	0%	RF	FAR	Moderate	38	C4
Dry Valley Creek	DVC6-2	0.9	1,972	95%	50%	RN	FAR	Slight	0	C4
Dry Valley Creek	DVC6-3	0.9	--	100%	0%	RF	FAR	Slight	0	C4
Dry Valley Creek	DVC7-1	0.5	2,883	100%	0%	RN	PFC	Slight	3	B6
Horse Creek	H1-1	0.1	1,093	50%	50%	RN	N	--	--	F/G5
Horse Creek	H2-1	0.3	408	35%	20%	RN	FAR	--	--	--
Horse Creek	H3-1	0.1	304	100%	0%	RN	BC	--	--	B2
Horse Creek	H4-1	0.1	626	100%	0%	BC	BC	--	--	--
Horse Creek	H5-1	0.5	2,772	60%	65%	RF	FAR	--	--	C
Horse Creek	H6-1	0.5	2,566	100%	0%	BC	FAR	--	--	--
Horse Creek	H7-1	0.6	--	80%	70%	RN	FAR	--	--	C6
Horse Creek	H7-2	0.6	--	60%	80%	GD	FAR	--	--	C6
Lanes Creek	LC 7.1-1	0.5	60	80%	33%	RN	PFC	Slight	1	C3
Lanes Creek	LC 7.1-2	0.5	45	100%	15%	RF	PFC	Severe	9	C3
Lanes Creek	LC 7.2-1	1.3	50	50%	70%	PL	N	Slight	2	C3
Lanes Creek	LC 7.2-2	1.3	150	80%	40%	GD	N	Severe	131	C3
Lanes Creek	LC 7.2-3	1.3	150	50%	75%	RN	N	Slight	0	C4
Lanes Creek	LC 8.1-1	0.3	65	100%	30%	RF	PFC	Slight	0	C4
Lanes Creek	LC 8.1-2	0.3	70	100%	30%	RN	PFC	Slight	0	C4
Lanes Creek	LC 8.1-3	0.3	65	100%	50%	PL	PFC	Slight	0	C4
Lanes Creek	LC 8.1-4	0.3	105	100%	15%	RN	PFC	Slight	0	C4
Lanes Creek	LC 8.2-1	0.2	293	30%	30%	RN	FAR	Slight	0	C4
Lanes Creek	LC 8.2-1	0.2	683	--	--	RN	N	Severe	56	C4
Lanes Creek	LC 8.3-1	1.3	200	100%	20%	GD	PFC	Slight	55	C4
Lanes Creek	LC 8.3-2	1.3	200	85%	25%	RN	PFC	Slight	11	C4
Lanes Creek	LC4-1	0.8	18	100%	20%	RF	FAR	Moderate	40	--
Lanes Creek	LC4-2	0.8	90	50%	33%	PL	FAR	Slight	1	--
Lanes Creek	LC4-3	0.8	150	85%	20%	RN	FAR	Slight	1	--
Lanes Creek	LC4-4	0.8	26	80%	20%	RF	FAR	Slight	1	--
Lanes Creek	LC5-1	0.7	76	90%	2%	RF	FAR	Slight	26	B
Lanes Creek	LC5-2	0.7	125	95%	0%	RN	FAR	Slight	26	C
Lanes Creek	LC5-3	0.7	200	100%	0%	RF	FAR	Moderate	15	C
Lanes Creek	LC6-1	1.2	500	40%	10%	GD	N	Severe	147	C4

Stream	Reach-Site	Reach Length (miles)	Site Length (feet)	Bank Stability	Sand -Silt	Site Type	PFC	SECI	ER (t/yr)	Rosgen Type
Lanes Creek	LC6-1	1.2	200	--	--	GD	N	Slight	0	C4
Maybe Creek	MC3-1	0.8	20	90%	0%	RF	PFC	--	--	B2
Maybe Creek	MC3-2	0.8	14	75%	10%	RN	PFC	--	--	B2
Maybe Creek	MC3-3	0.8	100	90%	0%	RF	PFC	--	--	B2
Poison Creek	P1-1	0.3	20	100%	10%	PL	PFC	--	--	A3
Poison Creek	P1-2	0.3	5	100%	0%	RF	PFC	--	--	A3
Poison Creek	P1-3	0.3	14	70%	20%	RN	PFC	--	--	A3
Poison Creek	P1-4	0.3	3	70%	10%	RF	PFC	--	--	A3
Poison Creek	P1-5	0.3	18	90%	20%	PL	PFC	--	--	A3
Poison Creek	P2-1	0.4	40	50%	40%	PL	FAR	--	--	B2
Poison Creek	P2-2	0.4	18	100%	10%	RF	FAR	--	--	B2
Poison Creek	P2-3	0.4	21	90%	60%	PL	FAR	--	--	B2
Poison Creek	P3-1	0.8	--	80%	60%	BC	PFC	--	--	BC
Poison Creek	P4-1	1.3	--	100%	0%	BC	PFC	--	--	A2/BC
Poison Creek	P5-1	0.6	--	100%	100%	BC	PFC	--	--	E6/B2
Rawlins Creek	RC1-1	1.0	--	100%	50%	RN	FAR	--	--	B5
Rawlins Creek	RC1-2	1.0	--	90%	30%	RN	FAR	--	--	B5
Rawlins Creek	RC2a-1	0.9	25	100%	50%	PL	FAR	--	--	C4
Rawlins Creek	RC2a-2	0.9	24	90%	40%	PL	FAR	--	--	C4
Rawlins Creek	RC2b-1	0.5	27	60%	5%	RN	FAR	--	--	C4
Rawlins Creek	RC2B-2	0.5	45	80%	--	PL	FAR			C4
Slug Creek	S1-1	0.8	3,938	100%	100%	RN	PFC	Slight		E6
Slug Creek	S1-2	0.8	--	90%	100%	GD	PFC	Slight		E6
Slug Creek	S1-3	0.8	--	100%	100%	GD	PFC	Slight		E6
Slug Creek	S2-1	0.9	202	100%	100%	RN	PFC	Moderate	2	E6
Slug Creek	S2-2	0.9	3,837	100%	100%	GD	PFC	Slight	4	E6
Wolverine Creek	W1-1	0.6	48	95%	40%	PL	FAR	--	--	B5
Wolverine Creek	W1-2	0.6	68	50%	7%	RN	FAR	--	--	B5
Wolverine Creek	W10-1	1.7	11	60%	80%	PL	N	--	--	A3
Wolverine Creek	W10-2	1.7	14	60%	25%	RN	N	--	--	G
Wolverine Creek	W3-1	0.6	70	30%	17%	RN	N	--	--	C5
Wolverine Creek	W4-1	1.1	29	100%	10%	PL	N	--	--	G
Wolverine Creek	W4-2	1.1	43	80%	15%	RN	N	--	--	G
Wolverine Creek	W5-1	0.4	60	100%	25%	RN	PFC	--	--	C5
Wolverine Creek	W6-1	0.5	21	90%	20%	RN	PFC	--	--	B4
Wolverine Creek	W6-2	0.5	5	100%	10%	RF	PFC	--	--	B4
Wolverine Creek	W6-3	0.5	13	100%	20%	PL	PFC	--	--	B4
Wolverine Creek	W7-1	2.0	30	50%	25%	RN	N	--	--	G
Wolverine Creek	W8-1	1.4	14	15%	40%	PL	N	--	--	B4
Wolverine Creek	W8-2	1.4	30	50%	25%	RN	N	--	--	B4
Wolverine Creek	W9-1	1.4	8	50%	10%	RF	FAR	--	--	B
Wolverine Creek	W9-2	1.4	16	50%	15%	RN	FAR	--	--	B
Wolverine Creek	W9-3	1.4	12	50%	65%	PL	FAR	--	--	B

APPENDIX B

Idaho Department of Lands

Agricultural Implementation Plan for State Lands

Goals and Objectives for Idaho Endowment Lands

To protect and enhance the quality of surface and ground water in the Blackfoot River sub-basin, the Idaho Department of Lands (IDL) is responsible for developing grazing management plans to meet State Water Quality Standards on impaired waterbodies. IDL is mandated by both the Idaho Constitution and Idaho Statute to manage Idaho endowment lands to maximize revenues to the beneficiary institutions in a manner consistent with sound long-term management practices based on land capabilities.

IDL authorizes livestock grazing in the Blackfoot River subbasin on approximately 127,000 acres of endowment lands by way of 44 grazing leases. These grazing leases are managed cooperatively with approximately 120,000 additional acres of private and federal lands segregated into 45 management planning units or allotments.

As part of the normal ten-year lease renewal cycle, IDL has completed Resource Assessments on endowment grazing leases within the sub-basin as shown in Table 1. IDL's Resource Assessment procedure includes completing Proper Functioning Condition Estimates for all perennial streams on a lease. Each lease will be re-assessed on a ten year cycle one year prior to grazing lease expiration. Based upon the findings of the Resource Assessments, IDL has developed, or will develop, grazing management plans for all endowment lands with a goal of achieving at least Proper Functioning Condition (PFC) status for all perennial streams. On a case-by-case basis, the grazing management plans will analyze alternatives for achieving habitat and water quality enhancements beyond PFC status. IDL will use the agricultural BMPs outlined elsewhere in this implementation plan to address non-point pollution issues. Grazing management plans will also include specific monitoring requirements to be completed by IDL or lessees to evaluate the effectiveness of prescribed component practices or BMPs in improving water quality.

Table 1. IDL Grazing Management Planning Units within the Blackfoot River Subbasin

Planning Unit Name	Total Unit Acres	Endowment Acres	Review History/Schedule (Endowment Land Only)
4/5 Caliber	2,804	1,650	Completed 2004/Re-assess 2013
Blackfoot River WMA	2,412	606	Completed 2001/Re-assess 2010
Brush Creek	16,513	5,873	Completed 2003/Re-assess 2012
Cedar Creek	5,866	3,491	Completed 2004/Re-assess 2013
Horse Creek	7,657	4,182	Completed 2003/Re-assess 2012
Corral Creek	13,134	11,136	Completed 2003/Re-assess 2012
Cranes Flat	785	100	Completed 2003/Re-assess 2012
Crooked Creek	9,606	4,470	Completed 2003/Re-assess 2012
Dry Valley	8,564	878	Completed 2001/Re-assess 2010
Dredge	189	162	Completed 2003/Re-assess 2012
Gentile Valley	928	40	Completed 2002/Re-assess 2011
Grave Creek	9,507	6,314	Completed 2003/Re-assess 2012
Grave Creek Roundup	2,158	900	Completed 2003/Re-assess 2012
Gravel Creek	962	419	Completed 1998/Re-assess 2007
Grizzly Creek	19,565	16,050	Completed 2003/Re-assess 2012
Grizzly Creek Roundup	2,135	1,026	Completed 2003/Re-assess 2012
High Basin	6,189	3,860	Completed 2004/Re-assess 2013
Jouglard	4,885	2,615	Completed 2001/Re-assess 2010
Lake Hollow	3,954	3,404	Completed 2003/Re-assess 2012
Lane Creek-1	1,645	640	Completed 1998/Re-assess 2007
Lane Creek-2	3,290	637	Completed 1998/Re-assess 2007
Long Valley	14,536	9,340	Completed 2003/Re-assess 2012
Maybe Canyon	12,496	616	Completed 2001/Re-assess 2010

Planning Unit Name	Total Unit Acres	Endowment Acres	Review History/Schedule (Endowment Land Only)
Meadow Creek	21,060	17,358	Completed 2003/Re-assess 2012
Meadow Creek Mtn-1	560	120	Completed 2002/Re-assess 2011
Meadow Creek Mtn-2	2,082	200	Completed 2002/Re-assess 2011
Natural Guardian	1,033	715	Completed 2000/Re-assess 2009
Paradise	10,836	10,450	Completed 2003/Re-assess 2012
Rasmussen Valley	3,875	444	Completed 2001/Re-assess 2010
Rawlings Creek	1,231	280	Completed 2004/Re-assess 2013
Reservoir Mtn.	11,863	9,142	Completed 2003/Re-assess 2012
Rich	6,551	2,028	Completed 2003/Re-assess 2012
Schmid Ridge	5,679	309	Completed 2001/Re-assess 2010
Sheep Creek	4,493	191	Completed 2001/Re-assess 2010
Slug Creek-1	151	38	Completed 2001/Re-assess 2010
Slug Creek-2	2,303	279	Completed 2001/Re-assess 2010
Slug Creek-3	907	450	Completed 2001/Re-assess 2010
Slug Creek-4	589	517	Completed 2001/Re-assess 2010
Stolworthy	15,810	1,872	Completed 2000/Re-assess 2009
Upper Meadow Creek	1,775	904	Completed 2002/Re-assess 2011
Wham Creek	1,906	470	Completed 2003/Re-assess 2012
Willow Creek	236	120	Completed 2003/Re-assess 2012
Wolf Mtn	1,210	613	Completed 2001/Re-assess 2010
Wolverine Creek	964	342	Completed 2000/Re-assess 2009
Woodall	2,303	1,750	Completed 2003/Re-assess 2012

Idaho Endowment Lands - Tasks

Task 1:	Prepare grazing management plans for management planning units/allotments so that water quality standards will be met within a reasonable length of time.
Milestones:	One year following the completion of the Review Schedule listed in Table 1.
Responsible Agency:	Idaho Department of Lands
Task 2.	Implement grazing management plans on management planning units/allotments.
Milestones:	Next year following development of grazing management plan.
Responsible Agency:	Idaho Department of Lands
Task 3.	Perform BMP/grazing management review/inspection on selected management planning units/allotments.
Milestones:	Annually in September/October.
Responsible Agency:	Idaho Department of Lands
Task 4.	Develop and implement site specific monitoring of selected management planning units/allotments.
Milestones:	Annually
Responsible Agency	Idaho Department of Lands

Blackfoot River TMDL Implementation Plan

BLM----Pocatello Field Office

I. Existing Condition

In 1993 and 1994 the Bureau of Land Management (BLM) funded a Riparian and Wetland Project conducted by the University of Montana on the Blackfoot River and its tributaries on reaches which run through public lands. (See accompanying maps for locations of these studies and BLM spot checks.) The tributaries they examined were Beaver Creek, Jones Creek and its tributary, Negro Creek, Grave Creek, Brush Creek, Rawlins Creek, Deadman Creek and Wolverine Creek. In addition, the BLM has conducted several spot studies on the Blackfoot River, Wolverine Creek, Jones Creek and a tributary to Brush Creek in 2000, 2003 and 2004. These spot checks represent isolated locations on the water ways and are not meant to characterize the entire reach.

A. High Priority Streams

1. Blackfoot River

Of approximately 29.8 miles of the Blackfoot River below Blackfoot Reservoir which were examined by the University of Montana, 9.3 miles were rated as Non-functional, 16.1 miles were rated as Functional at Risk, and 3.7 miles were rates as Proper Functioning Condition. In 2000, the BLM conducted two spot checks on two unnamed tributaries to lower Blackfoot River and found them to be Functional-at-Risk. In 2003, the BLM conducted eight spot checks on the lower Blackfoot River and observed it to be Non-Functional in three locations, and Functional-at-Risk in five locations. In 2004 the BLM conducted studies at the same eight sites and found the river to be Non-Functional in one location, Functional-at-Risk in five, and Proper Functioning Condition in two locations, bearing in mind that spot checks represent isolated locations and not the entire reach of the river. In 2000, the BLM conducted spot checks at two locations on the Blackfoot River above the Reservoir, and it was found to be Functional-at-Risk, and Proper Functioning Condition.

2. Wolverine Creek

Of 2.7 miles of Wolverine Creek examined by the Montana University, in 1993, approximately 1.3 miles of it was Non-Functional, and 1.4 miles was in Functional-at-Risk. In 2004, the BLM conducted a spot check on Wolverine Creek and found it to be in Proper Functioning Condition. It is unclear why there is a dramatic change in condition, but it may be a result of examining an isolated location which is not representative of the entire reach.

3. Jones Creek

Of 1.73 miles of Jones Creek and its tributary examined by the University of Montana in 1993, all was found to be Non-Functional. In 2004, the BLM conducted a spot check on Jones Creek and found it to be Functional-at-Risk.

B. Medium Priority Streams

1. Remaining 303(d)-Listed Streams within the Watershed: Brush, Dry Valley, Lanes, Meadow and Trail Creeks

Of 0.4 miles of Brush Creek examined by the University of Montana in 1993, all was Non-Functional. BLM has no updated information for the other streams listed here.

C. Low Priority Streams

1. Remaining Unlisted Streams within the Watershed

In 2000, the BLM examined Smiley Creek, a tributary to Brush Creek, and found it to be Functional-at-Risk. Of 0.8 mile of Negro Creek examined by the University of Montana in 1993, 0.5 mile was found to be Functional-at-Risk, and 0.3 mile was found to be in Proper Functioning Condition. Of 0.3 mile of Grave Creek examined by the University of Montana in 1993, all was found to be Non-Functional. Of 0.3 mile of Deadman Creek examined by the University of Montana in 1993, all was found to be Non-Functional.

II. Management Actions Proposed/Projected to Reduce Sediment Impacts

A. High Priority Streams

1. Blackfoot River

The 1988 Pocatello Resource Management Plan (RMP) proposed that the BLM: "Reinstate the primary use of the area as a stock driveway, restrict overnight use of riparian zones by trailing livestock, maintain bed-sites at appropriate intervals remove fences interfering with livestock movement, develop water sources where possible, limit utilization on key forage species on steep slopes to 50%, reseed areas of agriculture trespass." If other management practices do not produce the desired results, the RMP management alternative directs the BLM to "cancel all grazing privileges associated with (these) allotment(s) and fence along the driveway boundary, and install signs clearly indicating the public land lines." These proposals continue to give guidance to the BLM's management practices on the Blackfoot River. The BLM has built a quarter mile exclosure fence around a sensitive upper reach of Negro Creek in order to reduce erosion and sediment runoff, and has built a nearby exclosure to restrict livestock from an area adjacent to the Blackfoot River so that baseline data can be collected for riparian response to grazing management.

2. Wolverine

The 1988 Pocatello Resource Management Plan proposed that the BLM: "Remove livestock from the riparian habitat, exclude livestock grazing from Wolverine Creek for at least three seasons, construct fences to keep livestock out from the riparian area, and limit utilization on key forage species on steep slopes to 50%." If other management practices fail, the BLM may "adjust the stocking rate to greater than 5 acres/AUM." These management alternatives continue to give guidance to the BLM's management practices on Wolverine Creek.

3.

Jones Creek

The 1988 Pocatello Resource Management Plan proposed that the BLM: "Limit utilization on key forage species on steep slopes to 50%." This proposal continues to give guidance to the BLM's management practices on Jones Creek.

B. Medium Priority Streams

1. Brush, Dry Valley, Lanes, Meadow and Trail Creeks

Nothing is proposed outside of existing regulation and policy for these streams.

C. Low Priority Streams

1. Remaining Unlisted Streams Within the Watershed

Nothing is proposed outside of existing regulation and policy for these streams.

III. Monitoring Plan

BLM will provide Idaho DEQ—Pocatello Regional Office with an annual Monitoring Summary showing monitoring information and/or management actions on these streams gathered during the current year.

A. High Priority Streams.

Only three streams, the Blackfoot River, Wolverine Creek and Jones Creek are high priority streams for BLM within this watershed due to ownership pattern. Table 1 lists the stream miles managed by BLM and pollutant listed for these 303(d)-listed streams.

Table 1. BLM High Priority Streams within the Blackfoot River Watershed

303(d)-Listed Stream	BLM Length (Miles)	Listed Pollutant
Blackfoot River	22	Sediment, nutrients
Wolverine Creek	2	Sediment, nutrients
Jones Creek	0.5	Nutrients

1. Blackfoot River

Public lands administered by BLM on the Blackfoot River begins below the BIA dam on Blackfoot Reservoir and continues to the Just Canal diversion, about 2 miles below the mouth of Wolverine Creek. Here, DEQ is calling for a reduction of 19.9 tons/year total phosphorus and an 80% stream bank stability goal for sediment. BLM manages approximately 22 miles of stream bank along this river. These lands vary from gently sloping banks with sparse vegetation to dense riparian/wetland communities, to steep, basalt rock canyons with no road nor livestock access to the banks.

BLM does not control nor influence any of the Blackfoot Reservoir flow releases--BIA is responsible for this at this dam. Therefore, BLM has little impact on the channel

bed substrate changes caused by flow alteration. BLM does, however, have direct impact on the stream bank habitat which does influence sediment input to the river. Impacts are caused by recreational activities, livestock grazing and undeveloped roads.

BLM's goals here are driven by the TMDL and our own riparian and Healthy Rangelands policies. BLM has three goals for these river banks to improve habitat and therefore, water quality: 80% stream bank stability; riparian/wetland areas moving towards Proper Functioning Condition; and a 4" stubble height of key riparian species. Eighty percent stream bank stability and a proper functioning condition would reduce bank soil erosion and may reduce suspended sediment in the river. A proper functioning condition riparian system would store excess sediment and buffer banks from high flows, protecting water quality from excessive sediment and total phosphorus loading. About 3-5 BLM stream reaches will be monitored for PFC and stream bank stability every 3-5 years. Stubble height of key riparian species will be monitored each year along key areas during the grazing season to determine grazing use and impact. The Pocatello Field Office will select these stream reaches (for PFC and stream bank stability) and key areas (for stubble height) and conduct the monitoring.

2. Wolverine and Jones Creeks

BLM manages just over 2 miles of Wolverine Creek. About 2 miles of stream are in the "narrows" canyon section beginning about 1.1 miles above the Jones Creek confluence. Two other small reaches are below both the Jones Creek confluence and the county road. The furthest downstream parcel includes the mouth of Wolverine Creek on the Blackfoot River. The TMDL also mentions that Jones Creek, a tributary to Wolverine Creek, contributes about 25% of the total phosphorus loading into Wolverine Creek. BLM manages about 0.5-miles of Jones Creek and about 0.5-miles of the unnamed tributary to Jones Creek.

Impacts to Wolverine Creek include recreation and OHV use, livestock grazing and county road maintenance activities. Upstream on private lands, besides the impacts mentioned, additional watershed impacts that influence the streams may include septic systems, forestry practices and weed invasion.

The TMDL calls for a reduction of 6.7 tons/year total phosphorus and an 80% stream bank stability goal for sediment. BLM has three goals for both Wolverine Creek and Jones Creek: 80% stream bank stability; riparian/wetland areas moving towards PFC; and 4" stubble height of key riparian species.

About half of the polygons on Wolverine and Jones Creek will be monitored annually for stubble height and every 3-5 years for PFC and stream bank stability.

B. Medium Priority Streams

1. All remaining 303(d) listed streams (from the 1998 list) within the Blackfoot River watershed are listed in Table 2.

Table 2. BLM's Medium Priority Streams in the Blackfoot River Watershed

Stream	**BLM Stream Miles**	**Pollutant**
Brush Creek	0.3	Sediment
Dry Valley Creek	0.25	Sediment
Lanes Creek	0.25	Sediment
Meadow Creek	0.25	Sediment
Trail Creek	0.4	Sediment

Since BLM does not manage a significant length of any one of these streams, BLM's monitoring goals include: 80% stream bank stability; riparian/wetland areas moving towards PFC; and a 4" stubble height. BLM will monitor about one-half of these stream polygons for stream bank stability and PFC every 3-5 years and stubble height every 1-2 years. All stream reaches and key areas will be selected and monitored by the Pocatello Field Office. BLM will also measure stubble height at key areas annually during the grazing season.

C. Low Priority Streams

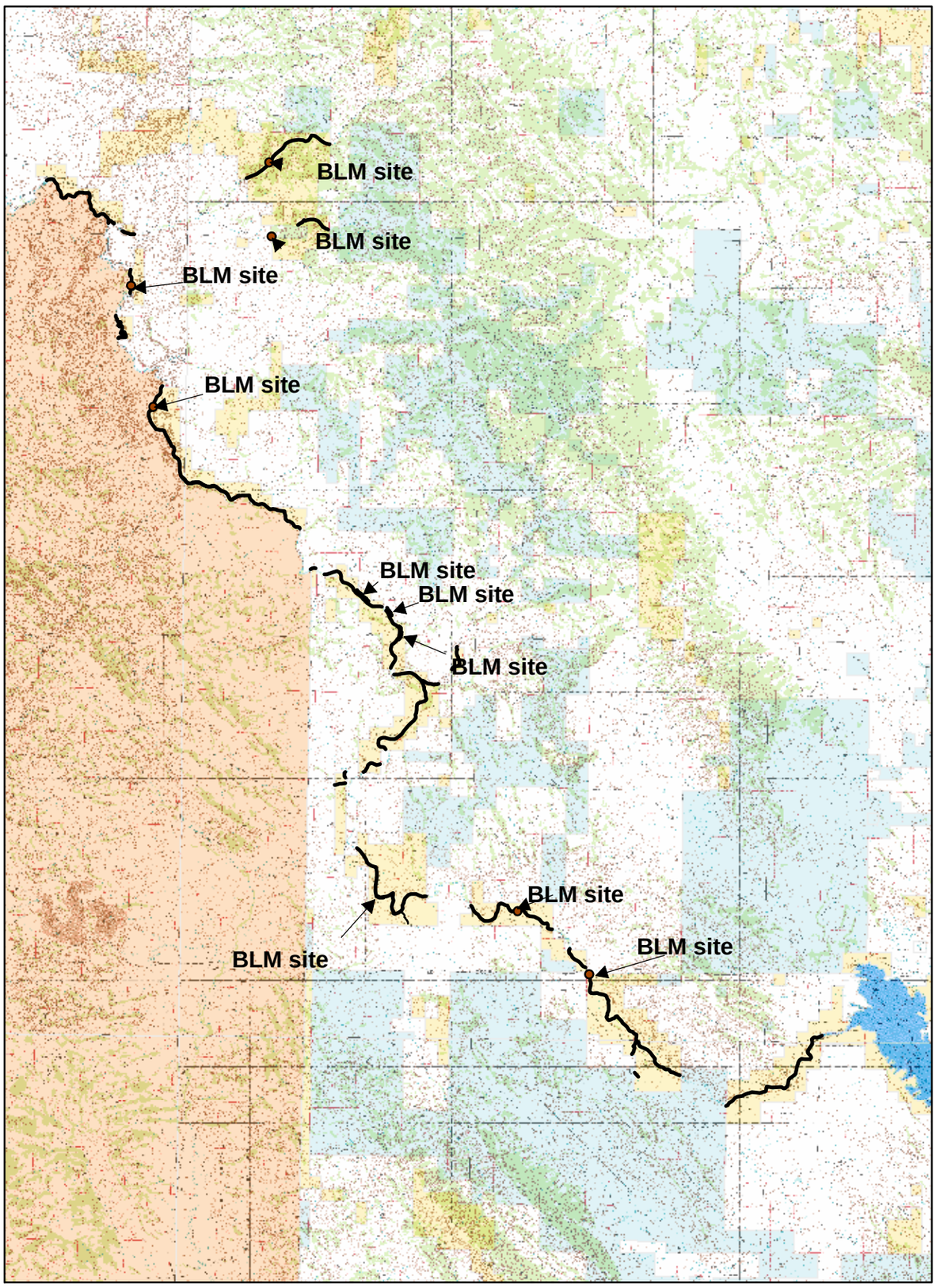
1. All remaining unlisted streams on BLM within the Blackfoot River watershed. These low priority streams will be monitored for PFC during scheduled Standards and Guides allotment assessments every 5-10 years and stubble height for grazing compliance as time permits. All stream reaches and key areas will be selected and monitored by the Pocatello Field Office.

Riparian Studies on the Blackfoot River and its tributaries
Overview

R. 37 S.

R. 40 E.

T. 1 S.



T. 5 S.

0 0.45 0.9 Miles

N
W
S

Location map

Legend

- BLM riparian study sites
- Montana riparian study sites
- IR
- BLM
- DOE
- MIL
- NPS
- PRIVATE
- STATE
- USFS
- USFWS
- WATER

No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by BLM.

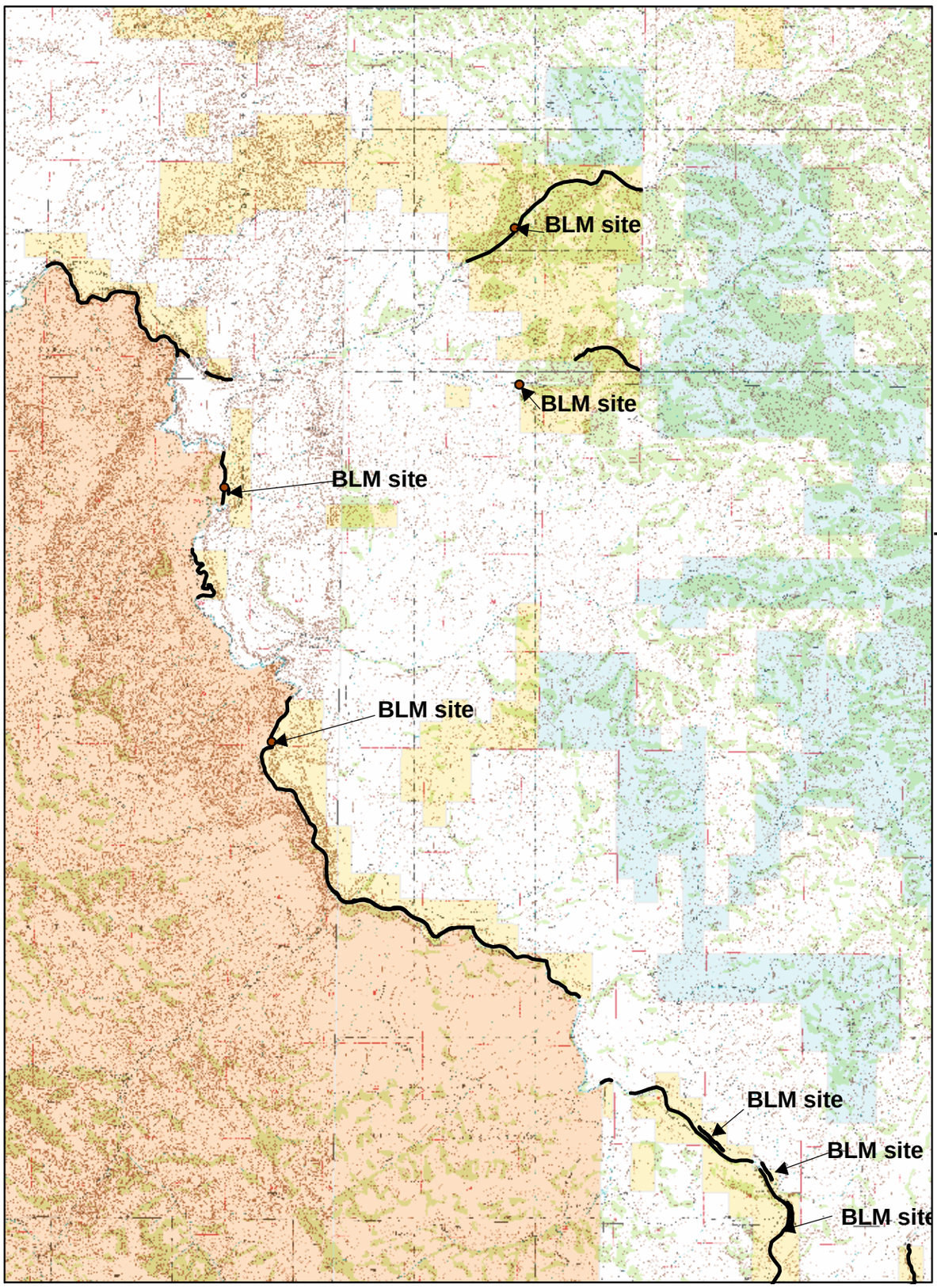
DRAFT

Prepared by Range Staff, sjc, March 15, 2005
Location of studies digitized on computer
IFD: UTM Zone 12 projection, NAD 1983 datum, meters

Riparian Studies on the Blackfoot River and its tributaries
Page 1

R. 37 E.

R. 38 E.



Location map

Legend

- BLM riparian study sites
- Montana riparian study sites
- IR
- BLM
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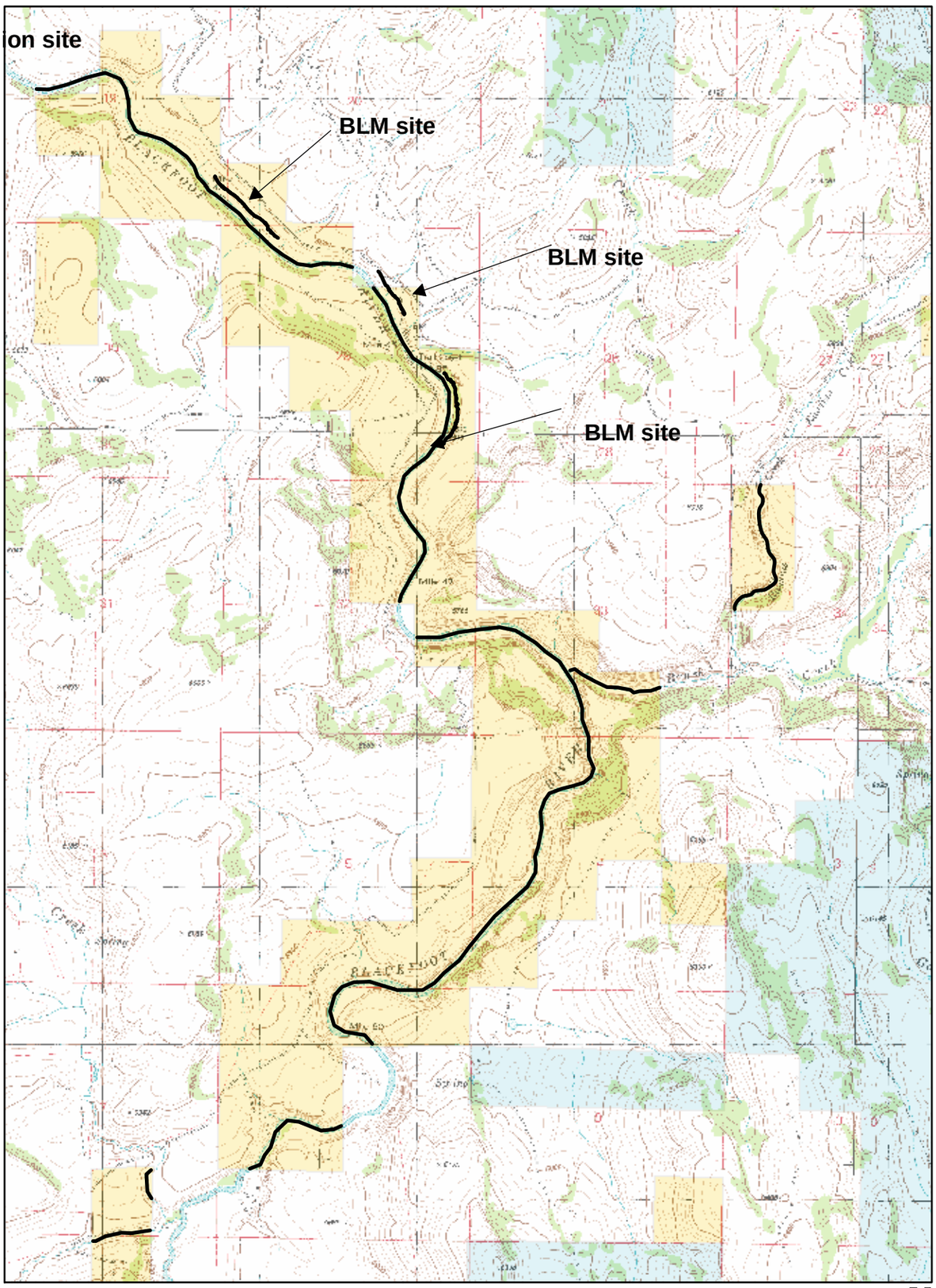
Riparian Studies on the Blackfoot River and its tributaries
Page 2

R. 38 E.

R. 39 E.



Location map

Legend

- BLM riparian study sites
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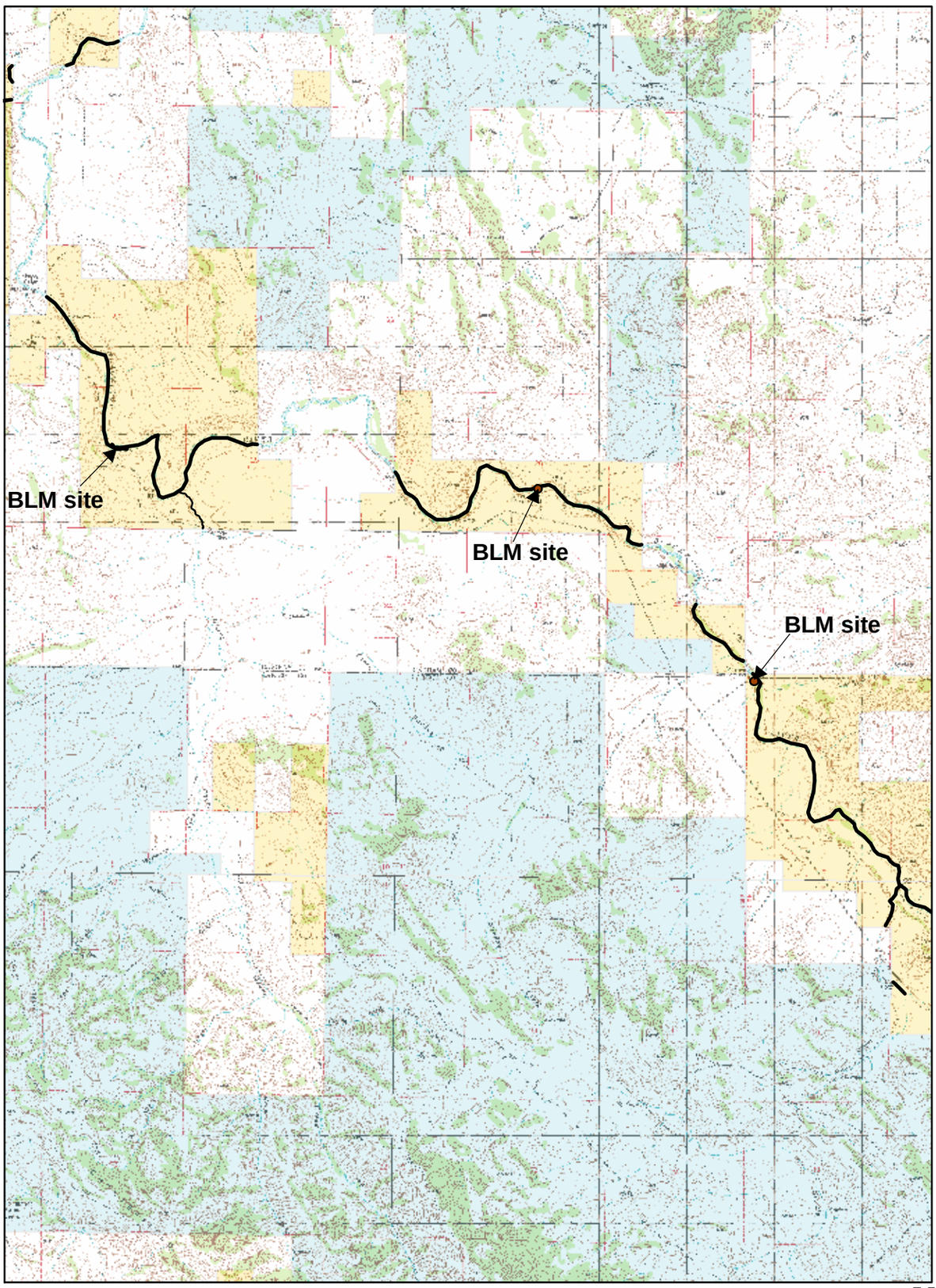
Riparian Studies on the Blackfoot River and its tributaries
Page 3

R. 39 E.

R. 40 E.



0.6 0.3 0 0.6 Miles

N
W E
S

Location map

Legend

- BLM riparian study sites
- Montana riparian study sites
- IR
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IFD: UTM Zone 12 projection, NAD 1983 datum, meters

Riparian Studies on the Blackfoot River and its tributaries
Page 4

R. 40 E.

T. 5 S.

0.6 0.3 0 0.6 Miles

N
W E
S

Location map

Legend

- BLM riparian study sites
- Montana riparian study sites
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Location of studies digitized on computer
IFD: UTM Zone 12 projection, NAD 1983 datum, meters

Blackfoot River Subbasin TMDL Implementation Plan

Caribou/Targhee National Forest

Introduction

The Clean Water Act, section 303(d) requires states to identify surface waters within their boundaries that do not fully support designated beneficial uses. For waterbodies determined by the state as not fully supporting designated beneficial uses, each state will establish total maximum daily loads of identified pollutants with seasonal variations and margins of safety.

To date, the only EPA approved list of 303(d) streams for the State of Idaho is the 1998 list. Streams on the 1998 list that have been determined as not fully supporting beneficial uses are: Blackfoot River, Wolverine Creek, Corral Creek, Meadow Creek, Trail Creek, Slug Creek, Angus Creek, Dry Valley Creek, Diamond Creek, Bacon Creek, Lanes Creek, Sheep Creek, Brush Creek, Grizzly Creek, and Maybe Creek. Of these streams, a portion of the Blackfoot River is within or adjacent to the Forest boundary, as well as Trail, Slug, Angus, Dry Valley, Diamond, Bacon, Lanes, Sheep, and Maybe Creeks. In 2002, EPA proposed a revised listing of 127 303(d) streams in Idaho, mostly for temperature. Only Brush Creek was identified in the Blackfoot River system for temperature. In 2002, the State of Idaho drafted an integrated 303(d)/305(b) report. This report has not yet been approved by EPA and is therefore still officially a "draft". In addition to the streams listed above, Rasmussen and Goodheart Creeks are listed within the Forest boundary.

Once a waterbody is identified and listed as not supporting designated beneficial uses and TMDLs are established, the State must prepare an Implementation Plan. This plan is to identify a plan-of-action needed to attain specified allocations or other criteria for listed waterbodies. This action plan should include actions to be taken, expected benefits or outcomes and projected timelines for each identified waterbody.

The following are waterbodies identified in Table 1-1 in the 2001 waterbody assessment and TMDL for the Blackfoot River. Those waterbodies in **bold** letters are within the Forest boundary.

Waterbody	Segment	Identified Pollutant	Beneficial Use(s) not fully supported	Likely pollutant Sources	Load Allocation	Comment
Blackfoot River	Main Canal to Wolverine	Sediment, Nutrients	Cold water aquatic	Agriculture, livestock grazing,	Depth Fines, Streambank Stability,	Not within or adjacent to the C/T National

	Creek		life, salmonid spawning	recreation, mass wasting and changes in hydrograph	Total inorganic nitrogen, Total phosphorus	Forest
Blackfoot River	Wolverine Creek to Blackfoot Dam	Sediment, Nutrients, Flow Alteration	Cold water aquatic life, salmonid spawning	Agriculture, livestock grazing, recreation, mass wasting and changes in hydrograph	Depth Fines, Streambank Stability, Total inorganic nitrogen, Total phosphorus	Not within or adjacent to the C/T National Forest
Blackfoot River	**Blackfoot Reservoir to headwaters**	**Sediment, Organics**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing, Recreation, Phosphate Mining**	**Depth Fines, Streambank Stability**	**Blackfoot Narrows is on-Forest as well as "headwaters"**
Wolverine Creek	Blackfoot River to headwaters	Sediment, Nutrients	Cold water aquatic life, salmonid spawning	Agriculture, livestock grazing, recreation, roads and mass wasting	Depth Fines, Streambank Stability, Total inorganic nitrogen, Total phosphorus	Not within or adjacent to the C/T National Forest
Brush Creek	Blackfoot River to headwaters	Unknown	Cold water aquatic life	Livestock Grazing, Recreation	Depth Fines, Streambank Stability	Not within or adjacent to the C/T National Forest
Corral Creek	Blackfoot River to Headwaters	Sediment	Cold water aquatic life	Livestock Grazing	Depth Fines, Streambank Stability	Not within or adjacent to the C/T National Forest
Grizzly Creek	Corral Creek to headwaters	Unknown	Cold water aquatic life	Livestock Grazing	Depth Fines, Streambank Stability	Not within or adjacent to the C/T National Forest
Meadow Creek	Blackfoot Reservoir to headwaters	Sediment	Cold water aquatic life, salmonid spawning	Livestock Grazing, Changes in Hydrograph	Depth Fines, Streambank Stability	Not within or adjacent to the C/T National Forest
Trail	**Blackfoot**	**Sediment**	**Cold**	**Livestock**	**Depth**	**Headwaters**

Creek	**River to headwaters**		**water aquatic life, salmonid spawning**	**Grazing**	**Fines, Streambank Stability**	**within C/T Forest boundary**
Slug Creek	**Blackfoot River to headwaters**	**Sediment**	**Cold water aquatic life**	**Livestock Grazing**	**Depth Fines, Streambank Stability**	**Headwaters within C/T Forest boundary**
Dry Valley Creek	**Above mining activity**	**Sediment**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing**	**Turbidity, Depth Fines, Streambank Stability**	**Within C/T Forest boundary**
Dry Valley Creek	**Below mining activity**	**Sediment**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing, Phosphate Mining**	**Turbidity, Depth Fines, Streambank Stability**	**Within C/T Forest boundary**
Maybe Canyon Creek	**Dry Valley Creek to mining waste dump**	**Unknown**	**Cold water aquatic life**	**Phosphate Mining**	**Depth Fines, Streambank Stability**	**Within C/T Forest boundary**
Angus Creek	**Blackfoot River to headwaters**	**Sediment**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing, Phosphate Mining**	**Depth Fines, Streambank Stability**	**Within C/T Forest boundary**
Lanes Creek	**Blackfoot River to headwaters**	**Sediment**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing**	**Depth Fines, Streambank Stability**	**Within C/T Forest boundary**
Bacon Creek	**Lanes Creek to FS boundary**	**Sediment**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing**	**Depth Fines, Streambank Stability**	**Adjacent to C/T Forest boundary**
Sheep Creek	**Lanes Creek to**	**Sediment**	**Cold water**	**Livestock Grazing**	**Depth Fines,**	**Within C/T Forest**

	headwaters		**aquatic life, salmonid spawning**		**Streambank Stability**	**boundary**
Diamond Creek	**Blackfoot River to headwaters**	**Sediment**	**Cold water aquatic life, salmonid spawning**	**Livestock Grazing**	**Depth Fines, Streambank Stability**	**Within C/T Forest boundary**

Forest Service Policy and Direction within the Blackfoot river subbasin

The Forest Service, Caribou/Targhee National Forest, has recently revised its Land Management Plan (LMP) for the Caribou National Forest, which includes those lands within the Blackfoot River subbasin. The revised Plan includes direction for managing watersheds and riparian zones for water quality. This direction is in the form of Desired Future Conditions, Goals, Objectives, Standards and Guidelines. Desired Future Conditions are statements of a condition desired to be attained, or move toward, during the life of the Plan. A Goal is an expressed long-term outcome of management activities. An Objective is a specific action addressing a goal. A Standard is used to promote the achievement of the desired future condition or Goal. A Guideline is used the same as a Standard, but offers more flexibility to respond to various changing conditions or management circumstances. The Following are Desired Future Conditions, Goals, Objectives, Standards and Guidelines contained in the revised LMP.

Desired Future Condition

- Public waters are restored where water quality does not support beneficial uses and otherwise are maintained or improved.

Goals

- Design and implement watershed management programs and plans that will restore water quality and watershed function to support beneficial uses.

- Protect waters meeting or surpassing State water quality standards by planning and designing land management activities that protect water quality.

- Cooperate as needed with the State, Tribes, other agencies and organizations to identify 303(d) impaired waterbodies, develop and implement Total Maximum Daily Load (TMDL) and their Implementation Plans for waterbodies influenced by National Forest System management.

- Maintain or restore water quality to a degree that provides for stable and productive riparian and aquatic ecosystems within the capability of the system.

- Participate in cooperative river basin planning efforts. Coordinate management activities to be consistent with these efforts.

- Focus maintenance and restoration efforts within disturbed watersheds that have the greatest potential for restoration of hydrologic function, riparian, water quality and aquatic values.

- Forest roads and trails are managed to maintain or improve watershed condition.

- Riparian and aquatic ecosystems provide water quality suitable for supporting designated beneficial uses.

Objectives

- Within one year of the signing of the ROD, incorporate the riparian grazing standards into livestock grazing permits and annual operating instructions.

Standards

- Within legal authorities, ensure that new proposed management activities within watersheds containing 303(d) listed waterbodies improve or maintain overall progress toward beneficial use attainment for pollutants which led to listing; and do not allow additions of pollutants in quantities that result in unacceptable adverse effects.

- Design, construct, and operate new recreation facilities, including trails and dispersed sites, in a manner that maintains progress toward desired AIZ attributes.

- Aquatic Influence Zones are not included in the suitable timber base and do not contribute to the Allowable Sale Quantity (ASQ).

Guidelines

- Projects in watersheds with 303(d) listed waterbodies should be supported by scale and level of analysis sufficient to permit an understanding of the implications of the project within the larger watershed context.

- Proposed actions analyzed under NEPA should adhere to the State Nonpoint Source Management Plan to best achieve consistency with both Sections 313 and 319 of the Federal Water Pollution Control Act.

- Minimize construction of new transportation routes, evaluate existing routes, and reconstruct or relocate those routes not meeting management goals. Surface gravel should be placed on roads where necessary to reduce rutting, surface erosion and to reduce maintenance costs.

- Avoid constructing roads within the AIZ unless there is no practical alternative.

- Manage existing recreation facilities, including trails and dispersed sites, to minimize adverse impacts and, where feasible, move towards desired AIZ attributes.

- Timber harvest, including fuelwood cutting, is generally not allowed unless:

    - catastrophic events such as fire, flooding, wind, or insect damage result in degraded riparian conditions, and unscheduled timber harvest (salvage and commercial fuelwood cutting) is selected as the most desirable management practice.

    - silvicultural practices are necessary to achieve desired vegetation characteristics and desired AIZ attributes.

Current Watershed Situation, Proposed Management Activities and Direction

The overarching vision for the Caribou National Forest, which includes the Blackfoot River basin is to provide a balance of physical landscape components, including upland terrestrial habitats, riparian areas, wetlands and clean water. All the above Desired Future Conditions, Goals, Objectives, Standards and Guidelines, as well as others not listed above, apply to all the streams and riparian areas on National Forest System Lands within the Blackfoot River drainage. To emphasize the importance of water quality, a special management area prescription was given to all riparian areas, termed Aquatic Influence Zones (AIZs). AIZ prescriptions apply to all lakes, reservoirs, ponds, perennial and intermittent streams and wetlands. These areas control the hydrologic, geomorphic and ecological processes that shape various features mentioned above and directly affect water quality. Management emphasis is to restore and maintain the health of these areas. Prescriptions provide a high level of aquatic protection and maintain ecological functions (e.g. sediment transport, microclimate control, nutrient and energy regulation and connectivity within the watershed) and processes (e.g. stream channel formation, plant community development, recruitment of organic material, including large wood, and hydrologic cycles) necessary for the restoration and maintenance of habitat for aquatic and riparian dependent organisms and provide clean water that supports designated beneficial uses.

Phosphate mining is the greatest land-disturbing activity within the watershed. Mines, both current and inactive, are regulated through a variety of mechanisms. These include

state and federal leasable minerals regulations, Forest Plan direction and Mining Operating Plans. Specific Forest Plan direction, as it pertains to mining operations within AIZs includes:

- Locate new structures, support facilities and roads outside AIZs.
- Do not locate debris, mine overburden, excess material, leaching pads, and other facilities within the AIZ.
- AIZs would generally not be available for development of mineral materials unless AIZ attributes would be maintained or improved.

The Revised Forest Plan recognizes that livestock grazing can affect water quality and provides specific management direction and utilization standards for uplands and within the AIZ. Previous Forest Plan direction was vague and specific grazing procedures and utilization standards were implemented on an individual allotment basis as part of the Allotment Management Plan. Direction varied between allotments and standards usually did not fully address resource needs and concerns. The revised, literature-based, guidance will be applied uniformly across the Forest. Riparian area direction considers the sensitivity of various channel types to impacts, the condition of the riparian area and stream channel and the presence of other factors, such as 303(d) waterbodies. This direction is designed to maintain conditions where they are considered to be in a satisfactory condition, and improve degraded areas.

Similar direction is supplied in the Revised Forest Plan for recreation activities, timber harvesting, roads and trails, and so forth.

The following is a discussion of the current situation, proposed management activities and direction addressing TMDLs, expected effects, and costs of each listed stream within the Forest boundary, or those streams that can be directly affected by activities within the Forest boundary. If specific actions are known at this time, these actions are addressed. Actions would include administration of grazing practices, road maintenance, minerals management and the like.

Blackfoot River

Current Situation

Blackfoot River is listed from near the confluence with Snake River to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Nutrients, organics and sediment have been determined to be impairing water quality, which are affecting the beneficial uses of cold water aquatic life and salmonid spawning. Only a short reach (approximately 2 miles) of Blackfoot River proper flows through the Caribou/Targhee National Forest. This is in a reach called "The Narrows", located in Township 7 South, Range 44 East, sections 18 and 19. Numerous headwater tributaries to Blackfoot River originate within the Forest boundary.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment and organics have been identified in this segment of the Blackfoot River as limiting water quality. The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment and organics are livestock grazing, mining and recreation. However, the road paralleling the river through The Narrows is probably the greatest contributor of sediment in that reach.

-Roads-

A major unpaved road provides access to the Forest and private lands within the upper watershed. This road parallels Blackfoot River for several miles, and in some reaches is only a few feet from the streambank. In the early 1990's, the maintenance of the road was turned over to Caribou County. The Forest has also been working with the county to maintain a vegetation barrier (primarily willows) between the road and the river and to minimize sidecast during road maintenance operations. Over the past four years, dust abatement has been provided by applying magnesium chloride to the road surface. This has made a substantial reduction in road dust as well as reduced the amount of required surface maintenance. The combination of these practices has made an observable reduction in sediment being delivered to the river through this reach.

-Livestock Grazing-

Grazing allotments exist on both sides of the Blackfoot River. Sheep will water from the river on an occasional basis, but no cattle grazing is authorized in the river corridor proper.

-Recreation-

Fishing and some waterfowl hunting are the primary recreation activities within this reach. Some dispersed camping occurs along the river, but pull-outs are limited and stays are usually only a day or two. Mill Canyon campground is located about ½ mile west of the River, in Mill Canyon. This is a lightly used facility containing 10 campsites containing picnic tables and fire rings. Sanitary facilities consist of vault toilets. A potable water system has been installed, but has not been used in several years due to maintenance problems. A new culvert was recently installed in Mill Creek under the Blackfoot Narrows road to facilitate fish passage. There are no plans to construct any other recreation facilities within this reach at this time.

-Mining-

There is no mining within or directly adjacent to the river corridor within the Forest boundary. However, phosphate mining occurs throughout the Blackfoot drainage. Implications of this mining are discussed in specific reach-by-reach evaluations below.

-Action-

No specific action will be taken other than those that have already been implemented and described above. As stated above, the road through the narrows is probably the largest contributor to sediment within NFS lands. The Forest has been diligently working with the County to keep the road maintained, minimize sidecast, maintain a vegetative buffer between the road and river and minimize dust. This coordination will continue into the foreseeable future.

-Expected Effects-

The effects would be to continue to reduce sediment delivered to Blackfoot River via the road through the narrows. As stated above, the Forest has recently implemented a revised land resources management plan (LRMP). The revised LRMP specifically addresses water quality and contains provisions designed to protect upstream surface waters currently meeting beneficial uses and improve those waters that are currently not fully supporting beneficial uses. Effects of upstream actions, or inactions, will be described for each water quality limited segment.

-Timelines-

Actions have already been implemented. There are no specific timelines for additional improvements, as none are scheduled or anticipated at this time.

-Costs-

There are no specific costs associated with this action other than routine road maintenance costs that would normally be associated with road management under the direction provided in the Revised Forest Plan and the road maintenance agreement with

Caribou County. Livestock administration would be implemented regardless of stream status.

-Monitoring

Blackfoot River has a listed pollutant of sediment and organics, with no specific pollutant load allocations or reductions. The load allocation TMDL for sediment is bank stability and depth fines. An 80% stable streambank target is used as a surrogate load allocation for active eroding streambanks. Depth fines are subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; Subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles. No data were reviewed that pointed to organics as a problem in this segment of the river; therefore, organics were not addressed in the TMDL.

The frequency of monitoring for the parameters bank stability and depth fines will be once every 2-5 years. Because of the influence of the road on the channel, little channel change is expected. Therefore the bank stability will be every 5 years and the depth fines sampling interval will be every 5 years. Sampling at a greater frequency would probably not show any measurable differences and would not be cost effective. If a monitored parameter exceeds target standards, repeated sampling will occur as needed.

The location of depth fines sampling will be at or slightly above the Forest boundary T7S, R43E, Section 19. The location of bank stability sampling will be near the mid-sections of Sections 18 and 19, T7S, R43E.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00, depending on the parameter(s) monitored.

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Trail Creek

Current Situation

Trail Creek is listed from near the confluence with Blackfoot River to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which is affecting the beneficial uses of cold water aquatic life and salmonid spawning. Only a short reach (less than 1 mile) of Trail Creek proper flows through the Caribou/Targhee National Forest. Perennial flows begin at a spring, which is located only about ¼ mile above the Forest boundary. Recreation and livestock grazing are the primary activities within the Forest boundary. Below the Forest boundary, the stream flows through about 4 miles of private and state-owned lands before reaching the Blackfoot River. These lands are primarily used for agriculture.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment has been identified in Trail Creek as limiting water quality. The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing and recreation. A major access road parallels the stream within and below the Forest boundary is probably the greatest contributor of sediment in that reach.

-Roads-

The road, maintained by Caribou County, provides access to the upper portion of the watershed and is used by Forest users and as an access to private lands. It is graveled and bladed periodically by the County. Less than one mile parallels the stream within the Forest boundary, with about the same length on state and private lands. The road then diverges from the stream and is no longer a factor.

-Livestock Grazing-

The stream is within the North Sulphur and Johnson S&G Allotments. These allotments support a band (~1050) of sheep each from June 16 to September 5, annually. Management is by herding on an once-over basis. Impacts to the channel by sheep are light, as the herders are instructed to allow the sheep to water in the stream, but are not allowed to loiter or bed in the AIZ. Allotment Management Plan (AMP) updates are scheduled for 2008. At that time, the watershed condition will be assessed and revised grazing protocols, if needed, will be implemented in 2009.

-Recreation-

The entire area is used by ORVs and dispersed camping, but neither activity is directly impacting the stream. The Forest maintains a cross-country skiing and snowmobile trailhead nearby. At one time the Forest proposed installing a dam on the stream to provide a fishing reservoir, but the idea was abandoned due to the projected high cost of constructing and maintaining a dam. The stream is fished by locals, but does not provide a very important fishery. Actual impacts from recreation are minimal and no management actions are proposed or projected.

-Mining-

There is no mining at this time within the headwaters of this drainage.

-Action-

No specific action will be taken other than those that have already been implemented and described above. As stated above, the road is probably the largest contributor to sediment within NFS lands. The Forest has been diligently working with the County to keep the road maintained, minimize sidecast, maintain a vegetative buffer between the road and river and minimize dust. This coordination will continue into the foreseeable future.

-Expected Effects-

The effects would be to continue to reduce sediment delivered to Trail Creek via the road. Revised grazing standards would help to reduce overall disturbance within riparian areas, which would serve to protect water quality.

-Timelines-

Actions have already been implemented. There are no specific timelines for additional improvements, as none are scheduled or anticipated at this time.

-Costs-

There are no specific costs associated with this action other than routine road maintenance, livestock grazing administration, and recreation management costs that would normally be associated with road management under the direction provided in the Revised Forest Plan and the road maintenance agreement with Caribou County.

-Monitoring-

Trail Creek has a listed pollutant of sediment with no specific pollutant load allocations or reductions. The load allocation TMDL for sediment is bank stability and depth fines. An 80% stable streambank target is used as a surrogate load allocation for active eroding streambanks. Depth fines is subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; Subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles.

The frequency of monitoring for the parameters bank stability and depth fines will be once every 2-5 years. Because of the influence of the road on the channel, little channel change is expected. Therefore the bank stability will be every 2 years and the depth fines sampling interval will be every 5 years. Sampling at a greater frequency would probably not show any measurable differences and would not be cost effective. If a monitored parameter exceeds target standards, repeated sampling will occur as needed.

The location of sampling will be at or slightly above the Forest boundary T8S, R43E, Section 29.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00 depending on the parameter(s) monitored

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Slug Creek

Current Situation

Slug Creek is listed from near the confluence with Snake River to its headwaters. It is primarily a low-gradient stream, containing numerous beaver ponds. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which is affecting the beneficial use of cold water aquatic life. Livestock grazing is a likely pollutant source. The headwaters of the stream and about ½ the total stream length is within NFS lands. The lower ½ of the stream flows through state and privately owned lands, which are primarily used for agriculture and livestock grazing.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment has been identified in Slug Creek as limiting water quality. The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing, mining and recreation. A primary road accessing both public and private land parallels the stream, but isn't a substantial sediment contributor. Numerous beaver ponds occur throughout the stream from near the headwaters through private land. These ponds, as the name suggests, ponds the water and slows streamflows. In some areas, beaver ponds are back-to-back, occupying the entire riparian zone and floodplain, with little or no free-flowing water between ponds. The lack of free-flowing water and suitable substrate for cold water biota probably contributes to the lack of cold water aquatic life within the system. Several springs occur in the headwaters which mark the perennial flows of the stream. These springs include Prichard, Cold and Horseshoe.

-Livestock Grazing-

The drainage is within the Slug Creek S&G Allotment and the Dry Valley C&H Allotments. These two allotments have grazing allocations of 1100 sheep and 1504 cattle respectively. Grazing dates are from mid June to mid September. Sheep grazing is managed via herding on a once-over basis. Impacts to the channel by sheep are light, as the herders are instructed to allow the sheep to water in the stream, but are not allowed to loiter or bed in the AIZ. Cattle grazing is managed on a pasture rotation basis. In 2004 grazing standards specified in the revised Forest Plan will be implemented. Updates to the Slug Creek AMP are due in 2008. At that time watershed condition will be assessed and additional adjustments to grazing, if needed, will be implemented. The Dry Valley Allotment AMP has recently been completed

-Recreation-

There is no specific recreation within the drainage other than normal dispersed camping/hunting/off-road travel that occurs throughout the Forest.

-Mining-

There is no active mining in the drainage. However, there has been some past mining and future mining has been proposed. Two streams in the upper valley portion of this watershed have been affected by phosphate mining. Upper Dry Creek watershed was mined for phosphate from the mid 1980's through 1993 at the Mountain Fuel mine. Flows in the upper drainage are ephemeral to intermittent, depending on the amount of precipitation during any given year. Flows, when they do occur, flow into intermittent wetlands below the mine and into Dry Creek.

Simplot conducted some phosphate ore evaluation/exploration drilling during the summer of 2003 and will continue in 2004. As part of the drilling, the company resurfaced portions of the Wilde Canyon road which was extremely rutted and contributing sediment to Slug Creek. Resurfacing substantially reduced the amount of sediment being delivered to Slug Creek from this source. The drilling has not had any impact on Slug Creek.

Ongoing investigations indicate that selenium may be migrating down gradient through the alluvial sediments in the upper reaches of Dry Creek. Further investigations will be conducted to determine whether this is in fact occurring may begin in 2005. Water quality samples collected downstream in Slug Creek show the presence of selenium.

-Timber-

Two timber sales are being planned for 2005 and 2006 within the Slug Creek drainage. The sales are about 200 acres in size, yielding about 2 million board feet each. Impacts to Slug Creek will be evaluated in associated Environmental Impact Statements.

-Action-

Revised grazing standards, as identified in the revised Forest Plan, will be implemented in 2004. These revised grazing standards are expected to maintain conditions where they are currently satisfactory and improve reaches in less than satisfactory condition.

Proposed timber sales will be evaluated through the appropriate NEPA documents. Best Management Practices and other mitigation will be applied to protect watershed values and water quality.

Mining will be thoroughly analyzed through Environmental Impact Statements should mining proposals be submitted to the Forest. State-of-the-art BMPs and other mitigation measures for all phases of the mining activity will be identified and implemented throughout the mining process from exploration to reclamation.

-Expected Effects-

Timber sales, if they occur, will be planned and implemented so there will be no net gain in sediment delivered to Slug Creek.

Revised grazing standards will help reduce overall bank disturbance which will help to improve overall bank stability slightly. However, due to the natural nature of the stream (low gradient and numerous beaver ponds) revised grazing standards are not expected to have any measurable downstream water quality improvements. Beaver ponds will continue to trap sediment, and as they wash out, release sediment in surges.

The reconstruction of the Wilde Canyon road will effectively reduce sediment from that source.

-Timelines-

Revised grazing standards will be implemented in 2004.

Phosphate ore reserves potentially occur within the drainage and are currently being evaluated by mining companies. The Forest will respond to requests for exploration and/or mining as proposed by the companies within timelines required by law. Investigations of releases and remedial actions are scheduled to begin in 2005 and continue in the Dry Creek drainage until the site complies with promulgated standards.

-Costs-

There are no specific costs other than routine livestock grazing management, phosphate exploration/mining administration, and timber harvesting administration that would be implemented regardless of stream status. Under the authority of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) the polluter pays for the government oversight, investigation and cleanup.

-Monitoring-

Slug Creek has a listed pollutant of sediment with no specific pollutant load allocations or reductions. The load allocation TMDL for sediment is bank stability and depth fines. An 80% stable streambank target is used as a surrogate load allocation for active eroding streambanks. Depth fines for this stream is only a single category: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles.

The frequency of monitoring for the parameters bank stability and depth fines will be once every 2-5 years. Because of the influence of the beaver ponds on the channel, little channel change is expected. Therefore the bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years. Sampling at a greater frequency would probably not show any measurable differences and would not be cost

effective. If a monitored parameter exceeds target standards, repeated sampling will occur as needed.

The location of depth fines sampling will be at or slightly above the Forest boundary T9S, R44E, Section 21 or 22. Bank stability sampling will occur at 3 sites. These are located near the center of sections 22, 27 and 34, T9S, R44E.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Phosphate mining monitoring is the responsibility of the polluter under CERCLA until released from that obligation by the responsible agency. Separate mining monitoring plans are the responsibility of the polluter with oversight by the Forest Service.

Dry Valley Creek

Current Situation

Dry Valley Creek is listed from the confluence with Blackfoot River to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which is affecting the beneficial uses of cold water aquatic life and salmonid spawning. Livestock grazing and mining are thought to be likely pollutant sources. Only a short reach (approximately 2 miles) of Dry Valley Creek proper flows through (National Forest System) NFS lands. However much of this reach is directly impacted by phosphate mining. Livestock grazing occurs in the upper headwaters. Portions of Dry Valley Creek have gone dry for the past several years.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment has been identified in Dry Valley Creek as limiting water quality. The primary activities within the NFS portion of the watershed that can affect sediment are livestock grazing, mining and limited recreation, with mining having the major impact within the drainage.

-Livestock Grazing-

The stream is within the Dry Valley C&H Allotment. The allotment supports 1504 cattle from June 6 to September 9 on a pasture rotation basis. It is recognized that livestock grazing can have detrimental impacts on streambank stability and downstream water quality. As such, standards and guidelines pertaining to livestock grazing were modified in the recently completed Revised Forest Plan. The intent is to restore and maintain the health of riparian areas and associated stream channels, aquatic habitat and water quality. Revised grazing standards will be implemented in 2004. Impacts around Lonetree Spring have been substantial over the past years. To reduce these impacts, the area was fenced in 2002.

-Recreation-

There are no specific recreation activities within this drainage other than dispersed recreation that occurs throughout the Forest. Dispersed recreation includes hunting, camping, fishing and off-road vehicle travel that occurs throughout the Forest.

-Mining-

Dry Valley is home to Dry Valley Mine, a major phosphate mining operation. Mining operations are analyzed and authorized via an Environmental Impact Statement and administered through a Mining Operation Plan. This Plan is reviewed on a periodic basis and modified as necessary to protect riparian areas, stream channels, aquatic habitat and water quality. The listing of Dry Valley Creek as a 303(d) stream will cause a review of the Operating Plan and, if necessary, adjustments will be implemented accordingly. This will be accomplished with cooperation of other state and federal agencies such as Idaho Department of Environmental Quality and Bureau of Land Management.

Mining is currently not active, but they are still shipping from an ore stockpile. It is possible that another mining company may purchase the lease within the next few years and operations may start up again, but this is not specifically known at this time.

Maybe Creek flows into upper Dry Valley Creek. Selenium contamination from the South Maybe Canyon mine contributes a substantial load to this system. Investigations are underway to identify the source, identify affective remedial technologies and development of remedial alternatives.

-Timber-

An approximate one-million board foot timber sale is being planned within the drainage for the year 2007. Effects on water quality will be analyzed in the accompanying NEPA document.

-Action-

Contaminant releases from South Maybe Canyon are being investigated and actions to reduce or eliminate contributions to Dry Valley Creek will be implemented as soon as possible. Mining impacts from the permitted Dry Valley mine will also be mitigated to minimize impacts from this source.

-Expected Effects-

Modified grazing practices will help maintain overall riparian condition and streambank stability within the drainage. However, current livestock impacts are considered to be light to moderate overall and it is not expected that modified grazing practices will have measurable downstream effects.

Phosphate mining has the greatest impact on the stream channel and water quality. Mine operation and Operating Plans will be reviewed and operations and reclamation measures will be modified accordingly.

-Timelines-

Modified grazing practices will be initiated in 2004.

Mitigations for the Dry Valley mine are in place and investigations and development of treatment alternatives for Maybe Creek are forthcoming in 2004. Implementation will occur once the CERCLA process is completed for alternative selection and negotiations for a cleanup order are concluded. This is expected to occur in 2004.

-Costs-

There are no specific livestock management costs other than routine livestock grazing management that would be implemented regardless of stream status.

The costs of modifying/mitigating mining practices, if any, is yet to be determined.

-Monitoring-

Sufficient data exists to establish both turbidity targets and sediment load allocations. Turbidity targets are established for two sites, above and below the mining activity. Above the mining activity, turbidity targets are not to exceed a 14-day average of 40.55 NTU at high flows and a 28-day average of 24.23 NTU at low flows. Below the mining activity, limitations are set for no net increase targets of a 14-day average not to exceed 4.6 NTU with a daily maximum not to exceed 20.15 NTU for the stream and tributaries in the reach. Load allocations are determined based on a target streambank stability of 80%. Depth fines targets are for support of both cold water aquatic life and salmonid spawning. Depth fines are subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; Subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles

The frequency of monitoring for the parameters will be once every 1-5 years. Because of the influence of the mining on the channel, little channel change is expected. Therefore the bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years. Turbidity sampling will be sampled twice annually, once during high flow and once during low flow. If a monitored parameter exceeds target standards, repeated sampling will occur as needed.

The location of depth fines sampling will be at or slightly above the Forest boundary T8S, R44E, section 21. Bank stability sampling will occur at 3 sites. These are located near the center of sections 22, 27 and 28, T8S, R44E. Turbidity monitoring will be conducted above and below the mining operations, specific sites to be determined.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Turbidity	= $5.00 per sample times 60 samples

Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $540.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Maybe Canyon Creek

Current Situation

Maybe Canyon Creek is listed from near the confluence with Dry Valley Creek to the mining waste dump. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Hazardous substances, primarily selenium, and sediment have been determined to be impairing water quality, affecting the beneficial use of cold water aquatic life, with mining activities the likely pollutant source. The stream is about 4 miles long. About 2 miles of Maybe Creek proper flows through the Caribou/Targhee National Forest. Once leaving the Forest, the stream flows across private land into Dry Valley Creek, approximately 2 miles below the Forest boundary.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment and chemical contaminants, primarily selenium, have been identified in Maybe Creek as limiting water quality. The primary activity within the National Forest System (NFS) portion of the watershed that can affect sediment and contribute hazardous substances is mining.

-Livestock Grazing-

Maybe Canyon Creek is within the Maybe Canyon S&G Allotment. This allotment supports 1000 sheep from June 21 to September 15 annually. Grazing standards are met by herding on an once-over basis. In general, sheep impacts on stream channels are light, because herders are instructed to allow the sheep to water but not loiter or bed within the AIZ. The AMP is scheduled for revision in 2008. At that time, watershed conditions will be assessed and revisions will be made as necessary to protect watershed values and water quality.

-Recreation-

Little recreation occurs within this portion of the Forest due to mining activities. Recreation is not a factor in this drainage.

-Mining-

The Maybe Canyon mine is a non-active phosphate mine within this drainage. Mining operations ceased in 1983. The site is being investigated for future rehabilitation under the authority of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), also known as “super fund”.

-Action-

A site investigation is nearing completion that will identify the sources of contamination and possible remedial alternatives. Public involvement and alternative selection are planned for 2004. Separate negotiations with the responsible parties must be undertaken to implement the selected alternatives. Remedial actions to rehabilitate the site may occur in 2005. Treatment monitoring could last for an additional 10 years to determine the effectiveness of the implemented alternatives.

-Expected Effects-

Surface and groundwater have been adversely affected by Phosphate mining within the drainage. Thirty years of disturbances have substantially damaged the channel and water quality. Implementing remediation at this site may not have an immediate affect on water quality, but should improve conditions over the long-term. Monitoring is necessary to determine the remedial effects and those may occur slowly over 10 years or more.

-Timelines-

Mine operations are reviewed periodically. Monitoring will occur over the next 10 years or so, with remedial actions taken as necessary.

-Costs-

The costs of modifying mining practices, if any, is yet to be determined. Investigation and remedial costs are generally borne by the responsible parties defined for a site. Negotiations for the order to conduct the removal action will allocate costs among the responsible parties.

-Monitoring-

Data were limited to estimate a traditional mass per unit time sediment load allocation and a surrogate load allocation of 80% streambank stability is assessed as well as depth fines for support of cold water aquatic life. Depth fines targets are for support of cold water aquatic life. Depth fines is defined as subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles.

The frequency of monitoring for the parameters will be once every 2-5 years. Because of the influence of the mining on the channel, little channel change is expected. Therefore the bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years. If a monitored parameter exceeds target standards, repeated sampling will occur as needed.

The location of depth fines sampling will be at or slightly above the Forest boundary T8S, R44E, section 10. Bank stability sampling will occur at the same site.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Monitoring the effects of the removal actions at South Maybe will be allocated among the responsible parties. Chemical analysis of water column and sediment content will be performed twice annually as a minimum. One sampling event will occur during the spring during peak runoff and another sample collected during the late summer when runoff affects would not influence contaminant loads. Sampling costs are estimated to be near $2000/year and would last for approximately 10 years following completion of the removal action.

Angus Creek

Current Situation

Angus Creek is listed from the confluence with Blackfoot River to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which is affecting the beneficial uses of cold water aquatic life and salmonid spawning. Livestock grazing and mining are likely pollutant sources. The headwaters for Angus Creek emerge from springs in drainages on and adjacent to the Wooley Valley mine within the Caribou/Targhee National Forest boundary. Water is collected in a reservoir constructed with the mine was active and emerges as Angus Creek. The stream flows through about a mile of NFS lands, then through about a mile of private and state lands, back on the Forest for about ½ mile, then off-Forest into Blackfoot River, about 1 mile below the Forest boundary. Angus Creek is joined by No-Name Creek, an intermittent stream that forms a confluence draining phosphate mined lands to the east. Phosphate mining, ranching and livestock grazing are the primary activities within the drainage.

Proposed Management Activities and Direction addressing TMDLs

-Background-

The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing, mining and recreation. Of these activities, mining has the greatest impact to stream channel stability and water quality. Livestock grazing on private lands is also having an impact, but not to the extent as mining. Livestock grazing on NFS lands has been well managed and the lower stream channel on NFS lands is in excellent condition.

-Livestock Grazing-

Angus Creek is within the Rasmussen C&H Allotment. This allotment supports 378 head of cattle from June 11 thru September 30 on an annual basis. Grazing standards are administered through a rest-rotation system. Stream channel conditions are excellent within NFS lands between the private/state land and the Forest boundary. No changes in livestock management are being proposed in this portion of the drainage. Above the private land, grazing standards will be revised slightly to conform to the new Standards and Guidelines contained in the revised Forest Plan. These revised grazing guidelines will be implemented in 2004. Grazing will continue within the allotment into the foreseeable future**.**

-Recreation-

No specific recreation occurs within this drainage other than dispersed camping, hunting, fishing and off-road vehicle travel that occurs throughout the Forest.

-Mining-

Agrium Company currently is mining in the drainage in North and Central Rasmussen Ridge Mines. Mining operations at Central Rasmussen Ridge have been ongoing for a number of years but most of the ore has been mined and mining operations are winding down. Central Rasmussen is currently being backfilled and should be completely backfilled within the next few years. Mining operations in North Rasmussen Ridge initiated in 2003 are expected to continue for about 8 years, or about 2012. An Idaho State lease south of the mine where Agrium is operating is called South Rasmussen Ridge and is currently being mined my Monsanto.

Rasmussen Ridge has been identified as a potential source of selenium in Angus Creek. While concentrations are currently low, background concentrations of selenium throughout most of the project area are below detection limits. However, selenium detected near Continuous Contaminant Concentrations defined in the Clean Water Act is found in No-Name Creek near the mine. Therefore, an investigation for the release of hazardous substances is scheduled for the southern portion of Rasmussen Ridge, initially mined by Rhone-Poulenc Chemical Company.

Mining ceased at the Wooley Valley Mine in 1991. Since then, selenium was discovered as a contaminant related to phosphate mining. Re3leases were identified in the springs emanating from beneath the Unit IV dump that forms a confluence with the drainage to the east that becomes Angus Creek. Discharging flow from the reservoir has selenium concentrations well below the inflow, though measurements are still above background. Further investigations of the selenium sources and potential control technologies are scheduled to begin in 2004.

-Timber-

Two small firewood sales are scheduled to be implemented in 2008 and 2009. The purpose is to reduce fuel loading by removing down and dead trees.

-Action-

A site investigation may be initiated in 2005 at Rasmussen Ridge and 2004 at Wooly Valley. No other actions will occur other than that noted above.

-Expected Effects-

Modified grazing practices will help maintain overall riparian condition and streambank stability within the drainage.

Phosphate mining has the greatest impact on the stream channel and water quality. Ongoing and future studies and mitigation projects should help retard selenium releases in the future. Once investigations of contaminant releases are complete, a decision will be made whether to remediate the southern portions of Rasmussen Ridge and Wooley Valley mines.

-Timelines-

There are no specific timelines other than that noted above.

-Costs-

The costs of modifying mining practices, if any, is yet to be determined. Investigation costs are incurred by the responsible mining companies. Remedial costs will be negotiated and allocated among the responsible parties.

Livestock and recreation administration costs are routine costs that would be implemented and administered regardless of stream status.

-Monitoring-

From information collected as part of the ISCCs Proper Functioning Condition evaluation, sediment loads are estimated with load allocations based on a target streambank stability of 80%. Depth fines targets are advocated for support of both cold water aquatic life and salmonid spawning. Depth fines are subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; Subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles

The frequency of monitoring for the parameters will be once every 2-5 years. Because of the influence of the mining on the channel, and the livestock grazing occurring on private lands, little channel change is expected. Therefore the bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years.

The location of depth fines sampling will be at or slightly above the Forest boundary T7S, R44E, section 5. Bank stability sampling will occur at 3 sites. These are located near the center of section 6 (T7S R 44E), and sections 27 and 34, T6S, R43E.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval

Total Cost per interval	= $200.00 to $240.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Mining contaminant monitoring is a standard component of mine operations. Monitoring water quality in Angus Creek will continue at the expense of the mine operator through completion of mining activities as specified in the mine's operating and monitoring plan. Water quality parameters and hazardous substances identified in the Clean Water Act are monitored at all sites.

Lanes Creek

Current Situation

Lanes Creek is listed from the confluence with Blackfoot River to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which is affecting the beneficial uses of cold water aquatic life and salmonid spawning. Livestock grazing is the likely pollutant source. Only a short reach (approximately 2 miles) of Lanes Creek headwaters flow through the Caribou/Targhee National Forest. Once leaving the Forest, the stream flows approximately 12 miles through state and private land before reaching the Diamond Creek confluence. The confluence of Lanes and Diamond Creek marks the "official" beginning of the Blackfoot River. Livestock grazing occurs on NFS, but impacts to Lanes Creek are limited. The 12 or so miles of private lands below the Forest boundary are heavily grazed by livestock. The stream channel has been heavily altered by both grazing and modifications by the private land owners.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment has been identified in Lanes Creek as limiting water quality. The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing and recreation.

-Livestock Grazing-

Lanes Creek is within the Lanes Creek S&G Allotment. This allotment supports 1000 head of sheep, managed by herding on an once-over basis. Impacts to the channel by sheep are light, as the herders are instructed to allow the sheep to water in the stream, but are not allowed to loiter or bed in the AIZ. The AMP is scheduled to be re-evaluated in 2006. At that time overall watershed conditions will be evaluated and changes to management, if needed, will be implemented in 2007. The allotment was not grazed in 2002 or 2003.

-Recreation-

Recreation on the NFS portion of this drainage is limited. The private land owner below the Forest boundary allows only selected individuals to pass through his land on to the Forest. There is no road access to or from the upper portion of the watershed.

-Mining-

There is no mining within this drainage within the Forest. However, mining is conducted on private lands down gradient of the Forest. Both aggregate for road surfacing and phosphate have been or are being mined.

-Timber-

An overstory removal timber sale is scheduled in Browns Canyon by 2005, depending on roadless issues and interpretation of Federal Regulations concerning roadless areas. The sale would impact about 50 acres of Browns Canyon, tributary to Lanes Creek. Impacts would be evaluated through NEPA.

-Action-

No specific actions will be taken other than livestock grazing modifications noted above.

-Expected Effects-

The effects of modified livestock grazing standards will have some positive effects on channel stability and water quality. However, the major impacts to the stream channel and water quality exist on the private lands, located below the Forest boundary. Unless management on these lands changes drastically, no changes in overall water quality are expected.

-Timelines-

Revised grazing standards on NFS lands will be implemented in 2004.

-Costs-

There are no costs associated with implementing revised grazing standards other than those normally associated with livestock management. There will be no recreation management costs other than routine administration costs.

-Monitoring-

From information collected as part of the ISCCs Proper Functioning Condition evaluation, sediment loads are estimated with load allocations based on a target streambank stability of 80%. Depth fines targets are advocated for support of both cold water aquatic life and salmonid spawning. Depth fines are subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; Subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles

The frequency of monitoring for the parameters will be once every 2-5 years. Because of the influence of the livestock grazing occurring on private lands, little channel change is expected. Therefore the bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years.

The location of depth fines sampling will be at or slightly above the Forest boundary T5S, R45E, section 30 or 31. Bank stability sampling will occur at 2 sites. These are located near the center of section 31 (T5S R 45E), and section 5 T6S, R45E.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Bacon Creek

Current Situation

Bacon Creek is listed from the confluence with Lanes Creek to the Forest boundary. No segment occurs within the Forest boundary. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Livestock grazing is the likely pollutant source. Sediment has been determined to be impairing water quality, which is affecting the beneficial uses of cold water aquatic life and salmonid spawning. Below the Forest boundary the stream channel has been diverted into multiple channels for irrigation and it is difficult to determine which one is the original channel and which is an irrigation ditch. These multiple channels are affecting stream connectivity and in-stream aquatic habitat.

Proposed Management Activities and Direction addressing TMDLs

-Background-

The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing and some limited recreation

-Livestock Grazing-

The majority of livestock grazing within this drainage occurs on the private land located at the lower end of the drainage. This is the same private land that is described in the Lanes Creek segment. The private land portion of the drainage is heavily grazed. Bacon Creek is within portions of the Diamond Boulder and Lower Bacon S&G Allotments. Both allotments support slightly over 1000 sheep. Grazing is from early July to mid-September. Herders are instructed to allow sheep to water in the stream, but the sheep are not allowed to loiter or bed within the AIZ. As a result, impacts to Bacon Creek are minimal. Both AMP's are scheduled for revision in 2006, and changes in grazing management and/or strategies, if needed, will be implemented in 2007.

-Recreation-

Recreational activities are limited in this drainage to an occasional hunter or hiker. Access is restricted to the public across the private lands on the downstream end of the drainage and there are no roads accessing the upper portion of the drainage.

-Timber-

No timber harvesting is occurring or anticipated to occur in this drainage in the foreseeable future.

-Mining-

There is no mining within this drainage.

-Action-

There will be no action taken other than that identified in Livestock Grazing above.

-Expected Effects-

Existing conditions on NFS lands will be maintained. Modification of grazing practices will have limited effects due to the good to excellent overall condition of the drainage that currently exists. Grazing effects on the private lands below the Forest boundary are not expected to change within the foreseeable future.

-Timelines-

Revised grazing standards will be implemented in 2004.

-Costs-

There are no costs other than routine grazing administration that is already occurring.

-Monitoring-

No monitoring will be done for this stream segment. Impacts within the Forest boundary are minimal and existing conditions are good to excellent. No detrimental changes within this watershed are expected in the foreseeable future on NFS lands.

Sheep Creek

Current Situation

Sheep Creek is listed from the confluence with Lanes Creek to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which are affecting the beneficial uses of cold water aquatic life and salmonid spawning. The majority of the stream is within the Forest boundary, but about two miles are within private lands which are heavily utilized by livestock. Sheep Creek has historically been a primary spawning tributary for wild cutthroat trout within the Blackfoot River system. Cutthroat trout spawning surveys conducted in the 1980's and early 1990's showed a progressive decline in the number of spawning cutthroat trout in the system. One reason for the decline was attributed to the poor in-stream habitat conditions within the private lands on the lower portion of the stream. Stream channel conditions within the Forest are considered to be good overall. Numerous beaver ponds dominate the drainage on Forest land near the Forest boundary. Phosphate mining occurs in the upper headwaters of the drainage, but impacts to the stream have been minimal.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment has been identified in Sheep Creek as limiting water quality. The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing, mining and recreation.

-Roads-

There are no open roads within this drainage, except the Lanes Creek road (FDR 1203) that crosses Sheep Creek. The Lanes Creek road is on private land and maintained by the County. An old road parallels the stream within the Forest boundary, but it has not been used for a number of years and it is currently stable.

-Livestock Grazing-

Sheep Creek is within the Sheep Creek S&G Allotment. This allotment supports 1000 sheep from July 1 to September 5, annually. Grazing is via herding on an once-over basis. Sheep are allowed to water from the stream, but are not allowed to loiter or bed in the AIZ. As a result, impacts to the AIZ and stream channel from sheep are minor. The AMP is scheduled for updating in 2008 and changes in management, if needed, will be implemented in 2009. The lower portion of the stream is within private land. The range is extensively used by private livestock growers and is part of the Lanes Creek pasture complex. Impacts to Sheep Creek on these private lands are extensive.

-Recreation –

Recreation activities within this drainage are minimal, mostly limited to an occasional hunter or hiker. Public access through private land located below the Forest boundary is restricted. However, an unauthorized, user-pioneered, 4-wheeler trail accesses the area from the Olson Creek road, located north of Sheep Creek. Disturbance is limited to the trail itself. Access to the upper end of the drainage is restricted due to phosphate mining activity.

-Timber-

No timber harvesting is currently ongoing or expected to occur within the foreseeable future.

-Mining-

Agrium Company currently is mining in the drainage in North and Central Rasmussen Ridge Mines. Mining operations at Central Rasmussen Ridge have been ongoing for a number of years but most of the ore has been mined and mining operations are near completion. Central Rasmussen is currently being backfilled and should be completely backfilled with waste rock from phosphate mining and should be completely backfilled within the next few years. Mining operations at North Rasmussen Ridge began in 2003 and are expected to continue for approximately eight years. South Rasmussen Ridge is currently being mined my Monsanto.

-Action-

There will be no specific action taken within this drainage within NFS lands. Mining is regulated through the Mining Operating Plans and will continue to be so. Livestock grazing will continue and is managed through standards and guidelines in the Revised Forest Plan.

-Expected Effects-

Existing conditions on NFS lands will be maintained or improved. Modification of grazing practices will have limited effects due to the good overall condition of the drainage that currently exists. Grazing effects on the private lands below the Forest boundary are not expected to change within the foreseeable future.

-Timelines-

Grazing modifications will occur in 2003.

-Costs-

There will be no specific costs other than routine grazing and mine management that is already occurring.

-Monitoring-

Little data are available to estimate a traditional mass per unit time sediment load allocation, therefore a surrogate load allocation of streambank stability of 80% is targeted. Depth fines targets are advocated for support of both cold water aquatic life and salmonid spawning. Depth fines are subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; Subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles

The frequency of monitoring for the parameters will be once every 2-5 years. Because of the influence of the livestock grazing occurring on private lands, little channel change in overall channel condition is expected. Therefore the bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years.

The location of depth fines sampling will be at or slightly above the Forest boundary T6S, R44E, section 30. Bank stability sampling will occur at 2 sites. These are located near the center of section 30 (T6S R 44E), and section 25 T6S, R43E.

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel)	= $200.00
Bank Stability	= no per sample cost
Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This will include salary and travel costs, as well as per sample analysis and equipment costs.

Diamond Creek

Current Situation

Diamond Creek is listed from the confluence with Lanes Creek to its headwaters. Designated beneficial uses include cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. Sediment has been determined to be impairing water quality, which is affecting the beneficial uses of cold water aquatic life and salmonid spawning. The majority of Diamond Creek occurs within the Forest boundary. The lower portion (about 5 miles) is within state and private lands. A road parallels the stream and crosses it several times, but sediment from this source is minimal. Historical activities that have occurred within this drainage include timber harvesting, mining, recreation and livestock grazing. During drought periods (as has occurred over the past several years), substantial reaches of the stream have been dry or have had very low flows during much of the year. Only during the springtime snowmelt runoff has water flowed through these reaches in recent years.

Livestock grazing has been identified as a likely pollutant source for sediment. Over the past decade, the Forest has taken major steps in reducing livestock grazing impacts and improving/protecting the stream channels. Numerous tree revetments have been placed in the channel to protect the banks and promote healing. These have been extremely effective in some locations. Tributaries, such as Bear Canyon and Stewart Canyon, have had the AIZ fenced from livestock to protect the channel and riparian area and promote healing. Off-site watering has been developed in several locations to reduce livestock impacts within the AIZ. Recreation in the form of dispersed camping and ORV use is heavy within the drainage. The area is popular for hunting camps and, during the hunting season, a dozen or so separate group camp sites can be found throughout the drainage. Summertime camping is also popular within the drainage. Even though there is a developed camp ground in the drainage, it is often bypassed by campers in favor of dispersed sites.

ISCC surveyed the stream for Properly Functioning Condition in 1999. It found some reaches in non-functioning condition, but the majority of the channel was at PFC or Functioning-at-Risk with an upward trend. Evaluations by the Forest have had similar findings.

Proposed Management Activities and Direction addressing TMDLs

-Background-

Sediment has been identified in Diamond Creek as limiting water quality. The primary activities within the National Forest System (NFS) portion of the watershed that can affect sediment are livestock grazing, mining and recreation. The newly revised Caribou

Forest Plan addresses all these activities and prescribes specific standards and guidelines required to protect resources, including water quality.

-Livestock Grazing-

Diamond Creek is within the Diamond Creek C&H Allotment. This allotment has 280 head of cattle from June 6 to October 10. Management is on a pasture rotation basis. In 2004 Standards and Guidelines in the revised Forest Plan will be implemented which will help to further protect and improve the riparian area, stream channel and water quality. The lower reach of Diamond Creek is within private land. These lands are heavily used by livestock, and impacts to the stream channel are extensive.

-Recreation-

Dispersed camping is extremely popular within the drainage. Campers can be found throughout the summer and through the fall hunting season. In the past several years, ORV's have been pioneering new trails throughout the watershed. Efforts are currently being made to control these new trails and limit or restrict the location of some dispersed camp sites that are adjacent to Diamond Creek and tributaries. The Diamond Creek Camp Ground is located near the junction of the Timber Creek road. This small camp ground is not heavily used, with most visitors preferring to camp at other dispersed sites. The Forest also maintains the Johnson Guard Station, located about a mile north of the Diamond Creek campground. This complex consists of several buildings and contains a well and septic system. The buildings are used by Forest Service personnel working in the area and are rented to the public on a day-by-day basis, pending availability. There are no known effects to the water quality of Diamond Creek from either the camp ground or guard station.

-Mining-

There is currently no active mining within the drainage. If a new activity is proposed, an Environmental Impact Statement will have to be prepared which would include an assessment of the water resources and mitigating measures needed to protect water quality. A slurry pipeline from Smokey Canyon Mine, located east of Diamond Creek, currently crosses Diamond Creek. The pipeline was installed in the 1980's. During construction, there were some short-term impacts to Diamond Creek, specifically sediment, but the disturbed area has been revegetated and is currently stable.

-Timber Harvesting-

There has been numerous timber harvesting activities within this drainage over the past several decades. The last harvesting activity occurred in 2001 in Campbell Canyon, tributary to Diamond Creek. Best Management Practice reviews have shown that these sales have not had any measurable effect on Diamond Creek water quality. There is no harvesting scheduled in this drainage within the foreseeable future.

-Action-

There will be no specific actions taken within this drainage within NFS lands. Livestock grazing will continue and is managed through standards and guidelines in the Revised Forest Plan. Recreation will be managed through routine recreation management.

-Expected Effects-

Existing conditions on NFS lands will be maintained or improved. Modification of grazing practices will have positive effects on the riparian area and stream channel.

-Timelines-

Modification of grazing practices will occur in 2004. No other actions are anticipated at this time.

-Costs-

Only those costs of routine Forest management and administration will be incurred. These costs would occur regardless of stream status.

-Monitoring-

From information collected as part of the ISCC's Proper Functioning Condition evaluation, sediment loads are estimated with load allocations based on a target streambank stability of 80%. Depth fines targets are advocated for support of both cold water aquatic life and salmonid spawning. Depth fines are subdivided into two categories: Subsurface streambed sediment less than 6.25 mm not to exceed a 5-year average of greater than 25% by volume in riffles; subsurface streambed sediment less than 0.85 mm not to exceed a 5-year average of greater than 10% by volume in streams with salmonid spawning as a beneficial use in riffles

The frequency of monitoring for the parameters will be once every 2-5 years. Because of actions already taken and those proposed, bank stability will be monitored every 2 years and the depth fines sampling interval will be every 5 years.

The location of depth fines sampling will be at or slightly above the Forest boundary T7S, R45E, section 31. Bank stability sampling will occur at 3 sites. These are located near the center of section 8 (T8S R 45E), section 28 (T8S, R45E) and section 16 (T9S, R45E).

The cost of monitoring and sample analysis is estimated to be:

1 person day per sampling interval (includes travel) = $200.00
Bank Stability = no per sample cost

Depth Fines	= $20.00 per sample
Miscellaneous supplies and equipment	= $20.00 per interval
Total Cost per interval	= $200.00 to $240.00, depending on parameter(s) sampled

If additional sampling is needed, additional costs per sample will add to the total cost above. This includes salary and travel costs, as well as per sample analysis and equipment costs.

FOREST PRACTICES

Forestry Pollution Control Strategies

Under the 1972 Clean Water Act, Congress authorized states to control nonpoint sources of pollution through the implementation of Best Management Practices (BMPs). A BMP is defined as a measure determined to be the most effective and practical means of preventing or reducing pollution inputs from point or nonpoint 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 Act 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, and the management of slash and the use of prescribed fire.

The Idaho Water Quality Standards and Waste Water Treatment Requirements, Title 39, Chapter 1, Idaho Code, reference the Forest Practices rules as the approved BMPs for silvicultural activities. The Idaho Department of Lands (IDL) is the designated state agency responsible for administering and enforcing the FPA on all forestlands in the state. On federal lands, the FPA must be met or exceeded.

Regulatory Actions

Prior to harvest of timber, a logging operator must notify IDL of planned timber harvest by filing a Certificate of Compliance & Notification of Forest Practice. This Compliance & Notification form lists the legal description of the area to be harvested, the contractor responsible for slash management, operator responsible for FPA compliance, landowner, and log purchasers. Fire hazard and basic forest environmental information on stream class, soil erodibility, and slope gradient 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.

When the department determines that an operator has violated any provision of the FPA, it shall be considered a violation and an unsatisfactory report and/or a Notice of Violation (NOV) may be issued. An unsatisfactory report is issued if the violation is minor. If the unsatisfactory items are corrected in a timely manner, no Notice of Violation will be issued. A NOV will be issued for all major infractions, where serious resource damage has occurred or will occur; or when an operator fails to correct previously noted unsatisfactory conditions. The NOV will specify the rule that was violated, any damage or unsatisfactory condition, and required repair or mitigation. If the operator corrects the violation, no further action is taken. If an operator fails to correct the problem the next step would be to issue a Cease and Repair Order and/or a Stop Work Order. At this time

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.

Compliance inspections were completed by the IDL Forest Practices Advisor during 2005 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.

As the IDL does not have enough personnel 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 to assist operators to comply with the FPA.

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 or multiple entries. The Idaho Cumulative Watershed Effects process (CWE) includes assessing erosion hazards, canopy closure, stream temperatures, 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.

As 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. To mitigate road issues the BMPs identified in the FPA provide protection against erosion, sediment delivery and other resource damage.

Monitoring Plan

Forest practices in the Blackfoot watershed may be inspected for compliance with the FPA. If any unsatisfactory conditions are identified, they will be corrected using standard IDL enforcement procedures. The IDL office in Idaho Falls will be the office of record for all Compliance and Notifications and FPA inspection reports in this drainage. 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 applications and effectiveness of Idaho Forest Practices Rules. This interagency independent audit is conducted every four years. The 2004 Forest Practice state wide audit found that FPA rules were implemented 99% 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.

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 of forest practices 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 rehabilitative 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 Landowners Stewardship Program and grants are other possible sources of limited funding for additional volunteer site-specific forest BMPs.

MINE PRACTICES

Mining 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 (BMP). A BMP is defined as a measure determined to be the most effective practical means of preventing or reducing pollution inputs from nonpoint sources in order to achieve water quality goals. Idaho surface mining BMPs are included in the Idaho Surface Mining Act (SMA), Title 47, Chapter 15. Idaho Code 47-1501 states "it is the purpose of this chapter to provide for the protection of the public health, safety and welfare, through measures to reclaim the surface of all the lands within the state disturbed by exploration and surface mining operations and measures to assure the proper closure of cyanidation facilities and thereby conserve natural resources, aid in the protection of wildlife, domestic animals, aquatic resources, and reduce soil erosion." (Idaho Code Title 47, Chapter 15, 47-1501.)

Under Executive order 88-23 (the Antidegradation Policy), the Idaho Department of Lands (IDL) is designated as the lead agency for surface mining and dredge and placer mining practices on all lands within the state, excluding tribal lands. IDL works closely with Idaho Department of Environmental Quality (IDEQ) in connection with the Surface Mining Act which forms the basis for achieving State and Federal consistency for nonpoint source activities on mined lands. Furthermore, IDL consults and cooperates with federal land managers (USFS and BLM) as well as other state agencies (Idaho Department of Fish Game and Idaho Department of Water Resources) to develop appropriate reclamation plans (Environmental Impact Statements for federal agencies on federal land).

The use of Mining Reclamation Plan information in developing TMDL implementation plans for watersheds will identify problem areas within the Blackfoot watershed and aid in the development of site specific BMP's for this TMDL implementation plan.

Selenium is the main contaminant resulting from phosphate mining within the Blackfoot Watershed. In addition to BMP's identified through the SMA, IDL, in conjunction with other federal agencies and phosphate mining companies, has developed the Selenium Management Practices guide to help eliminate selenium contamination from current and future mining practices. The revised BMP's found in the Selenium Management Practice guide have resulted in decreased amounts of selenium contamination from new mines. However, mine waste areas developed prior to the discovery of the selenium problem are still causing downstream contamination in the watershed. Discussions and studies among state and federal agencies, as well as the phosphate companies, are currently underway to resolve this pre-existing problem.

The main source of selenium contamination from phosphate mining is where middle waste shale overburden was placed outside of mined out pits, usually in valleys that are classified as a class 2, 3 or ephemeral. This practice was halted with the discovery that

selenium was becoming bioavailable due to surface and sub-surface water leaching selenium from the middle waste shale's within the overburden piles. BMP's identified in the Selenium Management Practices guide decrease the amount of selenium that can be leached out of new overburden piles.

Regulatory Actions

Under the SMA all mine operators, regardless of being on state, federal, or private lands, in Idaho must develop and submit a Reclamation Plan to the Idaho Department of Lands prior to mining. After IDL accepts the Reclamation Plan, a bond must be submitted by the mine owner or operator that will cover the entire estimated cost of the reclamation of the disturbed area. Periodically an inspection is conducted to insure the mine is being operated in accordance with the Reclamation Plan. If violations are found during an inspection then civil penalties will be assessed.

The IDL office in Idaho Falls will be the office of record for all SMA documentation concerning mining in the Blackfoot Watershed.

Reclamation Plan

Reclamation plans identify how a mine will be developed in relation to its surroundings. The plan details the location of the mine, its area and depth, where stockpiles and mine related equipment will be placed, where access and exit routs are established, the distance and location to the nearest water body, and how the mine will be reclaimed and what it will look like at the end of mine life.

Monitoring Plan

Mining practices in the Blackfoot Watershed may be inspected yearly for compliance with SMA. If any unsatisfactory conditions are identified, they will be corrected using standard IDL enforcement procedures.

SMA compliance inspections primarily include the following:

1. Area disturbed (acreage).
2. Type of disturbance.
3. Topography
4. Vegetation
5. Type of mining equipment.
6. Relationship with natural watercourses.
7. Hydrology issues.
8. Road stability and drainage.
9. Topsoil stockpiled and stable.
10. Weed control.
11. Erosion problems and potential problems.
12. Hazardous waste storage and removal.
13. Condition of pit walls in relation to their current state, final reclamation and potential safety issues.

14. Backfilling permits and covers. (If a pit is going to be backfilled with anything but concrete and asphalt debris, the mine operator will have to work with DEQ and acquire a Non Municipal Solid Waste Facility permit.)
15. Make sure mine is in compliance with other permits need.

IDL has the right of inspection on all lands. "Authorized officers of the Department of Lands, upon presentation of appropriate credentials, shall have the right to enter upon lands affected or proposed to be affected by exploration or surface mining operations to determine compliance "with SMA rules. (IDAPA 20.03.02.160.01 - Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities)

To date all current phosphate mining operations have been found to be in conformity with the SMA and relevant BMP's.

In addition to the regular SMA inspection program conducted by IDL, IDEQ oversees the water quality monitoring by the mining companies and periodically checks this data with testing of their own.

The Selenium Management Practices guide will be revised periodically to incorporate the latest and best technology and engineering practices.

Performance Bond Requirements
Under the SMA, mining companies are responsible for posting a bond prior to the beginning of any surface mining on a mine panel covered by a plan. "An operator shall submit to the director, on a surface mining reclamation bond form, a performance bond meeting the requirements of this rule. The amount shall be the amount necessary to pay the estimated reasonable costs of reclamation required under the reclamation plan for each acre of land to be affected during the first year of operation, plus ten (10%) percent." (IDAPA 20.03.02.120.01 - Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities)

All bonds will be for the reclamation of the mine only. IDL is not allowed to bond for water quality issues.

Civil Penalties
Civil penalties will be assessed against an operator of noncompliance. "In addition any operator who violates any of the provisions of the act or these rules, or who fails to perform duties imposed by these provisions, or who violates any order pursuant to the provisions of these rules shall be liable to a civil penalty of not less than five hundred dollars or more than two thousand five hundred dollars for each day a violation continues after notice from the director that such violation has occurred. In addition, the director may seek injunctive relief against the operator to enjoin the operator from continuing such violations." IDAPA 20.03.02.160.06.a - Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities)

“Any person who willfully and knowingly falsifies any records, plans, information, or other data required by the SMA rules, or willfully fails, neglects, or refuses to comply with any of the provisions of these rules, shall be guilty of a misdemeanor and shall be punished by fine of not less than one thousand dollars ($1,000.00) or more than five thousand dollars ($5000.00) or imprisonment, not to exceed one (1) year.” (IDAPA 20.03.02.160.06.b - Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities)

When and if the operator of an affected mining operation comes into compliance from an order of noncompliance “the director will consider the matter resolved and shall take no further action with respect to such non-compliance.” (IDAPA 20.03.02.003.05 - Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities)

TOTAL MAXIMUM DAILY LOAD IMPLEMENTATION PLAN
Idaho Transportation Department
District 5, Pocatello
For State Highways and Local Public Roads in the
Blackfoot River Watershed

September 11, 2003

OVERVIEW

The mission of the Idaho Transportation Department (ITD) is to provide high quality, cost-effective transportation systems that are safe, reliable, and responsive for the economical and efficient movement of people and products. ITD's operations include the highest possible level of environmental quality while serving the transportation needs of a growing population. ITD also provides local transportation agencies with planning support and contract administration services for Federally funded activities associated with local roads. For the Blackfoot River Implementation Plan, ITD will be working with local agencies that include Bingham, Bonneville, and Caribou Counties as well as the city of Blackfoot.

Inherent to ITD's mission and operations is the protection of the natural and human environment. ITD operates in compliance with all associated Federal, State, and local rules and regulations. Due to the hydrology and geomorphology in southeastern Idaho, compliance can be particularly challenging when dealing with environmental protection.

The effects of State and local roadway infrastructure on environmental quality is predominantly dictated by past roadway corridor development. For the most part, highway corridors are well established and will continue to influence environmental baseline conditions. Maintenance activities and roadway improvement projects on existing routes do pose some risk of additional adverse impact to these systems, primarily from short-term construction related sediment discharges. ITD's response to this risk has been and will continue to be a comprehensive effort to control erosion and manage sediment within construction limits.

In some cases, adverse environmental impacts resulting from previous construction of transportation systems near bodies of water may be correctable through beneficial stream channel and floodway alterations and/or reclamation actions. These may include but are not limited to the use of biological and physical stabilization techniques, as well as realignment and subsequent removal of original roadway fill material. Such opportunities have not been formally identified but a few may exist on the State highway system and within local roadway corridors.

s Total Maximum Daily Load (TMDL) Implementation Plan identifies various commitments made by ITD and local transportation agencies to prevent, and in some cases reduce sediment discharges to the Blackfoot River watershed. ITD's TMDL commitments are based on existing ITD policies for erosion and sediment control, an acknowledgment of new and improved erosion and sediment control products and practices, and a proactive effort to inventory and correct existing problem areas.

COMMITMENT TO WATER QUALITY

ITD is directed to implement effective erosion and sediment control practices by requirements set forth in the following ITD policies and standards:

- ITD-Administrative Policies A-04-07 and A-04-05 (Environmental Monitoring)
- ITD-DOH Memo No. E2 (Erosion and Sedimentation Control)
- ITD's Design Manual

Point and nonpoint source discharges from many State and local projects are subject to existing environmental requirements such as Clean Water Act Sections 402 (EPA-NPDES) and 404 (Army Corps of Engineers-Dredge and Fill), Idaho non-point source regulations, and local storm water and floodplain ordinances. National Environmental Policy Act (NEPA) requirements apply to all ITD and local agency projects that use Federal Aid funding, as administered by the Federal Highway Administration (FHWA). All of these requirements reinforce ITD's commitment to environmental protection. Table 1 documents inter- and intra-agency coordination and commitments from project development through construction.

TRAINING

Training for the District Environmental Planning Section includes courses in design, inspection, and regulations. Some courses offered to ITD planners, local agencies, consultants, and contractors are:

- Sediment Control/Wetland Workshop – Idaho Department of Environmental Quality
- NPDES Storm Water Management – ITD
- Best Management Practices (BMP) Training – ITD
- Stormwater Design to Protect Watersheds – Environmental Protection Agency
- Fish Passage Structure Course – FHWA
- Riparian Zone Ecology, Restoration & Management – Natural Resource Conservation Service
- River Channels: Form and Process – Luna Leopold, Teton Science School
- Clean Water Act/Wetlands for Planners – US Army Corps of Engineers
- Federal Wetland Policy/404 Permits – US Army Corps of Engineers
- Basic Wetland Delineation – Wetland Training Institute
- Wetland Plant Identification – Natural Resource Conservation Service
- Basic Hydric Soils & Hydric Soils for Wetland Delineation – US Army Corps of Engineers
- Watershed Funding Workshop – Environmental Finance Center, Boise State University
- Endangered Species Act & Biological Assessment – US Fish and Wildlife Service

The Design Section develops and manages the development of the plans and specifications for State and Federally funded construction projects. The ITD designers and project managers attend training in the following areas to enhance their knowledge and awareness of environmental issues:

- Project Development and Environmental Documentation – ITD
- Culvert Design – FHWA
- NPDES Storm Water Management – ITD
- Stormwater Design to Protect Watersheds – EPA
- Fish Passage Structure Course – FHWA

- Sediment Control/Wetland Workshop – IDEQ

Project Inspectors at ITD are required to complete an Inspector Qualification Program. Since both Construction and Maintenance personnel are responsible for inspecting projects, both sections are trained under this program. These courses are also open to local agencies, consultants, and contractors. The following Qualification Areas pertinent to Best Management Practices (BMP) are taught by ITD trainers:

- NPDES/Storm Water Inspector Training – ITD
- Wetland Identification and Regulation for ITD Inspectors – ITD
- Hazardous Materials Watersheds – ITD

Some ITD employees attend training taught by the National Highway Institute (NHI), a section of the Federal Highway Administration. Some example courses are:

- Highways in the River Environment
- Stormwater Pump Station Design
- Fundamentals of Air Quality for Highway Planning and Project Development
- Workshop on Transportation /Air Quality Analysis
- Functional Assessment of Wetlands (WET II)
- Managing the Environmental Process
- Stream Stability and Scour at Highway Bridges for Bridge Inspectors
- Urban Drainage Design
- Culvert Design

ITD, in cooperation with the U.S. Forest Service (USFS), will develop a workshop on the construction and maintenance of gravel roads to minimize erosion and sediment transport. This workshop will be available to the local agencies listed in the Overview Section.

MONITORING AND EVALUATION

With respect to sediment load allocations, ITD's TMDL monitoring and evaluation effort follows existing ITD administrative policies and procedures for erosion and sediment control (i.e., Administrative Policy A-04-07, Environmental Monitoring). These policies describe intra-agency coordination procedures for ITD's Project Development, Construction, and Maintenance staff involved with erosion and sediment control planning, implementation, and BMP effectiveness monitoring. The most notable element of these policies is the assignment of an Environmental Inspector on all construction activities. ITD's environmental inspections will continue to improve with the current trend of increased collaboration among Environmental Planners, Design Engineers, Construction Engineers, Inspectors, and reviewing agencies. Frequent BMP inspections by these multidisciplinary teams will continue to facilitate proper BMP maintenance and will provide critical feedback needed to ensure compliance with non-point source pollution regulations.

COSTS AND FUNDING

The cost of ITD's portion of the TMDL Implementation Plan will be funded from existing transportation programs. ITD anticipates minimal additional expense because of this plan. Effective erosion and

sediment control is not limited by project funding. Costs of erosion and sediment control practices and/or water quality improvement projects will be commensurate with the need to abate or correct particular water quality concerns in the Blackfoot watershed as they become apparent. ITD typically spends an average of five percent to ten percent of project costs on erosion and sediment control devices, mitigation, and monitoring.

Priority projects to improve water quality, as identified by ITD and local agencies during annual field inspections, may qualify for enhancement funds provided by TEA-21 or other Federal funding sources. ITD and local agencies will seek such funding on an ongoing basis. Local agencies are expected to pursue grants and other funding sources should State and Federal funds not be available.

PUBLIC INVOLVEMENT

The ITD District 5 Environmental Planner attends the Blackfoot Watershed Advisory Group (WAG) meeting whenever invited. This lends opportunity to hear public concerns and the ability to address these concerns in a timely manner. Mitigation opportunities often surface through discussion with agencies and the public that attend the WAG meetings.

As a State agency, all of ITD's operations involve the public. Most, if not all, of ITD's moderate to large scale projects include public involvement plans and well-advertised public meetings and/or hearings. In addition, Federally funded projects, which comprise the majority of ITD's projects, are subject to formal public involvement requirements set forth by FHWA. ITD continues to welcome and seek comment and review of its projects and erosion control policies and practices by the public and public agencies. The ITD District 5 office is located at 5151 S. 5th Avenue in Pocatello and is open weekdays between the hours of 8:00 am and 5:00 pm. Engineering and Environmental staff can be reached by telephone at (208) 239-3300.

Table 1

ITD TMDL MANAGEMENT MEASURES AND PARTICIPATION

MANAGEMENT MEASURES	ITD D5	LOCAL AGENCIES	ITD HQ	Contractor	FHWA	DEQ	Frequency or *Completion Time
1. ITD-D5 SEDIMENT CONTROL BMPS, PROCEDURES, AND REVIEWS							
a. Revise ITD-BMP Catalog and provide training	X		X				*06/02
b. Emphasize the following: • use of erosion and sediment control devices • protection of buffer zones • effective use of perimeter controls • specify erosion protection for runoff channels • rock armor erodible areas in and near concentrated flows • frequent use of check dams and sediment traps • use fast establishing cover crops • use retaining walls to avoid wetlands and streams where feasible	X		X				Every project
c. ITD preliminary design reviews	X		X				Every project
d. ITD final design reviews	X		X			Request	Every project
e. Environmental clearances (EISs, EAs, Cat Ex.)	X		X		X		Every project
f. Plans, specification and estimates (PSE) Reviews	X		X			Request	Every project
g. Pre-construction conferences	X			X		Request	Every project
h. Environmental inspections	X		X	X	X	Request	Every project
i. 404 compliance	X			X			Every project
j. NPDES compliance	X			X			Every project
k. TMDL compliance review	X					X	Annually
2. CONSTRUCTION CONTRACTS							
a. Stricter winter shutdown specifications and scheduling on large earthwork jobs	X			X			As needed
b. Construction staging plans	X			X			Every project
3. ITD/LOCAL AGENCY WATER QUALITY IMPROVEMENT							
a. ITD/Highway District MOA	X	X					*05/04
b. Develop list of known problem areas	X	X					*06/04
c. Annual evaluation of known or suspected problem areas	X	X					Spring of each year
d. List of future projects in TMDL watersheds	X	X					Ongoing
e. Planning and implementation of water quality enhancement projects	X	X					Ongoing

Appendix A

TIMELINE FOR IMPLEMENTATION

Idaho Transportation Department – District 5, Pocatello

1. Inventory roads and areas of sediment contribution
   Direct – roads, culverts
   Indirect – stormwater runoff from construction or maintenance projects
2. Remedy problem areas identified in survey
   Expected reductions – Not known at this time
   Cost – survey and remediation will be covered by State and Federal funds
3. Continue ongoing training for Planners, Designers, Inspectors, and Maintenance employees to stay current on erosion and sediment control issues, products, and procedures.
4. Timeline

Year 1	Survey roads and culverts to identify areas of sediment contribution
	ITD and U.S. Forest Service gravel road workshop development
Year 2	Continue road and culvert survey
	Budget or program funds for projects in problem areas identified
Year 3	Begin work on problem areas (e.g., replace culverts, stabilize banks)
	Budget or program funds for projects in problem areas identified
Year 4-9	Continue working on problems areas
	Budget or program funds for projects in problem areas identified
Year 10	Complete work identified by survey

County Highway and Highway District

1. Inventory roads and areas of sediment contribution
   Direct – roads, culverts
   Indirect – stormwater runoff from construction or maintenance projects
2. Remedy problem areas identified in survey
   Expected reductions – Not known at this time
   Cost – will seek State, Federal, and other funding avenues
3. Timeline

Year 1	Survey roads and culverts to identify areas of sediment input
	Seek funding and write grants for funding remediation
Year 2	Continue road and culvert survey
	Budget for problem areas identified in survey
Year 2-9	As funds become available, begin working on problem areas
	Attend workshops on erosion and sediment control issues, products, and procedures
Year 10	Complete work identified by survey