Big Wood River Watershed Total Maximum Daily Load (TMDL)

Implementation Plan for Agriculture

Developed for the Idaho Department of Environmental Quality

Prepared by

Chuck Pentzer
Idaho Soil Conservation Commission

In Cooperation With

Blaine County Soil Conservation District
Wood River Soil and Water Conservation District
Camas Soil Conservation District
Gooding Soil and Water Conservation District
Natural Resources Conservation Service
Idaho Soil Conservation Commission
Idaho Association of Soil Conservation Districts

October 2006

Big Wood River Basin Agricultural TMDL Implementation Plan

INTRODUCTION

PURPOSE:

The agricultural component of the Big Wood River (BWR) Sub-basin Total Maximum Daily Load (TMDL) Implementation Plan outlines an adaptive management approach for the implementation of Best Management Practices (BMPs) and Resource Management Systems (RMS) to meet the requirements of the Big Wood River Watershed Management Plan. This also satisfies the requirements described in the Idaho Code 39-3601 et al. Implementation activities will be phased on a sub-watershed basis due to the large size and complexity this 958,172-acre watershed.

GOALS AND OBJECTIVES:

The goal of this plan is to provide a strategy for implementation of agricultural-related Best Management Practices in the Big Wood River Basin. The Idaho Soil Conservation Commission is the designated agency responsible for ensuring that agricultural implementation occurs in a timely manner, striving towards restoring beneficial uses for the 303(d)-listed stream segments.

The implementation plan will provide guidance to Districts and producers to identify BMPs necessary to meet the requirements of the TMDLs on the Big Wood and 303(d)-listed streams. The objective of this plan is to reduce the amount of sediment and nutrients entering these water bodies from agricultural-related practices (surface and groundwater). Agricultural pollutant reductions will be achieved by on-farm conservation planning with individual operators and application of BMPs in critical areas. Implementation of Resource Management Systems (RMS) will provide quality assurance for phased approaches of implementation for agricultural activities. This plan recommends BMPs needed to meet TMDL targets on the Big Wood River, and suggests alternatives for reducing surface and groundwater quality problems from agricultural related activities.

Planned outputs

1. Prioritize implementation activities to maximize efforts in a timely manner.
2. Encourage landowner participation in water quality implementation efforts by implementing a water quality outreach program to be used within the watershed.
3. Develop individual Conservation Plans and implement BMPs on a site-specific basis, using numerous state and federal programs.
4. Evaluate installed BMPs to determine the effectiveness of implementation.
5. Follow up with monitoring efforts in the streams, as well as status of implementation, to verify improvements and identify additional work needed.
6. Share the success, status, and effectiveness with the agricultural implementation plan with other land management agencies.

BACKGROUND

PROJECT SETTING:

The Big Wood Watershed is located in South-Central Idaho **(See *Map 1, Big Wood River Location Map*)** and totals approximately 958,172 acres. Elevations in the Big Wood Watershed range from 11,112 feet at Silver Peak, in the Boulder Mountain Range of the Sawtooth National Forest, to 2760 feet at the confluence at the Snake River. The watershed borders Custer County in the north, and includes Blaine, Camas, Lincoln, and Gooding Counties.

All of the 303(d)-listed stream tributaries, with the exception of Thorn Creek, lie in the upper reaches of the Big Wood drainage, in Big Wood River Sections 2-4. These tributaries combine their flows into the Big Wood River, which then flows into the Magic Reservoir.

The four-county area is served by their corresponding Soil Conservation Districts:

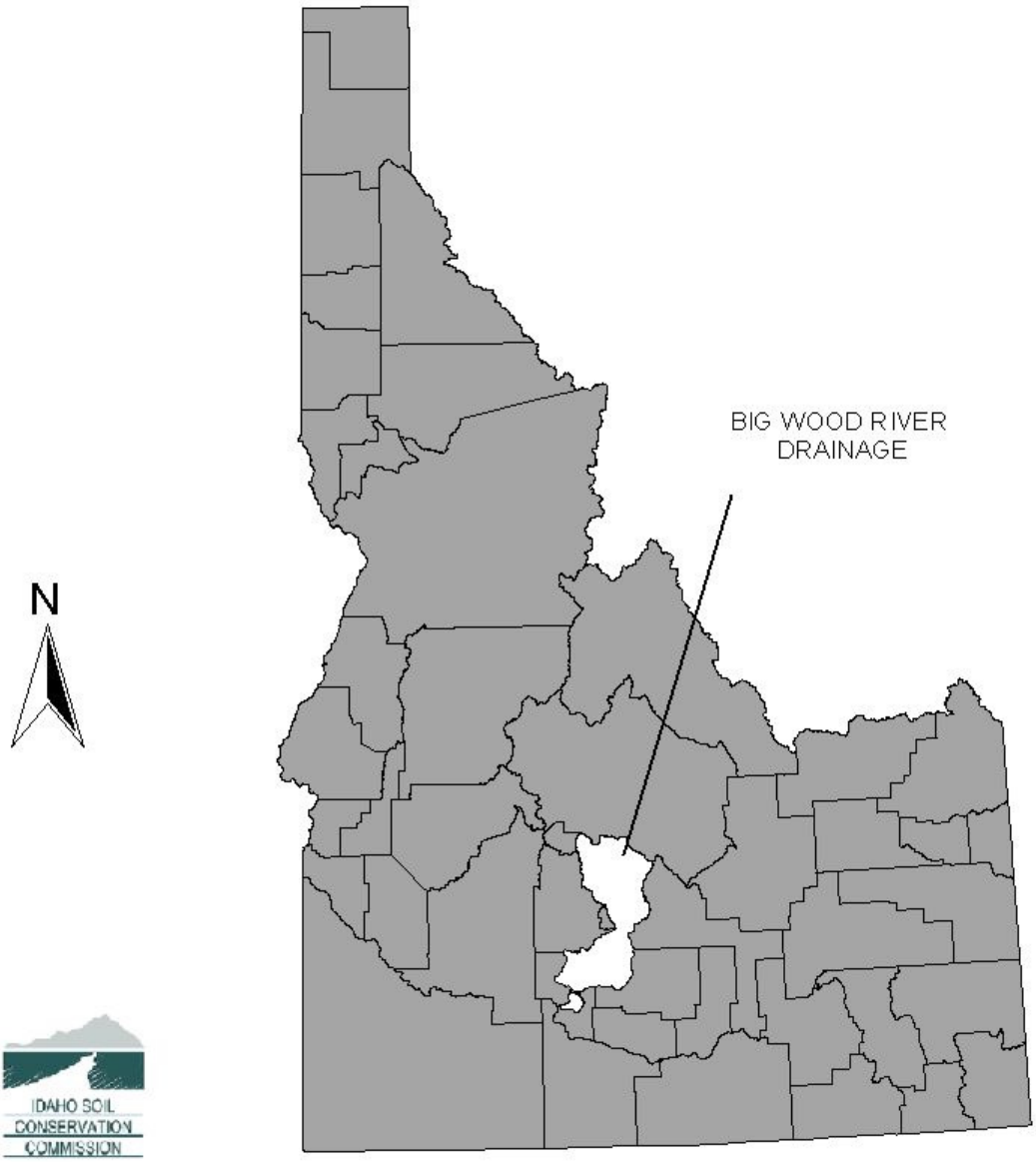
County Name	Conservation District	City
Camas County	Camas SCD	Fairfield
Lincoln County	Wood River SWCD	Shoshone
Gooding County	Gooding SCD	Gooding
Blaine County	Blaine SCD	Carey

The Big Wood River serves multiple areas as it makes its way through the watershed from north to south. The river is utilized by recreationists and visitors as it flows through the resort areas of Sun Valley, Ketchum, and Hailey. The river picks up flows from many side drainages, and south of Hailey begins to serve the agricultural water supply needs for cropland and pastureland, in addition to recreation, aesthetics, and fishing. Parts are diverted into what is commonly called the "Bellevue Triangle," and is used as the agricultural water supply for the cropland areas. All of remaining flows from upper Big Wood eventually flow into the Magic Reservoir. Rock Creek also drains into the Big Wood just before entering the Magic Reservoir. The Camas Creek Watershed also empties into the Magic Reservoir, and becomes part of the Big Wood system. As it leaves the reservoir, the water from the Big Wood is diverted into two major canal systems:

- The ***Richfield Canal*** travels through the adjoining Little Wood Watershed.
- The remaining Big Wood River flow works its way through irrigated cropland in Lincoln and Gooding counties, and meets the Little Wood River just west of the City of Gooding. The source of the water at this location may have come from a combination of Big Wood, Little Wood, Camas, or even Snake River water that has been diverted at Milner Dam, 35 miles away. From this location near the City of Gooding, the river becomes known as the ***Malad River***, and makes its way another 11.5 miles before joining the Snake River.

Because of the geology formations, 40% or more of the water that has been diverted into the canal systems may be lost to the aquifer during its progression from diversion to its intended use. This loss of surface water can create a gain for the aquifer recharge in the Eastern Snake River

BIG WOOD RIVER LOCATION MAP



IDAHO SOIL
CONSERVATION
COMMISSION

CHUCK PEDITZER
[illegible]

Aquifer. Increased efficiencies in delivery systems are providing more of the diverted water to be delivered to its intended area. **(See *Map 2, Big Wood and surrounding area canal systems*)**.

Ownership

It has been estimated that Blaine County's population increased 34% in the 1990s.

Of the total acreage in the Big Wood River Watershed, an estimated 220,030 acres are privately owned. Approximately 191,587 of these acres are used for agricultural, such as;

- Irrigated Cropland and Pastureland
- Rangeland
- Riparian Grazing
- Animal Confinements, (Beef and Dairy)

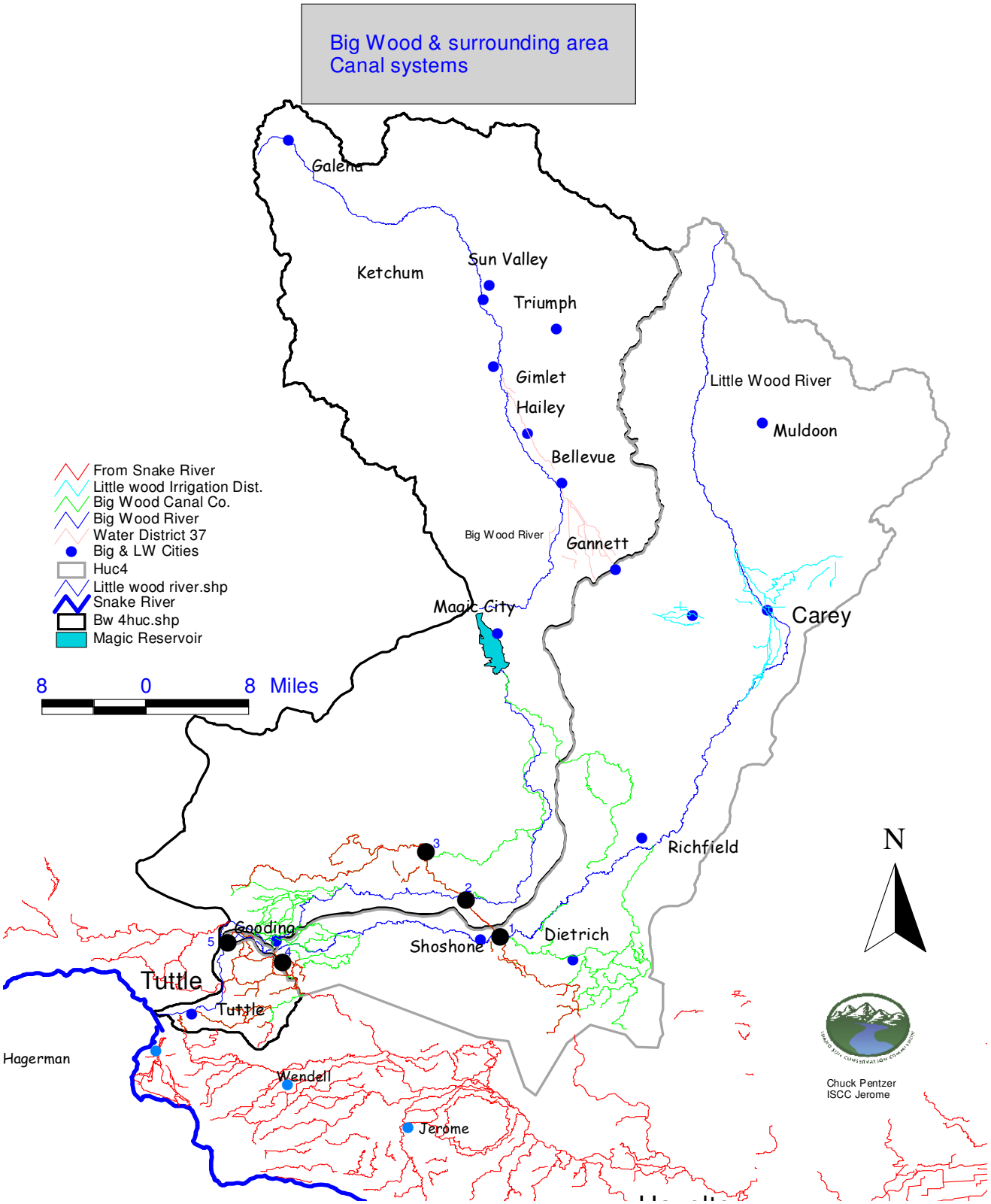
Table 1 lists the ownership with the Big Wood Watershed. Land ownership includes private citizens, Bureau of Land Management, (Department of the Interior), Forest Service (USDA), and the State of Idaho.

Table 1. Big Wood River Ownership by County

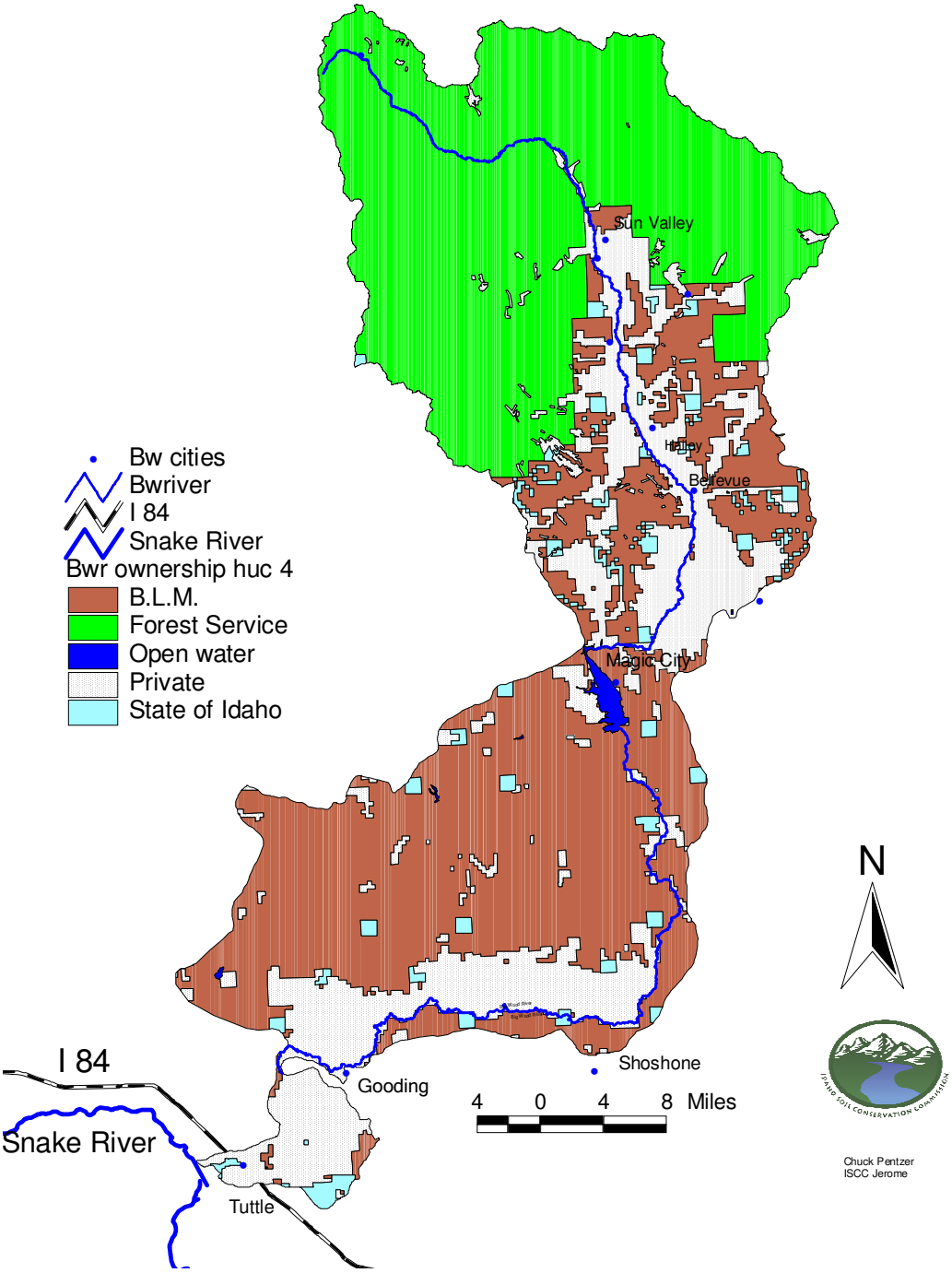
County	BLM	Forest Service	State	Open Water	Private	Total	Percentage of Big Wood River Watershed
Blaine SCD	110,163	336,188	15,402	3,254	114,967	581,795	61%
Gooding SCD	105,889	0	4,948	165	57,214	168,215	17%
Wood River SWCD	113,986	8	4,087	35	40,013	158,130	17%
Camas SCD	41,333	9	2,206	470	6,015	50,032	5%
Total Acres	371,372	336,206	26,642	3,923	220,030	958,172	100%

(See *Map 3, General Ownership*).

This Implementation Plan focuses on the agriculture land use activities, and helps to identify and prioritize implementation of BMPs to strive towards achieving Beneficial Uses as outlined in the TMDL.


Big Wood & surrounding area
Canal systems
Galena
Ketchum
Sun Valley
Triumph
Gimlet
Hailey
Bellevue
Big Wood River
Gannett
Little Wood River
Muldoon
Magic City
Carey
Richfield
Gooding
Shoshone
Dietrich
Tuttle
Tuttle
Hagerman
Wendell
Jerome
From Snake River
Little wood Irrigation Dist.
Big Wood Canal Co.
Big Wood River
Water District 37
Big & LW Cities
Huc4
Little wood river.shp
Snake River
Bw 4huc.shp
Magic Reservoir
8 0 8 Miles
N
Chuck Pentzer
ISCC Jerome

BWR Ag Implementation Plan
General Land Ownership Map



Agricultural Land Use (See Map) *

Agricultural land-use along the Big Wood River and its tributaries consists mostly of irrigated cropland, irrigated pasture, and grazing. Most of the cropland is irrigated by surface water, gravity systems, and/or sprinkler from surface or groundwater sources. There are no surface water influences from private agriculture lands in Big Wood River Segment 1, and very small influence from Big Wood River Segment 2. Also, agricultural activities on private land do not appear to be impacting surface water quality upstream at the mouths of Croy Creek and Quigley Creek, near Hailey.

Pasture/riparian areas above Magic Reservoir have been undergoing land use changes, and it is anticipated that more acreages will be converted to non-agricultural related or urban/small acreage dwellings.

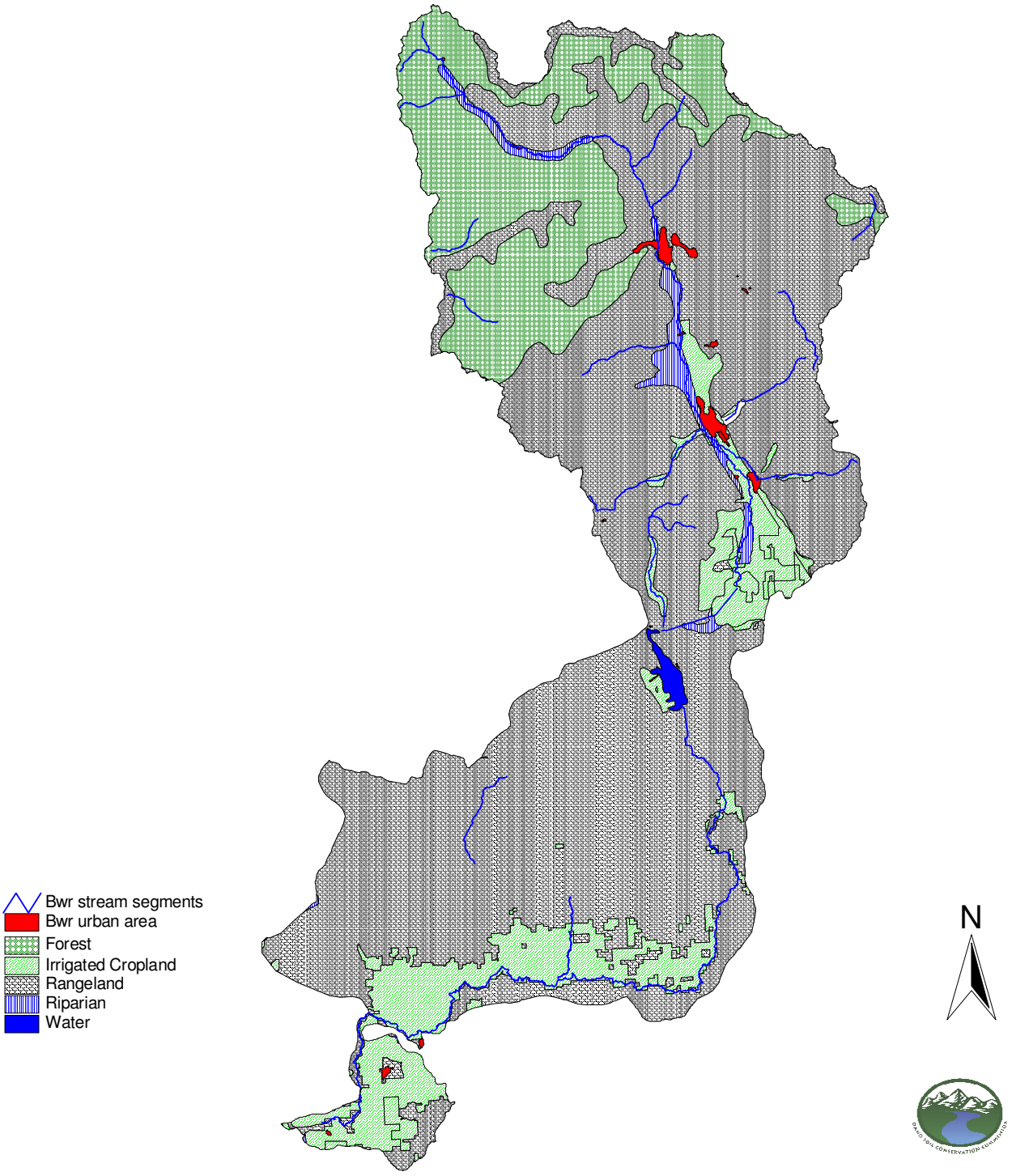
The urban/small acreage figure is always changing. Land use conversions from agricultural use (cultivated cropland and rangeland/pasture land) converted to residential and non-agricultural use land have been occurring in the last decade.

Many of the urban/small acreage areas are land use changes near stream segments or runoff flow areas. According the Blaine Soil Conservation District's five-year plan, impact should be minimal when adequately and properly planned. Land use owners in the urban/small acreage land use areas may play a key role in planning and implementing BMPs near drainage areas, ensuring that surface and groundwater quality is not degraded.

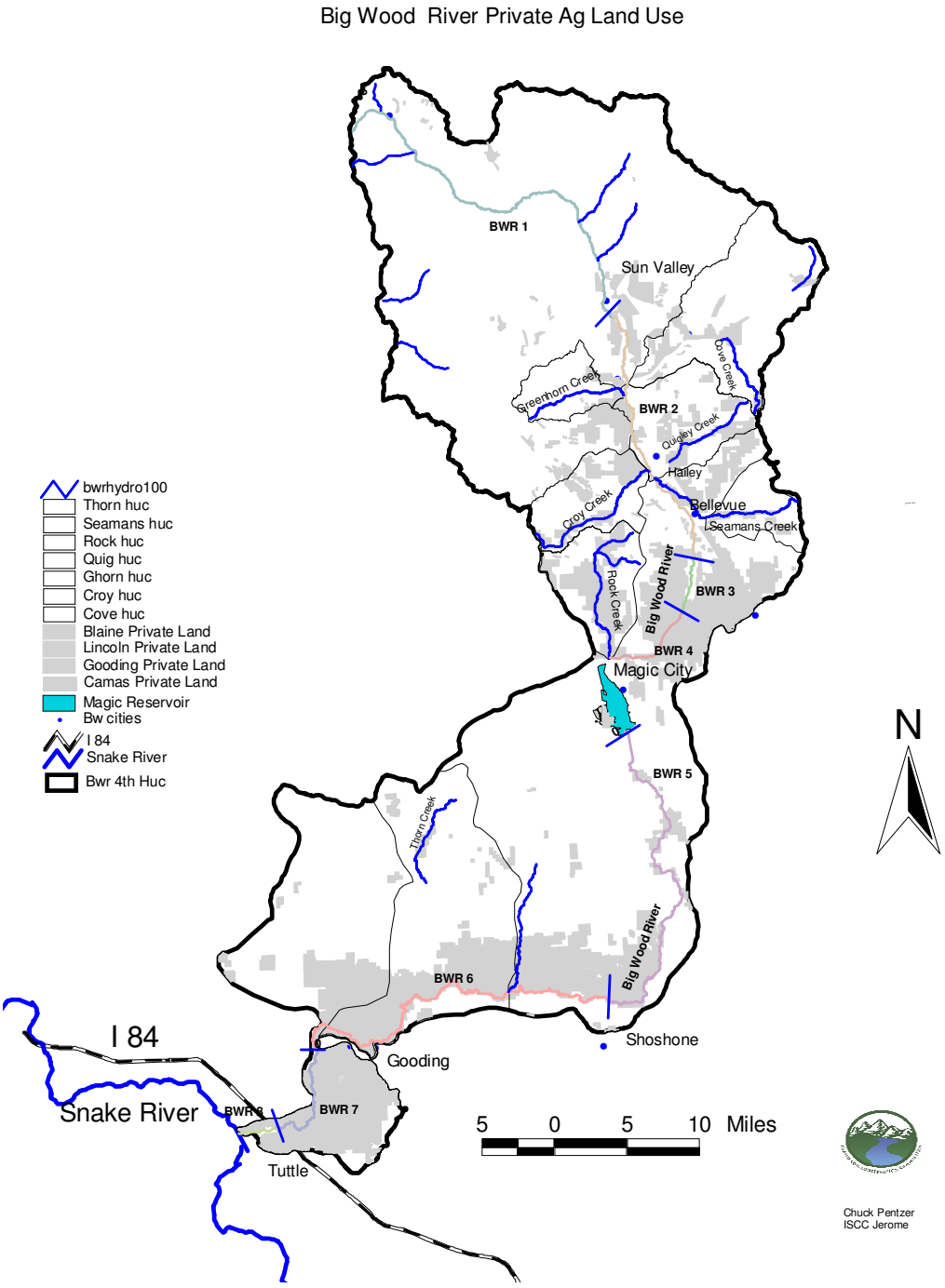
Table 2. Big Wood River Private Land Use by County

	IRRIGATED CROPLAND	PASTURE and RIPARIAN	RANGELAND	URBAN/ SMALL ACREAGE	INDUSTRIAL
BLAINE	18,889	7,019	63,475	23,770	1,297
CAMAS	288	0	6,933	475	
LINCOLN	19,554	13,793	5,890	2,400	
GOODING	34,474	5,990	16,183	3,400	
TOTALS	73,205	23,002	92,481	30,045	1,297
	Total Agricultural Acres	188,688	Total Other Acres	31,342	

Big Wood River Land Use Map



Map 5, Big Wood River Land Use and Ownership by County



Accomplishments

Soil Conservation Districts are dedicated to conserving renewable resources and using sound management practices. They promote clean water and productive soils. Districts strive to ensure that decisions on conservation problems are made at the local level, by local people. They channel expertise from all levels of government into action at the local level.
Accomplishments (Past Efforts)

Many BMPs have been installed within the Big Wood River largely because of the local leadership and direction of the four Soil Conservation Districts. Each District is comprised of locally elected supervisors who know the resources in their area, identify problems and concerns, and recommend feasible approaches to minimizing negative impacts from land use related activities. Since their beginnings, it is the local districts that have partnered with the Natural Resources Conservation Service (NRCS), the Idaho Association of Soil Conservation Districts (IASCD), and the Soil Conservation Commission (ISCC) to work collectively in providing technical and financial assistance in implementing Agricultural BMPs. (**See Table 3**).

According to the Wood River SCD, there has been a vast reduction of inverted and multiple tillage operations in the last ten years. The use of the herbicide Roundup® *(glyphosate)* to control weeds and grasses has aided in reducing tillage operations.

Benefits to water quality include;

- Reduction of irrigation-induced soil erosion and reduced nutrient runoff from fields.
- Reduction of soil compaction from excessive passes over the field
- Improved organic matter and water retention
- Improved soil quality
- Reduced fuel consumption

Table 3. Projects over a seven-year period

Field Office and Dates	Stream	Project/ Program	Benefits
Gooding 1998-2002	Big Wood River	RCRDP Loans	11 projects converted 1830 acres of gravity irrigation to sprinkler. Reducing sediment loadings by 54,900 tons/year (30 tons/acre) (Thompson)
Gooding 2000-2002	Big Wood River	EQIP	Converted 500 acres of gravity irrigation to sprinkler. Reducing sediment loadings by 15,000 tons/year (30 tons/acre) (Thompson)
Gooding 2001	Dry Creek	WHIP	.5 mile stream restoration and wildlife habitat development
Gooding 1998-2000	Big Wood River	CRP	Three contracts containing 112 acres

Field Office and Dates	Stream	Project/ Program	Benefits
Hailey	Rock Creek	SAWQP	Planning Project. Blaine County SCD identified improperly grazed rangeland, pastureland, unstable stream banks, and riparian zones with accelerated erosion rates that affect the beneficial uses
Wood River SWCD WQPA	700 Creek	WQ Project	Project to assist ongoing EQIP efforts converting 500 acres from gravity irrigation to sprinkler irrigation.
Big Wood Canal Co. 1995	Jim Byrns Slough	WQ Project	Sediment catch basin at head of Lateral 975. (Buidar)
Big Wood Canal Co. 1997		WQ Project	Pipe drain from dairy corral to avoid discharge to canal system. (Buidar)
Big Wood Canal Co. 1998	Jim Byrns Slough	WQ Project	Flow bypass to allow better quality water below canal diversion
Big Wood Canal Co. 1999		WQ Project	Sediment catch basin to create wetland area for wildlife on Black Butte.

Canal Companies and Irrigation Districts have also been instrumental in participating in pollution reductions entering into streams. The elimination of drains, and refinement of water delivery, helps to reduce nutrients and sediments entering the streams.

Additional tasks in the future include:

- Improvement of flow capacities for the Highway 75 widening project
- Installation of rock dams and basins for stream bank stability
- Installation of pipe to provide pressurized water, and minimize water loss, while eliminating four drains
- Installation of two sediment basins

PROBLEM STATEMENT

BENEFICIAL USE STATUS:

Beneficial uses of the Big Wood River and its tributaries are affected by numerous point and non-point sources of pollution. The Big Wood River TMDL lists designated beneficial uses in the sub-basin which include:

- Cold-water aquatic life
- Salmonid spawning
- Recreation (primary and secondary contact)
- Special resource water
- Domestic water supply
- Agricultural water supply

Total suspended solids, total phosphorus, E-coli, and substrate sediments have been identified as problems on the State of Idaho 303(d) list, and have loads established in the Big Wood River TMDL. The 303(d) list and the TMDL address specific sections of the Big Wood River.

The Big Wood River TMDL breaks out the river information into the following eight segments: (See Map 6)

Big Wood River Water Quality Limited Segments (WQLS)
Table #4 -- Also see Map #6

WQLS number	Segment number	Location	Notes
2483	1	Headwaters to Trail Creek	Not 303(d) listed -- Segment 1 has little or no impact from agriculture activities
2483	2	Trail Creek to Glen. Diversion	
2482	3	Glen. Diversion to Baseline	
	4	Baseline to Magic Reservoir	Not 303(d) listed
2478	5	Magic Reservoir to Highway 75	
2477	6	Highway 75 to Little Wood River	
2476	7	Little Wood River to Interstate 84	
	8	Interstate 84 to Snake River	Not 303(d) listed

Big Wood River Segment #1 has a very small amount of privately-owned ground. Tributaries in the uppermost reaches are owned and managed by the USDA Forest Service.

The Big Wood River tributaries that do not fully support the designated beneficial uses are addressed within the Agricultural TMDL Implementation Plan: (***See Map 5***).

Sub-watershed/Stream Segment Number

2487 Rock Creek and #5299 East Fork
2491 Croy Creek
5297 Quigley Creek
5298 Seamans Creek
5294 Greenhorn Creek
5300 Thorn Creek.

(See ***Summary Table 5***)

All of the 303(d) stream tributaries, with the exception of Thorn Creek, lie in the upper reaches of the Big Wood Drainage in Big Wood River sections 2 - 4. These tributaries combine their flows into the Big Wood River, which then flows into Magic Reservoir.

POLLUTANT REDUCTIONS

The Big Wood River TMDL sets load allocations and identifies load reductions for total suspended solids (TSS), total phosphorus (TP), E.coli, and substrate sediments. The pollutant allocations identified in the TMDL are broken out by landownership. The total allocation for private ownership includes urban, residential, and agricultural related activities.

This implementation plan provides an overview of priorities in the watershed to encourage implementation of agriculture-related Best Management Practices in these areas. However, BMPs may still be implemented in adjacent drainages, as individual landowners strive to make improvements on their land. On-farm planning and design is essential. Developing feasible alternatives and implementation of selected BMPs will help to improve water quality and achieve and/or maintain beneficial uses in those drainages and downstream segments.
The change of land use and increase of population cause additional stress on surface and groundwater supplies. More and more groundwater is being used to meet the increasing demands. It is likely that this trend will continue to add more pressure on both water quantity and quality.

The Big Wood River TMDL lists recommended reductions needed to achieve and/or maintain beneficial uses to streams. Percentage reductions needed, combined with land-use activities, are assessed to help prioritize the maximum benefit to installing best management practices. **Table 5** below illustrates the estimated reductions needed for each of the 303(d) stream segments. *(**See Map 7** for recommended reductions in proximity to each of the stream segments from the TMDL).*

Map #6, Big Wood River TMDL Implementation Plan for Agriculture

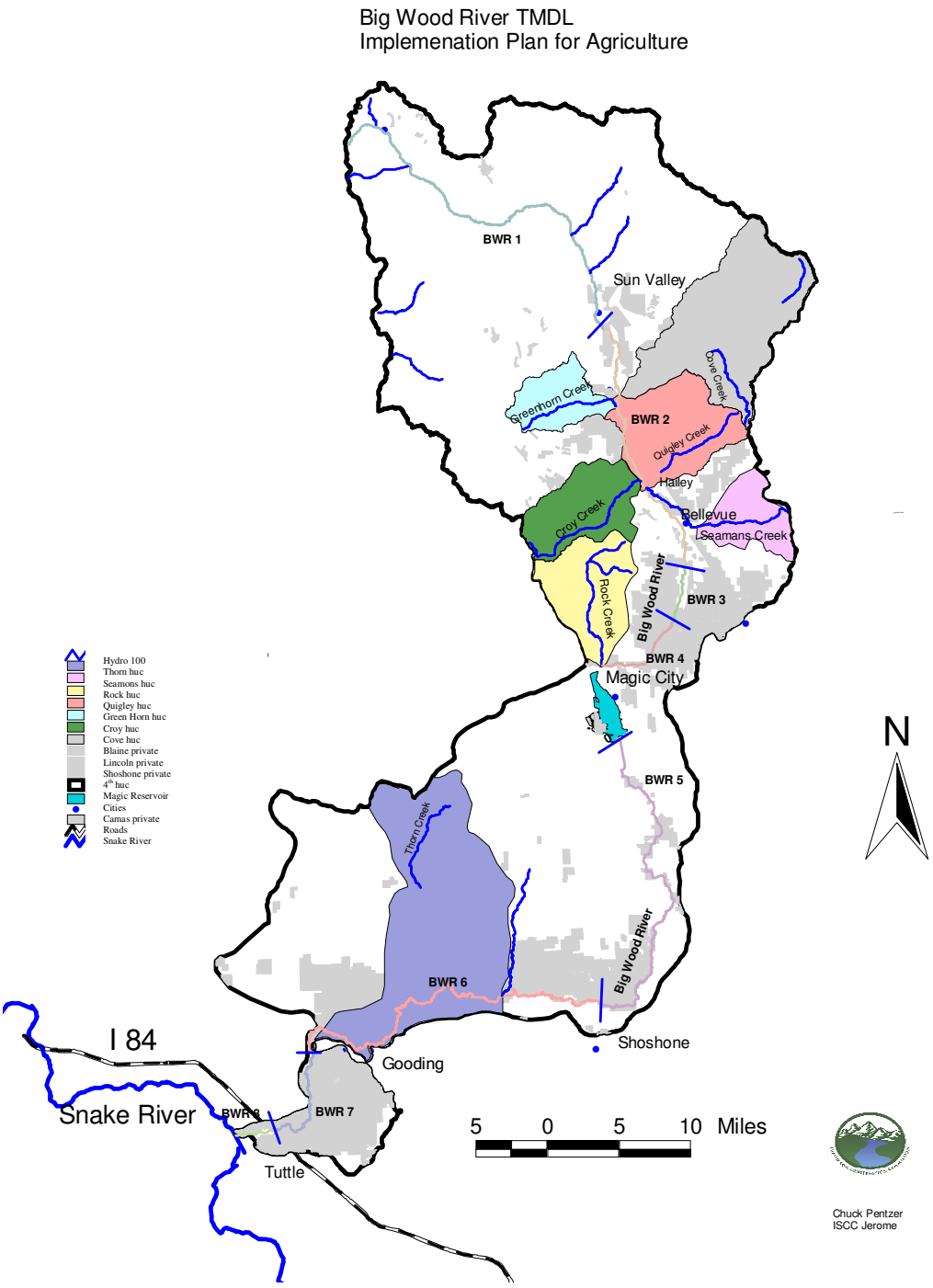


Table 6.
1998 303(d) list of streams, pollutants, beneficial uses, and percentage of reductions

From IDEQ TFRO Table A and B, Big Wood River Watershed Management Plan, pages xviii,xix

Table 6 Key

WQLS No. = Water quality stream identification number from 1998 ***303(d) list***

A =Ammonia
B = Bacteria
CW = Cold water aquatic life
DO = Dissolved oxygen
DW = Drinking water supply
E. coli = Escherichia coli
F = Flow alteration
N = Nutrients
PC = Primary contact recreation
S = Sediment
SC = Secondary contact recreation
SR = Special resource water
SS = Salmonid spawning
SUB = Substrate sediments
TM = Temperature modification
TP = Total phosphorus
TSS = Total suspended solids
U = Unknown

All streams are also protected for agricultural water supply

Table 6

Big Wood River Main Stem Segments	WQLS #	Pollutant(s) or Impediments	Beneficial Uses	Percent Reduction
BWR#1-Headwaters to Trail Creek	Not listed	U	CW, SS, PC, SR, DW	TSS – 0% SUB – 0% TP – 0% E. coli – 0%
BWR#2-Trail Creek to Glendale Diversion	2483	F	CW, SS, PC, SR, DW	TSS – 0% SUB – 24.4% TP – 0% E. coli – 69.9%
BWR#3-Glendale Diversion to Base Line	2482	S, N	CW, SS, PC, SR, DW	TSS – 0% SUB – 34.6% TP – 20.6% E. coli – 0%
BWR#4-Base Line to Magic Reservoir	Not listed	S, N	CW, SS, PC, SR, DW	TSS – 0% SUB – 40.3% TP – 24.2% E. coli – 22.2%

Table 6

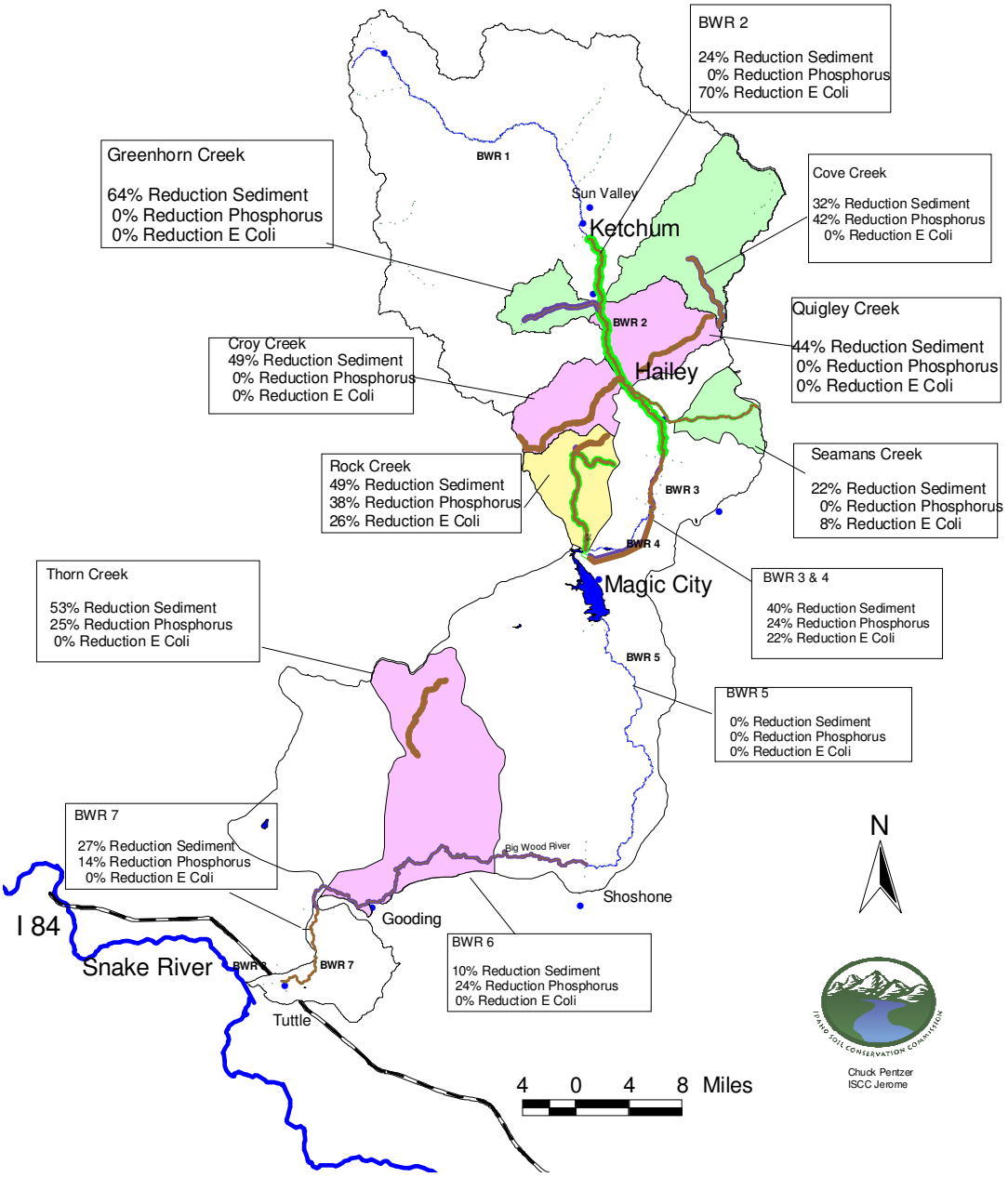
Big Wood River Main Stem Segments	WQLS #	Pollutant(s) or Impediments	Beneficial Uses	Percent Reduction
BWR#5-Magic Reservoir to Hwy 75	2478	N	CW, SS, PC	TSS – 0% SUB – 0% TP – 0% E. coli – 0%
BWR#6-Hwy 75 to Little Wood River	2477	S, N, DO	CW, SS, PC	TSS – 0% SUB – 9.5% TP – 23.7% E. coli – 0%
BWR#7-Little Wood River to Interstate 84	2476	S, N	CW, SS, PC	TSS – 0% SUB – 27.1% TP – 13.8% E. coli – 0%
BWR#8-Interstate 84 to Snake River	Not listed	S, N	CW, SS, PC	TSS – 0% SUB – 24.4% TP – 0% E. coli – 0%
Tributaries or Tributary Segments	**WQLS #**	**Pollutant(s)**	**Beneficial Uses**	Percent Reduction
Cove Creek – Hwy to east fork of Big Wood River	5296	S, N	CW, SS, PC, SR	TSS – 0% SUB – 32.3% TP – 41.9% E. coli – 0%
Greenhorn Gulch – Hwy to mouth	5294	S, N	CW, SS, PC, SR	TSS – 0% SUB – 3% TP – 63.8% E. coli – 0%
Quigley Creek – Hwy to mouth	5297	S, N	CW, SS, PC, SR	TSS – 0% SUB – 44.3% TP – 0% E. coli – 0%
Croy Creek – Elk Creek to Big Wood River	2491	S, N	CW, SS, PC, SR	TSS – 0% SUB – 49.2% TP – 0% E. coli – 0%
Seamans Creek – Hwy to Magic Reservoir	5298	**S, N**	**CW, SS, SR**	TSS – 0% SUB – 21.7% TP – 0% E. coli – 8%
Rock Creek – Hwy to Rock Creek	2487	**S, N**	**SS, PC, SR**	TSS – 0% SUB – 35.8% TP – 0% E. coli – 25.9%

Table 6

Big Wood River Main Stem Segments	WQLS #	Pollutant(s) or Impediments	Beneficial Uses	Percent Reduction
East Fork Creek – Hwy to Rock Creek	5299	**S, N**	**CW, PC, SC, SR**	TSS – 0% SUB – 58.1% TP – 37.5% E. coli – 0%
Thorn Creek – Hwy to Schooler Creek	5300	**S, N**	**CW, PC, SR**	TSS – 0% SUB – 52.7% TP – 24.8% E. coli – 0%

Map 7

BWR Ag Implementation Plan
TMDL Percent Reductions Map



POLLUTANT IDENTIFICATION

The following shows 303 (d) listed HUCs which have private agricultural influence and estimated reductions as referenced from the Big Wood TMDL. (**See Table 6 and Map 5**).

Table 7: Pollutants and agricultural-related activities in the Big Wood River

POLLUTANTS:

AMM = Ammonia
BAC=Bacteria
DO = Dissolved Oxygen
NUT = Nutrient
O/G = Oil/Gas
PST = Pesticides
QALT = Flow Alteration
SED = Sediment
UNKN = Unknown

Table 7: Pollutants and agricultural-related activities in the Big Wood River				
Waterbody	**WQLS #**	**SCD Affected**	**Pollutant**	**Agricultural Concerns**
BWR#1-Headwaters to Trail Creek	Not a 303(d) stream segment			
BWR#2-Trail Creek to Glendale Diversion	2483	Blaine	QALT	No Agricultural Influence above Hailey, Irrigation Diversions, Minimal Agricultural Improvements Possible
BWR#3-Glendale Diversion to Base Line	2482	Blaine	QALT	Irrigation Diversions, Grazing, Minimal Agricultural Improvements Possible
BWR#4-Base Line to Magic Reservoir	Not a 303(d) stream segment			
BWR#5-Magic to Hwy 75	2478	Blaine	SED, NUT, QALT	Grazing
BWR#6-Hwy 75 to Little Wood River	2477	Wood River and Gooding	SED, NUT, AMM, DO, BAC, QALT	Irrigation Return Flows, Grazing
BWR#7-Little Wood River to Interstate 84	2476	Gooding	SED	Irrigation Return Flows, Grazing
BWR#8-Interstate 84 to Snake River	Not a 303(d) stream segment			
Horse Creek	7613		UNKN	No Private Agricultural Influence
Owl Creek	5290		UNKN	No Private Agricultural Influence
Baker Creek	5292		UNKN	No Private Agricultural Influence

Table 7: Pollutants and agricultural-related activities in the Big Wood River				
Waterbody	**WQLS #**	**SCD Affected**	**Pollutant**	**Agricultural Concerns**
Eagle Creek	5291		UNKN	No Private Agricultural Influence
Lake Creek	7614		UNKN	No Private Agricultural Influence
Placer Creek	5293		UNKN	No Private Agricultural Influence
Cove Creek	5296		UNKN	No Private Agricultural Influence
East Fork BWR	5295		UNKN	No Private Agricultural Influence
Greenhorn Gulch	5294		UNKN	No Private Agricultural Influence
Quigley Creek	5297	Blaine	UNKN	Irrigation Diversions, Grazing
Croy Creek	2491	Blaine	SED, NUT, QALT	Irrigation Diversions, Grazing
Seamans Creek	5298	Blaine	UNKN	Irrigation Diversions, Grazing
Rock Creek	2487	Blaine	SED, T, BAC, QALT	Irrigation Divisions, Grazing
East Fork Rock Creek	5299	Blaine	UNKN	Grazing
Thorn Creek	5300	Gooding	UNKN	Irrigation Diversions, Grazing

Threatened and Endangered Species (See Map 8)

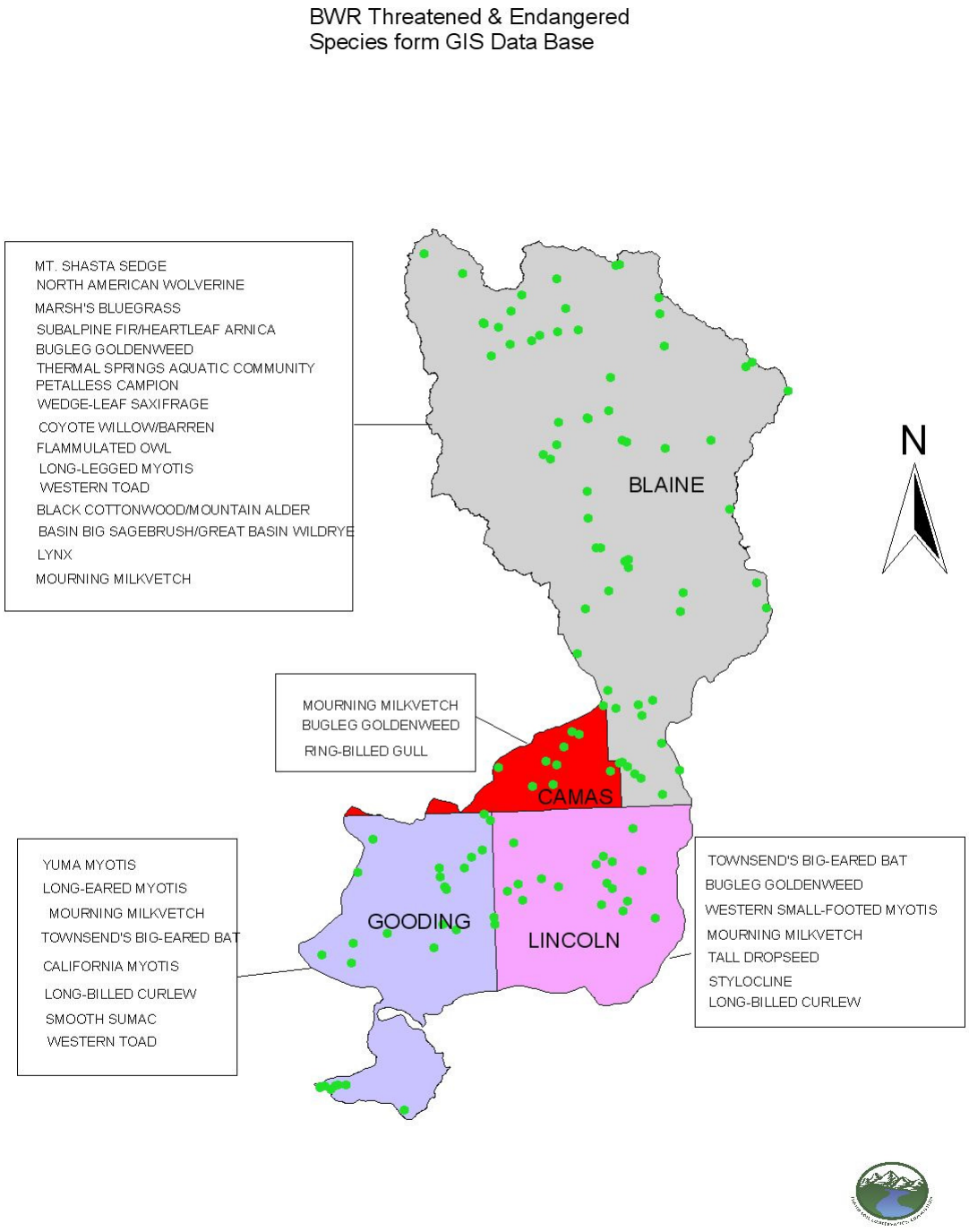
The threatened and endangered (T&E) species linked to water quality include:

1. Bald Eagles (rely on the fish in the streams)
2. Ute Ladies' Tresses (rely on water quality)
3. Utah Valvata Snails (several mollusk species are found in the Malad River Springs area)
4. Banbury Springs Lanx (rely on water quality)
5. Wood River Sculpin is considered a sensitive species in Idaho.

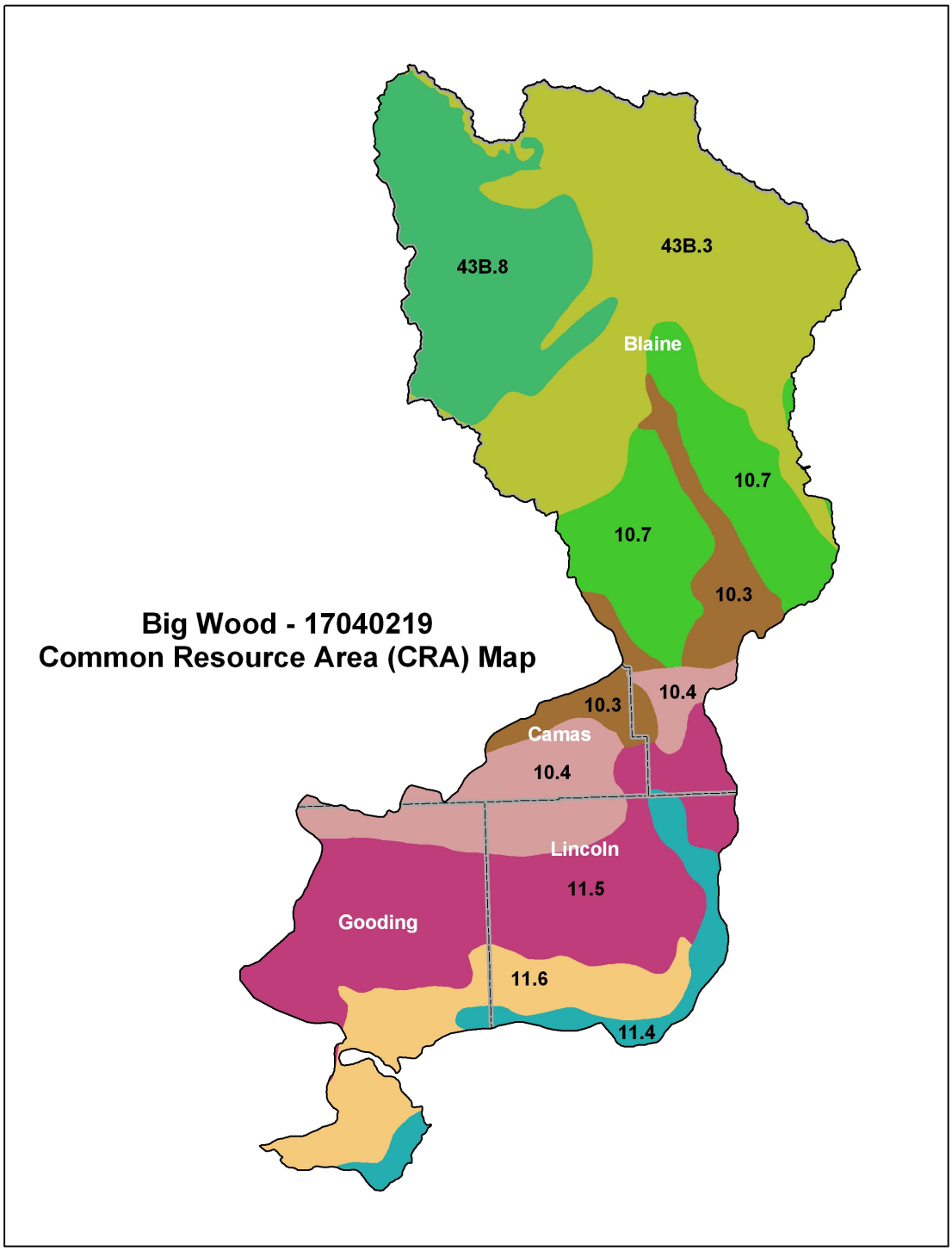
State and Federal agencies are working together to assess habitat and biological assessments.

To the extent practical, the T&E and sensitive species will not be adversely affected by improvements in water quality. Reductions in TSS, substrate sediments, TP, and E-coli from installed BMPs will not adversely affect the T&E or sensitive species (Buhidar), and should, with confidence, improve or enhance habitat environments for the listed species.

Map 8, Threatened and Endangered Species from GIS Database



Map #9, Big Wood Common Resource Area (CRA)



Big Wood TMDL Implementation Priority (Rationale)

Critical Areas

Areas of agricultural lands that contribute excessive pollutants to water bodies are defined as "Critical Areas" for BMP implementation. Critical areas are prioritized for treatment based on their location to a water body of concern and the potential for pollutant transport and delivery to the receiving water body. Accordingly, the following is a general rule that applies to the prioritization of critical acres within each tributary sub-watershed.

Agricultural critical areas within the Big Wood River include:

- Surface irrigated cropland and pastureland
- Unstable and erosive stream banks
- Areas of severe gully erosion
- Areas where livestock are grazed, irrigated pastures and rangeland
- Areas where livestock have unlimited or direct access to streams
- Animal Feed Operations (AFOs) and Confined Animal Feeding Operations (CAFOs)

In addition to the above, consideration is given to proximity to higher pollutant reduction goals, and willingness of landowner to implement the BMPs. Each operation and location is unique, and individual on farm planning is needed to optimize BMP implementation and load reductions.

Proposed Treatment Units (TU)

The following Treatment Units describe areas with similar land uses, productivity, resource concerns, and treatment needs. These TUs not only provide a method for delineating and describing land use, but are also used to evaluate land use impacts to water quality and in the formulation of alternatives for solving problems. All resource concerns will be evaluated on a site-specific basis in accordance with the NRCS National Planning Procedures Handbook.
Each treatment unit will also show a reference to the NRCS designation of the Common Resource Areas (CRA) See ***Map #9, Big Wood Common Resource Area***. The delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. CRAs are a subdivision of an existing Major Land Resource Area (MLRA) map delineation. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA. In addition, estimated critical acres and approximate costs for each treatment unit will be included.

The following table lists Treatment Units in the Big Wood Watershed

Table #8		
Treatment Unit	**Land Use**	**County/Area affected**
Treatment Unit #1	Irrigated cropland/hayland 0-4% slopes	Big Wood River, Blaine and Camas Counties
Treatment Unit #2	Irrigated cropland 0-4% slopes	Big Wood River, Gooding, Lincoln Counties
Treatment Unit #3	Irrigated Hay/Pasture 2-10% slopes	Big Wood River, Blaine County
Treatment Unit #4	Pasture 2-12% slopes	Big Wood River, Lincoln and Gooding Counties
Treatment Unit #5	Rangeland 5-30% slopes	Big Wood River, All counties, 3000-9000 ft. elevation
Treatment Unit #6	Riparian/Multiple land uses 2-5% slopes	Big Wood River, Blaine County
Treatment Unit #7	Livestock Feeding Operations	All Segments

Treatment Unit #1	*Irrigated cropland / hayland 0-4% slopes* *Big Wood River, Blaine and Camas Counties* *Average precipitation is 14 inches; 75 frost-free days* *Mostly sprinkler-irrigated crops of alfalfa hay, small grains, and potatoes in rotation*		
Acres	**Soils**	**Resource Problems/Concerns**	**Estimated Critical Acres**
19,180	• Mostly Little Wood Gravelly Loam and Brunell Loam soils on nearly level to gently sloping stream terraces, fan terraces, and flood plain • Majority of the soils are very deep and well drained. • Available water capacity is low • Most fields border or are close to residential developments and urban expansion • Nearby uplands consists of very steep grazed and non grazed rangeland and mixed timber and rangeland	• Soil Erosion - Irrigation Induced • Soil Condition - Soil compaction caused by excess tillage operations especially in wet conditions and lack of surface residue - Organic Matter Depletion • Water Quality - Potential Irrigation-induced Sediment, Nutrient, and Pesticide transport to surface and ground water • Water Quantity - Inefficient Water use on irrigated Land. - Aquifer Overdraft • Wind erosion	4,170 Gravity irrigated 2,500 Sprinkler irrigated

DESCRIPTION OF RESOURCE SETTING

CRA-10.7 - Central Rocky and Blue Mountain Foothills - Foothill shrub lands - Grasslands

CRA-10.3 - Central Rocky and Blue Mountain Foothills - Camas Prairie

Conventionally tilled, surface and sprinkler irrigated cropland / hay land on 0-7% slopes. Precipitation is 20 inches or less per year, and the growing season ranges from 80-160 days. Soil loss tolerance ranges from four to five tons per acre, per year. Irrigation Climatic Zones I-V; irrigation water is normally plentiful. Small grains and alfalfa hay are grown in rotation, with alfalfa typically maintained for four to six years. For purposes of the benchmark evaluation, a rotation of four years alfalfa and two years small grain is considered representative. Aftermath grazing of crop may occur. Nutrient, pest,

and/or irrigation water management may be less than desirable. Threatened and endangered species, cultural resources, and artificial and natural wetlands may be present.

Treatment Unit #2--

11.6 - Snake River Plains - Magic Valley
Surface-irrigated cropland.

Representative crop rotation consists of:

- Alfalfa - three years
- Silage corn - three years

Precipitation is less than 12". Growing season is 120-160 days. Soils are sandy loam or finer (T = 1 to 2), approximately 15" in depth. Slope is 0-3%. Typical existing practices include conservation crop rotation and surface roughening. Fertilizers and pesticides are applied. Threatened or endangered species, cultural resources, and natural or artificial wetlands may be present. 303(d) listed water bodies and groundwater sensitive areas may be present. Surface irrigated with gated pipe or siphon tubes. No inversion tillage is practiced, due to shallow soil depths. Wind erosion based on ***C < 50 and I=86***. Benchmark suspended sediment in surface water based on assumed 50% delivery of eroded soil (irrigation-induced).

Sprinkler irrigated cropland.

Located in areas with ground water quantity concerns. Conventionally tilled, sprinkler irrigated (hand or wheel line) cropland planted predominantly to row crops; may include hay and grain. Soil loss tolerance (T) ranges from 2 to 5 tons/ac/yr. Irrigation Climatic Zones I through V - irrigation water source is groundwater. Typical rotation is 67% low residue (e.g. potatoes, sugar beets) and 33% high residue (e.g. grain, alfalfa). Fertilizers and pesticides are applied. Threatened and endangered species, cultural resources, and artificial or natural wetlands may be present. 303d listed water bodies and groundwater sensitive areas may be present. Benchmark soil erosion for wind is based on C=40 and I=86. Sprinkler irrigation is an existing practice.

Treatment Unit #2	***Irrigated cropland 0-4% slopes*** ***Big Wood River, Gooding, Lincoln Counties*** ***Average precipitation is 10 inches; 110 frost free days*** ***Mostly irrigated alfalfa hay, small grains, potatoes, sugar beets, and corn***		
Acres	**Soils**	**Resource Problems/Concerns**	**Estimated Critical Acres**
54,028	• Mostly Gooding, Catchell, Power Silt Loam, and Brunell Loam soils on nearly level to gently sloping on basalt plains • Majority of the soils are very deep and well drained. • Available water capacity is low-to-moderate • Most fields border dry rangeland • Surrounding rangeland is moderate to gently sloping and mixed lava rock and soil.	• Soil Erosion - Irrigation Induced • Soil Condition - Soil compaction caused by excess tillage operations, especially in wet conditions and lack of surface residue - Organic Matter Depletion • Water Quality - Potential irrigation-induced sediment, nutrient, and pesticide transport to surface and ground water • Water Quantity - Inefficient Water Use on irrigated Land - Aquifer Overdraft • Wind erosion	20,806 Gravity irrigated 15,000 Sprinkler irrigated

Irrigated Cropland / Hayland, Surface and Sprinkler
Central Rocky and Blue Mountain Foothills-Camas Prairie Common Resource Area

Treatment Unit #3	***Irrigated Hay/Pasture 2-10% slopes Big Wood River, Blaine County Average precipitation is 14-18 inches; 75 frost-free days (Includes cross-over areas with small acreage pastures)***		
Acres	**Soils**	**Resource Problems/Concerns**	**Estimated Critical Acres**
7,026	• Mostly Vitale-Povey, Moonstone-Earcree, and Ketchum-Povey gravelly loam soils on 30-60% slopes • Majority of the Soils are very deep and well drained • Available water capacity is low to moderate • Most fields border dry rangeland • Surrounding rangeland is moderate to gently sloping and mixed lava rock and soil.	• Improperly managed pastures. • Concentrated flow around disturbed sights • Water Quality - Sediment and Nutrient transport during snowmelt runoff. • Animal, Wildlife Inadequate cover and shelter • Animal, Domestic - Inadequate quantity and quality of feed and forage	500 Acres

10.3 - Central Rocky and Blue Mountain Foothills - Camas Prairie

Conventionally tilled, surface irrigated hayland on 0-7% slopes. Precipitation is 20 inches or less per year, and the growing season is 80--160 days. Soil-loss tolerance ranges from two-three tons per acre per year. Irrigation Climatic Zones I-V - irrigation water is normally plentiful. Small grains and alfalfa hay are grown in rotation, with alfalfa typically maintained for four-six years. For purposes of the benchmark evaluation, a rotation of four years alfalfa and two years small grain is considered representative. Aftermath grazing of crop may occur. Nutrient, pest, and/or irrigation water management may be less than desirable. Threatened and endangered species, cultural resources, and artificial and natural wetlands may be present.

Treatment Unit #4	***Pasture -- 2-12% slopes Big Wood River, Lincoln and Gooding Counties Average precipitation is 10 inches; 110 frost free days (Includes cross over areas with small acreage pastures)***		
Acres	**Soils**	**Resource Problems/Concerns**	**Estimated Critical Acres**
23,584	• Mostly Gooding Silt Loam and Catchell stoney silt loam soils and rock outcrop. • Majority of the Soils are very deep and well drained. • Available water capacity is low to moderate. • Most fields border dry rangeland. • Surrounding rangeland is moderate to gently sloping and mixed lava rock and soil.	• Soil Condition ▪ Soil compaction caused by excessive grazing and reduced ground cover • Water Quality - Suspended Sediments, nutrient, Pathogens transport to surface and ground water from irrigation practices - Sediment and Nutrient transport during snow melt runoff • Water Quantity - Inefficient Water Use on irrigated Land. - Unprotected Stream Banks - Irrigation return flow • Animal, Wildlife - Inadequate cover and shelter • Animal, Domestic - Inadequate quantity and quality of feed and forage • Plant condition - Establishment, productivity, health and vigor, growth, harvest - Noxious and Invasive Plants	2,000 Acres

Description of Resource Setting

Tailwater from fields may be reused and eventually returned to a perennial stream or river. Fields may have been leveled, smoothed or shaped to allow for irrigation. Sediment, from irrigation induced

erosion, leaving the bottom of the surface irrigated pastureland is estimated to be moderate. Estimated irrigation efficiency is 25-35% (average annual water use is 48 to 60 ac-in/ac). These pasturelands traditionally are irrigated in years of normal water and receive little or no irrigation during low water years.

Plants are introduced perennial forage species. Conventional tillage is used when rotating pasture and grain. The average rotation is ten years of pasture and two years of small grain. Irrigation induced erosion is less than T but may exceed T during the grain rotation. Commercial fertilizers are occasionally used, and soil testing is rarely done. Animal waste deposited on the fields is harrowed on an irregular basis. The inefficient surface systems can add to the increased irrigation erosion as well as transporting nutrients off the fields into the receiving waters. Fencing and irrigation field ditches are generally existing practices, when feasible.

Areas near canals and drainages can get pressure from livestock looking for water. Grazing on public and private ground in the canals and drains can degrade canal banks and deposit nutrients and sediments into the flowing water. Offsite watering facilities can help reduce this pressure, along with fencing off strategic areas around the streams. However, fencing may not be feasible or cost effective throughout all the drainage ways, so management with water, food, and shade away from the stream area can be a cost-effective BMP to help protect the resource.

Treatment Unit #5	***Rangeland 5-30% slopes -- Big Wood River, all counties, 3000-9000ft. elevation Ave. Precipitation is 14 inches(Blaine County),10 inches (Lincoln/Gooding Counties) 60-70 frost-free days (Blaine County); 110 frost-free days(Lincoln/Gooding Counties)***		
Acres	**Soils**	**Resource Problems**	**Estimated Critical Acres**
92,480	• Mostly >50% gravelly loam Povey (Blaine) and Gooding complex (Lincoln, Gooding) • Deep and well drained (Blaine) • Lincoln/Gooding has shallower soils on rock outcrop, 30" to basalt, extremely stony silt loam on ridges, impermeable subsoil	• Soil condition - Slow Permeability • Animal, Wildlife - Inadequate cover and shelter • Animal, Domestic - Inadequate quantity and quality of feed and forage - Inadequate off-site stock water • Plant condition - Productivity, health and vigor, growth, harvest - Noxious and invasive Plants	22,500

Rangeland

CRA Central Rocky and Blue Mountain Foothills-Foothill Shrublands-Grasslands Common Resource Area

Rangeland vegetation consists of sagebrush and perennial grasses. Precipitation ranges from 12-16", most of which falls in winter and early spring outside the growing season. Average frost free period ranges from 80 to 140 days. Elevations range from 3,500 to 6,000 feet. Sites occur on nearly level flats up to benches and rolling foothills. Soils are loamy to gravelly, usually shallow with some rock outcrops. Fencing is generally an existing practice. The estimated sediment leaving rangeland is 1 ton per acre per year. The majority of this sediment is associated with spring snowmelt. Existing grazing management may not meet resource quality criteria or landowner objectives. Facilitation practices may be needed for range improvement and livestock distribution.

Treatment Unit #6	***Multiple land uses*** ***2%-5% slopes in and around flood plains,*** ***Big Wood River, Blaine County*** ***Average precipitation is 14-18 inches; 70 frost-free days***	
Acres	**Soils**	**Resource Problems**
1200	• Balaam-Adamson-Riverwash gravelly sandy loam • Majority of the soils are very deep and well-drained • Available water capacity is very low to moderate • Land Use activities within riparian zones of 200 -1000 feet of streams or canals	• Water Quality - Sediment and Nutrient transport during snow melt runoff - Concentrated flow around disturbed, heavy-use sights • Soil Quality - Compaction from grazing or small acreage utilization of forage, seasonal animal holding areas • Plant condition - Productivity, health and vigor, growth, harvest - Noxious and Invasive Plants

Riparian Land
Central Rocky and Blue Mountain Common
Initial Prioritization of Streams and Segments for Future Conservation Planning

Based on existing agricultural impact son riparian areas, the percentage of private agriculturally owned lands within each catchment, and potential or capability of the improvements, the following provides our observation from the greatest to least priorities of improving riparian areas:

Rock Creek
Quigley Creek (upstream reservoir)
Seamans Creek (portions upstream of lower reservoir to just upstream of upper reservoir)
Croy Creek (excluding areas converting to small-farm acreages)
Greenhorn Gulch (excluding areas converting to small-farm acreages)
Cove Creek
Big Wood River

Further work will occur in the development of the Big Wood River Watershed Implementation Plan, and with input from the WAG and local Soil and Water Conservation Districts, these priorities may be adjusted. One very important factor that will adjust priorities is landowner cooperation. Without it, planners generally address lower priorities first, where cooperative landowners exist.

Treatment Unit #7	***Animal Feeding Operations (AFOs)***	
Units	**Soils**	**Resource Problems**
200 approx	• Varied throughout all three counties	• Waste storage • Waste Management • Off-site water sources • Site runoff • Livestock access to streams

Rules and regulations affecting beef cattle animal feeding operations came about from the Clean Water Act of 1972. The Environmental Protection Agency (EPA), Idaho State Department of Agriculture (ISDA), Natural Resources Conservation Service (NRCS), Idaho Soil Conservation Commission (SCC), and University of Idaho Cooperative Extension (U of I) and cattle producers from around the state have provided significant input to the development of the Environmental Enhancement Program.

The size of the operation, as well as the type of livestock being fed, determines who is regulated.

Animal Feeding Operation (AFO):

In Idaho, a beef cattle ***animal feeding operation*** (AFO) is regulated by the Idaho State Department of Agriculture.

Concentrated Animal Feeding Operation (CAFO):

EPA regulates ***Concentrated Animal Feeding Operations*** (CAFOs) under the Clean Water Act (CWA), while the Idaho State Department of Agriculture (ISDA) (under the Idaho Beef Cattle Environmental Control Act) inspects Idaho CAFOs.

CAFOs are considered to be a "point-source pollutant," and are therefore required to apply for coverage under a National Pollutant Discharge Elimination System (NPDES) permit from EPA. Under EPA's new CAFO regulations, CAFOs are defined as follows:

1. **Small CAFO** (designated by the appropriate authority) – An AFO that is designated as a CAFO, and is not a Medium CAFO (less than 299 head of cattle)
2. **Medium CAFO** – An AFO is defined as a Medium CAFO if it confines or stables: 300 to 999 cattle (including but not limited to heifers, steers, bulls, and cow/calf pairs), and either one of the following conditions are met:
    - Pollutants are discharged into waters of the United States through a man-made ditch, flushing system, or other similar man-made device; or
    - Pollutants are discharged directly into waters of the United States, which originate outside or pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.

3. **Large CAFO** – An AFO is defined as a Large CAFO if it stables or confines 1,000 cattle (including but not limited to heifers, steers, bulls, and cow/calf pairs), or 700 mature dairy cows (milked or dry)

As of 2005, new and existing operations must have Nutrient Management Plans (NMP) in place. Cattle in winter feeding or grazing areas or pastures—those areas that are not confined—are not regulated under the AFO/CAFO regulations. Attempts are made to provide technical assistance, and improvements to winter feeding areas, or even relocating some operations away from live water sources.

In general, all AFO/CAFO types of pollutants to be considered include:

- Sediment
- Nutrients
- Bacteria
- Temperature

Some factors that may be considered when assessing a facility include:

- Can runoff from the confined area reach a body of water?
- Can manure from the AFO reach a body of water?
- Does runoff from manure piles reach a body of water?
- Can up-gradient runoff flow through the AFO pens?
- Does a significant amount of runoff from structure roofs flow through the pens?
- Do confined animals have access to a body of water?
- Are the animals confined and fed for 45 days or more during any 12 month period?
- Is there any vegetation growing in the lot, or is it over-compacted and utilized to sustain growth of plants?

Some of the BMPs to consider include:

- Install fence to keep animals away from running water.
- Install outlets for roof runoff
- Heavy Use Area Protection Berms or Basins to hold back runoff from entering streams
- Nutrient Management applications
- Offsite watering facility

The goals and objectives in providing implementation of BMPs are to help an AFO owner/operator to achieve his production and natural resource conservation goals through development and implementation of comprehensive nutrient management plans (CNMPs).
DEQ delegates authority to ISDA for cattle feeding operations and defines the roles of the agencies for regulating cattle feeding operations. The cattle feeding operations covered by this agreement are all those operations not covered by the Idaho Beef Cattle Environmental Control Memorandum of Understanding (see Water Quality Agreements).

Estimated BMP Installation Costs for the Big Wood River Watershed

The following is a summary of amounts from the tables above listing estimate types and costs of BMPs to install on Agricultural land. These estimates will change as time goes by. Variables to the cost estimate include;

The increased cost of installation of BMP components
Willingness of operator to adopt practices
Availability of incentives to install BMPs
Land use changes from Agricultural to Rural in some areas
Economics and markets of commodities which may affect rotations of crops and possibly grazing pressures or animal types.

Table #9

Treatment Unit 1 -- Surface and gravity irrigated cropland/hayland, Blaine and Camas Co.

Conservation Practice	NRCS Practice Code	Ave Cost	Unit	# of Units	C/S Funds@ 75%	Participant Funds	Total Funds
Forage Harvest Management	511	$-					
Irrigation Water Management	449	$5	Acre	4,170	$0	$0	$0
Nutrient Management	590	$5	Acre	4,170	$15,638	$5,213	$20,850
Pest Management	595	$10	Acre	4,170	$15,638	$5,213	$20,850
Upland Wildlife Habitat Management	645	$5	Acre	4,170	$31,275	$10,425	$41,700
Pasture and Hay Planting	512	$100	Acre	4,170	$15,638	$5,213	$20,850
Residue Management, Mulch Till	329B	$-	Acre	4,170	$312,750	$104,250	$417,000
Irrigation System, Surface and Subsurface	443	$-	Acre	4,170	$46,913	$15,638	$62,550
Irrigation System, Sprinkler	442	$800	Acre	4,170	$-	$0	$0
		Subtotals	***Acre***	***2,000***	***$1,200,000***	***$400,000***	***$1,600,000***
Pest Management	595	$10					
Upland Wildlife Habitat Management	645	$5	Acre	2,500	$18,750	$6,250	$25,000

Table #9							
Conservation Crop Rotation	328	$-	Acre	2,500	$9,375	$3,125	$12,500
Irrigation Water Management	449	$5	Acre	2,500	$-	$0	$0
Nutrient Management	590	$5	Acre	2,500	$9,375	$3,125	$12,500
Residue Management, Mulch Till	329B	$15	Acre	2,500	$9,375	$3,125	$12,500
Residue Management, Seasonal	344	$15	Acre	2,500	$28,125	$9,375	$37,500
Surface Roughening	609	$8	Acre	2,500	$28,125	$9,375	$37,500
			Acre	2,500	$14,063	$4,688	$18,750
Treatment Unit 1 Subtotal					***$1,755,038***	***$585,013***	***$2,340,050***

Treatment Unit 2 – Surface and gravity Irrigated Cropland and Hayland Gooding, Lincoln Counties							
Conservation Practice	**NRCS Practice Code**	**Ave Cost**	**Unit**	**# of Units**	**C/S Funds@ 75%**	**Participant Funds**	**Total Funds**
Conservation Crop Rotation	328	$-	Acre	20,806	$-	$0	$0
Irrigation Water Management	449	$5	Acre	20,806	$78,023	$26,008	$104,030
Nutrient Management	590	$5	Acre	20,806	$78,023	$26,008	$104,030
Pest Management	595	$10	Acre	20,806	$156,045	$52,015	$208,060
Surface Roughening	609	$8	Acre	20,806	$117,034	$39,011	$156,045
Upland Wildlife Habitat Management	645	$5	Acre	20,806	$78,023	$26,008	$104,030
Residue Management, Seasonal	344	$15	Acre	20,806	$234,068	$78,023	$312,090
Irrigation System, Surface and Subsurface	443	$-	Acre	20,806	$-	$0	$0
PAM - Anionic Polyacrylamide Erosion Control	450	$15	Acre	20,806	$234,068	$78,023	$312,090

Table #9							
Irrigation System, Sprinkler	442	$800	Acre	10,400	$6,240,000	$2,080,000	$8,320,000
Treatment Unit 2 (continued) – Sprinkler Irrigated Cropland and Hayland Gooding, Lincoln Co.							
Conservation Practice	**NRCS Practice Code**	**Ave Cost**	**Unit**	**# of Units**	**C/S Funds@ 75%**	**Participant Funds**	**Total Funds**
Pest Management	595	$5	$10	5,000	$37,500	$12,500	$50,000
Upland Wildlife Habitat Management	645	$-	Acre	5,000	$18,750	$6,250	$25,000
Conservation Crop Rotation	328	$5	Acre	5,000	$-	$0	$0
Irrigation Water Management	449	$5	Acre	5,000	$18,750	$6,250	$25,000
Nutrient Management	590	$15	Acre	5,000	$18,750	$6,250	$25,000
Residue Management, Mulch Till	329B	$15	Acre	5,000	$56,250	$18,750	$75,000
Residue Management, Seasonal	344	$8	Acre	5,000	$56,250	$18,750	$75,000
Surface Roughening	609		Acre	5,000	$28,125	$9,375	$37,500
				Treatment Unit 2 Subtotal	$7,449,656	$2,483,219	$9,932,875
Treatment Unit 3 – Irrigated Pasture							
Conservation Practice	**NRCS Practice Code**	**Ave Cost**	**Unit**	**# of Units**	**C/S Funds@ 75%**	**Participant Funds**	**Total Funds**
Forage Harvest Management	511	$-	Acre	500	$-	$0	$0
Irrigation Water Management	449	$5	Acre	500	$1,875	$625	$2,500
Nutrient Management	590	$5	Acre	500	$1,875	$625	$2,500
Pest Management	595	$10	Acre	500	$3,750	$1,250	$5,000
Pasture and Hay Planting	512	$100	Acre	500	$37,500	$12,500	$50,000
Prescribed Grazing	528	$5	Acre	500	$1,875	$625	$2,500

Table #9							
Treatment Unit 3, continued – Irrigated Pasture							
Upland Wildlife Habitat Management	645	$5	Acre	500	$1,875	$625	$2,500
Irrigation System, Surface and Subsurface	443	$-	Acre	500	$-	$0	$0
				Treatment Unit 3 Subtotal	**$48,750**	**$16,250**	**$65,000**
Treatment Unit 4 – Irrigated Pasture -- Lincoln Gooding Counties							
Conservation Practice	**NRCS Practice Code**	**Ave Cost**	**Unit**	**# of Units**	**C/S Funds@ 75%**	**Participant Funds**	**Total Funds**
Irrigation Water Management	449	$5	Acre	2,000	$7,500	$2,500	$10,000
Nutrient Management	590	$5	Acre	2,000	$7,500	$2,500	$10,000
Pasture and Hay Planting	512	$100	Acre	2,000	$150,000	$50,000	$200,000
Pest Management	595	$10	Acre	2,000	$15,000	$5,000	$20,000
Prescribed Grazing	528	$5	Acre	2,000	$7,500	$2,500	$10,000
Upland Wildlife Habitat Management	645	$5	Acre	2,000	$7,500	$2,500	$10,000
Irrigation System, Surface and Subsurface	443	$-	Acre	2,000	$-	$0	$0

Treatment Unit 4 – Irrigated Pasture -- Lincoln Gooding Counties							
Watering Facility	614	$1,750	Each	50	$65,625	$21,875	$87,500
Irrigation System, Sprinkler	442	$800	Acre.	2,000	$1,200,000	$400,000	$1,600,000
Fence	382	$2.50	Foot	55,000	$103,125	$34,375	$137,500
Structure for Water Control	587	$1000	Each	20	$15,000	$5000	$20,000
Tree/Shrub Establishment	612	$400	Acre.	Site Specific			
Heavy Use Area Protection	561	$10,000	Acre.	Site Specific			
Pipeline	516	$3.00	Ft.	Site Specific			
Rigid Gated Pipeline	430HH	$3.50	Ft.	Site Specific			
		Treatment Unit 4 Subtotal			**$1,578,750**	**$526,250**	**$2,105,000**

Treatment Unit 5 – Rangeland Big Wood River							
Conservation Practice	**NRCS Practice Code**	**Ave Cost**	**Unit**	**# of Units**	**C/S Funds@ 75%**	**Participant Funds**	**Total Funds**
Watering Facility	614	$1,750	Each	120	$157,500	$52,500	$210,000
Fence	382	$2.50	Foot	220,000	$412,500	$137,500	$550,000
Structure for Water Control	587	$1,000	Each	Site Specific			
Tree/Shrub Establishment	612	$400	Acre	Site Specific			
Heavy Use Area Protection	561	$10,000	Acre	Site Specific			
Pipeline	516	$3.00	Foot	Site Specific			
Rigid Gated Pipeline		$3.50	Foot	Site Specific			
Range Planting	550	$80.00	Acre	5,000	$300,000	$100,000	$400,000
Brush	314	$30.00	Acre	Site Specific			

Management							
				Treatment Unit 5 Subtotal	**$870,000**	**$290,000**	**$1,160,000**

Treatment Unit 6 Riparian land Big Wood River

Conservation Practice	NRCS Practice Code	Ave Cost	Unit	# of Units	C/S Funds @75%	Participant Funds	Total Funds
Watering Facility	614	$1,750	Each	40	$52,500	$17,500	$70,000
Fence	382	$2.50	Foot	75,000	$140,625	$46,875	$187,500
Structure for Water Control	587	$1,000	Each	Site Specific			
Tree/Shrub Establishment	612	$6	Each	Site Specific			
Heavy Use Area Protection	561	$10,000	Acre	Site Specific			
Pipeline	516	$3.00	Foot	Site Specific			
Relocation of Feedlot			Acre	Site Specific			
Wildlife Habitat Management	645	$7.50	Acre	1,200	$6,750	$2,250	$9,000
				Treatment Unit 6 Subtotal	**$199,875**	**$66,625**	**$266,500**

Treatment Unit 7 Livestock Feed Operation Big Wood River

Conservation Practice	NRCS Practice Code	Ave Cost	Unit	# of Units	C/S Funds @75%	Participant Funds	Total Funds
Nutrient Management	595	$5.00	Acre	4,000	$15,000	$5,000	$20,000
Waste Storage Facility	313	$3	Cubic yard	10,000	$22,500	$7,500	$30,000
Windbreak / Shelterbelt	650	$2.2	Foot	9,000	$14,850	$4,950	$19,800
Water Well	642	$25.0	Foot	3,000	$56,250	$18,750	$75,000
				Treatment Unit 7 Subtotal	**$108,600**	**$36,200**	**$144,800**

Table 7 Cost Estimate Summary for All Treatment Units in Big Wood River

Cost Estimate Summary for Best Management Practice, Big Wood River					
		Estimated Cost Share at 75%	Estimated Participants share	Total Estimated BMP Cost	Additional Site-specific BMP Estimates
Treatment Unit 1		$1,755,038	$585,013	$2,340,050	
Treatment Unit 2		$7,449,656	$2,483,219	$9,932,875	
Treatment Unit 3		$48,750	$16,250	$65,000	
Treatment Unit 4		$1,578,750	$526,250	$2,105,000	$750,000
Treatment Unit 5		$870,000	$290,000	$1,160,000	$750,000
Treatment Unit 6		$199,875	$66,625	$266,500	$1,000,000
Treatment Unit 7		$108,600	$36,200	$144,800	$2,000,000
	Total	**$12,010,669**	**$4,003,556**	**$16,014,225**	**$4,500,000**

Total Estimated BMP Cost	**$16,014,225**
Additional Sight Specific Estimate	**$4,500,000**
Overall Estimated BMP Cost	**$20,514,225**

IMPLEMENTATION ALTERNATIVES

Alternative 1 – No Action

This alternative would continue utilizing existing conservation programs without additional project activities focusing on more problem areas. Identified problems could continue to negatively impact beneficial uses in the watershed.

Alternative 2- Land Treatment with BMPs on Cropland, Pasture, and Rangeland

This alternative would reduce irrigation-induced erosion and excessive nutrient runoff from cropland areas. Nutrient and Bacteria runoff would also be reduced from excessive animal waste and fertilizer applications. Improved grazing management practices, and installation of BMPs such as offsite water facilities, will reduce pollutant runoff to the streams and Big Wood River. Voluntary incentive programs can be made available to assist in landowner participation.

Alternative 3- Riparian and stream channel restoration

This alternative would reduce accelerated stream bank erosion. Implemented BMPs would reduce nutrient and bacteria runoff from entering the river and creeks. This alternative improves water quality, riparian vegetation, and aquatic habitat in the creeks and upper Big Wood River. The improved water quality entering into Magic Reservoir can also provide better "lake-like" conditions, and provide a cleaner agricultural water supply for the lower Big Wood Drainage. Stream channels in the lower portions can be improved to reduce nutrient loading into canals, diversions, and accumulated deposits in the original Big Wood River channel.

Alternative 4- Animal facility waste management

This alternative would reduce sediment, nutrient, and bacteria runoff from animal waste storage and application areas. This will improve water quality in the watershed and reduce pollutant loading to the main drainages in the Big Wood River. Existing larger beef operations may be already regulated. All dairy facilities are regulated. Smaller operations will need evaluations and on farm planning to provide cost-effective, beneficial options to improve the resource area. Nutrient Management planning, in addition to irrigation water management, will be vital to securing optimal results for the goals of the TMDL.

Because of the complexity of land use in this large watershed, ongoing efforts from the four Soil Conservation Districts will be critical in providing direction and guidance to local landowners who strive to optimize implementation of BMPs that will achieve the goals of the TMDL. Implementation of BMPs at this large scale may take up to 20 years to accomplish. On-site monitoring and BMP effectiveness evaluations will be performed as part of the feedback loop, to assure agricultural-related activities are achieving the desired results.

Table 11 -- An Estimated Timeline for TMDL Agricultural Implementation

Task	Output	Year
Evaluate potential project area/identify participant readiness	Districts Priority Plan for implementation	2007
Develop conservation plans and contracts	Complete plans and contracts	2007-2012
Design and install approved BMPs	Certify BMP installations	2007-2020
Track BMP installation	Tracking/implementation progress report	Ongoing
Evaluate BMP and Project effectiveness	Project report, BMP Effectiveness evaluations, Report to Districts, DEQ	2008-2025

Funding

Financial and technical assistance for installation of BMPs is needed to ensure success of this implementation plan. The four Idaho Soil and Water Conservation Districts will actively pursue multiple potential funding sources to implement water quality improvements on private agricultural and grazing lands. These sources include (but are not limited to):

CWA 319 projects refer to section 319 of the ***Clean Water Act***. These are Environmental Protection Agency funds that are allocated to the Nez Perce Tribe and to Idaho State. The Idaho Department of Environmental Quality has primacy to administer the Clean Water Act §319 Non-point Source Management Program for areas outside the Nez Perce Reservation. Funds focus on projects to improve water quality, and are usually related to the TMDL process. The Nez Perce tribe has CWA 319 funds available for projects on Tribal lands on a competitive basis.

Source: Idaho Department of Environmental Quality

WQPA The Water Quality Program for Agriculture administered by the Idaho Soil Conservation Commission. This program is also coordinated with the TMDL process. Source: Idaho Soil Conservation Commission. http://www.scc.state.id.us/programs.htm

The **RCRDP program** is the **Resource Conservation and Rangeland Development Program** administered by the Idaho Soil Conservation Commission. This is a grant/loan program for implementation of agricultural and rangeland best management practices or loans to purchase equipment to increase conservation. Source: Idaho Soil Conservation Commission. http://www.scc.state.id.us/programs.htm

Conservation Improvement Grants are administered by the Idaho Soil Conservation Commission. http://www.scc.state.id.us/programs.htm

PL-566 The small watershed program administered by the USDA Natural Resources Conservation Service (NRCS).

Agricultural Management Assistance (AMA): AMA provides cost-share assistance to agricultural producers for constructing or improving water management structures or irrigation structures; planting trees for windbreaks or to improve water quality; and mitigating risk through production

diversification or resource conservation practices, including soil erosion control, integrated pest management, or transition to organic farming. http://www.nrcs.usda.gov/programs/ama/

Conservation Reserve Program (CRP): CRP is a land retirement program for blocks of land or strips of land that protect the soil and water resources, such as buffers and grassed waterways. http://www.nrcs.usda.gov/programs/crp/

Conservation Technical Assistance (CTA): CTA provides free technical assistance to help farmers and ranchers identify and solve natural resource problems on their farms and ranches. This might come as advice and counsel, through the design and implementation of a practice or treatment, or as part of an active conservation plan. This is provided through your local Conservation District and NRCS. http://www.nrcs.usda.gov/programs/cta/

Environmental Quality Incentives Program (EQIP): EQIP offers cost-share and incentive payments and technical help to assist eligible participants in installing or implementing structural and management practices on eligible agricultural land. http://www.nrcs.usda.gov/programs/eqip/

Wetlands Reserve Program (WRP): WRP is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. Easements and restoration payments are offered as part of the program-http://www.nrcs.usda.gov/programs/wrp/
Wildlife Habitat Incentives Program (WHIP): WHIP is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Cost-share payments for construction or re-establishment of wetlands may be included.
http://www.nrcs.usda.gov/programs/whip/

SRF State Revolving Loan Funds are administered through the Idaho Soil Conservation commission. http://www.scc.state.id.us/programs.htm

Grassland Reserve Program (GRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance grasslands on their property. Administered by the NRCS. http://www.nrcs.usda.gov/programs/GRP/

CSP Conservation Security Program is a voluntary program that rewards the Nation's premier farm and ranch land conservationists who meet the highest standards of conservation environmental management. More details can be found at http://www.nrcs.usda.gov

GLCI Grazing Land Conservation Initiative mission is to provide high quality technical assistance on privately owned grazing lands on a voluntary basis and to increase the awareness of the importance of grazing land resources. http://www.glci.org/

Many of these programs can be used in combination with each other to implement BMPs.

Outreach

The conservation partnership (the four Conservation Districts, ISCC, USDA/NRCS, FSA, U of I, ISDA Extension Service, and County Officials will use their combined resources to provide information to agricultural landowners and operators within the Big Wood River sub-basin. A local outreach plan can be developed by the conservation partnership. Newspaper articles, district newsletters, watershed and project tours, landowner meetings and one-on-one personal contact would be used as outreach tools. Outreach efforts will:

- Provide information about the TMDL process
- Supply water quality monitoring results
- Accelerate the development of conservation plans and program participation
- Distribute progress reports
- Enhance technology transfer related to BMP implementation
- Increase public understanding of agriculture's contribution to conserve and enhance natural resources
- Improve public appreciation of agriculture's commitment to meeting the TMDL challenge
- Organize an informational tour bringing together irrigation districts' Board of Directors and Soil Conservation Districts' Board of Supervisors.
- Identify and encourage the use of BMPs for recreation activities on the sub-basin

Monitoring and Evaluation

Field Level

At the field level, annual status reviews will be conducted to insure that the contract is on schedule, and that BMPs are being installed according to standards and specifications. BMP effectiveness monitoring will be conducted on installed projects to determine installation adequacy, operation consistency and maintenance, and the relative effectiveness of implemented BMPs in reducing water quality impacts. This monitoring will also measure the effectiveness of BMPs in controlling agricultural nonpoint-source pollution. These BMP effectiveness evaluations will be conducted according to the protocols outlined in the ***Agriculture Pollution Abatement Plan*** and the ***ISCC Field Guide for Evaluating BMP Effectiveness***.

The ***Revised Universal Soil Loss Equation (RUSLE)*** and ***Surface Irrigation Soil Loss (SISL)*** Equation 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 determine sheet and rill irrigation-induced and gully erosion. ***Stream Visual Assessment Protocol (SVAP)*** and ***Streambank Erosion Condition Inventory (SECI)*** are used to assess aquatic habitat, stream bank erosion, and lateral recession rates. The Idaho OnePlan's ***CAFO/AFO Assessment Worksheet*** is used to evaluate livestock waste, feeding, storage, and application areas. The ***Water Quality Indicators Guide*** is utilized to assess nitrogen, phosphorus, sediment, and bacteria contamination from agricultural land.

Watershed Level

At the watershed level, there are many governmental and private groups involved with water quality monitoring. The Idaho Department of Environmental Quality uses the ***Beneficial Use Reconnaissance Protocol (BURP)*** to collect and measure key water quality variables that aid in determining the

beneficial use support status of Idaho's water bodies. The determination will tell if a water body is in compliance with water quality standards and criteria. In addition, IDEQ will be conducting five-year TMDL reviews.

Annual reviews for funded projects will be conducted to insure the project is kept on schedule. With many projects being implemented across the state, ISCC developed a software program to track the costs and other details of each BMP installed. This program can show what has been installed by project, by watershed level, by sub-basin level, and by state level. These project and program reviews will insure that TMDL implementation remains on schedule and on target. Monitoring BMPs and projects will be the key to a successful application of the adaptive watershed planning and implementation process.

Works Cited

Brockway, C. E., Kahlown, M. Akram. 1994. Hydrologic Evaluation of the Big Wood River and Silver Creek Watersheds Phase I. University of Idaho, Idaho Water Resources Research Institute, Kimberly Research and Extension Center. 74 p.

Buhidar, Balthasar B. Ph.D. 2002. The Big Wood River Watershed Management Plan. Idaho Department of Environmental Quality. 177 p.

2001 Idaho Agricultural Statistics. Idaho Agricultural Statistics Service. 2001

Krajewski, Justin. Water Quality Resource Conservationist for ISCC. Pocatello, Idaho NRCS Field Office. GIS Maps and Personal Correspondence. December 2001

Roberts, Gail. Retired NRCS District Conservationist. Shoshone, Idaho Field Office. Personal Communication. August 2002

Peterson, Lee. Water Master for District 37/37M. Shoshone, Idaho. Personal Communication. August 2002

Thompson, Steve. NRCS District Conservationist. Gooding, Idaho Field Office. Personal Communication. June 2002

Wetzstein, Arnold. Engineer. Idaho Soil Conservation Commission. Jerome, Idaho NRCS Field Office. GIS Maps digitized from 1992 FSA Blaine County maps. August 2002

Rowen, Eileen, ISCC Water Quality Resource Conservationist, Orofino, Idaho, Funding list

Dansart, William, ISCC Water Quality Resource Conservationist, Moscow, Idaho, GIS, Arc View, Arc Map assistance

Fergusen, David. Initial Riparian Assessment, 2003

Josaitis, Bob. Rangeland Narrative, Big Wood River Implementation Plan, July 2006

APPENDICES

Appendix A

Big Wood River TMDL Implementation Plan
Riparian Assessment Summary

Stream Name	Reach	Recommended Tasks	Possible BMPs	Water Quality Benefits
East Fork Rock Creek				
3,050 ft.	EFRC 1	Overall in this reach, vegetation is in an upward trend		
		Reduce Small Head Cut	Grade Stabilization Structure	Stabilize head cut, reduce in stream erosion
		Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
		Add cross fencing with watering facilities to assist	Fence	Improve pasture efficiencies
		Grazing management systems	Spring Development	Offsite water developments to reduce in stream impacts
		Hardened Stream Crossings	Rock Crossings	Hardened crossings to minimize instability
		Riparian Pasture development		Improve native plant populations
		Protect existing Beaver Dams		Improve water table levels
1,350 ft.	EFRC 2	Evaluate condition and management of adjacent Pastureland		
		Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
		Add cross fencing with watering facilities to assist	Fence	Improve pasture efficiencies
		Grazing management systems	Spring Development	Offsite water developments to reduce in stream impacts
		Riparian Pasture development		Improve native plant populations
3,350 ft.	EFRC 4	Address Large Head Cutting	Grade Stabilization Structure	Stabilize head cut, reduce in stream erosion

Big Wood River TMDL Implementation Plan
Riparian Assessment Summary

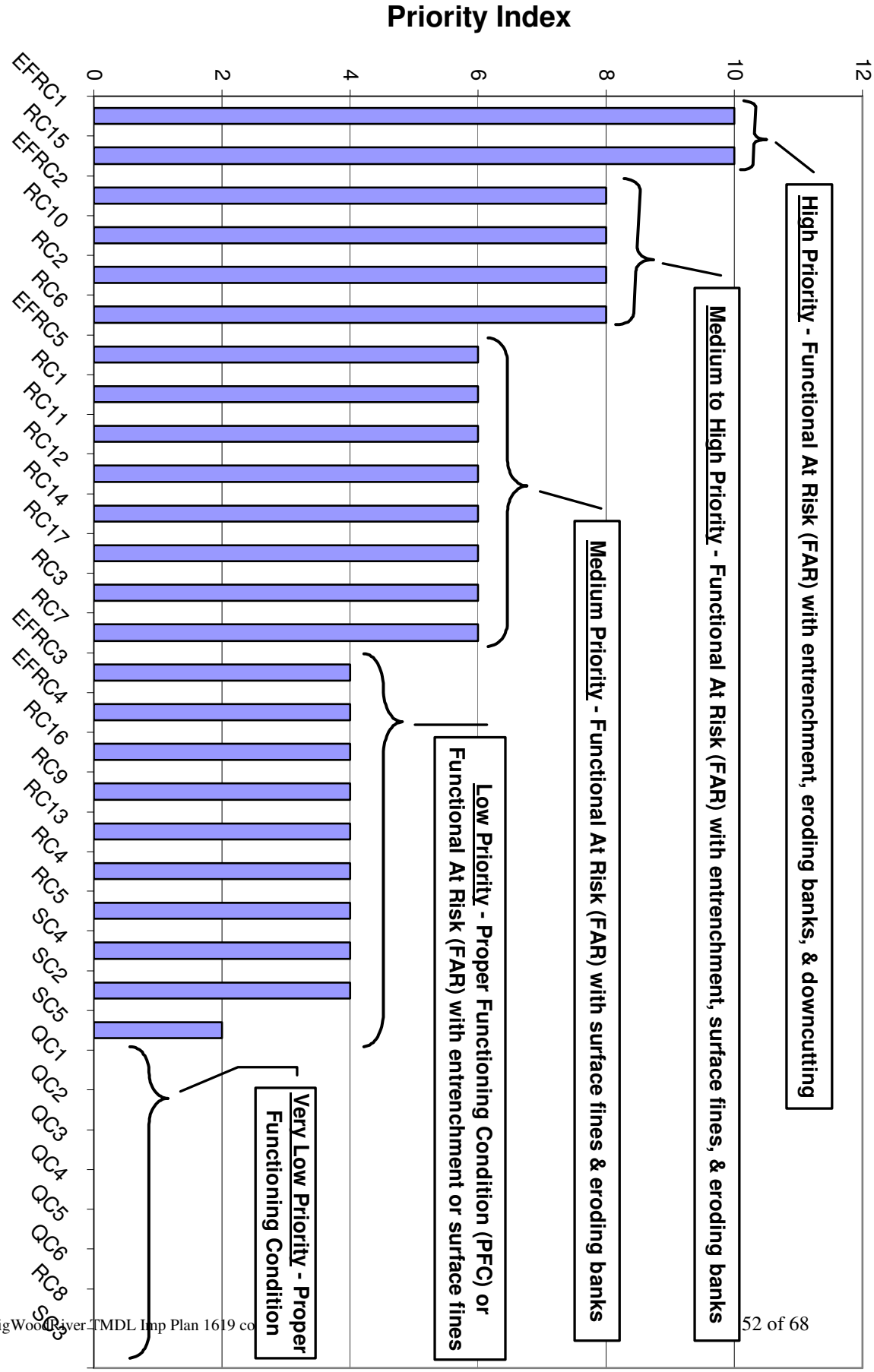
Stream Name	Reach	Recommended Tasks	Possible BMPs	Water Quality Benefits
				Pad with Rock to stabilize upstream/downstream toe
950 ft.	EFRC 5	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
		Limit access to channels in some locations to	Fence	Improve pasture efficiencies
		increase woody species populations	Spring Development	Offsite water developments to reduce in stream impacts
				Improve native plant populations
Rock Creek				
6,170 ft.	RC 1	Grazing Plan	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
				Also improve Willow Regeneration
2,560 ft.	RC 2	Grazing Plan	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
				Also improve Willow Regeneration
		Riparian Pasture development		Improve native plant populations
2,620 ft.	RC 3	Grazing Plan	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
				Also improve Willow Regeneration
		Riparian Pasture development		Improve native plant populations
24,475 ft.	RC 4,5,6, 7, 8,9	Vegetation in Upward Trend	Continue current management	Maintain current condition
4,680 ft.	RC 10	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity

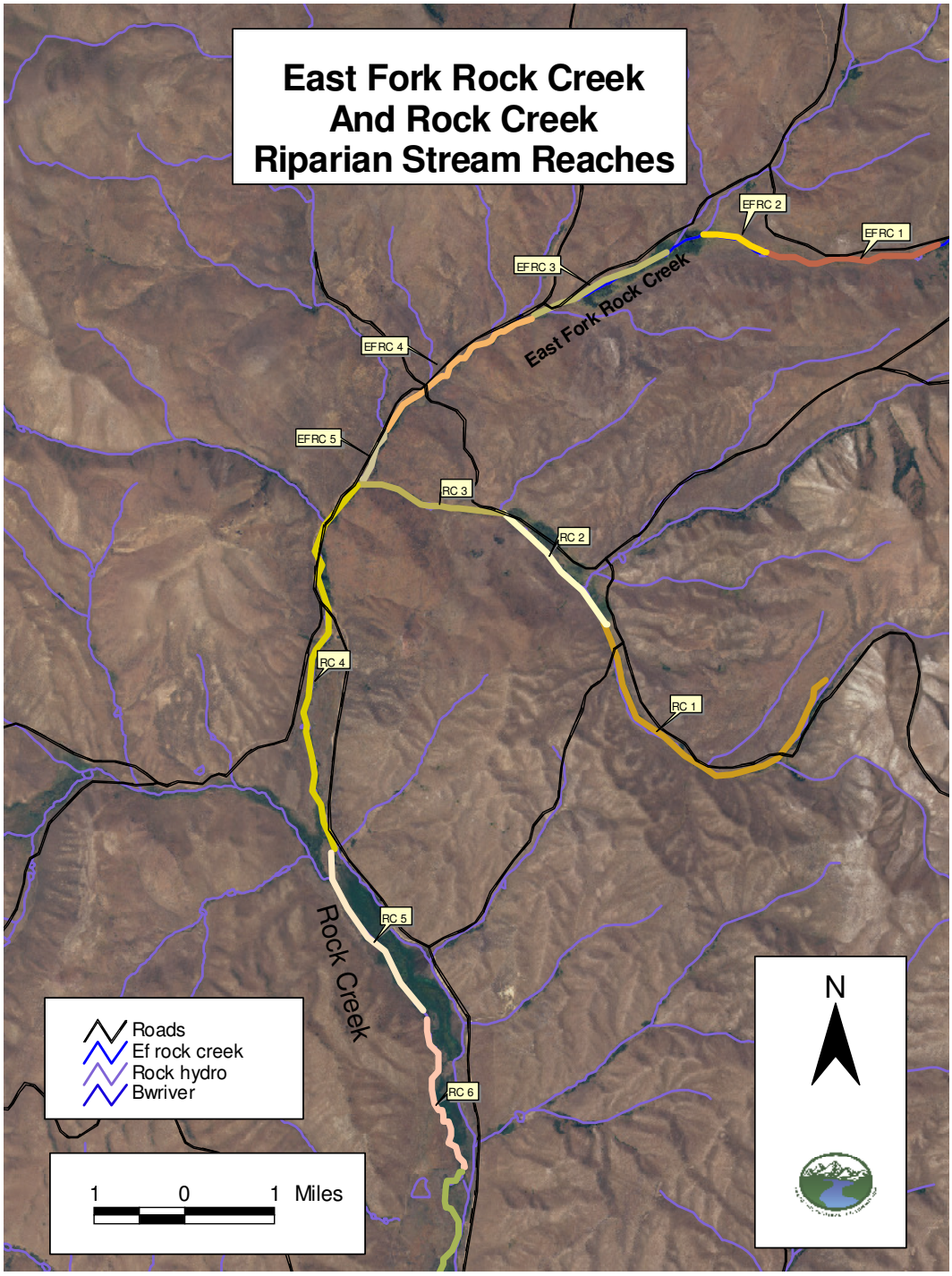
Big Wood River TMDL Implementation Plan
Riparian Assessment Summary

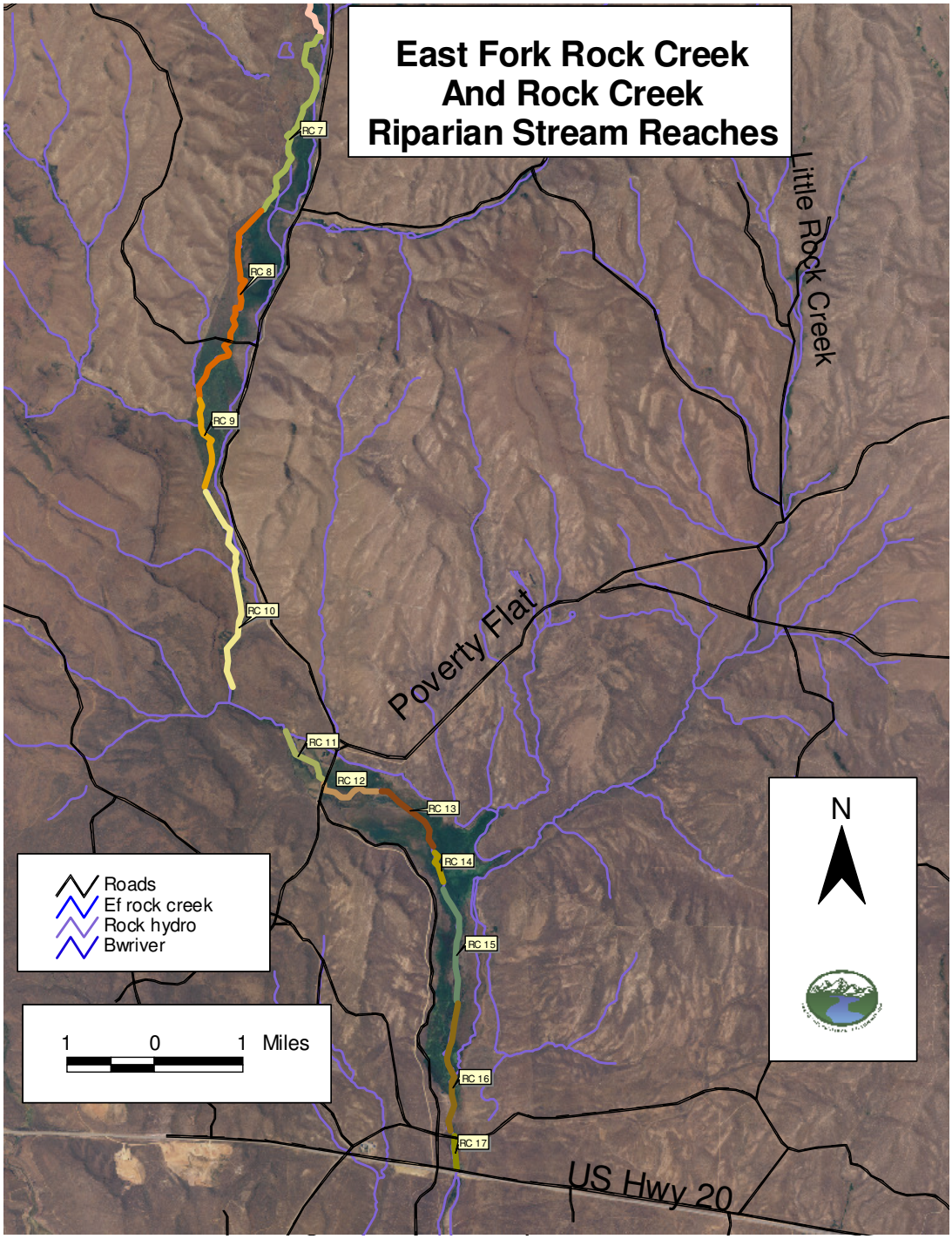
Stream Name	Reach	Recommended Tasks	Possible BMPs	Water Quality Benefits
		Add fencing with watering facilities to assist	Fence	Improve pasture efficiencies
		Grazing management systems	Spring Development	Offsite water developments to reduce in stream impacts
		Riparian Pasture development		Improve native plant populations
1,140 ft.	RC 11	Vegetation in Upward Trend	Continue current management	Maintain current condition & regrowth of woody species
1,400 ft.	RC 12		Continue current management	Maintain current condition & regrowth of woody species
1,800 ft.	RC 13	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
			Streambank & Shoreline Protection	Riparian plantings/ or reduce grazing pressure to allow regeneration of woody species in the area
790 ft.	RC 14	Riparian Pasture development		Improve native plant populations
		Hardened Stream Crossings	Rock Crossings	Hardened crossings to minimize instability
2,500 ft.	RC 15	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
		Riparian Pasture development		Improve native plant populations
		Add fencing with watering facilities to assist	Fence	Improve pasture efficiencies
		Grazing management systems	Spring Development	Offsite water developments to reduce in stream impacts
2890 ft.	RC 16	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity

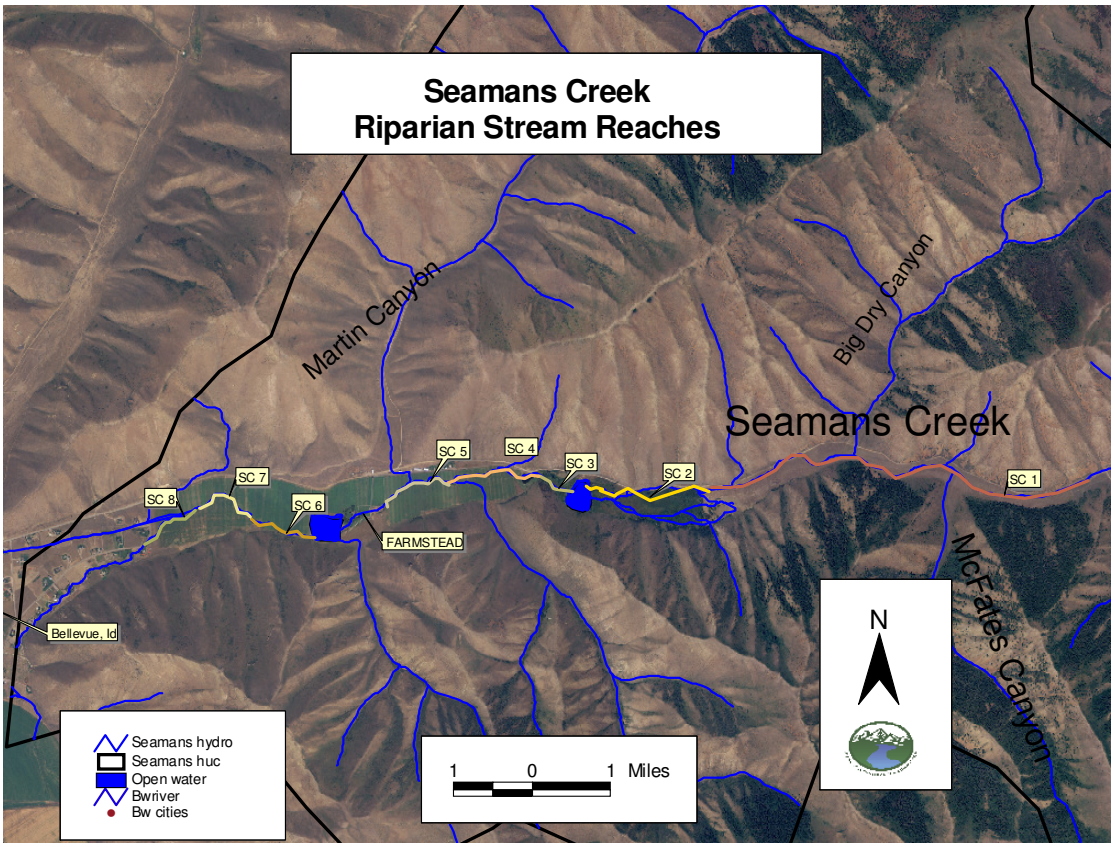
Big Wood River TMDL Implementation Plan
Riparian Assessment Summary

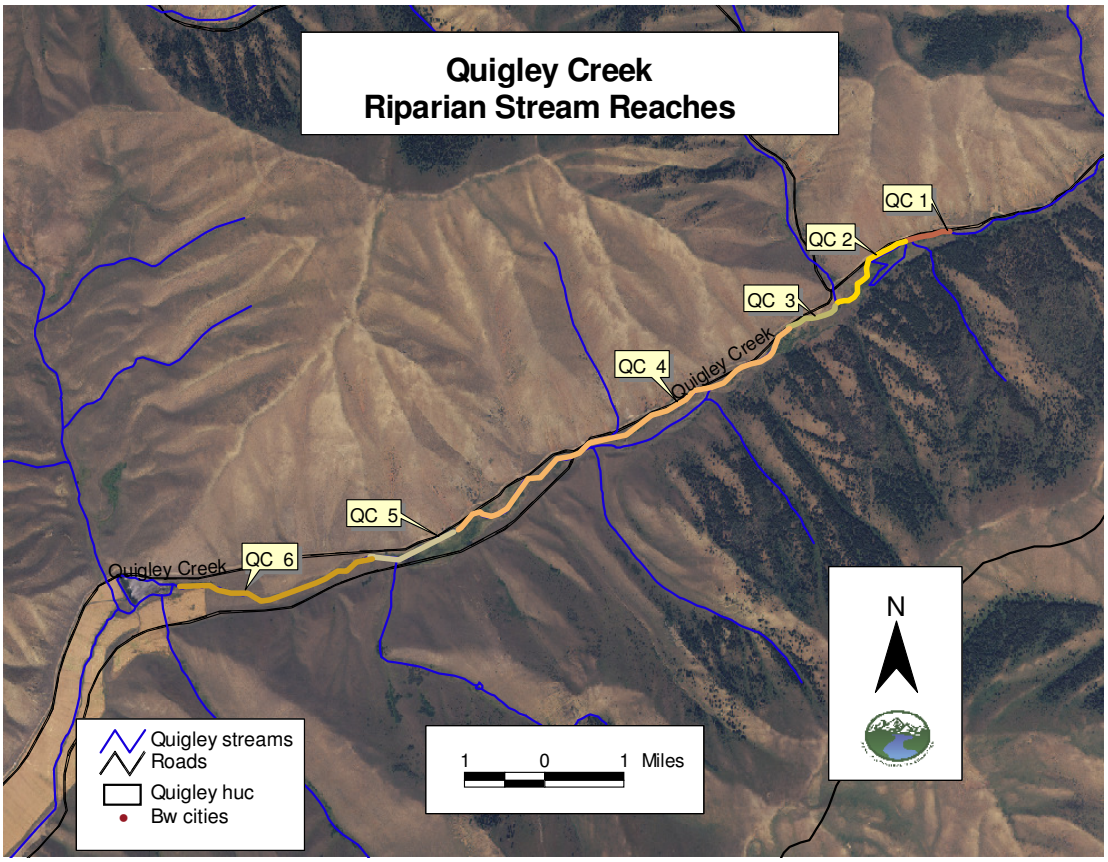
Stream Name	Reach	Recommended Tasks	Possible BMPs	Water Quality Benefits
820 ft.	RC 17	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
Seamans Creek				
12,900 ft.	SC 1,2	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
1,020 ft.	SC 3		Continue current management	Maintain current condition & regrowth of woody species
4,160 ft.	SC 4,5	Reduce Grazing duration & adjust grazing schedules	Prescribed Grazing	Improve plant vigor, increase vegetative productivity
				Existing sprinkler system impairing willow development
1,690 ft.	SC 5,6	Farmstead location on stream. Water flows through the facility	Relocate the Barnyard	
			Fence	Improve pasture efficiencies
			Spring Development	Offsite water developments to reduce in stream impacts
				Improve native plant populations
			Streambank & Shoreline Protection	Establish plant communities for stabilized stream area
4,875 ft.	SC 6,7,8	No flow observed during assessment		


Priority Index
0
2
4
6
8
10
12
EFRC1
RC15
EFRC2
RC10
RC2
RC6
EFRC5
RC1
RC11
RC12
RC14
RC17
RC3
RC7
EFRC3
EFRC4
RC16
RC9
RC13
RC4
RC5
SC4
SC2
SC5
QC1
QC2
QC3
QC4
QC5
QC6
RC8
SC3
Reach
High Priority - Functional At Risk (FAR) with entrenchment, eroding banks, & downcutting
Medium to High Priority - Functional At Risk (FAR) with entrenchment, surface fines, & eroding banks
Medium Priority - Functional At Risk (FAR) with surface fines & eroding banks
Low Priority - Proper Functioning Condition (PFC) or Functional At Risk (FAR) with entrenchment or surface fines
Very Low Priority - Proper Functioning Condition


East Fork Rock Creek
And Rock Creek
Riparian Stream Reaches
EF RC 1
EF RC 2
EF RC 3
East Fork Rock Creek
EF RC 4
EF RC 5
RC 3
RC 2
RC 4
RC 1
RC 5
Rock Creek
RC 6
Roads
Ef rock creek
Rock hydro
Bwriver
1 0 1 Miles
N


East Fork Rock Creek
And Rock Creek
Riparian Stream Reaches
Little Rock Creek
Poverty Flat
US Hwy 20
RC 7
RC 8
RC 9
RC 10
RC 11
RC 12
RC 13
RC 14
RC 15
RC 16
RC 17
Roads
Ef rock creek
Rock hydro
Bwriver
1 0 1 Miles
N


Seamans Creek
Riparian Stream Reaches
Martin Canyon
Big Dry Canyon
Seamans Creek
McFates Canyon
SC 1
SC 2
SC 3
SC 4
SC 5
SC 6
SC 7
SC 8
FARMSTEAD
Bellevue, Id
N
Seamans hydro
Seamans huc
Open water
Bwriver
Bw cities
1 0 1 Miles


Quigley Creek
Riparian Stream Reaches
QC 1
QC 2
QC 3
QC 4
QC 5
QC 6
Quigley Creek
Quigley Creek
N
Quigley streams
Roads
Quigley huc
Bw cities
1 0 1 Miles

Appendix B
Rangeland Narrative, Big Wood Implementation Plan, *prepared by NRCS*

Rangeland assessments utilize one of three major tools: Similarity Index, Rangeland Health, and/or Trend. All three tools view rangelands from a different perspective.

Similarity Index replaces the range "condition" terminology, and relates existing plant communities to the historic climax plant community (HCPC) of the site as known at the time of European immigration and settlement, or to an identified vegetative "state" other than HCPC if present. Similarity index is represented as a percent.

Rangeland Health assesses 17 or more attributes relating the departure of soil/site stability, hydrologic function, and integrity of the biotic community from the Ecologic Site Description (ESD) for the site being evaluated.

Rangeland Trend assessments determine the direction of change in relation to HCPC for the ESD. If no ESD is available for the area being evaluated, Planned Trend assessments determine the direction of change in relation to the management objectives of the plant communities involved and soil, water, air, plant and animal resource values.

Rangeland communities in the Big Wood HUC can be divided mostly into the mountain big sage brush sites in the northern half of the HUC above 5000 feet elevation and the Wyoming big sage brush sites in the southern half of the HUC below 5000 feet elevation. Other sites dominated by silver and low sagebrush species occur in mosaic patterns throughout the big sage complexes. These occur mostly on the Camas Prairie and southern half of the HUC.

Similarity indices (range conditions) in the Big Wood HUC decrease from north to south. Mountain big sage communities on U.S. Forest Service and BLM ground in the northern portion of the HUC are in the best condition and equal or exceed NRCS minimum quality criteria levels of 60% similarity index. Private rangelands in the northern half of the HUC generally may be at or below 60% similarity index, but generally are in stable condition. Heavy mountain big sage cover on these private ranges in the northern half of the HUC is common due to fire suppression. Combined with depleted herbaceous and forb understories due to overgrazing these ranges have depressed similarity indexes below 60% (fair condition class). Private rangeland in the northern half of the HUC with some fire history or brush management and proper grazing management is generally in good or better condition (similarity indexes 60% and higher).

Due to cheatgrass invasion in the Wyoming big sage sites of the southern portions of the Big Wood HUC (Gooding and Lincoln counties), similarity indices here are low and will never meet NRCS Quality Criteria when these sites are compared to historic climax plant communities. The majority of rangeland in this portion of the HUC has crossed the threshold into an irreversible state consisting of cheatgrass-dominated Wyoming big sage sites. These sites have varying amounts of Wyoming big sage depending on the number of fires and fire frequencies since the site's invasion by cheatgrass. Overall, range conditions in the southern portion of the HUC are at

best in fair condition. Trends here are generally stable, though some areas here with soil erosion and weed problems have downward trend.

Rangelands seeded to introduced grasses such as crested and other wheatgrasses are common on the Camas Prairie, Bennett Hills, Gooding and Lincoln counties. These communities generally display stable trends with improved herbaceous productivity for grazing but exhibit reduced overall rangeland health and wildlife values compared to historic plant communities.

Suggested BMPs for Rangelands, Big Wood HUC

Throughout the Big Wood HUC common rangeland condition problems center around lack of prescribed grazing that addresses proper frequency, intensity, and duration of livestock use for the range sites involve. Lack of water and associated livestock distribution problems are a common problem, particularly on the southern portion of the HUC. Drought has been a problem for the last 15 years in this area. Sagebrush management, tempered with the local needs of sage grouse and mule deer, needs to be a management consideration in the portions of the HUC where cheatgrass is not likely to invade. Range seedings for restoration and improvement of native and improved rangelands is needed throughout the HUC provided drought conditions are avoided during establishment. Accordingly, the following NRCS practices are needed for rangelands in the Big Wood HUC:

- Prescribed Grazing (528A)
- Watering Facility (614)
- Water Well (642)
- Pumping Plant (533)
- Spring Development (574)
- Pipeline (516)
- Range Planting (550)
- Prescribed Burning (338)
- Brush Management (314)
- Fence (382)
- Pest Management (595)

Prioritization of BMPs on Private Lands in the Big Wood HUC

In general, private rangelands in the southern portion of the HUC are most in need of range management and improvement, though no data exists as to the relative contributions these ranges make to water quality degradation. Priority areas in the northern portion of the HUC may be any fair condition rangelands occurring on the steeper slopes there. In all areas of the HUC where riparian areas dissect private grazing lands, improved management is most likely needed to protect water quality. This includes removing or minimizing direct access of livestock to streams by implementing prescribed grazing, fence, and/or water facility practices.

Bob Josaitis, Rangeland Management Specialist, Gooding NRCS 7/20/06

Individual reach assessments in all of the 303(d) listed streams were performed in the spring and summer of 2003 By Dave Ferguson, and Chuck Pentzer in the following drainages:

Rock Creek
East Fork Rock Creek
Seamans Creek
Quigley Creek

Croy Creek was not assessed, but observation shows pressures of urban development into previous irrigated hay and cereal grain crop.

Greenhorn Gulch was similar in that development in the past ten years has changed the land use from agricultural.

Cove Creek was not assessed, but improved agricultural grazing practices in the upper reaches are showing improvements to the stream below.

Resource problems associated with this land use include:

- Incised stream channels or entrenchment that lowers the water table in the adjoining soils
- Lack of adequate riparian vegetation to control erosion and provide habitat for fish

Riparian grazing units typically exhibit impacts to riparian vegetation and a loss of woody species. Riparian vegetation consists of grasses, sedges, rushes and a variety of woody species. Streams are primarily low gradient and depend on vegetation for stability. Soils vary from gravelly to loamy. Elevation and precipitation vary widely throughout the state. Noxious weeds may invade the site. These areas are important habitat for a variety of fish and wildlife. Water quality is often a concern for sediment, temperature and nutrients. Moisture for vegetation growth is primarily from high water tables and stream flows. Fencing is generally an existing practice. Benchmark suspended sediment in surface water is based on average sheet and rill erosion rate (2 t/ac/yr) with 25% sediment delivery over a 40- acre planning unit, plus 100% delivery of accelerated stream bank erosion. Benchmark stream bank erosion based on 1/2 mile

of stream (x 2 banks) with 15% eroding at an accelerated rate, average bank height of 2 ft, moderate erosion rate of 0.2 ft/year, average soil density 90 lbs/cu ft.

Big Wood River Watershed Advisory Group

Blaine, Gooding, and Lincoln Soil (and Water) Conservation Districts
Other interests within and related to the Big Wood River Catchment

Initial Riparian Assessment – Prioritization of Grazing Related Impacts

To those of interest,

David F. Ferguson and Chuck Pentzer of the Idaho Soil Conservation Commission is providing information regarding the physical characterization of those 303(d) listed and agricultural related stream segments identified within the Big Wood River Watershed Management Plan (Total Maximum Daily Load – TMDL) report. This information will assist local planners in the development and implementation of the Big Wood River Watershed Management Implementation Plan.

This initial report is intended to provide individuals a visual perspective of each of those streams of concern potentially impacted by agricultural activities within the Big Wood River catchment. Those streams include the Big Wood River, Rock Creek, Croy Creek, Greenhorn Creek, Cove Creek, Quigley Creek, and Seamans Creek. Other streams, such as Eagle Creek and Lake Creek do not fall within typical priorities and jurisdiction of the local Soil Conservation District priorities, as the primary land use has developed or is rapidly developing into urban use. The private land on Thorn Creek, according to the Gooding SCD and NRCS office, is no longer grazed, thus, no field inspection has been done. The East Fork Wood River has not been visited because it is not receiving a TMDL load allocations.

Each of these streams was viewed, primarily from road adjacent to and where crossed, to characterize physical conditions from the perspective of agricultural related grazing impacts. Other physical conditions were also noted, to provide an initial means of prioritization for future agricultural related application of Best Management Practices through a conservation planning process adopted by the Natural Resources Conservation Service, the Commission, and the Idaho Association of Soil Conservation Districts.

For each of these streams, numerous photos were taken with a digital camera, and then their location recorded with a Garmin II+ GPS unit. Waypoints are used to approximate each of the photo locations along the stream. Many of the photo locations are on road crossings, which could be used as permanent photo points, where physical locations are not expected to change and can easily be replicated (with or without using photo point protocols).

Numerous physical characteristics and agricultural related impacts (mostly grazing related) are discussed at the end of each individual stream report. Riparian vegetation

type and condition, channel shape and entrenchment, substrate types, bank erosions, beaver activity, livestock utilization, and other characteristics are discussed where appropriate. Each of these streams was viewed with the TMDL load allocations in mind. Some have substrate or bank erosion conditions that may or may not be related to agricultural activities. Bacterial exceedence for primary or secondary contact recreation due to agricultural activities was also kept in mind. Flow alterations, due to irrigation diversion and reservoir influence was also noted on each stream. Many portions of streams may or may not continually or adequately support beneficial uses, regardless of stream conditions, due to minimal or no flow because on-going irrigation related activities.

Upon our initial assessment, there are obvious priorities for agricultural related application of conservation measures (best management practices or BMPs) to improve not only riparian conditions for multiple beneficial uses, but adjacent agricultural land uses, such as pasture land. Rock Creek and upper Quigley Creek seem to rank the highest priority for future conservation work in regards to riparian areas. These two streams seem to have the greatest, directly impacted riparian areas, due to grazing. Vegetation improvement potential seems to be the greatest also due to available ground water. In areas where groundwater availability and surface flows are limited, such as in privately owned upper and lower portions of Seaman's Creek, priorities should be adjusted because of potential for improvement. Numerous conservation measures can be applied but without adequate water, results will be limited.

Rock Creek (Priority 1)

Rock Creek seems to have the greatest and most consistent grazing impacts of all these streams of concern within the Big Wood catchments. It also seems to have a good potential for improvement. Adequate ground water and flows seem present except for the East Fork, upstream of the confluence with the West Fork (or Rock Creek). There are major head cuts on the East Fork that seemed to have occurred during a single extreme storm event. This area's channel has a steep gradient (>5%) and much less floodplain, thus ground water availability is generally limited for vegetation, except at spring locations and beaver ponds.

On Rock Creek, downstream of the East Fork, a few in-stream crossings and diversions, mainly culverts, may be having some continual impact on channel stability, but only a limited impact on overall conditions. Springs contribute to a greater density of riparian species in a couple of locations along the lower and mid portions of the stream. Most of the channels are eroding, where vegetation is limited due to excessive grazing. Woody species in many areas are over-utilized, with "dish-shaped"/over-widened channels in many locations. Sinuosity is higher downstream of East Fork and the gradient is much less.

Quigley Creek (Priority 2)

The lower portion of Quigley Creek, below the reservoir, is generally dewatered due to the irrigation use from the reservoir. There seems to be little, if any, channel below the reservoir, toward the end of the 303(d)-listed reach (just upstream of new high school in Hailey). This area

is basically “farmed” over, with sprinkler irrigation in place. Above the reservoir, there is woody vegetation mixed throughout most of the privately-owned land, with fewer species near and within the BLM portion.

Stream gradients seem to range within 1%-4% within the privately-owned sections above the reservoir. Sinuosity is fairly high above the reservoir in some locations, where gradients are closer to 1%-2%. Stream classification changes between Rosgen B and C in those private land areas above the reservoir. Some springs are supplying additional water for increased vegetative growth.

Seamans Creek (Priority 3)

This stream has three ponds/reservoirs on it, storing much of the runoff from the catchment. Stored water is used for sprinkler irrigation below the most downstream reservoir, just upstream of Bellevue. The channel upstream of Bellevue is crossed by sprinkler irrigation wheel lines. Woody species are not allowed to increase (though some are present) to accommodate the irrigation system. Flows out of the reservoir are also very likely to be limited, primarily for irrigation use. Late spring and summer flows are not likely to occur below this lower reservoir, except during large storm events.

Upstream of the lower reservoir (downstream of the middle reservoir) there exists a significant amount of woody vegetation. The distance between these two reservoirs is not that great and the land use in this area is primarily for grazing. Cottonwood and willows seem to be the dominant woody species.

Woody vegetation exists upstream of the upper reservoir, but less than between the middle and upper reservoirs. Grazing impacts are more evident in this section, where woody species are over-utilized and the stream channels are over-widened. Not far above the upper reservoir, the woody and herbaceous riparian species become very limited. This seems primarily due to little ground water availability, likely due to a lack of spring water and flows. Annual and upland vegetative species are found within the channel, indicating low ground water availability.

Croy Creek (Priority 4)

The lower portions of Croy Creek are entrenched with a fair amount of woody species (primarily willows). A small floodplain exists within the entrenched area. The stream is not as entrenched downstream of Colorado Gulch Road, but very few riparian species are present. Of those species present, such as willows, the roots are deep enough to maintain them where ground water availability seems low and not near the stream channel surface.

During the initial stream inspections, both in March and April of 2003, water flow was not present within the 303d-listed portion. Flows stopped upstream of Rock Creek Road. Kelly Gulch seemed to be providing most or all of the surface flow in April. Small acreages seem to be increasing, and typical rangeland grazing does not seem to be occurring any longer. There are no fences present to protect the homesteads (Colorado and Pioneer Roads, for example).

Bank erosion is occurring between Kelly Gulch and the 303d-listed portion (upstream of Waypoint 018), and there are also over-widened stream channels in that area.

Greenhorn Gulch (Priority 5)

Woody species exist within the small channel in the private land area. Channels are somewhat entrenched, and flows seem limited farther downstream. Conversion to "ranchette" land uses seem to be occurring, where typical rangeland grazing has been or will be removed eventually. Channels have also been channelized near Greenhorn Gulch Road, near the upper portion of the private lands.

Channel/riparian species consist of willow and cottonwood. The species decrease downstream, likely due to ground water availability and past use. Channel substrate consists of cobbles and gravels, which are favored by cottonwood. Prior to entrenchment, this area may have had a wider floodplain and large populations of cottonwood within lower gradient-deposition areas.

Cove Creek (Priority 6)

Little private land exists on this stream, except for the lower mile of stream segment. The channel is entrenched, though some floodplain has been developed since the large flood event that likely caused the entrenchment. The banks are almost at a stable "angle-of-repose", meaning that excessive streambank erosion is no longer occurring in the upper portion of the private land, creating a adequate floodplain to accommodate the catchment's runoff.

Channel vegetation consists of mostly willow species. Channel substrate seems to be mostly a mixture of gravel and sand (alluvium). Stream channel gradient is such that a Rosgen B/C type seems appropriate. Ground water availability seems limited where upland vegetation is present within the channel bottom in the upper section of the private land area.

Big Wood River (Priority 7)

The Big Wood River is an altered flow river system, primarily below Magic reservoir. The river is not perennial below the Magic Reservoir, upstream of the confluence with the Little Wood River. Water from the Silver Creek catchment is transferred from the Little Wood River in Gooding to the Big Wood River, noted at least three separate times in March and April of 2003. Above the reservoir, agricultural lands are of little influence to the large river system, where most of the riparian areas are urbanized, used for recreation and other uses. Grazing still occurs in catchment areas upstream of the reservoir, but has little impact to the river system and channel stability.

Near the Glendale Road crossing, the river converts from a transport system to a depositional one. Cottonwood thrive in such an area. This tree dominates much of the system above the reservoir, with willow and other species present. Flows are intermittent downstream of the reservoir to Gooding, and largely managed for irrigation purposes. Most of the channel is lined with basalt, with large woody species providing additional stability in many areas around and downstream of Gooding. Between the reservoir and Gooding, stability is provided by basalt

bedrock and boulders. Natural ground water availability is low, due to substrate/geology type, and is dependent on agricultural irrigation returns to supply some flow during the irrigation season. Some gravel movement is visible in portions of the river system below the reservoir. The source does not seem to be agriculturally related, but found within the geology itself. There is some gravel underlying basalt or clay layers in some areas of the river channel, which has been scoured in some locations, and is probably the source of most of the gravel today. Finer material would generally be related to upland surface irrigated cropland erosion and erosive ditches in and around crop and pasture lands.

Grazing occurs on the riparian areas below the reservoir, but little impact on channel shape is possible because of the basalt lining the sides and bottom of the channel. Livestock have direct access where water backs up around the lower portion of the river, downstream of the Little Wood River. Finer textured soil material are available near the channel banks. Channel impact seems nominal.

Typical Conservation Measures for Riparian Areas

Sediment – Total suspended solids and substrates:

Many streams' sediment-related problems, originating from stream bank erosion caused by grazing activities, could be improved by simply adjusting time and duration of grazing. Adjustments that allow for existing riparian vegetation to increase in quantity and improve in vigor, increased stream bank stability generally follows. If soils are adequate to support multiple species for vegetation, along with adequate water supply, then improvements can be dramatic with grazing adjustments. Willows, alder, cottonwood and other appropriate riparian species should be managed to increase numbers and root densities along the stream channels, which in turn will generally convert a dish-shaped channel to a trapezoid-shaped channel, which increases the flood plain as well. Increasing woody species within the floodplain also increases roughness to dissipate storm flows. In low gradient streams, such as below 1%, water tables may be higher and woody species may not be as tolerable to saturated soils. Other herbaceous wetland plants, such as sedge and rushes, may be all that is necessary for adequate stream bank stability.

Total suspended solid (TSS) and substrate TMDL objectives may not fully coincide. Agricultural related stream bank damage and erosion can contribute to both TSS and substrate problems, but not necessarily at the same time or for similar lengths of time. High percentages of fine material, causing an increase of embedded gravels, may not only be sourced back to stream bank erosions but cropland, pasture, and ditch erosion. Typically, in surface-irrigated cropland, TSS exceedence is caused by in-field erosion and sedimentation. In riparian pasture areas where little commercial cropland exists, such as in Rock Creek and upper Quigley Creek, irrigated pasture waste runoff ditches may also be contributing to TSS and substrate problems. The timing of irrigation and pasture conditions, however, needs to be compared to in-stream TSS data to make that conclusion. Channel conditions and activities, such as stream gradient, channelization, and beaver activity will also cause pockets of increased percent fines and embeddedness. During the conservation planning process, pasture-by-pasture inventory and planning will generally identify actual and potential sources of substrate and TSS problems. The landowner will appropriate conservation measures associated to each pasture and associated riparian area.

Numerous techniques are available to the landowner to improve stream bank and pasture conditions, but each pasture and riparian area is generally managed differently, and requires individual attention. Fencing, grazing management, water facilities, water gaps, protein supplements, pasture irrigation water management, erosion controls, and other practices should all be considered during the development of an individual Conservation Plan.

Bacteria:

Where streams are designated as Primary or Secondary Contact Recreation (PCR and SCR) and have load allocations under a TMDL for bacteria, reducing a host's access to the stream may help reduce the chance for in-stream exceedences. However, overland flows, especially within irrigated pasture systems, need to be addressed as well. If irrigation occurs while grazing is taking place, the chance for bacteria movement to the stream increases. Therefore, grazing and irrigation schedules should be coordinated. The newly-revised state water quality standards focuses on E Coli, but no longer designates a critical period, as did it previously with fecal coliform. If a stream has no flow at certain locations for a period of time, then PCR, SCR, and other designated uses are not supported. Grazing management and other land uses may then be adjusted to occur within that period of time to reduce the chance of standards being exceeded. Typically, though, grazing management is not as dependent on stream flows as on forage availability. Regardless, planners must be cognizant of such flow characteristics and actual PCR and SCR uses of the stream when planning with landowners to help meet TMDL requirements. Acknowledging other non-agricultural bacterial sources during planning, such as waterfowl, is important.

In summary, to reduce the risk of bacterial contamination to a stream, landowners must reduce the chance for direct or indirect bacteria entry to the stream. This will generally include fencing, which may not be required for streambank stability. If timing and/or control of grazing and pasture irrigation can be accomplished within the critical period for PCR and SCR, then TMDL objectives can be met. The management and conservation measures necessary to meet bacterial TMDLs seem to be the most difficult of all pollutant TMDLs in the following situations:

- where land uses adjacent to streams need radical adjustment
- where livestock grazing and confinement is removed from the stream (which may simply mean capturing all storm and irrigation runoff prior to entering the stream)

Many times, perception of potential contamination may be more important than actual risk of contamination. Planners and landowners should incorporate social aspects into conservation plans.

Temperature

Typically, the longer a body of water is exposed to high ambient temperatures, such as >90º F, the more likely that the water body is going to warm up as it flows downstream. Additional inflows from tributaries and natural springs may help maintain lower water temperatures, but if those inflows are warmer than the receiving water, temperatures will increase. Grazing

management in riparian areas can help maintain water temperatures, but cannot lower them. Ambient temperatures typically drive water temperatures, even more so than does direct infrared solar radiation. Reflected radiation is important, as it can increase air temperatures, especially within narrow canyon areas.

Planting and/or maintaining vegetation, especially woody species, seem to be the most successful method for decreasing water temperatures. Again, it's actually only about reducing the "increase of temperature". Woody species are generally thought of as the only vegetative species tall enough to cast shadows over waters, to reduce infiltration infrared. They can do that, as well as reduce the adjacent microclimate temperatures, helping reduce ambient temperatures surrounding the water body. In very low gradient streams, with high water tables, woody species may not be appropriate. Herbaceous riparian species, such as sedge, rush, and other like varieties, can tolerate and thrive on saturated or nearly saturated soils. If this vegetation can be increased where stream channels are dish-shaped, channels can narrow, converting to more trapezoid-shaped channels with undercut banks. These channel shapes generally coincide with deeper water depths, narrower bankfull widths, and greater contact to subsurface ground water flow, which is cooler than ambient air temperatures. Depending on the stream type (gradient, soils, existing vegetation, or water availability), reducing the increase of stream water temperature can be achieved through woody or non-woody vegetation. Channel shape is also very important, which follows with the change in increase of riparian vegetation. The less surface exposure air and a greater contact to soil water, regardless of sunlight penetration (infrared to approx. 0.5 cm), temperatures are not as likely to increase dramatically in summer months. Regardless of the TMDL objectives, these rules apply to riparian areas.

Nutrients – Total phosphorus:

With a decrease or increase of sediment in a stream, there is generally a respective decrease or increase in total phosphorus (TP). Results will vary depending on the ration of soluble phosphorus to the total, Greater proportions of soluble phosphorus occur in low flow streams with low sediment concentrations. TSS levels are high when sediments come into a stream from sedimentation of upland croplands and other sources. Lower total phosphorus is normally found in areas with high stream bank erosion. However, this is not always the case.

Where a significant amount of the total flow comes from ground water sources, total P is often mostly soluble P. Even where large sediment attached P enters the system, such as in the Lower Boise River catchment, soluble P is the majority of the total (typically 65% to 85% soluble P regardless of extremely high TSS in some reaches of the Lower Boise River and tributaries). Within some reaches of these Big Wood River 303(d) tributaries, there are promising springs that contain soluble P, possibly high enough to allow for excellent aquatic vegetative growth, regardless of land use. Where the East Fork of Rock Creek has a load allocation for TP, it may be likely that spring waters' TP is high enough in soluble P for increased aquatic vegetative growth, increasing quantities.

Annual average TP in the East Fork Rock Creek and Cove Creek (Big Wood River Watershed Management Plan, 2001) are 0.08 and 0.086 respectively. Average annual flows are 1.1 and 1.4 respectively. However, TSS average concentrations are three times greater for Cove Creek, 4.1

and 12.9. Cove Creek geology is mostly an alluvium type and the East Fork Rock Creek is a mixture of calc-alkaline, felsic pyroclastic, and mixed miogeosynclinal; which may have something to do with why TSS and TP concentration do not correspond similarly. Croy Creek's gradient is generally less than the East Fork of Rock Creek in the lower portions, which may also affect TSS and TP concentrations. Gradient and soil types also affect how sediments erode and are transported in flow. One would expect that a steeper stream would transport greater amounts of sediments than those of a lesser gradient; however, the sediment concentration indicates an opposite response in these two streams. Flows may be small enough in the East Fork to make the difference. The stream data used here is limited, so conclusions cannot be properly made without additional data and further evaluation.

Regardless, TP loads may be reduced through sediment and other related activities as discussed within the sediment and bacteria sections above. Site-specific planning, pasture-by-pasture, is necessary to address potential excessive agricultural related sources of phosphorus.

Initial Prioritization of Streams and Segments for Future Conservation Planning

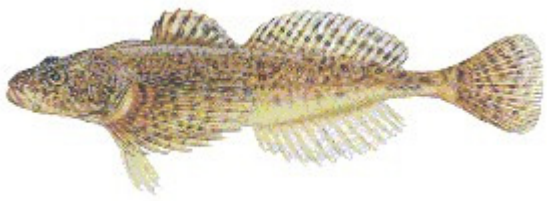
Based on existing agricultural impacts on riparian areas, the percentage of private agriculturally-owned lands within each sub-watershed, and potential or capability of the improvements, the following priorities for BMP implementation were established:

1. Rock Creek
2. Quigley Creek (upstream reservoir)
3. Seaman's Creek (portions upstream of lower reservoir to just upstream of upper reservoir)
4. Croy Creek (excluding areas converting to small-farm acreages)
5. Greenhorn Gulch (excluding areas converting to small-farm acreages)
6. Cove Creek
7. Big Wood River

Appendix C

Wood River Sculpin Project status 15 May 2006

(*Cottus leiopomus*)



Purpose and objectives:

The Wood River Sculpin Project is a pro-active effort to develop biologically unique habitat targets for total maximum daily loads (TMDLs) and to preclude the need to list the sculpin under the Endangered Species Act. This project is intended to provide basic ecological information on the Wood River Sculpin. The specific objectives of this project are to conduct a range-wide survey of sculpin occurrence; develop a model to predict sculpin presence and absence; investigate the feasibility of tagging individual

sculpins for tracking, and to conduct a Gap Analysis of the Wood River basin to help identify and prioritize areas needing conservation management.

Project status:

The project was initiated in 2004 with the collection of sculpin occurrence and stream habitat data. A second set of these data will be collected in 2006. The predictive model will be developed using the 2004 data and then tested and refined using the 2006 data.

The first phase of the feasibility study was conducted in March 2006. Sculpins were tagged and held for 29 days. No mortalities due to tagging were observed. Delectability of tagged sculpins will be assessed in 2006 once stream flows decline after spring runoff.

The Gap Analysis has been initiated with compilation of existing digital data layers. Processing of the digital data layers is set to begin in May 2006. The search for other existing data layers and funding to support this portion of the project continues.

Uses of the data:

There are two primary uses of the data and products from this project. These data will be used to develop biologically unique habitat targets for the three total maximum daily loads developed in the Wood River basin (Big Wood River, Camas Creek and Little Wood River). These data will also support development of a conservation plan and strategy for the Wood River sculpin under the Endangered Species Act.

Project partners:

U.S. Bureau of Land Management; U.S. Environmental Protection Agency; University of Idaho; Lava Lake Land and Livestock; The Nature Conservancy; Wood River Land Trust; Idaho Office of Species Conservation; Idaho Department of Environmental Quality.