# Wildhorse River Watershed (17050201--)

# Waterbody Identification # SW015 and # SW016

# Total Maximum Daily Load

# Implementation Plan for Agriculture

Developed for the Idaho Department of Environmental Quality

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In Cooperation With: Adams Soil and Water Conservation District,
Weiser River Soil Conservation District, and the Natural Resources Conservation Service

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## Introduction

The Wildhorse River Subbasin Assessment (SBA) and Total Maximum Daily Load (TMDL) was prepared by the Idaho Department of Environmental Quality (IDEQ) in April 2007 and approved by the Environmental Protection Agency (EPA) on October 2007. The Idaho Soil Conservation Commission (ISCC) is responsible for preparing the implementation plan for agriculture.

### PURPOSE

The Wildhorse River Watershed Total Maximum Daily Load (TMDL) Implementation Plan for Agriculture outlines an adaptive management approach for implementation of best management practices (BMPs) and resource management systems (RMS) on agricultural lands to meet the riparian shade targets established in the Wildhorse River SBA-TMDL.

### GOALS AND OBJECTIVES

The goal of this plan is to provide a strategy for agriculture to assist and/or complement other watershed efforts in restoring and protecting beneficial uses for water quality impaired streams in the Wildhorse River watershed. The Wildhorse River and its major tributaries are listed as impaired by temperature (Table 1) (Figure 2) (IDEQ 2008).

Table 1. Approved TMDLs by Assessment Unit in the Wildhorse River watershed.

| *Waterbody* | *Assessment Unit #* | *Approved TMDL* |
|---|---|---|
| Wildhorse River, 4th order | 17050201SW015_04 | Temperature |
| Bear and Lick Creeks, 1st & 2nd order | 17050201SW016_02 | Temperature |
| Wildhorse River 1st and 2nd order Crooked River | 17050201SW015_02 | Temperature |
| Lick and Deer Creeks, 3rd order Bear and Lick Creeks, 4th order | 17050201SW016_03,04 | Temperature |

The Wildhorse River watershed falls primarily within Adams County, but it also lies within a small portion of Washington County. These counties are served by the Adams Soil and Water Conservation District (SWCD) and Weiser River Soil Conservation District (SCD). The objective of this plan is to provide guidance to the Adams SWCD, the Weiser SCD, and agricultural producers concerning ways to reduce solar loading or increase shading on these waterbodies. Agricultural pollutant reductions will be achieved by on-farm conservation planning with individual operators and application of BMPs in agricultural critical areas. This plan recommends BMPs needed to meet TMDL targets in the Wildhorse River watershed and suggests alternatives for reducing surface and groundwater quality problems from agricultural related activities.

# Background

## PROJECT SETTING

The Wildhorse River watershed is located within the Brownlee Subbasin in southwestern Idaho (Figure 1). The Wildhorse River begins at the confluence of Bear Creek and Crooked River and flows southwestwardly until it enters the Snake River near Brownlee Reservoir at approximately 2,000 feet elevation. One of the highest mountainous regions, the Cuddy Mountains, reaches 7,000 feet in elevation. This watershed is bounded on the west by the Oregon/Idaho border and Hells Canyon, the east by the Blue Bunch Ridge, the north by the Seven Devils Mountains, and the south by the Shoe Peg Valley. Average mean temperature is 70 degrees F in the summer and approximately 20 degrees F in the winter. Average annual precipitation ranges from 20 inches at the southwestern tip of the watershed to 40 inches along the northeastern and southeastern portions of the watershed (http://lighthouse.nrcs.usda.gov/gateway/gatewayhome.html). Soils were formed from sedimentary and volcanic rocks. Soil texture is generally a fine loam (Rasmussen 1990). The entire watershed (113,189 acres) is in the Blue Mountains Section of Baileys Ecoregions (http://data.insideidaho.org).

The Wildhorse River watershed is comprised of four Common Resource Areas (CRAs). General characteristics for these CRAs are described below (ftp://ftpfc.sc.egov.usda.gov/ID/technical/pdffiles/IdahoCRAReport.pdf).

10.1 Central Rocky and Blue Mountain Foothills-Warm Dry Blue and Seven Devils Mountain Foothills-basalt and tuffaceous sediments; dry summers and moist winters; natural plant community of Wyoming big sagebrush, Idaho fescue, and bluebunch wheatgrass

43C.3 Blue and Seven Devils Mountains-High Elevation Blue and Seven Devils Mountain Forests-sedimentary and volcanic rocks; mean annual temperature between 0 and 8 degrees C; humid climate with moisture during the summer months; natural plant community of subalpine fir, Englemann spruce, and western larch

43C.6 Blue and Seven Devils Mountains-Melange-limestone, mudstone, and schists; mean annual temperature between 0 and 8 degrees C; dry summers and moist winters/humid climate with moisture during the summer months; natural plant community of Douglas fir, lodgepole pine, ponderosa pine, shrubs, and grasses

43C.8 Blue and Seven Devils Mountains- Blue and Seven Devils Mountains Dissected Uplands-mean annual temperature <8 degrees C; dry summers and moist winters; natural plant community of grand fir, Douglas fir, ponderosa pine, and grasses

For more background information regarding historical and physical characteristics of this watershed, please consult the Wildhorse River SBA and TMDL (IDEQ 2007).

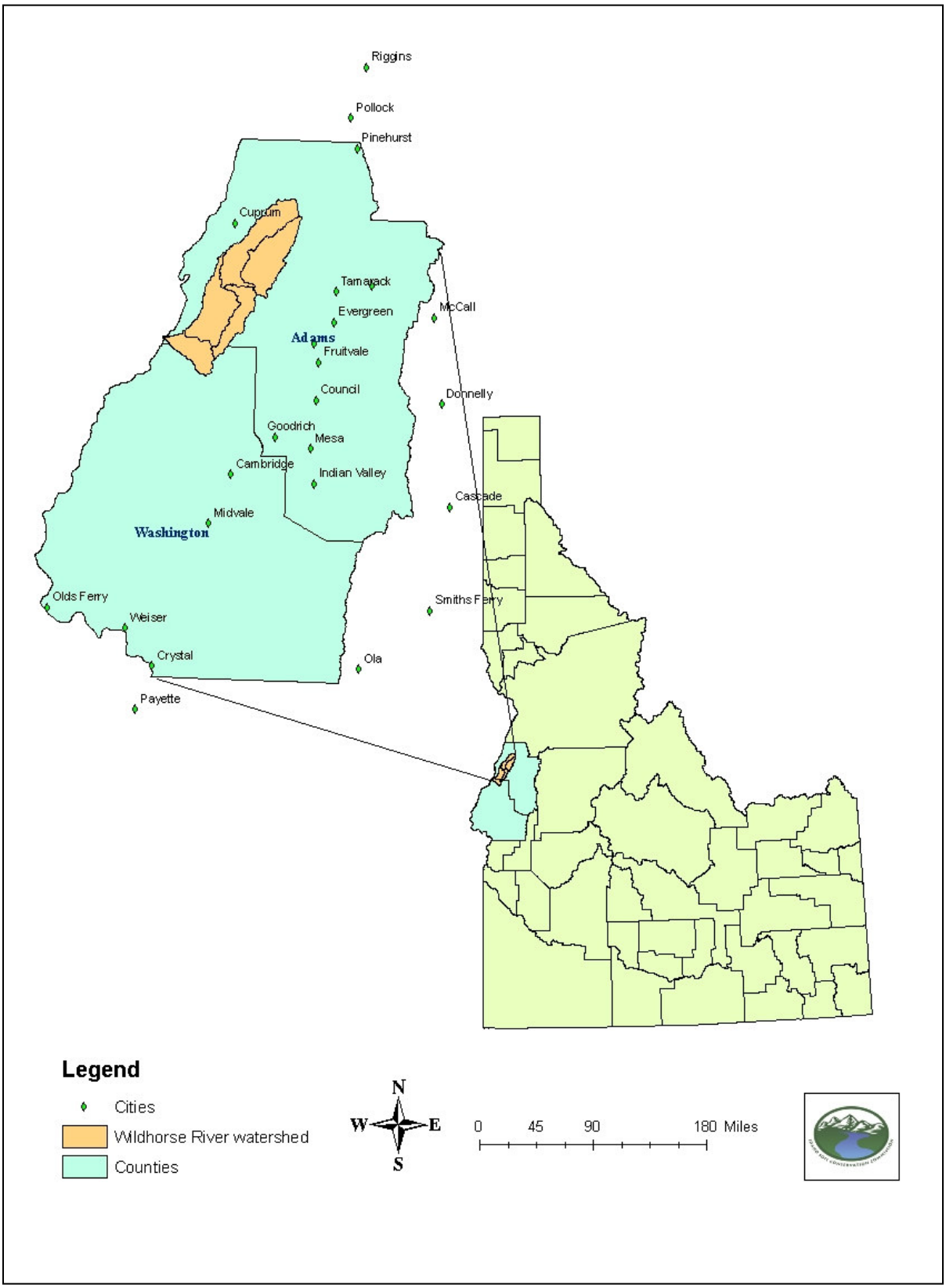


Figure 1. General Location of the Wildhorse River watershed

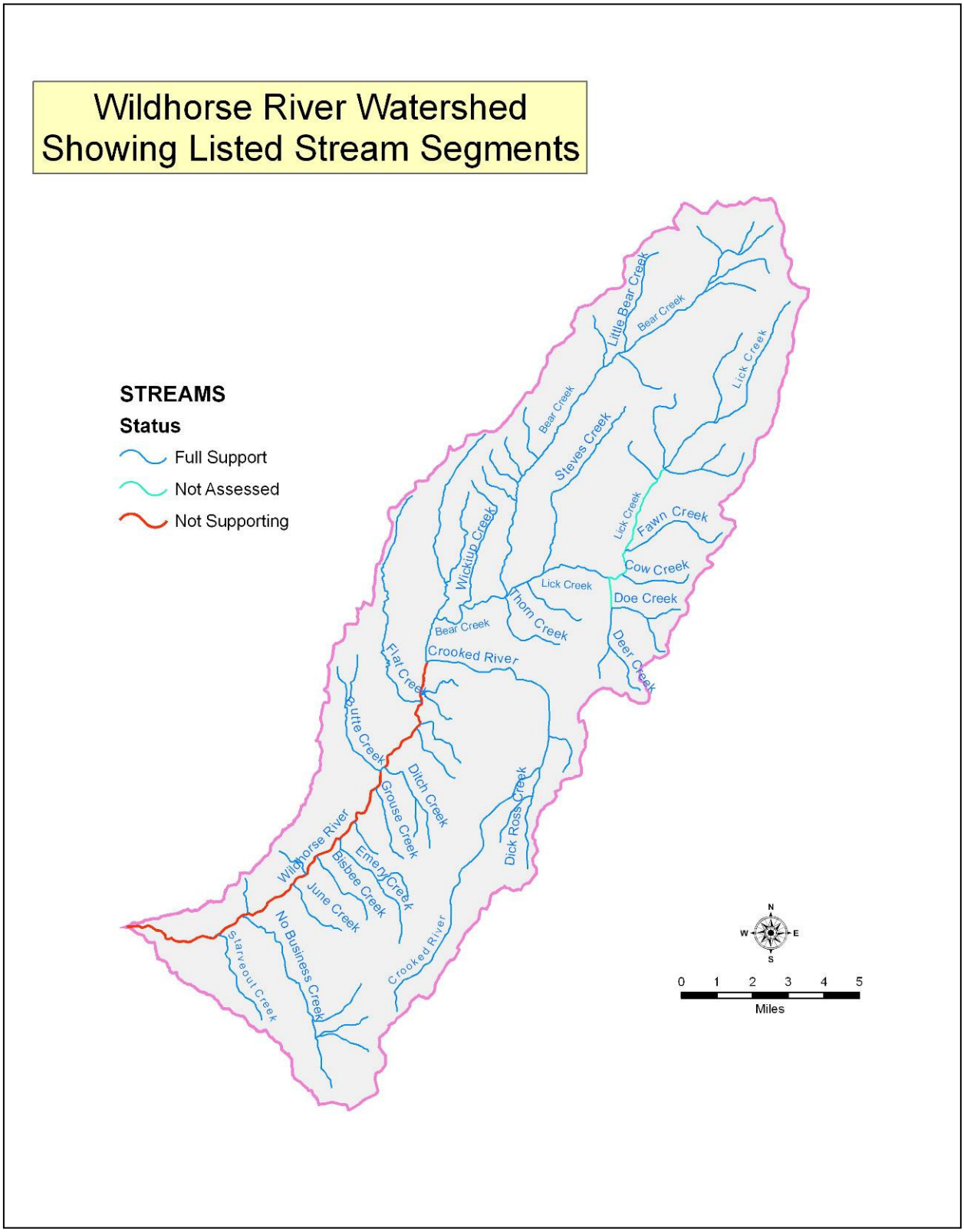


Figure 2. [2002] 303 (d) listed stream segments in the Wildhorse River watershed

## LAND USE

Most of the Wildhorse River watershed is in the Payette National Forest. Timber harvest has occurred on approximately 19,569 acres (34% of the Bear and Lick Creek subwatersheds) since the 1950's and continues to date (http://www.fs.fed.us/r4/payette/publications/lick_final_ea/lick_creek_index.shtml). There are no major highways that intersect the watershed; however, there are well established dirt roads along Crooked River and Wildhorse River. Rangeland is the second largest land use. It is found throughout the Wildhorse River corridor, west of the Wildhorse River, and within the Bear Creek and Lick Creek subwatersheds. Grass/pasture/hayland is found intermittently along the Wildhorse River corridor, as well as in the Bear Creek, Crooked River, and Lick Creek subwatersheds (Table 2, Figure 3).

Table 2. Land use in the Wildhorse River watershed.

| *Land use/cover* | *Acres* | *% of Watershed* |
|---|---|---|
| Grass/Pasture/Hay | 7,861 | 7 |
| Rangeland | 33,919 | 30 |
| Forest | 70,294 | 62 |
| Water/Wetlands | 986 | 1 |
| TOTAL: | 113,060 | 100 |

## LAND OWNERSHIP

Land management is primarily through the United States Forest Service (USFS) followed secondly by private owners and then lastly by the Bureau of Land Management (BLM). Table 3 describes the land owner or land manager, total acres, and percent of watershed occupied by each of the above land owners/managers. Figure 4 displays private and public land ownership/management for the Wildhorse River watershed.

Table 3. Land ownership/management in the Wildhorse River watershed.

| *Land owner/manager* | *Acres* | *% of Watershed* |
|---|---|---|
| Private | 17,144 | 15.2 |
| State | 205 | 0.2 |
| BLM | 6,731 | 6 |
| USFS | 88,987 | 78.6 |
| TOTAL | 113,067 | 100 |

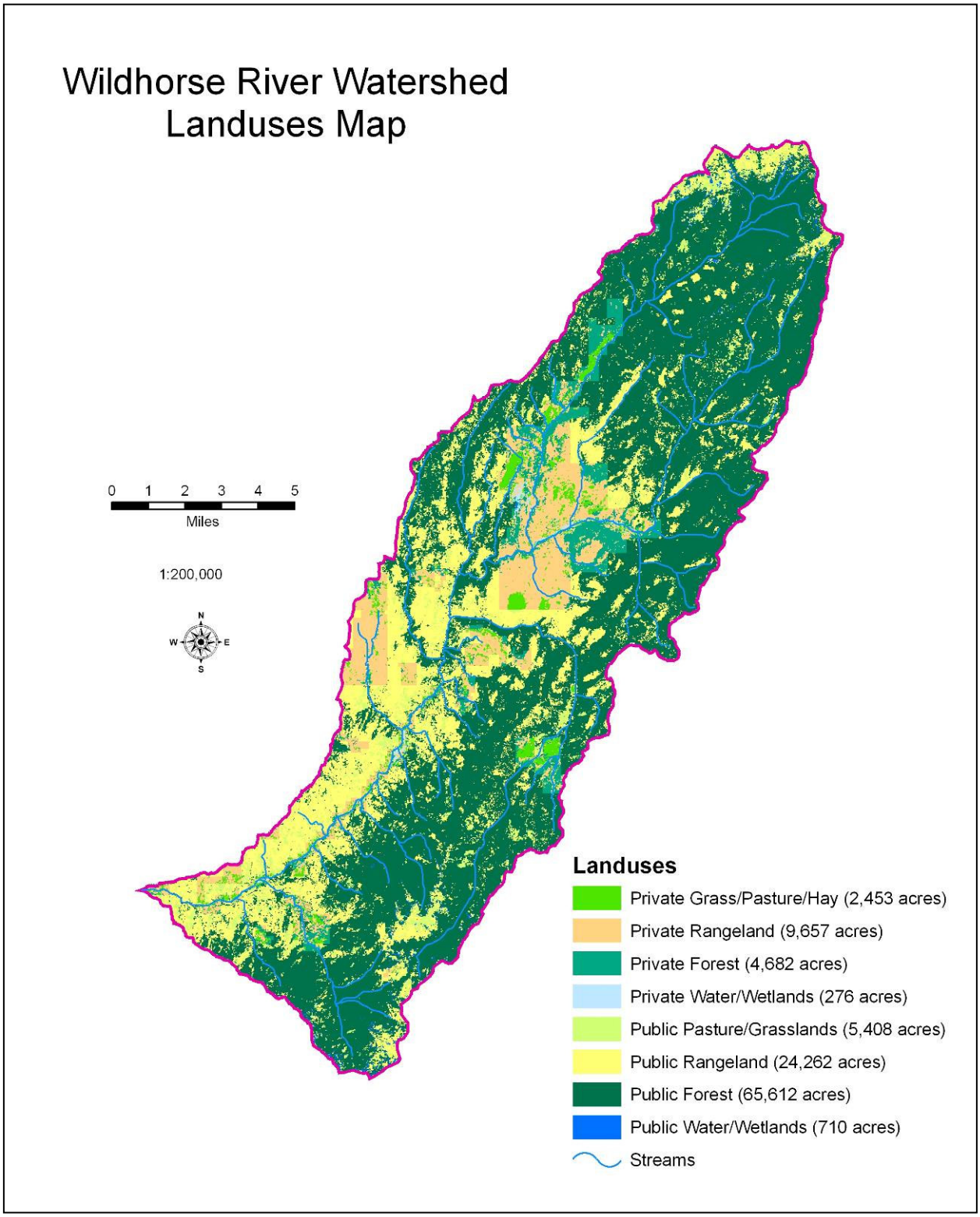


Figure 3. Land Use/Land Cover in the Wildhorse River watershed

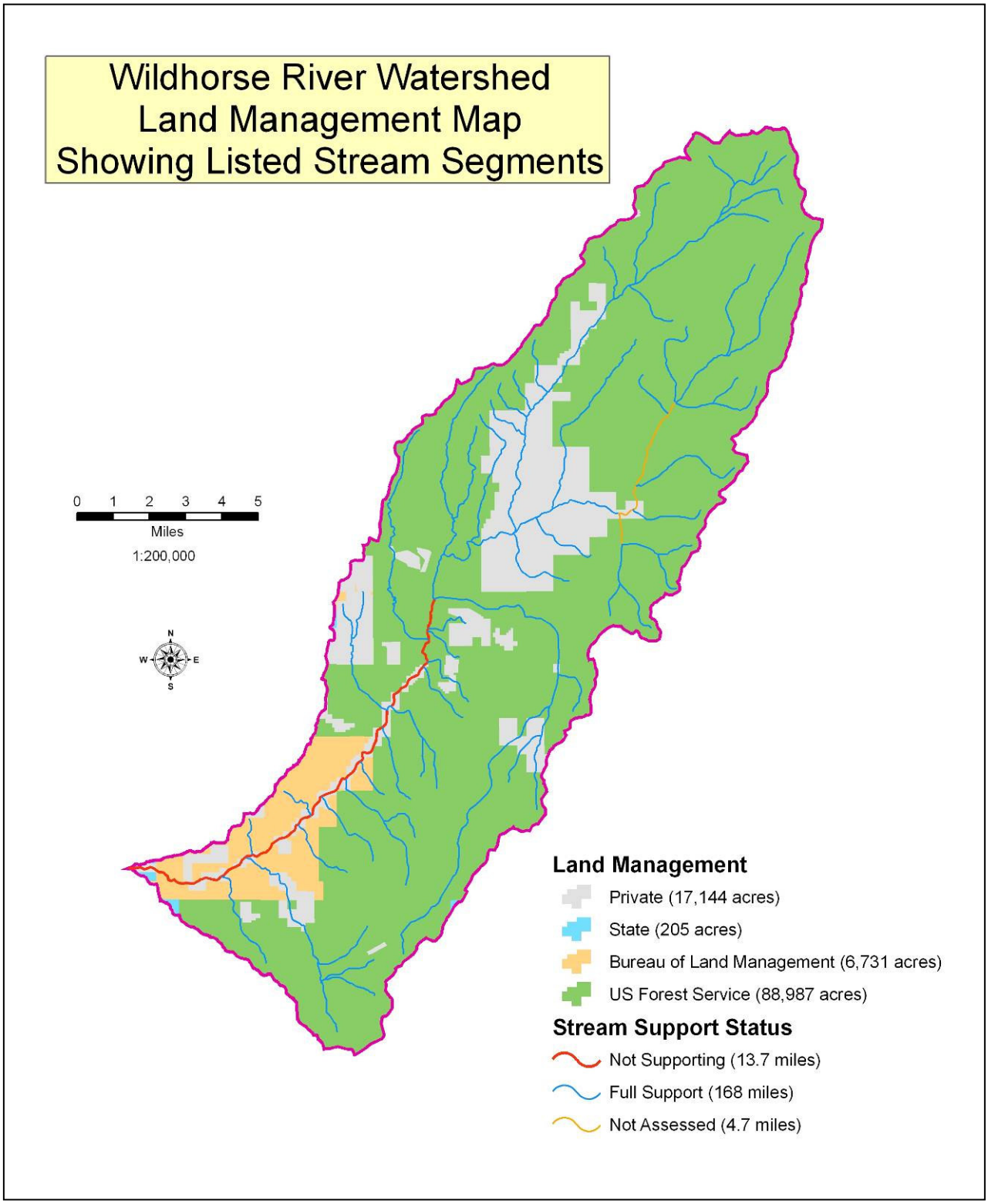


Figure 4. Land Ownership/Management in the Wildhorse River watershed

## CONSERVATION ACCOMPLISHMENTS

Table 4 and Figure 5 provide a summary and an illustration of the BMPs installed on private lands in the Wildhorse River watershed from 2005 through 2009. As shown in the table, few federally funded BMPs have been installed in the watershed during this time period. These BMPs have been funded through local SCWD/SCDs and NRCS Farm Bill programs such as the Conservation Technical Assistance-Grazing Lands Conservation (CTA-GLC) and the Environmental Quality Incentives Program (EQIP). Forest slash treatment and forest stand improvement are practices that were used to remove woody plants in the forested area near Bear Creek to address wildfire hazards. A pond and prescribed grazing were applied in the Lick Creek subwatershed.

There have also been state-funded BMPs installed in the Lick Creek subwatershed, a tributary to the Wildhorse River. The 2002 Report to Congress, an IDEQ publication, described how a non-point source management grant (319) was used to upgrade 3.1 miles of open ditch with enclosed pipe to reduce water loss, to provide off-site watering for livestock, and to improve irrigation efficiency. The landowner(s) funded the construction of a diversion structure to allow for safe fish passage. Additionally this project implemented off-site watering facilities, water tanks, and stockwater ponds (www.deq.idaho.gov/WATER/data_reports/surface_water/nps/reports.cfm. Approximately 1,100 feet of fence, 2,400 feet pipeline, 13 water developments, and 400 willow plantings were placed along Lick Creek (pers. comm. Mike Raymond, NRCS District Conservationist).

Table 4. Federal BMPs installed in the Wildhorse River watershed, by year.

| **WILDHORSE RIVER watershed HUC 17050201<br>Adams and Washington Counties, Idaho<br>Accomplishments by Year** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Practice Applied** | **Practice No.** | **Unit** | **Program** | **2009** | **2,008** | **2007** | **2006** | **2005** |
| Forest Slash Treatment | 384 | ac | EQIP | 19 | 14 | None | None | None |
| Forest Stand Improvement | 666 | ac | EQIP | 154 | | | | |
| Pond | 378 | no | EQIP | | 1 | | | |
| Prescribed Grazing | 528 | ac | CTA-GLC | | 11,921 | | | |

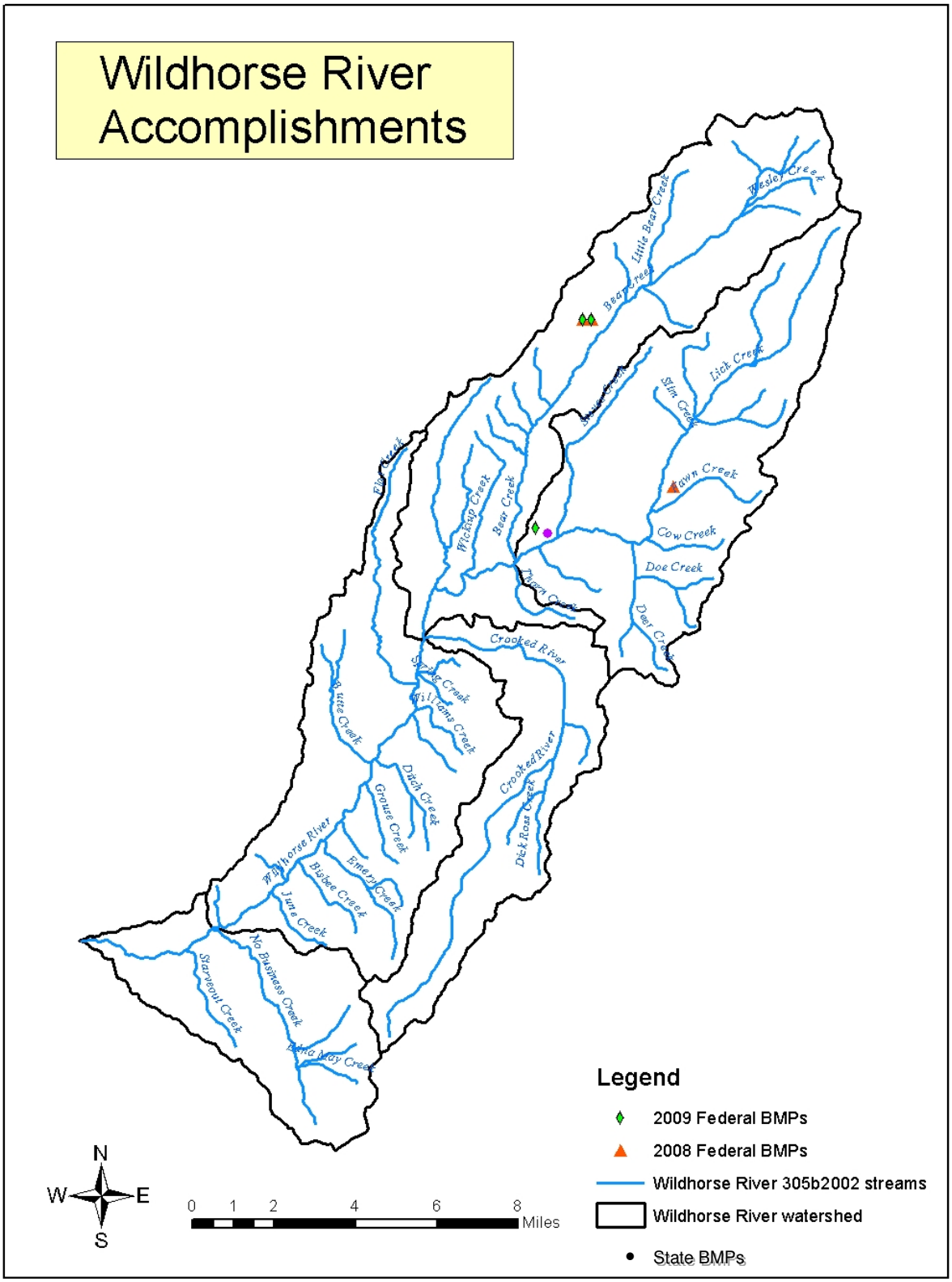


Figure 5. Location of BMPs applied in the Wildhorse River watershed

## BENEFICIAL USE STATUS

Idaho water quality standards require that beneficial uses of all water bodies be protected. Beneficial uses can include existing uses, designated uses, and presumed existing uses. Designated uses are uses officially recognized by the state. In cases where designated uses have not been established by the state for a given water body, DEQ has established the presumed existing uses of supporting cold water aquatic life and either primary or secondary contact recreation. Designated beneficial uses for the Wildhorse River and its tributaries are listed below in Table 5 (IDEQ 2007). In order for beneficial uses to be supported, water quality criteria must not be exceeded. Some of these criteria are:

- Cold water aquatic life-<22° C daily maximum or <19° C daily average
- Primary Contact Recreation (PCR)-< 126 *E.coli*/100 ml (geometric mean) or <406 *E.coli*/100 ml (instantaneous)
- Salmonid Spawning (SS)-<13° C daily maximum or <9° C daily average (during rainbow trout and bull trout spawning and incubation periods)

Table 5. Designated beneficial uses for the Wildhorse River.

| *Assessment Unit #* | *Boundaries* | *Beneficial Uses* | *Support Status* |
|---|---|---|---|
| 17050201SW015_04 | Confluence of Crooked River and Bear Creek to mouth, 4th order | CWAL<br>PCR<br>SS | Not supporting<br>Fully supporting<br>Not supporting |
| 17050201SW016_02 | Bear and Lick Creeks, 1st and 2nd order | CWAL<br>PCR<br>SS | Not supporting<br>Not assessed<br>Not supporting |
| 17050201SW015_02 | Wildhorse River 1st and 2nd order, including Crooked River | CWAL<br>PCR<br>SS | Not supporting<br>Not assessed<br>Not assessed |
| 17050201SW016_03,04 | Lick and Deer Creeks, 3rd order; Bear and Lick Creeks 4th order | CWAL<br>PCR<br>SS | Not supporting<br>Fully supporting<br>Not supporting |
| CWAL = cold water aquatic life; SS = salmonid spawning; PCR = primary contact recreation | | | |

## POLLUTANTS

Wildhorse River, from the headwaters to the mouth, was originally listed on the 1998 303(d) list for unknown pollutants. In 2000, temperature was added as a pollutant for this watershed by EPA. The final 2002 Integrated Report lists the 4th order segment of the Wildhorse River as impaired by unknown pollutants and temperature (Figure 2). Bear Creek, a tributary of the Wildhorse River was not assessed at that time. During the development of the Wildhorse River SBA and TMDL, IDEQ determined that three tributaries; Bear Creek, Crooked River, and Lick Creek were also impaired by temperature, therefore TMDLs were written for the 1st, 2nd, and 4th order segments of the Wildhorse River, Bear Creek, Crooked River, and Lick Creek. A temperature TMDL was completed for these four assessment units in April 2007. Approximately 180 total miles of the Wildhorse River watershed was given a solar load for temperature. The 2008 Integrated Report has classified the 1st, 2nd, and 4th order segments of the Wildhorse River; the 1st and 2nd order segments of Bear Creek; the 3rd order segments of Lick and Deer Creeks; and the 4th order segments of Bear and Lick Creeks as approved with temperature TMDLS (Table 6).

Table 6. [2002] 305(b)/303(d) listed stream segments: approved TMDL and required reductions needed to meet TMDL.

| *Water Body* | *Approved TMDL* | *Load Allocation* | *Percent Required Reduction to meet TMDL* | *Agricultural Concerns* |
|---|---|---|---|---|
| Wildhorse River | Temperature | 247,600 | 12 | Lack of riparian vegetation due to livestock feeding and holding areas; irrigated pasture alongside river; soil erosion from roads, gullies, and tributaries; channelization; embankments |
| Lick Creek | Temperature | 149,345 | 28 | Streambank erosion; past livestock access to riparian corridor; greatest amount of algae instream |
| Bear Creek | Temperature | 60,881 | 8 | Timber harvest; irrigation practices; livestock management |
| Crooked Creek | Temperature | 39,206 | 18 | Streambank erosion; heavy livestock access and use of riparian corridor; timber harvest |

## WATER QUALITY MONITORING

Water temperature data found in the Wildhorse River Subbasin Assessment and TMDL was obtained from Idaho Power and the USFS. The USFS placed temperature data loggers in the Wildhorse River, Crooked River, Bear Creek, and Lick Creek. Temperature exceedances of the bull trout temperature criteria, cold water aquatic life criteria, and salmonid spawning were documented in the summer months of 2006 (IDEQ 2007). The USFS recorded *E. coli* levels above the recommended SCR criteria for Lick

Creek (www.fs.fed.us/r4/payette/publications/lick_final_ea/lick_creek_index.shtml). Biological data was collected from five Beneficial Use Reconnaissance Program (BURP) sites. The only site that didn't meet beneficial uses, based on the stream fish index (SFI), the stream macroinvertebrate index (SMI), and the stream habitat index (SHI), was located near the confluence of Wildhorse and Crooked Rivers. For more information, please refer to the Wildhorse River watershed SBA-TMDL (IDEQ 2007).

## AGRICULTURAL WATER QUALITY INVENTORY AND EVALUATION

### Pasture

In 2007, NRCS staff used pasture condition score sheets to rate pasture condition for the Bear and Lick Creek subwatersheds. These score sheets are based on ten indicators that evaluate percent desirable plants, plant cover, plant diversity, plant residue, plant vigor, percent legume, uniformity of use, livestock concentration areas, soil compaction, and erosion. Overall pasture condition scores were between 35 and 45 indicating that only minor changes would be needed to enhance pasture condition.

The upper Lick Creek pastures are flood irrigated with gated pipe. The lower Lick Creek pasture is sprinkler irrigated with a big gun. Irrigation efficiency would be improved by using center pivots or lateral sprinkler systems. Nutrient management is a recommended practice in this subwatershed. Regular soil testing and a nutrient management plan would improve soil nutrient application and enhance forage condition and production.

There is a diversion above Bear Creek which is used to flood irrigate pastures below. Three ponds collect runoff from these flood irrigated pastures. Later this water re-enters Bear Creek via Wickiup Creek. These ponds are located west of the town of Bear, near an airstrip which has been seeded with intermediate wheatgrass. Sprinkler irrigation would improve water use efficiency in the Bear Creek subwatershed ((pers. comm. Mike Raymond (NRCS District Conservationist), Barry Nord (NRCS Area Range Conservationist), and Rusty Norrie (NRCS Rangeland Management Specialist)).

### Rangeland/Upland

In 2007, NRCS staff used a similarity index to rate range condition for representative portions of the Bear, Lick Creek, and Wildhorse subwatersheds. The similarity index can be used to compare the current plant community to a desired plant community. Overall scores were greater than 60 indicating good to high current condition. Plants present included bluebunch wheatgrass, Idaho fescue, Nevada bluegrass, and june grass. The apparent trend is improving or upward.

Pasture and rangeland feed and forage in the Wildhorse River watershed meets Idaho resource concerns and quality criteria for domestic animals. Proper grazing use has met guidelines and has been documented since origination of the CRMP. Grazing use is evaluated based on the acreage, species of grazing animal, season of use, plants present, and quantity of plants (pers. comm. Mike Raymond ((NRCS District Conservationist),

Barry Nord (NRCS Area Range Conservationist), and Rusty Norrie (NRCS Rangeland Management Specialist)).

## Riparian

### *Solar Pathfinder (SP)*

Estimates of existing and potential solar loads were generated by IDEQ. Field verification of these estimates is performed using a solar pathfinder. A solar pathfinder is used to determine the amount of shade received at a particular point based on canopy cover, topography, aspect, and so on. Solar pathfinder data was collected by ISCC personnel in the summer of 2009.

The protocol ISSC used was similar to the protocol described in the Wildhorse River SBA-TMDL. A reach was started at a known location, such as a bridge, livestock crossing, property boundary, etc. and then data points were taken at fixed intervals occurring 150 feet between readings and 300 feet between sets of readings so as to obtain a systematic distribution across the reach. Typically nine to twelve points were taken per reach. As shown in Table 7, the solar pathfinder data is quite varied. In a given reach, the data reflects solar pathfinder points where canopy cover provided 100% shade and where there was very little shade. Overall the Wildhorse River had greater shade than the tributaries (excluding Crooked River).

Table 7. Solar Pathfinder results for the Wildhorse River watershed

| | % Existing Shade | | | | |
|---|---|---|---|---|---|
| **Reach** | Six month average | Data set average | Min | Max | Standard Deviation |
| Wildhorse River Reach 1 | 32.4 | 41.3 | 26 | 74 | 10.7 |
| Wildhorse River Reach 2 | 64.5 | 76.1 | 3 | 66 | 19 |
| Wildhorse River Reach 4 | 57.8 | 65.7 | 37 | 100 | 17.8 |
| Wildhorse River Reach 5 | 41.7 | 48.7 | 16 | 100 | 27.3 |
| Wildhorse River Reach 6 | 42.1 | 51.8 | 17 | 96 | 28.7 |
| Lick Creek 1 | 15.3 | 11.7 | 0 | 70 | 17.8 |
| Lick Creek 2 | 22.6 | 38.3 | 4 | 71 | 24.7 |
| Bear Creek 1 | 25.7 | 21.7 | 5 | 38 | 13.7 |
| Bear Creek 2 | 50.2 | 52.8 | 7 | 100 | 28.6 |
| Crooked River 1 | 54.3 | 49.6 | 2 | 100 | 39.2 |
| Crooked River 2 | 46.0 | 42.6 | 6 | 93 | 29.3 |

*Stream Visual Assessment Protocol (SVAP)*

SVAP is a qualitative assessment of the stream's health based on a score from 1 to 10 for each category, with the exception of manure presence which is scored from 1 to 5. Results from the SVAP are shown below in Table 8 and Figure 6. The upper Bear River scored lowest for the categories, riparian zone and canopy (vegetative) cover. This was to be expected because of widespread damage caused by a tornado. The Crooked River scored lowest for the categories, bank stability and barriers to fish movement because of small sections of eroding banks and the presence of dams or dikes. Lick Creek had low scores for water appearance and nutrient enrichment in the lower section of the creek. The Wildhorse River scored the lowest for channel condition, hydrologic alteration, and riparian zone because some sections of the riverbank have been built up to prevent road failure and to prevent pasture flooding. Most of the streams assessed were rated in good or excellent condition.

Table 8. SVAP results for the Wildhorse River watershed

| Reach | Length (feet) | Channel Condition | Hydrologic Alteration | Riparian Zone | Bank Stability | Water Appearance | Nutrient Enrichment | Barriers to Fish Movement |
|---|---|---|---|---|---|---|---|---|
| CR1 | 1,200 | 9 | 8 | 8 | 7 | 10 | 10 | 1 |
| CR2 | 1,245 | 10 | 9 | 8 | 7 | 9 | 10 | 10 |
| BC1 | 2,645 | 10 | 10 | 7 | 9 | 10 | 10 | 10 |
| BC2 | 1,550 | 9 | 8 | 8 | 9 | 8 | 8 | 10 |
| LC1 | 12,840 | 10 | 9 | 8 | 9 | 10 | 10 | 10 |
| LC2 | 1,570 | 9 | 9 | 8 | 9 | 5 | 5 | 10 |
| WR 1 | 1,520 | 10 | 10 | 8 | 10 | 10 | 10 | 10 |
| WR 2 | 1,080 | 10 | 10 | 9 | 10 | 10 | 10 | 10 |
| WR 4 | 1,735 | 8 | 10 | 8 | 10 | 9 | 9 | 10 |
| WR 5 | 1,540 | 2 | 1 | 2 | 10 | 8 | 9 | 10 |
| WR 6 | 2,440 | 5 | 6 | 2 | 10 | 9 | 8 | 10 |

| Reach | Instream Fish Cover | Pools | Insect/ Invertebrate Habitat | Canopy Cover | Manue Presence | TOTAL | SCORE | RATING |
|---|---|---|---|---|---|---|---|---|
| CR1 | 9 | 7 | 10 | 7 | 4 | 90 | 7.5 | good |
| CR2 | 9 | 8 | 9 | 9 | X | 98 | 8.9 | good |
| BC1 | 9 | 9 | 10 | 5 | X | 99 | 9.0 | excellent |
| BC2 | 9 | 3 | 10 | 7 | 4 | 93 | 7.8 | good |
| LC1 | 9 | 8 | 9 | 7 | X | 99 | 9.0 | excellent |
| LC2 | 8 | 7 | 10 | 6 | X | 86 | 7.8 | good |
| WR 1 | 8 | 7 | 10 | 3 | X | 96 | 8.7 | good |
| WR 2 | 8 | 9 | 10 | 8 | X | 104 | 9.5 | excellent |
| WR 4 | 10 | 9 | 10 | 8 | 5 | 106 | 8.8 | good |
| WR 5 | 7 | 3 | 10 | 8 | X | 70 | 6.4 | fair |
| WR 6 | 8 | 6 | 10 | 3 | 4 | 82 | 6.8 | fair |

CR=Crooked River, BC=Bear Creek, LC=Lick Creek, WR=Wildhorse River

*Streambank Erosion Condition Inventory (SECI)*

SECI is a qualitative assessment of the potential for streambank erosion and deposition into a stream. This assessment is rated from 0 to 3 for the following categories: bank erosion evidence, bank stability condition, bank cover/vegetation, and channel bottom stability. Lateral channel stability is rated from 0 to 2 and in-channel deposition is rated from 0 to -1. In addition to solar pathfinder, SVAP, and SECI, ISCC staff measured bankfull width (Table 9).

The Crooked River (CR1) had the highest total ranking, i.e. the greatest qualitative risk of streambank instability and sediment input (Table 9). All of the tributaries (Bear Creek, Crooked River, and Lick Creek) have considerably less bank stability than Wildhorse River. Wildhorse River streambanks are armored with non erosive materials, such as cobbles and boulders. In contrast, lower bank material for tributary streams is sand and/or fine gravel and upper bank material is silt or clay, which is easily eroded.

Table 9. SECI results for the Wildhorse River watershed

STREAM EROSION CONDITION INVENTORY (SECI)

| | Bank Erosion Evidence | Bank Stability Condition | Bank Cover/ Veg. | Lateral Channel Stabilty | Channel Bottom Stability | In-Channel Deposition | TOTAL | Average Bankfull Width (ft) |
|---|---|---|---|---|---|---|---|---|
| CR1 | 0.5 | 0.5 | 0 | 0.5 | 0 | 1 | 2.5 | 18 |
| CR2 | 0.5 | 0 | 0 | 0 | 0 | 0.5 | 1 | 16 |
| BC1 | 0 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 35 |
| BC2 | 1 | 0.5 | 0 | 0 | 0 | 1 | 1.5 | 33 |
| LC1 | 0 | 0 | 0 | 0.5 | 0 | 0.5 | 1 | 26 |
| LC2 | 0 | 0.5 | 0.5 | 0 | 0 | 1 | 2 | 27 |
| WR 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| WR 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 |
| WR 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 |
| WR 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| WR 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |

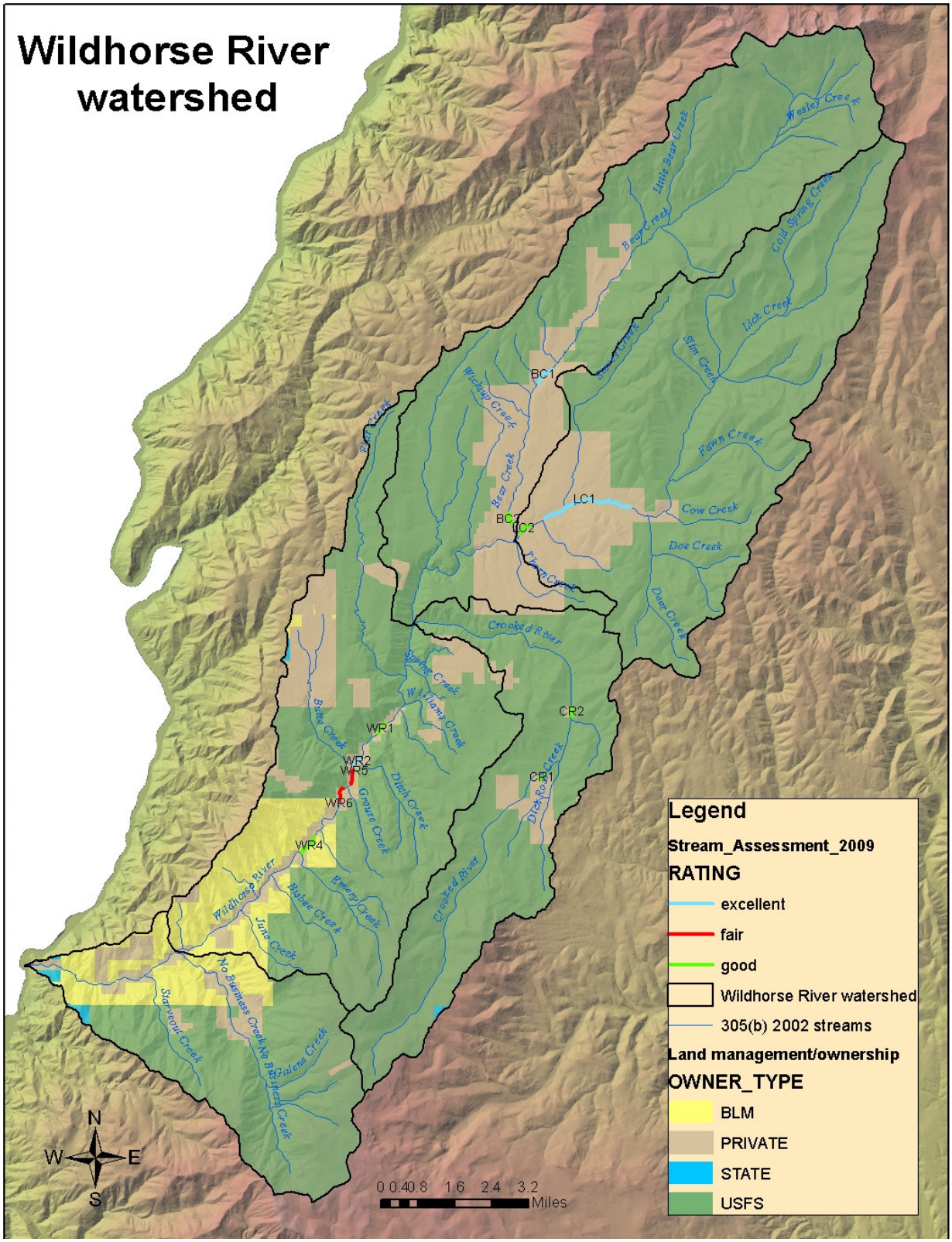


Figure 6. Rating of stream segments inventoried in the Wildhorse River watershed

The following information is based on the Soil Survey of Adams and Washington Area, Idaho, Parts of Adams and Washington Counties (Rasmussen 1990) and conservation system guides for those counties (https://csg.sc.egov.usda.gov/CSGReporteFOTG.aspx). This soil survey only includes the soil map units and their associated descriptions for the section of the Wildhorse River from the confluence with the Snake River to the confluence of Grouse Creek. The remainder of the watershed does not have soil data.

**Forest**

Forested areas of the Wildhorse watershed are found on mountain side slopes and summits with 30-60 % slopes. Average precipitation is 18 to 35 inches per year. Stony, silt, and clay loams are typical of forested areas. Soils are highly erodible by water and runoff can occur rapidly. Timber harvest is a common practice. Forest vegetation is dominated by ponderosa pine, Douglas fir, and lodgepole pine with an understory of shrubs, forbs, and grasses.

**Grass/Pasture/Hayland**

Grass, irrigated pasture, and conventionally tilled, surface irrigated hayland is characterized by clay loams, silt loams, and sandy to gravelly loams on side slopes of foothills. Brownlee sandy loam and Langrell gravelly loam are examples of soil units associated with this land use. Some soils may be stony, shallow, and/or highly erodible by water. Some of the soil units may have rapid runoff with potential for erosion by water. These soil class capabilities may inhibit crop cultivation. Slopes can be 0-3%, 1-5%, or 20-35%. Annual precipitation is 16-30 inches per year for irrigated pastureland and 20 inches per year for hayland. The growing season is 50-100 days for pastureland and 80-120 days for hayland. Elevations range from 4,000 to 6,500 feet. The main crop grown is alfalfa hay (http://www.nass.usda.gov). Irrigated pastureland is planted with smooth brome, timothy, and orchard grass. Partially irrigated pastureland may be planted with intermediate brome and crested wheatgrass.

**Rangeland**

Rangeland is characterized by shallow, gravelly to stony loams of rolling foothills and mountains. Soil units, such as Bakeoven-Reywat complex, Demasters loam, Gwin-Rock complex, McDaniel Stony loam, Meland-Riggins complex, Rockly Riggins complex have rapid to very rapid runoff and are highly erodible by water. Bakeoven-Reywat complex are located on summits and side slopes, Demasters loam on north slopes, Gwin-Rock complex on side slopes, McDaniel Stony loam and complex on north, west, or south slopes, and Meland-Riggins and Rockly Riggins on south slopes. Because there are so many soil units associated with rangeland; the slopes can be quite varied from 2-30%, 40-65%, or 10-60%. Precipitation varies from 14 to 20 inches per year. Average frost free days are 100-150 days. Elevations range from 2,000 to 5,500 feet. Rangeland vegetation consists of desert shrubs, such as sagebrush and perennial grasses.
Grazing is the predominant agricultural activity on rangeland with less than 1,000 head of sheep and horses and over 1,300 head of cattle grazing in this watershed (http://www.fs.fed.us/r4/payette/range_aoi/range_index.shtml). A typical rotation starts near Brownlee Reservoir in the lower portion of the watershed in early spring, moves to the uplands west of the Wildhorse River in the early summer, Bear Creek in late summer, and ends around Lick Creek in the fall. Cattle leave the watershed in the winter.

## ANIMAL FEEDING OPERATIONS AND DAIRIES

There are no existing dairies in the Wildhorse River watershed according to the IDWR (www.idwr.state.id/gisdata/gisdata-new.htm).

## FISH TRAP

The Crooked River fish trap is located in the center of the Wildhorse River watershed. Fish traps are used to collect fish of interest for propagation at fish hatcheries (http://imnh.isu.edu/digitalatlas/geog/fishery/hatchery.htm). There is no known water quality issue related to this fish trap.

## GROUNDWATER CONCERNS

There are no current nitrate priority areas or groundwater concern areas within the Wildhorse River watershed.

## HOT SPRINGS

Hot springs are known to exist around Ox Bow Reservoir and Brownlee Reservoir along Hells Canyon located at the southern tip of the Wildhorse River watershed (Litton 2005). Thermal loading instream from these hot springs may occur.

## THREATENED AND ENDANGERED SPECIES

Possible threatened and endangered species present in the watershed that may be directly affected by poor water quality are bull trout (*Salvelinus confluentus)*, Chinook salmon (*Oncorhynchus tshawytscha*), and steelhead (*Oncorhynchus mykiss*) (http://fishandgame.idaho.gov/cdc/t&e.cfm). The Wildhorse River, from the confluence of Bear Creek and Crooked River to the Snake River, is a migration route for bull trout. The bull trout use is unknown for the Crooked River itself (http://map.streamnet.org/website/bluesnetmapper/viewer.htm).

Lynx, *Lynx canadensis*, is listed as threatened for Adams County. The gray wolf's, *Canis lupus*, range extends into the Brownlee Reservoir subbasin. The Northern Idaho ground squirrel, *Spermophilus brunneus brunneus,* is listed as threatened and this subspecies is located in the Brownlee Reservoir Subbasin in Adams County. The Southern Idaho ground squirrel, *Spermophilus brunneus endemicus,* is listed as a candidate species and it is located in the Brownlee Reservoir Subbasin in Adams and Washington counties.

## WETLANDS

Wetlands are lands that are inundated by water or have saturated soil for significant periods of time. Wetlands are important because they contain a wide variety of plant and animal species and they function as natural filters (http://www.epa.gov/owow/wetlands/). Throughout the Wildhorse River watershed, there are numerous small tributaries with

freshwater forested/shrub wetlands. Emergent wetlands exist near No Business Creek, Bear Creek, Butte Creek, and Wickiup Creek.

# Treatment

## CRITICAL AREAS

Areas of agricultural lands that contribute excessive pollutants to water bodies are defined as critical areas for BMP implementation. Critical areas are traditionally prioritized for treatment based on their proximity to a water body of concern. Critical areas in this plan are all within the riparian corridor because of nature of the temperature listing. Critical areas will be further separated into the following tiers according to the shade analysis in the Wildhorse River SBA-TMDL (IDEQ 2007). These tiers will be used to prioritize recommendations for treatment (Figure 7). Tier 1 reaches have the greatest difference between target and existing shade (or the largest percent lack of shade); tier 2 reaches have the second greatest difference, and so on. Reaches identified below have a lack of or a loss of riparian cover that typically sustains suitable instream temperatures for invertebrates and fishes. Currently, these streams do not meet the temperature TMDL requirements.

ArcView GIS 9.3 software, NAIP imagery, topographic maps, land ownership, field investigations, and IDEQ shade analysis were used to describe riparian areas that fall under a particular tier.

## TIERS

| | *% Lack of Shade* |
|---|---|
| Tier 1 | -52 to -30 percent lack of shade |
| Tier 2 | -29 to -20 percent lack of shade |
| Tier 3 | -19 to -1 percent lack of shade |

### Wildhorse River

There are no estimated Tier 1 reaches for Wildhorse River based on the above described tier ranking and the findings in the Wildhorse River watershed SBA-TMDL (IDEQ 2007). Tier 2 reaches of Wildhorse River (starting from Brownlee Reservoir and working upstream) are located approximately one mile upstream of the confluence of No Business Creek and Wildhorse River and continue intermittently upstream to Ditch Creek. The specific fields are near the confluence of No Business Creek and Wildhorse River and south of the confluence of Wildhorse River and June, Bisbee, Emery, Grouse, and Ditch Creeks. A long Tier 2 reach can be found between Ditch Creek and Williams Creek. Figure 7 highlights, in yellow, Tier 2 reaches that are suggested for treatment and that are likely to positively contribute toward attainment of water quality goals in those reaches. Tier 3 reaches exist elsewhere along the Wildhorse River; however; Tier 3 reaches are not described here because implementation efforts should be focused on Tier 1 and/or 2 reaches.

Irrigated pasture/hayland and domestic livestock holding and feeding areas are the primary agricultural activities along Wildhorse River.

## Lick Creek

There is a small Tier 1 reach near Gladheart Gulch. This section of Lick Creek has already had BMPs, such as fencing, off-stream watering facilities and irrigation conveyance pipeline implemented to improve riparian condition. Lick Creek is fenced off on both sides of the creek from just upstream of its confluence with Bear Creek to downstream of its confluence with Deer Creek. Approximately 32 acres of use exclusion are included in this area. Tier 2 reaches are located from the confluence of Lick and Bear Creeks to the confluence of Lick and Deer Creeks. Specific fields are found downstream of Steves Creek as well as from the confluence of Lick and Steves Creeks to less than a mile downstream of the confluence of Lick and Deer Creeks. Tier 3 reaches exist elsewhere along Lick Creek; however; Tier 3 reaches are not described here because implementation efforts should be focused on Tier 1 and/or 2 reaches. Figure 7 highlights the Tier 2 reaches that are 29% to 20% below target shade.

The primary agricultural activity along Lick Creek is grazed pastureland and rangeland.

## Crooked River

There are no estimated Tier 1 reaches for Crooked River. There is one Tier 2 reach of the Crooked River that exists on private land, Crooked River downstream of Dick Ross Creek (between the crossing of Crooked River Road and NFD 511 Road). Tier 3 reaches exist elsewhere along Crooked River; however; Tier 3 reaches are not described here because they are a lower priority than Tier 1 or 2 reaches. Figure 7 highlights the Tier 2 reaches that are 29% to 20% below target shade.

The primary agricultural activity along Crooked River is livestock grazing on private and USFS lands. A water diversion was noted on private land inventoried in 2009.

## Bear Creek

Tier 3 reaches start at approximately 5,500 feet at the confluence of Lick and Bear Creeks and progress upstream. Tier 3 reaches are not described in detail here because implementation efforts should be focused on Tier 1 and/or 2 reaches. There is a Tier 2 reach less than a mile upstream of the town of Bear. A long Tier 1 reach starts at the end of the Tier 2 reach and continues upstream until just beforethe forest road crosses Bear Creek, near Bear campground. This long Tier 1 reach coincides with the area impacted by a tornado in 2006. Since this area was impacted by a natural disaster, it has been excluded from the temperature analysis; however, any properly administered projects in this area would likely expedite the natural regeneration process. Figure 7 highlights the Tier 2 reaches that are 29% to 20% below target shade.

The primary agricultural activity along Bear Creek is grazed pastureland. Pasture is irrigated by the Bear Creek Irrigation Ditch

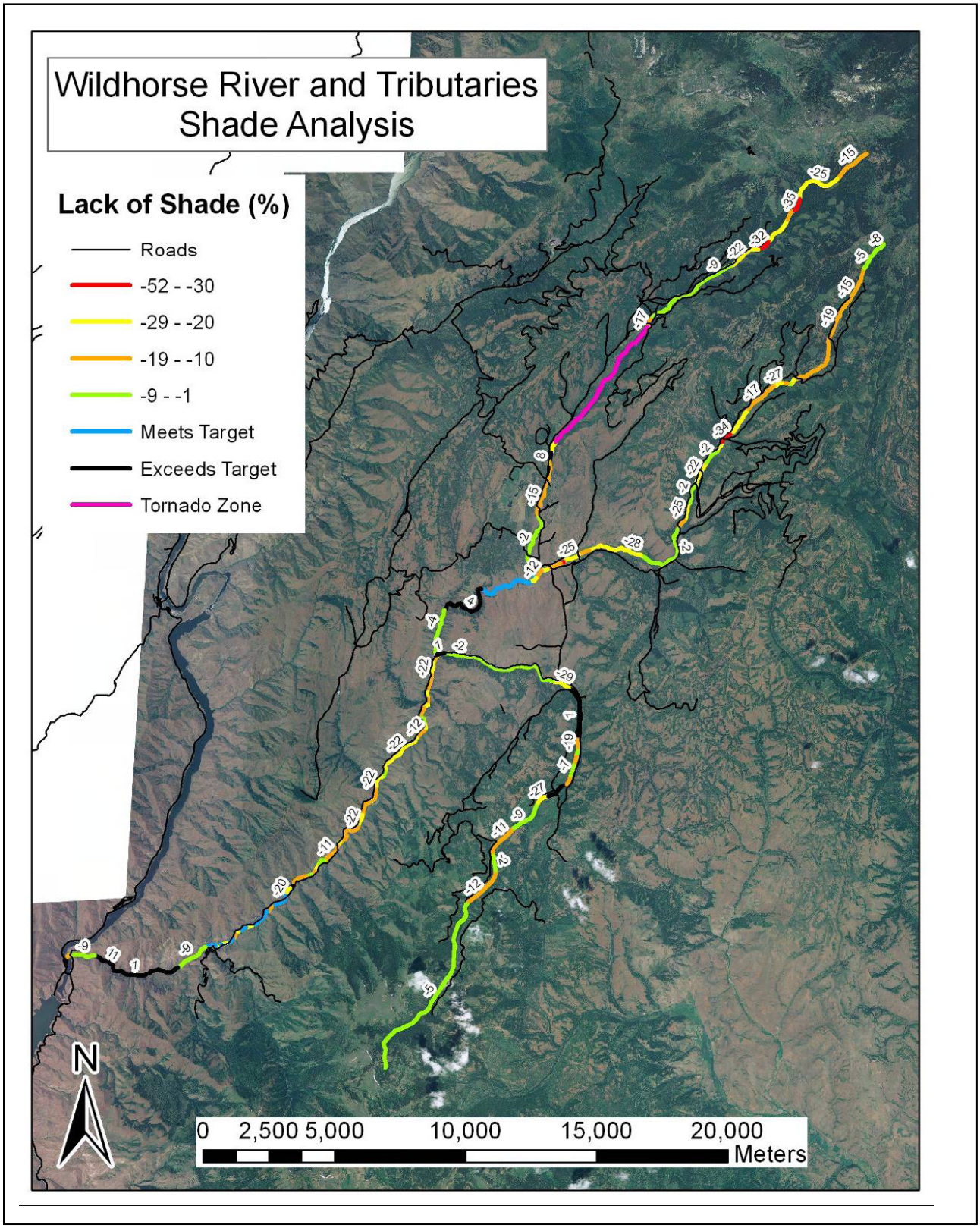


Figure 7. Wildhorse River watershed SBA-TMDL Shade Analysis (IDEQ 2007).

## TREATMENT UNITS (TU)

The following treatment units (TUs) describe areas in the Wildhorse River watershed with similar land uses, soils, plant communities, 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 to formulate alternatives for solving water quality problems. Treatment units for the Wildhorse River watershed focus on the riparian corridor (buffer width<= 100 feet) and include forest, irrigated grass/pasture/hayland, and rangeland. BMPs are suggested for each TU. BMPs will focus on riparian and wetland management using channel stabilization, channel vegetation, critical area planting, fence, riparian forest buffer, tree and shrub establishment, use exclusion, and watering facilities. Table 10 shows treatment units sorted by tier and plant form. Plants are described here because knowledge of present day and potential natural vegetation (PNV) is required in order to determine which plant materials would be best suited for revegetation purposes. Table 10 also includes the preferred method of replanting for select species. Common plant names are provided as a general reference for what currently exists or should exist in the Wildhorse River watershed based on climate, physiographic features, soils, and ecoregion (Hansen and Hall 2002, Hoag et al. 2008, Powell, et al. 2007, www.esis.sc.egov.usda.gov, www.natureserve.org/explorer).
This list is not all inclusive. It contains introduced plants as documentation of what exists now. Plants selected for revegetation purposes should be native species.

### Potential Natural Vegetation (PNV)

Potential Natural Vegetation (PNV), as described by the IDEQ below, is an analysis conducted by the IDEQ to determine target stream temperatures:

> Potential natural vegetation (PNV) along a stream is that intact riparian plant community that has grown to its fullest extent and has not been disturbed or reduced in any way. The PNV can be removed by disturbance either naturally (wildfire, disease/old age, wind-blown, wildlife grazing) or anthropogenically (domestic livestock grazing, vegetation removal, erosion). The idea behind PNV as targets for temperature TMDLs is that PNV provides a natural "mature state" level of solar loading to the stream. Anything less than PNV results in the stream heating up from either naturally created or anthropogenically created additional solar inputs.

IDEQ staff used the following plant community types to generate target shade conditions.

- Bunchgrass and shrub lands
- Willow, mountain alder
- Ash, red alder, willow, white oak, ponderosa pine, ninebark, Douglas fir
- Ponderosa pine, green ash, common chokecherry
- Grand fir, subalpine fir, sitka alder (Douglas fir, western larch, lodgepole pine, pacific yew)
- Subalpine fir, spruce, logdepole pine, whitebark pine, alder, bluejoint reedgrass
- Grand fir, Douglas fir, western larch, bunchgrass (ponderosa pine, Engelmann spruce, lodgepole pine)
- Quaking aspen, mixed willow, mixed alder, red osier dogwood
- Paper birch/Mixed firs, ponderosa pine, Engelmann spruce
- Grand fir, Douglas fir, ponderosa pine, redwood

Table 10. Treatment unit description and plants found in the Wildhorse River watershed.

| **Wildhorse River watershed** | (BR=bare root, D=Difficult to manage, I=introduced, HC=hardwood cuttings, RC=root cuttings, S=seed, SA=sapling, SE=seedling) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Treatment Unit Description** | **Trees** | | **Shrubs** | | **Forbs** | | **Grasses, Rushes, Sedges** | |
| **Treatment Unit 1-Private Forest** | | | | | | | | |
| | big tooth maple | SE | antelope bitterbrush | BR, SE | bluebells | | bluebunch wheatgrass | S |
| Tier 1 45.6 acres | black cottonwood | HC | Bebb willow | HC | corn lily | | elk sedge | |
| Tier 2 47.7 acres | Douglas fir | | blue huckleberry | | Jacobs ladder | | Idaho fescue | S |
| Tier 3 87.0 acres | Engelmann spruce | | Booth willow | HC | oregon grape | SE | pine grass | |
| | grand fir | SA | chokecherry | D | pussytoes | | beaked sedge | |
| **Soils** | hawthorn | BR, SE | coyote willow | HC | slender cinquefoil | | spikerush | |
| silt loam (Demasters) | lodgepole pine | | Drummond willow | HC | white spirea | HC | water sedge | |
| clay loam | narrowleaf cottonwood | HC | Geyers willow | HC | | | lesser panicled sedge | |
| stony loam (Klicker) | ponderosa pine | SA | gray alder | SE, SA | | | | |
| **Resource Concerns** | quaking aspen | SA | green alder | | | | | |
| forest management | sub alpine fir | SA | gooseberry currant | | | | | |
| habitat alteration-F&W | water birch | SE, SA | labrador tea | | | | | |
| invasive species | western larch | | mallow ninebark | BR, SE | | | | |
| plant condition (pests) | white alder | | mountain ash | | | | | |
| road erosion | whitebark pine | | netleaved hackberry | HC (2-4 yr) | | | | |
| streambank erosion | whiplash willow | SE | Pacific willow | D | | | | |
| surface water quality | | HC (2-4 yr) | red-osier dogwood | HC | | | | |
| wildfire hazard | | | scouler willow | SE | | | | |
| | | | serviceberry | HC, SE | | | | |
| | | | snowberry | HC, SE | | | | |
| | | | syringa | SE | | | | |
| | | | thimbleberry | SE | | | | |
| | | | whortleberry | BR, SE | | | | |
| | | | Woods rose | D | | | | |
| **Treatment Unit 2-Private Cropland/Hayland/Pastureland** | | | | | | | | |
| Tier 1 17.4 acres | black cottonwood | HC | gray alder | SE, SA | bluebells | | beaked sedge | |
| Tier 2 21.4 acres | narrowleaf cottonwood | HC | Booth willow | HC | Canada thistle | I | bluebunch wheatgrass | S |
| Tier 3 50.4 acres | quaking aspen | SA | coyote willow | HC | colomia | | field horsetail | |
| | | | gooseberry currant | | common camas | | lesser panicled sedge | |
| **Soils** | | | red-osier dogwood | D | cow parsnip | | orchard grass | I |
| sandy loam | | | service berry | SE | creeping buttercup | I | panicled bulrush | |
| gravelly loam | | | | | dandelion | I | spikerush | |
| clay and silt loams | | | | | false solomons seal | | tall fescue | I |
| **Resource Concerns** | | | | | houndstongue | I | timothy | I |
| habitat alteration-F&W | | | | | lupine | | water sedge | |
| inadequate feed and forage | | | | | meadow rue | I | | |
| inefficient water use | | | | | senecio | I | | |
| invasive species | | | | | sheep (red) sorrell | I | | |
| plant productivity | | | | | slender cinquefoil | | | |
| streambank erosion | | | | | sweetclover | I | | |
| surface water quality | | | | | yarrow | | | |
| wildfire hazard | | | | | | | | |
| **Treatment Unit 3-Private Rangeland** | | | | | | | | |
| Tier 1 24.8 acres | hawthorn | BR, SE | antelope bitterbrush | BR, SE | arrowleaf balsamroot | S, SE | bluebunch wheatgrass | S |
| Tier 2 44.4 acres | quaking aspen | SA | big sagebrush | BR, SE, S | biscuitroot | | bottlebrush squirreltail | S |
| Tier 3 89.0 acres | | | chokecherry | D | cow parsnip | | bulrush | |
| | | | Bebb willow | | creamy buckwheat | SE | cattail | BR, S, SE |
| **Soils** | | | coyote willow | HC | Douglas' buckwheat | SE | cheatgrass | I |
| stony loam (Gwin, Reywat, Riggins) | | | gray rabbitbrush | SE | golden buckwheat | SE | Cusicks bluegrass | |
| gravelly loam (Bakeoven, Brownlee, | | | mountain big sagebrush | BR, SE, S | Hookers balsamroot | S, SE | Great Basin wildrye | S |
| Jacknife, Langrell, Meland, Rockly) | | | Rocky Mountain juniper | SE | indian paintbrush | | Idaho fescue | S |
| **Resource Concerns** | | | Scouler willow | HC | knotweed | | mountain brome | I |
| invasive species | | | shrubby cinquefoil | RC | longleaf hawksbeard | I | muhly | |
| plant condition (pests) | | | silver buffaloberry | D | longleaf phlox | | Nebraska sedge | S |
| plant productivity | | | silver sagebrush | | lupine | | needlegrass | S |
| streambank erosion | | | snowbrush ceanothus | | pondweed | | prairie junegrass | S |
| surface water quality | | | Wyoming sagebrush | BR, SE, S | tapertip hawksbeard | | Sandberg's bluegrass | S |
| water quantity (livestock watering facilities) | | | | | water milfoil | | smooth sumac | D |
| wildfire hazard | | | | | waterweed | | spikerush | |
| | | | | | yarrow | S, SE | water sedge | |

## RECOMMENDED BMPS AND ESTIMATED COSTS

There are several BMPs that may be applied to the above described treatment units to improve water quality. As a result of the water quality inventory and evaluation and other research outlined in this implementation plan, the following strategies are recommended. It should be noted that these recommended BMPs may influence human-related activities; however, natural occurrences such as beaver activity, vegetation, log jams, and ice flows can alter water quantity and/or quality.

### Treatment Unit # 1, Forest

On private forest lands, especially along Crooked River and Bear Creek, the focus should be to limit livestock access to the impaired streams. Strategies to accomplish this may include stream access with livestock management, controlled stream access with heavy use area protection, and/or use exclusion with development of watering facilities. For timber harvested areas, low intensity management may be recommended as well as appropriate buffer distances from streams to prevent increased sediment input (via roads within 200 ft of stream channels) and to avoid additional solar loading. Crooked River (CR2) is likely receiving sediment from the road and culvert. Maintenance measures need to be taken to minimize overland flow of water and sediment into the stream.

### Treatment Unit #2, Grass/Pasture/Hayland

Some strategies may include, but are not limited to, livestock exclusion from the riparian area, nutrient management, improved water management, conversion from surface irrigation system to sprinkler irrigation system, riparian buffer strips, and/or riparian restoration projects.

### Treatment Unit # 3, Rangeland

On rangelands, the focus would be to continue to monitor livestock distribution, as well as duration, intensity, and/or frequency of grazing through increased management. Other BMPs may be necessary to provide livestock with an adequate water supply. Fence, spring developments, and watering facilities need to be developed and properly maintained in the uplands to allow for proper livestock management. Riparian restoration BMPs, such as channel vegetation, prescribed grazing, streambank protection, and/or use exclusion may also be necessary to improve riparian health and rangeland condition. Noxious weeds, such as rush skeletonweed, scotch thistle, spotted knapweed, and whitetop, need to be controlled throughout the watershed. It is important to note that although this plan focuses on improvements on private land; similar measures are needed on public lands in order to effectively manage the system as a whole within the watershed.

BMPs appropriate for the reduction of agricultural impacts to water quality in the Wildhorse River watershed and their installation costs are listed below in Table 10 (http://www.id.nrcs.usda.gov/programs/eqip/2008/eqip_practices_08.html).

Individual conservation planning for willing landowners will determine the most appropriate BMPs to install on a case by case basis. The information included in Table 11 provides an estimate of the BMPs recommended for critical acres in the subbasin and their approximate costs. A more precise estimate of quantities of each BMP recommended to install will be determined at the time of conservation planning for a particular landowner.

Table 11. Recommended BMPs and estimated costs for implementation of these BMPs in the Wildhorse River watershed.

| BEST MANAGEMENT PRACTICE (BMP) | UNIT | CODE | COST | AMOUNT | TOTAL COST |
|---|---|---|---|---|---|
| Channel bank vegetation, willow pole | ft | 322 | 2.05 | 1,069 | $2,191.45 |
| Channel stabilization, rock rip-rap, barbs | ft | 584 | 18.75 | 1,069 | $20,043.75 |
| Fence, barb wire | ft | 382 | 2.02 | 62,430 | $126,108.60 |
| Heavy use area protection | $ft^2$ | 561 | 0.68 | 10,200 | $6,936.00 |
| Irrigation water management | ac | 449 | 5 | 465 | $2,323.00 |
| Nutrient management | ac | 590 | 5 | 859 | $4,293.00 |
| Pasture and hayland planting | ac | 512 | 122 | 859 | $104,749.20 |
| Pest management | ac | 595 | 15 | 859 | $12,879.00 |
| Pipeline (PVC, HDPE, or PE pipe 2") | ft | 516 | 2.4 | 59,830 | $143,592.00 |
| Prescribed grazing | ac | 528 | 7 | 837 | $5,859.00 |
| Range planting | ac | 550 | 103 | 531 | $54,651.80 |
| Riparian forest buffer | ac | 391 | 1,125.00 | 44 | $49,189.57 |
| Spring development | ea | 574 | 1,800.00 | 5 | $9,000.00 |
| Stream crossing | ac | 578 | 1,050.00 | 2 | $2,100.00 |
| Stream habitat improvement & management | ft | 395 | 5 | 19,525 | $97,625.00 |
| Streambank and shoreline protection | ft | 580 | 45 | 1,069 | $48,105.00 |
| Tree/shrub establishment, planting only | ea | 612 | 0.75 | 39 | $29.55 |
| Upland wildlife habitat management | ac | 645 | 10 | 859 | $8,586.00 |
| Use exclusion | ac | 472 | 34 | 514 | $17,487.36 |
| Water well | ft | 642 | 22.5 | 1,500 | $33,750.00 |
| Watering facility, trough | ea | 614 | 1233 | 11 | $13,563.00 |
| GRAND TOTAL | | | | | $763,062.28 |

## Implementation Priority

This TMDL implementation planning process included assessing impacts to water quality in the Wildhorse River watershed from agricultural lands on 303(d) listed streams and recommending priorities for installing BMPs to meet water quality objectives stated in the Wildhorse River SBA-TMDL. Data from water quality monitoring and field inventory and evaluations were used to identify critical agricultural areas affecting water quality and to set priorities for treatment.

## RECOMMENDED PRIORITIES FOR BMP IMPLEMENTATION

Table 12 lists the streams prioritized for treatment and the rationale for their prioritization. Streams in the Wildhorse River watershed were ranked using TMDL reductions, field evaluation and inventory, streambank stability, and water quality data. According to this ranking, Crooked River is the highest priority because unstable streambanks affect plant establishment, channel dynamics, and sediment deposition. Although only a very small portion of the river is privately owned (approximately 1 mile out of 15 total miles), BMPs focused on improving streambank stability and preventing sediment erosion would be beneficial. The Wildhorse River ranks second because of impacts to riparian areas from livestock feeding and holding areas and because of hydrologic alteration that prevents this stream from accessing its floodplain. Although the Wildhorse River has the second most shade, it also has the longest reach under the Tier 2 category. The major concerns for Bear Creek are residual effects from the tornado, livestock management, and timber harvest that may remove canopy cover from near stream. The Wildhorse SBA-TMDL states …"For the purposes of prioritizing any implementation efforts geared towards improving shade, streams with percent reductions needed below 20% should be considered of lower priority. These percent reductions that are below 20% likely represent vegetative communities that will not need any additional planting or other riparian management work and will reach PNV on their own. However, riparian management techniques may be able to hasten this process." This includes all of the streams except for Lick Creek. Lick Creek has the least shade which gives it the highest priority for the percent load reduction category. However, the entire length of the creek from the uppermost private property boundary to its confluence with Bear Creek has been fenced off. The creek is in the process of recovering and there are no anticipated BMPs in this reach. Future concerns that may have water quality impacts downstream include timber harvest above the private property and USFS boundary.

Table 12. Priority for BMP implementation in the Wildhorse River watershed

| *Priority Ranking* | *Stream* | *% Load Reduction* | *Solar Pathfinder % Shade* | *SECI* | *SVAP* | *Current Condition* | *Agricultural Impacts to Water Quality* | *BMPs Available for Treatment* |
|---|---|---|---|---|---|---|---|---|
| 1 | Crooked River | 18.0 | 50.2 | 1.8 | 8.2 | Downward | Cattle grazing, timber harvest | Yes |
| 2 | Wildhorse River | 12.0 | 47.7 | 0.0 | 6.6 | Stable | Livestock grazing, irrigated pasture/hayland | Yes |
| 3 | Bear Creek | 8.0 | 38.0 | 1.0 | 8.4 | Stable | Livestock grazing, timber harvest | Yes |
| 4 | Lick Creek | 28.0 | 19.0 | 1.5 | 8.4 | Upward | None-Riparian Area Excluded | No |

A 5 year implementation plan table can be found in Appendix A. This table describes implementation activities that will work towards restoration of the potential natural vegetation for the purposes of increasing shade along the Wildhorse and Crooked Rivers, and Bear and Lick Creeks.

Implementation of BMPS will involve ongoing cooperation with the Adams SWCD and the Weiser River SCD to evaluate alternatives and carry out implementation. The chosen treatment alternative is likely to be alternative # 4.

Describe alternatives (examples):
1. no action
2. implement all recommended BMPs per Table 10.
3. implement BMPs for only the priority 1 watershed
4. implement BMPs based on available funding and landowner interest

## Funding

Financial and technical assistance for installation of BMPs is needed to ensure success of this implementation plan. The Adams Soil and Water Conservation District and the Weiser River Soil Conservation District will actively pursue multiple potential funding sources to implement water quality improvements on private agricultural and grazing lands. Many of these programs can be used in combination with each other to implement BMPs. These sources include (but are not limited to):

**CWA 319 –**These are Environmental Protection Agency funds allocated to the Nez Perce Tribe and the State of Idaho. The Idaho Department of Environmental Quality (DEQ) administers 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: DEQ http://www.deq.idaho.gov/water/prog_issues/surface_water/nonpoint.cfm#management

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

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

**Conservation Improvement Grants** – These grants are administered by the ISCC. Source: ISCC http://www.scc.state.id.us/programs.htm

**PL-566** –This is the small watershed program administered by the USDA Natural Resources Conservation Service (NRCS).

**Agricultural Management Assistance (AMA)** –The 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. Source: NRCS http://www.nrcs.usda.gov/programs/ama/

**Conservation Reserve Program (CRP) –**The 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. Source: NRCS http://www.nrcs.usda.gov/programs/crp/

**Conservation Technical Assistance (CTA) –**The 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. Source: 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. Source: NRCS http://www.nrcs.usda.gov/programs/eqip/

**Wetlands Reserve Program (WRP) –**The 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. Source: NRCS 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. Source: NRCS http://www.nrcs.usda.gov/programs/whip/

**State Revolving Loan Funds** (**SRF) –**These funds are administered through the ISCC. Source: ISCC http://www.scc.state.id.us/programs.htm

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

**Conservation Security Program** (**CSP) –**CSP is a voluntary program that rewards the Nation's premier farm and ranch land conservationists who meet the highest standards of conservation environmental management. Source: NRCS http://www.nrcs.usda.gov

**Grazing Land Conservation Initiative** (**GLCI) –**The GLCI's 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. Source: http://www.glci.org/

**Habitat Improvement Program (HIP)** – This is an Idaho Department of Fish and Game program to provide technical and financial assistance to private landowners and public land managers who want to enhance upland game bird and waterfowl habitat. Funds are available for

cost sharing on habitat projects in partnership with private landowners, non-profit organizations, and state and federal agencies. Source: IDFG http://fishandgame.idaho.gov/cms/wildlife/hip/default.cfm

**Partners for Fish and Wildlife Program in Idaho –** This is a U.S. Fish and Wildlife program providing funds for the restoration of degraded riparian areas along streams, and shallow wetland restoration. Source: USFWS http://www.fws.gov/partners/pdfs/ID-needs.pdf

## Outreach

Conservation partners in the Wildhorse River watershed will use their combined resources to provide information about BMPs to improve water quality to agricultural landowners and operators. A local outreach plan may be developed. Newspaper articles, district newsletters, watershed and project tours, landowner meetings and one-on-one personal contact may 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 contracts are 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.

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## Appendix A. 5 Year TMDL Implementation Plan for Agriculture

| Action Item | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| *Pollutant Identification/Monitoring and Evaluation* | | | | | |
| Re-evaluate water quality concerns on private lands | | | | | |
| Evaluate streambank condition and riparian corridor health | | | | | |
| Document findings using photo points, Solar Pathfinder, SECI, SVAP, etc. | | | | | |
| Coordinate with other agencies to evaluate needs and conduct assessments | X | | | | |
| Work with NRCS and local districts to set priorities | | | | | |
| Coordinate with the Adams SWCD, the Weiser SCD, NRCS, and IDEQ to identify... | | | | | |
| PNV monitoring locations, to document trends in shade, and to complete SBA-TMDL | | | | | |
| *Conservation accomplishments* | | | | | |
| Provide a table and summary of past conservation accomplishments | X | | | | |
| *Recommended BMPs and Estimated Costs* | | | | | |
| Provide a table of recommended BMPs and estimated costs | X | | | | |
| *Critical Areas Delineation/Treatment* | | | | | |
| Determine critical areas for treatment on private lands in the watershed | X | | | | |
| Refine critical areas to Tiers using the % lack of shade map from SBA-TMDL | X | | | | |
| Visit areas on private lands that are >20% below shade targets | X | | | | |
| Determine appropriate treatment alternatives for each site | X | | | | |
| Research and identify appropriate plant materials for revegetation in critical areas | X | | | | |
| Re-evaluate potential natural vegetation/shade targets based on recent data | | | | | |
| Monitor and treat noxious weeds | | | | | |
| Improve cattle distribution with cross fencing, spring developments, & watering facilities | | | | | |
| Coordinate restoration projects to develop appropriate riparian buffer width | | | | | |
| Seek funds and partnerships for restoration projects | | | | | |
| *Bear Creek* | | | | | |
| Visit a representative portion of Tier 1 and 2 reaches on private lands | | | | | |
| Evaluate livestock management | | | | | |
| Contact landowners regarding irrigation system upgrade to maximize instream flows | | | | | |
| Document and select treatment alternatives for areas >20% below shade targets | | | | | |
| *Crooked River* | | | | | |
| Visit Tier 2 reaches on private lands; applicable to only one parcel | | | | | |
| Evaluate livestock management | | | | | |
| Document and select treatment alternatives for areas >20% below shade targets | | | | | |
| Document and select treatment alternatives for unstable, eroding streambanks… | X | | | | |
| in order to effectively re-establish plant materials on site | | | | | |
| *Lick Creek* | | | | | |
| Evaluate livestock management | | | | | |
| Document plant re-establishment and growth, i.e. shade recovery in treated areas | | | | | |
| Research potential cause of excessive algal growth | | | | | |
| *Wildhorse River* | | | | | |
| Visit a representative portion of Tier 2 reaches on private lands | | | | | |
| Evaluate livestock management | | | | | |
| Document and select treatment alternatives for areas >20% below shade targets | | | | | |
| Contact landowners to determine interest in tree/shrub establishment | | | | | |