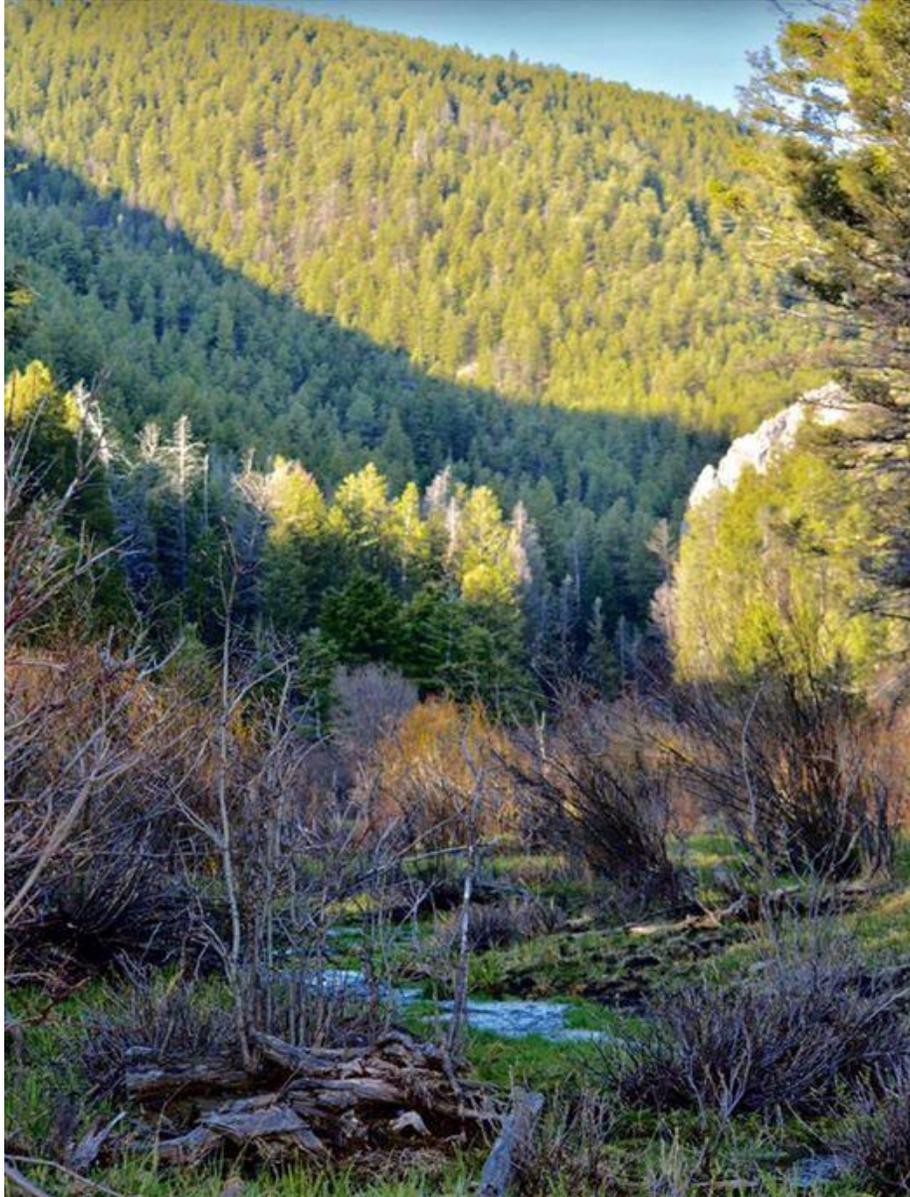


# Medicine Lodge Creek Subbasin Addendum Implementation Plan for Agriculture

Hydrologic Unit Code 17040215



Fritz Creek, Medicine Lodge Creek Subbasin, photographed by Lisa Sullivan

Prepared by the Idaho Soil and Water Conservation Commission in  
Cooperation with the Clark Soil Conservation District

2020

Original Plan: Medicine Lodge Creek Subbasin Total Maximum Daily Load  
Implementation Plan for Agriculture. July 2002.

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## **Introduction**

The objective of this plan is to address temperature and *E. coli* Total Maximum Daily Loads (TMDLs) presented in the Medicine Lodge Creek Subbasin TMDLs 2016 Addendum and Five-Year Review (IDEQ, 2016).

Temperature TMDLs in the 2016 addendum are revisions to TMDLs approved by the U.S. Environmental Protection Agency in May 2003 (IDEQ, 2003). The temperature TMDLs have been revised based on potential natural vegetation (PNV) methodology which uses shade surrogates rather than numeric criteria as TMDL targets (Shumar and Varona, 2009). This change did not affect the implementation strategies proposed in the original implementation plan (IASCD, 2002).

The *E. coli* TMDLs addressed in this implementation plan were developed based on data collected during water quality assessments conducted by the Idaho Department of Environmental Quality (IDEQ) after completion of the original subbasin assessment and TMDL. The data collection and analyses are described in detail in the 2016 TMDL addendum (IDEQ, 2016).

In accordance with section 39-3601 et seq., Idaho Code, and IDAPA 58.01.02, Water Quality Standards, the Idaho Soil and Water Conservation Commission (ISWCC) is the designated agency responsible for preparing a TMDL implementation plan and leading implementation activities on grazing and agricultural lands in the State.

Water diversions are allowed under Idaho statute. Even though they may affect the ability of the riparian zone to support shade-producing vegetation and result in increased water temperature, nothing in this plan is intended to interfere with the rights of Idaho appropriators in the utilization of the water appropriations which have been granted to them. Diversions notwithstanding, reaching shade targets as discussed in the TMDL and in this implementation plan will protect what water remains in the channel and allow the stream to meet water quality standards for temperature (IDEQ, 2016).

## **Project Setting**

The Medicine Lodge Creek Subbasin (USGS Hydrologic Unit Code 17040215) consists of six subwatersheds, Edie, Fritz, Irving, Indian, Middle, and Medicine Lodge. Rangeland is the predominant land use within the subbasin. Elevations range from 9,000 feet at Fritz Peak to 5,000 feet where Medicine Lodge Creeks disappears into the ground (IASCD, 2002).

The subbasin is a semi-arid steppe with many miles of ephemeral and intermittent drainages. Streams within the subbasin incorporate flow from natural steady thermal

springs, to receiving snowmelt directly from the Beaverhead Mountain Range. The subbasin's principal drainage is Medicine Lodge Creek. The headwaters begin at the confluence of Warm and Fritz creeks and then flows approximately 21 miles in a southeasterly direction slightly past the town of Small. The creek then dissipates from diversions and naturally sinks into the channel bed directly above the aquifer northwest of Cedar Butte.

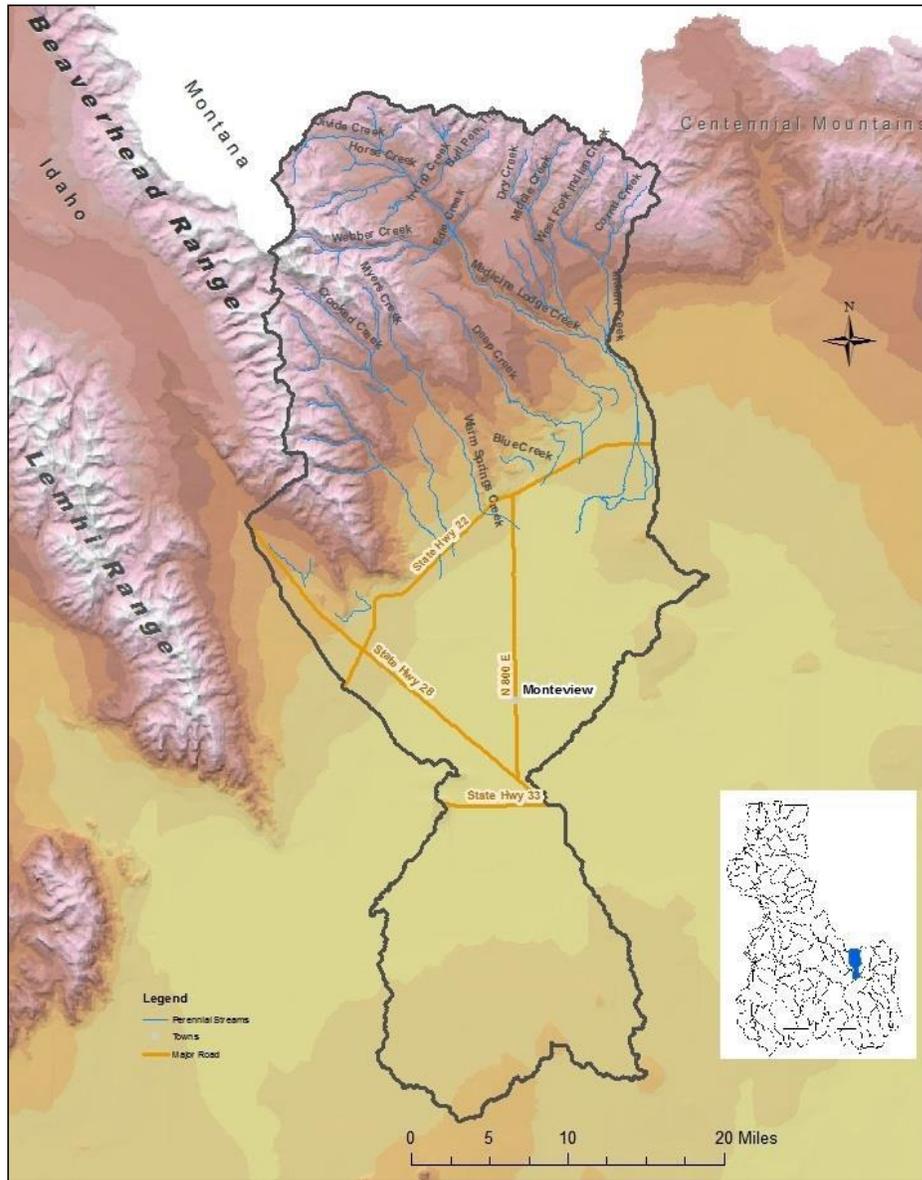


Figure 1. Medicine Lodge Creek subbasin in east central Idaho (IDEQ, 2016).

A detailed description of the project setting is provided in the Medicine Lodge Subbasin Assessment and TMDL (IDEQ, 2003), with the delineation of some watersheds having been updated and revised in the Medicine Lodge Creek Subbasin TMDL Addendum and Five-Year Review (IDEQ, 2016).

### **Land Use and Land Ownership**

The land in the Medicine Lodge Subbasin is 69% rangeland. Another 23% is agriculture with 7% forest. The forested area is found in the western part of the subbasin in the headwaters of Fritz Creek, Webber Creek and Crooked Creek. Most of the agricultural land is found in the southern part of the subbasin which is primarily flat and devoid of much hydrography.

The majority (77%) of the Medicine Lodge Subbasin is public land. The BLM manages 32%, the USFS 21%, the Idaho National Environmental Engineering Laboratory 23%, and the Idaho State Department of Lands 1% of the acreage in the subbasin. The remaining 23% of the subbasin is owned privately. For a detailed description of land use and land ownership, please refer to the Medicine Lodge Creek Subbasin Assessment and TMDL (IDEQ, 2003, 2016).

### **Accomplishments**

Since the original TMDL was approved in 2003, many watershed improvement projects have been completed or are ongoing in the Medicine Lodge Creek subbasin. The Clark Soil Conservation District (Clark SCD) and multiple land management agencies have worked cooperatively together and with private landowners to implement BMPs that restore proper riparian function. Rangeland and water resources are Clark SCD's top priorities and the District has been active in implementing projects designed to maintain and improve these resources. Clark SCD used IASCD's 2002 TMDL implementation plan as the framework for a project funded by a Clean Water Act §319 grant which implemented best management practices on Medicine Lodge, Edie, Irving, and Fritz Creeks.

The Medicine Lodge Creek TMDL Addendum and Five-Year Review describes recently completed BMP implementation work (IDEQ, 2016). This work is summarized in Table 1. While it is true that a significant number of the completed projects were implemented in order to address sediment rather than temperature TMDLs, it is also true that in almost all cases BMP's which reduce sedimentation also increase the health of riparian plant communities or alter stream morphology in ways that increase stream shading and so help to achieve temperature as well as sediment TMDL targets.

Table 1. Watershed Improvement Projects Completed or Ongoing as of 2016

<b>Clark SCD Projects</b>
<b>Medicine Lodge Creek §319 Project</b>
Restored beneficial uses on 35 miles of stream
Improved riparian and stream channel habitat
Reduced streambank and stream channel erosion
Implemented planned grazing, pasture development, and exclusion fencing to improve grazing management
Installed off-stream water developments to reduce livestock concentration on streams
Established stream buffers using grass, shrubs, and trees
Stabilized eroding streambanks and channels using stream renaturalization techniques
Monitored progress and applied adaptive management to projects
<b>Agricultural Water Quality Cost-Share Program and Continuous Sign-Up Conservation Reserve Program</b>
Installed 485 acres of riparian forest buffer with livestock exclusion
<b>NRCS Projects</b>
<b>Environmental Quality Incentives Program Program</b>
Implemented a spring development and stock water system in Middle Creek involving 1
miles of pipeline carrying water from the spring to 4 storage tanks and 8 troughs,
improving the condition of the riparian zone and the health of 11,000 acres of rangeland
Installed 4,300 feet of wildlife friendly cross fencing in large pastures.
Implemented prescribed grazing on 1,839 acres.
Installed 20 watering facilities to provide off-creek water for livestock and wildlife and reduce impacts to streambanks.
<b>BLM Projects</b>
<b>Edie Creek</b>
Installed 2 protective fences and 2 stream enclosures
After 2003 wildfire, rebuilt fences, installed streambank stabilization structures, and planted willows.
<b>Irving Creek</b>
To allow the channel to stabilize following a severe flood, restricted grazing to one out
<b>Medicine Lodge Creek</b>
Monitors streambank stability along sections of the Creek that are impacted by county road encroachment.
<b>Deep, Horse, Indian, Middle and Warm Creeks</b>
Monitors canopy cover and manages grazing to maintain and improve shading
<b>Caribou-Targhee National Forest, Dubois Ranger District Projects</b>
Manages riparian grazing on forest land in the subbasin according to these guidelines:
Maintain minimum canopy cover of 80%
Minimize livestock trampling of vegetated streambanks
Maintain minimum 50% of streambanks providing overhanging vegetation to provide fish cover.
Grazers required to install and maintain range improvements such as exclusion fencing and off-site watering facilities.

## Resource Concerns

Since the original TMDLs were approved in 2003, the Medicine Lodge Creek subbasin has been identified as requiring an addendum to the TMDLs for bacteria and temperature.

### Bacteria

Water quality monitoring conducted by IDEQ after the 2003 Medicine Lodge Creek subbasin TMDL had been approved indicated that four streams required additional TMDLs because they did not meet water quality standards for E. coli. Idaho water quality standards (IDAPA 58.01.02.251.01) stipulate that E. coli is not to exceed 126 colony forming units (cfu) per 100 mL water sample, based on a geometric mean of several samples collected according to a specific protocol. The data collection and analyses are described in detail in the 2016 TMDL addendum (IDEQ, 2016).

The four creeks for which E. coli TMDL's were developed are West Fork Indian Creek, Medicine Lodge Creek, Middle Creek and Warm Creek. Existing E. coli pollutant loads, and the load reductions required to achieve the TMDL target for each stream are presented in Table 2.

Table 2 Bacteria load allocations, existing loads, and load reductions necessary to achieve e coli TMDL targets on streams in the Medicine lodge creek subbasin.

Table 2. Bacteria load allocations, existing loads, and load reductions necessary to achieve E. coli TMDL targets on streams in the Medicine Lodge Creek subbasin.

Stream Name	Load Allocation*	Existing Load (cfu/100 ml)	Load Reduction Necessary to Achieve TMDL Target	
	(cfu/100 ml)		(cfu/100 ml)	(%)
West Fork Indian Creek	100	208	108	52
Medicine Lodge Creek	100	464.7	364.7	78
Middle Creek	100	1,235.60	1,135.60	92
Warm Creek	100	338.7	238.7	70

\* Load Allocations were calculated by subtracting natural background and a margin of safety from the water quality criterion of 126 E. coli cfu/100 ml.

### Temperature

The 2003 temperature TMDL targets were developed based on strict numeric temperature criteria. After approval of the 2003 TMDLs, IDEQ adopted the Potential Natural Vegetation (PNV) approach to develop target shade levels necessary to support the designated beneficial uses of a stream. The PNV procedures and methodologies are described in detail in The Potential Natural Vegetation (PNV) Temperature Total

Maximum Daily Load (TMDL) Procedures Manual (Shumar and de Varona 2009).

The PNV temperature targets in the 2016 addendum to the Medicine Lodge Subbasin TMDLs are based on analyses of how much stream shade would be created by the vegetation that would exist along the streams if human activities had no impact on that vegetation. The amount of shade provided by PNV and the associated solar loads are assumed to be the natural conditions; thus, stream temperatures under PNV conditions are assumed to be natural and are considered to be consistent with the Idaho water quality standards, even if they exceed numeric criteria (IDEQ, 2016).

Eleven streams in the subbasin have temperature TMDLs. Subtracting the percentage of existing shade from the target percentage established using PNV provides the percentage of shade that is lacking, or the 'shade deficit' that needs to be made up in order to achieve the TMDL target. Table 3 shows the shade deficits for the 11 streams with temperature TMDLS. A range of shade deficits are given for each stream because the amount of existing and target shade varies between different segments of each stream.

Table 3. Shade deficits on streams in the Medicine Lodge Creek subbasin that have temperature TMDLs.

Stream Name	Shade Deficit (%)*
Deep Creek	-4 to -17
Fritz Creek	-9 to -15
Warm Creek	-0 to -8
Webber Creek	-3 to -5
Indian Creek	-5 to -63
Horse Creek	-1 to -45
Middle Creek	-1 to -42
Irving Creek	-2 to -25
Crooked Creek	-5 to -31
Medicine Lodge Creek	-8 to -34
Edie Creek	-5 to -34

\* Shade deficit percentages were determined by subtracting the percent of the stream that is shaded under existing conditions from the percent that would be shaded under PNV conditions. If PNV would provide 80 percent shade and current conditions provide 50 percent, the shade deficit would be 30%. Thus, to achieve the TMDL target in this example (80% shade) shade would need to be provided to an additional 30% of the stream.

## Agricultural Inventory and Evaluation

Existing shade values are estimates based on the visual interpretation of aerial photos. Part of each individual BMP implementation project should include the pre-implementation measurement of existing shade levels to verify the estimate for the stream segment where the project is located. This will enable comparison of pre- and post-implementation shade values and calculation of actual shade increases resulting from of each project.

## Treatment

### Recommended BMPs

Tables 4 and 5 list BMPs that can contribute towards achieving the TMDL target levels for bacteria and shade, i.e., temperature, respectively. These lists were drawn from information contained in the Conservation Practices Physical Effects section of the NRCS Field Office Technical Guide.

Table 4. BMPs recommended to decrease E. coli levels (NRCS Field Office Technical Guide)

<b>Practice Name</b>	<b>NRCS Practice Code</b>
Animal Trails and Walkways	575
Channel Stabilization	584
Channel Bank Vegetation	322
Conservation Cover	327
Constructed Wetland	656
Critical Area Planting	342
Grazing Land Mechanical Treatment	548
Prescribed Grazing	528
Range Planting	550
Riparian Forest Buffer	391
Riparian Herbaceous Cover	390
Spring Development	574
Tree/Shrub Establishment	612
Use Exclusion	472
Watering Facility	614

Table 5. BMPs recommended to increase shade and decrease stream temperature (NRCS Field Office Technical Guide)

<b>Practice Name</b>	<b>NRCS Practice Code</b>
Channel Stabilization	584
Channel Bank Vegetation	322
Critical Area Planting	342
Grade Stabilization Structure	410
Grassed Waterway	412
Grazing Land Mechanical Treatment	548
Prescribed Grazing	528
Range Planting	550
Riparian Forest Buffer	391
Riparian Herbaceous Cover	390
Spring Development	574
Streambank and Shoreline Protection	580
Stream Habitat Improvement and Management	395
Tree/Shrub Establishment	612
Upland Wildlife Habitat Management	645
Use Exclusion	472
Watering Facility	614

Not every BMP on these lists will be applicable on every stream segment within the subbasin. To maximize the success of an implementation project, selection of BMPs must be done on a site-specific basis and be used as part of comprehensive resource management plan.

The lists of potentially beneficial BMPs are to serve as a starting point for implementation activities in the subbasin. IDEQ recognizes that implementation strategies for TMDLs may need to be modified if monitoring shows that TMDL goals are not being met or significant progress is not being made toward achieving the goals.

The implementation strategies for addressing temperature TMDLs that are discussed in the 2002 Medicine Lodge Creek subbasin TMDL implementation remain appropriate treatment recommendations. The change from a numeric temperature criterion to the PNV approach did not change implementation strategies for achieving the TMDL

targets.

### **Priorities**

Use of the PNV method provides a way to help prioritize implementation efforts in the subbasin. In order to provide the greatest benefit to the resource, implementation efforts should be focused on stream segments which lack the greatest amount of shade. Figure 2 shows the shade deficits for streams in the Medicine Lodge Creek subbasin. Shade deficits are calculated by subtracting the amount of shade which now exists from the target shade level for a given stream segment. As an example of how to interpret the shade deficit map, consider a stream segment that is identified as lacking 40% shade. This indicates that segment currently has 60% of the target amount of shade and so needs an additional 40% to achieve the TMDL target for that segment. It is recommended that stream segments lacking greater than 20% shade be the top priority for BMP implementation projects.

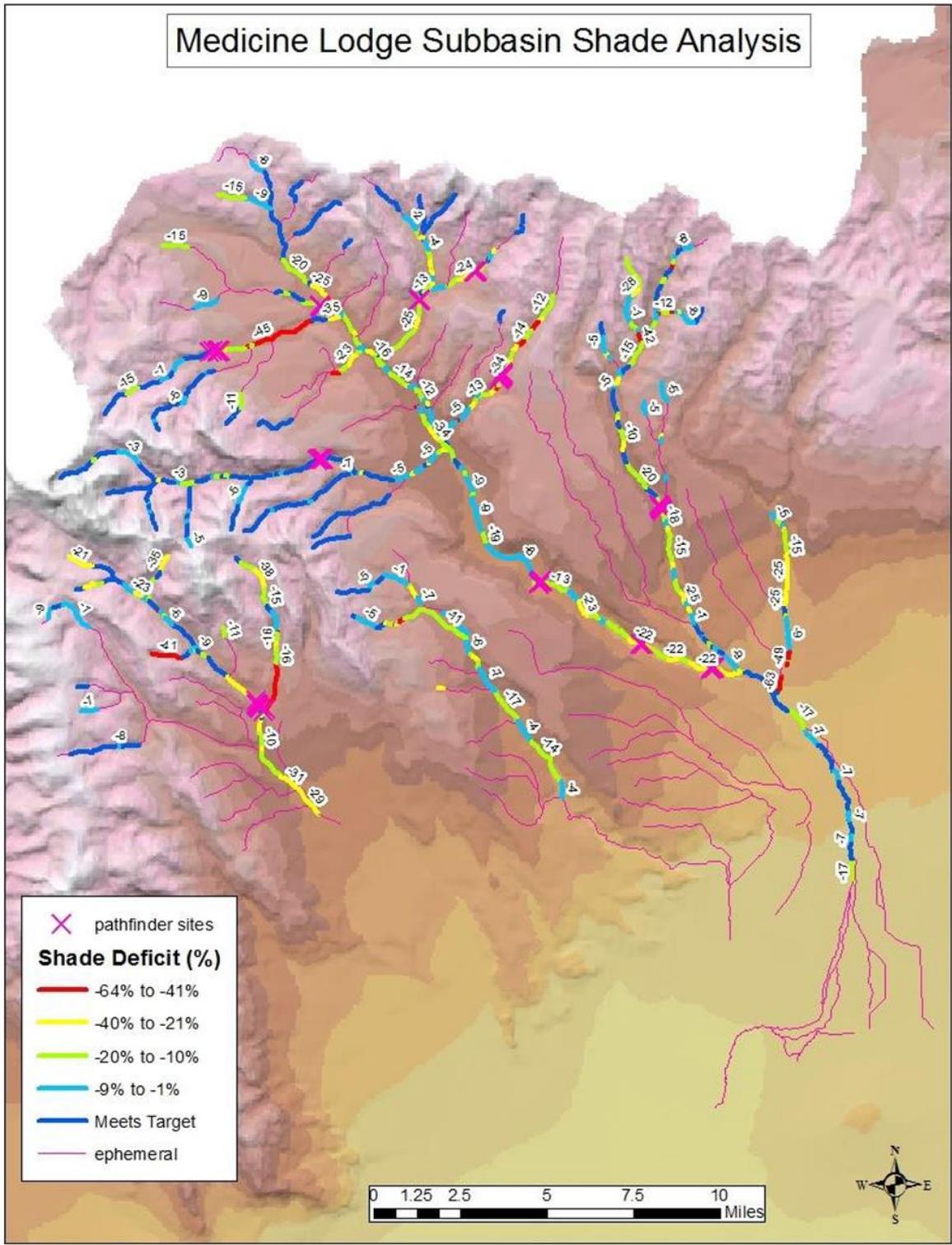


Figure 2. Lack of shade (difference between existing and target) for the Medicine Creek Lodge subbasin. (IDEQ, 2016)

## Funding

Financial and technical assistance for installation of BMPs may be needed to ensure success of this implementation plan. The Clark Soil Conservation District can assist interested landowners in actively pursuing potential funding sources to implement water quality improvements on private agricultural and grazing lands. The ISWCC and NRCS can provide technical assistance when needed. 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 Tribal entities 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 Tribal Reservations. Funds focus on projects to improve water quality and are usually related to the TMDL process.

[http://www.deq.idaho.gov/water/prog\\_issues/surface\\_water/nonpoint.cfm#management](http://www.deq.idaho.gov/water/prog_issues/surface_water/nonpoint.cfm#management)

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

**Environmental Quality Incentives Program (EQIP):** EQIP provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.

<http://www.nrcs.usda.gov/programs/eqip/>

**Regional Conservation Partnership Program (RCPP)** - RCPP promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farmland/rcpp/>

**The Agricultural Conservation Easement Program (ACEP)** – ACEP provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, NRCS helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect, and enhance enrolled wetlands.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/>

**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. <http://www.nrcs.usda.gov/programs/cta/>

**National Grazing Lands Coalition (NatGLC)** –The National Grazing Lands Coalition' promotes ecologically and economically sound management of grazing lands. Grants are available that facilitate the following: (1) demonstration of how improved soil health affects grazing lands sustainability (2) establishment of conservation partnerships, leadership and outreach, (3) education of grazing land managers, professionals, youth and the public (4) enhancement of technical capabilities, and (5) improvement in the understanding of the values and multiple services that grazing lands provide. <http://www.glci.org/>

**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 <http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index>

**Conservation Innovation Grants (CIG)** –CIG is a voluntary program to stimulate the development and adoption of innovative conservation approaches and technologies for agricultural production. <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/>

**State Revolving Loan Funds (SRF)** –These funds are administered through the IDEQ. <https://www.deq.idaho.gov/water-quality/grants-loans/water-system-construction-loans.aspx>

**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. <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/alphabetical/csp/>

**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. <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. <http://www.fws.gov/partners/pdfs/ID-needs.pdf>

### **Maintenance, Monitoring, Evaluation**

DEQ will continue to monitor the watersheds as per Idaho Code 39-3611, on a 5-year interval using BURP protocol. Additional monitoring of BMP's and the maintenance of BMP's installed will be performed by the designated agency or the agency that funded the BMP installations. The Clark Soil Conservation District follows the Natural Resource Conservation Service guidelines for BMP life expectancy and monitors BMP installations for the expected life of each practice to ensure proper maintenance of the practices. Typically, when a landowner approaches the district for BMP assistance the district evaluates the current site-specific resource concerns and collaborates with the landowner to develop an individualized plan that will conserve natural resources and serve the personal and business interests of the landowner. During the conservation planning phase, the most appropriate BMPs for each site are selected for implementation.

All BMP's will be maintained by the landowner for the life of the practice. BMP's will be monitored and evaluated upon completion of the project, during annual reviews, and throughout the life of the practice. Monitoring and evaluations will enable staff to ensure practices are maintained and to evaluate BMP effectiveness for future projects.

## References

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