

Hatwai Creek Watershed Review Implementation Plan for Agriculture

Hydrologic Unit Code 17060306

March 2020



By Idaho Soil and Water Conservation Commission and
Hatwai Creek Watershed Advisory Group

Original Plan: ISWCC (Idaho Soil and Water Conservation Commission). 2012. Hawaii Creek Watershed Total Maximum Daily Load Implementation Plan for Agriculture. Boise, ID: ISWC in cooperation with Nezperce Soil and Water Conservation District.

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Introduction

The purpose of this plan is to address the TMDL Five-Year Review for the Hatwai Creek Watershed with the goal to help restore designated beneficial uses. “Pursuant to section 39-3601et seq., Idaho Code, and IDAPA 58.01.02, Water Quality Standards, the Idaho Soil & Water Conservation Commission (SWC) is the designated agency for management of nonpoint source pollution on grazing and agricultural lands in Idaho and is therefore responsible to lead TMDL Implementation activities on grazing and agricultural lands in the State.” The objective of the plan is to outline a process of potential site-specific agricultural best management practices (BMPs) to help restore the designated beneficial uses by reducing pollutant loads in the Hatwai Creek watershed.

According to the 2019 Hatwai Creek TMDL Five-Year Review the water quality pollutants in Hatwai Creek are static to degrading, meaning that there are not substantial changes from the 2010 TMDL findings. The TMDL beneficial uses and pollutants from the TMDL are displayed in Table 1.

Table 1: Hatwai Creek beneficial uses and associated pollutants with TMDLs (DEQ 2019)

Assessment Unit Name	Assessment Unit Number	Beneficial Use	Pollutant	Numeric Criteria	Narrative Target
Hatwai Creek—1st and 2nd order	ID17060306CL067_02	Cold water aquatic life	NO ₃ +NO ₂ -N	—	0.072 mg N/L
			TP	—	0.03 mg P/L
			Temperature	19°C daily average, 22°C daily maximum	—
		Secondary contact recreation	<i>E. coli</i>	126 cfu/100 mL	—
Hatwai Creek—3rd order	ID17060306CL067_03	Cold water aquatic life	NO ₃ +NO ₂ -N	—	0.072 mg N/L
			TP	—	0.03 mg P/L
			Temperature	19°C daily average, 22°C daily maximum	—
		Salmonid spawning	Temperature	9°C daily average, 13°C daily maximum	—
Secondary contact recreation	<i>E. coli</i>	126 cfu/100 mL	—		

Notes: milligrams (mg); colony forming unit (cfu); milliliter (mL)

Background

Hatwai Creek is a third order tributary to the Clearwater River (hydrologic unit code 17060306). The Hatwai Creek subbasin is a 32-square mile watershed in Nez Perce county, Idaho. The headwaters begin in the rolling cropland of the Palouse at an elevation of approximately 2,900 feet, then flowing through a steep canyon and ranchland where it converges with the Clearwater River at an elevation of 788 feet (Figure 1).

Past Implementations

The Hatwai Creek Subbasin TMDL 5-Year Review document (2019) found, since the TMDL was developed, NPSWCD produced documents that used geographic information systems analysis to characterize Hatwai Creek:

- *Hatwai Creek Erosion Assessment Using WEPP* (2014)
<http://www.nezperceswcd.org/Portals/2/DynamicDocs/Publications//Hatwai%20Creek%20Erosion%20Assessment%20Using%20WEPP%20-%202014.pdf>
- *Hydrologic Analysis of the Hatwai Creek Watershed, Nez Perce County, Idaho: Level-1 Reconnaissance Report*
<http://www.nezperceswcd.org/Portals/2/DynamicDocs/Publications//Hatwai%20Creek%20Hydrologic%20Analysis%20-%202014.pdf>

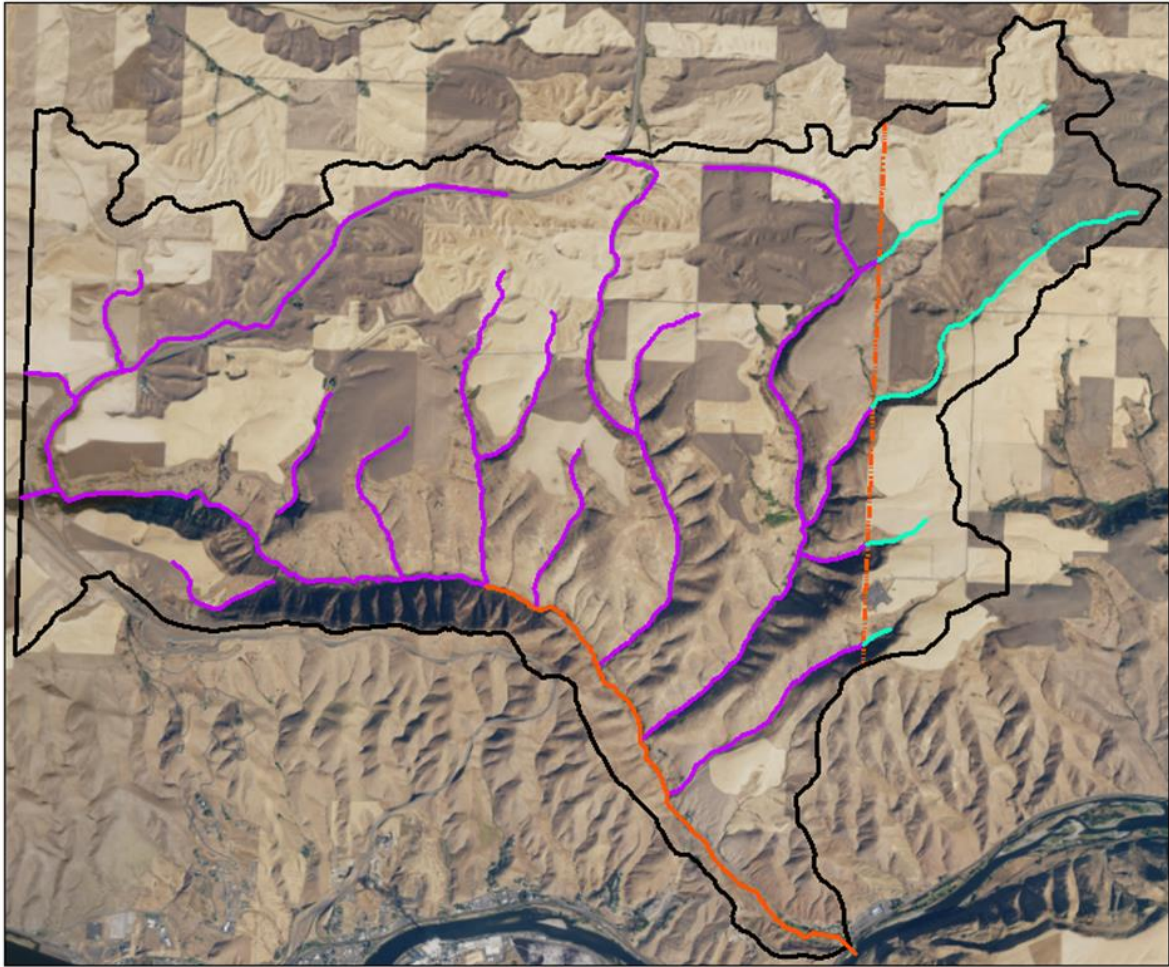
NPSWCD also developed documents focused on Hatwai Creek fisheries:

- *Hatwai Creek Fisheries and Fish Habitat Assessment* (2014)
<http://www.nezperceswcd.org/Portals/2/DynamicDocs/Publications//Hatwai%20Creek%20Fisheries%20and%20Fish%20Habitat%20Assessment%20-%202014.pdf>
- *Hatwai Creek Steelhead Habitat Restoration Plan* (2014)
<http://www.nezperceswcd.org/Portals/2/DynamicDocs/Publications//Hatwai%20Creek%20Steelhead%20Habitat%20Restoration%20Plan%20-%202014.pdf>

Resource Concerns






Escherichia coli

DEQ developed an *E. coli* TMDL to protect secondary contact recreation use in Hatwai Creek. IDAPA 58.01.02.110–160 do not list secondary contact recreation as a designated use in Hatwai Creek. In 2018, DEQ measured geometric mean concentrations in ID17060306CL067_03 in spring and summer, and in ID17060306CL067_02 in summer (DEQ 2018). Geometric means exceeded Idaho's water quality criterion in both AUs (Table 1).



Hatwai Creek Watershed Map Assessment Units and Tribal Waters

Legend

-  Hatwai Creek Watershed
-  Nez Perce Reservation Boundary
-  Nez Perce Tribal Waters
-  1st and 2nd Order - AU ID17060306CL067_02
-  3rd Order - AU ID17060306CL067_03

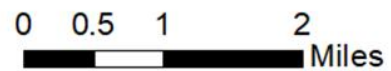
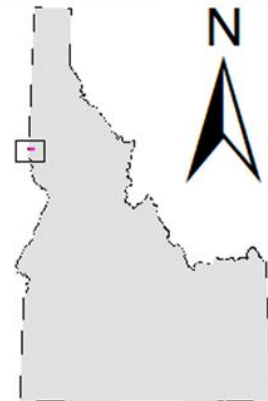


Figure 1: Hatwai Creek Watershed (DEQ 2019)

Table 1. Hatwai Creek subbasin *E. coli* load allocations based on 2018 data. (DEQ 2019)

Assessment Unit Name	Assessment Unit Number	Current Load	Load Capacity	Load Allocation ^a	Load Reduction Required ^b
		(mpn/100 mL)			
Hatwai Creek— 1st and 2nd order	ID17060306CL067_02	367.8 (July)	126	113.4	254.4 (69%)
Hatwai Creek— 3rd order	ID17060306CL067_03	645.1 (March)	126	113.4	531.7 (82%)
		227.8 (July)	126	113.4	114.4 (50%)

a. Load allocation (mpn/100 mL) = load capacity – (load capacity * 10% margin of safety)

b. Load reduction required (mpn/100 mL) = current load – load allocation; load reduction required (%) = 1-(load allocation/current load) * 100

Note: Units of most probable number (mpn)/100 mL are considered equivalent to cfu/100 mL.

Nutrients (NO₃+NO₂-N)

DEQ developed TMDLs for both nitrogen and phosphorus to protect cold water aquatic life use and prevent nuisance aquatic growths. Idaho’s water quality standards do not list cold water aquatic life as a designated use in Hatwai Creek, but DEQ applies presumed use protection for cold water aquatic life use to Hatwai Creek. DEQ presumes most waters of the state will support aquatic life use (IDAPA 58.01.02.101.01).

Current daily loads, load capacities, and load allocations were calculated using 2018 flow and nutrient data collected at the mouth. Nutrient concentrations greatly exceeded targets. Stream flows were also higher in 2018 than in 2006–2007 when the TMDL was developed because 2018 was an unusually wet year. Current loads exceeded load capacities and allocations, and substantial load reductions are needed (Table 3 and 4). (DEQ 2019)

Temperature

DEQ revised the 2010 Temperature TMDL for the Hatwai Creek Subbasin. The revised TMDL estimates loads for each AU to be consistent with Idaho’s Integrated Report. Loads were updated to reflect current stream vegetation and shade conditions. Both the 2010 TMDL and the 2019 TMDL use the most up-to-date potential natural vegetation (PNV) methodology (Shumar and de Varona 2009) to calculate loads. The resulting shade deficits for the Hatwai Creek subbasin are presented in Figure 2. Because Hatwai Creek Subbasin is divided into two assessment units the total average lack of shade is presented by assessment unit (Table 5). (DEQ 2019b)

Table 2. Hatwai Creek subbasin NO₃+NO₂-N load allocations based on 2018 data. (DEQ 2019)

Sample Date	Flow (cfs)	NO ₃ +NO ₂ -N (mg/L)	Current Load	Load Capacity	Load Allocation ^a	Load Reduction Required ^b
			(lbs/day)			(%)
3/6/18	7.68	6.45	267	2.98	2.68	99
3/20/18	8.63	7.74	360	3.35	3.02	99
4/3/18	8.83	6.57	313	3.34	3.09	99
4/17/18	12.51	6.87	463	4.85	4.36	99
5/1/18	7.05	5.72	217	2.74	2.47	99
5/15/18	5.21	5.13	144	2.02	1.82	99
5/29/18	4.59	4.65	115	1.78	1.60	99
6/12/18	3.84	4.16	86.1	1.49	1.34	98
6/26/18	2.45	4.09	54.0	0.951	0.856	98
7/10/18	1.39	3.83	28.7	0.539	0.485	98
7/24/18	1.13	4.17	25.4	0.439	0.395	98
8/7/18	0.82	3.91	17.3	0.318	0.286	98
8/21/18	0.76	3.70	15.2	0.295	0.265	98
9/4/18	0.81	3.43	15.0	0.314	0.283	98
9/18/18	0.96	3.34	17.3	0.373	0.336	98

a. Load allocation (lbs/day) = load capacity – (load capacity * 10% margin of safety)

b. Load reduction required (lbs/day) = current load – load allocation; load reduction required (%) = 1-(load allocation/current load) * 100

Note: pounds (lbs)

Table 3. Hatwai Creek subbasin TP load allocations based on 2018 data. (DEQ 2019)

Sample Date	Flow (cfs)	TP (mg/L)	Current Load	Load Capacity	Load Allocation ^a	Load Reduction Required ^b
			(lbs/day)			(%)
3/6/18	7.68	0.136	5.63	1.24	1.12	80
3/20/18	8.63	0.140	6.51	1.40	1.26	81
4/3/18	8.83	0.122	5.81	1.43	1.29	78
4/17/18	12.51	0.160	10.80	2.02	1.82	83
5/1/18	7.05	0.144	5.47	1.14	1.03	81
5/15/18	5.21	0.142	3.99	0.842	0.758	81
5/29/18	4.59	0.224	5.54	0.74	0.668	88
6/12/18	3.84	0.167	3.46	0.621	0.559	84
6/26/18	2.45	0.148	1.95	0.396	0.356	82
7/10/18	1.39	0.145	1.09	0.225	0.202	82
7/24/18	1.13	0.088	0.534	0.183	0.165	69
8/7/18	0.82	0.164	0.725	0.133	0.120	83
8/21/18	0.76	0.160	0.660	0.123	0.111	83
9/4/18	0.81	0.141	0.616	0.131	0.118	81
9/18/18	0.96	0.139	0.719	0.155	0.140	81

a. Load allocation (lbs/day) = load capacity – (load capacity * 10% margin of safety)

b. Load reduction required (lbs/day) = current load – load allocation; load reduction required (%) = 1-(load allocation/current load) * 100

Note: pound (lbs)

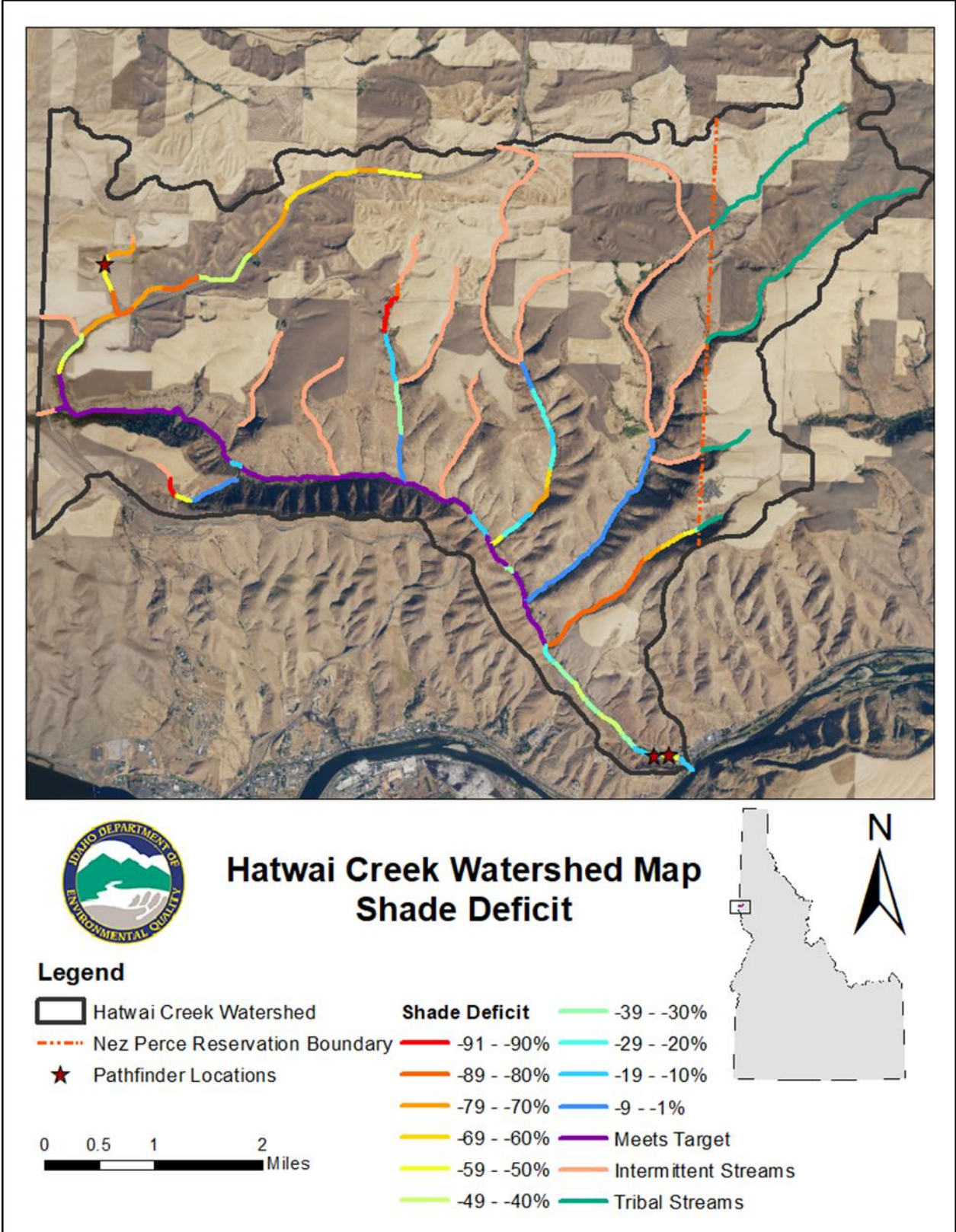


Figure 2. Lack of shade (difference between existing and target) for Hatwai Creek watershed. Lack of shade was not estimated for intermittent or tribal waters. (DEQ 2019)

Table 5. Total solar loads and average lack of shade for all waters.

Water Body	Assessment Unit Number	Total Existing Load	Total Target Load (kWh/day)	Excess Load (% Reduction)	Average Lack of Shade (%)
Hatwai Creek—3rd order	ID17060306CL067_03	120,000	95,000	28,000 (23%)	-8%

Note: Load data are rounded to two significant figures, which may present rounding errors.

The WAG recommended additional sampling. The Nezperce SWCD assisted with permissions for additional sites and DEQ sampled the sites in 2019. Table 6 displays the additional data and insights into water quality within the Hatwai Creek watershed. The conclusions from the data indicate that cattle are the most probable source of the fecal coliform contamination in Hatwai Creek. Reducing cropland nitrogen inputs will likely have the largest impact on the nitrate concentrations. Increasing riparian shade will help reduce stream temperatures in Hatwai Creek. (DEQ 2019c)

Table 6: Water chemistry results from May 20 and 21, 2019 (DEQ 2019c)

Location	Description	Date	Flow (cfs)	<i>E. coli</i> (mpn/100 mL)	Human Gut Bacterial DNA	Cow Gut Bacterial DNA	NO ₃ +NO ₂ -N (mg/L)	TP (mg/L)	δ ¹⁵ N of NO ₃ +NO ₂ (per mil)	δ ¹⁸ O of NO ₃ +NO ₂ (per mil)
HC67_03	3rd-order stream near mouth	5-20	7.06	816	Not detected	Detected	5.66	0.241	6.91	-1.59
HCSP	Spring near mouth	5-20	—	204.6	—	—	6.22	0.148	7.14	-1.79
HC67_03d	3rd-order stream segment	5-20	5.32	727	—	—	5.7	0.26	6.73	-1.76
HC67_02a	2nd-order stream—canyon	5-21	1.76	10.8	—	—	6.51	0.136	7.04	-1.85
HC67_02	1st-order stream—Leon Road	5-20	0.2	53.8	—	—	8.96	0.144	7.97	-2.81
HC67_02c	1st order McGuire Creek	5-20	0.42	57.6	—	—	12.7	0.256	3.84	-3.21

Notes: Deoxyribonucleic acid (DNA), — indicates a sample was not collected.

Treatment

The Idaho Soil and Water Conservation Commission and the Nezperce SWCD are named in the 2019 TMDL and monitoring report as the designated agencies responsible for identifying

treatments to address the pollutants within the Hatwai Creek watershed. The Hatwai Creek watershed is 63% cropland with about 5% of the watershed comprised of other agricultural lands. Treatment units are the same as the original implementation plan designated in 2011. Table 7 identifies Best Management Practices (BMP's) that are recommended.

Cropland (Upland)

Based on the 2019 TMDL for Hatwai Creek, excessive nutrients in Hatwai Creek is the primary pollutant attributed to cropland agriculture, with a 98 to 99% reduction required. Figure 3 shows that the 12,582 acres of cropland is primarily in the upland portion of Hatwai Creek.

Recommended treatments are to apply nutrients at a time and rate that maximizes plant uptake, to achieve reduced nutrient loading; reduce sediment attached phosphorus delivery by conservation tillage system. Reduce or eliminate gully erosion by installing water and sediment control structures and minimize transport of phosphorus bound to soil particles. Precision nutrient management and the use of nitrogen inhibitors/stabilizers may also help reduce nutrient loading. The Nezperce SWCD has offered to assist with some of the barriers that exist with the implementation of precision nutrient management.

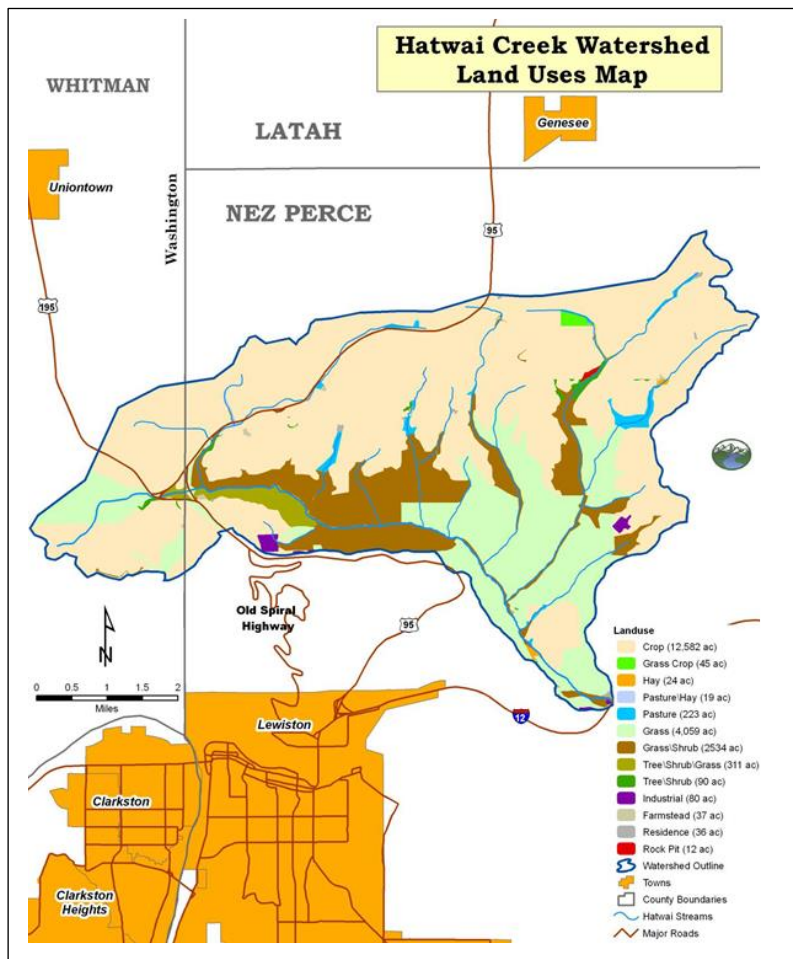


Figure 3: Hatwai Land Use Map

Riparian Zones

The 2018 and 2019 data indicate that nutrient and temperature loading may be able to be addressed in riparian zones. Figure 2 characterizes the priority needs for increasing shade in riparian zones. Channel erosion can deliver nutrients due to nutrient attachment to soil particles. Stabilizing the stream banks would assist with reducing streambank erosion and will increase shade that can aid in lowering stream temperatures. Riparian plantings will be key to increasing bank stabilization and increasing shade.

Range and Grazing Lands

The 2018 and 2019 data for the Hatwai Creek Watershed shows high E. coli concentrations due to cattle and high stream temperatures. Reductions to both stream temperatures and E. coli can be made by excluding cattle from the riparian zone during high runoff times. Riparian plantings will further stabilize banks and increase shade. Developing off-stream watering facilities and installing fence will make cattle exclusion from the riparian zone possible. Figure 2 and 3 in combination show the priority areas for range/grazing lands. The grazing and range lands are primarily lower in the watershed and often intersect with the riparian zones.

In March 2020, an interested landowner called. The landowner was interested in weed control measures including biological controls, and then range seedings for wildlife to replace the yellow star thistle populations after weed control. These practices would assist with controlling sediment losses.

Table 7: Recommended BMP's

Nutrient Management (includes nutrient timing, nitrogen inhibitors/stabilizers, precision nutrient management)
Conservation Tillage (includes no-till, mulch till)
Water and Sediment Control Basins (includes underground outlet)
Riparian Plantings
Streambank Stabilization
Exclusion Fencing
Watering Facilities (includes pipeline)
Spring Developments
Weed Control followed by Range Seedings (can include pollinator plantings)

Funding

Financial and technical assistance for installation of BMPs may be needed to ensure success of this implementation plan. The Nezperce Soil and Water Conservation Districts can assist interested landowners in actively pursuing potential funding sources to implement water quality improvements on private agricultural and grazing lands. The SWC 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

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>

Pacific Coast Salmon Recovery Fund (PCSRF): PCSRF is a cost-share program administered through Office of Species Conservation (OSC). The program targets the restoration of anadromous fish habitat.

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>

Idaho Transportation Department – Idaho transportation department has partially funded projects in the basins as part of their wetland mitigation program. <http://itd.idaho.gov/funding/>

Ecotrust – Ecotrust has provided matching funds on projects in the past that focus on restoration. <https://ecotrust.org/our-programs/water/>

Idaho Department of Lands – Forestry & Fire Grants – Includes the Landscape Scale Restoration Grants and the Western Fire Managers & Hazard Fuels Reduction Grants. <https://www.idl.idaho.gov/grants/index.html>

Maintenance, Monitoring, Evaluation

DEQ will continue to monitor the watersheds as per Idaho Code 39-3611, using BURP protocol. The designated management agencies or the agency that funded the BMP installation will perform additional monitoring of BMP's and the maintenance of installed BMP's. The Clearwater and Idaho Soil and Water Conservation District's monitor BMP installations to ensure proper maintenance of the practices. Typically, when a volunteer approaches the district for BMP assistance the district evaluates the current site-specific resource concerns. Individual conservation planning with willing landowners will determine the most appropriate BMPs to install on a case-by-case basis.

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