

1. Peterson Creek Watershed Summary

Description and Land Use

Table xxx: Peterson Creek Watershed Overview

Watershed Size	19,914 acres/31.1 sq miles/80.6 sq km
Elevation Range	3,412 Feet [4,587-7,999]
Stream Miles	39.9
Land Ownership	Private: 36% /State: 7%/Federal: 30%
Road Miles	Local Road/City Street = 27.1 Four Wheel Drive Trail = 10.1 Highway= .5 Driveway/Service Road= 5.4 Total = 43.1

Source: Montana GIS Portal Data Layers

Peterson Creek originates in the foothills of the Boulder Mountains and flows for more than twelve miles before joining the Clark Fork River. The Peterson Creek watershed comprises about thirty square miles (Table xxx) and includes the tributaries of Jack Creek, Spring Creek and Burnt Hollow Creek. The watershed contains mostly private land and is used for irrigated hay production, livestock grazing and timber harvest (MFWP, 2009).

2. Impairments

Table xxx: Listed and Suspected Impairments for Peterson Creek

2010			
Impairment	Reach (River Mile)	Pollutant	Impaired Uses
Copper	12.9-6.8	Metals	Aquatic Life, Cold Water Fishery
Iron	12.9-6.8	Metals	Aquatic Life, Cold Water Fishery
Lead	12.9-6.8	Metals	Aquatic Life, Cold Water Fishery
Sedimentation/ Siltation	12.9-6.8	Sediment	Aquatic Life, Cold Water Fishery
Temperature (water)	6.8-0.0	Temperature	Aquatic Life, Cold Water Fishery*
Sedimentation/ Siltation	6.8-0.0	Sediment	Aquatic Life, Cold Water Fishery
Lead	6.8-0.0	Metals	Aquatic Life, Cold Water Fishery

2008						
Impairment	Reach (River Mile)	Pollutant	Impaired Uses			
Copper	12.9-6.8	Metals	Aquatic Life, Cold Water Fishery			
Nitrogen (Total)	12.9-6.8	Nutrients	Aquatic Life, Cold Water Fishery, Primary Contact Recreation			
Phosphorus (Total)	12.9-6.8	Nutrients	Aquatic Life, Cold Water Fishery, Primary Contact Recreation			
Total Kjeldahl Nitrogen (TKN)	12.9-6.8	Nutrients	Aquatic Life, Cold Water Fishery, Primary Contact Recreation			
Sedimentation	12.9-6.8	Sediment	Aquatic Life, Cold Water Fishery			
Low Flow Alterations	12.9-6.8	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery, Primary Contact Recreation			
Alteration in stream-side or	12.9-6.8	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery			
Temperature (water)	6.8-0.0	Temperature	Aquatic Life, Cold Water Fishery*			
Low Flow Alterations	6.8-0.0	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery, Primary Contact Recreation			
Alteration in stream-side or littoral	6.8-0.0	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery*			
Physical substrate habitat alterations	6.8-0.0	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery*			
Temperature Measurements (Suspected Impairment)						
MFWP 2008	RM*	Start Date	End Date	Max T (°C)	Days>15°C	Days>20°C
	0.2	7/11	10/13	22.6	54	30
	7.5	7/11	10/13	19.9	46	0

*River Mile

Source: MDEQ, 2010; MFWP 2009

Metals

The area around the upper section of Peterson Creek contains several abandoned mine which have contributed to soil and surface water contamination (MDEQ, 2010). The main pollutants are copper, iron and lead, and have been found at levels high enough to warrant TMDL development (Table xxx,). These pollutants pose health issues for humans, wildlife and fish in the area. Levels on the lower section are also elevated levels, but metals in this section are most likely diluted contaminants from upper Peterson Creek (MDEQ, 2010).

Irrigation and Dewatering

Chronic dewatering results from agricultural irrigation within the basin and has many implications for both water quantity and quality. Over 200 water diversions exist on Peterson Creek and its tributaries (MDNRC, 2011). Low flows result in unsuitable habitat for fish and macroinvertebrates due to increased temperatures and algal growth (Table xxx). In addition, irrigation structures can create barriers which impede fish passage and migration (MFWP, 2010).

Sediment/Siltation

Impairments from sediment and siltation often occur from over-grazing in the riparian areas throughout the Peterson Creek drainage. Because livestock frequently have access to natural water sources in this area, riparian vegetation can be sparse. This, combined with livestock traffic, leads to accelerated bank erosion (MFWP, 2009). Sedimentation beyond that which is naturally occurring, damages fish and macroinvertebrate habitat by filling in redds, reducing available habitat (such as riffles and pools), and by altering stream channels (MDEQ, 2011). Sediment levels in Peterson Creek exceed those defined by Montana DEQ TMDL standards.

Temperature

Peterson Creek is used extensively for irrigation, and the lower ten miles contain many diversions (MFWP, 2009). Thermal impairments are attributed to agricultural dewatering, and have been documented throughout the basin (Table xxx). Temperatures below 16°C are optimum for westslope cutthroat trout growth, while temperatures below

20 °C are critical for their survival (Kirk, 2010). High temperatures also encourage algae growth and reduce dissolved oxygen content, which can be detrimental to fish health.

3. Native/Sport Fishery

Table xxx: Fish Distribution in the Peterson Creek Watershed

Waterbody	Begin RM*	End RM*	Species	Updated
Peterson Creek	0.8	3.2	Brown Trout	11/18/2009
Peterson Creek	0.0	0.8	Brown Trout	11/18/2009
Peterson Creek	0.2	12.9	Westslope Cutthroat Trout	1/5/2005
Peterson Creek	5.9	10.9	Brook Trout	1/5/2005
Peterson Creek	0.0	5.9	Brook Trout	1/5/2005
Peterson Creek	0.0	5.9	Slimy Sculpin	1/5/2005
Peterson Creek	0.0	8.0	Longnose Sucker	8/28/2009
Jack Creek	0.0	3.3	Westslope Cutthroat Trout	7/9/2009
Spring Creek	1.4	1.5	Brook Trout	9/14/2009
Spring Creek	0.0	1.5	Westslope Cutthroat Trout	7/9/2009

Source: MFWP, 2010

Current Condition

Montana FWP sampled Peterson Creek in five different sites in 2008 (River Mile 0.2, 1.1, 4.9, 7.9, 11.5). Trout populations in the lower reaches were sparse and mainly composed of brown trout. Brook and westslope cutthroat trout were present in the middle reaches, and westslope cutthroat trout became the main trout species in the upper reaches. Irrigation-related obstacles to fish passage also exist throughout the drainage (MFWP, 2009).

Fishery Potential

Table xxx: Tributary Rating Summary for Peterson Creek (Unranked)

Stream	Reach(RM)	Trout Species	Impairments
Peterson Creek	All: 0.0-12.8	Brook, Brown and Westslope Cutthroat	Low summer flows due to irrigation with complete dewatering at certain reaches, livestock grazing in riparian areas; high temperatures; competition to westslope cutthroat from brook/brown trout; bank erosion/siltation
Current Recruitment/Restoration Fishery Value			Protection/Enhancement Value
Low			Medium
Current Tributary/Replacement Fishery Value			Protection/Enhancement Value
Low			High
Current Native Fishery Value (westslope cutthroat)			Protection/Enhancement Value
Medium			High

Source: MFWP, 2010

While Peterson Creek experiences several impairments, protection and enhancement possibilities for a viable trout fishery exist on several levels (Table xxx). Montana FWP has shown an interest in managing (in collaboration with state agencies and other organizations) Peterson Creek as recreational fishery in the agency’s Final Tributary Rating Summary (2010). Improved management practices can increase the fishery viability by addressing documented impairments (Table xxx) with appropriate restoration projects.

4. Assessments

Peterson Creek’s habitat and water quality status have been assessed several times in the last 10 years (Table xxx). Assessments have included fish habitat and fishery potential, temperature, noxious weeds, stream flow, and stream channel and riparian habitat status.

Table xxx: Peterson Creek Assessments

Type	Agency	Year	Area
Riparian, Geomorphology/Flow Assessment	WRC	2011	Throughout Peterson Creek
Tributary Prioritization /Rating Summary	MFWP	2010	All of Peterson Creek
Fish Population/Riparian Habitat	MFWP	2009	River Mile 0.2, 1.1, 4.9, 7.9,11.5
Upper Clark Fork Tributaries TMDL	MDEQ	2010	All of Peterson Creek

WRC and FWP Riparian Assessment

The WRC (2011) conducted NRCS riparian assessments on 9.3 miles of Peterson Creek in 2010 and 2011. Of the 19 assessed reaches, the WRC classified 16 as “at-risk” and three as “sustainable”. Montana FWP (2009) also assessed sections of Peterson Creek (Table xxx) and found that riparian vegetation was often sparse and disturbance-induced vegetation was common. Bank erosion was also evident in several areas.

5.Restoration

Needs

- Continued temperature monitoring
- Work with landowners to address stream flow and dewatering issues
- Address fish passage barriers
- Limit livestock access to stream and riparian areas
- Continue to monitor metals loading
- Prevent further contamination through bank stabilization and riparian planting

Activities: Projects being undertaken by the WRC

6.Watershed Map

7.Bibliography

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