

1. Hoover Creek Watershed Summary

Description and Land Use

Hoover Creek originates in the mountains of the Garnet Range and flows for approximately 11.4 miles before reaching the Clark Fork River (MFWP, 2009). While the creek is considered to be a tributary to the Clark Fork, its actual connectivity is perhaps only possible during periods of high runoff (MFWP, 2009).

Hoover Creek drains an area of over thirty square miles—the majority of which is private (Table xxx). Timber harvest (past and recent) along with livestock grazing constitute the main land uses in the basin

Table xxx: Hoover Creek Watershed Overview

Watershed Size	19,801 acres/30.9 sq miles/80.2 sq km
Elevation Range	3,262 feet [4,081-7,343]
Stream Miles	37.7
Land Ownership	Private: 86% /State: 9%/Federal: 5%
Road Miles	Driveway/Service Road/Access Ramp = 1.0 Local Road/City Street = 18.5 Four Wheel Drive Trail = 0.4 Highway = 0.2 Total = 20.1

Source: Montana GIS Portal Data Layers

2. Impairments

Temperature

Thermal impairments are often attributed to agricultural dewatering and lack of stream cover, and have been documented at one site on Hoover Creek (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.

Table xxx: Temperature Measurements for Hoover Creek

FWP 2008	RM*	Start Date	End Date	Max T (°C)	Days>15°C	Days>20°C
	1.9	7/11	10/13	22.3	62	24

*River Mile

Source: MFWP, 2009

Sediment/Siltation

Impairments from sediment and siltation most likely occur from over-grazing in riparian areas and from timber harvest near Hoover Creek. Sedimentation beyond that which is naturally occurring, damages fish and macroinvertebrate habitat by filling in redds, reducing available habitat (such as riffles and pools), blocking sunlight and by altering stream channels (Kusnierz and Welch, 2011). Sediment levels in Hoover Creek exceed those defined by Montana DEQ TMDL standards.

Nutrients

Lower Hoover Creek exceeded Montana DEQ TMDL standards for nitrogen (nitrites/nitrates) in 2008 (Table xxx). Nitrites and nitrates mainly come from agricultural and urban runoff, and from in-stream livestock access. According to KirK (2008), excessive nutrient levels can lead to undesirable algae growth which in turn can cause:

- Unpleasant tastes and odors in drinking water
- Corrosion and blockages of irrigation equipment
- Reduced dissolved oxygen
- Altered ecological communities, especially macroinvertebrates
- Degradation of aesthetic value

Irrigation and Dewatering

Chronic dewatering often results from agricultural irrigation and has many implications for both water quantity and quality. Over 100 water rights exist in the Hoover Creek basin (MDNRC, 2011) and low flows have been noted by MFWP (2009). 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).

Table xxx: TMDL Impairments for Hoover Creek

2010			
Reach	Impairment	Pollutant	Impaired Beneficial Use
River Mile 11.4 to 6.3	Sedimentation/ Siltation	Sediment	Aquatic Life, Cold Water Fishery, Primary Contact Recreation

River Mile 6.3 - 0.0	Sedimentation/ Siltation	Sediment	Aquatic Life, Cold Water Fishery
2008			
Reach	Impairment	Pollutant	Impaired Beneficial Use
River Mile 11.4 - 6.3	Turbidity	Sediment	Primary Contact Recreation*
	Sedimentation / Siltation	Sediment	Primary Contact Recreation*
River Mile 6.3 - 0.0	Nitrogen (Total)	Nutrients	Aquatic Life, Cold Water Fishery, Primary Contact Recreation*
	Low Flow Alterations	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery, Primary Contact Recreation*
	Physical substrate habitat alterations	<i>Not a Pollutant</i>	Aquatic Life, Cold Water Fishery, Primary Contact Recreation*

Source: MDEQ, 2010

3. Native/Sport Fishery

Current Condition

Montana FWP electrofished four sections of Hoover Creek in 2008 (RM 2.4, 5.6, 7.0, and 9.7) and also conducted riparian assessments at each site. During the fish sampling, MFWP found mainly brook trout at the lower two sites and began to see native westslope cutthroat trout at RM 7.0 Westslope cutthroat trout were the main trout species at RM 9.7, and brook trout were present but much lower in density. As a side note, many of the brook trout sampled at the lower two sites exhibited cranial deformities which may be the result of whirling disease. The true cause was never actually confirmed (MFWP, 2009).

Montana FWP also completed riparian assessments of each site during the sampling. The assessments found that fish habitat at three of the four sites was “fair” (RM 7.0 was “good”) and cited a lack of woody vegetation and debris as well as fine sediment and fish passage barriers in the form of culverts and Miller Lake Dam. The riparian areas near the sites showed evidence of moderate grazing pressure and some erosion from timber harvest. Noxious weeds and other disturbance-induced plants were abundant and in some areas prevented native plant communities from regenerating (MFWP, 2009).

Table xxx: Fish Distribution in Hoover Creek

Waterbody	Begin RM*	End RM*	Species	Updated
Hoover Creek	5.9	11.4	Westslope Cutthroat Trout	11/18/2009
Hoover Creek	0.0	0.5	Redside Shiner	8/28/2009
Hoover Creek	6.2	11.4	Rainbow Trout	2/23/2009
Hoover Creek	0.0	0.5	Mountain Whitefish	8/28/2009
Hoover Creek	0.0	5.8	Longnose Sucker	2/23/2009
Hoover Creek	0.0	1.0	Brown Trout	8/28/2009
Hoover Creek	8.9	10.3	Brook Trout	2/20/2009
Hoover Creek	0.0	8.9	Brook Trout	2/20/2009

Source: MFWP, 2010

Fishery Potential

While Hoover Creek experiences some impairments, protection and enhancement possibilities for a viable trout fishery exist on several levels (Table xxx). Montana FWP has shown an interest in managing the creek (in collaboration with state agencies and other organizations) as a recreational fishery 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.

Table xxx: Tributary Rating Summary for Lower Hoover Creek (Unranked)

Stream	Reach(RM)	Trout Species	Impairments
Hoover Creek	Lower: 0.0-6.0	Brook and Brown	Fish passage barriers; livestock grazing; timber harvest; sedimentation; lack of large woody debris
Current Recruitment/Restoration Fishery Value			Protection/Enhancement Value
Low			Low
Current Tributary/Replacement Fishery Value			Protection/Enhancement Value
Low			Low
Current Native Fishery Value (westslope cutthroat)			Protection/Enhancement Value
Low			Low

Source: MFWP, 2010

Table xxx: Tributary Rating Summary for Upper Hoover Creek (Unranked)

Stream	Reach(RM)	Trout Species	Impairments
Hoover Creek	Upper: 6.0-11.4	Brook and Westslope Cutthroat	Fish passage barriers; livestock grazing; timber harvest; sedimentation; lack of large woody debris; competition from brook trout
Current Recruitment/Restoration Fishery Value			Protection/Enhancement Value
Low			Low
Current Tributary/Replacement Fishery Value			Protection/Enhancement Value
Low			Low
Current Native Fishery Value (westslope cutthroat)			Protection/Enhancement Value
Low			Low

Source: MFWP, 2010

4. Assessments

Hoover Creek and its riparian areas have been monitored by various agencies in recent years (Table xxx). Assessments have included fish habitat and fishery potential, noxious weeds, and stream channel and riparian habitat status.

Table xxx: Hoover Creek Assessments

Type	Agency	Year	Area
Tributary Prioritization /Rating Summary	MFWP	2010	River Mile 0.0-11.4
Fish Population/Riparian Habitat	MFWP	2009	River Mile 2.4, 5.6, 7.0, and 9.7
Upper Clark Fork Tributaries TMDL	MDEQ	2010	River Mile 0.0-11.4

5. Restoration

Needs

- Address fish passage barriers by working with landowners to clean or modify instream obstacles
- Monitor and treat noxious weed problems
- Address riparian vegetation issues with riparian plantings and by limiting livestock access to riparian areas and the stream
- Address sedimentation and turbidity issues with appropriate practices such as those suggested above

Activities: Projects undertaken by the WRC

6. Watershed Map

7. Bibliography

Bureau of Land Management, Montana State Office. Montana Surface Management Ownership (poly)[vector digital data]. 2007.

Fischer, Jessie. Hoover Creek Watershed Map. 1:100,000. [Printed/Computer Maps]. Fischer Geospatial Enterprises, LLC. Missoula, Montana. 2011.

Kirk Environmental and Natural Resources, Inc. *Cottonwood Creek Flow Monitoring and Fish Barrier Study, Flow Monitoring and Water Rights Report*. Watershed Restoration Coalition. Deer Lodge, Montana. March 5, 2010.

Kusnierz, Paul and Welch, Andy. *The Montana Department of Environmental Quality Sediment Assessment Method: Considerations, Physical and Biological Parameters, and Decision Making*. Montana Department of Environmental Quality. June, 2011

Montana Bureau of Mines and Geology (MBMG). Montana Abandoned and Inactive Mines Database [vector digital data]. Montana State Library. Helena, Montana. January 9, 2006

Montana Department of Environmental Quality. *Upper Clark Fork River Tributaries Sediment, Metals, and Temperature TMDLs and Framework for Water Quality Restoration*. March 4, 2010

Montana Department of Natural Resources and Conservation Water Resources Division. Montana Water Rights [vector digital data]. Montana State Library. Helena, Montana. July 11, 2011

Montana Fish, Wildlife & Parks. Montana Fish Distribution – Streams[vector digital data]. Montana Fish, Wildlife & Parks. Helena, Montana. May 17, 2010.

Montana Fish Wildlife and Parks. *Rating Summaries for the Prioritization of Tributaries of the Upper Clark Fork River Basin for Fishery Enhancement Draft Final*. May, 2010.

Montana Fish Wildlife and Parks. *An Assessment of Fish Populations and Riparian Habitat in Tributaries of the Upper Clark Fork River Basin (Phase II)*. March, 2009

Montana Fish, Wildlife & Parks. River Mile Locations (Tenth Mile Intervals) [vector digital data]. January 30, 2008.

Montana Natural Resources Conservation Service State Office. (6th-code) Hydrologic Units Montana Subwatershed [vector digital data]. Montana Natural Resources Conservation Service. Bozeman, Montana. 2007

U.S. Census Bureau Geography Division. Montana Roads from TIGER/Line Files (Redistricting Census 2000)[vector digital data. Montana State Library. Helena, Montana. 2001.

U.S. Department of Commerce U.S. Census Bureau, Geography Division. Montana TIGER/Line Files, UA Census 2000 [vector digital data]. Montana State Library. Helena, Montana. 2002.

U.S. Geological Survey. National Elevation Dataset for Montana [raster digital data]. Montana State Library. Helena, MT. April 1, 2002.