

## 1. Tin Cup Joe Creek Watershed Summary

### Description and Land Use

**Table xxx: Tin Cup Joe Creek Watershed Overview**

<b>Watershed Size</b>	14,695 acres/24.6 sq miles/63.8 sq km
<b>Elevation Range</b>	5,328 Feet [4,560-9888]
<b>Stream Miles</b>	36.2
<b>Land Ownership</b>	Private: 5%/State: 55%/Federal: 40%
<b>Road Miles</b>	Local Road/City Street = 24.9 Four Wheel Drive Trail = 12.6 Driveway/Service Road/Alley= .5 Total = 38.0

Source: Montana GIS Portal Data Layers

Tin Cup Joe Creek flows from the Flint Creek Range and travels for almost 15 miles before joining the Clark Fork River. The basin encompasses close to 25 square miles and is divided mainly between state and federal entities (Table xxx). Timber harvest, grazing and irrigated hay are the main land uses within the watershed, and a few abandoned mines are present.

## 2. Impairments

**Table xxx: Listed and Suspected Impairments for Tin Cup Joe Creek**

2010						
Impairment	Reach (River Mile)	Pollutant	Impaired Beneficial Use			
Sedimentation/ Siltation	0.0-14.7	Sediment	Aquatic Life, Cold Water Fishery			
2008						
Impairment	Reach (River Mile)	Pollutant	Impaired Beneficial Use			
Low Flow Alterations	0.0-14.7	<i>Not a Pollutant</i>	Agriculture			
Temperature Measurements (Suspected Impairment)						
PIBO	RM*	Start Date	End Date	Max T (°C)	Days>12°C	Days>18°C
2008	8.7	7/15	8/31	12.2	1	0
2003	8.7	7/15	8/31	14.4	37	0

\*River Mile

Source: MDEQ, 2010; PIBO/USFS 2010

### *Sediment/Siltation*

Impairments from sediment and siltation often occur from road, bank and upland erosion throughout the Tin Cup Joe Creek drainage (MDEQ, 2010). Because livestock frequently have access to natural water sources in this area, riparian vegetation can be sparse. This, combined with livestock traffic, also leads to accelerated bank erosion (MDEQ, 2010). 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, 2010). Sediment levels in Tin Cup Joe Creek exceed those defined by Montana DEQ TMDL standards. The creek's sediment TMDL is also the only evaluated stream TMDL to contain a Waste Load Allocation (WLA) due to two large point sources in the basin: the Montana State Prison Ranch and the Sun Mountain Lumber Company (MDEQ, 2010).

### *Irrigation and Dewatering*

Dewatering results from agricultural irrigation within the basin and has many implications for both water quantity and quality. Over 200 irrigation diversions exist in the Tin Cup Joe basin (MDNRC, 2011) and lower sections of Tin Cup Joe Creek suffer from chronic low flows (MFWP, 2003). Low water levels 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).

### *Temperature*

Thermal impairments are often attributed to agricultural dewatering, and have been documented on Tin Cup Joe Creek. Temperatures on some reaches of the creek have often climbed above 15 °C, and sometimes exceed 20 °C (MFWP, 2008). Concerning fishery health and fish survival, 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

Tin Cup Joe Creek has been assessed by Montana FWP for inclusion on the list of priority streams (MFWP, 2010). However, a detailed assessment summary and priority listing are pending publication at this time.

### 4. Assessments

Tin Cup Joe Creek's habitat and water quality status have been assessed several times in the last several 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: Tin Cup Joe Creek Assessments**

Type	Agency	Year	Area
Upper Clark Fork Tributaries TMDL	MDEQ	2010	River Mile 0.0- 14.7
PIBO Stream s and Riparian Areas	USFS	2010	River Mile 8.7
Tributary Prioritization /Rating Summary	MFWP	2010	Assessed, Priority Pending
FWP Dewatering Concern Areas	MFWP	2003	River Mile 0.0-5.2

### 5. Restoration

#### Needs

- Work with landowners to address dewatering issues
- Continue to monitor stream temperatures in the basin, preferably in more than one area
- Address sediment loading by restricting livestock access to streams and riparian areas, conducting riparian plantings, and monitoring road and bank erosion
- Continue to monitor sediment loading from the Sun Mountain Lumber Company and the Montana State Prison Ranch

*Activities: Projects being 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. Tin Cup Joe Creek Watershed maps 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

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 I)*. 2008.

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. Forest Service. PACFISH/INFISH Biological Opinion temperature and invasive weed datasets. U.S. Department of Agriculture. 2010

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.