Montana DEQ - Water Quality Standards Attainment Record

Reporting Cycle: 2020 **Assessment Record:** MT41Q002_010.pdf **Status:** Unassigned

ASSESSMENT UNIT INFORMATION

Reporting Cycle:	2020
Assessment Unit:	MT41Q002_010
Waterbody Name:	Lake Creek
Location Description:	LAKE CREEK, headwaters to mouth (Benton Lake)

Water Type:	Size (Miles/Acres)	Use Class:
RIVER	19.03 MILES	B-3

Hydrologic Unit Code:	10030102
HUC Name:	Upper Missouri-Dearborn
Watershed:	Upper Missouri
Basin:	Upper Missouri
TMDL Planning Area:	Benton Lake
Ecoregion:	Northwestern Glaciated Plains
County:	Cascade County, Chouteau County, Teton County
Lat/Long AU Start (U/S):	47.76318 / -111.610867
Lat/Long AU End (D/S):	47.693927 / -111.375038

MONITORING INFORMATION

Date Assessment Started:	10/02/2000
Assessed By:	Phillips, Perri

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CITATIONS

Citation	Location	Biological Data	Habitat Data	Chemistry Data
U.S. Fish and Wildlife Service (1999), Water Temperature, pH, Specific Conductance Data	Assessment Record			quantitative physical data
Montana Department of Fish, Wildlife, and Parks (2002), Montana Rivers Information System (MRIS): Montana Fisheries Information System (MFISH) - http://maps2.nris.mt.gov/scripts/esrimap.dll?name=MFISH&Cmd=INST	Assessment Record	algae; fish; macroinvertebrates; wildlife	Land use; photo points; riparian &/or instream surveys & physical features	benthic sediment data; common ions, pH, conductivity, miscellaneous; quantitative physical data
Bollman, Wease (2003), Biological Assessment of a Site on Lake Creek: Teton County, Montana, September 4, 2003	WQPB Ebrary	macroinvertebrates		
(2003), DEQ Field Assessment Form	Assessment Record	algae; chlorophyll; fish; macroinvertebrates; wildlife	Land use; photo points; riparian &/or instream surveys & physical features	Rosgen type; benthic sediment data; common ions, pH, conductivity, miscellaneous; major nutrients; metals; quantitative physical data
Bahls, Loren L. (2004), Biological Integrity of Lake Creek (Benton Lake Watershed) Based on the Structure and Composition of the Benthic Algae Community, DEQ Contract No. 200012-10	WQPB Ebrary	algae		
Montana State Library Natural Resouce Information System ; Montana State University (2006), Montana View at http://montanaview.org/	DEQ PPA Data Archive	chlorophyll; fecal coliforms; macroinvertebrates; other bacteriological data	photo points; riparian &/or instream surveys & physical features	benthic sediment data; bioaccumulation; common ions, pH, conductivity, miscellaneous; imagery data; major nutrients; metals; organics; quantitative physical data

Comments:

DATA MATRIX
Biological Data

Comments:

Lake Creek, upstream of the county road

Data Type	Comments	Ref Num	Citation
algae	"Diatom metrics indicate impairment at both sites for sedimentation and organic loading. Impairment was moderate at the upstream site and minor at the downstream site. The downstream site had a larger percentage of highly-motile diatoms than the upstream site, suggesting tha this site had more unstable substrates. Diatoms indicate higher levels of dissolved solids and organic nitrogen at the downstream site. Diatoms at both sites indicate alkaline and eutrophic waters with 25-70 % dissolved oxygen saturation and 4-13 mg/L BOD. The nuisance alga, Rhizoclonium was abundant and common, as was Schizomeris, which is common to eutrophic waters, including waters below discharges from sewage treatment plants."	3323	Bahls, Loren L. (2004), Biological Integrity of Lake Creek (Benton Lake Watershed) Based on the Structure and Composition of the Benthic Algae Community, DEQ Contract No. 200012-10
macroinvertebrates	Bioassessment score (MT DEQ metrics): 63.3%. Bramletts metrics: 30% of maximum. "The high biotic index value(7.80) suggests nutrient enrichment and warm water temperatures, as does the low mayfly taxa richness (2). Twenty-one percent of the organisms collected were hemoglobin-bearing, including the tubificid worm and midges. Sediments are likely hypoxic. It seems that near-lentic flow conditions characterized the site. The six "clinger" taxa were likely associated with macrophyte surfaces (not hard substrates). "	3322	Bollman, Wease (2003), Biological Assessment of a Site on Lake Creek: Teton County, Montana, September 4, 2003

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DATA MATRIX

Habitat Data

Comments:

Lake Creek, upstream of the county road

Data Type	Comments	Ref Num	Citation
photo points	2003 MT DEQ field sampling data and assessment forms: The naturally-ephemeral channel is channelized; flow from an interbasin transfer of Muddy Creek waste irrigation water was occurring at the time of the assessment. Photo #7 shows the meander cut-off. Low gradiennt channel with sedges native grasses in the riparian. Turbidity is high; cattle access channel, causing embayed streambanks.	4650	(2003), DEQ Field Assessment Form
riparian &/or instream surveys & physical features	2003 MT DEQ field sampling data and assessment forms: The stream is channelized and has incised 4-5 feet in the section of the reach that runs through state lands. Bank erosion is common . High sediment load. Grazed areas are mostly grasses; more willows, sedges and trees occur near the mouth. Willows near the mouth are lightly browsed. Grazed sections have little plant cover. Headcuts are common throughout grazed sections. Levees are in place. Several fish barriers are present, mostly culverts. The source of water comes from Muddy Creek. The water is cold. Very little shade throughout the reach. Patches of alkalai soils were observed. Saline seeps were seen on prairies and farmland. Rating is "At Risk". Overall rating: "Not Sustainable".	4650	(2003), DEQ Field Assessment Form

Lake Cr, upstream of the Hevron Road crossing

Data Type	Comments	Ref Num	Citation
photo points	2003 MT DEQ field sampling data and assessment forms: Photo # 3 Looking downstream at culvert. Photo # 4 Looking upstream at culvert. Highly turbid Rosgen E channel here.	4650	(2003), DEQ Field Assessment Form

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DATA MATRIX

Chemistry Data

Comments:

Lake Creek, upstream of the county road

Data Type	Comments	Ref Num	Citation
common ions, pH, conductivity, miscellaneous	2003 MT DEQ field sampling data and assessment forms: (Time: 11:15 AM) Water temperature: 15.9 C, pH: 8.51, Specific Conductivity: 0.969 mS/cm, Dissolved Oxygen: 9.78 mg/L, TDS: 622 mg/L	4650	(2003), DEQ Field Assessment Form
major nutrients	2003 MT DEQ field sampling data and assessment forms: Results: Nitrate plus nitrite: 2.39 mg/L, Total Kjeldahl Nitrogen: 0.53 mg/L, total Phosphorus: 0.075 mg/L . These values exceed the guideline nutrient values for the Upper Clark Fork River Nutrient Standards. (Total N: 300 ug/L, Total P: 20 ug/L)	4650	(2003), DEQ Field Assessment Form
major nutrients	1996 data: Nitrate plus nitrite: Avg: 1.90 mg/L, Maximum value: 3.70 mg/L. 8/16/94: N plus N: 2.40 mg/L . 5/24/95: N plus N: 4.10mg/L	2471	Montana State Library Natural Resouce Information System ; Montana State University (2006), Montana View at http://montanaview.org/
metals	2003 MT DEQ field sampling data and assessment forms: No exceedences of numerical Human Health or Aquatic Life standards.	4650	(2003), DEQ Field Assessment Form
metals	1996 data: Cd: 7.0 ug/L total recoverable. Zn: 3500 ug/L. Se: 10 ug/L .	2471	Montana State Library Natural Resouce Information System ; Montana State University (2006), Montana View at http://montanaview.org/
quantitative physical data	USFWS. Data on CD: 1997 and 1998 Water Temperature, pH, Specific Conductance Data : SC values exceeding 9000 mS/cm were recorded at the Ewign flume monitoring location.	12494	U.S. Fish and Wildlife Service (1999), Water Temperature, pH, Specific Conductance Data
quantitative physical data	2003 MT DEQ field sampling data and assessment forms: Discharge: 13-15 cfs estimated	4650	(2003), DEQ Field Assessment Form
quantitative physical data	1996 data: SC average value: 5497 umhos/cm @ 25 C. Max value: 17300 nmhos/cm. Nitrate plus nitrite: Avg: 1.90 mg/L,	2471	Montana State Library Natural Resouce Information System ; Montana State University

Data Type	Comments	Ref Num	Citation
	Maximum value: 3.70 mg/L. 7/25/90: Cd: 7.0 ug/L total recoverable. Zn: 3500ug/L. Se: 10 ug/L . Water temperature: 23 C. 6/22/92. 3/30/2004 Water temp: 26.5C. 4/15/94: Sulfate: 9000 mg/L. 4/29/94: SC: 9130 umhos/cm, N plus N: 0.23 mg/L 8/16/94: N plus N: 2.40 mg/L . 5/24/95: N plus N: 4.10mg/L, Se: 10 ug/L .		(2006), Montana View at http://montanaview.org/

Lake Cr, upstream of the Hevron Road crossing

Data Type	Comments	Ref Num	Citation
common ions, pH, conductivity, miscellaneous	2003 MT DEQ field sampling data and assessment forms: (Time: 6:45 PM) Water temperature: 20.1 C, pH: 8.92, Specific Conductivity: 0.826 mS/cm, Dissolved Oxygen: 11.69 mg/L, TDS: 622 mg/L	4650	(2003), DEQ Field Assessment Form
major nutrients	2003 MT DEQ field sampling data and assessment forms: Results: Nitrate plus nitrite: 2.05 mg/L, Total Kjeldahl Nitrogen: 0.61 mg/L, total Phosphorus: 0.065 mg/L . These values exceed the guideline nutrient values for the Upper Clark Fork River Nutrient Standards. (Total N: 300 ug/L, Total P: 20 ug/L)	4650	(2003), DEQ Field Assessment Form
metals	2003 MT DEQ field sampling data and assessment forms: No exceedences of numerical Human Health or Aquatic Life standards.	4650	(2003), DEQ Field Assessment Form
quantitative physical data	2003 MT DEQ field sampling data and assessment forms: Discharge: 15 cfs estimated	4650	(2003), DEQ Field Assessment Form

ASSESSMENT HISTORY

Cycle 2006

Cycle 2008

Not assessed this cycle

Cycle 2010

Not assessed this cycle

Cycle 2012

Not assessed this cycle

Cycle 2014

Not assessed this cycle

Cycle 2016

Not assessed this cycle

Cycle 2018

Removed Other Flow regime Alterations as a cause for Primary Contact Recreation (PCR). Changed PCR to Not Assessed as it no longer had any causes associated with it. Other Flow Regime Alterations cause was changed to Flow Regime Modification per EPA cause list

Cycle 2020

Not assessed this cycle

Overall Condition of Segment

Lake Creek is historically an ephemeral channel which has been channelized . It accepts large volumes of waste irrigation water from an interbasin transfer from Muddy Cr. Consequently, the channel has incised, accellerating bank erosion also. Little woody vegetation is present except in the lower reaches where willows and other trees species are present. The riparian area is heavily grazed. Aquatic Life & Warm Water Fishery: Biology: 2003 Macroinvertebrate report: Bioassessment score (MT DEQ metrics): 63.3%. Bramletts metrics: 30% of maximum. "The high biotic index value(7.80) suggests nutrient enrichment and warm water temperatures, as does the low mayfly taxa richness (2). Sediments are likely hypoxic. 2003 Periphyton report: "Diatom metrics indicate impairment at both sites for sedimentation and organic loading. Impairment was moderate at the upstream site and minor at the downstream site. The downstream site had a larger percentage of highly-motile diatoms than the upstream site, suggesting that this site had more unstable substrates."
Chemistry: High nutrient values exceed the guideline nutrient values for the Upper Clark Fork River Nutrient Standards. 1996 Storease data: Cd: 7.0 ug/L (total recoverable) and Zn: 3500 ug/L, exceed the Acute Aquatic Life standards. Se: 10 ug/L exceeds the chronic aquatic life standard. Detected concentrations of zinc and cadmium which exceed acute aquatic life standards constitute overwhelming evidence of severe impairment. Habitat: 2003 MT DEQ Stream Reach Assessment concludes "not sustainable" rating based on channelization, incisement of channel, bank erosion and flow modification. Agriculture: numerous specific conductance values > 16,000 umhos/cm which adversely affects crops & livestock when water is used for irrigation and for livestock water. Industrial: High salinity is indicated by specific conductivity vales exceeding 16,000 umhos/cm and TDS values from the 2003 DEQ monitoring. Drinking Water: Storease data: Cd & Zn Human Health Standard Exceedences. Primary Contact (recreation): 2003 MT DEQ sampling indicates that nuisance algae species are present, but probably not in quantities that would affect recreation. Flow modification adds considerable volume of water to the naturally-ephemeral channel. Esthetics are poor as a result of channelization and grazing impacts. The water is turbid.

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USE SUPPORT DECISION

Use Class B-3

Trophic Status: **Trophic Trend:**

Uses	DQA	Method, Data, and Information Used	Assessment Type and Confidence	Use Support	Partial Flag	Use Support Certainty	Threatened
Aquatic Life				Not Fully Supporting	No		No
Agricultural				Not Fully Supporting	No		No
Drinking Water				Not Fully Supporting	No		No
Primary Contact Recreation				Not Assessed	No		No

Method Number and Description

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IMPAIRMENT INFORMATION

Uses	Cause (Confidence): Source(Confirmed)	Observed Effects
Aquatic Life	127 (): 156 (N) 367 (): 156 (N) 371 (): 156 (N) 372 (): 156 (N) 423 (): 156 (N) 526 (): 58 (N), 66 (N)	
Agricultural	367 (): 156 (N)	
Drinking Water	127 (): 156 (N) 423 (): 156 (N)	
Primary Contact Recreation		

Cause Number and Description	Source Number and Description	Observed Effect Number and Description
127-Cadmium 367-Salinity 371-Sedimentation/Siltation 372-Selenium 423-Zinc 526-Flow Regime Modification	58-Impacts from Hydrostructure Flow Regulation/modification 66-Crop Production (Irrigated) 156-Agriculture	

DELISTING / STATUS CHANGES

Cause	Reason for Change	Date of Change

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CATEGORY INFORMATION

Previous Cycle

Cycle	2018
Category	5 - Waters where one or more applicable beneficial uses have been assessed as being impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat.
User Defined Category	N/A

Current Cycle

Cycle	2020
Category	5 - Waters where one or more applicable beneficial uses have been assessed as being impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat.
User Defined Category	N/A