

Montana DEQ - Water Quality Standards Attainment Record

Reporting Cycle: 2020 **Assessment Record:** MT41Q001_013.pdf **Status:** Unassigned

ASSESSMENT UNIT INFORMATION

Reporting Cycle: 2020
Assessment Unit: MT41Q001_013
Waterbody Name: Missouri River
Location Description: MISSOURI RIVER, Rainbow Dam to Morony Dam

Water Type:	Size (Miles/Acres)	Use Class:
RIVER	9.12 MILES	B-3

Hydrologic Unit Code: 10030102
HUC Name: Upper Missouri-Dearborn
Watershed: Upper Missouri
Basin: Upper Missouri
TMDL Planning Area: Missouri River
Ecoregion: Northwestern Glaciated Plains
County: Cascade County, Chouteau County
Lat/Long AU Start (U/S): 47.534048 / -111.206107
Lat/Long AU End (D/S): 47.581286 / -111.060279

MONITORING INFORMATION

Date Assessment Started: 03/06/2000
Assessed By: Tippie, Jessi

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CITATIONS

Citation	Location	Biological Data	Habitat Data	Chemistry Data
Montana State Board of Health (1960), Water Pollution in the Missouri River Drainage in Montana, Progress Report No. 60-1	WQPB Ebrary	fecal coliforms; fish; macroinvertebrates; other bacteriological data	riparian &/or instream surveys & physical features	common ions, pH, conductivity, miscellaneous; major nutrients; quantitative physical data
Bahls, Loren L. (1988), Montana Nonpoint Source Assessment Report	WQPB Ebrary	algae; other bacteriological data	Land use; riparian &/or instream surveys & physical features	common ions, pH, conductivity, miscellaneous; major nutrients; quantitative physical data
Montana Department of Fish, Wildlife, and Parks (1989), Application for Reservations of Water in the Missouri River Basin Above Fort Peck Dam. Volume 3: Reservation Requests for Waters Between Canyon Ferry Dam and Fort Peck Dam	WQPB Ebrary	fish; macroinvertebrates; wildlife	Land use; riparian &/or instream surveys & physical features	Rosgen type; quantitative physical data
Penkal, Russell F. (1990), Fisheries of the Missouri River from Great Falls to Fort Benton and Historical Discharges of Morony Dam: Draft	WQPB Ebrary	fish; macroinvertebrates	riparian &/or instream surveys & physical features	quantitative physical data
Dalby, Chuck ; 2188 Water Quality Technical Advisory Committee (1993), Review of Existing Water-Quality Data and Design of Long-Term Trend Monitoring Program: Upper Madison-Missouri River Basin: Draft, FERC Project No. 2188	WQPB Ebrary			common ions, pH, conductivity, miscellaneous; quantitative physical data
Saul, Lynda A. (1993), Summary of Great Falls Area Reservoir Sediment Core Trace Element Analysis; To: Art Compton, Facility Siting Bureau Chief	WQPB Ebrary			benthic sediment data; metals; quantitative physical data
Ramey, Michael ; Beck, Stuart M. ; Reiser, Dudley W. (1994), Supplemental Report: Determination of Flushing Flow Needs, Madison and Upper Missouri Rivers	WQPB Ebrary	fish; macroinvertebrates	riparian &/or instream surveys & physical features	quantitative physical data

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Citation	Location	Biological Data	Habitat Data	Chemistry Data
Palawski, Donald U. ; Pickett, Frank ; Olsen, Bill (1996), Trace Elements and Organochlorines in Sediments and Fish From Missouri River Reservoirs in Montana	WQPB Ebrary	fish		benthic sediment data; bioaccumulation; organics
Federal Energy Regulating Commission, Office of Hydropower Licensing (1999), Missouri-Madison Hydroelectric Project, Montana, FERC No. 2188: Final Environmental Impact Statement, FERC Project No. 2188; FERC/EIS-0115F	WQPB Ebrary	General; fish	Land use; riparian &/or instream surveys & physical features	General; benthic sediment data; metals
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=M FISH&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
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
(200n), Montana Interagency Stream Fishery Data for the Upper Missouri River Basin	DEQ PPA Data Archive	fish	Land use; photo points; riparian &/or instream surveys & physical features	quantitative physical data

Comments:

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DATA MATRIX
Biological Data

Comments:

From Rainbow Dam to Morony Dam			
Data Type	Comments	Ref Num	Citation
fecal coliforms	Missouri at Rainbow Dam- August 4th and 5th, 1959 grabs: 2300 to 23000 count per 100 ml	2693	Montana State Board of Health (1960), Water Pollution in the Missouri River Drainage in Montana, Progress Report No. 60-1
fecal coliforms	120 to 3500 count per 100 ml	2471	Montana State Library Natural Resouce Information System ; Montana State University (2006), Montana View at http://montanaview.org/
fish	fish species present in 1990: white sucker, longnose sucker, walleye, yellow perch, brown trout, rainbow trout, black bullhead, carp, flathead chub; white and longnose suckers most abundant fish during 1978-1990 gill netting in all reserovoirs except Ryan, where walleye were the most abundant fish captured; fish numbers in Cochrane Reservoir have remained constant from 1978 to 1990- trout numbers were highest in this reservoir; fish numbers in Morony Reservoir have decreased significantly from 1978 to 1990; rainbow trout planted in Rainbow Reservoir in 1975-1985; walleye fry planted in Cochrane Reservoir in 1977 and 1985-1986; walleye planted in Morony Reservoir in 1985-1987 and 1990; walleye condition appears to be good in both reservoirs	1240	Penkal, Russell F. (1990), Fisheries of the Missouri River from Great Falls to Fort Benton and Historical Discharges of Morony Dam: Draft
fish	white suckers dominate the reservoirs; rainbows were planted in Rainbow Reservoir, but no studies have been made to determine if population has been established; walleye fry were planted in Cochrane Reservoir, but gill netting failed to produce any walleye; Ryan Reservoir appears to have an established walleye population as a result of the fish travelling downstream after being stocked in Cochrane Reservoir;area has experienced a decline in cold water species and an increase in the diversity and numbers of cool and warm water	3860	Federal Energy Regulating Commission, Office of Hydropower Licensing (1999), Missouri-Madison Hydroelectric Project, Montana, FERC No. 2188: Final Environmental Impact Statement, FERC Project No. 2188; FERC/EIS-0115F

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Data Type	Comments	Ref Num	Citation
	species; fishing pressure in the reservoirs is low compared to upstream sites due to limited accessibility and low percentage of game fish		
fish	fish species present: bigmouth buffalo, black bullhead, blue sucker, brown trout, burbot, channel catfish, carp, emerald shiner, fathead minnow, flathead chub, freshwater drum, goldeye, Iowa darter, longnose dace, longnose sucker, minnow, mottled sculpin, mountain whitefish, northern pike, pumpkinseed, rainbow trout, river carpsucker, sauger, shorthead redhorse, shovelnose sturgeon, smallmouth buffalo, stonecat, walleye, white sucker, yellow perch	2130	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
fish	rainbow trout, mountain whitefish, stonecat, black bullhead, brown trout, carp, walleye, yellow perch- uncommon; longnose dace, fathead minnow, white sucker, mottled sculpin, flathead chub, longnose sucker- common; pumpkinseed- rare; rainbow trout are planted regularly	4655	(200n), Montana Interagency Stream Fishery Data for the Upper Missouri River Basin

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DATA MATRIX

Habitat Data

Comments:

From Rainbow Dam to Morony Dam

Data Type	Comments	Ref Num	Citation
riparian &/or instream surveys & physical features	land use includes public water supply, agriculture, industrial waste, public sewage and fishing/recreation	2693	Montana State Board of Health (1960), Water Pollution in the Missouri River Drainage in Montana, Progress Report No. 60-1
riparian &/or instream surveys & physical features	sediment, nutrients, flow alteration and high arsenic levels impair segment; factors leading to impairment include agriculture, irrigation, hydrologic modification, grazing, dryland farming and streambank erosion; severity of impairment is moderate	1874	Bahls, Loren L. (1988), Montana Nonpoint Source Assessment Report
riparian &/or instream surveys & physical features	dams do not affect streamflow except during power-peaking mode in periods of low flow	228	Montana Department of Fish, Wildlife, and Parks (1989), Application for Reservations of Water in the Missouri River Basin Above Fort Peck Dam. Volume 3: Reservation Requests for Waters Between Canyon Ferry Dam and Fort Peck Dam
riparian &/or instream surveys & physical features	high levels of sediment in reservoirs due to heavy sediment loading from Sun River	1240	Penkal, Russell F. (1990), Fisheries of the Missouri River from Great Falls to Fort Benton and Historical Discharges of Morony Dam: Draft
riparian &/or instream surveys & physical features	flushing Qs from Canyon Ferry would affect the river to Morony and would result in decreased fish habitat quality and quantity due to increased sedimentation	2421	Ramey, Michael ; Beck, Stuart M. ; Reiser, Dudley W. (1994), Supplemental Report: Determination of Flushing Flow Needs, Madison and Upper Missouri Rivers
riparian &/or instream surveys & physical features	vegetation consists mainly of grasses and conifers; some wetlands border areas of the reservoirs and are dominated by cattail, sedges and cottonwood; reservoirs usually turbid due to sediment loading from Sun River; active erosion present along the shores of all reservoirs, with the shores of Ryan Reservoir being the most stable	3860	Federal Energy Regulating Commission, Office of Hydropower Licensing (1999), Missouri-Madison Hydroelectric Project, Montana, FERC No. 2188: Final Environmental Impact Statement, FERC Project No. 2188; FERC/EIS-0115F

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Data Type	Comments	Ref Num	Citation
riparian &/or instream surveys & physical features	water uses include irrigation, industry, water assimilation/pollution dilution and stock watering; habitat trend is deteriorating	2130	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
riparian &/or instream surveys & physical features	habitat trend is deteriorating; factors limiting fishery include low aquatic invertebrates, excess siltation, domestic sewage and commercial chemical pollution	4655	(200n), Montana Interagency Stream Fishery Data for the Upper Missouri River Basin

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DATA MATRIX

Chemistry Data

Comments:

From Rainbow Dam to Morony Dam			
Data Type	Comments	Ref Num	Citation
benthic sediment data	metals scan of the fine class size (0.06 mm to 0.40 mm): As, Cu, Zn, Sb, Pb, Tl and Mn were elevated in Rainbow sediments relative to Black Eagle sediments; As, Sb, Cu, Pb and Zn were elevated in Cochrane relative to Black Eagle, but were lower than Rainbow concentrations; As, Cd, Cu, Zn and Pb were elevated in Ryan relative to Black Eagle, but generally Cu, Zn, As and Pb concentrations were lower than concentrations in Rainbow and Cochrane	2399	Saul, Lynda A. (1993), Summary of Great Falls Area Reservoir Sediment Core Trace Element Analysis; To: Art Compton, Facility Siting Bureau Chief
benthic sediment data	1994 grabs: Zn concentrations in samples collected at Rainbow, Cochrane, Ryan and Morony Reservoirs exceeded the western US mean concentration; Ni exceeded the western US mean at Morony; trace element concentrations tended to be higher at the upstream sites (ie. Hauser, Holter)	2609	Palawski, Donald U. ; Pickett, Frank ; Olsen, Bill (1996), Trace Elements and Organochlorines in Sediments and Fish From Missouri River Reservoirs in Montana
benthic sediment data	contaminants of concern in all reservoir sediments include Al, As, Cd, Cu, Fe, Pb, Mn, Se, Ag and Zn	3860	Federal Energy Regulating Commission, Office of Hydropower Licensing (1999), Missouri-Madison Hydroelectric Project, Montana, FERC No. 2188: Final Environmental Impact Statement, FERC Project No. 2188; FERC/EIS-0115F
bioaccumulation	Al, As, Ba and Cr levels elevated in invertebrates taken from Rainbow and Morony Reservoirs (Cr levels exceeded the 0.2 ug/g dry weight concentration proposed by Eisler for the protection of fish and fish predators); PCBs present in invertebrates and fish at Morony and Rainbow; Morony PCB concentrations = 34.66 to 93.43 ug/kg wet weight- PCB conc. fall within advisory consumption range recommended by MFWP (1 meal/week)	2609	Palawski, Donald U. ; Pickett, Frank ; Olsen, Bill (1996), Trace Elements and Organochlorines in Sediments and Fish From Missouri River Reservoirs in Montana

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Data Type	Comments	Ref Num	Citation
common ions, pH, conductivity, miscellaneous	Missouri at Rainbow Dam on Aug.4th and 5th, 1959: DO = 6.6 to 9.4 mg/L; pH = 8.4	2693	Montana State Board of Health (1960), Water Pollution in the Missouri River Drainage in Montana, Progress Report No. 60-1
common ions, pH, conductivity, miscellaneous	conductivity = 333 to 564 umhos/cm @ 25 C	2185	Dalby, Chuck ; 2188 Water Quality Technical Advisory Committee (1993), Review of Existing Water-Quality Data and Design of Long-Term Trend Monitoring Program: Upper Madison-Missouri River Basin: Draft, FERC Project No. 2188
common ions, pH, conductivity, miscellaneous	pH = 8.2 to 8.6; conductivity = 333 to 564 umhos/cm @ 25 C	2471	Montana State Library Natural Resouce Information System ; Montana State University (2006), Montana View at http://montanaview.org/
metals	high levels of iron from Sun River and high levels of naturally occurring arsenic present; all reservoirs experience heavy metal contamination from Anaconda Company refinery	3860	Federal Energy Regulating Commission, Office of Hydropower Licensing (1999), Missouri-Madison Hydroelectric Project, Montana, FERC No. 2188: Final Environmental Impact Statement, FERC Project No. 2188; FERC/EIS-0115F
metals	1994 As drinking water standards exceedance in > 10% of data set; chronic and acute aquatic life standards exceedance for Cu in > 10% of data set	2471	Montana State Library Natural Resouce Information System ; Montana State University (2006), Montana View at http://montanaview.org/
quantitative physical data	Missouri at Rainbow Dam on August 4th and 5th, 1959: Q = 3290 to 4570 cfs; T = 16.6 to 20 C	2693	Montana State Board of Health (1960), Water Pollution in the Missouri River Drainage in Montana, Progress Report No. 60-1
quantitative physical data	1917-1928, 1930-1964 T extremes: 0 to 27 C	1240	Penkal, Russell F. (1990), Fisheries of the Missouri River from Great Falls to Fort Benton and Historical Discharges of Morony Dam: Draft
quantitative physical	mean Q = 6790.45 cfs; T = 0.5 to 22.0 C	2185	Dalby, Chuck ; 2188 Water Quality Technical

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Data Type	Comments	Ref Num	Citation
data			Advisory Committee (1993), Review of Existing Water-Quality Data and Design of Long-Term Trend Monitoring Program: Upper Madison-Missouri River Basin: Draft, FERC Project No. 2188
quantitative physical data	Q = 1450 to 22900 cfs; T = 0.5 to 22 C	2471	Montana State Library Natural Resource Information System ; Montana State University (2006), Montana View at http://montanaview.org/

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

Not assessed this cycle

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Cycle 2020

Not assessed this cycle

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Overall Condition of Segment

Site Reach Name: From Rainbow dam to Morony dam Aquatic Life and Cold Water Fishery: BIOLOGY- moderate impairment; overall decline in fish population of Morony; Cochrane population has remained constant; walleye population becoming established in Ryan, Cochrane and Morony; area has experienced decline in cold water species and seen an increase in cool and warm water species; fishing pressure is relatively low; HABITAT- moderate impairment; excessive siltation due to natural sources (high sediment loads from Sun River); active erosion occurring at sites on all reservoirs; CHEMISTRY- severe impairment; aquatic life standard exceedance for Cu, but no hardness data was available so impact of elevated Cu is unknown; temperatures have been as high as 27 C and temperatures as high as 22 C are not uncommon; heavy metals contamination in sediment due to Anaconda Company refinery; PCB concentrations in fish fall within MFWPs consumption advisory range
Agriculture: no high salinity or toxicant levels documented Industrial: high turbidity levels discourage industrial use Drinking Water: 1994 As drinking water standards exceedance Fish Consumption: PCB concentrations fall within DPHHS limited consumption advisory range (1 meal per week) Primary Contact (recreation): no dewatering or nuisance algal blooms documented; high fecal coliform levels documented, but data is > 20 years old and conditions have likely changed since then

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USE SUPPORT DECISION

Use Class

Trophic Status:

Trophic Trend:

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

Method Number and Description

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IMPAIRMENT INFORMATION

Uses	Cause (Confidence): Source(Confirmed)	Observed Effects
Aquatic Life	96 (): 155 (N) 163 (): 28 (N), 56 (N), 62 (N) 348 (): 28 (N), 56 (N), 62 (N) 371 (): 28 (N), 56 (N), 107 (N) 388 (): 56 (N), 142 (N) 413 (): 56 (N), 62 (N), 107 (N), 142 (N)	
Agricultural		
Drinking Water	96 (): 155 (N)	
Primary Contact Recreation		

Cause Number and Description	Source Number and Description	Observed Effect Number and Description
96-Arsenic	28-Contaminated Sediments	
163-Copper	56-Impacts from Abandoned Mine Lands	
348-Polychlorinated Biphenyls (PCBs)	(Inactive)	
371-Sedimentation/Siltation	62-Industrial Point Source Discharge	
388-Temperature	107-Post-development Erosion and	
413-Turbidity	Sedimentation	
	142-Dam or Impoundment	
	155-Natural Sources	

DELISTING / STATUS CHANGES

Cause	Reason for Change	Date of Change
Pentachlorobenzene	Data and/or information lacking to determine WQ status; original basis for listing was incorrect	06/30/2010

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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