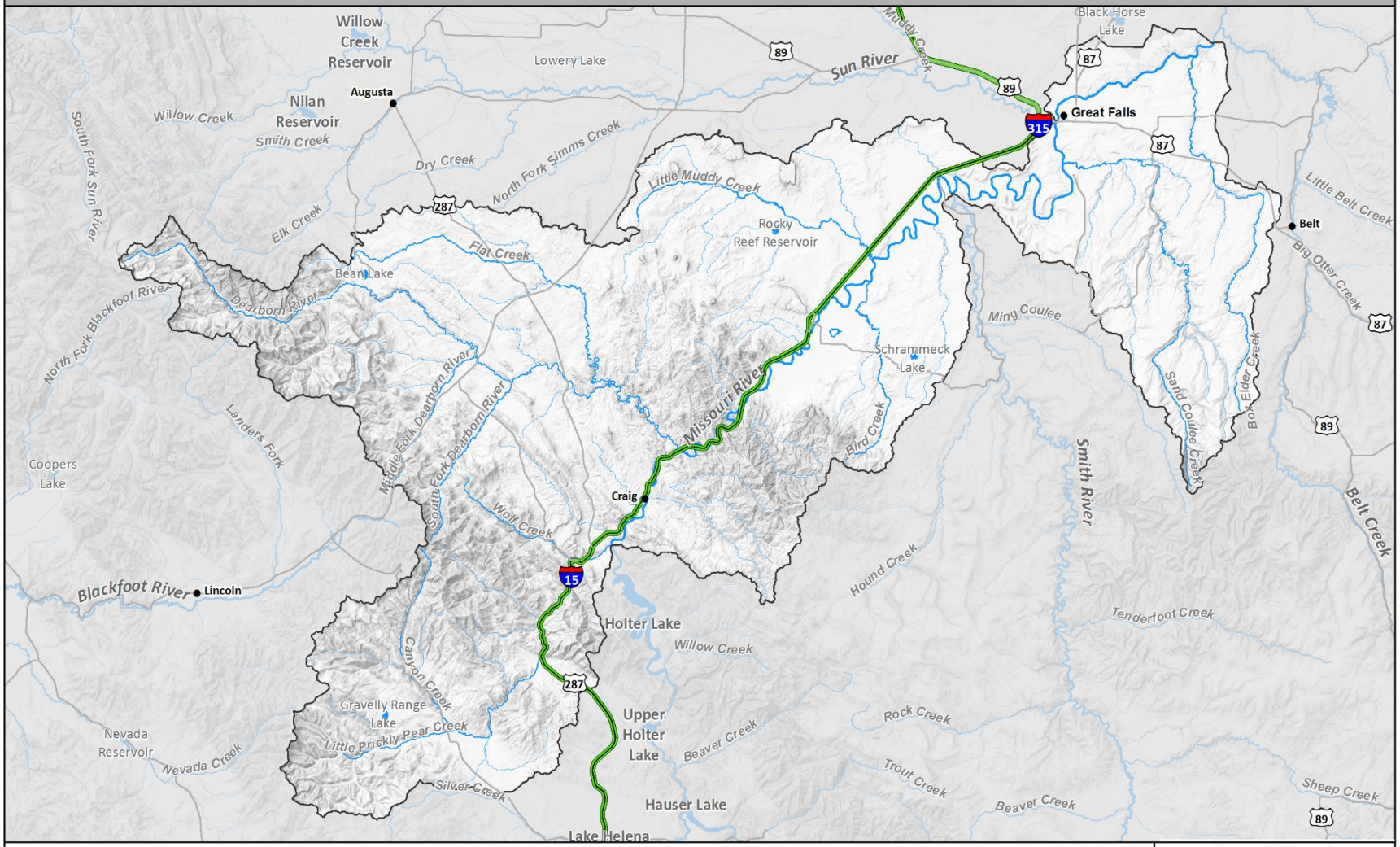
Missouri River - Dearborn Drainage

MONTANA FWP



Drainage Boundary

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Area of Interest

Map Produced by:
ASP - Geographic Data Services
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Administrative boundaries and FWP Lands data from Montana Fish, Wildlife & Parks, Helena, MT. Background Imagery from ESRI

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Miles

Missouri River - Dearborn Drainage

Physical Description

The Missouri River, Dearborn drainage includes the Missouri River and tributaries from Holter Dam near Wolf Creek downstream nearly 105 river miles to Morony Reservoir, 15 miles northeast of Great Falls. This river reach spans nearly 93 miles from Holter to Black Eagle dam. Below Black Eagle Dam, the river is impounded by Rainbow Dam Reservoir, creating a shallow run-of-the-river reservoir that is available for public fishing. Public boat access for fishing is not available between Rainbow Dam Reservoir and Morony Reservoir. Downstream of Morony Reservoir, boat angers may access the river through public access. Stream gradient averages only about 2 feet per mile and varies from 7.84 feet per mile at Pine Island Rapids to 0.52 feet per mile near Ulm. The river is surrounded by the Big Belt Mountains to the southeast and the east front of the Rocky Mountains to the northwest. Small communities along the river include Craig, Hardy Creek, Cascade and Ulm. The river channel upstream of the Dearborn River confluence has extensive side channel development. It becomes confined and entrenched in a single, deep channel as it flows through a mountainous canyon to the mouth of Sheep Creek. The river then meanders across a wide and flat prairie zone into Great Falls. Riparian vegetation consisting of a willow understory/cottonwood overstory lines much of the lower river.

Major tributaries in this reach include Little Prickly Pear Creek, Dearborn River, Sheep Creek, Smith River, and the Sun River. Minor tributaries include Rock, Wegner, Stickney, Hardy, Bird, Little Muddy, and Sand Coulee creeks. The tributaries add considerable flow to the Missouri during spring runoff but contribute little flow during the remainder of the year.

River characteristics and flow in this section are heavily influenced by the three upstream hydroelectric dams: Canyon Ferry, Hauser, and Holter. Canyon Ferry Dam is operated by the Bureau of Reclamation (BOR) for irrigation, hydropower, flood control, recreation, and as a supplemental water supply for the city of Helena. Hauser and Holter dams are downstream from Canyon Ferry and provide hydroelectric power. They are operated by NorthWestern Energy as run-of-the-river projects, passing out the same flows that enter the reservoirs. Water management and storage practices at Canyon Ferry Dam, the largest of the three upstream reservoirs affects flows in this tailwater reach below Holter Dam. Annual mean flow measured below Holter Dam from 1946 to 2020 ranged from 3,008 to 8,497 cubic feet per second (cfs), while annual mean inflows to Canyon Ferry ranged from 2,830 to 7,742 cfs. The mean peak flow below Holter Dam for this period is 14,089 (range 3,370-34,800) compared to a mean peak inflow of 18,206 cfs (range 6,580-34,000) to Canyon Ferry. From 1999 through 2007, a drought in central Montana reduced peak flows in the Missouri River substantially below the long-term average. Severe to exceptional drought conditions existed throughout the upper Missouri River basin in 2021 and into 2022.

Fisheries Management

Game fish species of the greatest interest to the public within this management area include rainbow and brown trout, mountain whitefish, walleye, and burbot (ling). The 35-mile reach from Holter Dam to Cascade Bridge is designated as one of Montana's premier trout fisheries. This reach supports an abundance of wild rainbow trout and brown trout, which are the dominant sport fish, including trophy-sized fish.

In most years since 1982, FWP has conducted population monitoring for rainbow and brown trout in two sections of the 35-mile river reach between Holter Dam and the town of Cascade (Craig study section = 5.6 miles, Cascade study section = 4.1 miles). Population estimates are derived using standardized methods, including night electrofishing to mark and recapture fish in the spring and fall. Estimates are based on trout 10 inches and longer.

In fall 2021, rainbow trout in the Craig section were estimated at 6,611 per mile. This estimate represents the second highest estimate on record and was well above the 39-year mean of 3,490 rainbow trout per mile. Brown trout 10 inches and greater in the Craig section were estimated at 362 per mile in spring 2021, which is below the long-term average of 556. In the Cascade section, the estimate of rainbow trout 10 inches and greater was 1,694 per mile in fall 2021, which is similar to the 39-year mean of 1,658. In the Cascade section, the brown trout estimate was 320 fish 10 inches and greater per mile in spring 2021, which is less than the long-term average of 372 fish, but within the long-term range of data (127-881). Historically, mountain whitefish have not been monitored due to logistical constraints with sampling. However, anglers have reported catching reduced numbers of mountain whitefish in recent years. Department staff began collecting catch per unit effort data on mountain whitefish in spring 2020 and 2021. These data will continue to be collected to evaluate trends over time and to compare to historical data collected in 2004 and 2005.

Additionally, walleye and burbot are incidentally sampled during electrofishing operations. Over the period of record there have been changes in the number of walleye sampled in the Missouri River below Holter Dam. The increase in walleye production in Canyon Ferry Reservoir since 1994 appears to have resulted in an increase in walleye in the Missouri River below Holter Dam. However, no evidence has been gathered which suggests an ecological impact to trout in this reach at the population level. Many factors are present that could negatively affect trout populations, including increased densities of walleye, increase in angler use, prolonged drought conditions, and whirling disease infections. Despite most of these factors in play for much of the past 25 years, trout populations appear resilient and there has been no apparent evidence of decline to this point. The Fish and Wildlife Commission established a no limit for walleye harvest regulation on the section of the Missouri River from Holter Dam to Cascade in 2011 as an effort to protect the rainbow and brown trout fishery. These regulations were changed in 2020 to 20 daily and 40 in possession from Holter Dam downstream to Cascade and 10 daily and 20 in possession downstream of Cascade.

Northern pike have become established in the Missouri River downstream of Holter Dam with increased reports and documentation beginning in 2018. See below for a complete discussion. A no limit regulation was implemented in 2020 from Holter Dam to Black Eagle Dam to encourage harvest and is consistent with regulations already in place upstream of Holter Dam.

Trout numbers drop markedly below Ulm largely due to habitat changes. Consequently, the proportional abundance of burbot and walleye in the fishery increases in this reach. Other common species in this reach of the Missouri River include mountain whitefish, longnose sucker, white sucker, carp, longnose dace, and Rocky Mountain sculpin. Northern pike are also likely now common within this reach, with reports as far downstream as Rainbow Dam Reservoir.

Fishing pressure in the reach is heavy, with the tail water fishery from Holter Dam to Cascade Bridge always ranking among the top four fisheries throughout the state during the past 28 years and frequently the top one or two between 1991 through 2019. This section of river has averaged over

113,000 angler days per year since 1991. A large increase in the number of anglers was observed in 2013 with record high 170,850 angler days estimated compared to 105,986 in 2011. The number of angler days over the last four surveys (2013-2019) has averaged 169,923 compared to 96,107 over the prior four surveys (2005-2011). This section of the Missouri River ranked second in the state in 2019 with 154,628 angler days estimated. The average annual revenue generated by this 35-mile reach of river was estimated at $60.2 million in 2019. Economic statistics for angler use are based on goods and services anglers purchased during a typical fishing trip, including food, gasoline, bait, lures, licenses, outfitter-guide fees, and lodging. This exercise produces a conservative estimate of the economic value of an angler day because only expenditures for nondurable goods were included and did not include durable goods such as boats, waders, fishing rods, and vehicles.

This section of the Missouri River is popular and heavily utilized for recreation due to both the characteristics of the fishery and the excellent access throughout much of the reach. A frontage road, old Highway 91, which has officially been designated as a state Recreation Road, parallels much of the river downstream to Cascade. The river section downstream from the Wolf Creek Bridge contains eleven FWP Fishing Access Sites (FAS). From Cascade to Morony Reservoir, there are six more fishing access points and Giant Springs State Park. Much of the existing recreational use of this reach of river is angling, but recreational floating is also popular seasonally. Other activities include picnicking, walking, bird watching, camping, trapping, and hunting.

Habitat

The Missouri River Advisory Committee was established in 1983 when the then operator of Holter and Hauser dams, the Montana Power Company (MPC), was considering returning the operation of Holter Dam to a power peaking facility. It had been operated in that manner prior to the early 1970s. The committee addressed the peaking issue with members representing FWP, MPC (now NorthWestern Energy), BOR, outfitters, irrigators, and sporting clubs. The power peaking plan was abandoned, and the dam has been operated as a baseload generation facility to this day. The committee continues to meet annually to discuss and coordinate information regarding the fishery, water supply, flow forecasts, and reservoir operations.

Previous research conducted by FWP indicated that trout, particularly brown trout, prefer side channels of the Missouri River, rather than the main channel, for spawning. The preference for side channels was apparently related to the presence of more suitable depth, velocity, substrate, and adjacent cover characteristics. These studies further indicated that Missouri River side channels are vital for the rearing of young-of-the-year (YOY) rainbow and brown trout until mid-October, when large numbers of YOY begin moving from the side channels to the main river. Side channels therefore appear to be vital year-round for trout spawning, the incubation of trout eggs, and the rearing of young. Observations indicate that habitat conditions and utilization of the side channels decline precipitously when flows recede below 4,100 cfs. At a flow of 4,100 cfs, 64% of the side channels contained adequate flow for trout spawning, incubation, and rearing, while at 3,600 cfs only 9% of the side channels contained adequate flow. Consequently, whenever possible, a year-round minimum flow of 4,100 cfs is recommended to maintain suitable conditions in side channels for trout spawning, incubation, and rearing. If water supply conditions do not allow due to drought, managers strive to maintain 3,000 cfs to maintain mainstem riffle habitat.

FWP works with partners to protect and restore habitat on the Missouri River and tributaries as opportunities arise. A habitat restoration project was recently completed on Hardy Creek in 2021 that reconnected Hardy Creek to the Missouri River. Prior to completing the project Hardy Creek flowed into an on-channel gravel pit, at times eliminating connectivity to the Missouri River and periodically resulting in trout being stranded in the gravel pit. A stream channel was built through the gravel pit and to the Missouri River allowing Hardy Creek to serve as a spawning tributary for trout in the Missouri River. Fish passage was also provided through a culvert that was previously a barrier to movement. Over the years, the department has worked on numerous other projects with landowners and various partners to protect and restore the Missouri River and tributaries. Examples include livestock fencing, streambank restoration, and construction of bridges to eliminate fording and sedimentation in important tributary streams.

Housing development along the riverbanks has resulted in numerous boat ramps, stairs, boat docks, rip rap, retaining walls and vegetation grooming in the upper and lower reaches of this section of the Missouri River. FWP has recommended the Conservation Districts (Lewis & Clark and Cascade) do not permit new boat ramps in the reach between Holter Dam and Cascade Bridge. Housing development in the lower 26 miles has increased and resulted in FWP making stronger recommendations against bank modifications to preserve river riparian habitat; however, riparian development continues to persist.

Special Management Issues

Hydropower Mitigation

Operation guidelines were integrated into the Federal Energy Regulatory Commission (FERC) order issued as part of the Madison-Missouri River 2188 Project License that included Hauser and Holter dam operations designed to protect the fishery. In addition, NorthWestern Energy has entered a Memorandum of Understanding (MOU) with FWP to cooperate in implementation of the fisheries Protection, Mitigation and Enhancement Technical Advisory Committee (TAC). The TAC meets annually to discuss potential projects, which must meet specific articles defined by FERC. These projects often include the funding of monitoring, research, and habitat restoration to protect, mitigate, or enhance the fishery. FWP will continue to bring monitoring, habitat, and research projects to the TAC for funding, as project opportunities develop. NorthWestern Energy staff works closely with FWP to implement license orders and mitigation and enhancement projects.

Missouri River Stock Assessment Study

Given the increased fishing pressure over the last decade FWP has initiated a stock assessment study on the Missouri River with Montana State University. The study will evaluate the effects of fishing mortality, including the effects of delayed mortality from catch-and-release fishing, on the Missouri River trout fishery. The results from this study will provide a benchmark for the trout fishery of the Missouri River, and a tool to assess the status of the fishery with future changes in angling pressure.

Westslope Cutthroat Trout Conservation

The Missouri River Dearborn drainage is also home to several conservation populations of westslope cutthroat trout, providing opportunities to conserve this native species in the drainage. Current populations exist in Fool Hen Creek, Page Gulch, Rooster Bill Creek, Specimen Creek, Stemple Creek, and Trout Creek. The short-term goal is to protect all remaining nonhybridized populations of westslope cutthroat trout. The long-term goal of cutthroat trout conservation in the Missouri River Dearborn drainage is to have approximately 20% of the historically occupied habitat restored to secure conservation populations of cutthroat trout (see Part 1, 1.6.8(1) Westslope Cutthroat Trout).

To meet the short-term goals of westslope cutthroat trout conservation within the drainage, a genetic rescue project is underway in Page Gulch. The goal of this project is to transfer the remaining nonhybridized individuals from this population into fishless habitat elsewhere within the drainage. The Page Gulch population of westslope cutthroat trout is actively hybridizing and will likely lose its conservation value within the next generation.

Wegner Creek is an ongoing restoration project that began in 2017 with the enhancement of a natural bedrock feature within the creek to create a fish barrier. A chemical treatment was performed in 2018 to remove non-native trout from the project area. In 2019, post-treatment monitoring found that non-native trout had re-invaded the system and further enhancements were made to the fish barrier. Additional enhancement of the fish barrier and chemical treatment will be needed before establishment of a westslope cutthroat trout conservation population can take place.

Falls Creek has been identified as an ideal location for westslope cutthroat trout restoration due to the presence of large waterfall barriers that isolate this drainage. An estimated 19 miles of high-quality habitat is present above the lowermost waterfall in the Falls Creek drainage.

Northern Pike Population Expansion

There has been an increased abundance of northern pike in the Missouri River downstream of Holter Dam since 2018. Northern pike have become more common in the reservoir system upstream providing a likely source to the tailwater section downstream of Holter Dam. While northern pike have always had the potential to be in the Missouri River based on their presence within the Sun River drainage, reports of northern pike were virtually nonexistent prior to 2018. High flows in 2018 appears to have flushed northern pike into the tailwater section downstream of Holter Dam. Most angler reports have been from downstream of Cascade; however, some reports have been received from below Holter Dam farther upstream, particularly in spring, and as far downstream as Rainbow Dam Reservoir. Some anglers have reported catching abundant numbers of northern pike and large size, with the largest confirmed report of 40 inches. The northern pike have increased in abundance to the point where anglers are successful in targeting in them in some areas.

Electrofishing was conducted in spring 2021 below Holter Dam after receiving reports of northern pike in the area and only one individual was collected that was 33 inches and 10.2 pounds. During annual sampling of the Craig section since 1982 and the Cascade section since 1980, one northern pike was collected in the Craig section in 2020 and one was observed in the Cascade section in 2022.

Annual surveys for YOY walleye at 12 sites from Cascade to Great Falls were initiated in 2009. No northern pike were caught from 2009 through 2018. One juvenile northern pike was collected at Little Muddy Creek in 2019 and in 2020. Zero were caught in 2021 during a very low water year. In 2022, seven total juvenile northern pike were collected from five of the twelve sites and one adult was observed. The juvenile northern pike documented at multiple sites in the Missouri River over approximately 20 river miles, indicate likely successful spawning and recruitment at multiple sites within the river system, in addition to the increasing upstream reservoir source.

Priority Drought Waters

The Missouri River from Holter Dam to Cascade is the only priority water affected by drought restrictions in the Dearborn drainage (Table 2.20-1). The non-native salmonid sport fishery has been affected on occasion by high water temperatures and low flow levels during summer periods historically and will likely continue to be impacted in some years. Classification, criteria, and measurements apply to the entire reach; however, implementation of restrictions may occur in all or parts of individual reaches depending on temperature, flow, and angling pressure at that time.

Table 2.20-1: Designated hoot owl reaches where drought related fishing restrictions and closures due to fishing pressure, high water temperatures, and/or low flows are expected to be implemented. Drought related restrictions and closures may also be placed on waters not listed here.

Waterbody	Reach	Classification	Criteria
Missouri River	Town of Cascade Boat Ramp to Holter Dam (RM 2,166.3 to 2,202.1)	Non-native salmonid sport fishery	• Daily maximum river temperature reaches or exceeds 73°F for three consecutive days or stream flows fall below the 5th percentile of daily mean values for the date. • Measurements relevant for criteria will occur at U.S. Geological Survey (USGS) gage 06066500 below Holter Dam. Additional temperature loggers will be deployed through the reach and monitored by FWP staff, as necessary. • Shifts in angling pressure due to fishing restrictions or closures on other waterbodies that could adversely impact the fishery.

FISHERIES MANAGEMENT DIRECTION FOR THE MISSOURI RIVER- DEARBORN DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Missouri River - Holter Dam to Cascade Bridge	35 miles	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Management priority is to maintain trout populations numbers within range observed since 1982 and with a sustainable proportion of larger sized fish available to anglers.
		Mountain whitefish (N)	Wild	General	Increase monitoring for mountain whitefish as conditions and workload allow.
		Burbot (N)	Wild	General	Monitor population through electrofishing and hoop net sampling protocol as conditions and workload allow.
		Walleye	Wild	Liberal Regulations	Provide high harvest opportunities above the Central District standard daily and possession limits to protect wild trout fisheries.
		Northern pike	Wild	Suppression	Encourage harvest through No Limit regulations to protect wild trout fisheries.
Habitat needs and activities: Cooperate with water management agencies to maintain minimum flows of 4,100 cfs to maintain side channel habitat. During drought, strive to maintain minimum flows of 3,000 cfs to maintain mainstem riffle habitat. Monitor increasing northern pike population. Pursue monitoring, habitat, and research opportunities through the TAC, as opportunities develop. Complete a semi-regular angler creel survey, based on past frequency and need.					
Little Prickly Pear Creek and tributaries	25.6 miles	Rainbow trout, Brown trout	Wild	General	Maintain resident and Missouri River spawning populations.
Habitat needs and activities: Explore opportunity to maintain habitat and instream flows of 70 cfs below Clark Creek and 22 cfs above Clark Creek. Explore habitat or stream restoration opportunities as they arise. Maintain access to stream for fluvial fish.					
Specimen Creek	1.5 miles	Westslope cutthroat trout (N)	Wild	Conservation	Maintain or enhance population to reduce extirpation risk.
		Brook trout	Wild	General	Monitor population and evaluate effects on westslope cutthroat trout population.
Habitat needs and activities: Update genetic and demographic monitoring of westslope cutthroat trout population.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Page Gulch	0.8 miles	Westslope cutthroat trout (N)	Wild	Conservation	Maintain or enhance population to reduce extirpation risk.
		Brook trout	Wild	General	Monitor population and evaluate effects on westslope cutthroat trout population.
Habitat needs and activities: Update genetic monitoring. Evaluate wild fish transfer to Sixteenmile Creek.					
Rooster Bill Creek	1.2 miles	Westslope cutthroat trout (N)	Wild	Conservation	Maintain or enhance population to reduce extirpation risk.
		Brook trout	Wild	General	Monitor population and evaluate effects on westslope cutthroat trout population.
Habitat needs and activities: Update genetic monitoring. Evaluate wild fish transfer to Sixteenmile Creek.					
Stemple Creek	1.7 miles	Westslope cutthroat trout (N)	Wild	Conservation	Maintain or enhance population to reduce extirpation risk.
		Brook trout	Wild	General	Monitor population and evaluate effects on westslope cutthroat trout population.
Habitat needs and activities: Update genetic and demographic monitoring of westslope cutthroat trout population.					
Trout Creek	5.5 miles	Westslope cutthroat trout (N)	Wild	Conservation	Maintain or enhance population to reduce extirpation risk.
		Brook trout, Rainbow trout	Wild	General	Monitor population and evaluate effects on westslope cutthroat trout population.
Habitat needs and activities: Update genetic and demographic monitoring of westslope cutthroat trout population.					
Wegner Creek	5 miles	Rainbow trout, Brook trout	Wild	Suppression	Explore opportunity to chemically remove non-native trout populations and establish westslope cutthroat trout conservation population.
Habitat needs and activities: Explore opportunity to chemically remove non-native trout populations and establish westslope cutthroat trout conservation population. Explore opportunities to enhance current fish barrier to preclude upstream movement of nonnative trout.					
Dearborn River and tributaries (South and Middle Forks)	73.3 miles	Rainbow trout, Brown trout	Wild	General	Maintain resident and Missouri River spawning populations.
		Mountain whitefish (N)	Wild	General	Maintain population numbers within historic range.

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Habitat needs and activities: Explore opportunity to work with water users to improve instream flow conditions in the drainage. Support FWP river recreation efforts to work with landowners to improve floating safety and maintain fences for livestock.					
Falls Creek	19 miles	Rainbow trout, Brook trout	Wild	Suppression	Explore opportunity to chemically remove non-native trout populations and establish westslope cutthroat trout conservation population.
Habitat needs and activities: Explore opportunity to chemically remove nonnative trout populations and establish westslope cutthroat trout conservation population.					
Missouri River - Cascade Bridge to Black Eagle Dam	57.8 miles	Rainbow trout, Brown trout	Wild	General	Maintain trout population numbers within historic range with a sustainable proportion of larger sized fish available to the angler.
		Mountain whitefish (N)	Wild	General	Increase monitoring for mountain whitefish as conditions and workload allow.
		Burbot (N)	Wild	General	Monitor population through hoop net sampling protocol as conditions and workload allow.
		Walleye	Wild	Liberal Regulations	Provide high harvest opportunities above the Central District standard daily and possession limits to protect wild trout fisheries.
		Northern pike	Wild	Suppression	Encourage harvest through No Limit regulations to protect wild trout fisheries.
Habitat needs and activities: Cooperate with water management agencies to maintain minimum flows of 4,100 cfs. Monitor increasing northern pike population. Pursue monitoring, habitat, and research opportunities through the TAC, as opportunities develop.					
Sheep Creek	2.0 miles	Rainbow trout	Wild	General	Maintain resident and Missouri River spawning populations.
Missouri River – Rainbow Dam Reservoir	200 acres	Rainbow trout	Hatchery, Wild	General, Put-and-Take	Manage as a recreational fishery.
		Brown trout	Wild	General	Manage as a recreational fishery. Consider hatchery supplementation, if needed.
		Walleye	Wild	General	Manage as a recreational fishery.

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Northern Pike	Wild	General	Monitor abundance. Manage as a recreational fishery.
Pelican Point Pond #1	23 acres	Largemouth bass	Hatchery, Wild	General	Manage as a recreational fishery. Population supplemented by occasional stocking.
		Black crappie, yellow perch, pumpkinseed sunfish	Wild	General	Manage as a recreational fishery. Black crappie may be supplemented by occasional wild fish transfers, if needed.
		Rainbow trout	Hatchery	Put-and-Take	Manage as a recreation fishery.
Habitat needs and activities: Continue monitoring for northern pike that were introduced around 2012. Suppression efforts appear to have been successful in eradication.					
Giant Springs Fishing Pond	0.3 acres	Rainbow trout	Hatchery	Family Fishing Water	Maintain existing urban fishery for youth.
Private/Public Ponds with public access		Trout warm water species	Hatchery/ Wild	Put-and-Take	Maintain existing pond fisheries available to the public for harvest.
Habitat needs and activities: Enhance structure in ponds when possible and needed. Seek additional opportunities.					