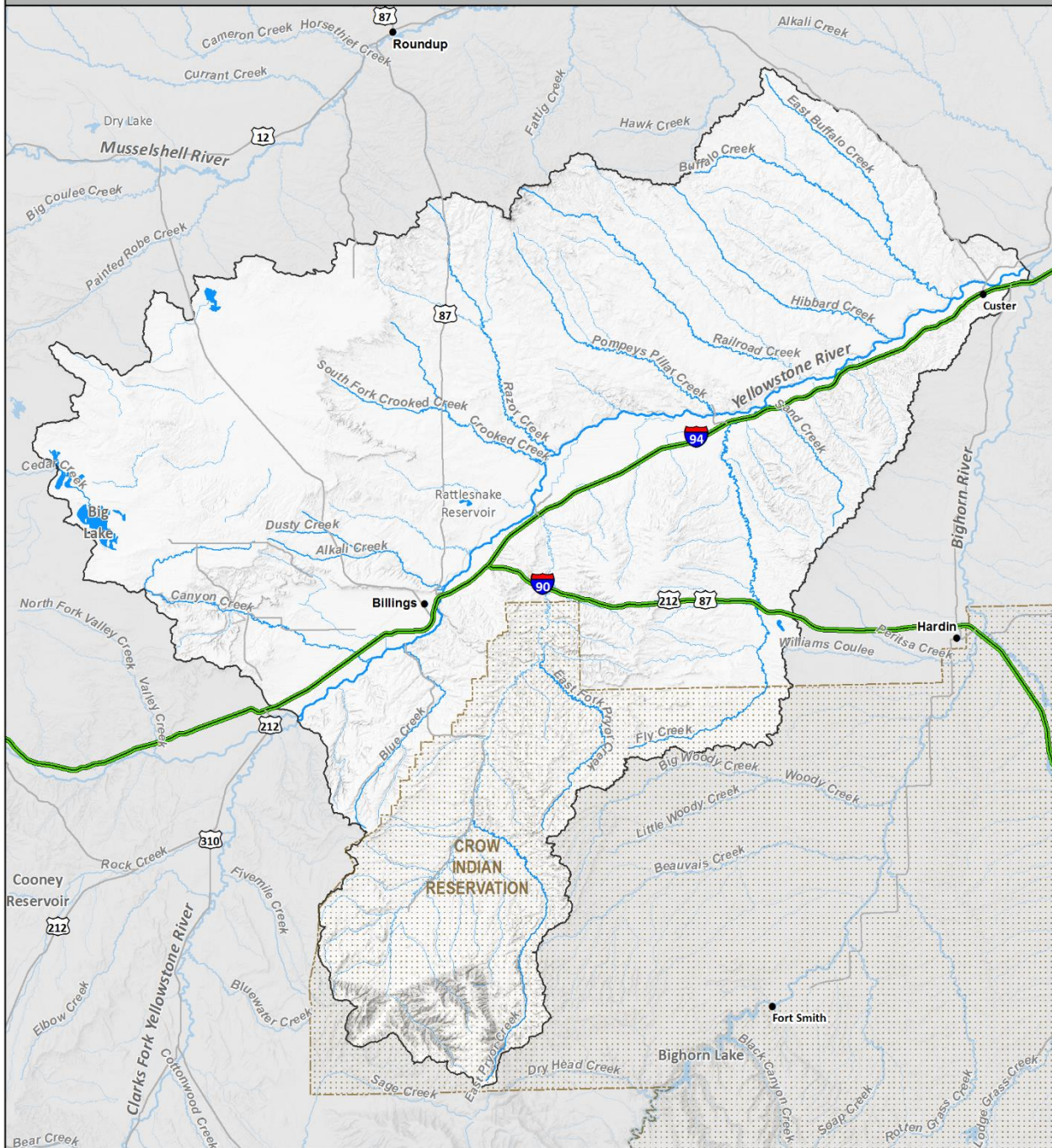


Middle Yellowstone River Drainage

MONTANA FWP



- Tribal Lands
- Drainage Boundary

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

Middle Yellowstone River Drainage

Physical Description

The middle reach of the Yellowstone River begins at the confluence of the Clarks Fork of the Yellowstone River and the Yellowstone River. The river flows west to east approximately 86 river miles to Ranchers Ditch Diversion Dam, which is about 2.5 miles downstream of the mouth of the Bighorn River. The river in this reach flows through Billings, the largest city in Montana, as well as the smaller towns of Huntley, Shepherd, Worden, Pompey's Pillar, and Custer. Most of this reach is in Yellowstone County with the lower 2.5 miles in Treasure County. The entire section of river flows through a wide valley with high sandstone bluffs that confine the river throughout most of the reach. The channel is dominated by cobble and gravel substrate, which form many islands and bars. The railroad right-of-way borders the south side of the Yellowstone River along most of this reach and in many places the railroad line forms the south bank of the river. As such, the riverbank is armored with large rip rap. The upper end of this reach is urbanized between the cities of Laurel, Billings, and Lockwood. As a result, much of the riverbank in this section is armored with rip rap and dikes. A high percentage of rip rap in this section is concrete rather than rock. For the remainder of the reach, the river has a dynamic channel that is constantly redistributing floodplain sediments.

The largest tributary in the middle reach of the Yellowstone is the Bighorn River, which drains much of central and north central Wyoming. The Bighorn River flows in from the south approximately 2.5 miles upstream from the lower end of this reach. Other notable tributaries include Canyon Creek from the north, and Pryor Creek from the south, both of which enter the Yellowstone in the Billings area. Several smaller tributary streams enter the Yellowstone from both sides of the valley throughout this section.

The Yellowstone valley is dominated by agricultural land that primarily produces sugar beets, grains, hay, and cattle. As a result, the valley contains large irrigation projects that divert a significant volume of water from the river. These irrigation projects can trap large numbers of fish, many of which end up in irrigated fields or are lost within the canal systems when the irrigation season ends. Excess irrigation flows are conveyed back to the Yellowstone River using existing stream channels. This unnatural increase in flow changes flow patterns in these streams, causing excessive erosion, and introducing fish species where they would not naturally occur.

Three major low-head diversion dams are present in this section of the Yellowstone, including the Huntley Diversion Dam, Waco Diversion Dam, and the Ranchers Ditch Diversion. Huntley Diversion Dam is located about 27.4 river miles downstream from the upper end of this reach, or about 10 miles east of Billings. The dam is a channel spanning, concrete capped weir with a structural height of 10.5 feet and a hydraulic height of 8.0 feet. Thus, during typical flows the dam acts as a fish passage barrier for most species. At higher flows, a side channel bypasses the dam on the north side and provides intermittent fish passage. The side channel merges with the main channel about 3,650 feet downstream of the dam thus fish blocked by Huntley Dam are unlikely to find this channel. High water in 1997 damaged the Huntley Diversion Dam and efforts to reconstruct the dam in 1999 included installation of a more natural fish passage structure for warmwater fish species. These reconstruction efforts did not build the passage as designed and follow-up studies found fish minimally using the bypass structure. In 2015, the channel was lengthened to reduce slope and improve fish passage. In 2021, a graduate study evaluated fish passage of the bypass structure. Results from this study demonstrated the utility of nature like

fishways as multiple fish species used the bypass structure to migrate upstream; however, fish using the bypass structure varied among species and was generally seasonal and associated with pre-spawning movements (April to August). Limiting factors for fishing entering the bypass include high river flows and low attraction efficiencies.

Waco Diversion Dam is located 62.4 river miles downstream from the upper end of this reach. Waco Diversion Dam is another channel spanning, concrete capped weir like the Huntley Diversion Dam. Although this structure is not as tall as Huntley Dam, a high velocity drop off the face of the dam during normal flow conditions is likely a fish barrier to most species in the area. Waco Dam has a more developed bypass channel around the dam to the north, which maintains better flows during lower water periods than the bypass around Huntley Dam. Additionally, the downstream connection of the bypass channel to the main channel is closer to the dam and may provide better fish passage than the Huntley bypass channel.

Ranchers Ditch Diversion is located at the downstream boundary of this reach. This diversion consists of two structures spanning both channels at the top of an island. The diversion in the smaller south channel consists of a concrete capped rubble weir with a well-defined dam crest yielding a nearly vertical plunging flow. This structure presents major fish passage issues. The structure on the larger north channel consists of a concrete and rock cap placed over an old steel piling and a brush bundle dam. Flow over this section of the diversion is more irregular with a less distinct drop and greater slope. Because flow over the north dam is more similar to flow over a steep riffle, this section of the dam is probably less of a fish passage barrier than the other diversions in this reach. The irrigation company is constantly working on the north dam, and recent plans to rebuild part of this diversion could increase fish passage issues.

Fisheries Management

The upper end of this reach on the Yellowstone River represents the transition zone from a coldwater, trout dominated river to a warmwater river. Trout numbers decline rapidly in the upper 27 miles as cool and warmwater fish numbers increase. The free-flowing nature of the Yellowstone River, natural hydrograph, and relatively natural habitat conditions allows the Yellowstone to support and maintain a wide diversity of native and introduced fish species. There are approximately 40 fish species within the middle Yellowstone River, 28 of which are native species.

FWP designs regulations to help protect native populations while promoting harvest on non-native predatory species, which can negatively influence native populations. FWP manages the entire Yellowstone River as a wild fishery. Therefore, there is no routine stocking on any section of the river. The middle Yellowstone River provides a diverse recreational fishery for both native and introduced species. Although ice can severely limit the winter fishery opportunities, angling is open year-round on this section of the Yellowstone River. The upper end of this reach supports a robust rainbow trout, brown trout, and mountain whitefish fishery. As the river transitions into a warmwater fishery below Huntley Dam, the fish communities change to native channel catfish, sauger, and burbot and non-native smallmouth bass and walleye. FWP staff have occasionally observed other game species, including northern pike, largemouth bass, and crappie. Some nongame species such as goldeye and freshwater drum also provide angling opportunities.

There are numerous limiting factors likely affecting the native fish populations within the middle Yellowstone River, including increased angler use and barriers to upstream fish movement. Historically, bank fishermen were the primary anglers on this section. More recently, anglers are using jet boats and kayaks, which has significantly increased angler use and activity during the spring, summer, and fall. In addition to increased angling pressure, there are numerous fish passage barriers throughout the middle and lower Yellowstone River reaches, including the Cartersville Dam near Forsyth, which is about 59 miles downstream of the middle Yellowstone River reach. There is a noticeable reduction in sauger numbers and almost total elimination of some species, like shovelnose sturgeon, upstream of the dam. Thus, FWP implements various regulation strategies within the middle Yellowstone River to protect and sustain the native fish populations in this reach, like the genetically unique sauger. The sauger regulations are restrictive and only allow a harvest of two sauger per day, with a possession limit of four. FWP has also reduced channel catfish limits statewide to provide additional protection to this long-lived native game fish. The Central and Eastern districts manage all other game species under the standard regulations.

The introduction of several non-native sportfish species, like smallmouth bass and walleye, are challenging the management of native and small-bodied fish populations. Smallmouth bass numbers have recently increased in this section of the river. FWP surveys have found their range expanding upstream in the Yellowstone River to the boundary with Yellowstone National Park, as well as into Pryor Creek, a major tributary to the Yellowstone River in this section. Although they provide a very popular fishery, the influence of this relatively new predator is poorly understood. In 2022, the U.S. Geological Survey (USGS) evaluated the distribution and expansion of smallmouth bass into the colder reaches of the upper Yellowstone River. Results suggest smallmouth bass are not constrained by water temperature alone and will likely continue to increase their population and distribution throughout the Yellowstone River. FWP increased the smallmouth bass bag limits to allow anglers to capitalize on this abundant fishery and slow down the upstream migrations; however, it is unlikely angler harvest will suppress the population and thus increase total annual mortality. Walleye numbers also appear to be increasing in this reach. Their effects, both as an added predator and their potential hybridization with sauger, could negatively influence native fish populations.

Another important management concern is the protection and enhancement of smaller native fish populations in the river and associated tributaries, including numerous minnow and sucker species. These nongame species are an important part of the diverse native fish fauna found in the middle Yellowstone River and fulfill multiple ecological roles. For example, small fish species play an integral role in the food web dynamics of a given system, influencing behavior and/or consuming aquatic invertebrate and algal assemblages and providing a forage base for larger game fish. These small fish populations are potentially at risk in some areas as commercial and recreational collection of native minnows and suckers for use as live baitfish is a common practice.

There are numerous small tributaries that contribute flow to the middle Yellowstone River. Most of these streams are smaller prairie streams that provide limited or no recreational angling opportunities; however, they are important to different life history stages of various native fishes. The Bighorn River is the only major tributary that flows into this reach of the Yellowstone.

Several smaller lakes, ponds, and reservoirs including Lake Elmo, Lake Josephine, Laurel Pond, Broadview Pond, Joel's Pond, Anita Reservoir, and private ponds with agreements to allow some public

access, provide important urban fisheries in the Billings area. FWP annually assists in stocking these waters with either trout as put-and-take fisheries, or with occasional largemouth bass put-grow-and-take fisheries. Being close to the largest population center in the state, these waters receive considerable angler use; however, sufficient creel data are lacking and are needed for these waters. Irrigation demands can influence water levels in some of these lakes and thus it is important to maintain a good working relationship with the associated irrigation districts.

Habitat

The upper end of this reach represents the transition zone from a relatively clear, coldwater stream to a more turbid warmwater stream. The Clarks Fork of the Yellowstone drainage at the top of the reach adds a considerable amount of sediment to the Yellowstone during early spring runoff and into late fall. Industrial water discharges around the city of Billings significantly increase water temperatures for the Yellowstone River in this section. Except during the most extreme conditions, these warmer water temperatures allow a section of the river to remain ice free throughout the winter. All the tributaries entering this section of the Yellowstone River transport a significant amount of sediment. Thus, the middle Yellowstone River contains naturally elevated turbidity. The turbidity is further elevated during the irrigation season when excess water flows into the tributaries. These excess flows significantly erode tributary channels, contributing additional sediment load and thus increasing turbidity levels above what would naturally occur. Water temperatures in the upper reach above Billings can reach the mid-70s F during low water years, while temperatures in the lower end of the reach above the Bighorn River can get into the mid- to high 80s F. Flows at the USGS gage at Billings have ranged from a low of 2,080 cfs on July 20, 1934, to a high of 84,000 cfs on June 15, 2022.

This section of the Yellowstone can be affected by the FWP Angling Restrictions and Fishing Closures rules ([ARM 12.5.5](#)), which reduces angling related fish mortality during periods of drought. Since this section of river represents the transition from cold to warmwater habitat on the Yellowstone, drought closures typically only extend downstream to the upper end of the warmwater section at Huntley Dam.

The channel in this section is predominately boulder and cobble substrate with fine sediments like sand and silt deposited in slower sections. Where the river is not confined by natural bluffs, railroad rip rap, or other human engineered bank armoring, it has a dynamic channel that frequently interacts with its floodplain sediments. River channels are constantly moving and shifting by eroding and laying down new gravel and point bars. Except in the highly urbanized upper section, the riparian zone along this section is in fair condition with healthy cottonwood and willow bottoms. Some agricultural activities extend to the river's edge and have facilitated the establishment of nonnative species like Russian olive and salt cedar. These invasions present serious threats to the riparian zone by altering not only the native riparian species present, but also by changing the type of vegetation litter deposited into the river and influencing water quantity and temperature. The section through Billings contains limited riparian area and there is a high density of rip rap and influences from industry, which can also alter temperature and water chemistry.

Huntley Dam, Waco Dam, and Ranchers Ditch Diversion all present fish passage and recreational boat passage issues. These diversions, along with several other pump and gravity feed irrigation systems, can influence instream flows along this section of the river. Fish populations are likely negatively influenced by these fluctuating instream flows as habitat availability and water quality become unpredictable. In

addition, fish may enter diversion canals and can become lost to irrigation fields or within the canal systems after the irrigation season ends. To mitigate the loss of aquatic habitat or elevated water temperatures associated with decreased stream flows, FWP has reserved instream flow water rights with a 1978 priority date on the Yellowstone River.

An irrigation ditch flume historically dammed Pryor Creek but eventually blew out in 2011. Rehabilitation efforts opted to build a siphon in place of the flume to allow fish passage. A subsequent Rocky Mountain College study funded by FWP found rapid re-colonization of this stream by most small prairie fish as well as large game fish species like channel catfish and smallmouth bass. Efforts have begun to improve fish passage at the rehabilitated irrigation siphon, but the project has not been fully implemented due to cost benefit restraints.

Special Management Issues

Sauger Conservation

Sauger in this river section is genetically unique from any other sauger populations in the remainder of the Yellowstone, Bighorn, or Missouri river drainages in Montana or Wyoming. The middle Yellowstone River has low abundances of sauger and marks the upstream extent of the species distribution in the Yellowstone basin. FWP has maintained a long-term monitoring program for sauger since 2006 to assess population trends and guide management decisions, such as harvest limits. Results suggest the middle Yellowstone River sauger can likely sustain its current level of recreational fishing pressure. Currently, FWP staff are refining sampling techniques to improve population estimates and quantify vital rates, such as growth and mortality. Coordinated sampling efforts will better identify actions to ensure their long-term viability and unique characteristics.

Burbot Monitoring

In Montana, burbot are listed as a Potential Species of Concern largely due to a lack of information regarding their population dynamics, movement, and habitat use, especially lotic populations. Burbot are native to the middle Yellowstone River, which marks the upstream extent of their distribution in the Yellowstone River. Historic data is incomplete for burbot as FWP did not explicitly sample burbot populations until 2006. Anecdotal evidence by anglers and bycatch data suggests burbot populations in the middle Yellowstone River during the early 2000s was low. Currently, results from long-term monitoring suggests the population is stable and harvest regulations are likely adequate. To better assess burbot population trends and quantify vital rates, such as growth and mortality, FWP staff are refining sampling techniques for greater standardization. Long-term goals are to increase the burbot population in this section and may include habitat restoration and fish passage at low head diversion dams.

Commercial Bait Seining

The effects of commercial bait seining on native minnow populations are a major concern for anglers and natural resources professionals. Commercial bait operations throughout eastern Montana have targeted the Yellowstone drainage as the main source for bait minnows. Seiners come from all over

eastern Montana to collect fishes throughout this reach. Commercial bait seining is likely to increase within the middle Yellowstone River section as areas in northeast Montana are closed to seining due to the presence of invasive Eurasian watermilfoil. Intensified seining efforts, especially when combined with predation from introduced species like smallmouth bass and walleye, are likely contributing to population declines of native minnow and suckers. Reduction in native minnow and sucker populations may have compounding effects on larger game fish species as they rely on these minnow and sucker species as prey.

Prairie Fish Sampling

There is growing concern from anglers and natural resource professionals about the status of small bodied, native fish populations and their assemblages in prairie streams and tributaries throughout the state. Challenges to the long-term persistence of small-bodied fishes include the introduction of non-native species, overharvest, habitat degradation and fragmentation, de-watering, and shifting temperatures. As an added challenge, data are limited regarding the distribution and relative abundance of many prairie fishes. Establishing a prairie stream monitoring program will allow biologists and managers to better respond to issues such as fish stocking, low head diversion dams construction or modifications, and bait use. Maintaining the prairie fish assemblages will also provide benefits to the larger sport fish species as prairie fish are often targeted prey by those predatory sport fish.

FISHERIES MANAGEMENT DIRECTION FOR MIDDLE YELLOWSTONE RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone River (Confluence of Clarks Fork of the Yellowstone River to Ranchers Ditch Diversion)	86.1 miles	Rainbow trout, Brown trout, Mountain whitefish (N)	Wild	General	Manage as a recreational fishery allowing for limited harvest with standard regulations.
		Sauger (N)	Wild	Conservation	Manage sauger populations for limited consumptive harvest with harvest restrictions upstream of Cartersville Dam. Conduct studies to evaluate the importance of the unique genetic character of the sauger population in this section of the Yellowstone. Identify spawning areas and migratory patterns that have helped maintain this genetic uniqueness. Evaluate value and importance of improving or restricting fish passage in the lower Yellowstone to maintaining this genetically unique population.
		Burbot (N)	Wild	General	Attempt to enhance burbot population and manage for limited harvest. Identify factors limiting the burbot population in this section of the Yellowstone.
		Channel catfish (N)	Wild	General	Manage as a recreational fishery with emphasis on maintaining a diverse population structure, while providing opportunities to catch larger catfish. Standardize catfish sampling as much as possible in eastern Montana.
		Smallmouth bass	Wild	General	Manage as a recreational fishery with emphasis on harvest.

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Walleye	Wild	General	Manage as a recreational fishery with emphasis on harvest.
		Native nongame species(N)	Wild	Conservation	Manage commercial minnow harvest to protect native fish populations. Conduct studies to evaluate habitat and flow needs for native fishes. Work with other permitting agencies to limit habitat changes along the Yellowstone River.
Habitat needs and activities: Improve fish passage for warmwater species at all diversion dams from Intake Dam upstream. Reduce entrainment and loss at head gates and pumps. Maintain or improve instream flows in the river and tributaries. Manage habitat projects to maintain the natural stream functions of a wild undammed river and evaluate habitat projects based on cumulative impacts.					
Pryor Creek (Downstream of Crow Reservation Boundary)	16.1 miles	Multiple species	Wild	General	Evaluate and improve fish passage issues upstream of the Yellowstone River. Monitor fish movement in and out of the Yellowstone River, monitor spawning success of game and nongame species, and monitor the establishment of resident fish populations in Pryor Creek. Manage Pryor Creek to provide a continuing source of young game fish and forage to the Yellowstone River.
Habitat needs and activities: Improve upstream fish passage now that Pryor Creek has been reconnected with the Yellowstone River. Improve summer stream flows and improve habitat to support ecosystem function and production of native species.					
Yellowstone Tributaries (smaller prairie streams)	42 streams and 290 miles	Multiple native species (N)	Wild	Conservation	Manage commercial minnow harvest to protect native fish populations.
Habitat needs and activities: Evaluate barriers in each tributary and improve fish passage and connectivity with the Yellowstone River. Improve habitat to support ecosystem function and production of native species.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Lake Elmo	65 acres	Rainbow trout, Brown trout, Yellowstone cutthroat trout(N), Largemouth bass, Smallmouth bass	Hatchery	Put-and-Take/ Family Fishing water	Manage for maximum recreational use with emphasis on harvest. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to support kid's fishing events.
		Tiger muskie	Hatchery	Quality	Stock a limited number of fish on a 3 to 4 year rotation as needed to maintain predation pressure on the sucker population in the lake while providing anglers the opportunity to catch a trophy sized fish.
		Channel catfish (N)	Hatchery	Put-Grow-and-Take	Stock annually if fish are available to provide an additional opportunity for anglers fishing this popular urban fishery.
		Yellow Perch, Crappie, Pumpkinseed	Wild	General	Consider wild fish transfers when fish are available.
Habitat needs and activities: Work with Billings Heights Water and Lake Elmo State Park on water management for the lake. Limit water level fluctuation during the weekends and ensure the lake is full before the ditch is shut off in the fall. Develop long-term lake management plan to improve fisheries habitat in the lake.					
Lake Josephine	20 acres	Largemouth bass	Hatchery/ Wild	General/ Family Fishing water	Stock as needed to supplement natural reproduction. Promote voluntary catch-and-release on 12 to 15 inch bass.
		Tiger muskie	Hatchery	Quality	Stock a limited number of fish on a 3 to 4 year rotation as needed to maintain predation pressure on the sucker population in the lake while providing anglers the opportunity to catch a trophy length fish.

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Channel catfish (N)	Hatchery	General	Stock annually if fish are available to provide an additional opportunity for anglers fishing this popular urban fishery.
		Yellow Perch, Crappie, Bluegill, Pumpkinseed	Wild	General	Wild transfers will be considered to improve fishing opportunity, particularly if habitat improvements are made.
Habitat needs and activities for Lake Josephine (Riverfront): Potential exists to improve average depth with excavation or building bars, installation of fishing piers, and other access and habitat improvements. Work with City of Billings, Natural Resource Damage Program, and others to make improvements when possible.					
Laurel Pond	18 acres	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put-and-Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to support kid's fishing events.
Habitat needs and activities: Maintain windmills for aeration. Would benefit pond to increase average depth. Opportunity to dredge/dig or create bars with existing bottom material may come from partnership with Lions Club and other interested groups. Pond has substantial goldfish population that may need to be addressed.					
Anita Reservoir	30 acres	Largemouth bass	Hatchery	General/Family Fishing water	Stock as necessary to maintain a recreational fishery.
Habitat needs and activities: Coordinate with the Huntley Irrigation District to improve long-term water management to benefit the fishery. Generally, the irrigation district has shown minimal interest in addressing fishery needs.					
Broadview Pond	20 acres	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put-and-Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to provide occasional larger trout.
Habitat needs and activities: Consider windmills for aeration to improve summer and overwinter survival.					

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Joel's Pond	14 acres	Largemouth bass	Hatchery	General/ Family Fishing water	Stock as necessary to maintain a recreational fishery.
		Green sunfish, Pumpkinseed, Common carp, Fathead minnow	Wild	General	Manage as forage for bass with recreational sunfish opportunity for family fishing.
Habitat needs and activities: Coordinate with the Yellowstone River Parks Association (YRPA) to manage fishery and public access.					
Shiloh Ponds 1 and 2	10 acres	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put-and-Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to provide occasional larger trout.
Deep Mill (Audubon Pond)	2.4 acres	Largemouth bass	Hatchery	General/Family Fishing water	Stock as necessary to maintain a recreational fishery.
		Green sunfish, Pumpkinseed, Black bullhead	Wild	General	Manage as forage for bass with recreational sunfish opportunity for family fishing.
Habitat needs and activities: Coordinate with the YRPA and Audubon Society to manage fishery and public access. Installed solar aeration system in 2018.					
Other private and public ponds	Various	Rainbow trout, Largemouth bass, Yellowstone cutthroat trout (N)	Hatchery	Put-and-Take	Several other opportunities in private ponds with public access. Work with landowners to maintain fisheries and access. New opportunities may arise.
		Other species as determined	Hatchery/ wild transfer		