Upper Missouri River Reservoir Fisheries Management Plan 2019-2028

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Upper Missouri Reservoir Fisheries Management Plan

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Fisheries Division
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Executive Summary and Plan Implementation

Since the mid-1980s, Montana Fish, Wildlife & Parks (FWP) recognized that the fishing public desires an opportunity to participate in the development of management strategies for the state's fisheries resources. In 1989 the department completed a five-year management plan for Hauser Reservoir and in 1993 a similar management plan was prepared for Canyon Ferry Reservoir. Following expiration of these plans in the late 1990s, the Upper Missouri River Reservoir Fisheries Management Plan (UMRRFMP) 2000-2009 was written to manage Canyon Ferry, Hauser, and Holter Reservoirs and the Missouri River from Toston to Canyon Ferry and below Hauser Dam as a system. In 2010 that plan was updated for another 10 years. Additionally, FWP developed the Statewide Fisheries Management Plan for 2013-2018 that recognizes the UMRRFMP 2010-2019 as the guide for managing these three reservoirs and river fisheries. In the cases of the previous two 10-year plans, a framework was developed for continued public involvement in monitoring and evaluating fisheries management activities. The structured approach for the 2000-2009 and 2010-2019 plans has worked well. The 2019-2028 plan serves as a supplement to the previous plan by providing new, updated information, but generally follows the same structure developed during the previous two plans.

This fish management plan addresses the fisheries of the upper Missouri River Reservoir system including Canyon Ferry, Hauser, and Holter reservoirs, and the Missouri River from Toston to Townsend and between Hauser and Holter reservoirs (Figure 1). The plan sets management direction for a 10-year period (2019-2028) by providing specific goals and strategies for each of these waters. The plan also provides a framework for continued public involvement in monitoring and evaluating fisheries management activities.

Fish communities in these reservoirs have changed dramatically since the initial management plans and the management strategies warrant periodic review. The establishment of a substantial walleye population in Canyon Ferry, the loss of the popular kokanee salmon fishery in Hauser Reservoir, and changes in the yellow perch fisheries in Canyon Ferry and Holter Reservoirs have significantly affected angler use of the fisheries in this reservoir system.

A variety of fisheries management strategies are available in this plan to affect fish populations, including, but not limited to, changes to fishing regulations (Table 1), habitat manipulations and fish stocking. In addition, established management "triggers" (catch rates in gill nets, Table 2) continue to be used to maintain populations at levels appropriate for balanced predator/prey interactions and to maintain the multi-species diversity required in the plan. The plan is adaptive, in that it offers management prescriptions as fish populations change and established management triggers are exceeded. Goals and objectives, rationale, and management strategies for primary sport fish and resource issues are outlined within each section of the plan.

Management Plan Organization

This Executive Summary provides an overview of the Montana Environmental Policy Act (MEPA) process, structure of the plan, a description of the public involvement processes used to develop the plan over the past 20 years, and a summary of management goals for each body of water. Plan Implementation details the ongoing public involvement process that will be used to monitor, evaluate, and modify the plan over the next 10-year period. The Management Plan Area provides a general description of the upper Missouri River reservoir system. Respective sections on individual waters provide more detailed information on history, physical and fisheries description, past/present management, and proposed management alternatives, goals, and strategies.

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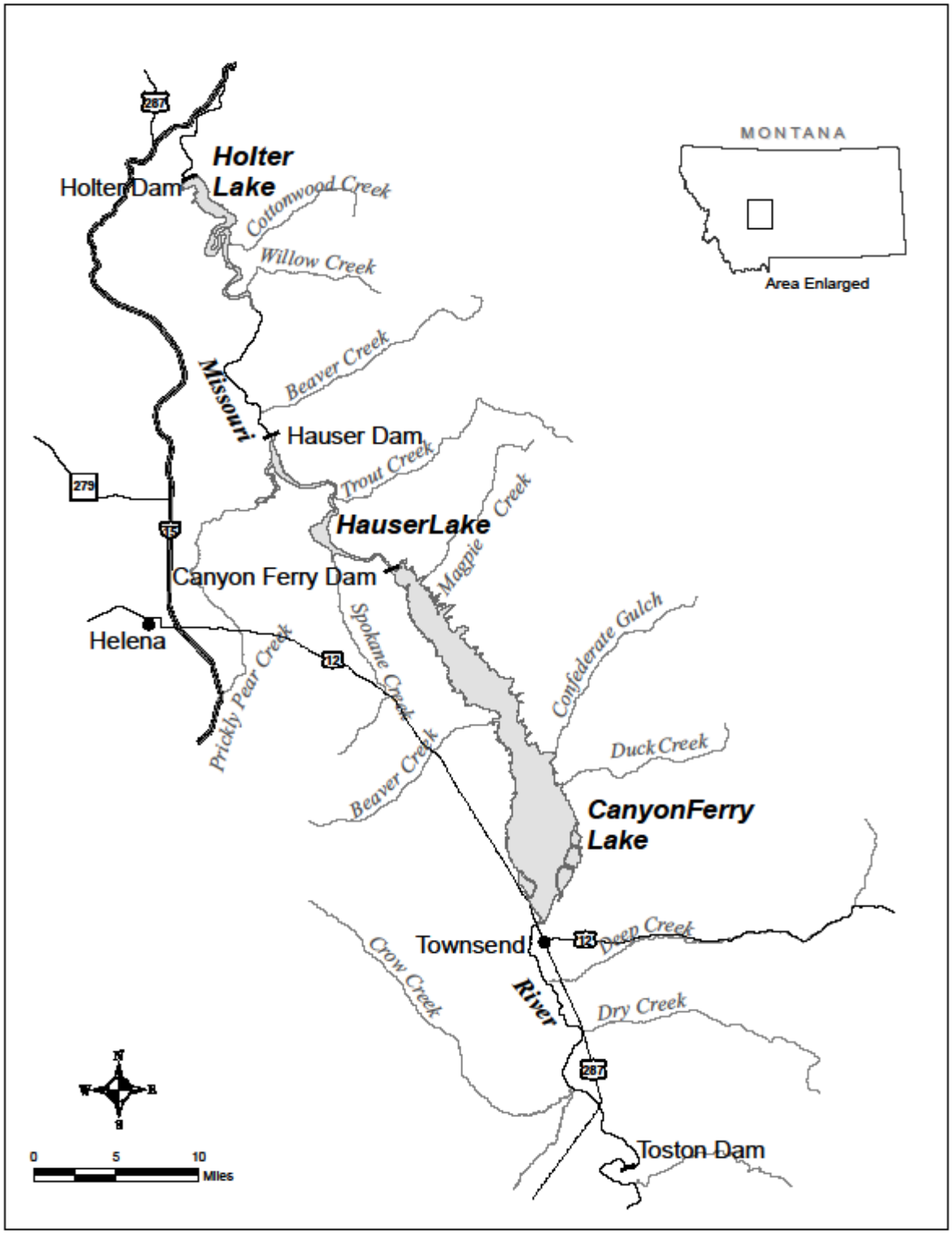

Figure 1. The upper Missouri River reservoir system.

Table 1. Summary of Fishing Regulation changes from 2000-2018 for Canyon Ferry, Hauser, and Holter Reservoirs for rainbow trout (and salmon when applicable), walleye, and yellow perch.*

Reservoir	Species	Years	Regulation	Rationale
Canyon Ferry	Rainbow Trout	2000-2018	Combined trout, 5 daily and 10 in possession.	
	Walleye	2000-2001	20 daily and 40 in possession.	Reduce predator densities.
		2002-2010	20 daily and 40 in possession, only 1 over 28".	Protect trophy component.
		2011-2013	10 daily, no more than 4 over 16", and 1 over 28". Possession limit is twice the daily limit.	New management plan, improve walleye size distribution.
		2014-2017	12 daily, only 1 over 25". Possession limit is twice the daily limit.	Yellow perch below management triggers. Perch bag limit also adjusted.
		2018	20 daily, only 1 over 20". Possession limit is twice the daily limit.	Record high walleye abundance tripped management trigger.
	Yellow Perch	2000-2005	50 daily and no possession limit.	Implement conservative management strategies.
		2006-2013	15 daily and in possession.	Yellow perch below management triggers.
		2014-2018	10 daily and in possession.	Yellow perch below management triggers. Walleye bag limit also adjusted
Hauser	Trout and Salmon	2000-2018	5 trout and salmon daily in any combination and 10 trout and salmon in possession in any combination.	
	Walleye	2000-2010	10 daily, only 1 over 28". Possession limit is twice the daily limit.	Reduce walleye densities.
		2011-2013	20 daily, only 1 over 28". Possession limit is twice the daily limit.	New management plan, reduce walleye densities.
		2014-2018	20 daily, only 1 over 25". Possession limit is twice the daily limit.	Adjust length restriction to maintain consistency within reservoir system.
	Yellow Perch	2000-2010	50 daily and no possession limit.	Implement conservative management strategies.
		2011-2013	25 daily and no possession limit.	New management plan, adopt more conservative strategies.
		2014-2018	10 daily and in possession, except from April 1 through June 30, only 1 fish daily and in possession, 14" minimum.	Perch abundance below management triggers, protect spring spawning fish.
Holter	Trout and Salmon	2000-2018	5 rainbow trout and salmon daily in any combination and 10 rainbow trout and salmon in possession in any combination.	
	Walleye	2000-2010	6 daily, includes 5 under 20" and 1 over 28". Possession limit is twice the daily limit.	Maintain trophy walleye fishery.
		2011-2013	10 daily, only 1 over 28", and all fish between 20 and 28" must be released. Possession limit is twice the daily limit.	New management plan. Reduce walleye densities while maintaining trophy fishery.
		2014-2018	10 daily, only 1 over 25 inches. Possession limit twice the daily limit.	Reduce walleye densities.
	Yellow Perch	2000-2010	50 daily and no possession limit.	
		2011-2014	25 daily and no possession limit.	New management plan.
		2015-2018	50 daily and no possession limit.	Record high perch abundance.

***Note: The following species have been managed under the same regulation from 2000-2018: Brown trout (Catch and release except anglers 14 years and younger may take 1 brown trout daily and in possession, any size), Burbot (5 daily and in possession), Northern Pike (No Limit)**

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Table 2. Management Goals and Triggers for the 2019-2028 Upper Missouri River Reservoir Fisheries Management Plan. Gillnet Trends are Based on Three-Year Running Average Catch Rates. WE = walleye, YP = yellow perch, RB = rainbow trout, SU = suckers, and LL = brown trout.

	Canyon Ferry			Hauser			Holter		
	Goal	**Upper Trigger**	**Lower Trigger**	**Goal**	**Upper Trigger**	**Lower Trigger**	**Goal**	**Upper Trigger**	**Lower Trigger**
Walleye	5 per net	> 7 per net or YP and/or RB < 3 per net	< 3 per net and YP > 6 per net and RB>5 per net	3 per net	> 6 per net or YP and/or RB < 1 per net	< 2 per net and YP and RB above goals	4 per net	> 6 per net or YP and/or RB < 2 per net	< 2 per net and YP and RB above goals
Yellow Perch	6 per net	> 9 per net recommend raising bag limit	< 3 per net	4 per net	> 7 per net recommend raising bag limit	< 1 per net	6 per net	> 10 per net recommend raising bag limit	< 2 per net
Rainbow trout	5 per net	None	< 5 per net evaluate stocking plan < 3 take active measures	3 per net	None	< 2 evaluate stocking plan < 1 take active measures	6 per net	None	< 4 evaluate stocking plan < 2 take active measures
Kokanee	N/a	N/a	N/a	None	None	None	None	Adjust stocking rate if LL < 100 per mile in Hauser tailrace	None
Brown trout	1 per net	> 1 consider allowing harvest	None	0.5 per net	None	None	None	None	None
Burbot	0.40 per net	None	None	1.0 per net	> 2 per net	< 0.5 per net	0.25 per net	> 2 per net	None
Northern pike	None	None	None	None	None	None	None	None	None
Forage	15 SU per net 6 YP per net 20 zoop/L	WE > 7 per net	SU < 5 per net YP < 3 per net	None	None	None	None	None	None

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Montana Environmental Policy Act

The MEPA requires state government to be accountable to the people of Montana when it makes decisions that affect the human environment. MEPA provides a process to help ensure that government actions are based on informed decisions. It does this by requiring that reasonable alternatives are evaluated, the consequences of a decision are understood, and the public's concerns are known.

MEPA requires all state agencies recognize and consider to the fullest extent possible the consequences that their actions may have on the quality of the human environment (75-1-201, Montana Code Annotated (MCA)) and directs them to:

- Utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural sciences and the environmental design arts in planning and decision making which may have an impact on the environment; and

- Develop methods and procedures which will ensure that environmental values and amenities are identified and may be given appropriate consideration in decision making along with economic and technical considerations.

MEPA requires FWP to:
- Issue a draft Management Plan;
- Encourage and accept public comments on the draft; and
- Issue a final Management Plan.

The Final Management Plan may:
- Develop and evaluate information not previously considered;
- Supplement, improve, or modify the analysis contained in the draft;
- Make factual corrections; and
- Explain why comments do or do not warrant further response.

Montana FWP has followed this framework while developing the previous two 10-year plans. Because no substantive changes are proposed in management direction for the waters covered under the plan, FWP will provide a supplemental analysis to the previous plan with updated information, corrections, and the status of the fisheries as managed under the 2010-2019 plan. Because no new management directions are proposed for the next 10-year plan, information gathered during the two previous working groups, along with input in 2018 from the UMRRFMP Citizen Scoping Committee, are sufficient to continue managing in a similar manner. A public comment period for the draft Management Plan will be open following presentation to the FWP Commission in October 2017. Please see Appendix A for more information on management changes and public comments.

This document assisted FWP in planning and decision making by presenting an integrated and interdisciplinary analysis of administrative alternatives for management of the upper Missouri River reservoir system. This document describes the proposed action and evaluates potential consequences on the physical environment. Analyses of impacts presented in this document were based on literature research, public comments, and interviews with FWP personnel and wildlife agency personnel in other states.

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Public Involvement

Citizen Workgroups and Scoping Committee

The two previous management plans (UMRRFMP 2000-2009 & 2010-2019) were developed with Citizen Workgroups appointed in May 1998 and January 2009 by FWP as advisory bodies to help identify fisheries goals and management alternatives to be addressed in the previous two 10-year management plans. This 10-year management plan builds upon past public involvement and was developed by FWP with input from a Citizen Scoping Committee, appointed in May 2018, to update and improve fisheries goals and management strategies throughout the management plan area.

The 1998 Workgroup identified the following goals/desired end results:

1. The fisheries management goal for the three-reservoir system should be to manage a high quality, cost-effective, multi-species fishery with high levels of angler satisfaction. This will be a difficult goal to achieve.
2. The process for monitoring and evaluating the implementation of the new 10-year plan should be open to the public and other affected interests.

The 2009 Work group identified that the Upper Missouri River Reservoir Management Plan should result in:

1. Management of all three reservoirs and connecting river sections as healthy multi-species fisheries.
2. Strategies that emphasize trout and walleye while recognizing perch as an important game and forage species.
3. Improved forage species and availability for game fish in the upper Missouri River reservoir system.
4. Realistic regulations and limits while providing a high level of angler satisfaction.
5. Social acceptance based on shared biological and social/economic interests.
6. An adaptive management plan and process to react to the changing dynamics of the system and adjust accordingly.

Fish, Wildlife & Parks endorsed and accepted these goals/end results in the previous 10-year plans.

The 2018 Scoping Committee agreed to provide input on FWP proposed changes within this management plan, commensurate with goals and desired end results identified by previous public involvement, and to continue effective fisheries management goals and strategies for the management plan area.

Please see Appendix A for more information on the Scoping Committee.

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Role of Other Government Agencies

FWP is the lead agency for fisheries management in the upper Missouri River reservoir system. Maintaining a high quality, cost-effective, multi-species fishery with high levels of angler satisfaction is the department's overall management goal. To achieve this goal, this management plan has been prepared to direct future Department activities for the study area. Other agencies have responsibility for managing land and water important to the fishery resource.

The Montana Department of Environmental Quality (DEQ) is responsible for regulating activities that could affect the quality of state water. A permit from DEQ is required to construct or use any outlet for discharge of wastes or wastewater into state surface water or groundwater under the Montana Water Quality Act. Nonpoint source discharges from new or increased sources are regulated by DEQ under the nondegradation policy described in Title 75, Chapter 5, Part 3, MCA.

The Montana Department of Natural Resources and Conservation (DNRC) is responsible for regulating state surface and groundwater rights. Owners of all supply wells within the state are required to file a notice of completion of any new well within 60 days of completion. Water supply wells must be drilled by a contractor licensed by the Board of Water Well Contractors or by a person who has obtained a permit from the board to drill a well on agricultural property for private use. Any groundwater appropriation exceeding 35 gallons per minute or 10-acre feet of water per year for beneficial use, or is located inside an established controlled groundwater area, must be permitted by DNRC prior to well construction.

Three federal agencies are involved in management of resources in the upper Missouri River reservoir management area. The U.S. Bureau of Reclamation (BOR) manages federal lands around Canyon Ferry Reservoir, including numerous campgrounds and boat launches, and is responsible for operation of Canyon Ferry Dam. The Bureau of Land Management administers campgrounds and boat launch facilities on Hauser and Holter Reservoirs. The U.S. Army Corps of Engineers is responsible for permitting placement of any dredged or fill material into waters of the U.S. or wetlands under Section 404 of the Clean Water Act. The U.S. Army Corps of Engineers also provides operational oversight of Canyon Ferry Reservoir under the Flood Control Act of 1944.

Managing the Fisheries

The species composition of the Upper Missouri River Reservoir system is typical of large river and reservoir fisheries in the intermountain region. The sport fishery is comprised primarily of rainbow trout, yellow perch, walleye, brown trout, kokanee salmon, mountain whitefish, and burbot (ling). Combined, the upper Missouri River reservoir system accounted for 8.6% of the fishing pressure in Montana in 2015. Fishing pressure on these reservoirs is high relative to other bodies of water in Montana. These reservoirs traditionally are in the top 5 most heavily fished waters in Montana with Canyon Ferry averaging 97,072 angler days (1989-2015), Hauser averaging 54,476 angler days (1989-2015) and Holter averaging 64,398 angler days (1989-2015). This level of pressure equates to an average 2.8 angler days per acre on Canyon Ferry, 14.3 angler days per acre on Hauser, and 13.4 days per acre on Holter. In 2015, Canyon Ferry was the fifth most heavily fished water in the state and was the number two flatwater fishery in Montana (Figure 2).

Generally, angler use on the reservoir system trended downward from 1999-2007, while use increased from 2009-2015. Overall angler use in the system peaked at 315,558 angler days in 2009, accounting for 9.4% of all angler use in the state of Montana that year.

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Canyon Ferry Reservoir was the most heavily fished water in Montana in 1989, 1993, 1995, 1999 and 2009. Up until 1998 this top designation was the result of high quality trout and perch angling. In 1999 and 2009 the top designation was the result of rainbow trout, perch and walleye. Walleye have become a significant component of the Canyon Ferry fishery after the population expanded to reach fishable numbers in 1998. Prior to 1996, no walleye were observed in the standard roving creel census and reports of walleye caught by anglers were uncommon. Walleye now serve as an important component of the summer fishery, with nearly 40% of summer anglers targeting exclusively walleye in 2017. Walleye contribute little to the ice fishery; however, rainbow trout and perch have sustained the fishery, and ice fishing continues to make up approximately 1/3 of Canyon Ferry annual angler use.

Angling pressure on Hauser Reservoir has varied considerably and has been closely linked to the abundance of kokanee salmon. Hauser Reservoir was the most heavily fished body of water in the state in 1991, which was attributable to a booming kokanee salmon population that resulted in a record 141,000 fish harvested that year. Angler use trends decreased in response to the collapse of the kokanee fishery in the late 1990s. All efforts to revive the Hauser kokanee fishery following record high water flows in 1997 failed. Currently, Hauser contains high abundance of walleye due mostly to flushing of juvenile walleye from Canyon Ferry Reservoir upstream. Hauser perch and rainbow abundance declined following expansion of the walleye population, but currently perch size and abundance are improving and the rainbow fishery is at historically high levels.

Holter Reservoir traditionally provided one of the most diverse and productive multi-species fisheries in the state. Historically, Holter provided good to excellent fishing for rainbow trout, kokanee salmon, walleye, and yellow perch simultaneously. Like in Hauser, flushing of walleye from Canyon Ferry Dam has heavily influenced the Holter fishery. Yellow perch harvest and abundance fell sharply following development of the Canyon Ferry walleye fishery in the late 1990s, but a huge cohort of perch in 2013 dramatically changed use of the fishery. Angler use on Holter increased nearly 49% from 2013 to 2015, primarily due to increased winter fishing for perch. Walleye abundance has declined from record-highs over the past 4 years, but trophy fish are still commonly observed during monitoring surveys and in the angler creel. Modifications to the Holter rainbow trout stocking scheme in the early 2000's has maintained a quality trout fishery. High angler catch rates for large rainbows are common, especially in the spring.

The presence of walleye at the head of the most heavily fished reservoir complex in Montana creates a challenge in maintaining these historically popular fishery resources. Walleye have tremendous reproductive potential in Canyon Ferry, in contrast to Hauser and Holter reservoirs, and will thrive there if there is an adequate forage fish supply. To sustain a multi-species fishery composed of trout, perch, walleye, native species, and other forage species will require active management of walleye to reduce predation on yellow perch, rainbow trout, and other sport fish. Failure to adequately manage walleye numbers will result in diminished perch and trout fisheries, which would be inconsistent with the goals developed by the Citizen Workgroups. As documented in other western reservoir systems, poor walleye management may ultimately result in populations of stunted walleye as the prey base is depleted.

Missouri River Management Goals

(Toston Dam to Canyon Ferry Reservoir)

The goal for managing the Missouri River between Toston Dam and Canyon Ferry Reservoir is to provide naturally reproducing brown and rainbow trout populations in the Missouri River and associated tributaries for recreational fishing opportunities, and to provide important spawning and rearing conditions for the

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Missouri River/Canyon Ferry system. In addition, a naturally reproducing walleye population provides recreational fishing opportunities in the main stem Missouri River. Management goals and strategies include:

- Rely on rainbow trout to provide both a resident fishery throughout the year and a migratory fishery linked to Canyon Ferry that enters the river during the fall and spring.
- Rely on brown trout to provide a resident fishery throughout the year and a migratory population of large fish that enter the river during the fall.
- Manage the walleye population consistent with Canyon Ferry and to minimize impacts on existing trout and forage species and provide a spring to fall sport fishery.
- Monitor and manage the northern pike population in the river and reservoir to minimize impacts to the existing trout and forage species. Expansion of a predator such as northern pike could have negative effects to the existing fish community in the Missouri River.

Canyon Ferry Reservoir Management Goals

Walleye abundance in Canyon Ferry Reservoir has remained relatively steady over the past 20 years. Following rapid population expansion in the late 1990s, walleye abundance peaked at 10.4 per net in 1998, fluctuated between 2.0 to 8.9 per net from 1999 to 2016, and reached a record high level in 2017 at 11.6 per gill net. The current walleye population is composed of a large number of smaller-sized fish. Yellow perch abundance has increased slightly in recent years, following record low abundance in 2004 and 2005. Historic declines in perch abundance are largely attributable to increased predation by walleye. Canyon Ferry continues to maintain a quality rainbow trout fishery following changes to stocking strategies to reduce predation by walleye on rainbow trout plants.

Management of walleye in Canyon Ferry Reservoir in the previous twenty years focused on high levels of angler harvest to manage walleye population growth to maintain a multi-species fishery. Although management strategies in the 2010-2019 plan provided some strategies to improve size structure of the walleye population, active walleye management through high bag limits is still necessary to maintain the multi-species fishery by maintaining walleye population levels appropriate for available forage.

The primary goal for managing the Canyon Ferry-Missouri River fishery is to maintain a cost-effective multi-species fishery that maintains high levels of angler use during both the open water and ice fishing seasons. Management of the multi-species fishery will attempt to maintain desirable sport species (rainbow trout, yellow perch, walleye, brown trout, and burbot) as well as maintain populations of non-game species (e.g., suckers, dace, sculpins). To achieve this goal for the system, management strategies must be developed to enhance reproduction and survival of all potential species that will be influenced by predation. Management goals and strategies include:

- Rely on hatchery rainbow trout to continue providing angling opportunity at approximately the current level of angler catch when funding is available. Changes to the numbers and size of rainbows stocked in response to walleye population growth have so far maintained the quality of the rainbow fishery.
- Continue to recognize the importance of yellow perch and apply management strategies to improve the current population to enhance the sport fishery and identify importance as a forage species. Yellow perch are the preferred prey of walleye and provide a significant component to the winter ice fishery.

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In order to preserve spawning sized perch, continuing conservative harvest regulations already in effect is recommended.

- Rely on walleye to maintain a self-sustaining sport fishery to enhance the summer fishery and provide an additional component to the winter fishery. Active walleye management will be necessary to maintain population levels consistent with availability of forage. Strategies for maintaining walleye abundance at levels appropriate for available forage are based on population "triggers" to adjust management actions as walleye populations fluctuate.

- Increase the number of brown trout residing in the reservoir as an additional component to the sport fishery. Maintain restrictive regulations in the reservoir as well as the Missouri River from Toston to Canyon Ferry.

- Rely on burbot (ling) to compliment the winter sport fishery by maintaining the current level of burbot in the reservoir. Burbot is the most popular native sport fish in Canyon Ferry Reservoir. Little is known about the population dynamics and limiting factors that regulate the burbot population.

- Manage and enhance the forage base to support a productive multi-species fishery that includes trout, yellow perch, and walleye. Continue yellow perch habitat enhancement project (i.e., Christmas tree structures) and identify other potential habitat enhancement projects for existing forage species. Introduction of new forage species is not proposed in this Management Plan.

- Monitor and manage the northern pike population in the river and reservoir, and evaluate impacts to other species. An already limited forage base in Canyon Ferry may be unable to support a voracious predator such as northern pike. The Plan proposes strategies to suppress the northern pike population to limit further population expansion.

- Manage fishing contests at Canyon Ferry Reservoir to balance general angling public concerns with competitive tournaments on a species-specific basis and ensure that tournaments are consistent with species management objectives. Regulation of fishing tournaments on Canyon Ferry will reflect management strategies for individual fish species. Authorize up to three walleye tournaments in a calendar year but no more than one tournament per month to provide a balance with existing users of the lake that are not interested in competitive fishing events and who would be impacted by tournament activities. Applications for fishing tournaments will be accepted per FWP policy and considered on a first come, first served basis until all available slots are filled.

- Prevent introduction of new fish species into the upper Missouri River reservoir system by continued prohibition of the use of live fish as bait. An inadvertent introduction could significantly impact the existing fish communities in Canyon Ferry Reservoir as well as upstream and downstream waters.

- Prevent new diseases and Aquatic Invasive Species (plant and wildlife) from entering the Canyon Ferry/Missouri River system and limit the expansion of current disease agents.

- Work with FWP's Wildlife Bureau and other government agencies to determine the impacts of pelicans and cormorants to Canyon Ferry fish populations. Consider bird population management measures only if impacts to sport fish populations are documented and deemed significant.

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Hauser Reservoir Management Goals

The goal for managing the Hauser Reservoir fishery is to provide a cost-effective, balanced multi-species fishery with the opportunity to catch rainbow trout, yellow perch, walleye and with kokanee, brown trout, and other species occasionally contributing to the sport fishery. Until factors limiting fisheries production in Hauser Reservoir are addressed, the fishery will not reach it's full potential. Management goals and strategies include:

- Rely primarily on stocked rainbow trout to provide the principal fishery and most fishing opportunity when funding is available. Continue current stocking regime and adjust as angler use and population abundance change.

- Rely on yellow perch to provide a self-sustaining fishery that is based entirely on natural reproduction. Maintain conservative angler harvest limits on yellow perch.

- Rely on walleye to provide a balanced, cost-effective fishing opportunity in Hauser. Utilize angler harvest as a tool to counteract the effects of walleye flushing from Canyon Ferry Dam. Rely on population "triggers" to adjust walleye management strategies as needed.

- Recognize kokanee salmon as a limited sport species with poor angling opportunity in Hauser Reservoir. Current kokanee abundance is too low to set or maintain a realistic management goal. Consider occasional supplemental stocking to see if there are positive population impacts.

- Rely on brown trout to provide a limited trophy-fishing experience that is reliant entirely on natural reproduction.

- Rely on burbot to provide a low-level, self-sustaining fishery that is supported entirely by wild reproduction.

- Monitor and manage the northern pike population in Hauser Reservoir, and evaluate impacts to other species. An already limited forage base in the reservoir may be unable to support a voracious predator such as northern pike. The Plan proposes strategies to suppress the northern pike population to limit further population expansion.

- Continue to evaluate annual and seasonal flushing rates of fish out of Hauser Reservoir. Identify opportunities to reduce Hauser dam flushing losses.

- Determine walleye flushing rates from Canyon Ferry and evaluate measures to reduce or eliminate walleye flushing from Canyon Ferry Dam. Increased walleye densities in Hauser affect the balance of the multi-species fishery with increased predation on trout and perch.

- Enhance wild fish spawning opportunities in Hauser Reservoir and in tributary streams to Hauser Reservoir.

- Continue to monitor and prevent introductions of aquatic invasive species (plant and wildlife) throughout the reservoir system.

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- Manage fishing derbies/tournaments on Hauser Reservoir to minimize conflict with the general angling public and to ensure consistency with fishery management goals and objectives. Authorize up to three tournaments per year.

Missouri River - Hauser Tailwater Management Goals

(Hauser Dam to Holter Reservoir)

The management goal for the 4.6 mile-long reach of the Missouri River below Hauser Dam is to provide a multi-species fishery focused on wild rainbow and brown trout, with walleye and kokanee providing a low-level component to the fishery. Management of this water is greatly affected by the management direction of Canyon Ferry, Hauser, and Holter reservoirs. Management goals and strategies include:

- Rely on rainbow trout (particularly wild rainbow trout) to provide a cost-effective, sustainable fishery. Encourage the development of wild rainbow trout spawning and recruitment from the Hauser tailrace and Beaver Creek.

- Rely on walleye flushed from Hauser Reservoir, resident walleye, and migratory adults from Holter to contribute to a multi-species fishery. Adjust walleye bag limits to maintain consistency with walleye management strategies in the reservoirs. Continue to determine walleye flushing rates from Canyon Ferry Reservoir and downstream survival of flushed walleye if research funds become available.

- Rely on brown trout to provide a self-sustaining trophy component to the Hauser tailwater fishery. Maintain the catch and release fishing regulation that was implemented in 1992 for this reach of the Missouri River and Holter Reservoir.

- Rely on remaining kokanee salmon flushed from Hauser Reservoir and any natural reproduction and supplemental stocking that may occur in Holter Reservoir to contribute in a limited way to the multi-species fishery.

- Enhance wild fish spawning opportunities in Holter Reservoir tributary streams.

- Continue monitoring the Missouri River and principal tributaries for Aquatic Invasive Species. Continue efforts to prevent AIS from entering the river.

Holter Reservoir Management Goals

The management goal for Holter Reservoir is to provide a cost-effective, balanced multi-species fishery with the opportunity to catch rainbow trout, walleye, yellow perch and kokanee salmon. Management goals and strategies include:

- Rely on rainbow trout to provide one of the principal sportfish species in Holter Reservoir. Continue to emphasize maximizing the contribution of wild to stocked rainbow trout in the fish community to minimize flushing losses. Stocking of fish will occur after high water.

- Rely on yellow perch to provide a cost-effective, self-sustaining fishery that is maintained entirely by wild reproduction. Adjust perch bag limits based on outlined management strategies to prevent over harvest and provide forage for walleye.

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- Rely on walleye to provide a cost-effective fishery that allows a moderate level of harvest while providing the opportunity to catch a trophy fish. This fishery will be reliant entirely on wild reproduction or flushing from upstream dams for recruitment. Adjust harvest regulations to maintain walleye densities appropriate for forage abundance. Determine walleye flushing rates and survival from Canyon Ferry Reservoir and impacts on Holter Reservoir.

- Rely on kokanee salmon flushed from Hauser Reservoir, stocking of surplus hatchery fish, and any natural reproduction that may occur in Holter Reservoir to provide limited kokanee harvest. Recognize kokanee as a supplemental fish to the sport fishery in Holter Lake.

- Rely on burbot to provide a self-sustaining fishery that is supported entirely by wild reproduction. Increase data collection efforts to learn more about the Holter burbot population.

- Determine annual and seasonal flushing rates of fish out of Holter Reservoir and the feasibility of screening Holter Dam or adjust dam operations to reduce flushing losses if funds become available.

- Enhance wild fish spawning opportunities in Holter Reservoir tributary streams. Identify and complete enhancement projects that will benefit spawning and recruitment of wild fish in Holter Reservoir.

- Continue monitoring Holter Reservoir and principal tributaries for AIS. Continue efforts to prevent AIS from entering Holter Reservoir.

- Due to potential conflicts with the general angling public and safety concerns due to limited access points, open water derbies/tournaments are not recommended. Ice fishing contests are not recommended due to safety concerns from variable ice conditions.

Plan Implementation and Public Involvement

This plan will be used to direct fisheries resource management activities for the next 10 years (2019-2028) on Canyon Ferry Reservoir, Hauser Reservoir, Holter Reservoir, and associated sections of the Missouri River. Fish population monitoring will be conducted annually to verify the effectiveness of management decisions. Data will be summarized and presented to interested citizens at annual public meetings (Table 3). Time frames for the draft Plan and final approval are contingent upon FWP Commission action and subject to change.

Table 3. Upper Missouri River Reservoir Management Plan Implementation Process

Schedule	
Action	**Dates**
Draft Management Plan Public Comment	October-November, 2018
Final Management Plan (FWP Commission final approval)	December 2018
Adopt new fishing regulations	Annually, or as needed
Monitor Fisheries	On-going, annually
Prepare Annual Report	Fall, annually
Public Meetings	Late winter or early spring, annually
Review/Revise Management Plan	As needed
Propose Changes to Fishing Regulations	Regulation review cycle, or as needed

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Section 1
Management Plan Area

The Upper Missouri River Reservoir Management Plan area is comprised of a portion of the Missouri River from Toston Dam, approximately 18 miles south of Townsend, to Holter Dam, approximately 30 miles north of Helena (Figure 1). Three reservoirs are included in the management area: Canyon Ferry, Hauser, and Holter. Two river sections are included in the area: from Toston Dam to Canyon Ferry Reservoir and the Hauser Tailrace from Hauser Dam downstream 4.6 miles to Holter Reservoir. A variety of important fish species are present within the management area. Rainbow trout, yellow perch, walleye, brown trout, burbot (ling), and kokanee salmon are among the species of greatest interest to the public. Canyon Ferry Reservoir is the first major storage impoundment on the Missouri River. Hauser and Holter reservoirs lie about 3 and 30 miles downstream from Canyon Ferry, respectively. Downstream movement of hatchery rainbow trout from Canyon Ferry to Hauser and Holter reservoirs has been documented during periods of high surface water releases (Skaar and Humphrey 1996) and flushing of walleye out of Canyon Ferry has heavily influenced fish species composition in the downstream reservoirs.

Combined, the upper Missouri River reservoir system averaged over 8% of the fishing pressure in Montana from 2001-2015. These reservoirs traditionally are in the top 5 most heavily fished waters in Montana with Canyon Ferry averaging 97,072 angler days (1989-2015), Hauser averaging 54,476 angler days (1989-2015) and Holter averaging 64,398 angler days (1989-2015). This level of pressure equates to an average 2.8 angler days per acre on Canyon Ferry, 14.3 angler days per acre on Hauser, and 13.4 days per acre on Holter. Canyon Ferry was the most heavily fished water in Montana in 1989, 1993, 1995, 1999, and 2009 and is consistently the top flatwater fishery in Montana (Figure 2). Hauser Reservoir was the most heavily fished body of water in the state in 1991 (Figure 2), which was attributable to a booming kokanee salmon population that resulted in a record 141,000 kokanee harvested that year. Over the entire system, angler use generally trended downward from 1999-2007, and use generally trended upward from 2009-2015 (Figure 2). Angler use in the system peaked at 315,558 angler days in 2009, accounting for 9.4% of all angler use in Montana that year.

Canyon Ferry Reservoir and Missouri River
(Toston Dam to Canyon Ferry Reservoir)

The Toston Dam to Canyon Ferry Reservoir reach of the Missouri River has been managed for wild trout since 1973, including significant seasonal movement of hatchery fish into this reach of the Missouri River. The sport fishery is primarily comprised of and rainbow trout, walleye, and brown trout. Although this reach of river is located downstream from Toston Dam, it does not have characteristics of tailwater fisheries like reaches of the Missouri River below Canyon Ferry, Hauser and Holter dams because the low head structure (26 feet) does not disrupt natural temperature extremes. Toston Dam is located 23 miles above Canyon Ferry Reservoir and is a barrier to upstream migrating fish. The 23-mile reach of the river upstream of Canyon Ferry Reservoir represents a transition area of the upper Missouri where cold-water species of fish and invertebrates thrive during average precipitation years or cool/wet years. During dry/warmer summers, this reach of the Missouri River becomes unsuitable for cold-water species of fish and invertebrates. Since the Canyon Ferry/Missouri River fishery is linked by seasonal fish migrations, the reservoir and the river are managed as a system.

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Canyon Ferry Dam and Reservoir is operated by the U.S. Bureau of Reclamation (BOR) for power production, flood control, irrigation, recreation, and as a municipal water source. Canyon Ferry has been in full operation for the past 63 years. At full pool, Canyon Ferry has a surface area of 35,200 acres and a volume of nearly 2 million acre-feet. It is about 25 miles long and 1 to 4.5 miles wide. Canyon Ferry is a moderately deep reservoir, with an average depth of 58 feet and maximum depth near the dam of 160 feet (Table 4). The upper, southern half of the reservoir is characterized by low relief, relatively shallow depth (less than 50 feet), and gently sloping shorelines. It is frequently subject to strong winds, especially during the spring months. The lower, northern half is more protected and is characterized by cliffs and steeply sloping, rocky shorelines, particularly on the western shore. Depths tend to increase rapidly to greater than 60 feet a short distance from the shoreline. Submerged or emergent aquatic vegetation is almost totally absent in the reservoir (McMahon 1992).

The shoreline length of Canyon Ferry at full pool is 76 miles. The shoreline development factor, an index of the irregularity of the shore, is 2.9 (Rada 1974), reflecting a relatively uniform shoreline (1.0 is a circle) punctuated by a number of small coves and bays located near the mouths of tributary streams. Land immediately surrounding the reservoir is principally owned by the BOR with some private land. BOR manages recreational areas, including campgrounds, boat ramps, and day-use areas around the reservoir. Major tributaries to the reservoir include Duck Creek, Confederate Gulch, Hellgate Creek, Avalanche Creek, Magpie Creek, and Beaver Creek (Figure 3).

Reservoir Operation

Rapid filling of the reservoir begins in early May with peak storage occurring in late June to early July, followed by a steady decrease (about 2 feet per month) during the summer period of high irrigation use (July-September). Decreases in reservoir volume continue throughout the fall and winter in preparation for storage of spring run-off. The retention time of water in the reservoir averages 135 days but ranges from 50-200 days depending on reservoir elevation and inflow-outflow regimes (Horn and Boehmke 1998). The storage ratio (reservoir water volume divided by average annual water release) averages 0.53. The annual water level fluctuation (drawdown) averages about 12 feet (McMahon 1992).

Canyon Ferry Reservoir is typically drawn down to its minimum level in March, and then is refilled during the March to June period. A reservoir operations steering committee comprised of FWP, NorthWestern Energy, BOR, irrigators and sportsmen meets annually to review operational recommendations for Canyon Ferry Reservoir to balance multiple uses like flood control, power generation, irrigation and recreation and to minimize impacts to fish and wildlife.

Discharge from Canyon Ferry Dam occurs at various outlets: the radial gates near the top of the spillway (30 feet deep); power penstocks (94 feet); irrigation outlet (110 feet); and the river outlet (147 feet). The power penstocks are usually the main release point, except in spring and summer when additional releases are made from the spillway, irrigation, and river outlets (Rada 1974). Releases from the radial gates typically occur during June and July following peak river run-off. Radial gate spills occur in roughly two out of every three years, with an average duration of 30-45 days (McMahon 1992). Canyon Ferry has a generating capacity of 50-megawatts.

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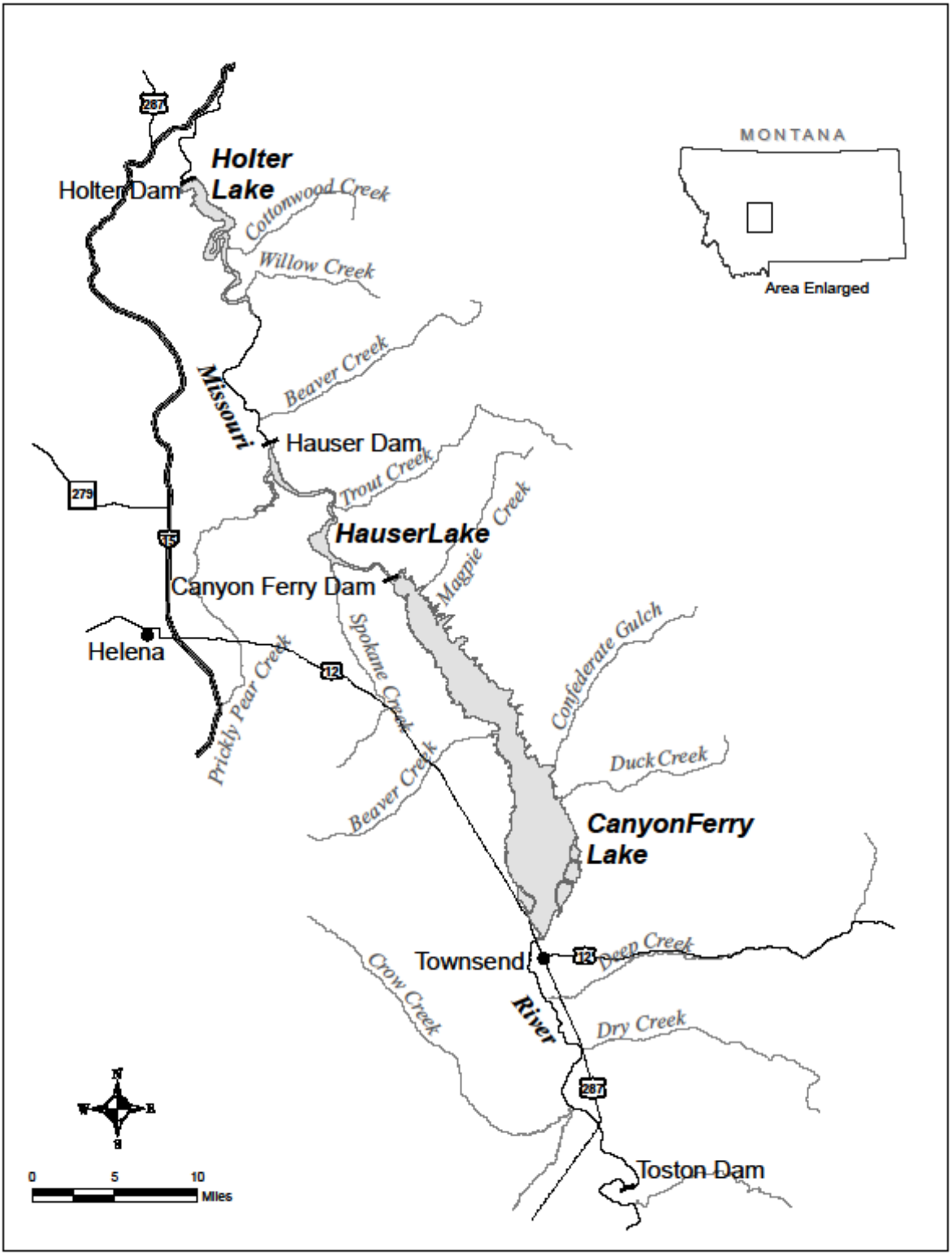

Figure 1. Upper Missouri River Reservoir Management Area.

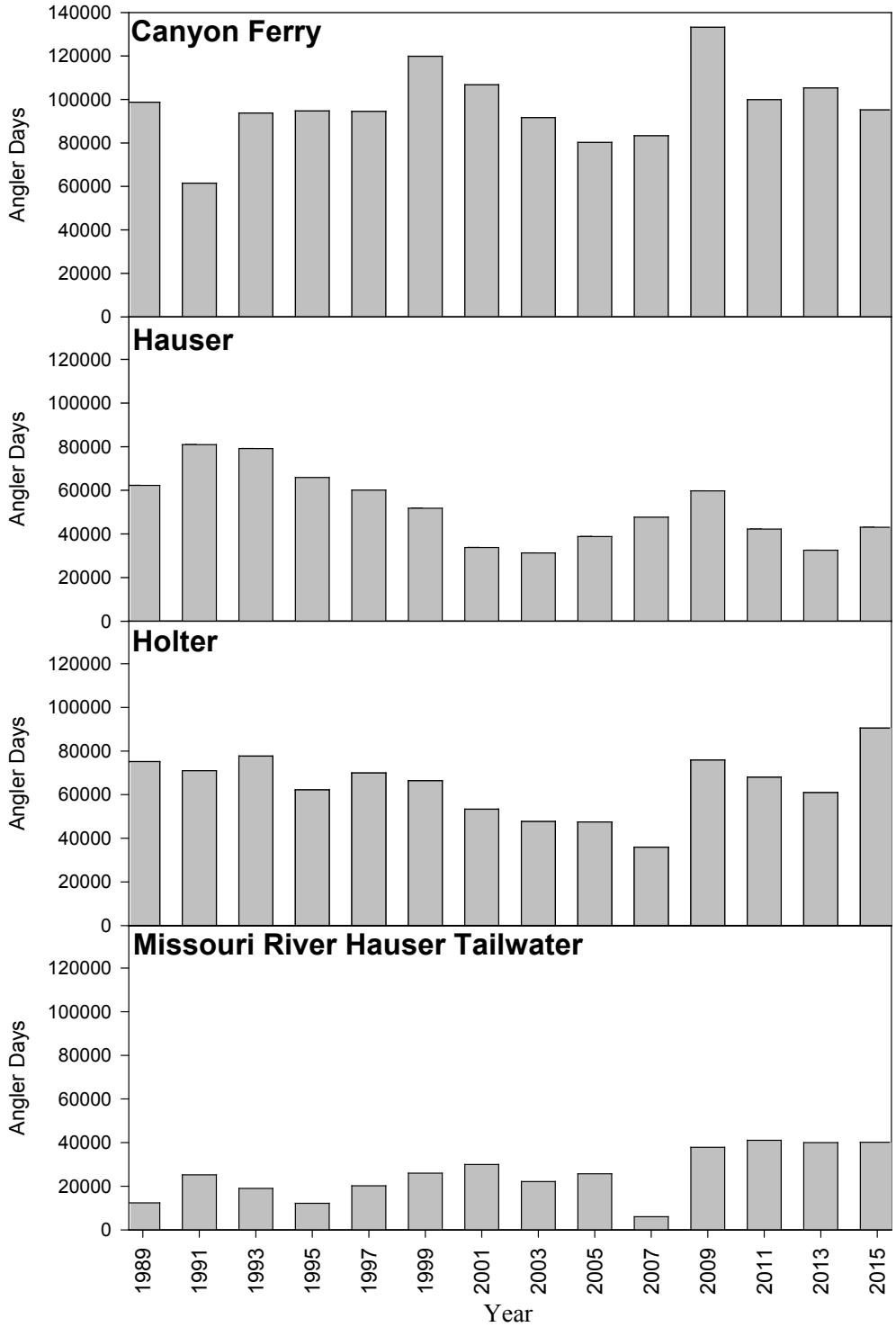

Figure 2. Angler Days on Canyon Ferry, Hauser, and Holter Reservoirs and Missouri River Hauser Tailwater.

Fisheries and Water Quality

Canyon Ferry Reservoir

The sport fishery of the Canyon Ferry Reservoir/Missouri River system is primarily comprised of rainbow trout, yellow perch, and walleye with a brown trout and burbot (ling) component. Other game fish species in the system currently are not abundant enough to provide significant sport fishing opportunities, including northern pike, smallmouth bass, bluegill, and largemouth bass. Non-game species in this system are abundant, but not particularly diverse. The three primary nongame species include common carp, longnose sucker, and white sucker. Anglers at Canyon Ferry Reservoir primarily target rainbow trout (year-round), yellow perch (year-round), and walleye (summer). Yellow perch continue to be popular during the winter ice-fishing season despite relatively low population abundance levels. Burbot (ling) are also a popular sport fish during the winter and early spring season and can be an important component of the winter fishery. Yellow perch, walleye, brown trout, and burbot sustain populations entirely through natural reproduction. Rainbow trout in Canyon Ferry Reservoir are primarily sustained through hatchery plants. Natural reproduction accounts for less than 10% of the total population of rainbow trout.

Walleye have become a significant component of the Canyon Ferry fishery, especially during the summer fishing season. This population has expanded rapidly since the late 1990s and is now one of the most sought-after species in the reservoir. Prior to 1996, no walleye were observed in the standard roving creel census and reports of walleye caught by anglers were uncommon. In summer 2017, 40% of anglers were fishing for walleye exclusively and 75% were targeting walleye in combination with some other species, such as trout.

Angling pressure at Canyon Ferry typically ranks near the top of the statewide angling pressure survey, averaging 97,072 angler days from 1989-2015 (Figure 2). Canyon Ferry was the most heavily fished water in Montana in 1989, 1993, 1995, 1999, and 2009. Angling pressure peaked at 133,220 angler days in 2009. Approximately one third of the angling pressure at Canyon Ferry (35, 000 angler days) occurs during the relatively short ice-fishing season of January, February, and early March. Yellow perch and rainbow trout comprise most of the winter fishery, with minimal contribution from walleye and burbot.

Water transparency (Secchi disc depth) averages about 10 feet. Transparency varies by a factor of two to three from the upper to the lower reservoir, averaging 6, 10, and 15 feet in the upper (Silos), mid (White Earth), and lower (Cemetery) sections during the summer. A detailed limnological analysis of the reservoir in the early 1970s classified Canyon Ferry as mesotrophic or of intermediate fertility on the scale between shallow, nutrient-rich, often turbid eutrophic waters and clear, deep, nutrient-poor oligotrophic waters (Rada 1974). More recent studies have found little change in nutrient levels and trophic status of the reservoir (Horn and Boehmke 1998). Dissolved oxygen (DO) levels recorded for Canyon Ferry surface waters are excellent, with minimum values typically exceeding 7 mg/l (Priscu 1986, Thomas 1992). However, Rada (1974) reported that DO levels fell below 5 mg/l during summer at depths below the thermocline (60 feet) near the dam. Low DO levels may affect some cold water fish species and can create a low DO plume in Hauser Reservoir. The pH levels in Canyon Ferry vary between 7 and 8.5 (Rada 1974).

Surface temperatures typically warm to 55ºF by late May, peak near 70ºF in early August, and cool to below 50ºF by late October. The combination of wind action and a deep reservoir outlet (94 feet at power penstock) results in a deep, weakly developed thermocline in Canyon Ferry. Water in the upper reservoir tends to remain mixed throughout the ice-free season (April-December) because of shallow depths and frequent winds. In the middle and lower reservoir, a weak thermocline is present from June through August at a depth near 60 feet (McMahon 1992).

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Missouri River (Toston Dam to Canyon Ferry Reservoir)

Drought conditions in the early 2000's had detrimental effects to the Missouri River fishery between Toston Dam and Canyon Ferry. CPUE electrofishing surveys conducted annually in the fall indicate that mountain whitefish, rainbow trout, and brown trout abundance has remained at low levels since the drought years. The rainbow fishery in this section is highly dependent upon stocking in Canyon Ferry, and rainbow CPUE in the river has increased slightly in recent years. This is likely due to improved water flows and modifications to the stocking regime in the reservoir.

Abundance of brown trout in the river has changed little over the past ten years. Brown trout have always comprised a small component of the Canyon Ferry fishery and have been historically present in low to moderate numbers in the river. Spawning habitat and dewatering of spawning tributaries have typically limited brown trout abundance in the river. It appears that two distinct populations have developed in this portion of the Missouri River/Canyon Ferry system. One population completes their entire life cycle within the Missouri River and its tributaries, while the other population depends on the Missouri River and its tributaries for reproduction, spending the remainder of their life cycle in Canyon Ferry Reservoir. Brown trout reared in the reservoir become larger than those that reside in the Missouri River. Both populations appear to be limited by their ability to recruit and remain at low levels.

Migratory Canyon Ferry walleye have become seasonally abundant from spring to fall in the Missouri River since the mid-2000's. A walleye telemetry study, conducted during 2015-17, confirmed a pattern of walleye movement into the Missouri River from Canyon Ferry Reservoir in mid-April and the return of the fish to the reservoir in mid-October. Northern pike abundance increased in the Toston Dam area in the 2000's and continues to cause concern in regard to fish management in the upper Missouri River system, as northern pike are an additional predator in an already prey-depleted system. A failure of Toston Dam in 2012 resulted in an influx of northern pike to the river system downstream and to Canyon Ferry Reservoir.

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Table 4. Physical Characteristics of Canyon Ferry, Hauser, and Holter Reservoirs.

Characteristic	Reservoir		
	Canyon Ferry	**Hauser**	**Holter**
Impounded River	Missouri River	Missouri River	Missouri River
Surface Area (acres)	35,200	3,800	4,800
Mean Depth (feet)	58	26	50
Maximum Depth (feet)	164	70	121
Shoreline Length (miles)	76 miles	31 miles	50 miles
Age (years)	63 years	107	114
Drainage Area (square miles)	15,904	16,876	17,149
Avg. water retention time (days)	135	8	21
Discharge Type Spill gates a) Bottom b) Mid-depth c) Surface Turbines d) Bottom e) Mid-depth f) Surface	 River Outlet Gates: 138 feet Surface to 31 feet Turbine outlet 91 feet	 Spill gates – surface (0-14 feet) Turbines – 16-32 feet	 Spill cap (0-6 feet) Spill gates (6-16 feet) “Exciter Unit” – 25-29 feet Turbines – 24-32feet
Surface elevation at full pool (feet above sea level)	3797 feet	3650 feet	3578 feet
Average annual pool height fluctuation (avg pool ht – avg drawdown height) (feet)	12 feet	2 feet	2 feet

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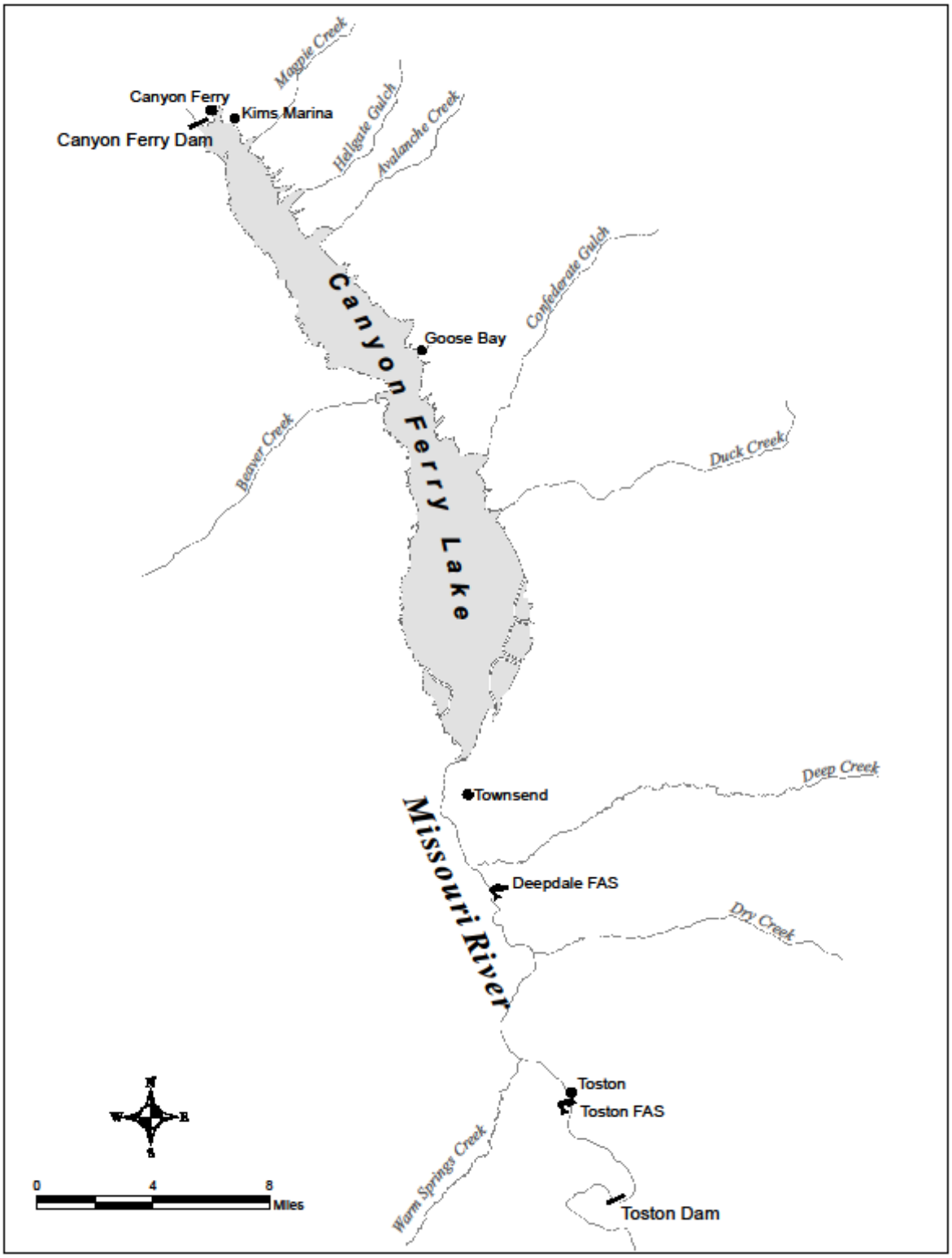

Figure 3. Canyon Ferry Reservoir and the Missouri River from Toston Dam to Canyon Ferry.

Hauser Reservoir, Holter Reservoir, and Missouri River (Hauser Tailwater)

Hauser and Holter are the second and third reservoirs below Canyon Ferry (Figure 4). These two reservoirs differ significantly from Canyon Ferry Reservoir in that they are "run-of-the-river" facilities. This means that approximately the same volume of water flowing into the reservoirs is released. Hauser and Holter dams were constructed in 1911 and 1904 for generating electric power and both reservoirs have limited storage capacity. The dams were historically owned and operated by the Montana Power Company; however, the dams were sold and purchased through the 2000s and are currently owned and operated by Northwestern Energy. Operations of the dams are regulated under a 50-year license negotiated with the Federal Energy Regulatory Commission (FERC) in 2000 (FERC 2000). A 4.6-mile reach of the Missouri River is located between Hauser Dam and Holter Reservoir. This unique segment of river flows through a narrow, high-walled gorge for most of its length prior to entering upper Holter Reservoir.

Hauser Reservoir has a surface area of about 3,800 acres and stores approximately 98,000 acre-feet of water at full pool (Table 4). The Reservoir is about 15.5 miles in length and is relatively narrow, ranging from about 0.1 to 1.1 miles in width. The average depth of the reservoir is 26 feet, with a maximum depth of 70 feet. Important tributaries to Hauser Reservoir include Prickly Pear, Silver, Trout, Spokane and McGuire creeks (Figure 4).

A biologically important feature of Hauser is Lake Helena, which is a large, shallow water body connected to the Causeway Arm by a narrow channel. This impoundment was created when Hauser Dam inundated the lower reach of Prickly Pear Creek. Lake Helena connects to Hauser Reservoir through the Causeway Arm, which enters the reservoir about 1.5 miles upstream from Hauser Dam. The Causeway Arm is 3.9 miles in length from its Hauser Reservoir outlet to the Lake Helena Causeway bridge. The outlet works of the Lake Helena Causeway consist of a narrow rectangular concrete bridge through which water flows from Lake Helena into the Causeway Arm of Hauser Reservoir. Lake Helena has a surface area of 2,100 acres, average depth of five feet, and a maximum depth of 10 feet. Because of the shallow average depth, Lake Helena develops dense mats of aquatic vegetation and is an important waterfowl production area. FWP has a Wildlife Management Area (WMA) on the north shore. Most fish species probably move in from Hauser Reservoir seasonally, especially to take advantage of the early spring water temperatures and productivity.

The free flowing segment of the Missouri River, located between Hauser Dam and Holter Reservoir, is about 4.6 miles in length. This segment of river flows through a narrow, high-walled gorge for most of its length prior to entering upper Holter Lake. Impounded water from Holter Dam greatly influences the lower 1.5 miles of river. Productivity in this river segment is affected by the two upstream reservoirs (Canyon Ferry and Hauser). Deep-water releases from Canyon Ferry Dam and associated releases from Hauser Dam create tailrace conditions where water temperatures are moderated and the water is enriched with nutrients.

Holter Reservoir has a surface area of about 4,800 acres, stores 243,000 acre-feet of water at full pool and is 25 miles long with widths ranging from 0.1 to 1.1 miles (Table 4). The average depth of the reservoir is 50 feet, with a maximum depth of approximately 121 feet. The 4.6-mile segment of free-flowing river located upstream of Holter Reservoir provides very important spawning habitat to migrant salmonids. Beaver Creek, a tributary to this river segment, is the principal spawning stream for reservoir fish, especially in the spring. Cottonwood and Willow creeks are also important tributaries that empty directly into Holter Reservoir (Figure 4).

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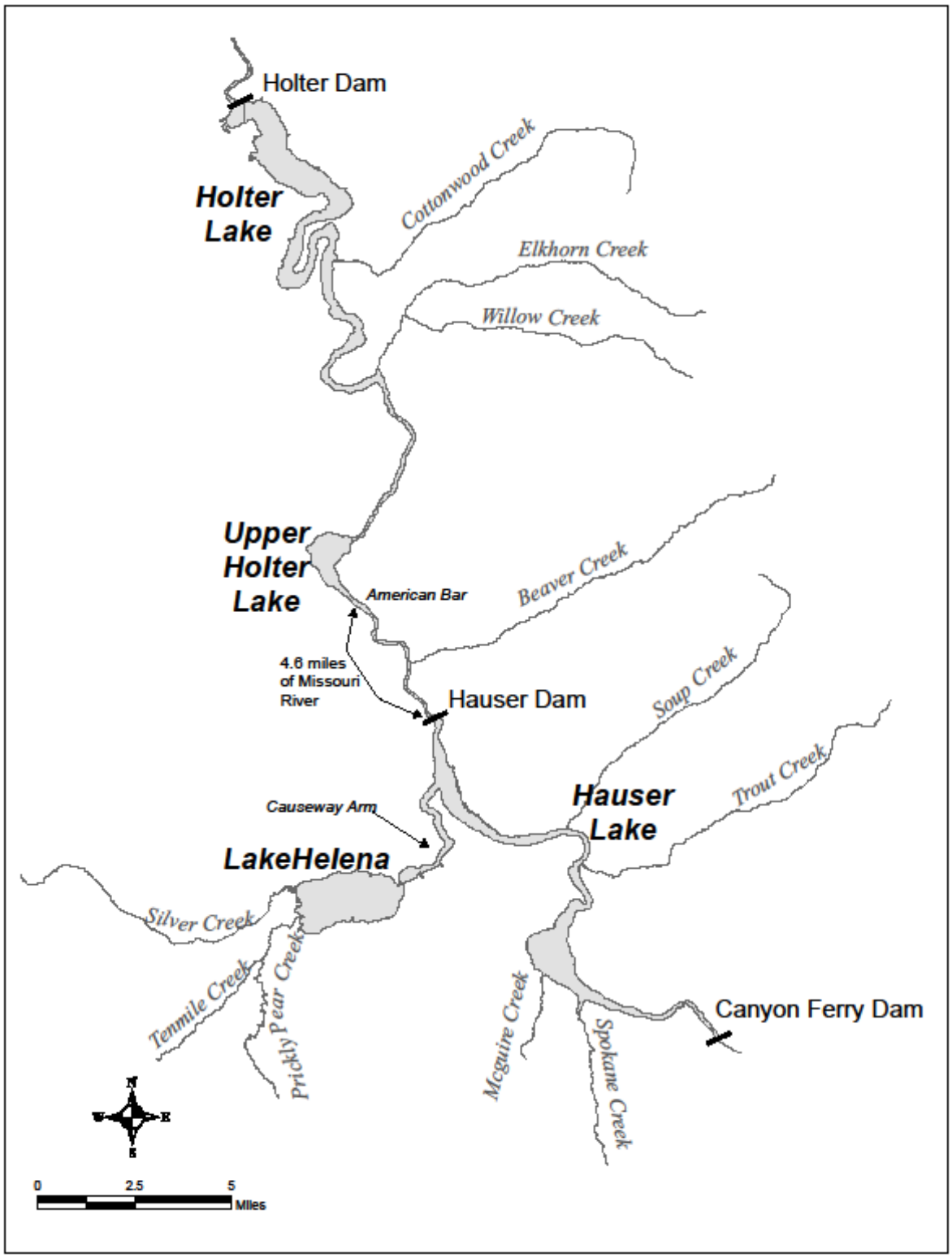

Figure 4. Hauser and Holter Reservoirs.

Reservoir Operation

Hauser Dam is a straight concrete gravity structure that is 700 feet long and 80 feet above the riverbed. The structure consists of an overflow spillway, a non-overflow section, a forebay intake section and two abutment sections. The spillway is 493 feet long with slide gates and removable flashboards for flow control. Hauser Dam has the lowest powerhouse capacity of the three dams (19-megawatts) and therefore spills the most water. Turbine water enters a 32-foot deep intake channel on the east side of the dam. The six-penstock intakes draw from this channel with the openings from 16 to 30 feet below full pool. Water is spilled from five hydraulic gates and 17 manually operated gates. Water that is spilled is drawn from 0-14 feet below full pool. Even on a dry water year such as 1986, water was spilled through much of January, February, and March and again in May. In wet water years such as 1997 and 2011, water is spilled all year.

Holter Dam is a straight concrete gravity structure that is 1,364 feet long and 124 feet above the riverbed. The top of the dam is at elevation 3,568 feet. The structure consists of an overflow spillway section, a powerhouse/intake section, a left non-overflow section and a right non-overflow section. Holter has a generating capacity of 50-megawatts. It has a usable storage of approximately 81,920-acre feet between elevations 3,543 and 3,564 feet. Penstocks are between 24-32 feet below full pool. In addition, an "exciter" unit is always operating which has penstock opening from 25-29 feet below full pool. Water is spilled from a depth of 6-16 feet. In very high-water conditions a "cap" can be removed from the spill gates allowing the top six feet of water to be spilled. In dry years there may be no water flow over the spill gates, while wet water years result in spilling throughout most of the year.

Operation of Holter Dam has a significant impact on the fishery, wildlife and recreational resources of the reservoir and downstream (as experienced in 1986 when flows were shut down). As part of the Federal Energy Regulatory Commission's (FERC) re-licensing process, a draft Environmental Impact Statement (EIS) released in 1997 outlined proposed operational modifications for Holter Reservoir. These guidelines direct NorthWestern Energy to operate Holter as a run-of-the-river project with pool elevations maintained within one foot between 3,543 and 3,564 feet msl (FERC 1997). Previously, a steering committee comprised of FWP, Montana Power Company, BOR, U.S. Forest Service (FS), irrigators, and sportsmen formulated operational guidelines for Holter Dam to optimize recreational values and to minimize impacts to fish and wildlife (FWP 1985). Steering committee recommendations for the operation of Holter Dam included: 1) provide a stable reservoir level, 2) no large spills (10,000 cfs, total turbine and spill) in August or September; and 3) facility maintenance drawdowns should be accomplished in March or during September (after Labor Day) through October 15.

Fisheries and Water Quality

Hauser Reservoir

Angling pressure on Hauser Reservoir has varied considerably and has been closely linked to the abundance of kokanee salmon. In 1991, Hauser Reservoir was the most heavily fished water body in the state at 80,938 angler days (Figure 2). Angler use has stabilized in recent years, averaging 37,897 angler days from 2001-2007 and is currently 44,402 angler days for the period 2009-2015 (Figure 2). Angler demographics historically shifted in response to the status of the kokanee fishery. The percentage of anglers from Lewis and Clark County decreased to 32% during the kokanee boom years (1988 through 1993) while the proportion of nonresidents and Montana anglers traveling more than 150 miles increased. Nonresident angling pressure peaked in 1988 at 19%. In 2017, 67.4% of anglers were from Lewis & Clark County and

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only 3.0% were from out of state. An average fishing trip on Hauser Reservoir in 2017 was 2.3 hours for shore anglers and 3.6 hours for boat anglers.

Yellow perch abundance has improved since hitting record lows in 2008, with the three year average (2015-2017) of 6.6 perch per net. Declines in perch abundance over time are largely attributable to flushing large numbers of walleye into the reservoir from Canyon Ferry. Angler perch harvest has averaged 830 fish annually since 2009, compared to an average harvest of 33,114 annually from 1989-1999. Few anglers target perch specifically, with 0.6% and 1.0% anglers targeting only perch in the 2017 summer and winter creel.

Hauser Reservoir historically supported a small population of walleye, with the first walleye stocked by FWP in Lake Helena in 1951 and additional supplemental stocking in the early 1990s. Presently walleye abundance is highly influenced by flushing of walleye from Canyon Ferry Reservoir. Average walleye abundance was 0.4 walleye per net 1991-1997 and increased to 4.7 walleye per net 1998-2017. Angler catch rates were high over the past 10 years, with an average catch of 0.17 walleye per hour among all anglers; however, harvest rates (number of fish kept per hour) averaged 0.09 fish per hour due to high abundance of small fish. Walleye remain a popular component of the summer fishery, with 24.2% of anglers targeting specifically walleye in 2017. In 2015, anglers harvested 9,049 walleye from Hauser.

Kokanee salmon and rainbow trout dominated the angler creel through the early 1990's. Angler harvest of kokanee declined drastically following the high water year of 1997 and kokanee currently contribute little to the Hauser sport fishery. Rainbow trout are currently the most sought after species in the reservoir, with 66.2% summer anglers and 77.6% winter anglers targeting rainbows in 2017. In 2015, 19,200 rainbows were harvested from Hauser. The majority of the rainbow trout caught in the reservoir continue to be of hatchery origin (average less than 10% wild fish caught).

Brown trout numbers have remained low with long-term gillnet catches averaging 0.3 fish per net in spring and fall sinking gillnets from 2009-2017. Numbers are so low that long-term population trend evaluation is difficult. However, trophy sized brown trout are occasionally taken in the reservoir, especially during the fall when spawners concentrate around the mouths of the tributaries and the Canyon Ferry tailrace area.

Water quality in Hauser is heavily influenced by Canyon Ferry Dam, especially in areas upstream of Spokane Creek. Short water retention times can lead to riverine-like conditions throughout Hauser, which can limit in-reservoir productivity. Weak layers of thermal stratification occur late in the summer in the lower reservoir. Deep-water releases from Canyon Ferry Dam can form a low DO plume during late summer, which is below the state water quality standard of 6.5 mg/L in flowing water. When stratification breaks up in Canyon Ferry in the fall, Hauser DO increases to saturation. This low DO plume may be a limiting factor in fish movement and habitat use in Hauser (Horn 2004). An air compressor on one power turbine improved DO above state water quality standards; however, the unit was only used for two seasons due to lost efficiency for power generation.

Missouri River - Hauser Tailwater (Hauser Dam to Holter Reservoir)

Angler use is very high on this short section of the Missouri River. Angler days per year averaged about 21,000 (1991-2007) and has increased to 40,000 (2009-2015). This is reflective of the fact that this is the closest river fishery to the greater Helena area. A comprehensive creel survey initiated in 2011 revealed that a majority of anglers fishing the river are from Lewis and Clark County (79%), while about 9% of the anglers are from out of state. Most (48%) of anglers interviewed on the river are using flies whereas 30% are using bait. Rainbow trout are the most targeted game species at 77% with trout general (both brown

and rainbow) representing 10%. Annual catch rates for rainbow in 2017 were an excellent 0.83 fish/hour with most fish (88%) being released.

Recent fall electrofishing population estimates found rainbow trout numbers to be relatively stable, averaging 4,416 fish/mile during 2013, 2015, and 2017 sampling. In 2017, the average rainbow captured during fall estimates was 17.3-inches long, and 80% were hatchery fish that migrated upstream from Holter Reservoir or were flushed from Hauser Reservoir. Brown trout abundance is currently lower than in the 1980s, averaging 191 brown trout per mile 2015-2017, verses 391 in the 1980s. Trophy brown trout are a significant component of this river section, which is reflected in electrofishing estimates. In 2017 the average size brown trout was 19.5-inches. Walleye also provide a seasonal element to the fishery, with trophy walleye often caught early in the spring and fall.

Migrant kokanee from Holter Reservoir historically contributed to the river fishery during the fall. This fishery has fluctuated through the years and has reached record lows with the collapse of the Hauser Reservoir kokanee fishery. The remaining game fish species, including burbot, yellow perch, and mountain whitefish, are not commonly caught in the river.

Holter Reservoir

Holter Reservoir has historically been one of the most diverse and productive multi-species fisheries in the state. In some years, Holter provides good to excellent fishing for rainbow trout, kokanee salmon, walleye, and yellow perch simultaneously. Angling pressure on Holter Reservoir averaged 60,657 angler days annually from 1989-2007 and has increased to 73,797 angler days from 2009-2015 (Figure 2). In 2015 Holter had a record 90,470 angler days, largely attributed to higher yellow perch numbers since 2013. Because of Holter's proximity to Great Falls, most anglers fishing on the reservoir are from Cascade County (55% from Cascade County in 2017) while 14% of the reservoir users were from Lewis and Clark County and 4% traveled from out of state. Most anglers fishing Holter Reservoir in 2017 during the summertargeted rainbow trout (54%) while anglers fishing for perch specifically comprise 30% of the fishing pressure.

Rainbow trout are generally the most sought after species in Holter. Historically the average harvest of rainbows was 39,500 during the period of 1989-1999; however average harvest decreased to 28,800 from 2000-2008. Harvest numbers have increased in recent years, averaging 71,500 rainbows annually from 2009-2015. Average size of creeled rainbow trout has remained high with an average rainbow in 2017 measuring 17.5-inches. Historically, wild trout comprised a significant component of the rainbow fishery (between 20-66%), but in recent years wild fish make up a much smaller component of the fishery, generally less than 10% of the catch in fall floating gillnets from 2009-2017.

Yellow perch harvest reached record levels in 2015 with 319,902 perch harvested, well above the long-term average of 151,479 perch (1989-2007). For anglers specifically targeting perch, catch rates reached record levels in 2014 when they increased to 5.37 fish/hour during the summer and 7.85 fish/hour during the winter.

Walleye harvest in Holter has increased significantly following development of the Canyon Ferry walleye fishery. From 1989-1999 angler harvest averaged 1,536 walleye annually. From 2000-2008 angler harvest increased to an average of 9,544 walleye annually. Currently (2009-2015) angler harvest has increased even further to an average of 16,743 walleye annually. Average size of walleye harvested has remained small as Holter historically has had a slot limit to protect larger spawning sized fish but also from an increase in the number of young of the year fish thought to be flushed from Canyon Ferry when water is spilled from

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the surface spill gates. Walleye growth rates have declined as a function of increased walleye population densities.

Like in Hauser, kokanee harvest has declined drastically since 1998. From 1986-1998, Holter kokanee harvest averaged 13,897 fish. From 1999-2007, annual harvest averaged only 577 fish and only 296 kokanee were harvested in 2007. There is a remnant kokanee fishery in Holter that is sustained by stocking of surplus hatchery fish and fish flushed from Hauser Reservoir. The last time kokanee were stocked into Holter was in 2009 when approximately 104,000 fish were stocked in the spring. Recruitment of these fish to the sport fishery is highly variable and kokanee are expected to maintain a low-level population in Holter.

Brown trout are seldom caught in Holter Reservoir and contribute very little to the reservoir fishery. Very few anglers target brown trout due to low population densities; however, trophy-sized brown trout are occasionally caught by anglers in the upper reservoir.

Burbot are native to the upper Missouri River system and have always had a very low level of abundance in Holter. Population monitoring in fall gillnetting has shown increases in burbot numbers in recent years. Burbot maintained low densities of 0.01 per gillnet during the period 1986-1999. That number increased slightly to 0.3 per gillnet from 2000-2008 and to 1.4 per gillnet from 2009-2017. In recent years burbot have been caught during the winter creel surveys, with anglers specifically targeting them.

Canyon Ferry Dam normally controls flow patterns in Holter Reservoir. Annual discharge from Holter Dam averages about 3.7 million acre-feet (1929 through 1988). The intake capacity for water into the generators within the dam is approximately 7,000 cfs with all remaining water being spilled. Spilling surplus water over Holter Dam is a common occurrence, especially during the spring. Because of a relatively small storage capacity, Holter Reservoir has a short retention time with water in the lake being replaced about every 21 days. During spring runoff, retention time can be significantly less than 21 days. Holter Reservoir can be considered slightly productive when compared to other impoundments. Blooms of algae occasionally develop during the summer. Water temperatures tend to be similar to those in Hauser Reservoir and weak thermal layering has been found to occur during the mid-summer period.

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Section 2
Missouri River (Toston Dam to Canyon Ferry Reservoir)

Management History

Management efforts since 1991 have focused on rehabilitating degraded spawning and rearing habitat in tributaries entering both the river and Canyon Ferry Reservoir. Project funding has come from Broadwater Power Plant fisheries mitigation (Toston Dam), FWP Future Fisheries Improvement Program, and the Broadwater Stream and Lake Committee. These efforts have targeted both rainbow and brown trout populations. Monitoring of these tributaries for spawning use includes redd counts, juvenile fish trapping, and the operation of an adult fish trap at Deep Creek since 1993. As a general indicator of the extent of spawning use in system tributaries, the adult fish trap captured an average of 1,311 spawning rainbow trout from 1993 through 2008 (range from 176 to 2,386 rainbow trout per year). Anecdotal evidence indicated increased use of this river section by walleye through the 2000s, and a tracking and tagging study from 2015-17 found seasonal concentrations of walleye throughout the summer and early fall. Fish management trends in the mainstem Missouri River are monitored through spring and fall electrofishing annually.

Management Goals and Limiting Factors

The goal for managing the Missouri River between Toston Dam and Canyon Ferry Reservoir is to provide naturally reproducing brown and rainbow trout populations in the Missouri River and associated tributaries for recreational fishing opportunities, and to provide important spawning and rearing conditions for the Missouri River/Canyon Ferry system. In addition, a naturally reproducing walleye population provides recreational fishing opportunities in the main stem Missouri River.

Quality spawning and rearing habitat is limited for sustaining a high-density brown trout or rainbow trout fishery in this reach of the Missouri River. In addition, high water temperatures (approaching 80 degrees) and low stream flow occasionally impact trout fisheries and the food base during drought years. High sediment loading also impacts the quality of habitat for trout and invertebrates. Although improvements to habitat and stream flow have been made on a number of tributaries in the system since 1991, the overall quality of available spawning and rearing streams remains relatively poor. Extreme drought conditions from 2000-2007, 2013, and 2015-2016 have further deteriorated habitat conditions in the river and tributaries.

Whirling disease has been documented in the system, and although rates of infections appear to be relatively steady at the present time, increased mortality of young rainbow trout rearing in tributaries can be expected as this disease persists. Increasing observations of physical deformities due to whirling disease at the Deep Creek fish trap are cause for concern for adult fish that were infected by the disease as juveniles. Long-term impacts will likely result in decreased numbers of juvenile rainbow trout and reduced recruitment of adults that were infected as juveniles.

Quality habitat for rearing trout, particularly along shoreline areas, is limited in this reach of river resulting in poor juvenile rearing for brown trout, particularly during drought years. This lack of

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structural habitat, including good cover and holding areas for protection, results in increased predation by birds and fish.

Angler observations of walleye from Toston Dam to Canyon Ferry have increased in recent years. The development of a northern pike population above Toston Dam and within Canyon Ferry Reservoir further confounds fisheries management in this stretch of river. Walleye and northern pike are a highly predatory species and depending on population abundance, could further limit fish production in the river as well as Canyon Ferry Reservoir. Increased use of river habitats by both northern pike and walleye may result in increased predation losses for trout and forage fish in future years.

Missouri River Management Goals by Species (Toston Dam to Canyon Ferry Reservoir)

Rainbow Trout

Goals and Objectives:

Rely on rainbow trout to provide both a resident fishery throughout the year and a migratory fishery linked to Canyon Ferry that enters the river during the fall and spring.

- Maintain a stable trend of rainbow trout exceeding 1.0 rainbow trout per minute based on fall CPUE electrofishing sampling near Toston.

Rationale:

Through the late 1990s, the rainbow trout population increased to approximately 300 trout per mile because of seasonal migration of wild strains of rainbow stocked in Canyon Ferry Reservoir. In addition, the wild strains successfully reproduced, enhancing the wild, resident component of the rainbow fishery. Following drought conditions from 2000-2007, not enough rainbows were collected during fall sampling to calculate a viable population estimate; therefore current management goals are set on CPUE of 1.0 rainbow per minute of electrofishing. Sustaining this rainbow fishery will be a challenge and may be unrealistic if the walleye and northern pike populations in the Canyon Ferry and Missouri River expand. Water temperatures and flows may further limit trout abundance if low stream flow levels observed from 2000 to 2007 become more common. Fishing closures on primary spawning tributaries until June 15 helps protect fish during spawning runs.

Strategies:

- Continue stocking wild strains of rainbow trout in Canyon Ferry Reservoir to support the existing spawning runs in the system. Monitor movement and use of the river by domesticated strains of rainbow trout.

- Experiment with new strains of rainbow trout that may develop life history strategies conducive to the limiting conditions.

- Continue tributary enhancement (e.g., Deep Creek where Clean Water Act and DNRC Broadwater Power Plant Mitigation funds are used to enhance watershed health). Work with local water districts and irrigators to improve stream flows during critical periods.

- Maintain harvest regulations designed to protect spawning fish in tributaries and other important spawning areas.

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- Identify additional limiting factors and consider management changes as needed.

Walleye

Goals and Objectives:

Manage the walleye population to minimize impacts on existing trout and forage species and provide a low-level sport fishery.

Rationale:

Rainbow and brown trout provide fishing opportunity during spring and fall seasons, but walleye likely comprise the primary sport fishery during summer months in the past 5-10 years. A walleye telemetry study conducted during 2015-17 (Strainer 2018) confirmed a pattern of walleye movement from Canyon Ferry into the Missouri River in mid-April and the return of the fish to the reservoir in mid-October. During summer months, walleye are common in the Missouri River throughout the reach (Toston Dam to Canyon Ferry) and are likely the primary sport fish targeted by anglers during that time. Continued expansion of walleye from Canyon Ferry into the river could adversely affect rainbow and brown trout populations due to increased predation. Impacts from drought conditions could further limit the trout sport fishery from Toston to Canyon Ferry. In addition, walleye reproduction in the river was first documented in 2017 through the capture of young of the year walleye during beach seining efforts.

Strategies:

- Manage the river walleye population consistent with Canyon Ferry management goals and objectives.
- Continue to monitor the Missouri River walleye population and determine impacts to wild trout populations in the river.
- Determine the feasibility of conducting a creel survey on the Missouri River from Toston Dam to Canyon Ferry to determine walleye angling dynamics.
- Recommend additional management action as needed.

Brown Trout

Goals and Objectives:

Rely on brown trout to provide a resident fishery throughout the year and a migratory population of large fish that enter the river during the fall.

- Attempt to increase the population to historic levels observed prior to drought conditions from 2000-2007. (Approximately 0.40 brown trout per minute based on CPUE sampling near Toston).

Rationale:

The main reason for the brown trout population decline is not known, although factors such as drought conditions during the early 1990s and early 2000s have been a major factor throughout southwest Montana. In addition, other factors may have contributed to the decline, including: the elevated rainbow trout population resulting in increased competition for limited spawning habitat; the 1989 Toston Dam hydropower retrofit; whirling disease; angler over-harvest during fall spawning periods; and others. One component of the Broadwater Power Project mitigation was to collect brown trout eggs in the wild, rear these fish in the hatchery, and imprint brown trout to the Missouri River and Deep Creek after habitat projects were completed. Approximately 400,000 brown trout were imprinted during 1992 to 1998, but return on these fish was very poor. In fact, the population continued to decline during the imprint process.

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It is possible that egg collection efforts impacted the natural spawning runs and the imprinting of juvenile brown trout was insignificant in offsetting the egg collection impacts.

There is potential for improved brown trout numbers as record drought conditions from 2000-2007 has broken; however, concerns over dewatering, lethal temperature thresholds, and competition for limited habitats present management challenges for brown trout.

Strategies:

- Continue tributary enhancement (e.g., Deep Creek where Clean Water Act and DNRC Broadwater Power Plant Mitigation funds are used to enhance watershed health). Work with local water districts and irrigators to improve stream flows during critical periods.

- Protect spawning-sized brown trout through modified bag limits.

  - Continue to implement catch and release only regulations for brown trout. Children age 14 and under can possess one brown trout.

  - Recommend allowing harvest if brown trout abundance increases above management goals in the river and in the reservoir.

- Identify additional limiting factors and consider management changes as needed.

Northern Pike

Goals and Objectives:

Monitor and suppress the northern pike population from Toston Dam to Canyon Ferry Dam and evaluate impacts to other species.

Rationale:

Canyon Ferry and the Missouri River between Toston and Canyon Ferry have long held a low-level northern pike population. An abundance of northern pike was discovered in the impoundment upstream of Toston Dam in the mid-2000's and adult northern pike were routinely captured by FWP staff during annual electrofishing efforts into the early 2010's. In 2008, reproduction of northern pike in the reservoir was documented through the capture of young of the year pike during summer beach seining. Reports of sub-adult and adult northern pike caught by anglers from Toston Dam to Canyon Ferry Dam became more numerous. Northern pike are highly piscivorous fish and the current forage base from Toston Dam to Canyon Ferry Dam is likely not adequate to support an additional voracious predator. In 2012 FWP issued a decision notice on an environmental assessment to remove northern pike from the management plan area (Toston Dam to Holter Dam) incidental to other fish survey programs.

Strategies:

- Eliminate all angler bag limits for northern pike in the upper Missouri River reservoir system and in the Missouri River from Headwaters State Park to Toston Dam. Managing northern pike population according to the Missouri River Basin Northern Pike Suppression Project EA Decision Notice. See Appendix E for additional discussion on northern pike suppression efforts within the Upper Missouri River Reservoir Fisheries Management Plan area.

- Allow spear fishing for northern pike in the impoundment above Toston Dam.

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- Identify critical spawning habitats in the river and reservoir and determine if habitat manipulations can suppress pike numbers and emigration through the system.
- Explore other opportunities or techniques to suppress pike numbers.
- Determine impacts of northern pike to existing forage.

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Section 3
Canyon Ferry Reservoir

The species composition of the Canyon Ferry Reservoir/Missouri River system is typical of large river and reservoir fisheries in the intermountain region (Table 5). Fisheries of the Missouri River downstream from Toston Dam, Canyon Ferry Reservoir, and associated tributaries are managed as an ecological system. Many fish species in the system do not complete their entire life cycle within any single component of the system. Management considerations for any portion of the system (river, reservoir, or tributaries) must be considered in the context of the entire system.

Fisheries management of the upper Missouri River reservoir system has changed following expansion of the walleye population in Canyon Ferry. Walleye have affected recruitment of wild reproducing and stocked species not only in Canyon Ferry, but also in the river above Canyon Ferry as well as the reservoir and river sections downstream. Active walleye management is necessary to manipulate walleye abundance in Canyon Ferry, as well as maintain multi-species fisheries throughout the entire upper Missouri River reservoir system.

Management History

The rainbow trout population in Canyon Ferry Reservoir is maintained through annual stocking of hatchery fish. Annual stocking is required because natural recruitment is not sufficient to meet demand by the fishing public. The most probable reason for inadequate natural reproduction for rainbow trout in Canyon Ferry Reservoir is limited spawning and rearing habitat. Tributaries to the reservoir, as well as tributaries to the Missouri River, have been degraded as a result of land use practices both public and private. The discovery of whirling disease in the Missouri River and some associated tributaries in the 1990s has created an additional factor that can limit successful natural reproduction of rainbow trout.

Since the filling of the reservoir in 1955, the rainbow trout fishery in Canyon Ferry has been maintained by stocking between 250,000 and 1.2 million fish, mostly fingerlings each year. Exceptions to this range in stocking rates occurred twice. In 1980, 2.0 million fingerlings were planted into the reservoir, with 1.0 million of these fish coming from a private hatchery donation. In 1992, a portion of Creston National Fish Hatchery was available for a one-year increase in stocking density at Canyon Ferry resulting in nearly 1.5 million fingerlings stocked. For the period between 1981 and 1998, the stocking allocation at Canyon Ferry Reservoir averaged about 1.0 pounds of rainbow trout per acre, which was typically represented by stocking about 400,000 yearling fish per year. Following expansion of the walleye population, predation on stocked rainbow reduced survival of fingerling rainbow plants. Rainbow stocking problems were further complicated by the discovery of polychlorinated biphenyls (PCBs) at Big Spring State Trout Hatchery in 2004, resulting in the shutdown of that facility during raceway treatment. The previous hatchery allocation called for 300,000 8-inch rainbow trout planted in summer and fall, which represented about 1.7 pounds of rainbow trout per acre. Stocking of larger sized fish increased hatchery costs approximately 7-fold due to increased hatchery space necessary to grow larger fish, increased food, and transportation costs to haul additional loads of fish. In 2004 stocking was adjusted to 7-inch fish in the summer and fall, which reduced hatchery costs by reducing the amount of time the fish were held in the hatchery and reduced transportation costs with fewer trips needed to stock the fish.

FWP has adjusted the stocking of Canyon Ferry Reservoir several times in an attempt to enhance the rainbow population. These adjustments have included changing the number and size of fish stocked, as

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well as adjusting the season of the year that the fish were distributed. Beginning in the early 1980s, FWP began experimenting with different strains of rainbow trout and with different methods of dispersing them into the reservoir in an attempt to improve the fishery. Evaluation of stocking techniques indicated that stocking yearling rainbow trout (5-7 inches in length) during spring plankton bloom (May) yielded the most consistent survival of hatchery fish. Following walleye population expansion, it was found that stocking larger sized fish in the summer and fall was necessary to avoid predation. Stocking in the fall also takes advantage of lower energy demands of walleye during cooler water temperatures, reduces the potential for avian predation, and maximizes use of hatchery space for production. In order to cut stocking costs, stocking of yearling fish was discontinued in 2013, and season of stocking was adjusted to summer and fall.

Table 5. Fish Species in Canyon Ferry Reservoir/Missouri River System Including Native Status, First Stocking Date (In Drainage), Population Trend and Relative Abundance as of 2017.

Species	Native	First Stocking Date	Population Trend	Relative Abundance (Based on historic field monitoring.)
Game Fish Species				
Rainbow trout	No	1928	Stable	Abundant
Mountain whitefish	Yes	N/A	Decreasing	Common
Walleye	No	N/A	Stable	Abundant
Brown trout	No	1931	Decreasing	Common
Burbot	Yes	N/A	Stable	Common
Brook trout	No	1934	Unknown	Rare
Black crappie	No	N/A	Unknown	Rare
Cutthroat trout	Yes	N/A	Unknown	Rare
Northern pike	No	N/A	Increasing	Common
Smallmouth bass	No	N/A	Increasing	Common
Largemouth bass	No	N/A	Unknown	Rare
Yellow perch	No	1938	Decreasing	Abundant
Nongame Fish Species				
Common carp	No	Unknown	Stable	Abundant
Longnose dace	Yes	N/A	Unknown	Abundant
Longnose sucker	Yes	N/A	Decreasing	Abundant
White sucker	Yes	N/A	Decreasing	Abundant
Mottled sculpin	Yes	N/A	Unknown	Abundant
Fathead minnow	Yes	N/A	Unknown	Common
Stonecat	Yes	N/A	Unknown	Common
Utah chub	No	N/A	Unknown	Rare
Bluegill	No	N/A	Unknown	Rare
Flathead chub	Yes	N/A	Unknown	Rare
Mountain sucker	Yes	N/A	Unknown	Rare

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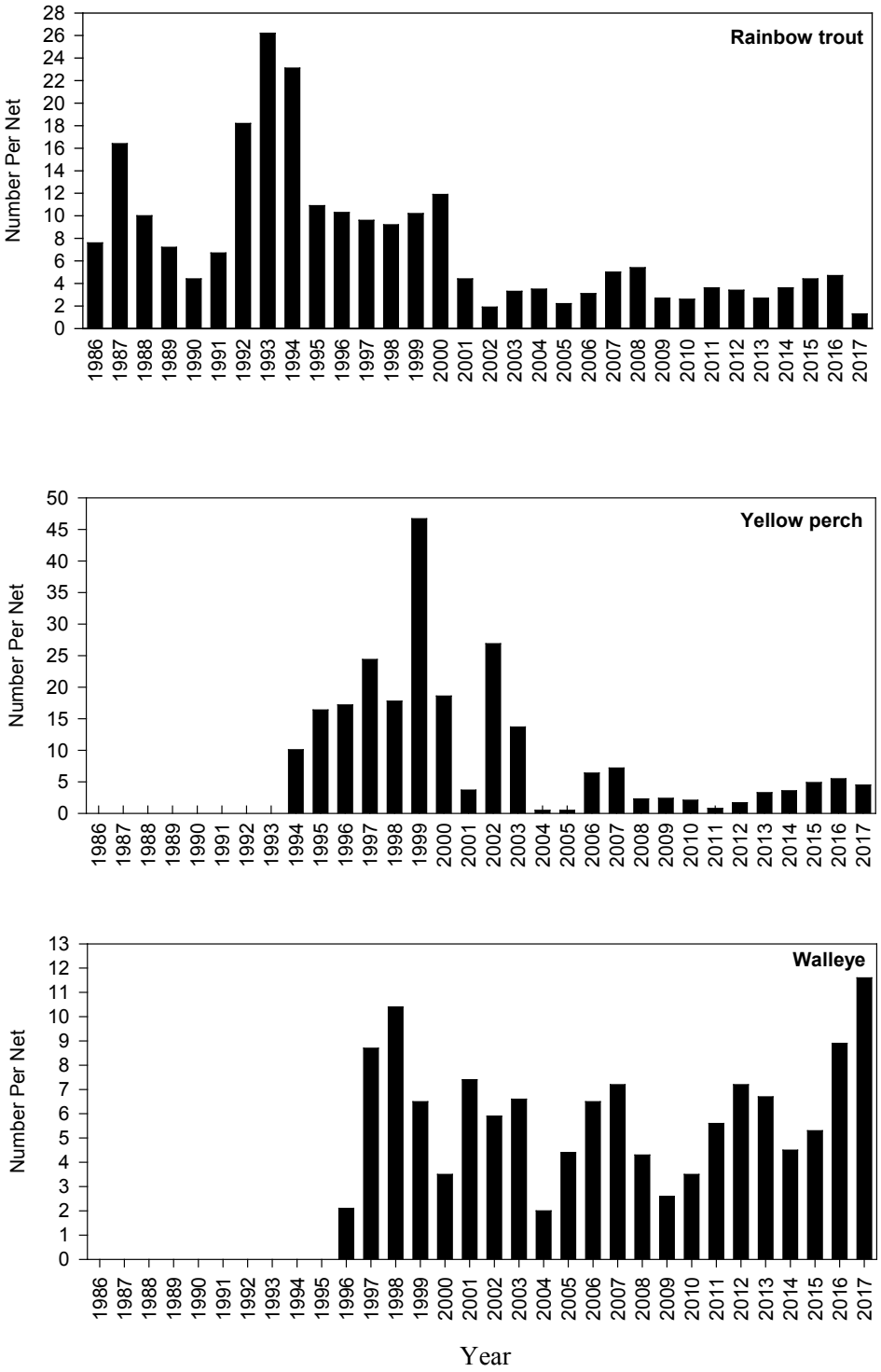

Figure 5. Canyon Ferry Reservoir Fish Population Trends for Rainbow Trout, Yellow Perch, and Walleye from Standardized Gill Netting Series. Perch and Walleye gill netting series began in 1994 and 1996 respectively.

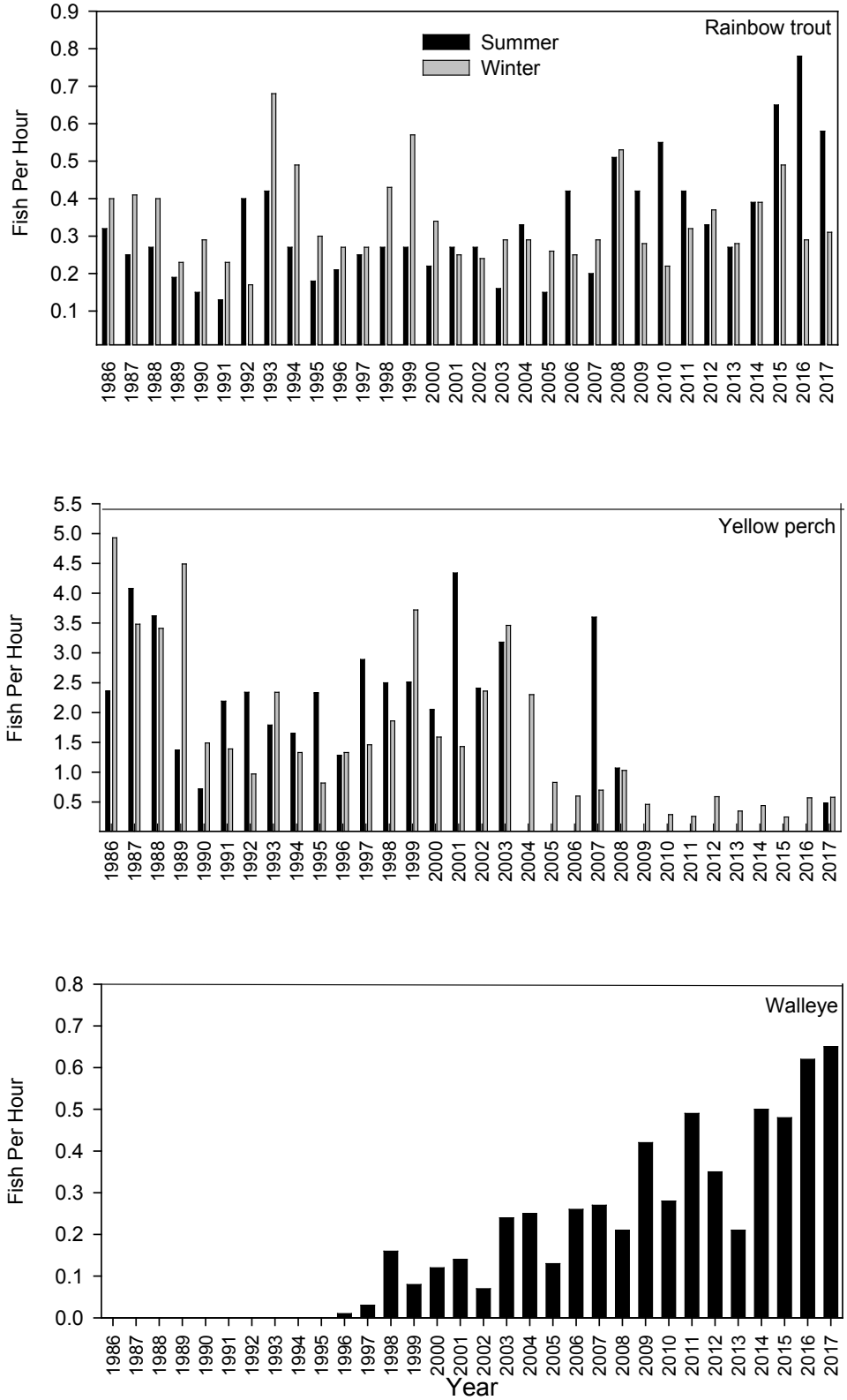

Figure 6. Angler Catch Rates (fish/hour) for the Principal Game Species in Canyon Ferry Reservoir. Summer (dark bars) and winter (light bars) are represented. Walleye catch rates are summer only. Catch rates are for anglers specifically targeting those species.

Over the last 50 years, there have been significant fluctuations in the number of rainbow trout in Canyon Ferry Reservoir, which have affected fishing success over the years. The Department measured poor fishing success (catch rates) in the mid 1960s (0.08 rainbow/hour), and again in the 1980s (0.08 – 0.14 rainbow/hour). These fluctuations were closely associated with the varying success of the Department's stocking program for the reservoir. After a significant increase in rainbow trout abundance during the mid-1990s from increased stocking rates of yearling fish, the rainbow trout population trend remained relatively stable at approximately 10 rainbow trout per net throughout the late-1990s (Figure 5). By 2000, large year classes of walleye produced in 1996 and 1997 were large enough to effectively prey upon stocked rainbow fingerlings, and rainbow numbers declined in subsequent years. Stocking larger sized, 7 to 8-inch fish in spring and fall improved rainbow recruitment, resulting in stable to slightly increasing abundance. Adjustment to summer and fall stocking has maintained abundance levels high enough to maintain the quality of the rainbow fisher. The current population level maintains annual angler catch rates of 0.15 to 0.78fish per hour (Figure 6).

Past management efforts have focused on rehabilitating degraded tributaries entering the Canyon Ferry/Missouri River system to enhance spawning habitat and increase recruitment of juvenile trout into the fishery. Sizeable spawning runs of wild strain rainbow trout have developed in various tributaries in the system, but recruitment of wild trout from this increased spawning activity to the sport fishery is minimal. Efforts to improve spawning habitat and improve the wild fishery will continue.

The brown trout population in Canyon Ferry Reservoir has remained at a relatively low level since the reservoir first filled in 1955. Results from sinking gill nets set periodically since 1955 indicate that brown trout numbers were highest immediately after the reservoir first filled, then remained relatively stable from 1958 through 1988. The brown trout population declined significantly between 1988 and the mid-1990s as a result of drought and spawning competition with stocked wild strain rainbow trout. Spawning habitat enhancements resulted in little improvement, and brown trout abundance persists at historically low levels.

Yellow perch have been one of the most abundant species of fish in Canyon Ferry Reservoir for the past sixty years. However, the perch population has fluctuated extensively over time. These fluctuations are related to poor spawning and rearing habitat, variable spring weather conditions, and fluctuating reservoir levels. Each year the BOR draws down Canyon Ferry Reservoir in the fall and winter to make storage space for potential spring floods. The BOR operating plan for Canyon Ferry Reservoir is to drop pool elevation to 3,782 feet elevation by March 30, and then fill to 3,795 by the following June 30. As such, the annual elevation fluctuation of 13 feet means much of the important habitat necessary for spawning and rearing yellow perch is dry for nearly 4 months of the year. From 2000 to 2015 the average annual difference in pool elevation between March and June was 11.8 feet (range 4.5-19.8 feet). Yellow perch are a vulnerable prey species selected by walleye over other prey species, further influencing the variable nature of perch populations. Trends in yellow perch abundance in Canyon Ferry Reservoir have been periodically monitored since 1955, and annually monitored since 1994, using a sinking gill net series set in June and August. Catch of perch per net pre-walleye declined from a high of 79 per net in 1964 to a low of 10 per net in 1994. Following walleye expansion in the late 1990s, catch of yellow perch per net has fluctuated between a high of 47 per net in 1999 and a low of 0.5 per net in 2004 and 2005 (Figure 5). An average catch of 3.3 perch per net has been observed in recent years (2010-2017). Yellow perch population trends are also monitored with summer beach seining data and a roving creel census that began in 1985. The beach seining series was initiated in 1991 to provide an index of annual perch production. Reliability of this tool for assessing annual production of perch is variable but it indicates that perch production can vary significantly from year to year and highlights years when yellow perch contribute to higher levels of forage

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availability. However, the relationship between annual production of yellow perch (measured by beach seine catches) and size of the adult population (measured by gillnet sets) shows little correlation.

Based on the roving creel census the number of anglers fishing on Canyon Ferry Reservoir during the summer specifically seeking to catch yellow perch has remained at historically low levels, with an average of 1.5% of all anglers targeting only perch from 2004-2017. Fishing for yellow perch is more popular during the winter. During the winter of 2017, 39% of all anglers were specifically seeking to catch yellow perch. Winter angler catch rates for yellow perch can be high, with an average of 2 fish per hour from 1986-1996 (Figure 6). However, winter angler catch rates for yellow perch have remained comparatively low since 2005, were at record low of 0.3 fish per hour in 2010 (Figure 6), and have averaged 0.4 fish per hour in recent years (2010-2017).

Yellow perch was first classified as a game fish in Montana in 2000 when the FWP Commission placed harvest limits on perch in Holter Lake and Canyon Ferry Reservoir. As of 2017, perch are managed in 8 waters throughout the state. Yellow perch daily and possession bag limits on Canyon Ferry were reduced from 50 to 15 in 2005, and from 15 to 10 in 2014 to counteract record low abundance in the reservoir. Additional ongoing management efforts included methods to reduce the impacts of reservoir operations on fishery resources and enhancing spawning and rearing success by providing additional lake bottom structure. For the past two decades, thousands of recycled Christmas tree structures have been placed in the reservoir with the aid of several community and sportsman's groups. Yellow perch have been documented using the structures as spawning habitat, however it is difficult to determine if the structures positively influence perch abundance.

Walleye were not observed in Canyon Ferry biological sampling from 1955 through 1988. The first walleye was captured in 1989 during fall netting efforts to monitor rainbow trout. From 1989 to present, walleye have been captured in various monitoring net series annually. Walleye population trends in Canyon Ferry are based on four monitoring systems developed to assess fish populations: 1) sinking gill net series conducted periodically since 1955 (June and August sampling); 2) floating gill net series set annually since 1986 (May and October); 3) fall walleye gill netting series initiated in 1996 (September); and 4) roving creel census conducted since 1986.

The walleye population initially entered a phase of extremely rapid population growth that is characteristic of newly developing populations (McMahon 1992). Walleye relative abundance in the fall walleye gill netting series increased to 10.4 walleye per net by 1998, varied between 2.0 and 8.9 walleye per gill net from 1999 to 2016, and reached an all-time record high in 2017 at 11.6 per gill net. (Figure 5). Since 2010, fall relative abundance has averaged 6.7 walleye per fall sinking gillnet. The current composition of the walleye population consists of smaller-sized, young walleye with 85% of walleye captured in fall gillnets in 2017 between 10-14.9-inches total length.

Forage diversity and supply is critical for sustaining quality walleye populations. Consequently, intensive walleye diet analyses has been conducted since 1994. Yellow perch and suckers comprised most of the walleye diet when the population first developed in Canyon Ferry. Yellow perch are still a significant component of the walleye diet, with perch comprising 44% of the diet on average since 1994. Suckers have contributed little to the walleye diet in recent years, comprising only 3% of the diet on average from 2004 to 2016. Low frequency of suckers in the walleye diet is largely a function of lower sucker densities. Salmonids (trout) can also comprise a substantial percentage of the walleye diet, with trout comprising over 70% of the diet in some years. Since 1994 salmonids average 21% of the walleye diet. Food habits vary

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seasonally and other prey items, such as crayfish and other invertebrates, are of significance during different periods of the year.

A risk assessment entitled "Potential Impacts of the Introduction of Walleye to the Fishery of Canyon Ferry Reservoir and Adjacent Waters" concluded that the possibility of increasing fishing opportunities with the introduction of a species such as walleye is offset by the potential impacts on other fish species (McMahon 1992). This assessment, along with numerous other sources of expertise, experience, and input, provided the basis for management efforts centered on walleye management. The primary concerns at Canyon Ferry are that walleye reproductive potential is very high, and there is tremendous potential for creating a high-density walleye population that could deplete prey species, including sport fish such as yellow perch and trout. Under this scenario, without intensive population monitoring and management, walleye quality would diminish as food resources became depleted. Also, the highly variable nature of walleye populations can result in large fluctuations in population numbers annually (Scott and Crossman 1973). In Canyon Ferry Reservoir, walleye densities did not increase to proportions anticipated after the population first expanded in the late-1990s, but the reproductive potential was realized again in 2017 with record high densities. The reproductive potential of walleye.in Canyon Ferry remains very high.

Results of intensive walleye sampling conducted since 1994 confirm concerns expressed in the 1992 risk assessment. A small spawning population in 1996 produced a very strong year class of fish that resulted in a well-established walleye fishery at Canyon Ferry. In 1997, the reservoir was drawn down to near record low levels that reduced the quality of walleye spawning habitat at the only documented spawning site. Concurrently, FWP conducted an effort to remove mature walleye from spawning areas. Approximately 40 million walleye eggs were intercepted from 175 females prior to spawning. Despite this effort, walleye produced 4.0 yearlings per net in the fall 1998 netting series, compared with 6.27 yearlings per net in the 1997 fall netting series. Following failed walleye removal efforts in 1997 and pressure from organized angling groups, FWP developed strategies to incorporate a managed walleye population into the multi-species fishery in the 2000 and 2009 management plans.

In addition to monitoring traditional game fish species as far back as 1955, FWP gillnetting and beach seining efforts in years since also track populations of other species present in the system. Monitoring remains an important component of data collection as the fish community fluctuates due to habitat changes, harvest, and natural reproduction. Monitoring abundance of white suckers, for example, will assist efforts to evaluate the forage fish availability for walleye. White suckers have decreased significantly since the mid-1950s when the reservoir was filled, remained relatively stable through the early 1990s, declined significantly since 1996, and are currently at record low levels, averaging 4.7 per net since 2008. Examining sucker abundance in conjunction with other species (both predators and prey) will provide important information for future management of the Canyon Ferry-Missouri River system.

Continued monitoring of relative abundance of selected fish species as well as angler use is critical in identifying and maintaining management goals. Improvements in angler technology coupled with changes in angler pressure can influence the amount of fish harvest in the system. For primary species actively managed in Canyon Ferry, management "triggers" have been implemented to adjust management strategies with changing fish populations and resulting changes in angler trends.

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Aquatic Invasive Species (AIS) discovery and management

In October 2016 AIS samples from Canyon Ferry Reservoir and the Missouri River upstream of Townsend had suspect larvae from invasive *Dresenid* mussels. On November 30, 2016 Governor Steve Bullock issued Executive Order No. 18-2016 proclaiming an invasive species emergency in the State of Montana. Governor Bullock convened a rapid response team and incident command to temporarily quarantine these waters while a plan could be formulated to contain the suspected organisms and develop a monitoring program. Canyon Ferry Reservoir and the Missouri River were opened to public use in March 2017. The plan for containment involved decontaminating any watercraft leaving Canyon Ferry Reservoir before it goes to another water, instituting a certified boater program that allows recreationists to use their watercraft only on Canyon Ferry Reservoir, and inspecting all watercraft leaving the reservoir. As of September 2018 no *Dresinid* mussels have been detected via FWP monitoring.

Canyon Ferry Reservoir Management Goals and Limiting Factors

The management goal for Canyon Ferry Reservoir is to provide a cost effective, multi-species fishery that maintains the current level of angler use during both the open water and ice fishing seasons and maintain populations of non-game species (e.g., suckers, dace, sculpins). Fisheries management will focus primarily on maintaining populations of rainbow trout, yellow perch, walleye, brown trout, and burbot while providing additional opportunity to fish for other species that occasionally contribute to the sport fishery (e.g., smallmouth bass).

To achieve this goal for the system, management strategies must be developed to enhance reproduction and survival of all potential species that will be influenced by walleye predation.

Determining all of the limiting factors that regulate fisheries in complex systems like the Canyon Ferry-Missouri River system is difficult to accurately assess. However, there are some basic limitations that are known to exist for each of the major sport fish species in Canyon Ferry Reservoir. Perch populations tend to be limited by reproductive/rearing success and predation, while trout populations are limited by number and size of fish stocked and recruitment of stocked fish. In contrast, walleye reproductive potential is high in Canyon Ferry and may ultimately be limited by available forage, other predators (e.g. Northern pike), and other environmental variables (i.e., spring spawning conditions). A depleted forage base will ultimately result in reduced growth and productivity of not only walleye, but also other fish in the system. Other factors currently or potentially limiting sport fish species in Canyon Ferry Reservoir include but are not limited to:

- Available spawning and rearing tributaries are insufficient to adequately supply juvenile brown and rainbow trout for the reservoir, and hatchery allocation constraints and costs limit the number of fish available for stocking. The limited spawning habitat of rainbow trout and brown trout further impacts their poor reproductive success, and predation by walleye further reduces recruitment of successfully reared fish. Yellow perch spawning and rearing success is variable and density of the adult population appears to be limited by recruitment. A relatively small spawning stock of perch are capable of producing large age classes of perch, however lack of suitable nursery and cover habitats leave juvenile perch vulnerable to predation and limiting recruitment of entire age classes. Heavy predation has the potential to permanently suppress the yellow perch population and may jeopardize the ability to manage the yellow perch sport fishery.

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- Walleye diet studies indicate a high preference for yellow perch, suckers, and trout. At current yellow perch and sucker population levels and reproductive capability, it is unknown if these species can adequately maintain a sustainable forage base for the walleye population. Predation of stocked trout could impede the cost-effectiveness of fish stocking and hinder recruitment to the sport fishery.

- Development of a low dissolved oxygen plume in the deep water at the base of Canyon Ferry Dam occurs in the summer months. Deep areas, greater than 60-80 feet, at the north end of the lake may not be suitable for some fish species because of low dissolved oxygen levels during the summer months.

- Aquatic invasive species and aquatic pathogens (e.g.; whirling disease, invasive mussel larvae, Eurasian water milfoil) have been found or suspected in the upper Missouri River drainage between Toston Dam and Canyon Ferry Dam and/or in some of the associated tributaries. Aquatic invasive species have the potential to reduce the reproductive success of various fish species, cause dynamic changes to the structure of the food web or negatively affect an angling experience.

- Reservoir operations that result in average annual fluctuations of 12 feet limits establishment of shoreline vegetation to serve as spawning and rearing habitat for yellow perch or other species with similar spawning requirements.

- Extended surface water spills during spring run-off may result in fish loss/transport out of Canyon Ferry. Losses of perch, walleye and rainbow trout have been documented and may be significant.

- Localized depletions of fish may occur during intensive fishing periods (e.g. concentrated areas of yellow perch anglers during high-use periods in the winter) limiting recruitment and survival in distinct subpopulations in the reservoir.

- Expansion of the northern pike and smallmouth bass populations could increase predation on an already limited forage base.

Canyon Ferry Reservoir Management Goals by Species

In order to manage a fish community that includes multiple sport fish species, it is important to recognize that the goal for each species is affected by the success of management strategies for other species in the system and not all fish species can be maximized simultaneously. This plan emphasizes management for trout and walleye while recognizing the importance of yellow perch as a sport fish and a forage species.

Rainbow Trout

Goals and Objectives:

Rely on rainbow trout to continue providing angling opportunity at approximately the current level of angler catch.

- Maintain a three-year running average gill net catch of 5 rainbow trout per net in the fall floating gillnet series.

- Maintain a three-year running average summer angler catch rate of 0.25 rainbow trout per hour.

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Rationale:

The 2010-2019 Upper Missouri River Reservoir Fisheries Management Plan (2010) established a goal of 5-6 rainbow per gill net. Although the goal was never met within the previous management plan, three-year average gill net catches remained above the lower and below the upper triggers from 2010-2017. At present stocking levels and with current minimal levels of natural recruitment to the reservoir, it is reasonable to expect that a relatively stable fishery with good angler catch rates can be maintained at approximately 5 rainbow trout per gill net. Stocking of larger sized rainbow trout is necessary to avoid predation by walleye and fall stocking takes advantage of lower energy demands by walleye due to lower water temperatures. Spring and fall stocking of 8-inch Eagle Lake and Arlee strain rainbow trout from 2006-2013 increased overall rainbow abundance and angler harvest. Rainbow trout size and stocking timing was modified in 2014 to allow for more efficient use of hatchery raceways while maintaining recent abundance and angler harvest levels.

Strategies:

- Continue annual planting of approximately 100,000 age 0, 7-inch Arlee rainbow trout in the summer and approximately 200,000 age 0, 7-inch Eagle Lake rainbow trout in the fall when funding is available.

    - If funding for stocking catchable rainbow trout (fish > 7-inches in length) is unavailable, management strategies for rainbow trout, walleye, and yellow perch will be reevaluated.

- Continue annual monitoring and data collection to evaluate if management goals are being met.

- If three-year average catch for rainbow in fall floating gillnets falls below 5 rainbow trout per net and/or angler catch rates decline substantially, recommend changes to the stocking plan (e.g., timing and location of fish plants, different rainbow strains, size at stocking) and implement if deemed cost-effective. Determine what limiting factor is reducing rainbow trout recruitment (e.g., hatchery or strain issues, increased predation by walleye).

- If three-year average catch for rainbow trout in fall floating gillnets falls below 3 rainbow trout per net, consider more active management actions such as lowering angler harvest limits and/or implement predator suppression measures based on biological justification if predation is identified as the primary factor limiting recruitment.

- Continue to improve trout spawning tributaries in the system to increase wild trout abundance.

- Maintain restricted harvest regulations and closures associated with spawning areas to promote wild trout spawning.

- Consider stocking additional rainbow trout when additional hatchery fish are available. Do not stock if surplus fish will interfere with rainbow trout strain or season of stocking evaluations.

- Work with Wildlife Division of FWP and U.S. Fish and Wildlife Service (USFWS) to better quantify effects of pelicans and cormorants on stocked rainbow trout recruitment.

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Yellow Perch

Goals and Objectives:

Continue to recognize the importance of yellow perch and apply management strategies to improve the current population to enhance the sport fishery and identify importance as a forage species.

- Achieve and maintain a three-year running average gillnet catch of 6 yellow perch per net in the summer sinking gillnet series.

- Maintain a three-year running average winter angler catch rate of 2.0 yellow perch per hour.

Rationale:

Yellow perch goals were adjusted to a three-year average of 6 perch per net to accommodate more realistic recent population abundance trends. Yellow perch abundance averaged 6.6 per gill net from 2000-2017 and 3.3 per gill net from 2010-2017. Three-year average objectives for yellow perch were never met during the previous management plan (10 yellow perch per net) and were only above the established lower trigger (3.0 yellow perch per gill net) from 2015-2017. Yellow perch abundance has increased and stabilized since 2011 (Figure 5) likely due to moderately successful recruitment in recent years in conjunction with conservative perch regulations (10 fish daily and in possession). Yellow perch continue to be the preferred prey item for most predator species in Canyon Ferry Reservoir and predation losses continue to have significant population affects as the walleye population expands. Increasing the abundance of yellow perch is difficult and achieving a level of 6 per net will require successful implementation of a variety of management actions including spawning/rearing habitat enhancement, conservative angler harvest regulations, and active management of walleye through angler harvest. Cost-effective spawning/rearing habitat enhancement projects such as building juniper or Christmas tree reefs have been implemented since the early 90s, with larger scale efforts beginning in 1998 and continuing to present. Strategies to meet management goals for yellow perch relative to walleye abundance will be based on management "triggers" to initiate progressive management actions.

Strategies:

- Continue conservative harvest regulations to prevent over-harvest by anglers. Evaluate and implement further regulation changes if needed. In 2014, yellow perch daily and possession bag limits were dropped to 10 fish.

- Continue adequate data collection to determine if strategies are effective and the goal is being met.

  - If three-year average catch for perch in summer sinking gillnets falls below 3 perch per net, implement more conservative perch management strategies, such as further reductions in angler harvest, increased predator suppression, and/or additional habitat manipulations and improvements.

  - If three-year average catch for perch in summer sinking gillnets increases above 9 perch per net, recommend increasing angler harvest limits.

- Continue to construct spawning/rearing habitat in Canyon Ferry as long as the project remains cost-effective.

  - Continue to evaluate the feasibility of proposed enhancement opportunities (e.g., use of other artificial habitat). Previous evaluation of the dust abatement ponds for forage fish production found that maximizing the ponds for forage fish production was contrary to management objectives for

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waterfowl production. Infrastructure requirements for fish production also limited practicality of using the ponds to raise fish.

- Continue the Christmas tree habitat enhancement project. Evaluate success of structures in other locations. Maintain relationship with City of Helena to continue supply of Christmas trees.

- Work with reservoir managers and water users to identify opportunities to modify reservoir levels and improve shoreline spawning habitat.

- Continue to identify critical spawning habitats and nursery areas.

- Determine other funding sources and options for habitat enhancement projects (e.g., Walleyes Unlimited, Non Government Organization).

■ Report measurable progress annually through public meetings and annual reports.

Walleye

Goals and Objectives:

Rely on walleye to maintain a self-sustaining sport fishery to enhance the summer fishery and provide an additional component to the winter fishery.

■ Maintain a three-year running average of 5 walleye per net in the fall walleye gillnetting series.

■ Evaluate criteria for determining appropriate walleye density consistent with the availability of forage.

Rationale:

Based on extensive studies since 1990, including a risk assessment for a walleye introduction in Canyon Ferry (McMahon 1992), maintaining the long-term quality of the walleye fishery is difficult because of fluctuating walleye reproductive success relative to available forage supply. Management of other desirable fish species in the reservoir will be difficult without active walleye management. Maintaining walleye at a level that sustains a balanced fish community is necessary to reaching multi-species goals. Failure to adequately control walleye population growth will result in further depletion of the food supply including sport fish species such as yellow perch, trout, and burbot. Substantial reductions in the population levels of yellow perch and rainbow trout are inconsistent with the goal of managing for a multi-species fishery in Canyon Ferry Reservoir. Angler harvest is the most cost-effective tool for walleye management; however other strategies may need to be explored if the walleye population reaches full reproductive potential. FWP monitoring and creel data suggests that liberal fishing regulations likely play a role in size distribution of the walleye population, with high rates of exploitation limiting the number of larger fish in the population. However, due to known forage limitations in the reservoir, adjustments to limits may be necessary to maintain walleye population numbers compatible with forage abundance. Strategies for managing the walleye population to sustain the desired trout and yellow perch fisheries by using more aggressive tools are based on “triggers” to initiate progressive management actions.

Strategies:

■ Use angler harvest regulations to manage walleye population abundance and reduce predation on other desirable species. This remains the most cost-effective and selective management tool available at Canyon Ferry to manage the walleye population. Bag limits above standard regulations

for the Central Fishing District for walleye (5 daily and 10 in possession) are necessary to maintain a suitable forage base and preserve populations of other species. Modified angler bag and size limits may be used as management tools to improve desirable size groups (i.e., slot limits, bag limits, closures, among other tools). Previous efforts at using modified bag limits to improve walleye quality (i.e., fish in more desirable size groups) had limited success but were not sustainable due to increased densities of small fish from a larger spawning stock.

- At implementation of this plan, the walleye bag limit is 20 daily, only 1 over 20-inches. Possession limit is twice the daily limit. This regulation will be reevaluated if walleye abundance declines to trigger levels.

- If needed, implement more aggressive management to control walleye population growth or manage population size structure. Triggers for modifying management actions will be based on annual fall monitoring of walleye (15 sinking gillnets set in September), summer netting for yellow perch (33 sinking gillnets set in June and August), and fall monitoring for rainbow trout (18 floating gillnets set in October). Additional aggressive management techniques may be implemented if, based on a three-year running average, any of the following criteria are reached:

1. Walleye density increases above 7 fish per net.
2. Yellow perch density decreases below 3 per net.
3. Rainbow trout density decreases below 3 per net and walleye predation determined the primary factor limiting rainbow trout recruitment.

Upon reaching the targets listed above and within the adaptive management framework more aggressive actions may be implemented following public discussion. The following actions may be considered through a Montana Environmental Protection Act (MEPA) analysis and/or public review process of FWP Commission action:

- Increase angler bag limits for walleye. This would likely be the first action implemented to reduce walleye densities.

- Consider use of gill nets or trap nets to remove walleye during periods when fish are concentrated in specific areas (e.g., spawning period, fall).

- Allow spear fishing by submerged swimmers or through the ice to increase harvest. Consider imposing a maximum size restriction to prevent targeting the biggest fish and to retain a trophy component in the fishery.

- Evaluate walleye derbies/tournaments as a tool for aggressively harvesting fish.

- Authorize commercial harvest of walleye. In anticipation of the necessity to establish a commercial walleye operation on Canyon Ferry Reservoir, FWP must request authorization from the Montana Legislature to allow the taking and sale of walleye (87-4-601, Montana Code Annotated (MCA)) and subsequently revise the Administrative Rules of Montana governing commercial fishing (12.7.101, Administrative Rules of Montana (ARM)).

- Use electrofishing to remove walleye from the Missouri River during periods of high concentration (e.g., fish congregations at tributary mouths during low flow periods, migrating fish in spring).

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- If it is determined that the walleye population is over-harvested and more conservative limits are necessary to support a viable walleye population, walleye daily and possession limits will be modified, and derbies/tournaments will be evaluated to protect walleye. Decisions will be based on fall monitoring showing a decline in walleye to below 3 per fall gillnet net based on a three-year running average.

- Should three-year average walleye catch decline below 3 per gillnet while perch and rainbow abundance are below management goals (6 perch per summer gillnet and 5 rainbow per fall gillnet), changes to walleye harvest limits will be recommended only after impacts to perch and rainbow populations are determined.

- Should three-year average walleye catch decline below 3 per gillnet while yellow perch and/or rainbow trout abundance are below management triggers (3 per summer gillnet for yellow perch and 3 per fall gillnet for rainbow trout) adjustments to walleye limit will not be made.

- Continue adequate data collection to determine if strategies are effective and goals are being met.

- Report measurable progress annually through public meetings and annual reports.

- Conduct additional monitoring and research as needed (e.g., supplemental netting, tagging studies, 3-inch mesh gillnets). Explore sampling methods that reduce mortalities.

- Recognize the importance for anglers to have multiple size classes of walleyes represented in the population. Maintain a proportional stock density (PSD) value within a range of 30-50. PSD is the proportion of all walleye greater than 15-inches divided by the total number of walleye greater than 10-inches. Changes to regulations will be evaluated if PSD values fall below the desired range to maintain more, quality sized fish. Regulation changes will first be dependent upon walleye abundance relative to management goals and triggers for walleye, other fish, and forage availability.

Brown Trout

Goals and Objectives:

Increase the number of brown trout residing in the reservoir as an additional component to the sport fishery.

- Increase the current catch of 0.1 brown trout per net to a three-year running average of 1.0 brown trout per net in the summer sinking gillnet series.

Rationale:

The decreased abundance of brown trout observed in the past 20 years is largely attributable to drought conditions in the river and primary spawning tributaries throughout the early 2000s. Other factors such as drought impact from 1985 through the late 1990s, whirling disease, turbine installation at Toston Dam in 1989, and increased competition with the wild strains of rainbow trout introduced in the late 1980s are also potentially responsible for the decline observed in recent years.

Strategies and Management Alternatives:

- Maintain restrictive regulations to protect the spawning brown trout population.

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- Maintain catch and release only regulations for Canyon Ferry. Children age 14 and under can possess one brown trout.

- Recommend allowing harvest if brown trout abundance increases above management goals.

- Continue ongoing efforts to enhance spawning and rearing habitat for brown trout.

- Continue work with landowners and irrigators to reduce dewatering of critical streams during brown trout spawning (fall). Brown trout monitoring with radio telemetry in 2015-2017 found brown trout in a previously dewatered reach of Deep Creek. Previously this stream reach would dry out each summer, but water leases for instream flow maintained flows year-round. Obtaining water leases for instream flow will continue as funding allows.

- Continue work with Department of Natural Resource and Conservation (DNRC) to mitigate impacts of hydropower on Toston Dam.

- Continue to evaluate brown trout limiting factors and develop new solutions.

Burbot (Ling)

Goals and Objectives:

Rely on burbot to compliment the winter sport fishery by maintaining the current level of burbot in the reservoir.

- Increase efforts to monitor the burbot population in Canyon Ferry Reservoir.

- Maintain a three-year running average gill net catch of 0.40 burbot per net in the summer sinking gillnet series.

- Provide brood and/or foundation stock for re-introductions to other waters for conservation and sport fishing considerations.

Rationale:

Burbot is the most popular native sport fish in Canyon Ferry Reservoir. Burbot are sought by anglers primarily in the ice-fishing season and provide little to the summer fishery. Unlike other upper Missouri River reservoirs, burbot abundance and angler catch rates in Canyon Ferry have declined in recent years. Little is known about the population dynamics and limiting factors that regulate the burbot population.

Strategies:

- Improve data collection to better understand burbot population dynamics. Pursue research projects that identify burbot limiting factors.

- Maintain current angler harvest regulations unless monitoring justifies adjustments to bag limits.

Forage Fish

Goals and Objectives:

Manage and enhance the forage base to support a productive multi-species fishery that includes walleye, trout, and yellow perch.

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- Increase white sucker gill net catch to 15 per net or higher.

- Increase yellow perch gill net catch to 6 per net or higher.

- Maintain mid-summer zooplankton density of 20 per liter and maintain current zooplankton species composition.

Rationale:

Additional fish species (forage fish species and sport fish species) introduced into Canyon Ferry Reservoir will compound an already rapidly changing system and may result in irreversible effects on the fish communities of Canyon Ferry, Hauser, and Holter reservoirs, and the Missouri River below Holter Dam. Sucker species and yellow perch are expected to continue providing the bulk of the walleye diet. White sucker abundance averaged 10.7 per gill net from 2000-2017 and 4.2 per gill net from 2010-2017. Three-year average objectives for white sucker were never met during the previous management plan and abundance has continued to decrease. Yellow perch are particularly important to the fish community because of their significant value as both a sport fish and a forage fish for walleye. One of the primary concerns of introducing new forage species would be the impact on the plankton community, which currently provides the bulk of the rainbow trout and yellow perch diet and are vital for survival of naturally produced walleye fry. Changes to the zooplankton community composition following introduction of a forage species could potentially limit recruitment of juvenile fish, especially yellow perch and walleye. There is also potential that walleye would not utilize a new species stocked as forage. Maintenance of at least 20 organisms per liter of cladocerans and copepods during mid-summer plankton sampling (average June, July, and August) will ensure that the yellow perch, rainbow trout and juvenile walleye food supply is maintained at current levels. Zooplankton species composition is also a vital component to a functional food web; in Canyon Ferry *Daphnia sp*. are essential to growth and survival of all juvenile fishes in the reservoir.

Strategies:

- Prevent depletion of the available forage by managing the walleye population at a sustainable level of no more than 7 fish per gillnet on a three-year running average. Consider active management measures if walleye abundance increases above 7 fish per gillnet and/or sucker abundance decreases below 5 per net or yellow perch abundance decreases below 3 per net on a three-year running average.

- Active management measures may include increasing walleye bag limits, species specific netting, or commercial fishing. See Walleye discussion for adaptive management strategies.

- Explore opportunities to improve the forage base in Canyon Ferry.

- Give priority to increase current forage species to support a multi-species fishery. Previous evaluation of forage introductions has shown that risks associated with a new species introduction outweigh any potential benefits. Consequently, no new species will be evaluated or considered for introduction into the management plan area.

- FWP will work to prevent the unauthorized introduction of new fish species to protect the resident fish community. Implementation measures would include development of a public education program, surveillance, and strict enforcement of State laws and policies prohibiting introduction of unauthorized species.

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Northern Pike

Goals and Objectives:

Monitor and suppress the northern pike population from Toston Dam to Canyon Ferry Dam and evaluate impacts to other species.

Rationale:

Canyon Ferry and the Missouri River between Toston and Canyon Ferry have long held a low-level northern pike population. An abundance of northern pike were discovered in the mid-2000's in the impoundment upstream of Toston Dam and reports of smaller-sized pike caught by anglers in Canyon Ferry Reservoir became more numerous. Reproduction of northern pike in the reservoir was first documented in 2008 through the capture of young of the year pike during summer beach seining. Northern pike young of the year have been routinely captured from 2008-2017 as well as multiple age classes of adult fish (10- to 45-inches) in various monitoring surveys from 2009-17. Northern pike are highly piscivorous fish and the current forage base in Canyon Ferry is likely not adequate to support an additional voracious predator. In 2012 FWP issued a decision notice on an environmental assessment to remove northern pike from the upper Missouri River system (including Canyon Ferry) incidental to other fish survey programs.

Strategies:

- Eliminate angler bag limits for northern pike in the upper Missouri River reservoir system and manage northern pike population according to the Missouri River Basin Northern Pike Suppression Project EA Decision Notice. See Appendix E for additional discussion on northern pike suppression efforts within the Upper Missouri River Reservoir Fisheries Management Plan area.

- Identify critical spawning habitats in the river and reservoir and determine if habitat manipulations can suppress pike numbers and emigration through the system.

- Explore and implement other opportunities or techniques to suppress northern pike numbers.

- Determine impacts of northern pike to existing forage.

- Additional management methods may be necessary to reduce pike populations (e.g., spearing, commercial fishing, required harvest during tournaments) following public review and/or FWP Commission or MEPA process.

Other Canyon Ferry Reservoir Fisheries Management Issues

Reservoir Operations

Goals and Objectives:

Work cooperatively with Bureau of Reclamation to incorporate fisheries management and angler access concerns into the management of Canyon Ferry Reservoir.

Rationale:

Reservoir operations have a significant impact on fish populations residing in Canyon Ferry Reservoir by influencing the quality of shoreline habitat, flushing losses over and through the dam, and recreational access to the lake. The Bureau of Reclamation and FWP have been effective partners in water management in the reservoir system; however, flood control, irrigation, and power production are prioritized over recreation and fisheries management.

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Strategies:

- Continue participation with the reservoir operations steering committee to focus efforts on optimizing reservoir operations for the fisheries resources. The reservoir operations steering committee, comprised of FWP, NorthWestern Energy, BOR, irrigators, marina operators, guides and outfitters, and sportsmen, meet annually to review water supply forecasts, proposed dam operations and operational guidelines in an effort to minimize impacts of dam operations on fish, wildlife and recreational resources.

- Work with reservoir steering committee and BOR to manage reservoir operations to promote better fish habitat.

- Manage reservoir levels to better promote shoreline vegetation development.

Derbies/Tournaments

Any regional, district-wide or statewide policies, restrictions or regulations governing tournaments which may be developed during the plan period and which geographically include Canyon Ferry will supersede restrictions listed here unless less restrictive.

Rationale:

Fishing tournaments can impact fish populations and conflict with non-tournament angling and recreational opportunity. All proposed tournaments will be evaluated based upon biological impacts, potential conflict with other recreational users, and public safety.

Strategies:

- Regulation of fishing tournaments on Canyon Ferry Reservoir will be based on management strategies for individual fish species. Generally, this will require a conservative approach to harvesting native fishes (burbot or ling) and sport fish species (trout and perch) that are subject to predation by walleye. Management strategies direct a liberal approach to harvesting walleye unless monitoring shows a significant decline in walleye. If walleye decline below the goal of 3 per gillnet for a three-year average, tournaments may be restricted or denied to minimize handling mortality. Conversely, if walleye monitoring shows a three-year average exceeding 7 per gillnet, it may be necessary to encourage or require selective harvest of fish taken to support management objectives.

- Harvest-oriented and/or catch and release tournament sponsors may be required to accommodate data collection or fish tagging by the department. Important data can be generated from the tagging or sampling of fish caught in tournaments that would be beneficial to management of the fishery in Canyon Ferry.

- Regulation of tournaments will account for the need to distribute tournaments evenly throughout the year and provide for angling opportunities on the reservoir free from tournaments. A maximum of 12 tournaments per year of any type (open water angling, ice fishing, bowfishing, etc.) will be permitted. More than one tournament will not be permitted for the same day and tournaments will not be approved for consecutive weekends in order to minimize the potential for conflicts. Applications will be considered on a first come basis until all available slots are filled. Applications must be received by July 1 for ice derbies and November 1 for open water of the year preceding the proposed tournament. Applications received earlier than May 1 for ice fishing and September 1 for open water will be returned to the applicant for resubmittal.

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Rainbow Trout

Harvest from competitive fishing events is not consistent with the management strategy to maintain conservative regulations relating to rainbow trout harvest and support year around angler opportunity.

- Maintain the past and current management strategy of not allowing competitive fishing derbies for rainbow trout in Canyon Ferry.

Yellow Perch

Perch are highly sought after by anglers as a sport fish in both the ice and open water seasons, but also are the primary forage fish for all piscivorous (fish-eating) fish species in the reservoir.

- Maintain the past and current management strategy of allowing one competitive fishing event during January.

- Based on the conservative perch harvest limits adopted by the FWP Commission, it may be necessary to modify the structure of events (such as team fishing events) to ensure compliance with the daily harvest limits (currently 10 fish daily and in possession).

Walleye

Tournaments would potentially attract new or additional anglers to the reservoir to assist efforts to promote angler harvest of walleye, which is consistent with strategies to manage walleye numbers.

- Authorize up to three tournaments in a calendar year but no more than one tournament per month to provide a balance with existing users of the lake that are not interested in competitive fishing events and who would be negatively impacted by tournament activities.

- All applications (catch and release or harvest oriented) will receive the same consideration. Preference will be given to tournaments held previously (first come basis).

- Fish mortality for catch and release tournaments is a concern during the summer months when water temperatures exceed 65 degrees. Logistics for handling and transporting fish will be addressed as necessary to minimize mortality.

Burbot (Ling)

Burbot population trends are not well understood and additional harvest caused by a competitive fishing derby may cause unforeseen impacts to the fishery. Burbot are a long-lived and slow growing native species.

- Allow up to two derbies (restricted to angling only) per year. Structure these events to allow for competitive fishing for large and/or the largest fish and not to include competitive fishing for the most fish or most total weight of fish.

Carp

Carp are a non-native fish, which probably contribute very little to the community of native and/or preferred sport fish in the reservoir. No biological concerns are raised by these events and there is currently no biological need to restrict the number of carp derbies.

- No restriction on number of events other than the total number of events allowed on Canyon Ferry Reservoir, but derbies must be compatible with management objectives.

- Derbies for young anglers should avoid competitive events by structuring the derbies to reward participation rather than for catching the largest or most fish.

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- Adult competitive carp events can and should emphasize biggest fish, most fish and/or most weight. Harvest is recommended but not required.

Use of Live Fish as Bait

Goals and Objectives:

Prevent introduction of new fish species into the Upper Missouri River Reservoir system from the use of live fish as bait.

Rationale:

The use of live fish as bait poses significant risks for introducing new fish species to the system. An inadvertent introduction could significantly impact the existing fish communities in Canyon Ferry Reservoir and downstream waters. There is substantial interest in fishing with live fish as bait for walleye fishing, particularly during seasons when catch rates are low (i.e., ice-fishing).

Strategies:

- Continue to prohibit the possession or use of live fish as bait.
- Continue education efforts regarding the risks associated with use of live baitfish and the importance of preventing inadvertent introductions of new species.
- Educate anglers regarding effective bait alternatives that are commercially available that pose no threat of inadvertent species introductions.

Habitat

Goals and Objectives:

Aggressively protect and enhance fish habitat as a management tool.

Rationale:

Habitat quality for sport fish species and forage species is an important factor in determining the quality and sustainability of the fish community in the Canyon Ferry/Missouri River system. The limiting factors in habitat management are well understood in Canyon Ferry Reservoir. Habitat complexity is critical for providing balance in predator/prey relationships, particularly in western reservoirs where habitat diversity is minimized by fluctuating lake water levels and associated poor development of submergent and emergent vegetation. Continued enhancement of spawning habitat for salmonids provides diversity of recruitment sources to the system.

Strategies:

- Efforts to expand yellow perch spawning and rearing habitat may enhance habitat diversity for this important sport fish and forage species. Implementation will focus on using natural materials, limiting costs, and monitoring effectiveness.
- Enhancement projects for salmonids will focus on providing fishing opportunities and spawning areas in the Missouri River and associated tributaries to enhance trout fishing opportunities in locations where walleye are less abundant.
- Enhancement of tributary habitat and improved water quality will be used to mitigate effects of disease and drought on trout populations in the system.

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- Other habitat concerns will be addressed by working with BOR on lake level issues, working with DNRC on Toston Dam operation and Broadwater Power Project mitigation, reviewing 310 and 124 permitting, private pond licensing, and implementation and monitoring of instream flow reservations on the Missouri River and associated tributaries.

Disease and Aquatic Invasive Species

Goals and Objectives:

Prevent new diseases and exotic aquatic plant and wildlife species from entering the Canyon Ferry/Missouri River system and limit the expansion of current disease agents.

Rationale:

The outbreak of disease has potential to impact all fish species and hatchery egg sources in the Canyon Ferry/Missouri River system. Introductions of invasive aquatic species (e.g., *Dressenid* spp mussels, Eurasian watermilfoil, New Zealand mudsnail, asian carp) have the potential to out-compete desirable flora and fauna in the reservoir system and can negatively impact recreation and water use as well as fish populations. Illegally moving live fish to or from the reservoir for introduction into other systems is a threat to the Missouri River system as well as water bodies throughout Montana. One sample of a suspect *Dressind* spp mussel (i.e., zebra or quagga mussel) was sampled in Canyon Ferry in 2016, but no positive detections have been observed in subsequent sampling.

Strategies:

- Maintain boat check and decontamination stations as long as Canyon Ferry is suspect for invasive mussels.
- Reduce the risk of introducing disease agents to the system by disease testing hatchery fish and egg sources.
- Continue education efforts to reduce spread of disease and aquatic invasive species.
- Continue regulating private ponds near Canyon Ferry.
- Continue monitoring of invasive species and pathogens.
- Continue work with Enforcement personnel to insure compliance with boat decontamination and AIS rules (e.g., transport of live fish).

Piscivorous Birds

Goals and Objectives

Work with FWP Wildlife Bureau and the U.S. Fish and Wildlife Service to determine the impacts of pelicans and cormorants to Canyon Ferry fish populations. Consider active bird management strategies if research shows significant impacts to fish populations.

Rationale:

Numbers of American pelicans on Canyon Ferry have grown exponentially from record-low population levels of the early 1990s. Double crested cormorant numbers steadily increased through the late-1990s and have currently stabilized near 500 nesting pairs on the Canyon Ferry Wildlife Management Area. Both pelicans and cormorants are piscivorous (fish eating) birds. Recent research (Vivian and Mullan 2018) documented extensive pelican predation on surrounding fisheries by pelicans at the Canyon Ferry nesting

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colony, with observations of previously tagged fish from the Smith River commonly found. Tagged fish from the Little Blackfoot, Big Hole, and Yellowstone Rivers have also been observed during previous monitoring.. FWP observations of pelican and cormorant diet while fledgling birds were still on the nest (typically mid-June) found pelican diet comprised primarily carp and crayfish, while cormorants showed a preference for trout. These observations only provide a snapshot of what comprises the bird's diet—additional study is necessary to determine seasonal variation in bird diets and to better assess total fish consumption by pelicans and cormorants.

Strategies:

- Continue monitoring and research to assess seasonal diet and composition for pelicans and cormorants.

- Evaluate the economic impact of consumption of stocked rainbow trout by cormorants.

- Evaluate the impact of pelicans and cormorants to sport and native fish populations in Canyon Ferry and the Missouri River as well as surrounding watersheds.

- Determine if population control measures of pelicans and/or cormorants could positively influence fish populations.

- Any proposal to implement population management measures will require an Environmental Assessment and provide opportunity for public comment. No management action will be taken without thorough research and evaluation of bird and fish interactions.

Access

Goals and Objectives

Identify areas and strategies to improve fishing, boating, and camping opportunities on Canyon Ferry Reservoir. Maintain or improve access for shore anglers and kid's fishing.

Rationale:

Maintaining quality access to the reservoir is essential to maintaining Canyon Ferry as one of the most heavily fished waters in the state. Shoreline development in some areas of the reservoir may lead to additional conflict between homeowners and anglers. Other areas of the reservoir have limited boat-launching facilities, which can lead to increased bank erosion from boats launching from beaches.

Strategies:

- Continue working with BOR regarding installing an additional boat ramp on the east shore (i.e., Duck Creek, Confederate Bay) to reduce bank erosion due to boats launching from the beach and for safety of boats during wind and storm events. Launching in these areas are currently limited due to boat decontamination requirements for AIS, but opportunities for improved boat launching facilities may arise if AIS monitoring finds no positive detections of zebra or quagga mussels.

- Educate anglers and landowners about what areas are legally accessible by anglers and recreators.

Flushing Losses at Canyon Ferry Dam

Goals and Objectives:

Evaluate annual and seasonal flushing rates of fish out of Canyon Ferry Reservoir. Determine feasibility of screening Canyon Ferry Dam to reduce flushing losses.

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Rationale:

Flushing loss of fish out of Canyon Ferry Reservoir can be significant, especially during high water years. Skaar and Humphrey (1996) documented that flushing losses of hatchery rainbow trout was correlated with high runoff. Flushing loss can effect recruitment of stocked fish, but appears to have little overall effect to perch and walleye abundance in Canyon Ferry. Flushing loss from Canyon Ferry have significant impacts to fish populations downstream of Canyon Ferry. Flushing flows typically occur in the spring, when pelagic walleye fry are readily flushed over Canyon Ferry Dam. Adult walleye are also susceptible to flushing, with walleye tagged in Canyon Ferry captured in Hauser Reservoir and below Hauser Dam. Historically, high levels of walleye abundance in Hauser and Holter Reservoirs are largely attributable to flushing from Canyon Ferry Dam. In the Missouri River below Holter Dam, walleye abundance increases following years with flushing flows. Achieving balance between predator and prey species in downstream waters will remain difficult unless walleye flushing issues can be addressed.

Strategies:

- Continue to evaluate entrainment and flushing rates of fish out of Canyon Ferry Dam. Determine timing and magnitude of flushing losses.

- Determine feasibility of reducing fish flushing losses out of Canyon Ferry Reservoir.

- Evaluate screening devices on Canyon Ferry Dam that would reduce flushing losses.

- Investigate other technologies that may be effectively employed on Canyon Ferry Dam to reduce fish flushing losses and entrainment to downstream waters.

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Section 4
Hauser Reservoir

Management History

Hauser Reservoir supports 12 game and 10 nongame fish species (Table 6). Of these 22 species, 12 are native and 10 are nonnative. Yellow perch, rainbow trout, and kokanee salmon have historically been the most abundant game fish found in the reservoir. In the past 20 years, walleye numbers have increased to comprise a major component of the Hauser fishery. Suckers (white and longnose) are the most abundant nongame species. Native game species including westslope cutthroat trout and mountain whitefish occur at low densities, while burbot (ling) densities have increased.

Since construction of Hauser Dam in 1911, a variety of fish species have been introduced into the reservoir without consideration of habitat requirements. Earliest records from the 1930s document the introduction of sunfish, bass, bullhead, bluegill, coho salmon, rainbow trout, brown trout, and yellow perch. Most of these early introductions failed to produce a fishery. Rainbow trout, brown trout, and yellow perch proved relatively successful (Figures 7 and 8). Walleye were first planted by FWP into Lake Helena in 1951. Survivors from this plant maintained a sparse population in Hauser Reservoir with numerous documented angler creel reports and gill net catches throughout the 1960s and 1970s. Walleye were again stocked in 1989 by FWP as part of the 1989-1994 Hauser Reservoir Management Plan. Approximately 5,000 advanced fingerlings (3-5" total length) were stocked annually from 1989 through 1998. Walleye stocking ceased following expansion of the Canyon Ferry walleye population.

In the early 1950s, kokanee salmon were introduced into Hauser Reservoir. Kokanee plants were unsuccessful in producing a fishery in the reservoir despite stocking almost one million kokanee over a six-year period. The kokanee population that thrived through the 1980s and 1990s apparently originated from plants that were made into Canyon Ferry Reservoir in the late 1960s or from plants made into the Helena Valley Regulating Reservoir in the 1970s. Some of the kokanee stocked in Canyon Ferry Reservoir were siphoned into the Regulating Reservoir where they survived and produced a good fishery, which prompted annual stocking beginning in 1971. The kokanee population in Hauser Reservoir began to develop when the Regulating Reservoir was drained for repairs in 1978. Apparently, kokanee from the Regulating Reservoir were spilled into the Hauser system when the repair work was conducted. Since the late 1970s, the kokanee population in Hauser Reservoir expanded dramatically and has undergone large annual fluctuations. Record high runoff and associated fish flushing during 1995, 1996 and 1997 resulted in a severe decline in the Hauser kokanee population to a fraction of early 1990s levels. Hatchery plants throughout the late 1990s and early 2000s were unsuccessful at reestablishing the kokanee population. Each year a small number of kokanee spawn in Spokane Creek and other reservoir tributaries or spill from the Regulating Reservoir into Hauser.

The rainbow trout fishery in Hauser Reservoir is maintained by annual stocking. Wild rainbow comprise less than 10% of the fishery due primarily to poor quality spawning habitat in the reservoir and tributary streams. Approximately 200,000 3-5 inch Arlee rainbow trout were planted annually through 1990 when stocking numbers were reduced to nearly half in response to the dramatic increase of the kokanee salmon population. Catch rates for rainbow trout declined steadily following reductions in the number of hatchery rainbow stocked. Through the early and mid 1990s, Arlee rainbow were planted after spring runoff in an attempt to minimize losses of fish over the dam when water was spilled. Following the

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Table 6. Fish Species in Hauser Reservoir Including Statewide Native Status, First Stocking Date, Population Trend and Relative Abundance.

Species	Native	First Stocking Date	Population Trend	Relative Abundance (Based on historic field monitoring.)
Game Fish Species				
Kokanee salmon	No	1950	Decreasing	Common
Rainbow trout	No	1934	Stable	Abundant
Brown trout	No	1931	Stable	Common
Burbot	Yes	Native	Stable	Common
Mountain whitefish	Yes	Native	Decreasing	Common
Yellow perch	No	1938	Increasing	Abundant
Walleye	No	1951	Increasing	Abundant
Northern pike	No	Unknown	Increasing	Uncommon
Largemouth bass	No	1926	Unknown	Rare
Smallmouth bass	No	Unknown	Unknown	Rare
Brook trout	No	Unknown	Unknown	Rare
Cutthroat trout	Yes	Native	Unknown	Rare
Nongame Fish Species				
Common carp	No	Unknown	Stable	Abundant
Longnose sucker	Yes	Native	Decreasing	Abundant
Mottled sculpin	Yes	Native	Unknown	Abundant
White sucker	Yes	Native	Decreasing	Abundant
Fathead minnow	Yes	Native	Decreasing	Common
Longnose dace	Yes	Native	Unknown	Uncommon
Utah chub	No	Unknown	Decreasing	Uncommon
Flathead chub	Yes	Native	Unknown	Rare
Smallmouth buffalo	Yes	Unknown	Unknown	Rare
Stonecat	Yes	Native	Unknown	Rare

kokanee population crash in the late 1990s, numbers of stocked rainbows were increased to the current level of 50,000 Eagle Lake strain rainbow trout planted after spring runoff and 100,000 Arlee rainbow trout stocked in the fall. Plants of catchable sized rainbow trout (fish longer than 7-inches) were initiated in 2002 to reduce predation by the growing walleye population.

Prior to 1988, daily and possession limits for trout were 10 pounds and 1 fish, not to exceed 10 fish. For kokanee and walleye, the daily and possession limits were 10 fish and 5 fish, respectively. Beginning in 1988, more conservative regulations were implemented to prevent over harvest of kokanee and protect the walleye population. The trout and kokanee limits were combined making the daily and possession limits 10 trout and kokanee in combination. In 1996, the combined trout/kokanee limit was reduced to 5 fish with a possession limit of 10 trout and salmon in any combination. From 1996 through 2018 walleye numbers and size has been highly variable. Regulations have changed to meet management goals. Over the past 22 years the regulations were (1996-1999) 5 walleye daily one over 20 inches, possession twice daily limit, (2000-2010) 10 walleye daily one over 28 inches, possession twice daily limit, (2011-2013) 20 walleye daily one over 28 inches, possession twice daily limit, (2014-present) 20 walleye daily one over 25 inches, possession twice daily limits. Perch were managed with a 50 fish daily limit through 2010. Since then, the limit has changed to 25 daily (2011-2013) and currently (2014-present) is 10 daily, except April 1-June 30 only 1 fish daily and in possession, 14 inch minimum.

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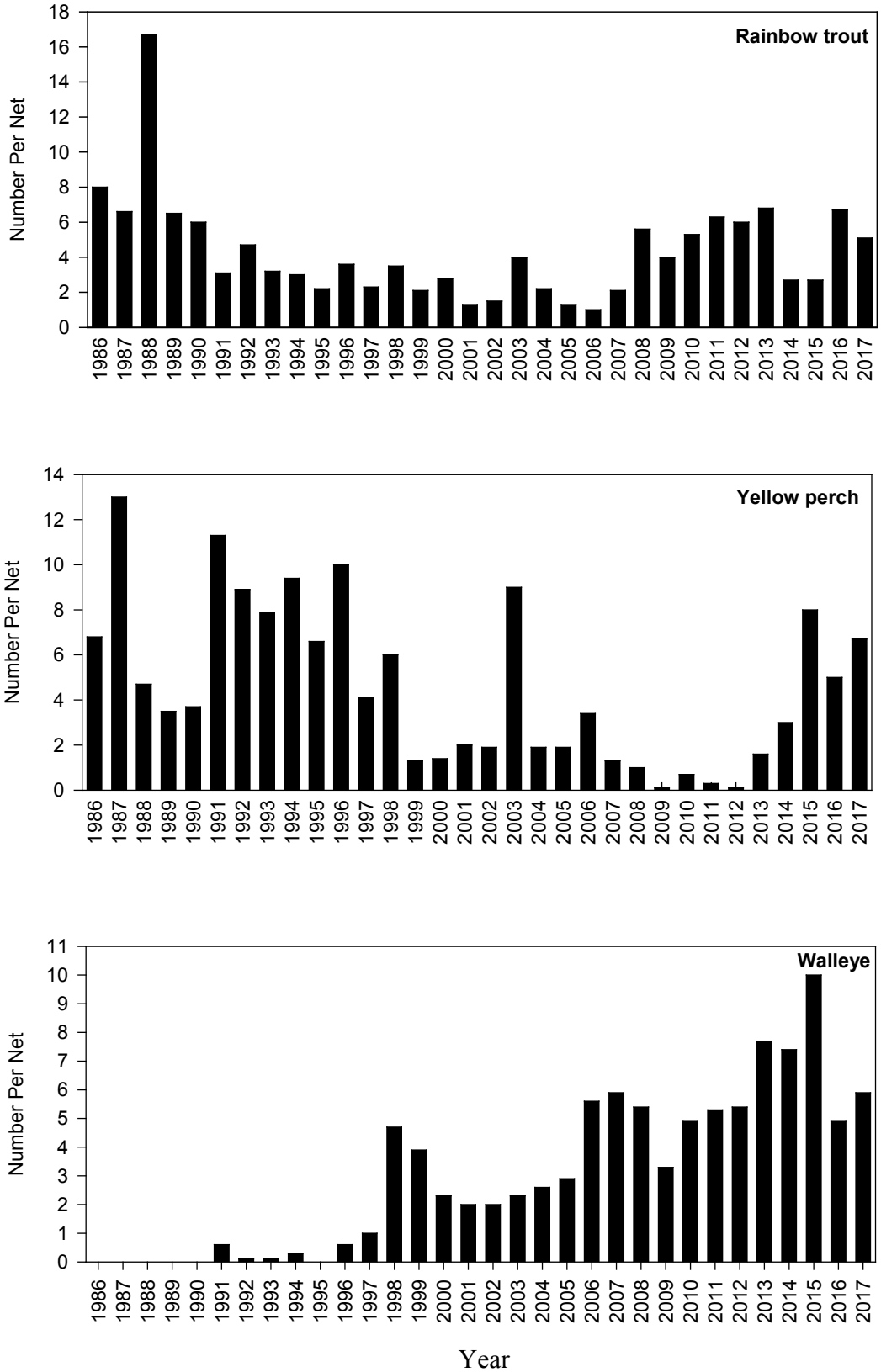

Figure 7. Hauser Reservoir Fish Population Trends for Rainbow Trout, Yellow Perch, and Walleye from Standardized Gill Netting Series.

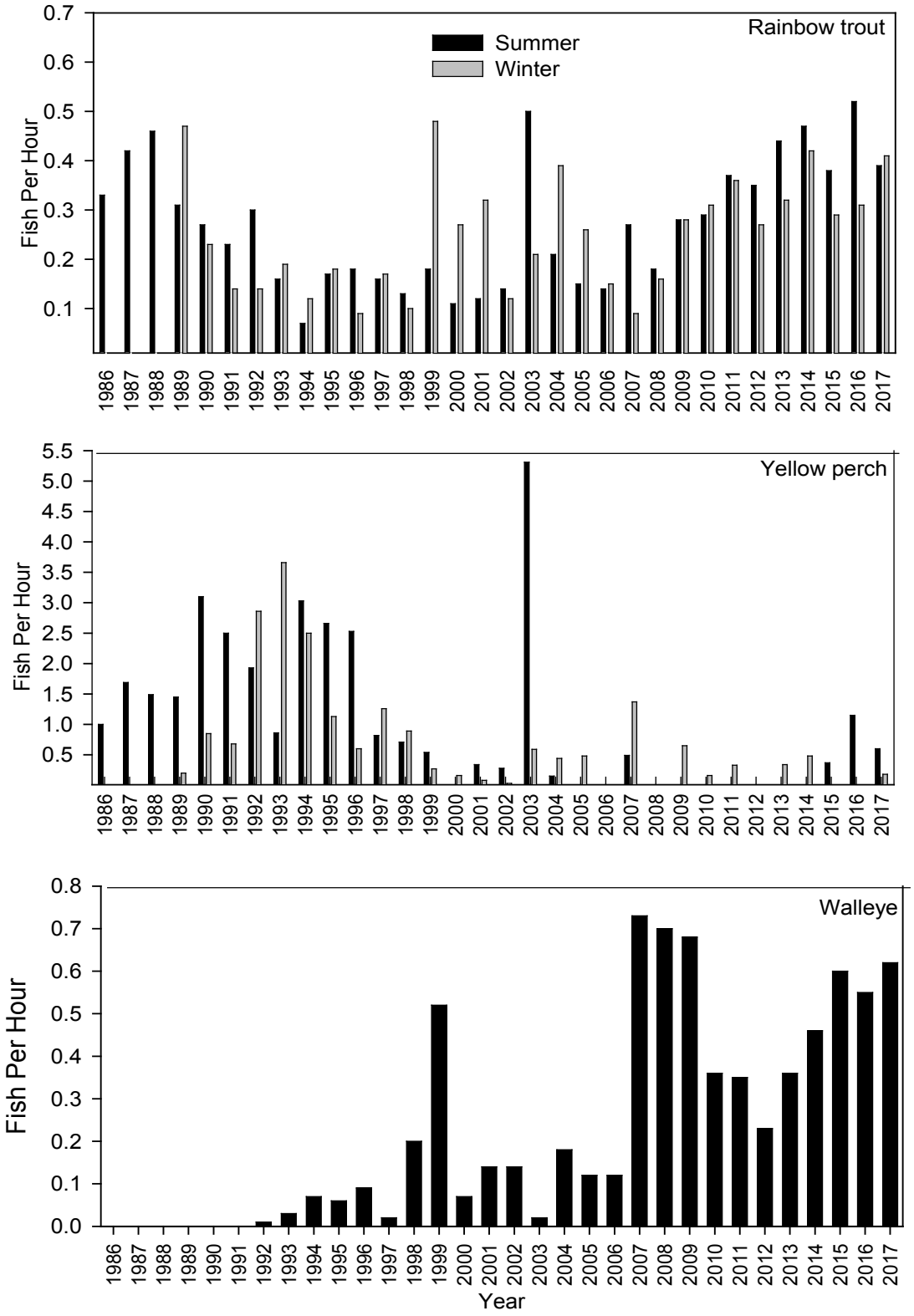

Figure 8. Angler Catch Rates (Fish/Hour) for the Principal Game Species in Hauser Reservoir. Summer (dark bars) and winter (light bars) are represented. Walleye catch rates are summer only. Catch rates are for anglers specifically targeting those species.

Hauser Reservoir Management Goals and Limiting Factors

The goal for managing the Hauser Reservoir fishery is to provide a cost-effective, balanced multi-species fishery with the opportunity to catch rainbow trout, walleye, and yellow perch with kokanee, brown trout, burbot, and other species occasionally contributing to the sport fishery.

Until factors limiting fisheries production in Hauser Reservoir are addressed, the fishery will not reach its full potential. Most of the problems are large in scale and involve numerous government agencies and private landowners. Resolution of these problems will require cooperation of individuals representing the various agencies. As with many large-scale resource management problems, money and manpower will limit the completion of any goals targeted at benefiting the fishery. PPL (now NorthWestern Energy - NWE) Montana took over operational control of Hauser and Holter dams in 2000, and received a new federal operating license in 2001. FERC requires Northwestern Energy to provide funds for monitoring, protection, maintenance, and enhancement of fisheries resources in Hauser and Holter Reservoirs.

Five factors have been identified as limiting fisheries production in Hauser Reservoir:

- Oxygen deficient water continues to be an issue and could be a key limiting factor. Oxygen deficient water (less than 6.5mg/l) is being released annually during fall months (August, September, and October) from Canyon Ferry Dam. Low levels of dissolved oxygen (DO) were first discovered in 1996 below Canyon Ferry dam in Hauser Reservoir, although evidence suggests that it may not be a recent phenomenon. Data collected through the summer and fall of 1998 revealed that the problem is severe at times with low DO values falling below 3mg/l and extending through as much as 75-80% of the surface area of Hauser Reservoir. Based on scientific literature, low DO related impacts to fish range from simple avoidance to increased susceptibility to disease or death if fish are exposed to chronically low DO. Each species is affected differently; although salmonids are more sensitive than most cool and warm water species, especially to DO levels less than 5 mg/l (Environmental Protection Agency (EPA) 1976). Levels below 5 mg/l are especially critical to aquatic life and are estimated to occur an average 45 days/year in Hauser Reservoir. FWP studies conducted in 2002 found that Hauser fish are forced down-reservoir to avoid deoxygenated water, forcing fish to reside either in the Causeway arm or in front of Hauser Dam, where DO typically is at saturation. Downstream movement to avoid low DO waters may cause increased entrainment over Hauser Dam during the fall months. Kokanee salmon likely sustained the most severe impact from low DO, as they would spawn in the fall immediately below Canyon Ferry Dam, where DO values are lowest. Air compressor units were installed at Canyon Ferry Dam have in 2007 and were effective at bringing DO at least to statewide standards for running water during all flow conditions. Unfortunately design inefficiencies with the compressors made the unit inoperable and it was only operated for two seasons.

- Fish loss out of Hauser Reservoir from flushing over the spillway and entrainment (passage through the turbines in the dam) continues to be one of the principal factors affecting species assemblages on an annual basis. While all fish species are susceptible to flushing, kokanee salmon may flush at higher rates because of behavioral tendencies. Skaar and Humphrey (1996) documented flushing of stocked rainbow trout correlated with high runoff. Walleye flushing has been documented through the recovery of tagged fish. Walleye tagged in Hauser Reservoir have been recaptured in Holter Reservoir and the Missouri River below Holter Dam by anglers and FWP survey crews. Spinelli (2014) also documented entrainment of rainbow and walleye through Hauser Dam.

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- Walleye flushed from Canyon Ferry Reservoir into Hauser Reservoir is an issue that affects the balance of the multi-species fishery. Depending on annual year class strength and water year, the number of walleye flushed into Hauser Reservoir has the potential to be significant. Since the expansion of the Canyon Ferry walleye fishery, walleye relative abundance in Hauser increased 1,700%, from an average abundance of 0.2 walleye per net (1986-1997) to an average of 3.6 walleye per net (1998-2008). Walleye abundance further increased to 6.1 walleye per net (2009-2017). Although Hauser has historically supported a low-level walleye population, there is not enough forage to support the current abundance of walleye in Hauser. Growth rates and condition factors for Hauser walleye are very poor. Invertebrates and zooplankton continue to comprise the majority of walleye diet samples rather than fish, which is an expected and preferred prey item.

  No screening devices are in place on Canyon Ferry Dam to limit the number of walleye flushed into Hauser and Holter Reservoir. However, there may be technology available that may limit the effects of fish flushing from Canyon Ferry. Electric weirs have been successful at reducing entrainment at some dam and diversion facilities. There may also be potential to add pressurization devices that kill any fish that are entrained. Such systems will be expensive and further research is needed to evaluate the cost-effectiveness of such a system. These types of measures may be necessary to maintain a balanced multi-species fishery in Hauser Reservoir.

- Poor quality spawning tributaries to Hauser Reservoir will continue to limit the production of wild fish and the contribution of wild fish to the Hauser fishery. Kokanee salmon have been the only sport fish that has at times had excellent success spawning in Hauser. Spawning has occurred in the Hauser tailrace and Spokane Creek. Other available streams (Trout, McGuire, Soup, Prickly Pear and Silver Creeks) have water quality and quantity problems. Poor land management practices (both historic and present) in these watersheds will continue to limit fish production. Until these issues are addressed, there is little potential for establishing wild runs of fish that could contribute significantly to the Hauser Reservoir fishery.

  Yellow Perch spawning habitat in Hauser Reservoir is limited by the lack of structure in the Reservoir. This is a common problem in many reservoirs as submerged wood that is initially inundated following dam construction breaks down over time. Based on the age of Hauser Reservoir, nearly all of the trees that were initially flooded have decayed.

- Whirling disease and other diseases remain a concern in fish management in Montana. Because Hauser Reservoir trout fishery is sustained with hatchery rainbow trout, whirling disease is not likely to impact this fishery. Because of the high amount of angler and boater use, Hauser is at high risk of exposure to pathogens or invasive species due to inadvertent transport on boats and equipment.

Hauser Reservoir Management Goals by Species

In order to manage a fish community that includes multiple sport fish species, it is important to recognize that the goal for each species is affected by the success of management strategies for other species in the system and that all fish species may not be maximized simultaneously.

Rainbow Trout

Goals and Objectives:

Rely on rainbow trout to provide a principal component of the sport fishery.

- Maintain a three-year running average of 3 rainbow trout per net in fall floating gillnet series.

- Maintain an average summer angler catch rate of 0.15 to 0.20 fish/hour for anglers specifically targeting rainbow.

Rationale:

Throughout the late 1980s, rainbow trout provided a significant percentage of the Hauser Reservoir fishery. Catch rates during this period were considered good, averaging 0.24 rainbow/hour. Concurrently, FWP was annually stocking roughly 220,000 rainbow fingerlings per year. In 1990, the number of rainbows planted was reduced by nearly half to an eight-year average of only 118,000 fingerlings based on recommendations made in the previous management plan to maximize harvest of the self-sustaining kokanee population (FWP 1989). From 1995-1996, an average 100,000 fingerlings were stocked annually with catch rates during this period averaging 0.06 rainbow/hour. Following the crash of the kokanee fishery in the late 1990s, beginning in 2002 rainbow stocking rates and size of fish at stocking were increased to 150,000 8-inch rainbows stocked in the summer and fall. These stocking rates have yielded an average summer angler catch rate of 0.23 rainbow per hour (2002-2008) and have increased to 0.39 rainbow per hour (2009-2017).

Strategies:

- Commit to stocking annual rainbow plants of approximately 100,000 Arlee rainbow (average 8-inches in length) and 50,000 Eagle Lake rainbow (8-inches) when funding is available. These fish will be stocked following peak runoff to reduce flushing impacts. Adaptive management changes in the rainbow stocking plan could occur in response to walleye predation.

  - If three-year average catch in fall floating gillnets falls below 2 rainbow per net, consider changes to the stocking plan (e.g., timing and location of fish plants, strains, size at stocking) and implement if deemed cost-effective.

  - If three-year average catch in fall floating gillnets falls below 1 rainbow per net, consider more liberal management actions, such as reducing harvest limits and/or predator suppression measures.

- Continue evaluation of fall released rainbow trout:

  - Stock rainbow trout at a larger size in the fall to reduce susceptibility to walleye predation and reduce flushing losses.

  - Avoid low DO by waiting until Canyon Ferry Reservoir turns over (generally the first two weeks in October) before stocking fish. Stocking would occur when DO values in Hauser Reservoir are within a more optimum range for rainbow trout (greater than 6.5mg/l).

- Maintain the current fishing regulation of 5 trout or salmon daily in combination, 10 trout or salmon in combination in possession.

- In 2018 and 2019 rainbow trout stocking was reduced by approximately 50% due to budget constraints. During the review process of this version of the plan it is assumed that funding for stocking of catchable size fish in the reservoir will resume in 2020. If continued budget constraints prevent stocking of catchable sized fish after 2020, fish management strategies and objectives for all fish species will need to be reconsidered.

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Yellow Perch
Goals and Objectives:

Rely on yellow perch to provide a self-sustaining fishery that is based entirely on wild reproduction.

- Maintain a three-year running average of 4 yellow perch per net in fall sinking gillnet series.

Rationale:

Yellow perch were planted in Hauser Reservoir from 1939 to 1955. Subsequently they have maintained moderate population levels in the reservoir entirely through natural reproduction. Although present for approximately the same period of time, perch densities have not achieved levels comparable to Holter Reservoir. Yellow perch populations have been limited by flushing, habitat conditions, and predation. Populations appear to be driven by environmental conditions rather than by the number of spawning aged adults. A relatively small spawning stock of adult yellow perch can still produce large year-classes of fish. Perch flushed from Canyon Ferry also heavily influence population abundance.

Yellow perch were commonly the most sought after species by Hauser ice-fisherman and can be an important component of the Hauser winter fishery. Catch rates have always been variable but have declined as walleye abundance has increased. Winter angler catch rates averaged 1.53 fish per hour (1989 through 1997), declined to an average of 0.39 fish per hour (1998-2008), and currently stand at an average of 0.24 fish per hour (2009-2017). Perch were managed with a 50 fish daily limit through 2010. Since then, the limit has changed to 25 daily (2011-2013) and currently (2014-present) is 10 daily, except April 1-June 30 only 1 fish daily and in possession, 14 inch minimum. The current April-June length restriction is intended to protect additional spawning age fish, which are especially vulnerable during the spring spawning season.

Strategies:

- Identify and implement cost-effective yellow perch habitat enhancement projects.
    - Construct and deploy tree structures for spawning and rearing habitat if an easily accessible source of trees is available. Recycled Christmas trees from the Helena and Bozeman areas are used to construct perch spawning structure in Canyon Ferry. Hauling of Christmas trees or cutting junipers from nearby areas are options for more trees, however these options are often limited by the cost of cutting and hauling trees on site.
    - Identify and experiment with other artificial habitat structures that may enhance perch spawning.
- Maintain daily angler bag limit at 10 daily with no possession limit.
    - Limiting factors listed above (see Rationale) likely have more significant impacts to yellow perch abundance than angler harvest. Maintaining the daily bag limit at 10 will allow evaluation of angler harvest and determine if harvest is a significant limiting factor.
    - Recommend raising the bag limit if yellow perch abundance increases above 7 perch per fall sinking gillnet on a three-year running average.
    - Recommend eliminating or reducing yellow perch length restrictions when the management goal of 4.0 yellow perch per three year running average is met.

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- Consider additional management actions if yellow perch abundance falls below 1 perch per fall sinking gillnet on a three-year running average.

  - Additional actions may include further reductions in angler harvest of perch and/or implementation of active walleye management strategies.

Walleye
Goals and Objectives:

Maintain walleye as a species that provides a balanced, cost-effective fishing opportunity in Hauser.

- Maintain a three-year running average of 3 walleye per net in fall sinking gillnet series.

Rationale:

The current prey base in Hauser is not capable of supporting walleye abundance at current population levels. Walleye population numbers should be decreased to meet prey availability. The stated objective of 3 walleye per sinking fall gillnet is based on gillnetting trends as well as the successful multi-species fishery that historically existed in Holter Reservoir prior to expansion of walleye in Canyon Ferry. Holter has provided a sustainable multi-species fishery containing rainbow trout, walleye, and yellow perch. Hauser Reservoir differs from Holter Reservoir in several key physical parameters. Most prominent is water retention time: Holter exchanges water on average every 21 days while Hauser is only 8 days (Table 1). This has the potential to strongly influence walleye populations and prey availability because of flushing losses. The substantially lower growth rates of Hauser walleye indicate prey availability is much lower than in adjacent reservoirs. Flushing of walleye from Canyon Ferry will continue to be a problem unless a way to reduce entrainment at Canyon Ferry Dam is found.

Strategies:

- Adjust angler bag limits to increase harvest and lower walleye abundance to levels sustainable with forage abundance.

  - Maintain daily bag limit of 20 fish only one over 25-inches, 40 in possession to maximize walleye harvest and decrease abundance to levels more consistent with available forage.

  - Monitor harvest from the Lake Helena Fishing Access Site (FAS) to determine if size or seasonal restrictions are necessary to protect larger-sized fish during the spring.

- Evaluate restrictions in walleye bag limits if walleye abundance falls below the three-year average of 3 walleye per gillnet and angler harvest is determined to be the cause of abundance declines.

  - Regulation changes will be considered if rainbow trout abundance exceeds management goals (three-year running average of 3 rainbow trout per fall floating gillnet) and yellow perch abundance is near management goals (three-year running average of 4 yellow perch per fall sinking gillnet).

  - Restrictions may include reducing bag limits, size restrictions, and/or seasonal closures.

- Evaluate use of other tools to reduce walleye numbers if three-year average walleye catch in fall sinking gillnets increases above 6 walleye per net or if rainbow trout and/or yellow perch abundance falls below 1 fish per fall gillnet on a three-year average. Other tools may include unlimited harvest, gillnetting or

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trap netting during periods when fish are highly concentrated, spearing through the ice or underwater, among others. Any of these management actions will require public input prior to implementation.

- Solicit funding to determine walleye flushing and entrainment at Canyon Ferry Dam.
  - Determine the feasibility of screening or other methods to reduce walleye entrainment and evaluate the effects on Canyon Ferry Reservoir.

Kokanee Salmon
Goals and Objectives:

Recognize kokanee salmon as a limited supplemental species to rainbow trout with low opportunity as a viable sport species in Hauser Reservoir. Current kokanee abundance is too low to set or maintain a realistic management goal.

Rationale:

Although once abundant and popular with anglers, the kokanee fishery in Hauser has historically proven to be erratic and heavily influenced by runoff and to a lesser degree, harvest. Following record water years in 1997 and increased flushing of walleye from Canyon Ferry, abundance of Hauser kokanee is a fraction of historic levels. Attempts at reestablishing the kokanee population through stocking have failed. Given the current species composition and abundance in the reservoir, it is no longer cost effective to maintain the Hauser kokanee fishery. A small spawning stock of kokanee are still present in Hauser, with low densities of spawning fish observed in tributaries and drainage ditches.

Strategies:

- Eliminate stocking kokanee in Hauser Reservoir. Water quality issues, walleye predation, and flushing rates of kokanee make the cost-effectiveness of continued kokanee stocking unjustifiable. Stocking may continue if these limiting factors can be mitigated.

- Evaluate other strategies that may provide cost-effective solutions to maintaining the Hauser kokanee fishery (i.e., artificial spawning channels).

- Monitor tributary streams and drainage ditches to assess spawning stock present in Hauser.

- When feasible attempt to develop occasional kokanee fishing opportunity through stocking with the understanding the fishery may provide short term or cyclic angling opportunity.

Brown Trout
Goals and Objectives:

Rely on brown trout to provide a limited trophy-fishing experience that is reliant entirely on wild reproduction.

- Maintain at least 0.5 brown trout per sinking gillnet.

Rationale:

Evidence suggests that kokanee salmon had a detrimental impact on brown trout populations in Hauser Reservoir by spawning on top of brown trout spawning redds. With kokanee populations depressed, brown trout populations have demonstrated minor increases. Brown trout are a long-lived species that have maintained low densities in Hauser because of limited reproduction and/or recruitment. Relatively few

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anglers target brown trout however, records indicate that prior to the kokanee population increase in the early 1990s, brown trout numbers were higher and represented an important trophy fishery.

Strategies:

- Identify critical brown trout spawning areas (e.g., Spokane Creek) and implement habitat improvement projects to increase spawning and recruitment.

- Continue catch and release angling regulations on brown trout from below Canyon Ferry dam to Hauser Dam.

  - Eliminating angler harvest allows the brown trout population to rebuild. Continuing this regulation maintains consistency with brown trout regulations proposed throughout the reservoir system.

Burbot (Ling)

Goals and Objectives:

Rely on burbot to provide a low-level, self-sustaining fishery that is supported entirely by wild reproduction.

- Attempt to recruit a three-year running average of 1.0 burbot per fall sinking gill net.

Rationale:

Burbot (ling) is one of three native game fish in Hauser Reservoir. Limited information is known on burbot population dynamics and basic life history in the upper Missouri River reservoir complex, however burbot abundance in Hauser appears to have increased over the past several years.

Strategies:

- Increase knowledge of burbot population dynamics in Hauser Reservoir. Specifically, efforts will be made to collect data (age, growth, food habits, general abundance) from burbot during normal field sampling (gill netting and electrofishing).

- Evaluate reduction in angler harvest if three-year running average falls below 0.5 burbot per fall sinking gillnet.

- Evaluate increasing angler harvest if three-year running average catch of burbot increases above 2.0 burbot per fall sinking gillnet.

- Consider establishing a sampling regime specifically targeting burbot. This would likely involve use of specialized sampling gears deployed in the late winter months.

- Continue winter creel to determine burbot harvest.

Northern Pike

Goals and Objectives:

Monitor and suppress the northern pike population in the reservoir, and evaluate impacts to other species.

Rationale:

Increased abundance of northern pike in upstream waters significantly increases the likelihood of flushing of northern pike into Hauser. FWP documented the first northern pike in Hauser during standardized

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sampling in fall 2009. Northern pike are highly piscivorous fish and the current forage base in Hauser is likely not adequate to support an additional voracious predator. In 2012 FWP issued a decision notice on an environmental assessment to remove northern pike from Hauser Reservoir incidental to other fish survey programs.

Strategies:

- Eliminate all angler bag limits for northern pike in the upper Missouri River reservoir system.
- Identify critical spawning habitats in the reservoir and determine if habitat manipulations can suppress pike numbers and emigration through the system.
- Continue removing northern pike when captured during other fish survey programs. Explore and implement other opportunities or techniques to suppress northern pike numbers.
- Determine impacts of northern pike to existing forage.
- Additional management methods may be necessary to reduce pike populations (e.g., spearing, commercial fishing, required harvest during tournaments) following public review and MEPA process.

Other Hauser Reservoir Fisheries Management Issues

Low Dissolved Oxygen (DO)

Goals and Objectives:

- Monitor DO values in Hauser Reservoir to ensure that water released from Canyon Ferry contains at least 5mg/l DO throughout the summer and fall.

Rationale:

Low levels of DO (less than 6.5 mg/l) were first discovered in 1996 below Canyon Ferry Dam in Hauser Reservoir. Based on scientific literature, DO values of at least 5 mg/l are required to maintain "well-rounded" fish populations while 6 mg/l is required to support healthier and more diverse populations (EPA 1976). Impacts of broad environmental stresses such as low DO are manifested through an increased incidence of parasites and disease. Species are affected differently by low DO, but in general, salmonids are more sensitive than most cool and warm water species to DO levels less than 5 mg/l. Monitoring on Hauser has found that fish are avoiding the upper reservoir; especially during periods when oxygen levels from water releases from Canyon Ferry Dam are lowest (late-summer and early-fall). Presence of a low DO plume may also increase fish entrainment at Hauser Dam as fish move into the lower reservoir to avoid the low DO plume.

Strategies:

- Continue to monitor fish movement in Hauser Reservoir. Work with Bureau of Reclamation to revisit use of air compressor units on Canyon Ferry dam.
- Evaluate the results of the most recent flushing study at Hauser Dam (Spinelli 2014) to determine effects of water quality on fish entrainment at Hauser Dam and determine if low DO increases fish flushing out of Hauser Reservoir.
- Enhance water quality monitoring by collecting DO measurements in the upper reservoir during low DO periods (July-September).

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Flushing Losses at Hauser Dam

Goals and Objectives:

- Evaluate annual and seasonal flushing rates of fish out of Hauser Reservoir. Determine feasibility of screening Hauser dam to reduce flushing losses.

Rationale:

Flushing loss of fish out of Hauser Reservoir is a key limiting factor affecting fish populations. While all fish species are susceptible to flushing, kokanee salmon may flush at higher rates because of behavioral tendencies. Rainbow trout and walleye flushing have also been documented. Skaar and Humphrey (1996) documented that flushing losses of hatchery rainbow trout was correlated with high runoff. Fish flush both through turbines and over the spillway. Walleye flushing has been documented through the recovery of tagged fish. Walleye tagged in Hauser Reservoir have been recaptured in Holter Reservoir and in the Missouri River below Holter Dam by anglers and FWP sampling. Spinelli (2014) also documented entrainment of rainbow and walleye through Hauser Dam.

Strategies:

- Evaluate entrainment and flushing rates of fish out of Hauser Dam as determined by the most recent graduate study (Spinelli 2014). Determine timing and magnitude of flushing losses.

- Determine feasibility of reducing fish flushing losses out of Hauser Reservoir.

  - Evaluate screening devices on Hauser Dam that would reduce flushing losses.

  - Investigate other technologies that may be effectively employed on Hauser Dam to reduce fish flushing losses.

Walleye Flushing from Canyon Ferry Reservoir

Goals and Objectives:

Determine walleye flushing rates from Canyon Ferry Reservoir and evaluate measures to reduce or eliminate walleye flushing from Canyon Ferry Dam.

Rationale:

Walleye flushing out of Canyon Ferry into Hauser Reservoir increased when the walleye population in Canyon Ferry increased. Increased walleye densities in Hauser Reservoir affect the balance of the multi-species fishery with increased predation on trout and yellow perch, and decreased walleye size. Since the expansion of the Canyon Ferry walleye fishery, walleye relative abundance in Hauser increased 1,700%, from an average abundance of 0.2 walleye per net (1986-1997) to an average of 3.6 walleye per net (1998-2008). Walleye abundance further increased to 6.1 walleye per net (2009-2017). Although Hauser has historically supported a low-level walleye population, there is not enough forage to support the current abundance of walleye in Hauser.

Strategies:

- Request funding from BOR to determine how most walleye pass through Canyon Ferry Dam, study walleye flushing rates, and identify strategies to reduce or eliminate entrainment.

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- Determine feasibility of reducing fish flushing losses out of Canyon Ferry Reservoir.
  - Evaluate screening devices on Canyon Ferry Dam that would reduce flushing losses.
  - Investigate other technologies that may be effectively employed on Canyon Ferry Dam to reduce fish flushing losses and entrainment to downstream waters.

Habitat

Goals and Objectives:

Enhance fish spawning opportunities in Hauser Reservoir and in tributary streams to Hauser Reservoir.

Rationale:

In the past, lack of funding limited the number of projects completed to enhance wild reproduction of Hauser fish. Habitat enhancement projects on Prickly Pear Creek, Tenmile Creek, and channel reconstruction on Merritt Spring Creek and Spokane Creek have been constructed to improve habitat for resident fish and for migratory fish from Hauser Reservoir. The Future Fisheries Improvement Program provides funding for projects targeting enhancement of wild fish and will continue to provide financial assistance for projects in the future. NorthWestern Energy has also funded many stream habitat projects as mitigation outlined in their FERC license. An important component to accomplishment of habitat enhancement projects on Hauser Reservoir will be the participation by various watershed and local sportsman's groups.

Strategies:

- Develop a list of habitat projects that could be funded by NWE through FERC relicensing funds. Develop this list in conjunction with sportsmen's groups and local watershed groups. Prioritize projects based on cost-effectiveness and highest benefit.
- Implement enhancement projects that will benefit spawning and recruitment of wild fish in Hauser Reservoir.
- Submit Future Fisheries and NWE grant proposals for habitat enhancement projects benefiting Hauser Reservoir fish populations.

Disease and Aquatic Invasive Species

Goals and Objectives:

Monitor Hauser Reservoir tributaries for disease and Aquatic Invasive Species. Prevent introduction of exotic plant and wildlife species from entering the reservoir system.

Rationale:

Introductions of invasive aquatic species have the potential to out-compete desirable flora and fauna in the reservoir system and can negatively impact recreation and water use as well as fish populations.

Strategies:

- Sample Hauser Reservoir and its tributaries for disease and AIS as part of a state-wide monitoring program.

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- Support AIS education and outreach programs to educate water users about the threat of AIS and how users can reduce the spread of AIS.

Derbies/Tournaments

Goals and Objectives:

Manage derbies/tournaments on Hauser Reservoir to minimize conflict with the general angling public, encourage safety, and ensure consistency with fishery management goals and objectives.

Rationale:

Currently one angling tournament is held on Hauser Reservoir in the summer and no tournaments are held in the winter. Increased interest in fishing tournaments may result in additional requests in the future. Due to high densities of recreational boating use, proposed tournaments will need to address safety concerns and minimize conflict with other recreational boaters.

Strategies:

- Do not allow ice fishing tournaments on Hauser Reservoir for public safety reasons. Ice on Hauser often does not develop to a thickness that would allow for safe ice-fishing tournaments.

- Monitor harvest associated with angling tournaments. If harvest of sport fish is deemed excessive and detrimental to the population, angling tournaments of this nature will be discontinued.

- No more than three derbies/tournaments will be allowed each year. Tournaments would be required to coordinate with Bureau of Land Management (BLM) and/or FWP for access (where appropriate). FWP will encourage use of private access facilities (where possible) to alleviate crowding problems.

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Section 5
Missouri River - Hauser Tailwater (Hauser Dam to Holter Reservoir)

The free flowing segment of the Missouri River is a 4.6 mile-long reach between Hauser Dam and the American Bar Gulch. It flows through a narrow, high-walled gorge for most of its length prior to entering into upper Holter Reservoir. Impounded water from Holter Dam greatly influences the lower 1.5 miles of river. Productivity in this river segment is affected by the two upstream reservoirs (Canyon Ferry and Hauser). Deep-water releases from Canyon Ferry Dam and associated releases from Hauser Dam create tailrace conditions where water temperatures are moderated and the water is enriched with nutrients.

One of the unique aspects of this area is that access is limited to foot or boat travel because of the ruggedness of the canyon. Boating restrictions imposed during the 1999 legislature established a no-wake zone in this section of river from Hauser Dam to Beaver Creek. Areas accessible by car include Hauser Dam, Beaver Creek, and Gates of the Mountains Marina (private ownership).

This segment of the Missouri River has been designated as a Class I, Blue Ribbon sport fishery. The river provides important spawning habitat to brown trout, rainbow trout, kokanee salmon, and mountain whitefish. Species of fish present in the river are similar to those found in Hauser and Holter Reservoirs (Tables 6 and 7). Rainbow trout, brown trout, mountain whitefish, and walleye are the most abundant game fish species and suckers are the most abundant nongame species.

Management History

Trout populations in this segment of the Missouri River were monitored nearly annually until 1987, when electrofishing surveys were discontinued because of concerns about potential adverse effects to spawning rainbow and brown trout. Due to increased fishing pressure and concerns over angler impacts to the fishery, electrofishing surveys were resumed during odd-numbered years in 2003. Historic estimates of the number of rainbow trout (longer than 9.0 inches) ranged from a low of 1,600 fish per mile (1983) to a high of 5,300 fish per mile (1986) while estimates conducted in the 2000s range from 1,900 fish per mile (2005) to 6,798 fish per mile (2009). Studies in 1995 and 1996 indicated that flushing of fish from Hauser Reservoir heavily influences the abundance and species of fish in this reach (Skaar and Humphrey 1996). Rainbow trout (Skaar and Humphrey 1996) and walleye flushing (Teuscher and Humphrey 1996) have been documented along with kokanee salmon. A recent study indicated that fish are flushed both through turbines and over the Hauser Dam spillway (Spinelli 2014). An increasing number of walleye have been caught over the past 20 years, which corresponds with an increasing Canyon Ferry walleye population and years with high runoff. Walleye tagged in Canyon Ferry and Hauser Reservoirs have been recaptured in Hauser tailrace by anglers and FWP survey crews.

Historically, this section of the Missouri River has been managed as a wild trout fishery and, with the exception of McConaughy strain rainbow trout plants (1984 through 1986), has not been supplemented with hatchery fish. However, rainbow trout planted into Hauser and Holter reservoirs undoubtedly influence the resident population. Electrofishing data from 2017 indicated that approximately 80% of the rainbow population in the river was comprised of hatchery fish. Hatchery fish appear more susceptible to

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angling, with 14% of hatchery fish exhibiting hook scars, verses only 6% of wild rainbows with hook scars during 2017 estimates.

Historical brown trout population estimates obtained during 1982 and 1983 indicated that 250 to 425 fish were residing in the river throughout the year and that approximately 1,000 migrant spawners entered the river segment every fall. The average total length of brown trout was exceptional, with fish longer than 18.0 inches comprising up to 48% of the population. Since these early estimates, brown trout populations have declined. Throughout the mid-1980s, the kokanee salmon population in Hauser and Holter Reservoirs increased dramatically resulting in concerns about the potential adverse effects that kokanee may have on this brown trout population. Brown trout abundance was well below historic levels, averaging 157 brown trout per mile (2003-2009). However; these numbers have improved to current averages of 331 brown trout per mile (2011-2017). Average size of brown trout is still exceptional, with an average length of 19.5 inches in 2017.

Fishing regulations on this segment of river allow for year around angling and differ from Holter Reservoir in that only one rod is allowed compared to two on the reservoir. All brown trout caught must be released whereas Holter allows for one brown trout to be harvested by anglers 14 years of age or younger.

Prior to 1983, daily and possession limits for trout were 10 pounds and 1 fish, not to exceed 10 fish. Beginning in 1983, the Department implemented a more restrictive limit of 5 fish. In 1992, catch and release regulations were implemented to protect the remaining brown trout population. Currently (2018) brown trout remain catch and release only and rainbow limit is 5 fish daily and in possession, only 1 over 18-inches. Walleye limits were 6 daily and in possession, includes 5 under 20-inches and 1 over 28-inches through 2010. Walleye limits from 2011 to present are 10 daily, only 1 over 25 inches, possession is twice the daily limit.

Angler use in this section shows a steadily increasing trend. From 1999-2009 the average angler days for this reach was 24,607 per year. From 2011-2015 angler use increased 40% to an average 40,394 angler days per year.

Missouri River – Hauser Tailwater Management Goals and Limiting Factors

The management goal for the 4.6 mile-long reach of the Missouri River below Hauser Dam is to provide a multi-species fishery focused on wild rainbow and brown trout, with walleye and kokanee providing a low level component to the fishery.

The following factors have been identified as limiting the fisheries production in the Missouri River below Hauser Dam. Until they are addressed, the fishery will not reach its full potential. These problems are directly affected by the management direction of Canyon Ferry, Hauser, and Holter Reservoirs.

- Walleye flushed from Canyon Ferry and Hauser Reservoirs into the Missouri River below Hauser Dam is an issue that influences the dynamics of the multi-species fishery. Detailed information on the magnitude of flushing rates from Canyon Ferry is needed to determine timing, magnitude, and influence of walleye flushing. Currently, no screening devices are in place on Canyon Ferry or Hauser Dams to limit the number of walleye flushed.

- Poor spawning conditions in Beaver Creek will continue to limit wild fish production in the Missouri River. Beaver Creek is the principal stream that supports substantial runs of spawning rainbow trout. U.S. Forest Service (USFS) data demonstrates that large beaver dams on the lower reaches (the first 1-2 miles upstream of the confluence with the Missouri River) can substantially impact fish passage to important upstream spawning gravels. Problems have surfaced in the past when angler groups and FWP have removed dams from Beaver Creek without consensus from USFS. High sediment values and embeddedness of substrates further compound spawning success. In 2015 USFS initiated surveys and designs for habitat improvements in lower Beaver Creek. This project is moving forward with work slated to begin in 2018 or early 2019 on the lower mile of the stream.

- Angling pressure is increasing because of the proximity to the greater Helena area. The growing population in the Helena valley suggests that pressure will continue to increase as the quality of this river section becomes widely known. Statewide mail-in creel survey will be used to evaluate angler use, and a comprehensive creel survey initiated in 2012 will continue to determine angler impacts to the fish populaion. The creel survey is done throughout the entire year with one weekday and both weekend days being surveyed with the survey encompassing the section from Hauser Dam to Beaver Creek.

Missouri River – Hauser Tailwater Management Goals by Species

Because of the proximity and association with Holter Reservoir and to a lesser degree Hauser Reservoir, many of the species specific goals for the river below Hauser are the same or similar as those stated for the reservoirs. FWP monitors fish populations via electrofishing on odd numbered years.

Rainbow Trout

Goals and Objectives:

Rely on rainbow trout (particularly wild rainbow trout) to provide a cost-effective, sustainable fishery.

- Maintain fall rainbow trout abundance at or above 3,500 rainbows per mile during fall electrofishing surveys.

- Manage angling pressure to sustain population and manage angler conflict.

Rationale:

This section of the Missouri River has always been managed as a wild trout fishery and, with the exception of McConaughy strain plants (1984 through 1986), has not been directly supplemented with hatchery fish. Rainbow trout planted into Hauser and Holter reservoirs have a significant influence on the resident population. Electrofishing data from 1986 and 1987 indicated that approximately 15% of the rainbow population in the river were comprised of hatchery fish. In 2017, 80% of rainbows captured during population monitoring were of hatchery origin. Increased use of this river section in recent years has led to increased conflicts between various recreational users in the tailrace (e.g., fly fisherman, bait anglers, boaters, guides). A no wake zone currently in place from Hauser Dam to Beaver Creek is designed to reduce conflict between shore anglers and boaters, however poor accessibility in the canyon can make enforcement difficult.

Strategies:

- Continue fall electrofishing on odd-numbered years to monitor rainbow trout numbers. If rainbow trout abundance falls below 1,000 rainbow trout per mile, consider regulation changes to protect the wild trout fishery. Changes may include but are not limited to:
  - Seasonal closures and/or time of day closures.
  - Additional motorized restrictions (also see other Management Issues).
  - Evaluation of guided fishing pressure and strategies to address the issue.
  - Additional size restrictions to protect spawning-sized fish.
  - Evaluation of predator (walleye) impacts to the wild trout fishery.
- Educate anglers about current regulations and rationale for management actions.
- Monitor reservoir-operating plans to ensure adequate stream flows in this river segment to support fish populations.
- Encourage the development and maintenance of wild rainbow trout spawning and recruitment from the Hauser tailrace and Beaver Creek.
  - Continue work with USFS for habitat and fish passage improvements in lower Beaver Creek.
  - Maintain the closure on Beaver Creek from November 30th to June 15th to protect spawning rainbow trout.
- Continue angler creel census using Northwestern Energy FERC relicensing funds to evaluate angler catch rates, annual harvest of rainbow trout, percent of rainbows caught and released, among several other statistics.

Walleye

Goals and Objectives:

Rely on walleye flushed from Hauser Reservoir, resident walleye, and migratory adults from Holter to contribute to a multi-species fishery.

Rationale:

Walleye trends in this river section largely mimic walleye trends from Hauser and Holter Reservoirs. Historic surveys and angler tag return data show many flushed walleye appear to remain immediately below the dams from which they are flushed. Investigations specific to the Holter reservoir walleye population determined that this river section plays a minor role for the Holter Reservoir walleye population (Binkley 1996). There is a trophy component to the walleye fishery in this reach, with large walleye (greater than 25-inches) caught by anglers, especially in the spring and fall months. Typically, not enough walleye are captured during fall electrofishing to produce a viable population estimate; therefore an abundance management goal for walleye is not set.

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Strategies:

- Adjust river regulations to reflect regulations on Holter Reservoir to maintain consistent walleye management strategies between the river and the reservoir.

  - Maintain daily bag limit at 10 fish daily, with only one fish over 25 -inches. Possession limit of 20 fish. Adjust limits up or down consistent with Holter Reservoir management strategies.

- Continue angler creel census using Northwestern Energy FERC relicensing funds to evaluate angler catch rates, annual harvest of walleye, percent of walleye caught and released, among several other statistics.

Brown Trout

Goals and Objectives:

Rely on brown trout to provide a self-sustaining trophy component to the Hauser tailwater fishery.

- Maintain brown trout abundance at or above 150 brown trout per mile during fall electrofishing surveys.

Rationale:

Brown trout numbers remain limited by existing habitat. Tools to enhance brown trout numbers are limited to restrictive fishing regulations because habitat and flow conditions are considered good. Potential competition with kokanee salmon has been reduced due to failed kokanee reintroduction efforts in Hauser Reservoir. Brown trout could be adversely affected if kokanee abundance ever reach historic levels. In the interim, brown trout populations have a good chance to experience growth with catch and release regulations in place on this section of river and throughout Holter Reservoir.

Historically, during the fall spawning season, brown trout in the 5-10 pound size range would migrate into the river from Holter Reservoir. Fall population estimates documented that fish greater than 18 inches comprised up to 48% of the population. Anglers occasionally landed these large fish, however, historic catch rates were relatively low, averaging only 0.04 fish per hour. Historic harvest was also low with an estimated 700 brown trout harvested in 1983. Population estimates in 2007 were below historic levels at 120 brown trout per mile. Large brown trout were prevalent in this river section, with an average size of 21-inches in 2007 estimates. Current (2017) population estimates are at 228 brown trout per mile with and average size of 19.5 inches in length.

Strategies:

- Maintain the catch and release fishing regulation for brown trout for this reach of the Missouri River and Holter Reservoir.

- Consider additional restrictions if brown trout numbers fall below 100 brown trout per mile during fall estimates.

  - Consider use of seasonal fishing closure during critical spawning periods.

  - Identify critical spawning areas and seasonally restrict fishing these areas if deemed feasible.

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- Continue work with USFS to improve potential spawning habitat in Beaver Creek.

- Continue angler creel census using Northwestern Energy FERC relicensing funds to evaluate angler catch rates among several other statistics.

- When feasible, monitor the Holter kokanee population and evaluate impacts to the brown trout population in the Hauser tailrace. Discontinue stocking or reduce stocking rates of surplus kokanee in Holter Reservoir if there are observable effects to brown trout abundance.

Kokanee Salmon

Goals and Objectives:

Rely on kokanee salmon flushed from Hauser Reservoir and any natural reproduction and supplemental stocking that may occur in Holter Reservoir to contribute in a limited way to the multi-species fishery.

Rationale:

This fishery has been heavily supplemented through annual flushing of kokanee out of Hauser reservoir. Historically, large numbers of kokanee spawned in this river section but survival of eggs to hatching remains low. Due to unsuccessful attempts to reestablish the kokanee fishery in Hauser, kokanee abundance is low in the Hauser tailrace. Unless the Hauser kokanee fishery rebounds, this river section will rely upon natural reproduction or supplemental stocking of kokanee from Holter Reservoir.

Strategies:

- Depend on supplemental kokanee stocking and natural reproduction from Holter Reservoir to provide a low-level kokanee fishery to the Hauser tailrace.

- Reduce or discontinue stocking kokanee in Holter Reservoir if kokanee impact spawning of brown trout in the Hauser tailrace.

Other Missouri River – Hauser Tailwater Fisheries Management Issues

Walleye Flushing from Canyon Ferry Reservoir

Goals and Objectives:

Determine walleye flushing rates from Canyon Ferry Reservoir and evaluate measures to reduce or eliminate walleye flushing from Canyon Ferry Dam.

Rationale:

Walleye flushing out of Canyon Ferry into Hauser and Holter Reservoirs increases during high water runoff years. Increased walleye densities in Holter Reservoir and in the Missouri River will continue to affect the balance of the multi-species fishery due to increased predation on trout, perch, and kokanee. It is unknown if walleye densities in the Missouri River will increase substantially over the long term with increased flushing from upstream. A portion of the flushed fish undoubtedly disperse directly into Holter Reservoir. Walleye have historically been caught in low numbers in this reach. Walleye increases in upstream waters over the past 20 years have brought about increased angler catch rates in this portion of the Missouri River. No screening devices are in place on Canyon Ferry dam to limit the number of walleye flushed.

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Strategies:

- Request funding from BOR to determine walleye flushing rates from Canyon Ferry Dam.

Habitat

Goals and Objectives:

Enhance wild fish spawning opportunities in Holter Reservoir and Missouri River tributary streams.

Rationale:

Habitat conditions in Beaver Creek will continue to limit wild fish production in the Missouri River. Beaver Creek is the principal spawning stream that supports substantial runs of rainbow trout. Habitat conditions in Beaver Creek have been degraded through a variety of land use activities. Agricultural development, roads on the floodplain, channelization, and pipeline construction have all contributed to the decline in quality habitat. Channel alteration has allowed beaver dams to block fish passage. Specific limiting factors include elevated fine sediment values, embeddedness of substrates, channel straightening (loss of stream length), and loss of large woody debris recruitment. Fires and beaver colonization are other factors influencing fisheries production.

Strategies:

- Identify and complete enhancement projects that will benefit spawning and recruitment of wild fish in Holter Reservoir and the Missouri River below Hauser Dam. Work cooperatively with the USFS to develop a fisheries management strategy for the Beaver Creek watershed. Specifically, find agreeable solutions to beaver management in Beaver Creek and restore impacted stream reaches to facilitate use by wild fish.

Disease and Aquatic Invasive Species

Goals and Objectives:

Monitor the Missouri River below Hauser Dam and principal tributaries for Aquatic Invasive Species. Prevent introduction of exotic plant and wildlife species from entering the reservoir system.

Rationale:

Wild fish produced in this portion of the Missouri River and from Beaver Creek have a chance of exposure to whirling disease. Due to the high amount of angler pressure, this river reach may be more susceptible to inadvertent introductions of invasive species from anglers (i.e., improperly cleaned boats, waders, boots).

Strategies:

- Educate anglers about aquatic invasive species and diseases and how their spread can be prevented. Conduct angler and boat check stations during high use periods.

Creel Survey

Goals and Objectives:

Determine angler catch rates and satisfaction on this reach of the Missouri River and Beaver Creek and make adaptations to strategies and regulations accordingly.

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Rationale:

Creel surveys in this reach need to be maintained to better direct adaptive management strategies. Increased use by boat and shore anglers, as well as increased use by guides could affect the wild trout fishery. Increased monitoring of recreational use may be necessary to determine user safety and overall impacts to the aquatic environment (not only fisheries impacts).

Strategies:

- Use statewide angler mail surveys to determine use. Continue an angler creel survey on the Missouri River from Hauser Dam to Beaver Creek to monitor angler catch rates, annual harvest, percent of fish caught and released, angler origin, species targeted, among several other statistics.

- Use collected creel data to implement adaptive management strategies for the Hauser tailrace.

- Consider implementing comprehensive boat and user surveys to determine the need for recreational restrictions. Any recreational restrictions will be implemented in a separate process (not part of this version of the Fish Management Plan).

Motorized Access

Goals and Objectives:

Manage social conflict and maximize safety on this stretch of the Missouri River.

Rationale:

Substantial enforcement staff time has been expended patrolling the Hauser tailrace area during the spring due to the heavy boat and angler use. Currently a no-wake speed restriction is in effect from Hauser Dam downstream to Beaver Creek. Complaints are frequent regarding the heavy boat use in an area with substantial navigation hazards. Closing the area to all motorized boat use limits accessibility by many anglers due to the remote nature of the area.

Strategies:

- Maintain the no wake zone from Beaver Creek to the base of Hauser Dam.

  - Continue enforcement efforts to reduce conflicts between boaters and shore anglers, especially during high use periods.

- Monitor spawning activities and evaluate the effects of motorized boat use and wade fishing on spawning behavior.

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Section 6
Holter Reservoir

Management History

Species of fish present in Holter Reservoir (Table 7) are similar to those found in Hauser Reservoir. Rainbow trout, yellow perch, and walleye historically have been the most abundant game species in the reservoir. Suckers are the most abundant nongame species.

Rainbow trout were first introduced into Holter Reservoir during the early 1940s. From the 1970s through 1995 the reservoir fishery was supplemented by annually stocking approximately 325,000 Arlee rainbow trout. Since 1990, wild rainbow trout have comprised less than 14% of the fish harvested by anglers. Annual stocking is required because natural recruitment cannot meet current angler demand. From 1984 through 1986 an attempt to develop a migratory population that would spawn in the river and then grow to a large size in the reservoir with McConaughy strain rainbow trout was undertaken. This approach was unsuccessful. In 1996, in an effort to increase the proportion of wild rainbow trout in Holter, FWP shifted from Arlee rainbow trout to Eagle Lake rainbow trout. On alternating years, age one and age zero rainbows were planted to evaluate the most cost effective approach. This adaptive approach involved planting approximately 100,000 age one fish (average length 7.8 inches) in 1996 and 1998 and 371,000 age zero fish (average length 4.2 inches) in 1997. Evaluation of this program was difficult because of flushing losses in 1996 and 1997. Throughout the 2000s Holter has been stocked with 125,000 age 1 Eagle Lake rainbow trout in the summer and 125,000 Arlee rainbow trout in the fall. This stocking rate currently yields an exceptional summer angler catch rate of 0.59 fish per hour (2009-2017, Figure 10). Holter is the egg source for Eagle Lake rainbows that are planted in Canyon Ferry, Hauser, Holter and other Region 4 waters.

Kokanee salmon were first introduced in the early 1950s with the stocking of about 800,000 fish over a six-year period. These initial plants were unsuccessful in producing a viable kokanee fishery. The kokanee population that eventually established in Holter Reservoir apparently originated from fish that were flushed out of Hauser Reservoir. Kokanee spawn unsuccessfully or with limited success in Holter Reservoir. This fishery has undergone significant population fluctuations with anglers first catching substantial numbers of kokanee beginning in the mid-1980s. Kokanee harvest peaked in the early 1990s with harvest averaging over 22,000 fish for the years 1990 through 1992. Harvest fell by nearly half in 1993 to 12,000 kokanee but rebounded to record highs in 1996 as the age zero kokanee that were flushed out of Hauser during high water of 1993 recruited to the creel. The kokanee population continued to decline following severe flushing losses associated with high water in 1995, 1996, and 1997. In 2007, only 296 kokanee were harvested in Holter. The last time kokanee were stocked into Holter was in 2009 when approximately 104,000 fish were stocked in the spring. The current kokanee fishery is comprised of remnant fish flushed from Hauser and limited natural production in Holter.

Prior to 1988, daily and possession limits for trout were 10 pounds and 1 fish, not to exceed 10 fish. For kokanee, the daily and possession limit was 10 fish. Beginning in 1988, more conservative regulations were implemented to protect kokanee populations. The trout and kokanee limits were combined, making the daily and possession limits 10 pounds and 1 fish, not to exceed 10 trout and kokanee in combination. Beginning in 1996, limits were made still more restrictive with a combined trout and salmon limit of 5 and a possession limit of 10. That limit is still in place today.

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Table 7. Fish Species of Holter Reservoir Including Statewide Native Status, First Stocking Date, Population Trend and Relative Abundance.

Species	Native	First Stocking Date	Population Trend	Relative Abundance (Based on historic field monitoring.)
Game Fish Species				
Kokanee salmon	No	1950	Decreasing	Common
Rainbow trout	No	1941	Stable	Abundant
Yellow perch	No	N/A	Decreasing	Abundant
Walleye	No	N/A	Increasing	Abundant
Mountain whitefish	Yes	N/A	Decreasing	Common
Brown trout	No	1931	Stable	Uncommon
Burbot	Yes	N/A	Increasing	Common
Brook trout	No	N/A	Unknown	Rare
Cutthroat trout	Yes	N/A	Unknown	Rare
Largemouth bass	No	N/A	Unknown	Rare
Smallmouth bass	No	N/A	Unknown	Rare
Nongame Fish Species				
Carp	No	N/A	Stable	Abundant
Longnose sucker	Yes	N/A	Decreasing	Abundant
Mottled sculpin	Yes	N/A	Unknown	Abundant
White sucker	Yes	N/A	Decreasing	Abundant
Fathead minnow	Yes	N/A	Unknown	Uncommon
Longnose dace	Yes	N/A	Unknown	Uncommon
Flathead chub	Yes	N/A	Unknown	Rare
Smallmouth buffalo	Yes	N/A	Unknown	Rare
Stonecat	Yes	N/A	Unknown	Rare
Utah chub	No	N/A	Unknown	Rare

The walleye population in Holter Reservoir likely originated from the single plant made into Lake Helena in 1951. This population of fast growing walleye historically maintained a relatively stable level with natural reproduction. The fishery has become increasingly popular over the past 25 years, requiring adjustments to regulations to enhance the trophy component. Prior to 1988, daily and possession limits were 5 fish but beginning in 1988, to protect spawning fish, 5 fish could be harvested with only one exceeding 20 inches. Regulations were made even more restrictive in 1990 when the daily limit was reduced to 3 fish with one fish exceeding 20 inches. Beginning in 1996, a slot limit was imposed to protect walleye between 18 and 28 inches, the limits allowed harvest of 3 walleye under 18 inches and one over 28 inches. In 2000, the slot limit was modified to allow harvest of 6 walleye, 5 under 20-inches and 1 over 28-inches and a possession limit twice the daily limit. In order to reduce walleye numbers but maintain size quality, in 2011 the limit was modified to 10 fish daily, only 1 over 28-inches, and no harvest of fish between 20-28 inches. In 2014 the limit was changed to 10 daily with only 1 over 25 inches and a possession limit twice the daily limit.

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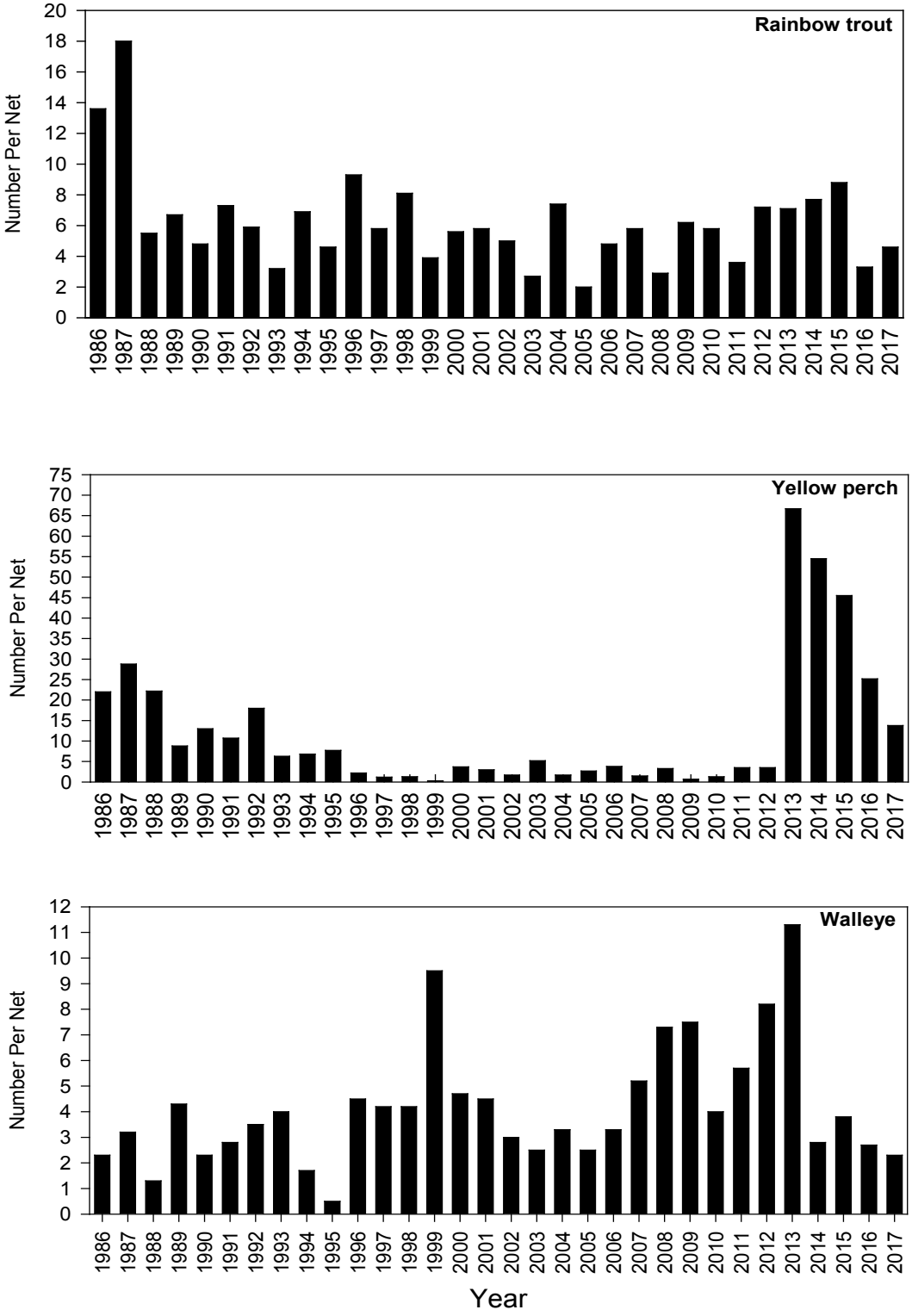

Figure 9. Holter Reservoir Fish Population Trends for Rainbow Trout, Yellow Perch, and Walleye from Standardized Gill Netting Series.

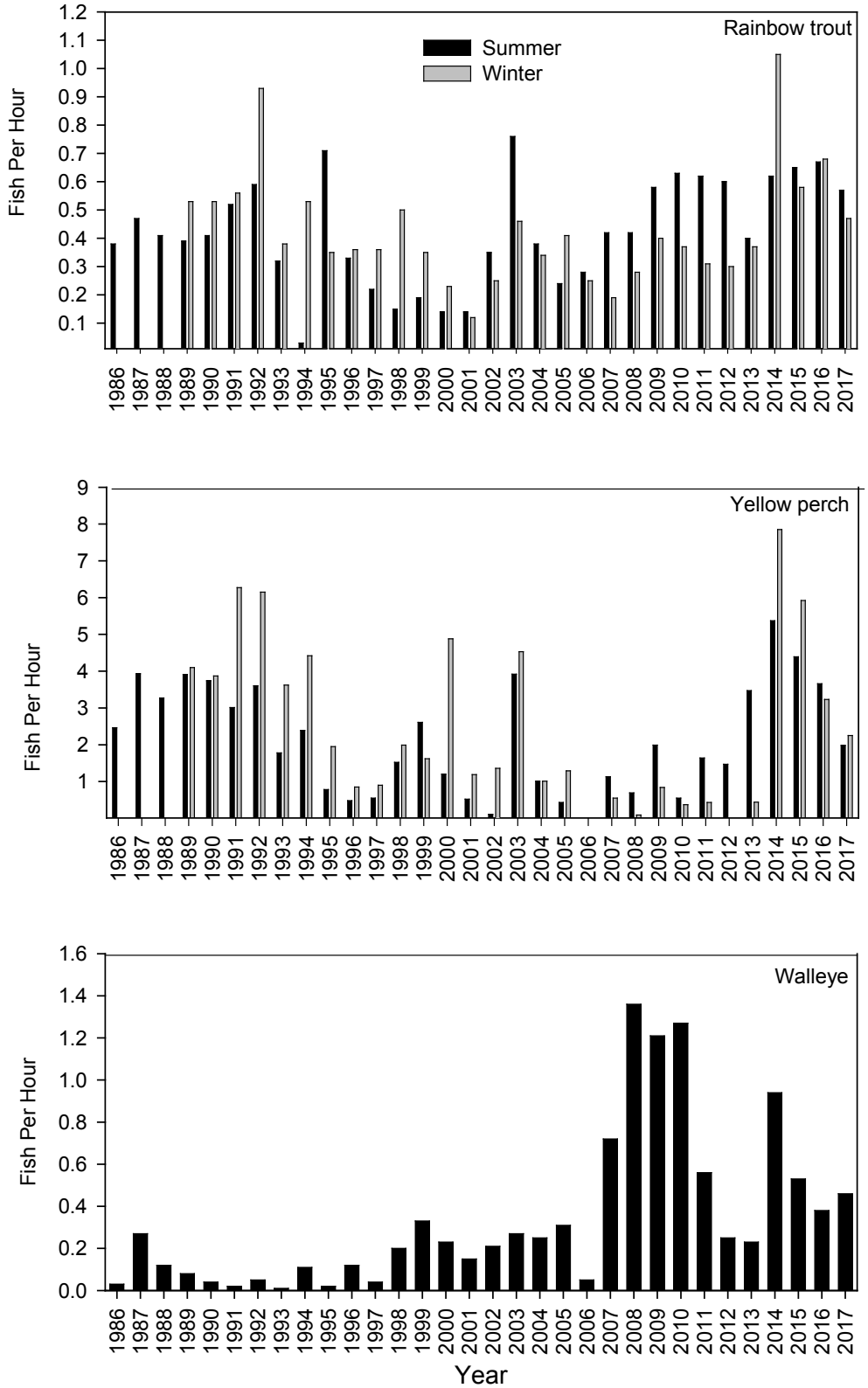

Figure 10. Angler Catch Rates (fish/hour) for the Principal Game Species in Holter Reservoir. Summer (dark bars) and winter (light bars) are represented. Walleye catch rates are summer only. Catch rates are for anglers specifically targeting those species.

Yellow perch were established in Holter Reservoir from plants into Hauser Reservoir during the period 1939-1955. They have maintained a significant population entirely through natural reproduction. Historically, perch have comprised an important component of the Holter fishery--principally the winter ice fishery. Catch rates in spring and fall gill nets peaked in the late 1980s after which they demonstrated normal population variation through 1995 (Figure 9). High water years of 1995-1997 and the development of the Canyon Ferry walleye fishery had detrimental effects to the yellow perch population. Average perch abundance from 1986-1996 averaged 13.3 perch per fall gillnet, compared to 2.45 per net from 1997-2008 and currently (2009-2017) have dramatically improved to 23.85 per net. Perch reached an all-time high of 66.67 per net during fall of 2013. This perch boom has been represented in the creel as well. Holter went from 60,939 angler days per year in 2013 to 90,470 angler days per year in 2015, (Figure 2) largely due to the quality winter perch fishing. Historically, no limits were in place on the number of perch anglers can harvest. Due to declining numbers, a 50 fish limit on perch was implemented in 2000 with the intent that reduced harvest would assist in recovery of the population. As numbers continued to decline, the limit was reduced to 25 in 2011. Perch numbers increased dramatically in 2013 so the harvest limit was increased to 50 fish in 2015 and remains today.

From the early 1930s to 1950, approximately 1.5 million brown trout were stocked into Holter Reservoir. Brown trout in the reservoir today are likely the progeny of these early plants that have maintained a low-level population through natural reproduction. Few anglers target this species because of consistently low population densities. As fall spawners, kokanee were thought to have a negative impact on the brown trout population through superimposition of redds after brown trout spawned in the limited spawning habitat in the Hauser tailrace and potential transmission of disease from spawned out kokanee. Disease testing was completed and no conclusive evidence ever validated this theory. Prior to 1988, daily possession limits for brown trout were part of the combined trout limit (10 pounds and 1 fish, not to exceed 10 fish). Beginning in 1992, catch and release regulations were implemented to protect the remaining brown trout population. Brown trout regulations remain catch and release only today.

Holter Reservoir Management Goals and Limiting Factors

The management goal for Holter Reservoir is to provide a cost-effective, balanced multi-species fishery with the opportunity to catch rainbow trout, walleye, and yellow perch with kokanee, burbot, and other species occasionally contributing to the sport fishery.

The following factors have been identified as limiting the fisheries production in Holter Reservoir. Until they are addressed, the fishery will not reach its full potential. The problems are large in scale, involve numerous government agencies and private landowners, and will be difficult or perhaps impossible to solve. Resolution of these problems will require cooperation of individuals representing the various agencies. As with many large-scale resource management problems, money and manpower will limit the completion of any goals targeted at benefiting the fishery. PPL Montana (now NorthWestern Energy) took over operational control of Hauser and Holter dams in 2000, and received a new federal operating license in 2001. FERC requires Northwestern Energy to provide funds for monitoring, protection, maintenance, and enhancement of fisheries resources in Hauser and Holter Reservoirs.

Five factors have been identified as limiting fisheries production in Holter Reservoir:

- Fish losses out of Holter Reservoir from flushing and entrainment are one of the principal factors affecting fish populations. Feasibility studies to reduce fish losses from Holter need to be conducted.

- Walleye flushed from Canyon Ferry and Hauser Reservoirs have impacted the balance of the multi-species fishery.

- Spawning tributaries to Holter Reservoir provide substantial wild fish production. Beaver Creek is the principal spawning stream that supports substantial runs of rainbow trout. Other streams that provide potential spawning areas include Willow, Elkhorn, and Cottonwood creeks, which are located on the FWP-owned Beartooth Wildlife Management Area.

- Diseases and predation may impact the wild trout in the reservoir and tributaries.

- The burbot population expanded initially in 2007 and reached a high of 2.7 per net in 2014. Numbers have stabilized since 2014 to 1 per net. More information is needed to determine if burbot are impacting fish populations.

Holter Reservoir Management Goals by Species

Rainbow Trout

Goals and Objectives:

Rely on rainbow trout to provide one of the principal fish species in Holter Reservoir with continued emphasis on maximizing the proportion of wild rainbow trout.

- Maintain a three-year running average of 6 rainbow trout per net to fall floating gillnet series.

- Maintain a running average summer angler catch rate of 0.25 fish/hour for anglers specifically targeting rainbows.

Rationale:

Rainbow trout have been stocked in Holter Reservoir since the early 1940s and have provided the principal fishery. Wild rainbow trout have comprised less than 15% of the fish harvested by anglers since 1990. Stocking is required to supplement natural recruitment and meet angling demand. Attempts have been made to enhance wild rainbow trout runs without success. Annual monitoring in the late 1990s showed improved survival of age 1 over age 0 Eagle Lake rainbows. Currently Holter is stocked with 125,000 age 1 8-inch Eagle Lake rainbows in the summer and 125,000 8-inch Arlee rainbows in the fall. Stocking of larger sized fish with average length of 8-inches has improved recruitment of stocked rainbows by reducing predation by walleyes. This stocking rate currently yields an excellent summer angler catch rate of 0.59 fish per hour (2009-2017). This population of Eagle Lake rainbows also serves as an egg source for hatchery propagation of rainbow trout that are planted in Canyon Ferry, Hauser, Holter and other Region 4 waters. Rainbow trout eggs are collected in conjunction with walleye sampling in the spring and efforts to maintain genetic diversity are necessary to reduce inbreeding within the population.

Strategies:

- Commit to stocking at least 125,000 age zero 8-inch Arlee rainbow and 125,000 age one Eagle Lake rainbow trout when funding is available. To minimize flushing losses, stocking of fish will occur after high water.

- Continue to monitor and investigate that this stocking approach provides substantial angler return. Specific parameters used to evaluate the stocking approach will include: growth rates, survival rates, flushing rates (quantified through a flushing study at the dam and/or fish population

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monitoring in the Missouri River below Holter Dam), reproductive potential, and angler harvest rates.

- If three-year average catch in fall floating gillnets falls below 4 rainbow trout per net, consider changes to the stocking plan (e.g., timing and location of fish plants, strains, size at stocking) and implement if deemed by FWP to be cost effective.

- If three-year average catch in fall floating gillnets falls below 2 rainbow trout per net, consider more liberal management actions, such as reducing harvest limits and/or predator suppression measures.

- Consider stocking additional rainbow trout when additional hatchery fish are available. Do not stock if surplus fish will interfere with rainbow trout strain evaluation or identification for spring rainbow trout egg take.

- Continue work with hatchery personnel to maintain genetic diversity of Holter Eagle Lake rainbow for use as an egg source for hatchery propagation.

■ Continue monitoring disease presence and impacts and identify management strategies to minimize impacts to the Holter rainbow trout fishery.

■ Encourage the development of wild rainbow trout spawning and recruitment from the Hauser tailrace and principal spawning tributaries (Beaver, Cottonwood, Willow and Elkhorn creeks).

- Continue closure on Beaver Creek from November 30th to June 15th to protect spawning rainbow trout.

- Continue development of fish passage management plans with FWP Wildlife Division and USFS that incorporates beaver management programs on Beaver, Elkhorn, Willow, and Cottonwood creeks.

- In 2018 and 2019 rainbow trout stocking was reduced by approximately 50% due to budget constraints. During the review process of this version of the plan it is assumed that funding for stocking catchable size fish in the reservoir will resume in 2020. If continued budget constraints prevent stocking of catchable sized fish after 2020, fish management strategies and objectives for all fish species will need to be reconsidered.

Yellow Perch

Goals and Objectives:

Rely on yellow perch to provide a cost effective, self-sustaining fishery that is supported entirely with wild reproduction.

■ Maintain a three-year running average of 6 yellow perch per net in fall sinking gillnet series.

■ For anglers specifically targeting perch maintain a running average angler catch rate of 0.2 to 0.4 yellow perch per hour in the summer creel and 1.0 to 2.0 perch per hour in the winter creel.

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Rationale:

Yellow perch have maintained significant population levels in the reservoir through natural reproduction. Historically, perch have comprised a substantial portion of the Holter fishery; principally the winter ice fishery. High water years in the late 1990s and expansion of the Canyon Ferry walleye fishery have had detrimental effects to the Holter yellow perch population. Average perch abundance in fall gillnets from 1986-1996 averaged 13.3 per net, compared to 2.5 per net from 1997-2008. Perch numbers have increased dramatically and currently (2009-2017) are at 23.9 per net. Perch reached an all-time high of 66.7 per net during fall of 2013. Historically, no limits were in place on the number of perch anglers can harvest. Due to declining numbers, a 50 fish limit on perch was implemented in 2000 with the intent that reduced harvest would assist in recovery of the population. As numbers continued to decline, the limit was reduced to 25 in 2011. Perch numbers increased dramatically in 2013 so the harvest limit was increased to 50 fish in 2015 and remains today. Perch limits are in place to achieve two objectives: 1) maintain adequate spawning stock of perch in the population, and 2) recognize that increased walleye populations in the three reservoirs have had an impact on perch populations. Recognizing that yellow perch are an important component of the walleye diet, a conservative limit may increase the number of perch available as forage.

Strategies:

- Maintain daily limits of perch at 50 fish daily with no possession limit.
  - Recommend maintaining 50 fish bag limits if yellow perch abundance remains above 10 perch per fall sinking gillnet on a three-year running average.
  - Consider reducing the daily bag limit if perch abundance declines below 10 perch per fall sinking gillnet on a three-year running average.
- Consider additional management actions if yellow perch abundance falls below a three-year average catch of 2 perch per fall sinking gillnet.
  - Additional actions may include further reductions in angler harvest of perch and/or implementation of active walleye management strategies (see Walleye section).
- Continue monitoring of perch populations to determine seasonal flushing losses.
- Continue to evaluate predation impacts by walleye on yellow perch populations.
  - Collect walleye stomachs during normal field surveys.
  - Maintain a database on seasonal walleye perch consumption.
- Explore opportunities to improve perch spawning habitat.

Walleye

Goals and Objectives:

Rely on walleye to provide a cost-effective fishery that allows a moderate level of harvest while providing the opportunity to catch a trophy fish. This fishery will be reliant entirely on wild reproduction and flushing from upstream dams.

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- Maintain a three-year running average of 4 walleye per net in fall sinking gillnet series.

- Maintain a running average summer angler catch rate of 0.10 fish/hour for anglers specifically targeting walleye.

Rationale:

Holter historically supported a healthy population of walleye that likely originated from fish flushed out of Hauser. This wild reproducing population has remained relatively stable, providing a moderate level of harvest while furnishing the opportunity to catch a trophy walleye greater than 28 inches. With increasing popularity, harvest became more restrictive to protect spawning fish while enhancing the trophy component. The Holter walleye population appears to be strongly influenced by flushing, both from Canyon Ferry and Hauser but is also influenced by losses out of Holter into the Missouri River. Walleye abundance in Holter has increased significantly since expansion of the Canyon Ferry population, increasing from an average of 2.6 walleye per gillnet (1986-1996) to 4.6 per gillnet (1997-2008). Walleye abundance reached a record high at 11.3 per net in 2013 and is currently averaging 5.4 per net (2009-2017). As walleye abundance has increased, average length and growth rates have decreased which are likely functions of a limited forage supply in the reservoir.

Strategies:

- Use angler harvest as a management tool to maintain walleye population levels that are appropriate for forage availability.

  - Promote harvest by maintaining a bag limit of 10 fish daily, with only one fish over 25-inches. Possession limit is twice the daily limit.

  - To maintain a trophy component to the fishery, evaluate walleye harvest regulations to maintain size quality when walleye population abundance meets management goals and perch and trout abundance are at management goals.

- Evaluate reductions in angler daily limits and/or adjusting length restrictions if three-year running average falls below 2 walleye per fall sinking gillnet. Reductions will be considered only if rainbow trout and yellow perch abundance are near or above management goals.

  - Additional restrictions may include reducing bag limits, adjusting size restrictions, and/or seasonal closures.

- Consider increasing walleye limit if three-year running average increases above 6 walleye per fall sinking gillnet or if on a three-year average rainbow trout abundance declines below 2 rainbow per net and yellow perch abundance declines below 2 per net.

  - Evaluate use of other tools to reduce walleye numbers. Other tools may include unlimited harvest, gillnetting or trap netting during periods when fish are highly concentrated, spearing through the ice or underwater, among others. Any of these management actions will require public input prior to implementation.

  - Determine if adjustments to the size limit are necessary to maintain population levels appropriate for forage abundance.

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- Determine how flushing of walleye from Canyon Ferry influences the Holter Reservoir walleye fishery. Continue tagging walleye in Canyon Ferry and Holter in the spring using live release trap nets. Evaluate year class strength of spawning aged females. Maintain a database of walleye tag returns (angler returns and field survey returns) to determine annual flushing statistics.

- Continue enforcement efforts on the walleye size limit to reduce the proportion of walleyes that are illegally harvested.

- Utilize creel data to determine periods of high walleye catch rates and use this information to focus enforcement activities on the reservoir.

- Programmatically develop a schedule for routine patrolling with special emphasis on peak fishing periods. As needed, operate periodic check stations to evaluate regulation compliance.

- Recognize the importance for anglers to have multiple size classes of walleyes represented in the population. Maintain a Proportional Stock Density (PSD) value within a range of 40-60. PSD is the proportion of all walleye greater than 15-inches divided by the total number of walleye greater than 10-inches. Changes to regulations will be considered if PSD values fall below the desired range to maintain more, larger sized fish. Recommended regulation changes will first be dependent upon walleye abundance relative to management goals and triggers for walleye, other fish, and forage availability.

Kokanee Salmon

Goals and Objectives:

Rely on kokanee salmon flushed from Hauser Reservoir, stocking of surplus hatchery fish, and any natural reproduction that may occur in Holter Reservoir to provide limited kokanee harvest. Recognize kokanee as a supplemental fish to the sport fishery in Holter Lake.

- Determine appropriate kokanee densities to maintain kokanee fishery with minimal impacts to brown trout spawning.

Rationale:

Kokanee spawn unsuccessfully or with limited success in Holter Reservoir. Kokanee populations in Holter historically mirrored kokanee population trends observed in Hauser Reservoir. Flushing losses associated with high water in 1995, 1996, and 1997 reduced the number of kokanee captured in 1998 summer vertical gill nets (July through September) to only four. Of these four fish, three were hatchery kokanee planted into Hauser. Supplemental stocking into Holter with surplus fish since 2002 had limited results. Holter has not received surplus kokanee since 2009 with current and future surplus stocking efforts being a low priority.

Strategies:

- Consider supplementing the Holter sport fishery by stocking surplus kokanee when available.

- Monitor river and reservoir brown trout population densities to determine if kokanee spawning negatively effects brown trout recruitment.

- Adjust or eliminate stocking of surplus kokanee if brown trout densities in the Missouri River below Hauser Dam decline below 100 fish per mile.

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Burbot (Ling)

Goals and Objectives:

Rely on burbot to provide a self-sustaining fishery that is supported entirely by wild reproduction.

- Maintain a three-year running average of 0.25 burbot per net in fall sinking gillnet series.

Rationale:

Burbot are native to the upper Missouri River system and have always had a low level of abundance in Holter. Population monitoring has shown increases in burbot numbers in recent years (0.01 burbot per fall gillnet 1986-1999, 0.3 per gillnet 2000-2008, and 1.4 per gillnet 2009-2017) however; abundance of burbot is low relative to other predators in the reservoir. Burbot are a piscivorous (fish-eating) species, and it is presently unclear what effect increases in the burbot population will have on other species.

Strategies:

- Increase knowledge of burbot population dynamics in Holter Reservoir. Specifically, efforts will be made to collect data (age, growth, diet, general abundance) from burbot during normal field sampling (gillnetting and electrofishing).

- Evaluate increasing angler harvest if three-year running average catch of burbot increases above 2.0 burbot per fall sinking gillnet.

- Consider establishing a sampling regime specifically targeting burbot if conventional sampling means are not effective. This would likely involve deployment of additional sampling gears in the late winter spawning period.

- Increase effort during winter creel to determine burbot harvest.

Northern Pike

Goals and Objectives:

Monitor and suppress the northern pike population in the reservoir and evaluate impacts to other species.

Rationale:

Increased abundance of northern pike in upstream waters significantly increases the likelihood of flushing of northern pike into Holter. Northern pike are a highly piscivorous fish and the current forage base in Holter is likely not adequate to support an additional voracious predator. In 2012 FWP issued a decision notice on an environmental assessment to remove northern pike from Holter Reservoir incidental to other fish survey programs.

Strategies:

- Eliminate all angler bag limits for northern pike in the upper Missouri River reservoir system. Manage the northern pike population according to the Missouri River Basin Northern Pike Suppression EA Decision Notice. See Appendix E for additional discussion on northern pike suppression efforts within the Upper Missouri River Reservoir Fisheries Management Plan area.

- Monitor Holter Reservoir to determine presence and abundance of northern pike in the reservoir. Take active management action as needed. Explore and implement other opportunities or techniques to suppress northern pike numbers.

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- Continue removing northern pike when captured during other fish survey programs

Other Holter Reservoir Fisheries Management Issues

Flushing Losses at Holter Dam

Goals and Objectives:

Determine annual and seasonal flushing rates of fish out of Holter Reservoir and the feasibility of screening or operation modifications at Holter Dam to reduce flushing losses.

Rationale:

Flushing losses of fish out of Holter Dam is a principal factor affecting fish populations on an annual basis. All fish species are susceptible to flushing, however, kokanee may flush at higher rates because of behavioral tendencies. Rainbow trout and walleye flushing have also been documented via tag returns and other fish marks.

Strategies:

- Determine feasibility of reducing fish flushing losses out of Holter Reservoir.

  - Evaluate screening devices on Holter Dam that would reduce flushing losses.

  - Investigate other technologies that may be effectively employed on Holter Dam to reduce fish flushing losses.

  - Pursue changes to dam operations to minimize flushing losses. Continue discussions with NorthWestern Energy regarding dam operations and explore opportunities to reduce fish loss during spill.

Walleye Flushing from Canyon Ferry Reservoir

Goals and Objectives:

Determine walleye flushing rates and survival from Canyon Ferry Reservoir.

Rationale:

Walleye flushing out of Canyon Ferry into Hauser and Holter reservoirs has increased as the population in Canyon Ferry increased. Increased walleye densities in Holter Reservoir affect the balance of the multi-species fishery with increased predation on trout and yellow perch and potential negative effects on walleye growth rates. Walleye abundance remains at high levels, adding to an already limited forage base in the reservoir.

Strategies:

- Request funding from the BOR to determine walleye flushing rates from Canyon Ferry Dam.

- Continue walleye tagging on Canyon Ferry and Holter Reservoirs to evaluate rates of walleye flushing into and out of Holter Reservoir.

Habitat

Goals and Objectives:

Enhance wild fish spawning opportunities within Holter Reservoir and Holter tributary streams.

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Rationale:

Spawning and rearing habitat in the principal tributaries to Holter Reservoir has been degraded through a variety of land use activities. Logging, agricultural development, and road related impacts have all contributed to a reduction of productive stream habitat throughout the watershed. Specific limiting factors include increased amounts of fine sediments, embeddedness, channel straightening (loss of stream length), and loss of large woody debris recruitment. Recent fires and beaver colonization are also influencing fisheries production. Successional changes with reservoir aging have also led to degraded spawning habitats within the reservoir.

Strategies:

- Identify and complete enhancement projects that will benefit spawning and recruitment of wild fish in Holter Reservoir and in Holter Reservoir tributaries.

Disease and Aquatic Invasive Species

Goals and Objectives:

Monitor Holter Reservoir and principal tributaries for disease and invasive species. Prevent new diseases and exotic plant and wildlife species from entering Holter Reservoir and limit the expansion of current disease agents.

Rationale:

Whirling disease remains a concern in fish management in Montana. Rainbow trout are planted in Holter when they are 8 inches and are not as susceptible to contract whirling disease. However, wild fish produced from Beaver Creek, the river section above Holter Reservoir, or other tributaries have a high chance of exposure to the disease. To date, only a low-level infection rate has been detected in Beaver Creek with no evidence of infection in the tailrace section. Introductions of invasive species (e.g., Zebra mussels, Eurasian watermilfoil, New Zealand mudsnail, asian carp) have the potential to out-compete desirable flora and fauna in the reservoir system and can negatively impact recreation and water use as well as fish populations.

Strategies:

- Conduct routine sampling for fish disease, parasites and Aquatic Invasive Species.
- Initiate and continue education efforts to reduce spread of disease and invasive species.
- Work with the AIS Bureau to conduct boat-check and boat washing stations during periods of exceptionally high angler use.

Derbies/Tournaments

Goals and Objectives:

Do not allow open water or ice fishing tournaments on Holter Reservoir to minimize conflicts with the general angling public and to address safety issues.

Rationale:

No angling tournaments are currently scheduled on Holter Reservoir. Increased interest in fishing tournaments may result in additional requests to hold tournaments in the future. Due to limited access points and high densities of anglers and recreational boaters, approving a contest that may concentrate use in specific areas could substantially impact conflicts with non-tournament participants and cause safety

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concerns. Biologically, catch and release tournaments would likely have minimal impacts to the fish population.

Strategies:

- Do not allow ice-fishing tournaments on Holter Reservoir. Ice on Holter rarely develops to a level that would allow for safe ice-fishing tournaments.

- Do not allow open water fishing tournaments due to displacement of non-competitive anglers from tournament participants, high concentrations of anglers and recreational boaters, and safety of high concentrations of boaters in some sections of the reservoir.

    - Tournament organizers can petition the FWP Commission to allow one open water tournament. Organizers must specifically address how they will minimize conflicts with other boaters and address safety concerns.

Access

Goals and Objectives:

Pursue any opportunities to improve angler access to Holter Reservoir with a focus on youth and handicap fishing access. BLM has improved the Holter Lake Ramp and associated parking area to accommodate more shore and dock fishing and handicap accessibility.

Rationale:

Shoreline development and limited road access can be a limiting factor for youth and handicapped anglers. Currently, access sites administered by the BLM do offer handicapped fishing access. Most of the reservoir is accessible only by boat.

Strategies:

- Work with BLM, NorthWestern Energy , private landowners, and other interests to improve fishing access to Holter, with an emphasis on areas that provide more opportunity for youth and handicapped anglers.

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Section 7
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Appendix A
Citizen Scoping Committee Framework

In spring 2018, FWP called for nominations to serve on a Citizen Scoping Committee to identify potential issues related to the joint management goals identified in the draft 2010-2019 Management Plan. The role of the Citizen Scoping Committee was to provide information and input needed for FWP to make informed decisions on the management of these fisheries. Citizen Scoping Committee nominations were submitted and examined by a panel consisting of FWP personnel from multiple Bureaus and the Management Plan Facilitator. Nominations were considered to represent the following groups or interests: unaffiliated warmwater angler, unaffiliated coldwater angler, organized warmwater angler group, organized coldwater angler group, ice fishing angler, conservation group, fishing tournament organizer, landowner, outfitter, local government, local business, kids fishing, upstream/downstream interests, and other. Nominees were selected based on their experience and willingness to work in a collaborative process, knowledge and affiliation with the interest or group they were chosen to represent, and their experience and knowledge of the reservoir system. Initially, 7 citizens and 5 members of FWP were chosen to sit on the Scoping Committee.

The Citizen Scoping Committee convened 2 times throughout 2018 to consider data and proposed changes to the new plan presented by FWP. The Scoping Committee also discussed and provided information and input to FWP for proposed changes to the new plan. The Citizen Scoping Committee worked within a collaborative framework developed by the Scoping Committee and FWP. As defined by its framework document, the Scoping Committee functioned in an advisory capacity only and did not have final decision making authority.

The Scoping Committe reported constituent feedback on five FWP proposed changes to the new plan (1. Canyon Ferry Reservoir perch goals, 2. Northern pike management, 3. Rainbow trout management, 4. Holter Lake walleye tournament interest, and 5. Canyon Ferry Reservoir and Holter Lake walleye size criteria management.). The Scoping Committee reported public comments, consisting of 16 summarized themes, throughout collaboration process. A formal public comment period from October XX – November XX, 2018 allowed public opportunity to comment on proposed changes to the new plan or any other aspects of the draft Management Plan. During the public comment period XXX written comments were received.

Summaries of Citizen Scoping Committe structure are contained here via the Scoping Committee Framework, goals and guidelines provided by FWP, and proposed management plan changes submitted for public comment. Information provided here only presents a brief outline of issues considered by the Citizen Scoping Committee. For more information about the Citizen Scoping Committee and the collaborative process used to consider changes to the new management plan, please contact FWP Fisheries Bureau, PO Box 200701, Helena MT 59620, or by calling (406) 444-2449.

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Citizen Scoping Committee Framework
Upper Missouri River Reservoirs Fisheries Management Plan (2019-2028)

The previous (2000-2009) and current (2010-2019) UMRRMP established similar goals that these fisheries should be managed as balanced, high quality, cost effective, multi species fisheries. Based on the success of those plans, FWP envisions maintaining similar goals for the next 10-year plan.

Framework for Citizens Scoping Committee Participation in the 2019-2028 UMRRMP:

Interests to be Represented in the Citizens Scoping Committee;

- Montana Walleyes Unlimited
- Montana Trout Unlimited
- Unaffiliated Local Angler
- Local Business
- Fishing Outfitter
- Kids Fishing and Education
- Montana Fish and Wildlife Commission

<u>Role of the Citizens Committee</u>
The Committee will:

- Identify potential issues related to the joint management goals identified in the draft plan.
- Provide information and input needed for FWP to make informed decisions on the management of these fisheries.

<u>Responsibilities of the Citizens Committee</u>
The Committee:

- Is a cooperative effort with all members participating and assisting in formulating the management direction for the next 10 years;
- Is not charged with developing consensus any one issue;
- Members acknowledge the value of each members' comments and viewpoints;
- Members agree to bring information into the process and likewise to communicate to their constituents about the process as it goes forward;
- Functions in an advisory capacity aligned with the state laws and policies, and does not have decision making authority;
- Members will be required to attend every meeting;

In addition to the Citizens Scoping Committee, FWP staff and other resource professionals from the BOR and BLM will comprise the Resource Specialist Group.
FWP will:

- Provides biological, social, hydrological information on all aspects of the upper Missouri River reservoir system fisheries. Biologists will bring in other technical representatives to add information to the process as needed.
- FWP fisheries biologists and managers will provide fisheries management expertise, background on past management and management constraints.
- FWP plan coordinators will ensure the process is timely and effective. FWP plan coordinators will;
    - Serve as a general information source;
    - Serve as scoping committee members regarding any special needs or requests;

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- Organize meetings and provide written meeting summaries in cooperation with facilitator;
- Organize resource specialists to provide information as determined by the Group;
- Write drafts of plan chapters and alternatives;
- Manage the review of the plan;
- Compile final draft;
- Coordinate the public involvement process after the draft is released to the public.

Meetings

- The Committee will meet an estimated 3 times between June 2018 and August 2018. If fewer meetings are necessary, the schedule will adjust by general agreement of the group.
- Meetings will be held in Helena due to the proximity of the fisheries in the plan.
- The facilitator will:
  - Conduct the meetings in a positive and inclusive manner;
  - Help develop agreement among Committee members on ground rules for member conduct and meeting operation;
  - Help address the issues in a timely manner;
  - Ensure participation is equitable and courteous;
  - Assist in producing a written summary of the major point discussed at each meeting;
  - Help the group identify issues and develop an effective management plan.

Timeline

- The scoping process will begin in June 2018.
- Comments and ideas from the Scoping Committee will be gathered during June and July.
- This will be presented as an information item at the August commission meeting.
- A Draft Plan will be presented at the October Commission meeting
- A Commission decision will be made in December.

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Proposed Changes for the Draft 2019-2028 Management Plan

- Reduce Canyon Ferry yellow perch goal to three-year average catch of 6 yellow perch per net in the summer sinking gillnet series
    - Average yellow perch catch from 2000-2017 = 6.0/net
    - Perch abundance has slowly trended upward over last 5 years
    - Lower perch goal expected to maintain winter perch fishery while maintaining adequate abundance as a primary forage species
    - Lower trigger thresholds would remain at three-year average catch of 3 perch per net (below this trigger additional management prescriptions are recommended)
    - Upper trigger thresholds would decrease to three-year average of 9 perch per net (above this trigger additional management prescriptions are recommended)
    - Setting perch goal at 6 per net allows additional flexibility for management of size and quality for perch and walleye
    - Generally supported during public scoping
- Incorporate actions from 2012 Northern pike Environmental Assessment into the management plan
    - Final decision for Northern pike suppression in the upper Missouri River system was issued after the 2009 management plan was finalized
    - Maintains actions to reduce expansion of the Northern pike population in the system
    - Widely supported during public scoping
- Use proportional stock density (PSD) to evaluate size criteria for Canyon Ferry and Holter walleye populations
    - PSD is the proportion of walleye greater than 15-inches divided by the total number of walleye greater than 10-inches
    - Typically, a PSD between 30-60 represents a "balanced" fishery, with a good number of small and large fish with multiple age classes represented
        - A PSD value below 30 is a population consisting of mostly small fish with few large fish
        - A PSD value above 60 is a population consisting of mostly large fish with few small fish available to replace larger fish which are harvested or die naturally
    - PSD is recognized criteria typically used to evaluate sport fisheries, and is commonly used to evaluate walleye populations in North America
    - Recommend PSD range 30-50 for Canyon Ferry
    - Recommend PSD range 40-60 for Holter
    - PSD is a secondary management objective. Walleye management changes to modify PSD will not be considered if triggers are exceeded for walleye, perch, or rainbow trout
    - Use of PSD to evaluate walleye size structure was generally supported during public scoping
- Reevaluate fisheries management strategies if stocking of catchable size (greater than 7-inch) rainbow trout is not restored to previous levels.
    - Budget cuts in 2017 resulted in half the typical number of rainbow trout stocked in Canyon Ferry, Hauser, and Holter Reservoirs
    - Rainbow trout stocking is necessary to maintain the fishery due to limited spawning habitat in the reservoirs.
    - FWP will ask legislature for authority to allocate funding to stock at previous levels
        - FWP already has the money available, but needs legislative authority to spend

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- Due to time required to grow fish in the hatchery, stocking of catchable fish at previous levels may not occur until late 2019 or 2020.
- Much discussion about this issue during public scoping; stocking of catchable sized fish widely supported

- Holter walleye tournament
  - In 2017, FWP denied an open water tournament application for Holter based on criteria outlined in the 2009 management plan. That denial was appealed and upheld by the FWP Commission, with the direction to evaluate this issue during the current plan update.
    - The 2009 plan prescribed no walleye tournaments as long as slot limits were in place. FWP staff interpreted the length restriction of 1 fish greater than 25-inches like a slot limit, so the tournament application was denied.
  - For the Draft 2019 management plan, FWP staff recommends no open water or ice fishing tournaments for Holter Reservoir.
    - Limited access points and constricted areas (from Gates of the Mountains to Split Rock) lead to high concentrations of boats in some areas and would likely instigate conflict with non-tournament boaters and cause safety concerns.
    - A catch and release open water walleye tournament would likely have minimal impacts to the overall population, but a tournament during the pre-spawn period (early spring) could negatively impact individual spawning fish.
    - Due to safety concerns from highly variable ice conditions on Holter, holding ice fishing tournaments are not recommended.
  - Discussion of this topic during public scoping was mostly split, with some favoring a tournament on Holter, while others were opposed.

Other Comments During Scoping

- There are too many small walleye in Canyon Ferry
- Consider stocking forage fish
- Concerns that the plan is not adaptable and cannot change quickly enough as the fishery fluctuates
- Be more proactive with perch management on Holter
- Consider seasonal closures in the river below Hauser Dam; limit boat and outfitter use
- Address habitat needs for perch in Canyon Ferry

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Appendix B
Response to Public Comments

Over XXX written comments on the draft Management Plan were accepted during the open comment period. Most comments were in response to XXXXX in the draft plan. Many other comments pertained to other aspects of the Management Plan and did not address specific proposed changes. This Appendix addresses comments to specific proposed changes in the draft Management Plan as well as comments on other aspects of the Plan. Please see Appendix A for more information on proposed changes and the Citizen Scoping Committee that collaborated during this process.

Missouri River (Toston – Canyon Ferry Reservoir) Brown Trout

Canyon Ferry Walleye

Canyon Ferry Yellow Perch

Canyon Ferry Brown Trout

Canyon Ferry Forage Fish

Hauser Walleye

Hauser Yellow Perch

Hauser Kokanee

Hauser Tailrace Motorized Access

Holter Walleye

Holter Yellow Perch

Holter Kokanee
Rainbow Trout

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General Comments

Walleye

Yellow Perch

Northern Pike

Carp

Reservoir Operations

Fishing Tournaments

Use of live Fish as Bait

Habitat

Missouri River

Piscivorous (fish eating) Birds

Management Plan and Goals

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Appendix E
Environmental Assessment Decision Notice
Environmental Assessment for Montana Fish, Wildlife & Parks Region 3 and 4, Missouri River Basin Northern Pike Suppression Project

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Environmental Assessment Decision Notice

Environmental Assessment for Montana Fish, Wildlife & Parks Region 3 and 4, Missouri River Basin Northern Pike Suppression Project

Montana Fish, Wildlife & Parks

Region 3 Bozeman and Region 4 Great Falls

February 23, 2012

Proposed Actions

Montana Fish, Wildlife and Parks (FWP) proposes to conduct suppression actions on northern pike to reduce threats to Upper Missouri River Basin wild trout populations and reservoir fisheries. The proposed action would involve finding and removing northern pike from the headwaters of the Madison, Gallatin, and Jefferson River basins downstream to Holter Dam on the Missouri River. Funding for this effort would be through existing budgets. All northern pike removed during this project would be killed; northern pike that are salvageable and of suitable size for consumption would be field dressed and donated to food banks or other similar organizations.

Montana Environmental Policy Act

Montana Fish, Wildlife & Parks is required by the Montana Environmental Policy Act (MEPA) to assess significant potential impact of a proposed action to the human and physical environment. In compliance with MEPA the environmental assessment, entitled "Environmental Assessment for Montana Fish, Wildlife & Parks Region 3 and 4, Missouri River Basin Northern Pike Suppression Project" was released on 7 April 2011, for a 30-day public comment period, which ended on 6 May 2011.

The draft EA was circulated to standard FWP Region 3 and 4 contact lists, and to local landowners, sporting groups, government and federal agencies. The EA was posted and remains available for viewing on the FWP webpage: http//fwp.mt.gov/news/publicNotices. Legal notices indicating release of the EA were sent to local media including the Bozeman Chronicle, the Great Falls Tribune, the Montana Standard, and the Helena Independent Record.

Summary of Public Comment and FWP Response

Montana Fish, Wildlife & Parks received a total of 32 comments. Of these comments 19 were classified as opposed to the proposal, 8 were classified as supportive, two were not sure of the proposal (for example, one was against use of rotenone, which is not being considered by FWP), and three were unclear as to whether they were opposed or supportive.

Issue 1. There were several comments received by the public that asked for variations on specific locations of suppression activities. In some cases (4 comments) commenter's wanted suppression actions only upstream from Toston Dam, others wanted no suppression from Toston Dam to the Three Forks area, and other commenter's asked about what could be done downstream from Toston Dam. One other commenter asked for further details on the specifics of suppression actions (location and methods).

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Response: Fish, Wildlife & Parks believes Toston Reservoir to be one of the primary sources of northern pike reproduction from which juvenile pike are dispersing to upstream and downstream waters. Under the proposed action, FWP would suppress northern pike (using gill nets, electrofishing and other standard gears; listed in the Environmental Assessment) in Toston Reservoir to minimize the risk of northern pike spreading throughout the system (either through escapement or due to being moved by anglers). Several northern pike tagged in Toston Reservoir have been recovered downstream. For example, a northern pike tagged in Toston Reservoir in 2010 was harvested by an angler in the Causeway area of Hauser Reservoir in 2011, and several fish tagged in the reservoir have been harvested by anglers in the Missouri River immediately below Toston Dam. A less intensive suppression effort would take place during routine electrofishing surveys in the river between Toston Dam and Canyon Ferry Reservoir. Similar methods would be used; however, electrofishing is likely the most effective method in flowing habitats. Upstream from Toston Reservoir to the lower reaches of the Jefferson, Madison and Gallatin rivers, occasional suppression actions will take place where pike are searched for and removed. All pike encountered during standard annual sampling would be removed.

In Canyon Ferry, Hauser, and Holter Reservoirs no active northern pike suppression is proposed at the current time. However, all northern pike observed through standard annual sampling would be removed. If concentrations of northern pike are discovered in Canyon Ferry, Hauser, or Holter reservoirs, active northern pike removal would be covered by the Environmental Assessment.

In all cases, FWP intends northern pike suppression to be dynamic, such that any new location where northern pike are observed throughout the project area can be suppressed under this Environmental Assessment, whether it is passive (through annual sampling) or actively searching for northern pike. This approach is necessary given the early stage of establishment of northern pike in the project area. It is unknown at this point where northern pike will become established and at what level. Therefore, the suppression program needs to be responsive and dynamic to minimize impacts to wild trout and reservoir fisheries.

In any situation, FWP cannot ignore any section of water when considering the risk for northern pike expansion and establishment. If Toston Reservoir is in fact the primary source of northern pike being observed upstream and downstream from the reservoir, then failure to address this source would be counterproductive.

Issue 2. Comments were received regarding the limiting factors for the trout populations within the Toston to Three Forks area, suggesting that pike were not the limiting factor. In addition, comments were received stating that trout are abundant and pike are not.

Response: Historically and at the present time FWP agrees that habitat and low flow conditions have been limiting to trout populations within parts of the project area (especially the Jefferson and Missouri from Three Forks to Canyon Ferry Reservoir). It is likely that drought conditions will continue to influence trout populations within the project area in the future. Predation losses due to pike or other species are expected to be more severe when trout habitat is limited by poor stream flow conditions.

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FWP assumes that the comment received stating that trout are abundant refers broadly to western Montana, given that trout densities are relatively low (100 to 400 trout per mile) in the reach from Three Forks to Canyon Ferry Reservoir compared to other large rivers in the Upper Missouri Basin. Many high-quality trout fisheries exist in Southwest Montana, and public support for maintaining these fisheries remains high. Therefore, suppressing northern pike to minimize the risk of northern pike to wild trout population is an important management approach.

Issue 3: Many general comments were received on the Environmental assessment related to the general draw of northern pike to anglers. Comments received addressed various aspects of northern pike, including: pike are popular, it is nice not to have to travel long distances to fish for pike, like the idea of a multispecies fishery, anglers prefer catching pike over trout, pike will increase economic draw to the area.

Response: Suppression of pike will not eliminate them from the system and anglers will continue to be able to fish for pike in the Upper Missouri System. A balanced population of predator and prey will allow for anglers seeking other species to continue angling in the local area. Further, FWP's mission is not to provide fishing opportunities for all species in all regions of the state. The Southwest region of Montana is managed primarily for wild trout fisheries.

Although economics and angling pressure are always a secondary effect of many fish management actions, the primary responsibility of the agency is to foster healthy fish communities within a healthy system. Failure to control a potentially dominant predator species (especially when recently introduced to a system) would neglect an important responsibility of the agency. FWP believes that the economic impact that northern pike could have on blue ribbon trout fisheries far outweighs the economic impact of limiting the northern pike population near Toston Reservoir.

Issue 4: FWP received many comments related to removing or reducing the impact of northern pike in the Upper Missouri River system, in effect supporting the proposed alternative. Comments included: "given the importance of trout fisheries, it is incumbent for FWP to address the potential threat of an expanding pike population"; "Timing is good (for suppression) with predictable occupancy (habitat), early stage, and fishing regulation changes"; "Have observed pike affecting other fish populations in Montana (Flathead, Echo Lake, and Salmon-Seeley)"; "Don't allow northern pike to crash fisheries such as walleye did in Canyon Ferry"; "Don't reward bucket biology"; "Pike are typical wolf in a fish population"; "people can fish for pike in other areas, and we don't want them in the Missouri River"; and "Don't want to see more waters wrecked".

Response: FWP agrees that northern pike are a significant threat to the wild trout and reservoir fisheries in the Upper Missouri River Basin. FWP initiated a Northern Pike evaluation at Toston Reservoir in 2009 and is proposing this suppression effort after 3 years of study.

Issue 5: Several alternative actions were proposed by the public, including:

Require catch and kill regulations (pike specifically and all non-native species also).

If removing limits for pike does not result in maximizing angler harvest and there are indications that anglers are practicing catch and release, this requirement will be considered in more detail. That said, there are very few examples of these types of regulations, and there may be

enforcement and legal issues that could prevent success of such a regulation. Further, recreational angling is generally an insufficient tool to effectively reduce or eliminate fish species. When fish densities get low, anglers generally do not put sufficient effort in angling to catch the species. Successful control requires removal of all size classes of northern pike, and angler caught pike tend to be older age classes of fish.

Add new forage species to compensate for pike predation.

Response: Adding new species to any fish community creates numerous known and unforeseen consequences. Predator suppression is a much more conservative and lower risk approach to attempt to maintain predator/prey balance.

Allow spearing.

Response: Although allowing spearing may increase the opportunities to harvest pike, spearing is not a sufficient tool to significantly reduce northern pike populations. FWP will consider diversifying angling regulations in the future, including the use of spearing.

Install a barrier near headwaters

Response: Cost for a large-river barrier would be prohibitive and impractical. In addition, the impacts of a barrier on non-target fish species migrating in this reach would be significant.

Give anglers one more year to get pike out legally.

Response: As stated above under the catch and kill regulation response. Angling is not a sufficient tool to significantly reduce northern pike populations. Anglers will continue to have the opportunity to fish for northern pike, and the current harvest regulations have been liberalized.

Provide a detailed map to enhance the public's ability to control pike.

Response: FWP will evaluate the utility of providing such maps to aid anglers in harvesting northern pike. However, even with maps detailing concentrations of northern pike, anglers are unlikely to have a significant effect on northern pike populations except in areas of concentration like Toston Reservoir.

Manage habitat to improve overall fisheries.

Response: FWP actively protects and enhances habitat throughout the Upper Missouri River basin. Actions include permitting stream bank work, enhancing physical habitat and work to improve instream flows. Although physical habitat attributes are critical to determining the health of a fish community, the biological aspects (addition of exotic predators or invasive species) can impact the overall fish community, even when habitat conditions are pristine. Examples of this can be found in Flathead Lake concerning lake trout and their effect on bull trout and cutthroat trout, or throughout the western half of the state where westslope and Yellowstone cutthroat trout have been replaced by brook trout and rainbow trout (through hybridization).

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Make it mandatory to kill any non-native fish caught by an angler. Consider other options that are less damaging to native and invasive species. Do the same thing for walleye. What about carp? Trout are also nonnative.

Response: Liberal harvest limits on predatory species such as northern pike and walleye are already in place. Additional measures not related to angling are likely needed to suppress predator populations such as northern pike, but mandatory harvest of all non-native species is not currently practical or enforceable.

Issue 6. Comments relative to the perceived effect of Northern Pike on trout populations:

Pike Coexist well in other waters. Pike will never hurt trout populations.

Response: Northern pike obviously do coexist with other fish species in many water bodies in North America. Northern pike and various prey species or sport fish species eventually reach a balance depending on characteristics of specific lakes. Adding pike to the upper Missouri System has uncertain effects on existing fish populations, but there is high risk of predation loss of other fish species depending on the available habitat and refuge available to prey. For example, the periodic dewatering of the Jefferson River poses is significant risk to the existing trout fishery without the presence of large predator species like pike. When low water conditions and moderate pike abundance occurs in the Jefferson River, there is a significant risk that pike will further reduce trout abundance beyond that occurring due to low flow conditions. Pike certainly have potential to impact trout fisheries in these situations.

Brown trout are predators of pike fry and will stabilize and control a pike population (form letter 1 comment).

Response: Northern pike abundance has increased in the past ten to twenty years. Although other species, including brown trout, consume young pike, additional means to slow population expansion appear warranted. FWP has reviewed scientific literature looking for studies that document population level impacts of trout predation on juvenile northern pike, however, no studies were found describing such an impact. It is possible that food habit studies on brown trout or other salmonids have detected juvenile northern pike as prey items, but the effect of such trout predation on juvenile northern pike at a population level is unlikely and undocumented in the scientific literature.

Pike predation will increase body condition of walleye (form letter 1 comment)

Response: Pike predation on walleye could conceivably improve condition of other walleye in the population by reducing the abundance of the walleye population. Conversely, pike predation on species currently providing forage for walleye could decrease condition of the walleye population.

Action will have adverse effect on other species besides pike, walleye in particular.

Response: The methods proposed for northern pike removal are fairly selective. In fact, the bycatch of 3 years of sampling northern pike in Toston Reservoir with monofilament gill nets has

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been minimal (one hour sets of monofilament gill nets allow live release of non-target species). Electrofishing techniques are also effective at minimizing impacts to non-target species. FWP will evaluate bycatch effects and modify methods (timing, location, and technique) to minimize impacts to non-target species.

Issue 7. A variety of comments were received suggesting that this project is not likely to be effective, or feasible: Can't catch them all anyway, leave the pike alone, manage like Fort Peck. Don't waste money. Other suppression projects have failed. Already too late, pike are very well established already.

Response: FWP acknowledges that complete elimination of northern pike from the upper Missouri River system is unlikely, but working to minimize the recruitment by removing adult pike will help prevent further expansion of the species within the basin and help keep densities of pike lower thereby reducing pike predation on other sportfish populations.

Failure to address the establishing northern pike population in the Upper Missouri River basin would be inconsistent with FWP's responsibilities as the manager of the fisheries resources in Montana. If northern pike continue to expand and impact economically-important wild-trout or other fish populations, FWP would be held accountable by the citizens of Montana. Secondly, the fish community, habitat, climate and operation of Ft Peck and other cool water systems are very different from the habitats in the Upper Missouri River basin.

Conduct a comprehensive study of pike impact

Response: FWP has studied the distribution and movement on northern pike throughout the upper Missouri River Basin for four year. Through this period of time, FWP has documented distribution changes and population level changes. Many case histories exist in Montana and throughout North America to describe the effects of introduced northern pike populations on existing fish communities. Further, the scientific literature provides a plethora of diet information for northern pike, and in some cases utilizes bioenergetics modeling to estimate the population level effects of northern pike populations on other fish species. FWP is comfortable that a sound decision on management direction is possible without further research.

Missouri River provides marginal pike habitat, pike unlikely to become dominant species in the river, will pike have an effect in higher gradient streams, pike like slow water, trout like fast. Will pike truly cause harm to trout populations?

Response: FWP agrees that certain habitats throughout the Upper Missouri River are better habitats for northern pike than others. However, sufficient habitats exist within all of the headwater rivers where pike could become established, and have at least seasonal influence on trout populations and other fish populations. In other situations throughout the basin, establishment of northern pike population will likely have measurable effects on fish populations, in particular in reservoir systems throughout the basin.

People are fishing for sustenance.

Response: If a primary objective of the fishery was to maximize sustenance, the best focus would be to maximize abundance of fish species lower on the trophic pyramid which consume plankton

and invertebrates (e.g., trout, perch, suckers, etc.). Therefore, maximizing angler harvest on predators probably provides the most efficient means to provide a sustainable fishery for those focused on fish consumption.

Comments were received by a few individuals requesting some of the pike from the removal efforts.

Response: FWP will work to distribute northern pike that are of suitable size to food banks, wildlife rehabilitation centers and the public whenever possible; however, logistic realities will minimize FWP's ability to ensure that individuals requesting northern pike will receive them.

In conclusion, FWP recognizes that managing predator/prey dynamics is often controversial. Many of the above comments are centered on personal preferences for one species of fish over another. Based on current population trends of northern pike in the Upper Missouri River complex, FWP has determined that the risk to the fish community is highest if no action is taken. Predator suppression provides the best opportunity for achieving long-term balance of the entire fish community. If, in the future, it is determined that this suppression effort is not effective or causes unforeseen impacts, FWP maintains the discretion to cease or modify the action with a new EA process. FWP also believes conservative actions to suppress northern pike abundance are prudent, and failure to suppress northern pike may limit future options for managing the fish community. Alternatively, if suppression is no longer desired or needed, the recovery of the predator population is predictable based on observations of the past population trend. 3

Final Environmental Assessment:
There are no modifications necessary to the Draft Environmental Assessments based on public comment. The Draft Environmental Assessments, together with this Decision Notice, will serve the final documents for these proposals.

Decision
Based on the Environmental Assessment, public comment, and the need protect and conserve wild trout and reservoir fisheries in the Missouri River drainage of SW Montana, FWP's decision is to proceed with the proposed northern pike removal efforts in the Missouri River upstream from Holter Dam.

FWP finds no significant impacts on the human and physical environments associated with this project. Therefore, we conclude that the Environmental Assessment is the appropriate level of analysis, and that an Environmental Impact Statement is not required.

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Region Three Supervisor

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Region Four Supervisor

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