Draft
Upper Missouri River Reservoir Management Plan

2000-2009

Montana Fish, Wildlife & Parks
Fisheries Division
Draft – September 1999

Prepared By:

Steve Dalbey, Fisheries Biologist
R-4, Helena

Steve Leathe, Fisheries Manager
R-4, Great Falls

Bruce Rich, Fisheries Manager
R-3, Bozeman

Ron Spoon, Fisheries Biologist
R-3, Townsend

Dave Yerk, Fish & Wildlife Technician
R-3, Helena

Karen Zackheim, Fish Mgmt. Bureau Chief
Helena

Mail comments by October 22, 1999 to:
Karen Zackheim, MFWP, P.O. Box 200701, Helena MT 59620-0701

Executive Summary

This fish management plan addresses the fisheries of 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 (2000-2009) 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.

The Montana Environmental Policy Act (MEPA) requires state government to be accountable to the public when it makes decisions that affect the human environment. This document describes the proposed action and evaluates potential consequences on the physical environment. Analysis of impacts presented in this document are based on literature research, public comments, monitoring data, and interviews with Montana Fish, Wildlife and Parks personnel and wildlife agency staff in other states.

Fish communities have changed dramatically in the past 10 years and existing management strategies need to be revisited. The establishment of a substantial walleye population in Canyon Ferry will significantly affect the future of fisheries in this reservoir system.

The Canyon Ferry, Hauser, Holter Fisheries Management Work Group was appointed in May, 1998 by MFWP to help identify future fisheries goals to be addressed in the 10-year management plan. This group was comprised of representatives from FWP, business interests, federal agencies, anglers, local government, Montana Power Company, trout interests, walleye interests, and upstream/downstream interests. Based on public input, there is general agreement on two important goals for a 10-year management plan:

- This three-reservoir system should be managed as a high quality, cost-effective, multi-species fishery with high levels of angler satisfaction. Multi-species is defined as an attempt to maintain a high quality fishery with a mix of existing species present (rainbow trout, walleye, yellow perch, burbot, brown trout, kokanee salmon, whitefish, and smallmouth bass). No species introductions will be proposed for these Missouri River reservoirs.

- An annual process for monitoring and evaluating the implementation of the new 10-year plan should be open to the public and other affected interests.

The species composition of the Upper Missour River Reservoir system is typical of large river and reservoir fisheries in the intermountain region. The sport fishery is comprised primarily of rainbow trout, brown trout, yellow perch, kokanee salmon, walleye, mountain whitefish, and burbot (ling). Combined, Canyon Ferry, Hauser and Holter reservoirs accounted for 15% of the fishing pressure in Montana in 1997. These reservoirs traditionally are in the top 5 most heavily fished water in Montana with Canyon Ferry averaging 85,087 angler days (1982-1995), Hauser averaging 72,054 angler days (1989-1995) and Holter averaging 71,483 angler days (1989-1995). This level of pressure equates to an average 18.9 angler days per acre and 14.9 days per acre on Hauser and Holter respectively and 2.4 angler days per acre on Canyon Ferry. Hauser reservoir was elevated to the number one most heavily fished body of water in the state in 1991. This was attributable to a booming kokanee salmon population that resulted in a record 141,000 fishharvested in 1991.

Walleye have become a significant component of the Canyon Ferry fishery in the past two years as this newly developed population has expanded to reach fishable numbers. Prior to 1996, no walleye were

observed in the standard roving creel census and reports of walleye caught by anglers were uncommon. During 1998, the walleye population was abundant enough that nearly 50% of the summer anglers were seeking walleye exclusively, or in combination with other species such as perch or trout.

Angling pressure on Hauser Reservoir has varied considerably and has been closely linked to the abundance of kokanee salmon. Angler use trends are decreasing in response to the collapse of the kokanee fishery and declines in rainbow trout catch rates.

Results from an angler satisfaction survey conducted during the summer of 1996 and 1997 indicate a general lack of satisfaction with the fishery in Hauser Reservoir. More than half of the anglers surveyed (58%) were dissatisfied with the number of fish caught. Of the anglers who possessed fish in 1997, 54% were satisfied with the size of fish caught.

Holter Reservoir typically provides 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. Yellow perch harvest has fallen sharply since it peaked in 1992. Rainbow trout are generally the most readily caught species. Catch rates peaked in the early 1990's when anglers documented a catch rate of nearly 0.3 fish per hour. Average size of creeled rainbow trout has remained relatively constant at slightly over 14 inches. Kokanee harvest in Holter never attained comparable levels of harvest observed in Hauser. Results from the angler satisfaction survey conducted in 1996 and 1997 indicated a general lack of satisfaction with the current fishery in Holter.

The presence of a prolific predator such as walleye at the head of a reservoir complex that provides 15% of Montana's statewide fishing pressure creates a challenge to maintain the historically popular fishery resources. Walleye have tremendous reproductive potential in Canyon Ferry, in contrast to Hauser and Holter reservoirs, and will thrive as long as 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 likely require suppression of walleye to reduce predation on yellow perch, rainbow trout, and kokanee salmon. Failure to adequately control walleye numbers will likely result in diminished perch and trout fisheries, which would be inconsistent with the multi-species goal established during the 1998 consensus council process. As documented in other reservoir systems, it would also likely result in a population of stunted walleye when the prey base is depleted.

Canyon Ferry Reservoir Management Goals

Walleye in Canyon Ferry Reservoir have now entered a phase of extremely rapid population growth that has been characteristic of other newly developing populations. Over 95% of the fish sampled in the walleye netting series were produced during 1996 or later. The 1998 fall gill net catch of walleye reached 10.4 walleye per net, which matches or exceeds gill net catches of established walleye fisheries in other Montana lakes and reservoirs. Walleye age information confirms that the expanding walleye population is almost entirely composed of young fish.

Management of walleye in Canyon Ferry Reservoir in the 1990s has been based on the 1993 Canyon Ferry Management Plan. This plan mandated walleye removal and suppression. From 1994 through 1997, MFWP evaluated potential tools to eliminate the walleye population via suppression techniques such as reducing spawning success by electric current over incubating eggs and removing mature spawning fish from the spawning grounds prior to egg deposition. These tools, used independently, either proved to be technically infeasible or insufficient to significantly suppress walleye reproduction in Canyon Ferry Reservoir.

The goal for managing the Canyon Ferry-Missouri River fishery is to maintain a cost-effective multi-species fishery that maintains the current level of angler use during both the open water and ice fishing seasons. Management of the multi-species fishery will attempt to maintain historically desirable species (rainbow trout, yellow perch, brown trout, and burbot) while adopting strategies to control the expanding walleye population. Refer to the Management Objectives Matrix for species-specific management targets.

- Rely on yellow perch to provide the current level of angler satisfaction during the winter and secondarily to increase diversity of angling opportunity during the ice-free seasons. Yellow perch are currently the preferred prey for walleye in Canyon Ferry Reservoir, and predation is expected to increase significantly as walleye numbers expand. To prevent over-harvest by anglers, recommend conservative harvest regulations with a daily limit of 50 yellow perch for the 2000-2001 Fishing Regulations.
- Rely on hatchery rainbow trout to continue providing angling opportunity at approximately the current level of angler catch. With the expanding walleye population and the projected increase in walleye predation on trout, it will be difficult to maintain the current rainbow fishery without the ability to substantially increase stocking rates.
- Suppression efforts will be necessary to maintain walleye at a level that sustains a balanced fish community. Strategies for suppressing walleye population expansion to sustain the desired trout and yellow perch fisheries are based on "triggers" to initiate progressive management actions. The first phase involves facilitating maximum harvest by anglers through implementation of liberal harvest regulations. A limit of 20 walleye daily and 40 in possession is proposed for the 2000-2001 Fishing Regulations. Walleye daily and possession limits will be reduced if it is determined that the population is over-harvested and more conservative limits are necessary to support a viable walleye population as part of the multi-species fishery in Canyon Ferry Reservoir. Walleye limits could be removed entirely if population levels continue to exceed management targets and do not respond to liberalized daily limits.
- Maintain restrictive regulations to protect the spawning brown trout population and increase the number of brown trout residing in the reservoir.
- Rely on burbot 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 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, which generally directs a conservative approach to harvesting sport fish species (trout and perch) that are subject to predation by walleye, and a liberal approach to harvesting walleye. 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.

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

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

- 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.

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, kokanee salmon, walleye and yellow perch. Until factors limiting fisheries production in Hauser Reservoir are addressed, the fishery will not reach it's full potential. Refer to the Management Objectives Matrix for species-specific management targets.

- Rely on rainbow trout to provide the principal fishery with kokanee salmon furnishing a varying proportion of the harvest. Increase rainbow stocking and evaluate fall planting of age zero fish to reduce walleye predation on hatchery rainbow trout.
- Rely on kokanee salmon to provide a supplemental fishery to rainbow trout while attempting to reestablish a self-sustaining, wild fishery. Reestablish a self-sustaining population in Hauser Reservoir by stocking approximately 100,000 – 300,000 (based on availability) kokanee annually. If the fishery has not met specific criteria by 2004, kokanee stocking will be reevaluated.
- Rely on walleye to provide a balanced, cost-effective fishing opportunity in Hauser. Discontinue annual stocking of 5000 advanced walleye fingerlings. Change daily limit regulations from 5 fish, one greater than 20 inches to 10 fish, one greater that 28 inches. Walleye limits could be removed entirely if population levels continue to exceed management targets and do not respond to liberalized daily limits.
- Rely on yellow perch to provide a self-sustaining fishery that is based entirely on wild reproduction. Propose a 50 fish limit on yellow perch.
- Determine annual and seasonal flushing rates of fish out of Hauser Reservoir using special dam re-licensing funds if and when they become available. Determine feasibility of screening Hauser dam to reduce flushing losses.
- Determine walleye flushing rates from Canyon Ferry and survival in downstream reservoirs if research funds become available. Walleye flushing out of Canyon Ferry into Hauser Reservoir will increase as the walleye population in Canyon Ferry increases. Increased walleye densities in Hauser Reservoir will affect the balance of the multi-species fishery because of increased predation on trout and yellow perch.
- Enhance wild fish spawning opportunities in Hauser Reservoir and in tributary streams to Hauser Reservoir. Lack of funding has limited the number of projects that have been completed to enhance wild reproduction of Hauser fish. The Future Fisheries program provides funding for projects targeting enhancement of wild fish and will provide financial assistance for projects in the future.
- 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 (Hauser Dam to Holter Reservoir) Management Goals

The management goal for the Missouri River below Hauser Dam is to provide a salmonid fishery including wild rainbow trout and brown trout for sport fishing. Management of this water is greatly affected by the management direction of Canyon Ferry, Hauser and Holter reservoirs.

- 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.
- Maintain brown trout at or above current levels. Maintain the catch and release fishing regulation that was implemented in 1992 for this reach of the Missouri River and Holter Reservoir.
- Rely on kokanee salmon flushed from Hauser reservoir and any natural reproduction that may occur in Holter reservoir to provide a limited kokanee harvest. Continue efforts to re-establish a self-sustaining population of kokanee salmon in Hauser Reservoir that will supply flushed fish to this section of the Missouri River.
- Rely on walleye flushed from Hauser Reservoir and migratory adults from Holter to provide a limited fishery. Propose changing angler harvest regulations from 3 fish less than 18 inches and only one greater than 28 inches to 5 fish less than 20 inches and one greater that 28 inches. All fish between 20 and 28 inches would be released. Determine walleye flushing rates from Canyon Ferry Reservoir and downstream survival of flushed walleye if research funds become available.
- Enhance wild fish spawning opportunities in Holter Reservoir tributary streams.

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. Refer to the Management Objectives Matrix for species-specific management targets.

- Rely on rainbow trout to provide the principal fishery in Holter Reservoir with continued emphasis on maximizing the proportion of wild rainbow trout. To minimize flushing losses, stocking of fish will occur after high water.
- 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. Revise angler harvest levels from 3 fish less than 18 inches and 1 fish greater than 28 inches to 5 fish less than 20 inches and 1 over 28 inches. All fish between 20 and 28 inches must be released.
- Rely on yellow perch to provide a cost effective, self-sustaining fishery that is supported entirely with wild reproduction. Propose a 50 perch limit on Holter Reservoir to prevent over harvest and provide forage for walleye. Determine walleye flushing rates and survival from Canyon Ferry Reservoir and impacts on Holter Reservoir if funds become available.
- Rely on kokanee salmon flushed from Hauser Reservoir and any natural reproduction that may occur in Holter Reservoir to provide limited kokanee harvest.
- Determine annual and seasonal flushing rates of fish out of Holter Reservoir and the feasibility of screening Holter Dam 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.
- Manage derbies/tournaments for consistency with fisheries management goals and objectives for Holter Reservoir and to minimize conflicts with the general angling public. Authorize up to two tournaments per year.

Plan Implementation and Public Involvement

This plan will be used to direct fisheries resource management activities for the next 10 years on Canyon Ferry Reservoir, Hauser Reservoir, Holter Reservoir, and asscoiated 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 in February or March.

Schedule

Action	Dates
Draft Management Plan Public Comment	September through October 22, 1999
Distribute Final Management Plan	December 1999
Monitor Fisheries	On-going, annually
Prepare Annual Report	Fall, annually
Public Meetings	February/March, annually
Review/Revise Management Plan	As needed
Propose Changes to Fishing Regulations	Odd years, as needed

Mail comments by October 22, 1999 to:
Karen Zackheim, MFWP, P.O. Box 200701, Helena MT 59620-0701

Matrix - Upper Missouri River Reservoir Management Objectives

(Monitoring methods vary by species. Refer to management plan for detailed description of net type and season. ACR = Angler Catch Rates)

	Canyon Ferry Reservoir		Hauser Reservoir		Holter Reservoir	
Size	35,000 acres		3,800 acres		4,800 acres	
Retention Time	194 days		8 days		21 days	
	Relative Abundance	Limiting Factors	Relative Abundance	Limiting Factors	Relative Abundance	Limiting Factors
Rainbow Trout	1998 actual: 9/net Proposed Objective: 10/net (3-year avg.)	Spawning habitat Hatchery allocation Walleye predation	1998 actual: 5/net Proposed Objective: 5/net (3-year avg.) ACR: 0.15 fish per hour	Low dissolved 0_2 Flushing Spawning habitat Whirling disease Predation Hatchery Demands	1998 actual: 8/net Proposed Objective: 8/net (3-year avg.) ACR = 0.25	Flushing Spawning habitat Whirling disease Predation Hatchery Demands
Yellow Perch	1998 actual: 18/net Proposed Objective: 20/net (3-year avg.)	Spawning habitat Juvenile rearing Predation	1998 actual: 6/net Proposed Objective: 7/net (3-year avg.) ACR = 0.10 fish per hour	Low dissolved 0_2 Flushing Spawning habitat Predation	1998 actual: 1 Proposed Objective: 10/net (3-year avg.) ACR (winter) = 2/hr	Flushing Spawning habitat Predation
Walleye	1998 actual: 10/net Proposed Objective: 5/net (3-year avg.)	Forage supply	1998 actual: 5/net Proposed Objective: 2-3/net (3-year avg.)	Flushing Spawning habitat Forage supply	1998 actual: 4/net Proposed Objective: 3/net (3-year avg.)	Flushing Spawning habitat Angler Harvest
Kokanee	N/A	N/A	1998 actual: 1 total in summer vertical gillnets Proposed Objective: 20/net (3-year avg.) ACR = 0.10 fish per hour	Low dissolved 0_2 Flushing Spawning habitat Predation	Management Objectives reliant on success of Hauser kokanee population	Spawning habitat Flushing Predation
Brown Trout	1998 actual: 0.5/net Proposed Objective: 2/net	Spawning habitat	1998 actual: 0.1/net Proposed Objective: 1/net	Low dissolved 0_2 Interaction with kokanee salmon Spawning habitat	N/A	N/A
Burbot	1998 actual: 0.4/net Proposed Objective: 0.4/net	Unknown	Proposed Objective: 0.5-1.0/net	Low dissolved 0_2	N/A	N/A

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Introduction

Since the mid-1980s, Montana Fish, Wildlife & Parks has 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. These plans have provided the basis for fisheries management in the Upper Missouri River Reservoir system for the past 10 years (twice as long as intended), and are now out-dated. It is time to re-evaluate management of fisheries in these waters and to reconsider angler and community preferences for these waters.

Fish communities have changed dramatically in the past 10 years and existing management strategies need to be revisited. Significant reductions of kokanee salmon in Hauser and Holter have seriously impacted the fishery. The establishment of a substantial walleye population in Canyon Ferry will significantly affect the future of fisheries in this reservoir system. The preference of the public in 1993 was for MFWP to manage Canyon Ferry primarily as a trout fishery. As part of that management direction, MFWP committed to evaluating control measures for fish species that might put trout at risk. For the past several years MFWP has experimented with methods to control the abundance of walleye, a predator that could potentially impact Canyon Ferry's trout fishery, however, elimination of walleye is not possible.

This fish management plan addresses the fisheries of Canyon Ferry, Hauser, and Holter Reservoirs, and the Missouri River from Toston to Townsend and between Hauser and Holter Reservoirs. The plan sets management direction for a 10-year period (2000-2009) 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.

Objective evaluation criteria are provided to assess ongoing management for each water. MFWP will sponsor an annual public meeting to share current information with the public and report on the status of the plan implementation. This meeting and associated mailings will also be used to make modifications to the plan that may become necessary during the 10-year planning horizon.

Management Plan Organization

This plan is divided into the following sections; introduction, study area, individual waters, and plan implementation. The introduction provides an overview of the MEPA process, structure of the plan, and a description of the public involvement process used to develop the plan. The study area chapter provides a general description of the upper Missouri River Reservoir system. Sections on each individual water provide more detailed background information on history, physical and fisheries description, past/present management, and proposed management goals and strategies. The final section, plan implementation, details the ongoing public involvement process which will be used to monitor, evaluate, and modify the plan over the 10-year period.

Montana Environmental Policy Act

The Montana Environmental Policy Act (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 to 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, MCA) and directs them to:

- use 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

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

MEPA requires MFWP 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:

- modify alternatives, including the preferred alternative;
- develop and evaluate alternatives not previously considered;
- supplement, improve, or modify the analysis contained in the draft;
- make factual corrections; and
- explain why comments do not warrant further response.

The purpose of preparing a draft plan prior to decision making is to describe the proposed action, and evaluate potential impacts, including cumulative and secondary impacts, on the physical environment.

This document will assist MFWP in planning and decision making by presenting an integrated and interdisciplinary analysis of administrative alternatives for management of the Upper Missouri River Reservoir system. Analyses of impacts presented in this document are based on literature research, public comments, and interviews with MFWP personnel, and wildlife agency personnel in other states.

Role of Other Government Agencies

MFWP 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 (Appendix A). 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 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 manages federal lands around the reservoirs, including numerous campgrounds and boat launches, and is responsible for operating Canyon Ferry Dam. The U.S. Department of Interior, Fish and Wildlife Service, administers the Federal Endangered Species Act which provides special protection to any species or its habitat if the species is listed as threatened or endangered. 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.

Public Involvement

The Canyon Ferry, Hauser, Holter Fisheries Management Work Group was appointed in May, 1998 by MFWP to help develop the future fisheries management alternatives to be addressed in the development of a ten-year management plan. This group was comprised of representatives from FWP, business interests, federal agencies, anglers, local government, Montana Power Company, trout interests, walleye interests, and upstream/downstream interests. Public workshops were designed to advance peoples' understanding of the issues and to provide input into the discussion of management alternatives. The Montana Consensus Council facilitated work group meetings.

The Fish Work Group met six times over a five month period and sponsored two large public forums on July 15 and September 17, 1998. The first public forum focused on education about the baseline fisheries, current trends, and pressing issues for a 10-year management plan. Approximately 50 people attended this evening forum. The second public event engaged a panel of out-of-state experts to provide independent insights and commentary on habitat, fish passage, and predatory-prey issues pertinent to the Upper Missouri River Reservoir study area. Experts were jointly selected by the work group to boost credibility and provide a balanced perspective. Approximately 45 participants attended the presentation.

Based on public input and work group participation from the various interest groups concerned about management decisions on the Upper Missouri River Reservoir system, there is general agreement on two important goals for a 10-year management plan:

- This three-reservoir system should be managed as a high quality, cost-effective, multi-species fishery with high levels of angler satisfaction. Multi-species is defined as an attempt to maintain a high quality fishery with a mix of existing species present (rainbow trout, walleye, yellow perch, burbot, brown trout, kokanee salmon, whitefish, and smallmouth bass). No introductions of new species (either not present or previously introduced) will be proposed for these Missouri River reservoirs.

- 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 final report of the Fish Work Group is attached in Appendix A.

The department's draft management plan will be available for public comment through October 22, 1999. During the public comment period, the department will hold public meetings in Helena and Great Falls. The plan may be revised based on public review. A final management plan will be published in December, 1999.

Table 1. Upper Missouri River Reservoir Management Plan Decision Process

When	What	Who
September, 1999	Draft Upper Missouri River Reservoir Management Plan Released to the Public	Montana Fish, Wildlife & Parks
September, 1999	Conduct Public Meetings	Montana Fish, Wildlife & Parks: Bozeman Butte Great Falls Helena Townsend
September through mid-October, 1999	Public Comment Period	Public
November, 1999	Revise Plan Based on Internal and External Review/Comment	Montana Fish, Wildlife & Parks
December, 1999	Publish Final Upper Missouri River Reservoir Management Plan	Montana Fish, Wildlife & Parks

Management Plan Area

The Upper Missouri River Reservoir Management 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. A variety of important fish species are present within the management area. Rainbow trout, kokanee salmon, yellow perch, brown trout, burbot (ling), and walleye are among the species of greatest interest to the public. Canyon Ferry Reservoir is the first major 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, 1996).

Combined, Canyon Ferry, Hauser and Holter reservoirs accounted for 15% of the fishing pressure in Montana in 1997. 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 water in Montana with Canyon Ferry averaging 85,087 angler days (1982-1995), Hauser averaging 72,054 angler days (1989-1995) and Holter averaging 71,483 angler days (1989-1995). This level of pressure equates to an average 18.9 angler days per acre and 14.9 days per acre on Hauser and Holter respectively and 2.4 angler days per acre on Canyon Ferry. Hauser reservoir was elevated to the number one most heavily fished body of water in the state in 1991. This was attributable to a booming kokanee salmon population that resulted in a record 141,000 harvested in 1991.

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, although hatchery stocking of Canyon Ferry Reservoir has resulted in significant runs of hatchery fish into this reach of the Missouri River. The sport fishery in this reach is primarily comprised of brown trout and rainbow trout. Although this reach of river is located downstream from Toston Dam, it does not have characteristics of tailwater fisheries similar to 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. 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 coldwater species of fish and invertebrates. Since the Canyon Ferry/Missouri River fishery is linked by seasonal migrations, the reservoir and the river must be managed as a system.

Canyon Ferry Reservoir is operated by the Bureau of Reclamation for power production, flood control, irrigation, recreation, and as a municipal water source. The reservoir has been in full operation for the past

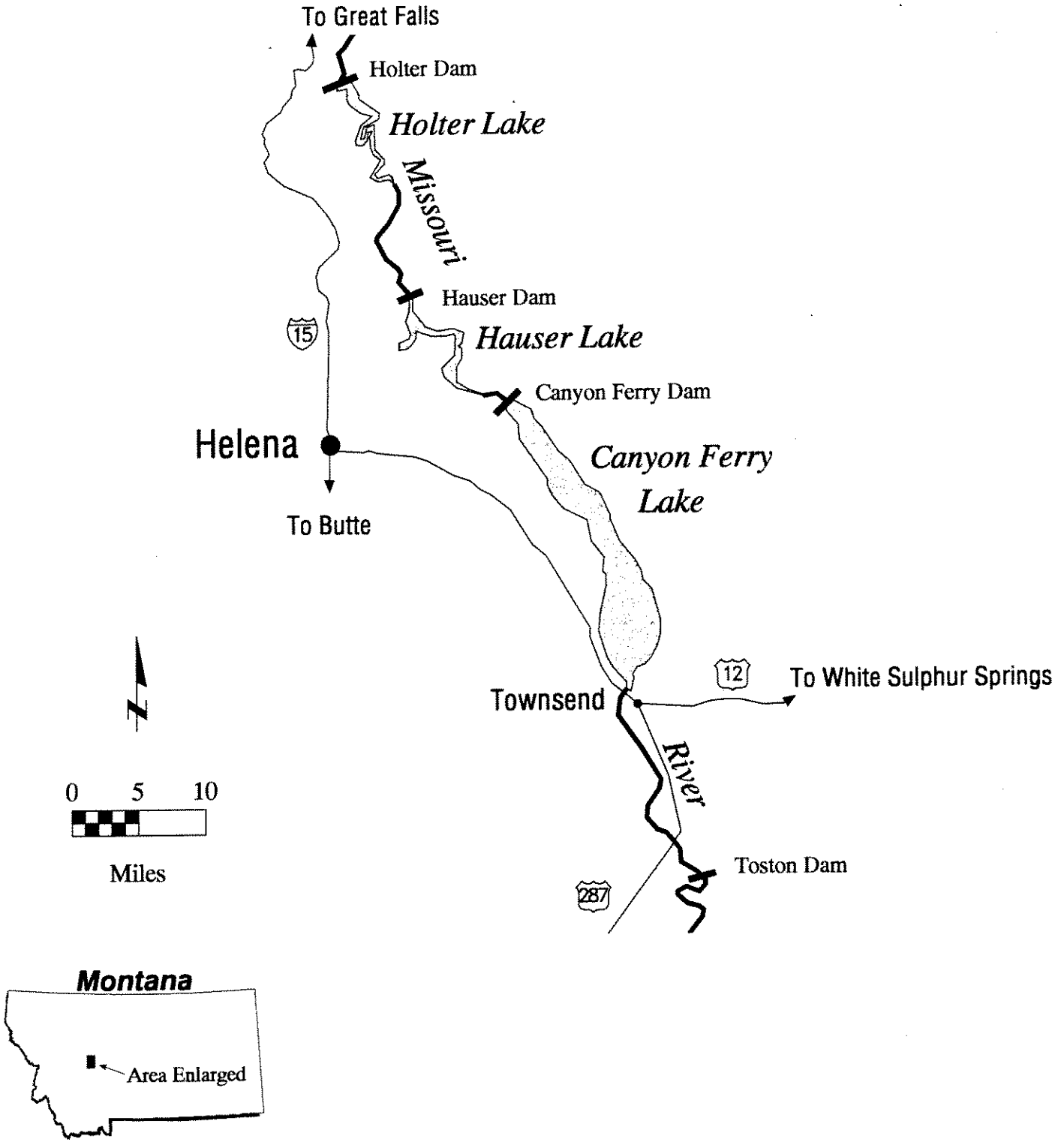


Figure 1. Upper Missouri River reservoir management area.

44 years. Toston Dam is located 23 miles above Canyon Ferry. The dam is 26 feet high and is a barrier to upstream migrating fish.

At full pool, Canyon Ferry has a surface area of 35,200 acres and a volume of about 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 2). 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.

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. Lands immediately surrounding the reservoir are principally owned by the Bureau of Reclamation (BOR) with some private land. BOR manages recreational areas around the reservoir. Major tributaries to the reservoir include Duck Creek, Confederate Gulch, Hellgate Creek, Avalanche Creek, Magpie Creek, and Beaver Creek (Figure 2).

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 is about 194 days. 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.

Canyon Ferry Reservoir is typically drawn down to its minimum level in March, and then is refilled during the March to June period. The annual drawdown over the last 10 years has averaged 12 feet. A reservoir operations steering committee, comprised of MFWP, Montana Power Company, Bureau of Reclamation, irrigators and sportsmen have formulated operational guidelines for Canyon Ferry Reservoir to balance recreational values and minimize impacts to fish and wildlife. This committee meets annually to review operational guidelines.

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.

Fisheries and Water Quality

Canyon Ferry Reservoir

The sport fishery of the Canyon Ferry Reservoir/Missouri River system is primarily comprised of rainbow trout, brown trout, yellow perch, mountain whitefish, burbot (ling) and walleye. Other game fish species in the system are not abundant enough to provide significant sport fishing opportunities, including smallmouth bass, largemouth bass, and northern pike. Non-game species in this system are abundant, but not particularly diverse. The four primary nongame species include carp, longnose sucker, white sucker, and Utah chub.

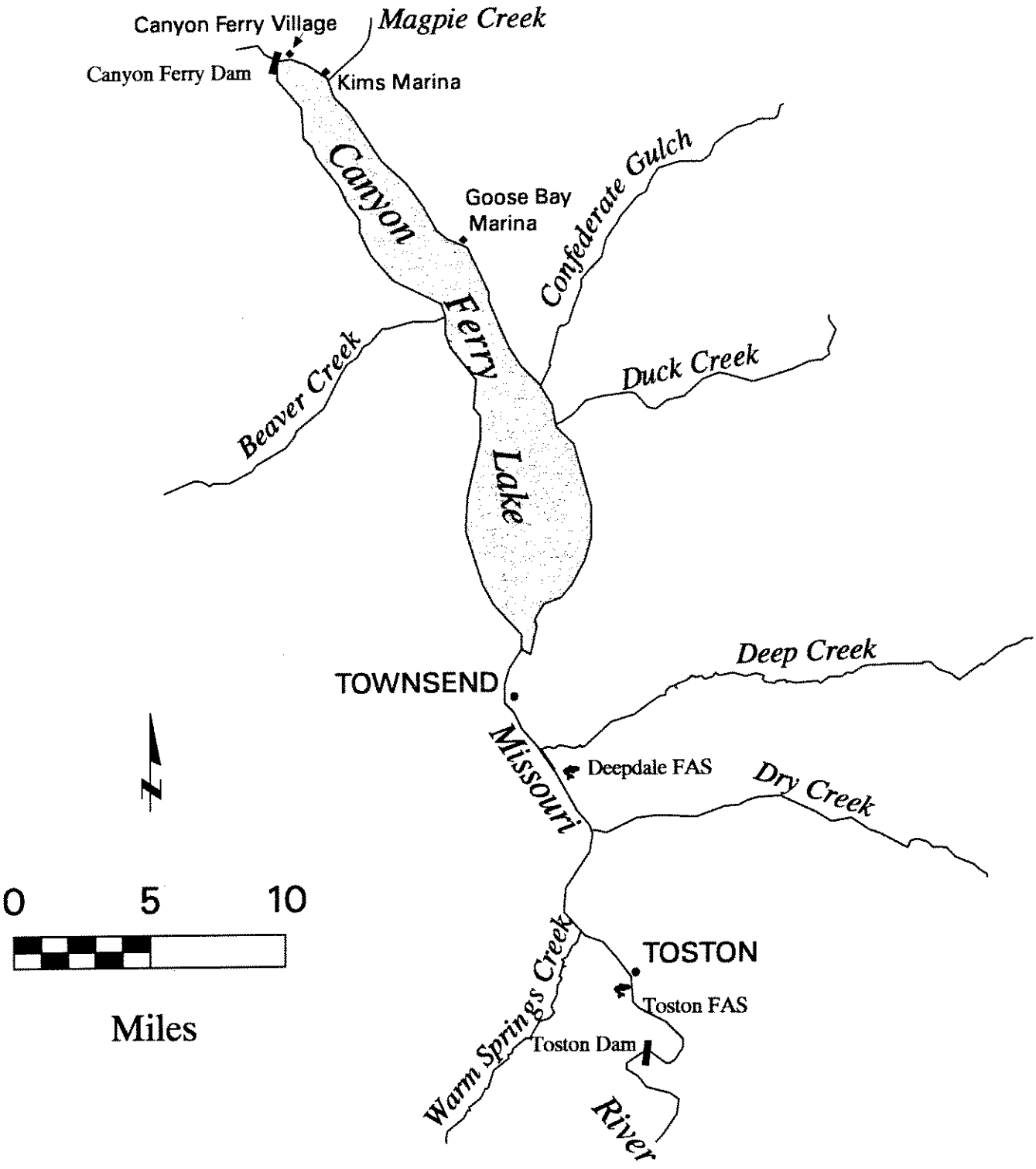


Figure 2. Canyon Ferry Reservoir.

Anglers at Canyon Ferry Reservoir have historically sought rainbow trout and yellow perch during ice free months of the year. Yellow perch are particularly popular during the winter ice fishing season. Burbot (ling) are also a popular sport fish during the winter and early spring season. The burbot population appears to be increasing in Canyon Ferry Reservoir, and there has been a corresponding increase in angler interest in the species during the 1990s. Yellow perch 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.

Brown trout populations are typically sustained by natural reproduction, but supplemental imprint stocking of brown trout occurred between 1992 and 1997. Brown trout have provided an important trophy component to the fishery in the past, but low numbers of brown trout have resulted in low catch rates in Canyon Ferry Reservoir and the Missouri River upstream to Toston Dam since the mid-1990s.

Walleye have become a significant component of the Canyon Ferry fishery in the past two years. This newly established population has rapidly expanded to reach catchable numbers. Prior to 1996, no walleye were observed in the standard roving creel census and reports of walleye caught by anglers were uncommon. During 1998, the walleye population was abundant enough that nearly 50% of the summer anglers were seeking walleye exclusively, or in combination with other species such as perch or trout.

Angling pressure at Canyon Ferry typically ranks near the top of the statewide angling pressure survey, averaging about 86,000 angler days from 1982 through 1997. Angling pressure was at an all-time low of 61,494 angler days in 1991 and has increased and remained steady at approximately 94,000 angler days during the past 5-years (1993-97). 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.

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. More recent studies have found little change in nutrient levels and trophic status of the reservoir. Dissolved oxygen (DO) levels recorded for Canyon Ferry surface waters are excellent, with minimum values typically exceeding 7 mg/l (Priscu 1986, Thomas 1991). 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 is creating 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 55° F by late May, peak near 70° F in early August, and cool to below 50° F 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.

Missouri River (Toston Dam to Canyon Ferry Reservoir)

Spring population estimates of rainbow trout in the Missouri River during 1991 and 1999 indicate that the rainbow fishery has increased significantly in recent years. Rainbow trout from 10 to 17.9 inches increased from 50 per mile in 1991 to 208 per mile in 1999. Although spring estimates on sexually mature rainbow trout are highly influenced by spawning movements, there has been a noticable increase in the number of large rainbow trout (over 18 inches) during the same period. In addition, increased natural reproduction is evident in the vicinity of spawning tributaries such as Big Springs, Dry Creek and Deep Creek. Rainbow trout densities were not estimated during the fall prior to 1998 in the Toston Section of the Missouri River. Fall estimates ranging from 250 to 300 per mile were observed in 1998 and 1999.

Although it is difficult to accurately estimate rainbow trout abundance in the Missouri River because of the migratory nature of the fishery, it is apparent that rainbow trout numbers have increased significantly in the 1990's during the spring and fall seasons. Rainbow trout over 18 inches were not abundant enough to estimate in 1991, but increased to 66 per mile in 1999. In addition to enhanced numbers of rainbow trout in this reach of river, there is evidence of successful reproduction by wild strains using tributaries and this reproduction is observed during fry trapping near the mouths of tributaries and by observing juvenile fish near spawning tributaries during river electrofishing runs.

In contrast to the increasing rainbow trout population in the Missouri River, the brown trout population trend has continued to decline in the past 10 years. Brown trout comprise an extremely small percentage to the Canyon Ferry Reservoir fishery, and are present in low to moderate numbers in the Missouri 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 rearing 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 both populations are declining. This decline is particularly evident for brown trout between 10.0 and 17.9 inches in length, where numbers have decreased from a high of 284 per mile in the faster section of the river in 1979 to 18 per mile in 1991. In 1999, too few brown trout were captured to calculate an estimate.

Catch per effort electrofishing surveys in this reach of the Missouri River during spring, 1999 indicate that mountain whitefish are the most abundant fish species in the river, followed by suckers, rainbow trout, carp and brown trout. No walleye have been sampled in the river upstream of Canyon Ferry during routine electrofishing runs.

Hauser Reservoir, Holter Reservoir and Missouri River-Hauser Tailwater

Hauser and Holter are the second and third reservoirs below Canyon Ferry (Figure3). These two upper Missouri River 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 respectively for the purpose of generating electric power and both reservoirs have limited storage capacity. The dams are owned and operated by the Montana Power Company. Pennsylvania Power and Light (PP&L) purchased these dams in 1999 with transfer of ownership and operation expected to occur during the development of this plan. 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. 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 (Table 2). Important tributaries to Hauser Reservoir include Prickly Pear, Trout, Spokane and McGuire creeks (Figure 3).

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 the lower reach of Big Prickly Pear Creek was inundated by Hauser Dam. 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 2100 acres, average depth of only five feet, and a maximum depth of only 10 feet. Because of the shallow

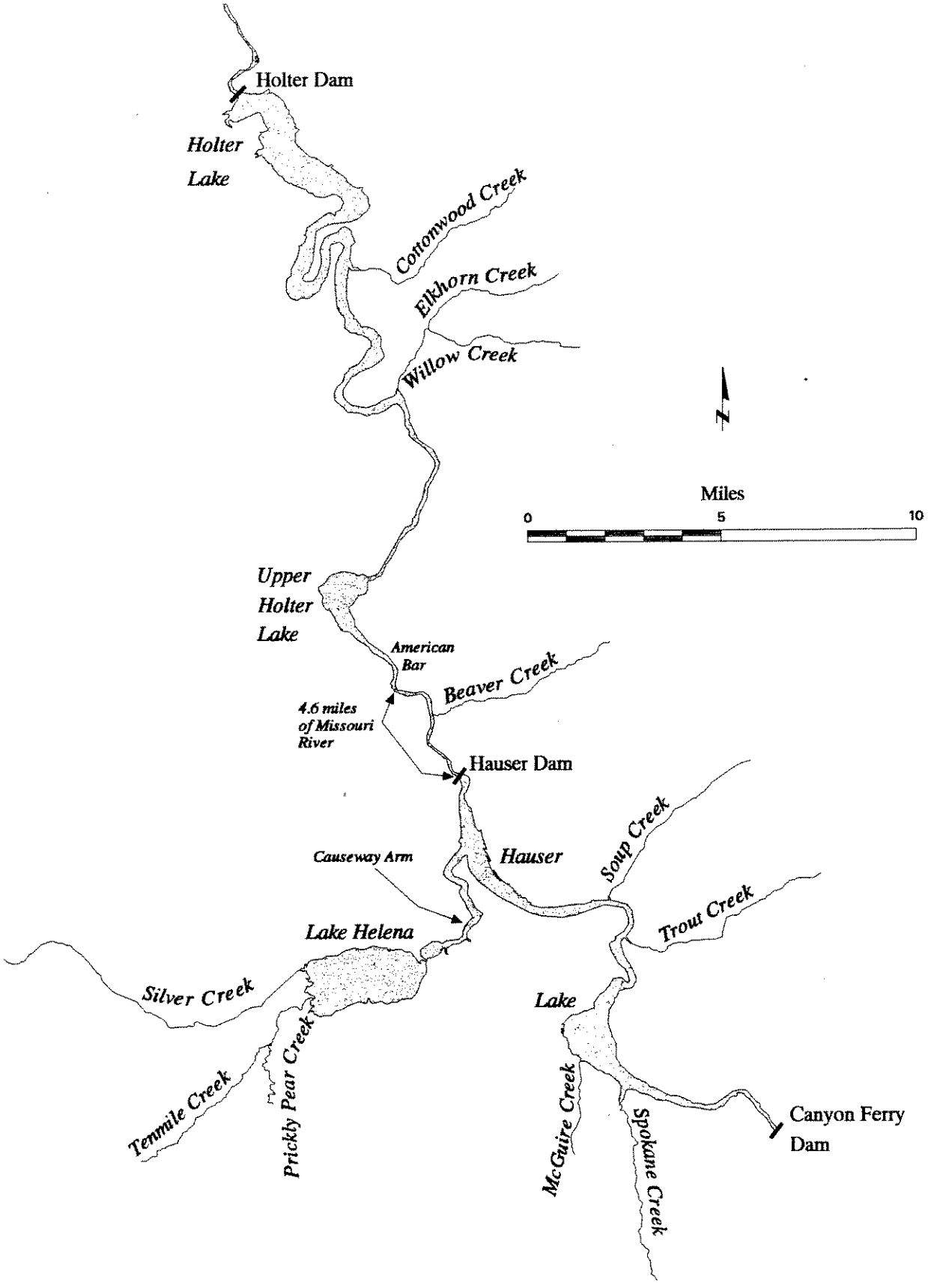


Figure 3. Hauser and Holter reservoirs.

Table 2. 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)	48 years	88	95
Drainage Area (square miles)	15,904	16,876	17,149
Avg. water retention time (days)	140	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 feets 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

average depth, Lake Helena develops dense mats of aquatic vegetation and is an important waterfowl production area. MFWP has a Wildlife Management Area (WMA) on the north shore. All species probably move in from Hauser Reservoir to take advantage of the early spring 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 into 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. The average depth of the reservoir is 50 feet, with a maximum depth of approximately 121 feet (Table 2). 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, provides the principal spawning stream for reservoir fish. Cottonwood and Willow creeks are also important tributaries that empty directly into the reservoir.

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 (16.5-megawatt) 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 being 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 a wet water year such as 1997, water is spilled every day of the 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-megawatt. 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 a dry year (1992) water was spilled only one day. 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 re-licensing process, a draft Environmental Impact Statement released in 1997 outlined proposed operational modifications for Holter Reservoir. These guidelines direct MPC 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 MFWP, MPC, U.S. Bureau of Reclamation, U.S. Forest Service, irrigators, and sportsmen formulated operational guidelines for Holter Dam to optimize recreational values and to minimize impacts to fish and wildlife (MFWP 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) hydrostructure 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. Angler demographics 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% and has averaged roughly 10% of the pressure since 1986. Angler use trends are decreasing in response to the collapse of the kokanee fishery and declines in rainbow trout catch rates. Currently, the majority of anglers on Hauser Reservoir are from Lewis and Clark County (51%) while anglers from west of the continental divide (Montana residents) and non-residents account for 25%. An average fishing trip on Hauser Reservoir in 1997 was 2.8 hours from shore and 4.2 hours for boat anglers.

Kokanee salmon and rainbow trout dominated the angler creel through the early 1990's surpassing the 1989-1994 management goal of a combined harvest of 80,000 fish (1989 through 1993). Hauser has failed to reach this management goal since 1994. Following high runoff in 1993, the combined kokanee and rainbow harvest significantly declined from 105,800 (1993) to 41,300 (1994). Declining harvest fell to a low of 21,300 rainbow and kokanee in 1997. Regardless of kokanee densities in the reservoir, average length has remained relatively constant since 1986 at 15.7 inches. The majority of the rainbow trout caught in the reservoir continue to be of hatchery origin (average 90% (1986-1997)). The average size of rainbow trout caught in Hauser Reservoir, however, increased from 13.5 inches in 1986 to 17.5 inches in 1995 and 1996 and 16.9 inches in 1997. This size increase could be a result of reduced competition for food with kokanee salmon.

Walleye numbers escalated to record highs in 1998 in gillnets and angler surveys. Gillnet catches averaged less than one walleye per net for the period 1991 through 1997 while in 1998 catch rates were nearly six per net. Walleye were an important part of the summer creel in 1998 with catch rates exceeding rainbow trout periodically throughout the summer. The reason for this dramatic increase in walleye remains uncertain, although there are four possible explanations: 1) progeny of walleye stocked by MFWP in Hauser since 1989; 2) flushing of walleye from Canyon Ferry; 3) progeny of 59 adult walleye (35 females, 24 males) relocated from Canyon Ferry to Hauser in May of 1997; or 4) a combination of 1, 2 and/or 3.

Yellow perch harvest has oscillated around 35,900 fish since 1989 peaking in 1992 at 55,400 fish and reaching a record low in 1997 at 19,000 fish. Brown trout numbers have remained low with long-term gillnet catches averaging 1.0 and 0.6 fish per net in spring and fall sinking gillnets respectively. 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. Largemouth bass are not commonly caught in Hauser Reservoir. Only 16 have been registered by angler creel surveys since 1986. Fishing for smallmouth bass in Hauser is generally confined to the Causeway Arm and Lake Helena.

Results from an angler satisfaction survey conducted during the summer of 1996 and 1997 indicate a general lack of satisfaction with the current fishery in Hauser Reservoir. In 1996, 24% respondents were satisfied with the number of fish while 60% were satisfied with the size of fish. In 1997, following record high runoff and associated fish flushing losses, the percentage of satisfied anglers declined significantly. Only 12% were satisfied with the number of fish while 54% remained satisfied with the size of fish. The proportion of anglers that were dissatisfied with the number of fish caught remained roughly the same at 58%. More than half of the anglers who possessed fish in 1997 (54%) were satisfied with the size of fish caught.

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

Angler use is very high on this short segment of the Missouri River, averaging about 18,000 (1989 through 1997) angler days per year. This is reflective of the fact that this is the closest river fishery to the greater Helena area. Fishing use appears to have remained relatively steady over the past several years. No recent creel survey information has been collected. However, creel surveys in 1983 revealed that a majority of anglers fishing the river were from Lewis and Clark County (79%). About 9% of the anglers were from out of state. A majority of anglers interviewed on the river during 1983 were bait fishermen. Rainbow trout and mountain whitefish were the most readily caught species in 1983, comprising 63 and 18% of the catch, respectively. Rainbow trout averaged 13.2 inches in the creel. An estimated 6,000 rainbow trout and 15,000 mountain whitefish were harvested from the river segment in 1983.

Anglers seeking to catch trophy brown trout view this segment of the Missouri River with special interest. The overall catch rate for brown trout was relatively low during 1983, averaging 0.04 fish per hour. During the fall spawning season, however, brown trout in the 5 to 10 pound size range migrate into the river form Holter Reservoir and are occasionally landed by anglers. Approximately 700 brown trout were harvested from the river in 1983. Current regulations provide catch-and-release only for brown trout.

Migrant kokanee from Holter Reservoir also contribute to the river fishery during the fall. This fishery has fluctuated through the years and recently has reached record lows with the collapse of the Hauser Reservoir kokanee fishery. The remaining game fish species, including walleye, largemouth bass, cutthroat trout and brook trout, are not commonly caught in the river.

Holter Reservoir

Holter Reservoir typically provides 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 has remained consistently high, averaging 71,483 angler days per year between 1989 and 1995. Because of Holter's proximity to Great Falls, 60% of anglers fishing on the reservoir are from Cascade County (average for the period 1986 through 1998). On average, 9% of the reservoir users are from Lewis and Clark County and only 6% travel from out of state. Most anglers fishing Holter Reservoir target rainbow trout (43%) or general species (31%). Anglers specifically targeting walleye average approximately 8% of the angling pressure. Walleye catch rates for these individuals remains good at 0.20 walleye/hour (1998). Anglers fishing specifically for kokanee have declined from a high of 24% of all anglers in the mid-1990's to 6% in 1998.

Yellow perch harvest has fallen sharply since it peaked in 1992 at 492,900 perch. Only 26,800 perch were harvested in 1997 with much of the decline attributed to flushing losses. Catch rates for perch during the winter ice-fishing season has also shown significant declines from 5.6 perch/hour in 1992 to 0.38 fish/hour in 1997.

Rainbow trout are generally the most readily caught species with an average harvest of 42,400 fish since 1989. Catch rates peaked in the early 1990's when more than 62,000 rainbows were harvested with anglers documenting a catch rate of nearly 0.3 fish per hour. Average size of creeled rainbow trout has remained relatively constant at slightly over 14 inches. On average, between 0% and 14% of rainbows harvested by anglers are classified as wild. The percentage of wild rainbow collected in floating gillnets ranges from 20% to 66% indicating that wild fish are less susceptible to angler harvest than hatchery fish.

Kokanee harvest in Holter never attained comparable levels of harvest observed in Hauser; harvest has averaged 15,200 compared to 62,500 in Hauser (1989 through 1997). Kokanee harvest in Holter Reservoir eclipsed rainbow harvest only in 1994 with an estimated kokanee harvest of 13,400 compared to 10,400 rainbows. Catch rates for kokanee peaked in 1996 at 0.16 fish per hour although the average catch rate from 1986 to 1997 has been 0.06 fish per hour. The average size of kokanee harvested has remained surprisingly constant since 1986 at 16.1 inches.

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. During summer creels since 1986, only 31 brown trout have been creeled, averaging 2.5 fish per year.

Walleye harvest in Holter has undergone large fluctuations during the period 1989 through 1997. Harvest has averaged approximately 940 walleye per year with a peak occurring in 1996 (2167 walleye). Average size of walleye harvested has decreased in recent years due in part to the slot limit (no fish can be harvested between 18" and 28") but also an increase in the number of young of the year fish presumably flushed from Canyon Ferry during record runoff in 1997. Impacts of flushing on the Holter walleye population have yet to be identified. Based on 1998 fall gillnetting results, high numbers of age one fish and low numbers of older fish (age two through eight) were collected.

Results from the angler satisfaction survey conducted in 1996 and 1997 indicate a general lack of satisfaction with the current fishery in Holter reservoir. In 1996, 36% respondents were satisfied with the number of fish while 70% were satisfied with the size of fish. In 1997, following record high runoff and associated flushing losses, the percentage of satisfied anglers declined significantly. Only 14% were satisfied with the number of fish while 42% remained satisfied with the size of fish. Concurrently, the proportion of anglers that were dissatisfied with the number of fish caught increased from 50% in 1996 to 67% in 1997. The proportion of anglers that were dissatisfied with the size of fish remained relatively constant at 26% (1996) and 21% (1997).

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.

Managing the Fisheries

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 3). Fisheries of the Missouri River downstream from Toston Dam, Canyon Ferry Reservoir, and associated tributaries are managed as an ecological system. Many game 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.

Management of the Canyon Ferry Reservoir and Missouri River (upstream to Toston Dam) fishery will take a new course with the expansion of walleye in the system. This highly predatory species is relatively new to Canyon Ferry but has tremendous reproductive potential and cannot be eliminated from the reservoir. Consequently, the existing fish community is expected to change significantly during the next 10 years. The presence of walleye will influence all species in Canyon Ferry because of walleye's role as a top-level predator. The degree of influence walleye will have on the system will be directly related to the level of abundance they achieve and maintain.

The presence of a prolific predator with tremendous reproductive potential such as walleye at the head of a reservoir complex that currently provides almost 15% of Montana's statewide fishing pressure creates a significant challenge to maintain the historically popular fishery resources. The outcome of a Montana Consensus Council public involvement process conducted throughout 1998 was acceptance of the goal to manage the entire Missouri River Reservoir system as a multi-species fishery. To sustain a multi-species fishery composed of trout, perch, walleye, native species, and forage species will likely require suppression of walleye to reduce the walleye predation rate on yellow perch and rainbow trout. Failure to adequately control walleye population expansion will likely result in diminished perch and trout fisheries, which would be inconsistent with the multi-species goal established during the 1998 consensus council process. As documented elsewhere, it would also likely result in a stunted walleye population when the prey base is depleted.

Management History

The rainbow trout population in Canyon Ferry Reservoir is maintained through annual stocking of hatchery fish. Annual stocking of hatchery trout is required because natural recruitment is not sufficient to meet current 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 by dewatering from irrigation withdrawals and through increased sedimentation as a result of land use practices. In recent years, the discovery of whirling disease in the Missouri River and some associated tributaries has created an additional limitation for successful natural reproduction for rainbow trout.

Table 3. Fish Species in Canyon Ferry Reservoir/Missouri River System as of 1998.

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

Since the filling of the reservoir in 1955, the rainbow trout fishery in Canyon Ferry has been maintained by stocking between 350,000 and 1.2 million 4-inch 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 Hatchery was available for a one-year increase in stocking density at Canyon Ferry resulting in nearly 2.5 pounds of fish per acre. For the period between 1981 and 1998, the stocking allocation at Canyon Ferry Reservoir has averaged about 1.0 pounds of rainbow trout per acre which is typically represented by stocking about 400,000 yearling fish per year.

Over the last 30 years there have been significant fluctuations in the number of rainbow trout in Canyon Ferry Reservoir. These fluctuations in numbers have affected fishing success over the years. The Department measured poor fishing success (catch rates) in the mid 1960s (0.08 rainbow/hr. During May-June, 1965), in the early 1980s (0.08 rainbow/hr.), and in the late 1980s (0.14 rainbow/hr.). These fluctuations appear to be 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 current rainbow trout population trend has remained relatively stable at approximately 10 rainbow trout per net (Figure 4). This population level sustains annual catch rates of 0.15 to 0.2 fish per hour.

In past years, the Department 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 well as adjusting the season of the year when the fish were distributed. Beginning in the early 1980s, the department 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 growth (May) yielded the most consistent survival of hatchery fish.

Recent 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 contributions of juvenile trout from this spawning escapement continues to produce less than 10 percent of the Canyon Ferry rainbow trout fishery.

The brown trout population in Canyon Ferry Reservoir has remained at a relatively low level since the reservoir was filled in 1955. Bottom gill net sets have been monitored periodically since 1955. Results from gill netting during the months of June and August between 1955 and 1998 indicate that numbers of brown trout were highest in the reservoir immediately after the reservoir was first filled, and remained relatively stable from about 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 rainbow trout, and is currently at an all time low level.

Yellow perch have been one of the most abundant species of fish in Canyon Ferry Reservoir for the past thirty years. However, the perch population has fluctuated substantially over time. These fluctuations are related to the relatively poor habitat available for spawning and juvenile rearing and to variable spring weather conditions, which are believed to influence yellow perch spawning and rearing success recruitment on an annual basis. Trends in yellow perch abundance in Canyon Ferry Reservoir have been periodically monitored since 1955 using a sinking gill net series in June and August. Catch of perch per net declined from a high of 71 per net in 1983 to a low of 10 per net in 1994. Yellow perch catch has ranged from 10 to 24 per net between 1994 and 1998 (Figure 5).

Population trends are also being monitored using summer beach seining data and through a roving creel census begun in 1985. The beach seining series was initiated to provide an index of annual perch production in 1991. Reliability of this tool for assessing annual production of perch remains unknown but appears to indicate that perch production has significant variation from one year to the next. The relationship between annual production of perch (measured by beach seine tows) and size of the adult

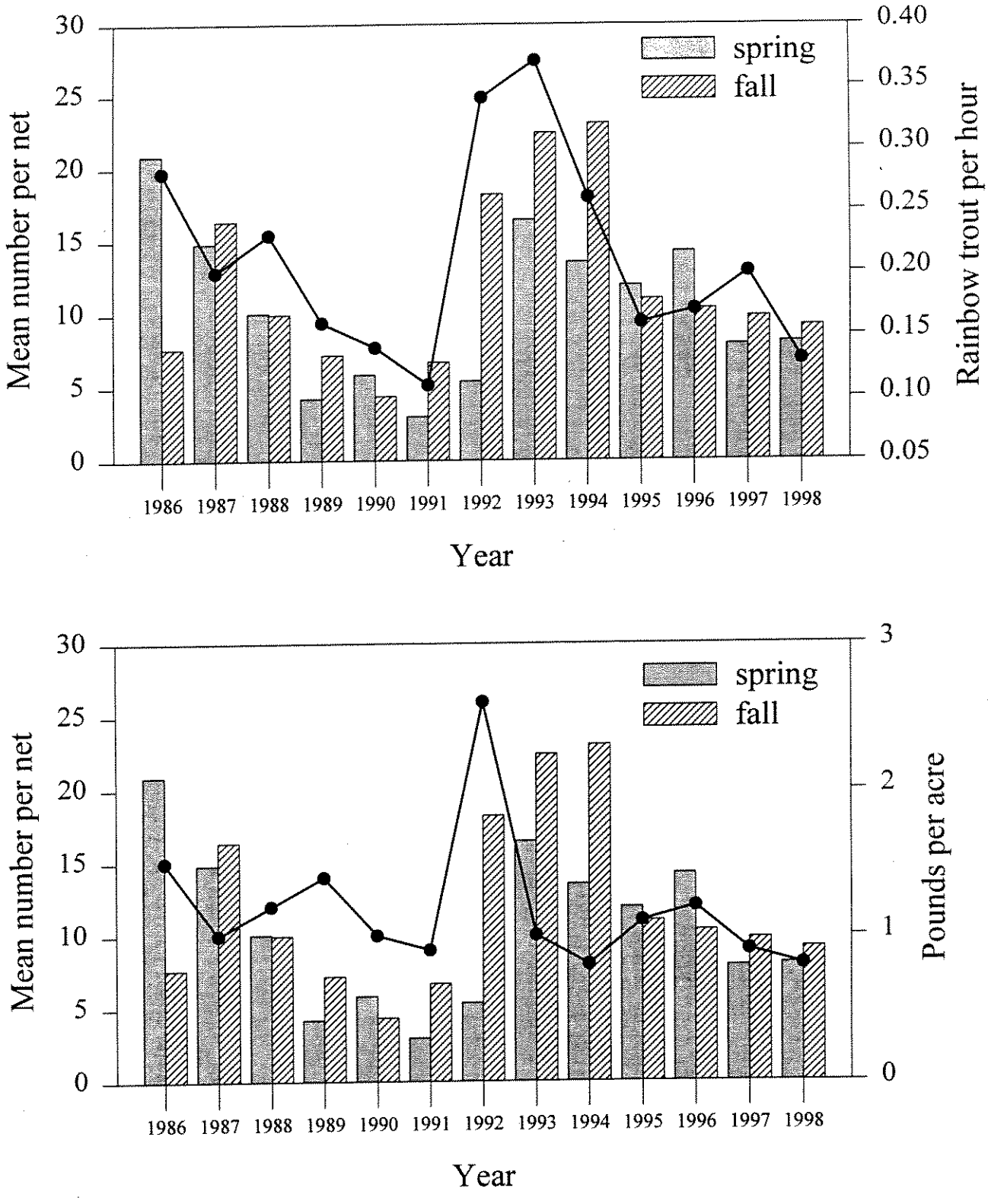
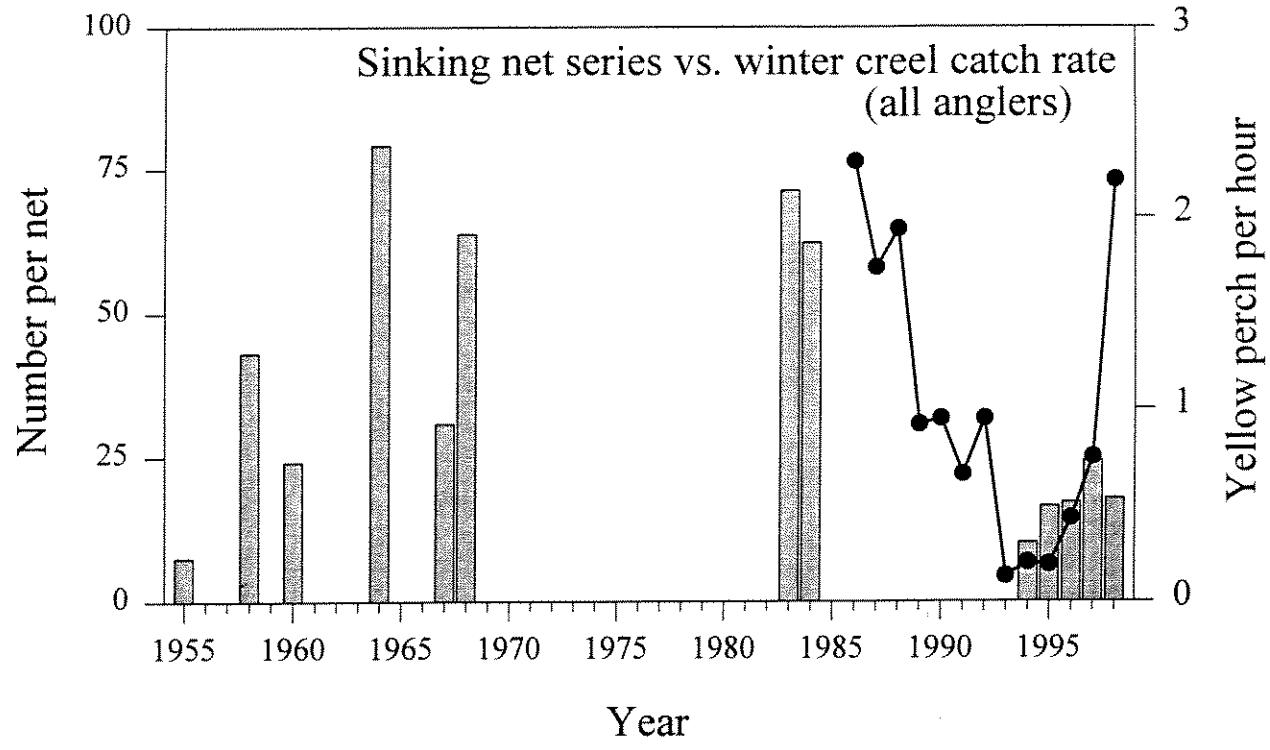


Figure 4. Canyon Ferry Reservoir floating net series rainbow trout population trends



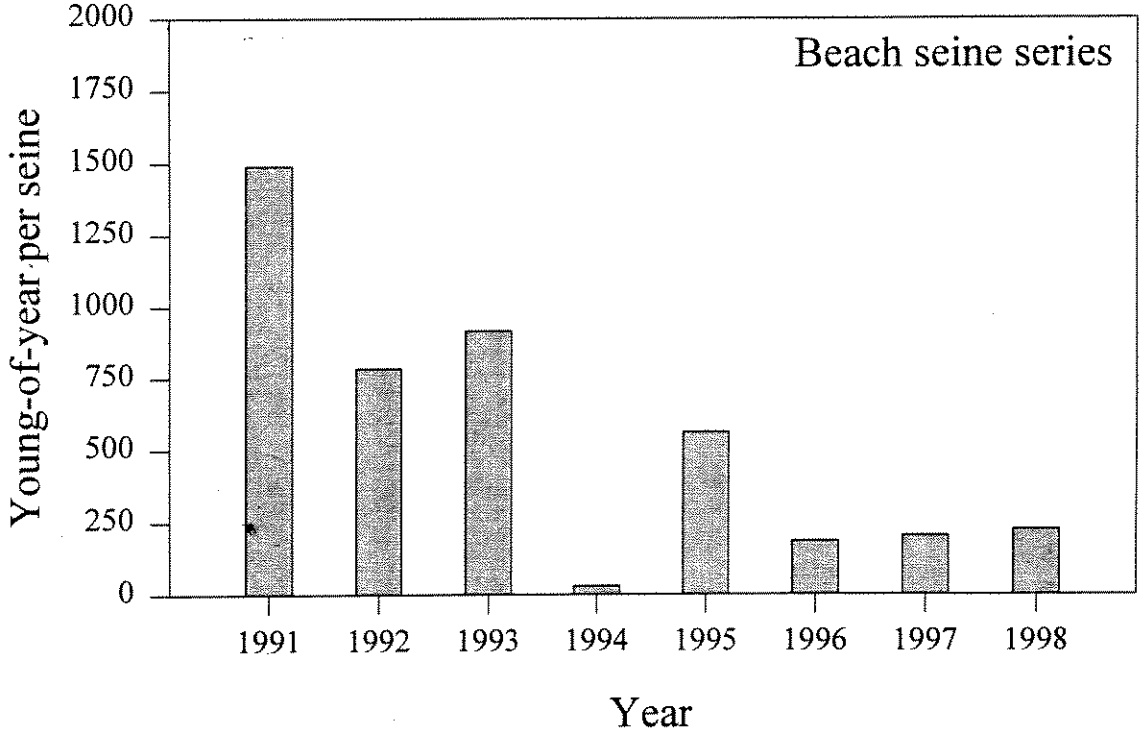


Figure 5. Canyon Ferry Reservoir yellow perch population trends

population (measured by gill net sets) will take at least five additional years of data collection. To determine if changes in abundance of young yellow perch in beach seines will translate into changes in the general perch population in subsequent years.

Based on the roving creel census during the early 1990s, only 5% of all anglers fishing on Canyon Ferry Reservoir during the summer were specifically seeking to catch yellow perch. However, fishing for perch is more popular during the winter. During the winter of 1991, 41% of all anglers were specifically seeking to catch yellow perch and an additional 38% were seeking to catch either trout or perch. In 1998, the roving creel indicated an increase in the percentage of anglers seeking and or catching perch during the summer months. Catch rates of 0.66 perch/hr indicated one of the highest perch catch rates ever recorded during the summer. The number of anglers seeking perch or a combination of perch and walleye also increased significantly. Much of the increased perch interest and harvest during the summer of 1998 was believed to be an artifact of changing fishing methods due to the presence of walleye in Canyon Ferry.

Yellow perch is not classified as a game fish in Montana and there are no catch limits for perch in Canyon Ferry Reservoir. Past management efforts have focused on encouraging use of this popular species by anglers. Ongoing management efforts have addressed methods to reduce the impacts of reservoir operations on fishery resources and enhancing spawning and rearing success by providing additional lake bottom structure. Beginning in 1992, MFWP assisted the Broadwater Stream and Lake Committee in providing additional perch spawning and rearing structures in Canyon Ferry Reservoir near the Silos. This effort has expanded in the past two years with interest from Walleyes Unlimited, MFWP, and the Bureau of Reclamation. Over 500 structures were placed in the reservoir at 10 locations in 1998.

Walleye were not observed in Canyon Ferry biological sampling from 1955 through 1988. The first walleye were captured in 1989 during fall netting efforts designed to monitor the rainbow trout population. From 1989 to the present, walleye have been captured in various monitoring net series every year. Walleye population trends in Canyon Ferry are based on four monitoring systems developed to assess fish populations: 1) sinking net series conducted since 1955 (June and August sampling); 2) floating net series since 1986 (May and October); 3) fall walleye gill netting series initiated in 1996 (September); and 4) roving creel census conducted since 1986. All of these sampling tools have shown a rapid increase in the walleye population of Canyon Ferry Reservoir (Figure 6).

The walleye population has now entered a phase of extremely rapid population growth rate that has been characteristic of newly developing populations. Over 95% of the fish sampled in the walleye netting series were produced during 1996 or later (Figure 6). The 1998 fall gill net catch of walleye reached 10.4 walleye per net, which matches or exceeds gill net catches of established walleye fisheries in other Montana lakes and reservoirs (Table 4). Walleye age information confirms that the expanding walleye population is almost entirely composed of young fish.

Table 4. Comparison of Walleye Catch Per Unit Effort in Eight Montana Reservoirs.

Water Body	# of walleye per sinking gill net
Canyon Ferry Reservoir	10
Holter Reservoir	4.5 (1998)
Hauser Reservoir	4.5 (1998)
Fort Peck Reservoir	3 (1995)
Tiber Reservoir	6 (1995)
Lake Frances	3 (1995)
Bynum Reservoir	10 (1995)
Cooney Reservoir	28 (1998)

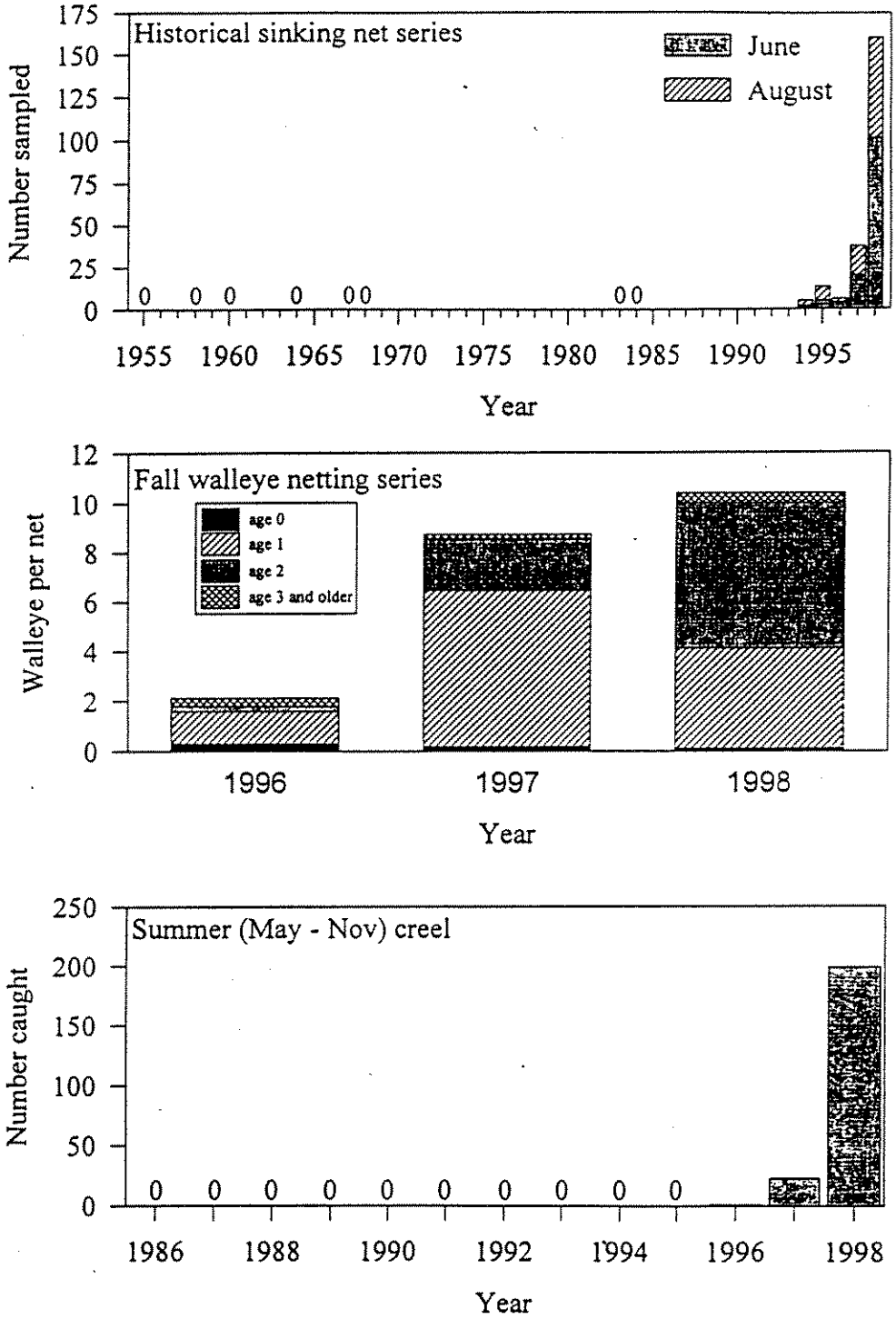


Figure 6. Canyon Ferry Reservoir walleye population trends

Forage diversity and supply is critical for sustaining quality walleye populations. Consequently, intensive walleye diet analysis has been conducted seasonally since 1996. Based on the most recent information summarized (1997), yellow perch and suckers currently comprise the majority of the walleye diet in Canyon Ferry (Figure 7). Food habits can vary on a seasonal basis and other food items may be determined to be of significance. Food habit assessments will continue.

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 suppression. 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.

Management of walleye in Canyon Ferry Reservoir in the 1990s has been based on the 1993 Canyon Ferry Management Plan. This plan mandated walleye removal and suppression if feasible. From 1994 through 1997, MFWP evaluated potential tools to manage the walleye population via suppression techniques such as reducing spawning success by electric current over incubating eggs and removing mature spawning fish from the spawning grounds prior to egg deposition. These tools, used independently, either proved to be technically infeasible or insufficient to significantly suppress walleye reproduction in Canyon Ferry Reservoir.

Results of intensive walleye sampling conducted from 1994 through 1998 confirm concerns expressed in the 1992 risk assessment and the 1993 management plan. 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, MFWP 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 6.0 yearlings per net in the 1996 fall netting series.

In addition to monitoring traditional game fish species, MFWP gill netting and beach seining operations also track populations of other species present in the system. Monitoring will be an increasingly important component of data collection as the fish community adjusts to the expanding population of walleye. 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, but have remained relatively stable over the past 20 years (Figure 8). 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 (Figure 9).

Management Goals and Limiting Factors

The goal for managing the Canyon Ferry-Missouri River fishery is to maintain a cost effective multi-species fishery that maintains the current level of angler use during both the open water and ice fishing seasons (Appendix A). Management of the multi-species fishery will attempt to maintain historically desirable species (rainbow trout, yellow perch, brown trout, and burbot) while adopting management strategies to integrate the expanding walleye population.

For fishery managers to achieve this goal for the system, management strategies must be developed to enhance reproduction and survival of all potential prey species that will be influenced by walleye predation. Concurrently, strategies will be developed to suppress reproduction and survival of walleye in order to buffer prey species from over-exploitation and to help maintain a multi-species sport fishery. Determining all of the limiting factors that regulate fisheries in complex systems like the Canyon Ferry-Missouri River

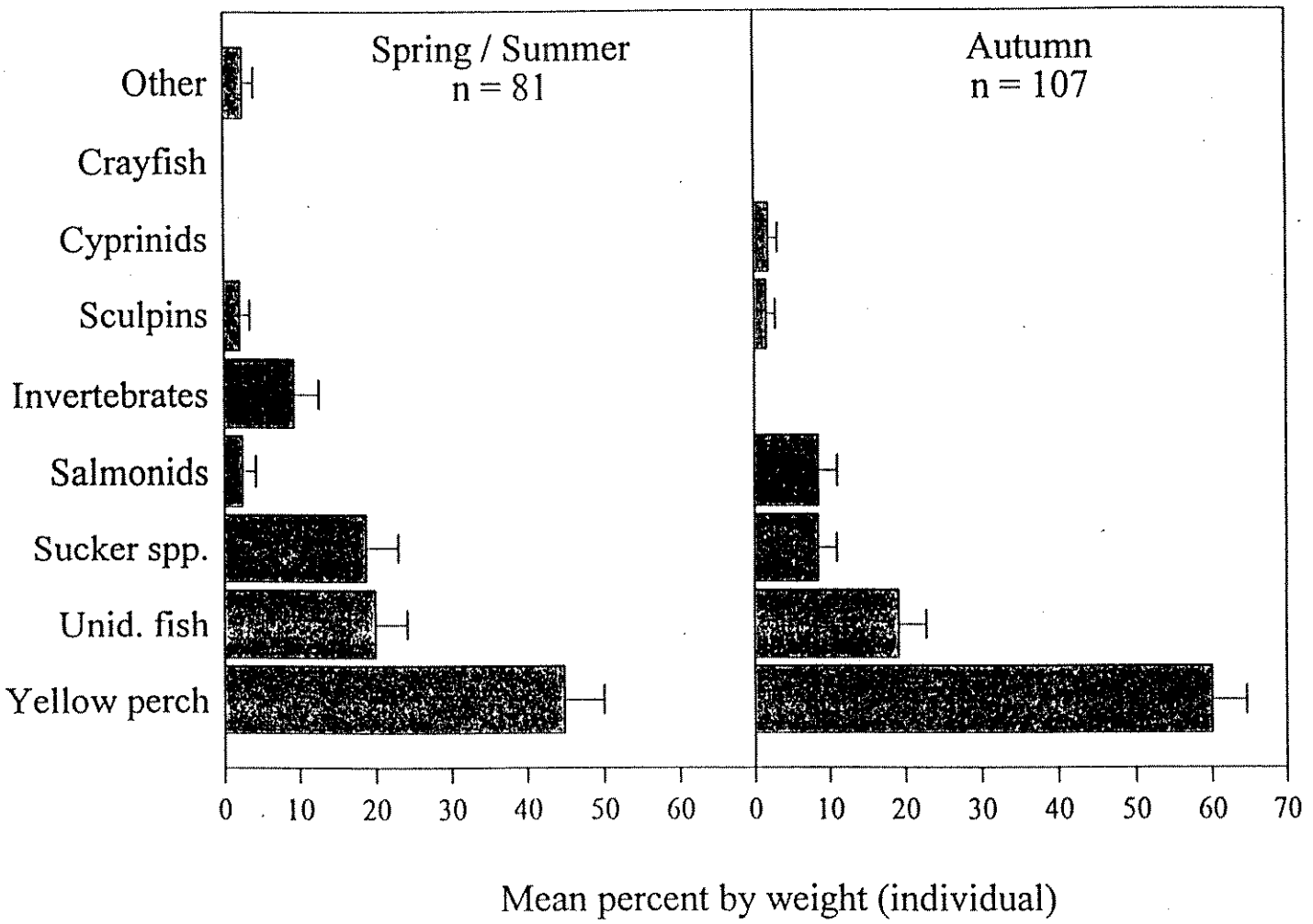


Figure 7. Canyon Ferry Reservoir seasonal walleye food habits, 1997.

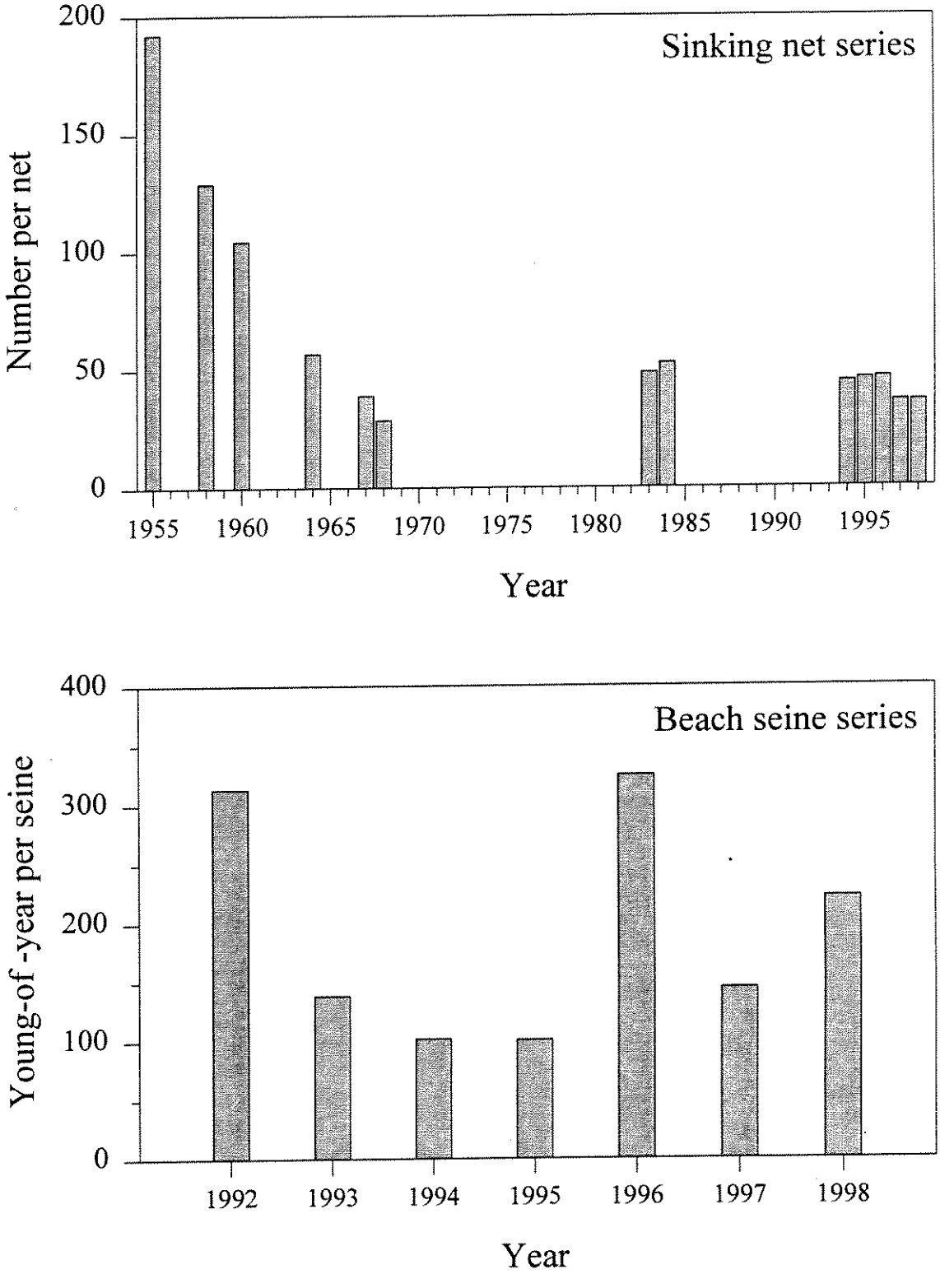


Figure 8. Canyon Ferry Reservoir white sucker population trends.

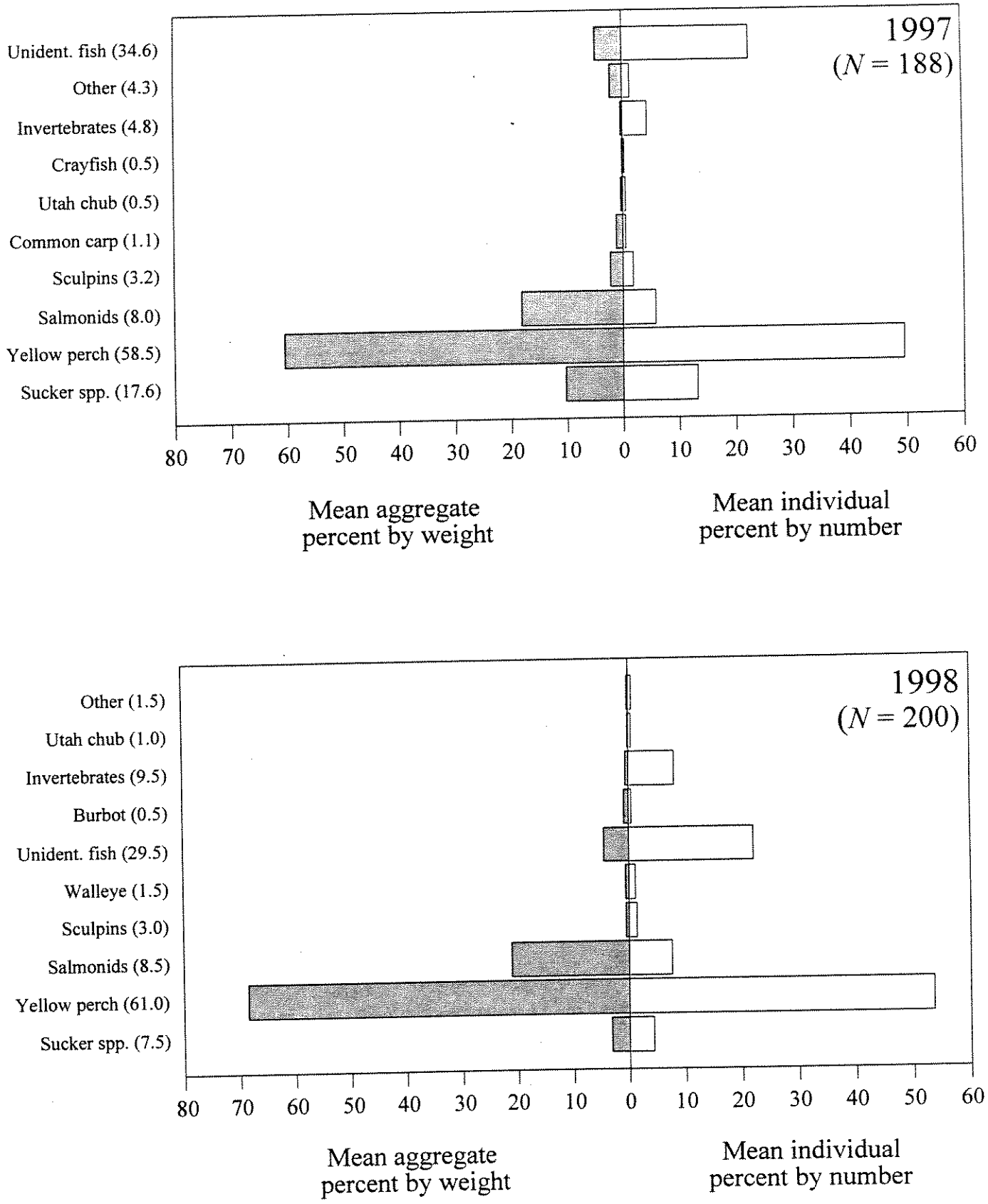


Figure 9. Canyon Ferry Reservoir historical sinking net series selected fish trends.

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. Trout and perch populations have abundant food and space within the reservoir and these populations tend to be limited by reproductive and rearing success. In contrast, walleye reproductive potential appears to be extremely high in Canyon Ferry and this predator of fish will ultimately be limited by available forage. A depleted forage base will result in stunted growth and reduced productivity. Other factors currently or potentially limiting sport fish species in Canyon Ferry Reservoir include:

- Available spawning and rearing tributaries are insufficient to adequately supply juvenile brown and rainbow trout for the large reservoir, and hatchery allocation constraints and costs limit the number of fish available for stocking. The limited spawning habitat may result in rainbow trout excavation and destruction of brown trout redds, further impacting their poor reproductive success.

- Perch spawning and rearing success is variable and density of the adult population appears to be limited by recruitment (reproductive success).

- Walleye diet studies indicate a high preference for yellow perch and suckers. At current walleye population levels and reproductive capability, it is unlikely that these species can adequately provide a stable forage base for the growing walleye population. Yellow perch is a desirable sport fish that provides significant angling opportunity on Canyon Ferry Reservoir.

- Development of a low dissolved oxygen plume in the deep water at the base of Canyon Ferry Dam 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.

- Whirling disease has been found in the Missouri River between Toston Dam and Canyon Ferry Reservoir and in some of the associated tributaries. This disease is caused by a parasite that affects the cartilage of young trout and leads to physical deformities that reduce their ability to feed and avoid predators. As this disease progresses in the system it will likely further reduce reproductive success of rainbow trout.

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

- Frequent spill during spring run-off may result in fish loss/transport out of Canyon Ferry. Losses of walleye and rainbow trout have been documented and may be significant.

- Angler harvest is not currently a major source of mortality to limit fish populations in Canyon Ferry. Some localized depletions of fish may occur during intensive fishing periods (e.g. angler catch rates for yellow perch tends to decrease in localized areas during high-use periods in the winter).

Management Goals By Species

In order to manage a fish community that includes multiple sport species and walleye, 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 proposes implementing strategies that strive to maintain an acceptable level of trout and yellow perch fishing in the presence of increasing predation by an expanding walleye population (Figure 10).

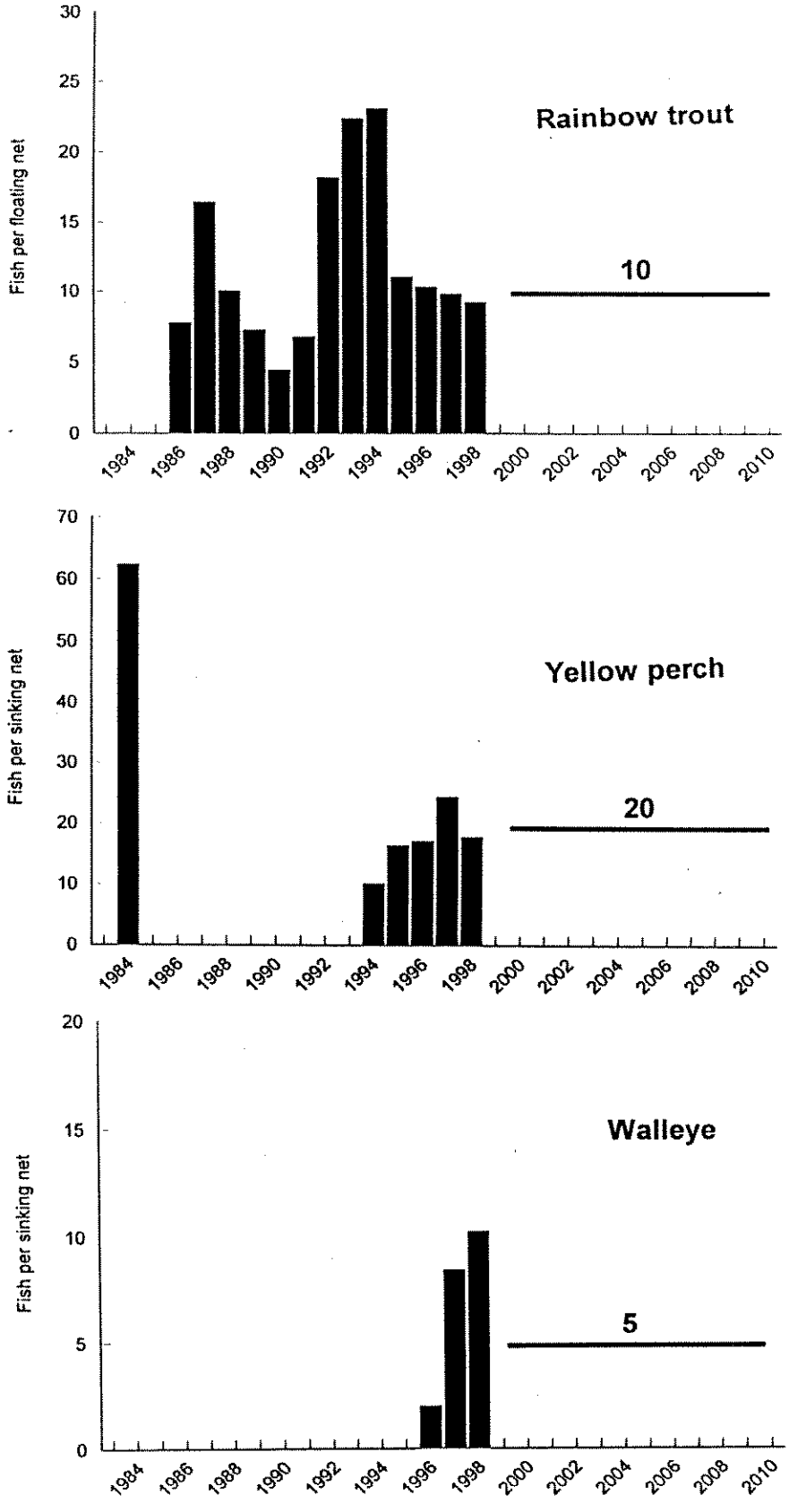


Figure 10. Population trends and species management objectives for rainbow trout, yellow perch and walleye in Canyon Ferry Reservoir.

Yellow Perch

Goals and Objectives:
Rely on yellow perch to provide the current level of angler satisfaction during the winter fishery and secondarily to increase diversity of angling opportunity during the ice-free seasons.

- Maintain the current gill net catch of 20 yellow perch per net in the summer and fall.
- Maintain the winter angler catch rate at the average for the past three years of 2.0 yellow perch per hour.

Rationale:
Yellow perch are currently the preferred prey item for walleye in Canyon Ferry Reservoir, and predation losses are expected to increase significantly as the walleye population expands. Increasing the abundance of yellow perch is unlikely and maintenance of the current level of 20 per net will require successful implementation of a variety of management actions including spawning/rearing habitat enhancement, conservative angler harvest regulations, and maximization of walleye exploitation. Cost-effective spawning/rearing habitat enhancement such as building juniper or Christmas tree reefs has been implemented on a small scale since 1992. In 1998 efforts to enhance habitat increased significantly using volunteer labor and support from MFWP, BOR and Walleyes Unlimited.

Strategies:

- Construct additional spawning/rearing habitat in Canyon Ferry as long as the projects remain cost effective. It is unknown whether habitat enhancement projects can improve the quantity and consistency of perch reproduction in a large reservoir such as Canyon Ferry, but there is general agreement that it is worth trying.
- Propose conservative harvest regulations to prevent over-harvest by anglers. Recommend a daily limit of 50 yellow perch for the 2000-2001 Fishing Regulations as the first step to implement this strategy. Future monitoring may result in proposals to change limits.
- Intensify data collection to assist evaluation of harvest regulations and habitat enhancement.

Rainbow Trout

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

- Maintain or slightly increase the current annual average angler catch of 0.15 fish per hour and maintain the fall gill net catch rate of 10 rainbow trout per net.

Rationale:
The 1993-1998 Canyon Ferry Reservoir/Missouri River Fisheries Management Plan established higher objectives for rainbow trout in Canyon Ferry (20 rainbow per gill net and 0.30 fish per hour), but it was not feasible to sustain the fishery at that high level. The hatcheries could not supply the request for fish. These objectives were only met during 1993 and 1994. 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 can be maintained at approximately 10 rainbow trout per gill net set. With the expanding walleye population and the projected increase in walleye predation on trout, it will be challenging to maintain the current rainbow fishery and it would be unrealistic to set a goal of 20 fish per net as was done in the 1993 plan. To achieve an objective of 20 rainbow trout per net with the current multi-species management goal would require a major increase in the hatchery allocation for Canyon Ferry, which is neither logistically possible nor cost effective.

Strategies:

- Develop innovative use of hatchery space.
  Monitoring survival of fish plants will be key to making optimal use of the hatchery allocation, and changes in strains stocked, size of fish stocked and timing of stocking may be necessary to maintain the rainbow trout fishery. Evaluating survival of relatively large fish (7 to 9 inches) stocked in the fall

(September/October) may provide a potential management alternative to reduce mortality from walleye predation. This option, in combination with the stocking of yearling fish during spring (April/May) allows maximum utilization of hatchery space without increasing the allocation of hatchery resources to Canyon Ferry Reservoir. Additional manpower, food and distribution costs would result from this option.

- Use new strains of rainbow for stocking.
- Improve spawning tributaries in the system.
- Maintain restricted harvest regulations associated with spawning areas.
- Manage the walleye population to minimize mortality of rainbow trout from predation (refer to management goals for walleye).
- Continue to propose and enforce area closures to protect spawning populations as needed. The closure of Cave Bay at Kim's Marina will be deleted because fish no longer spawn in the area and restrictions are no longer needed.

Walleye

Goals and Objectives:
Rely on walleye to supplement the existing sport fish community and enhance the summer and fall fishery over the long term.

- Reduce the current catch of 10 walleye per net to 5 per net.
- Develop criteria for determining appropriate walleye density consistent with the objective of maintaining a multi-species fishery.

Rationale:
Based on extensive studies since 1990, including a risk assessment for walleye introductions in Canyon Ferry (McMahon 1992), the long term quality of the walleye fishery is not likely to be sustainable because of high walleye reproductive success relative to available forage supply. In addition, the rainbow trout and yellow perch objectives are not sustainable in the long term at the current population of 10 walleye per net. The walleye population will continue to expand without management intervention. Therefore, suppression efforts will be necessary to maintain walleye at a level that sustains a balanced fish community. Failure to adequately control walleye population growth will result in 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. Strategies for suppressing walleye population expansion to sustain the desired trout and yellow perch fisheries are based on "triggers" to initiate progressive management actions.

Strategies:

- Facilitate maximum harvest by anglers through implementation of liberal harvest regulations. This is the most cost effective and selective suppression tool available at Canyon Ferry to reduce the walleye population. Based on existing data showing: 1) a rapid increase in the walleye population and, 2) the small percentage of the population that has reached sexual maturity, a liberal harvest regulation of 20 daily and 40 in possession is proposed for the 2000-2001 Fishing Regulations. This proposal is designed to require few fish to be released, even by the most successful anglers, and the daily limit is not likely to be exceeded. If monitoring results show that significant numbers of anglers are able to catch more than 20 walleye per day, this regulation may be liberalized further to accomplish the goals and objectives for Canyon Ferry Reservoir. There will be no maximum size restriction unless monitoring indicates that the size structure is adversely affected by this regulation. The effectiveness of angler harvest to suppress walleye population growth is unknown and will depend on the amount of fishing pressure and catch rates by anglers.
- Encourage maximum harvest by anglers. MFWP will provide information and education to encourage harvest of walleye, increase angler success and to attract anglers to Canyon Ferry Reservoir. MFWP will coordinate with Walleyes Unlimited to provide additional educational opportunities.
- Implement more aggressive management to control walleye population growth. Triggers for modifying management actions will be based on annual fall monitoring of walleye (15 sinking gill nets set in September), summer netting for yellow perch (33 sinking gill nets set in June and August), and fall

monitoring for rainbow trout (18 floating gill nets set in October). Additional suppression techniques will be implemented if ,based on a three year running average, any two of the following criteria are exceeded:

1. Walleye density increases to 15 fish per net.
2. Yellow perch density decreases to 15 per net.
3. Rainbow trout density decreases to 8 per net.

Upon reaching the criteria for increasing walleye population control efforts, more aggressive management actions will be implemented. The following actions, listed in order of increasing potential to impact the walleye population, may be considered:

- Adjust daily limit regulations to increase angler harvest.
- Allow spear fishing by submerged swimmers or through the ice to increase harvest. Evaluate the benefits of imposing a maximum size restriction to prevent targeting the biggest fish and to retain a trophy component in the fishery.
- Initiate egg collection for hatchery rearing (recognizing potential complications from sauger hybridization).
- Initiate egg collection and removal of spawning fish to reduce recruitment and spawning potential.
- Authorize commercial harvest of walleye. In anticipation of the necessity to establish a commercial walleye operation on Canyon Ferry Reservoir, MFWP must request authorization from the Montana Legislature to allow the taking and sale of walleye (87-4-601, MCA) and subsequently revise the Administrative Rules of Montana governing commercial fishing (12.7.101, ARM).
- Use electrofishing to remove walleye from the Missouri River during spring spawning.
- Control walleye by other means as determined necessary and considered through a MEPA analysis and public review process.

- Walleye daily and possession limits will be reduced if it is determined that the population is over-harvested and more conservative limits are necessary to support a viable walleye population as part of the multi-species fishery in Canyon Ferry Reservoir. Regulations will be modified if fall monitoring shows walleye decreasing to below 5 per net based on a three year running average.

Brown Trout

Goals and Objectives:
Increase the number of brown trout residing in the reservoir.

- Increase the brown trout numbers from the current level of 0.5 per gill net to the historic average of 2.0 per gill net.

Rationale:
The decreased abundance of brown trout observed in the past 10 years is not well understood. Factors such as drought impact from 1985 through 1994, 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 potentially responsible for the decline observed in recent years. Reductions in the size of the rainbow trout spawning population may contribute to improving the brown trout population in the future.

Strategies:

- Maintain restrictive regulations to protect the spawning brown trout population.
- Continue ongoing efforts to enhance spawning and rearing habitat for brown trout.
- Work with DNRC to improve flows through better operation of releases at Toston Dam.
- Continue to evaluate the problem 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 dynamics in Canyon Ferry Reservoir.
- Maintain the 1994-1999 average of 0.40 burbot per sinking gill net.
- 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. Little is known about the population dynamics and limiting factors that regulate the burbot population.

Strategies:

- Increase data collection to better understand burbot population dynamics.
- Maintain current angler harvest regulations unless monitoring indicates a need for more conservative limits.

Forage Fish

Goals and Objectives:
Manage the existing forage base to support a productive multi-species fishery that includes yellow perch, trout and walleye by suppressing walleye abundance and by not introducing new species of fish into the system during the term of the management plan.

- Maintain white sucker gill net catch at 40 per net.
- Maintain yellow perch gill net catch at 20 per net.
- Maintain mid-summer zooplankton density of 20 per liter.

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 possibly the Missouri River below Holter. Sucker species and yellow perch are expected to continue providing the bulk of the walleye diet. One of the primary impacts of introducing new forage species would be a predictable impact on the plankton community, which currently provides the bulk of the rainbow trout and yellow perch diet. 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 and rainbow trout food supply is maintained at current levels which have been adequate for growth and survival of these sport fish populations. Yellow perch are particularly important to the fish community because of their significant value as both a sport fish and a forage fish for maintaining walleye.

Strategies:

- Prevent depletion of the available forage by controlling the walleye population at a sustainable level of no more than 5-10 fish per gill net. This level is based on an expectation of no negative impacts on yellow perch and rainbow trout, and is consistent with levels measured in other Montana reservoirs (Table 4).
- During the course of this 10-year management plan, no new species of fish will be introduced into Canyon Ferry Reservoir, and MFWP 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 prohibiting introduction of unauthorized species.

Other Fisheries Management Issues

Reservoir Operations

Goals and Objectives:
Work cooperatively with U.S. 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, fish spill through the dam, and recreational access to the lake.

Strategies:

- Actively participate with the reservoir operations steering committee to focus efforts on optimizing reservoir operations for the fisheries resources and to provide comments on the development of the upper Missouri River Decision Support System being developed by the U.S. Geological Survey. The reservoir operations steering committee, comprised of MFWP, Montana Power Company, Bureau of Reclamation, irrigators 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.

Derbies/Tournaments

Goals and Objectives:
Manage fishing contests at Canyon Ferry Reservoir to balance general public angling use with anglers seeking participation in competitive tournaments on a species specific basis, and ensure that tournaments are consistent with species management objectives.

Rationale:
Fishing tournaments can impact fish populations and conflict with non-tournament angling and recreational opportunity.

Strategies:

- Regulation of fishing tournaments on Canyon Ferry Reservoir will reflect management strategies for individual fish species, which generally directs a conservative approach to harvesting sport fish species (trout and perch) that are subject to predation by walleye, and a liberal approach to harvesting walleye.
- 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.

Rainbow Trout
Maintain the past and current management strategy of not allowing competitive fishing derbies on rainbow trout in Canyon Ferry.

Rationale:
Increased harvest from competitive fishing events is not consistent with the management strategy to maintain conservative regulations relating to rainbow trout harvest.

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

Rationale:
Based on the conservative harvest limits proposed, allow one event annually but modify the derby structure to reduce the amount of time in the team fishing event. Require limits to be observed.

Walleye

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 impacted by tournament activities.

Rationale:

Tournaments would potentially attract new or additional anglers to the lake to assist efforts to promote angler harvest of walleye, which is consistent with the management strategy to control walleye numbers and limit population growth.

Burbot (ling)

Allow two derbies per year. Structure these events to allow for competitive fishing for the largest fish and not to include competitive fishing for the most fish.

Rationale:

Ling population trend is not well understood and additional harvest caused by a competitive fishing derby may cause unforeseen impacts to the fishery. Ling are long lived and slow growing.

Carp

No restriction on number of events, but derbies must be compatible with Canyon Ferry Reservoir management objectives.

Rationale:

No biological concerns are raised by these events and there is currently no need to restrict the number of carp derbies. The primary issue for kids derbies is to avoid a competitive event by structuring the derby to reward participation rather than for catching the largest or most fish.

Use of Live Fish as Bait

Goals and Objectives:

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

Rationale:

The use of live fish as bait poses significant risks for introducing new fish species to the system and this inadvertent introduction could significantly impact the existing fish community in Canyon Ferry Reservoir and downstream. The practice of using live bait significantly increases the risks of inadvertently introducing new fish species to a water body and is not consistent with the proposed management direction. There is likely to be increasing pressure to fish with live bait as the walleye fishery continues to develop, particularly during seasons when catch rates are low.

Strategies:

- Continue to prohibit the use of live fish as bait.
- Initiate education efforts about the risks associated with use of live bait and the importance of preventing inadvertent introduction of bait fish species.

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. Habitat complexity is critical for providing balance in predator/prey relationships, particularly in western reservoirs where habitat diversity is minimized by fluctuating lake 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 one important sport fish species. Implementation will focus on using natural materials, limiting costs and monitoring effectiveness.
- Enhancement projects for salmonids will focus on providing fishing opportunities 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 from projects like the Deep Creek Watershed Enhancement Project will be used to mitigate effects of whirling disease on trout populations in the system.
- 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

Goals and Objectives:
Prevent new diseases 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.

Strategies:

- Reduce the risk of introducing disease agents to the system by disease testing hatchery fish and egg sources.
- Initiate education efforts to reduce spread of disease.
- Continue regulating private ponds near Canyon Ferry.
- Expand monitoring of existing diseases such as whirling disease.

Missouri River (Toston Dam to Canyon Ferry Reservoir)

Management History

Management efforts since 1991 have focused on rehabilitating degraded tributaries entering both the river and Canyon Ferry Reservoir to enhance spawning and rearing habitat. Project funding has come from Broadwater Power Plant fisheries mitigation (Toston Dam), MFWP's 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. As a general indicator of the extent of spawning use in system tributaries, the adult fish trap operated annually since 1992 captures between 1500 and 3500 rainbow trout spawners each year.

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 for recreational fishing opportunities in the

Missouri River and associated tributaries and to provide important spawning and rearing conditions for the Missouri River/Canyon Ferry system.

Quality spawning and rearing habitat is limited for sustaining a high density of 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 habitat and stream flow improvements 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.

Whirling disease has been documented in the system, and although infections appear to be relatively light at the present time, increased mortality of rainbow trout can be expected as this disease spreads. Impacts will likely result in decreased numbers of juvenile rainbow trout.

Quality habitat for rearing trout, particularly along shoreline areas, is limited in this reach of the river resulting in poor juvenile rearing for brown trout, particularly during drought years. This lack of structural habitat, including good cover and holding areas for protection, results in increased predation by birds and larger fish.

Management Goals by Species

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 spring and fall densities of 300 rainbow trout per mile.

Rationale:
The current rainbow trout population has increased to approximately 300 trout per mile because of the seasonal migration of wild strains of rainbow stocked in Canyon Ferry Reservoir. In addition, the wild strains have successfully reproduced, enhancing the wild, resident component to the rainbow fishery. Sustaining this improved rainbow fishery will be a challenge and may be unrealistic if the walleye population in Canyon Ferry Reservoir expands.

Strategies:

- Stock wild strains of rainbow trout in Canyon Ferry Reservoir to support the existing spawning runs in the system.
- Experiment with new strains of rainbow trout that may develop life history strategies conducive to the limiting conditions.
- Continue tributary enhancement, particularly at Deep Creek where Clean Water Act funds are being used to enhance watershed health. Work with local water districts and irrigators.
- Propose harvest regulations designed to protect spawning fish in tributaries and other important spawning areas.

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 prior to 1985. (Approximately 300 brown trout per mile).

Rationale:
The reason for the brown trout population decline is not known, although factors such as drought conditions during the late 1980s and early 1990s may have been a major factor throughout southwest Montana. In addition, factors such as: the elevated rainbow trout population resulting in increased competition for limited spawning habitat; the 1989 Toston Dam retrofit; whirling disease; angler overharvest during fall spawning periods; and others may have contributed to the decline. 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 the 1992 to 1998 period and return on these fish has been very poor. In fact the population continued to decline during the imprint process. 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, however, some basis for anticipating improved brown trout populations in the Toston reach. It appears that declines in brown trout in the lower reaches of the Jefferson river have stabilized, perhaps from improved flow conditions in recent years. The expected reduction in the rainbow trout fishery from whirling disease may reduce the competition between rainbow trout and brown trout because brown trout are less susceptible to whirling disease.

Strategies:
- Continue to enhance spawning and rearing areas, particularly where groundwater and spring areas exist.
- Protect spawning-sized brown trout. This remains a valid strategy to avoid overexploitation of brown trout between 18 and 24 inches in length.
- Discontinue egg collection and imprint stocking. Based on results of past egg collection and imprint stocking, this strategy does not appear to provide enhanced recruitment in areas that lack quality spawning habitat.

Hauser Reservoir

Management History

Hauser Reservoir supports 11 game and 10 nongame fish species (Table 5). Of these 21 species, 11 are native and 10 are nonnative. Rainbow trout and kokanee salmon have historically been the most abundant game fish found in the reservoir. In recent years, walleye numbers have increased to comprise a major component of the Hauser fishery. Suckers (white and longnose) and yellow perch are the most abundant nongame species. Native game species including burbot (ling), westslope cutthroat trout and mountain whitefish all occur at low densities.

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 haphazard introduction of sunfish, bass, bullheads, bluegills, 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 11 and 12).

Walleye were first planted by MFWP 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 MFWP as part of the 1989-1994 Hauser Reservoir Management Plan. Approximately 5,000 advanced fingerlings were stocked annually from 1989 through 1998.

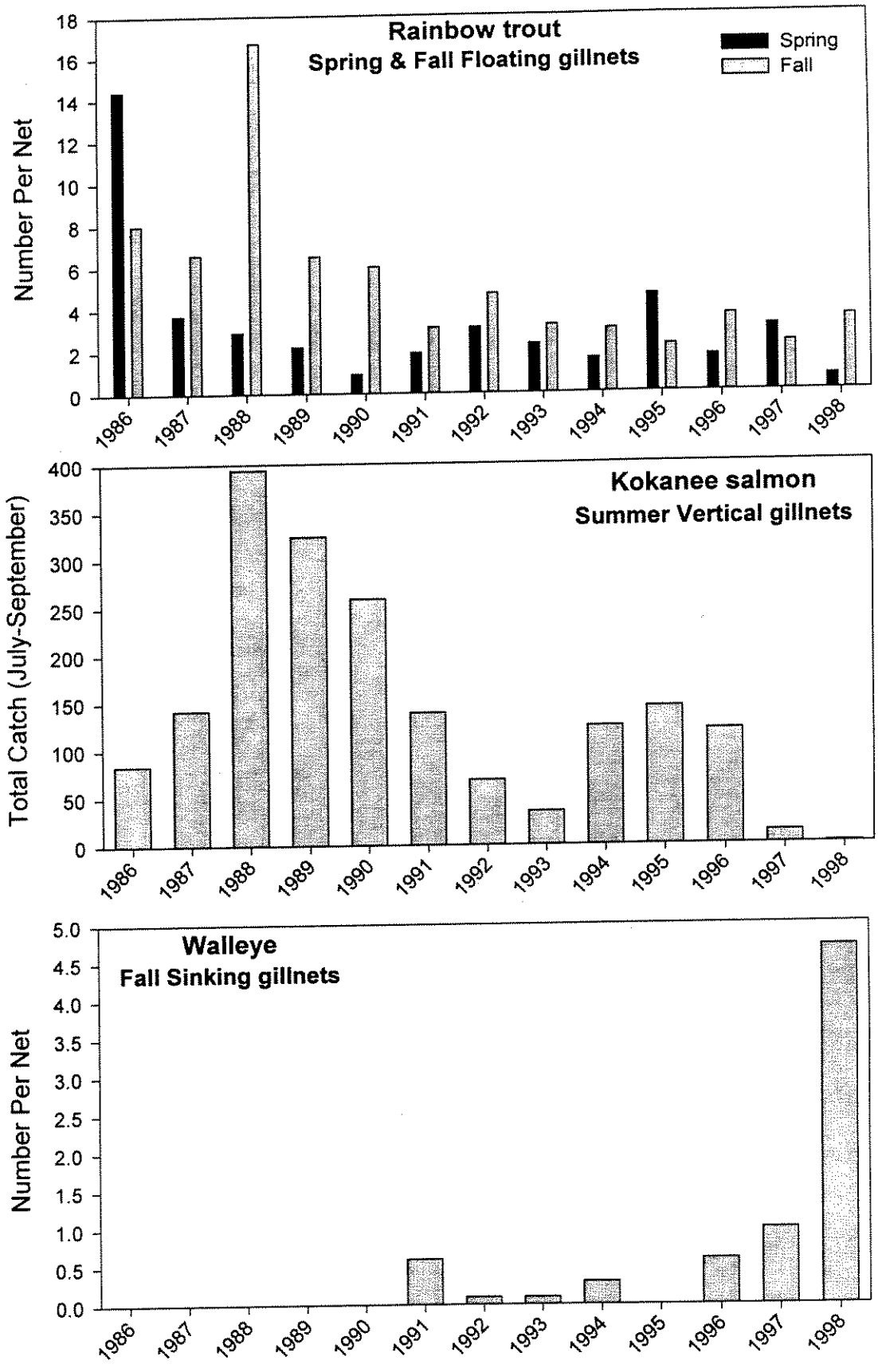
In the early 1950s, kokanee salmon were introduced into Hauser Reservoir. Kokanee plants were unsuccessful in producing a fishery in the reservoir despite stocking almost one million kokanee over a six-

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 of 150,000 and 220,000 kokanee were made in 1997 and 1998 respectively in an effort to reestablish this once wild reproducing population.

The rainbow trout fishery in Hauser Reservoir has been maintained by annual stocking. Wild rainbow comprise less than 10% of the fishery because of flushing losses and poor quality spawning habitat in tributary streams. Approximately 200,000 3-5 inch Arlee rainbow trout were planted annually through 1990 when stocking numbers were reduced to nearly half. This reduction was in response to the dramatic increase of the kokanee salmon population. Catch rates for rainbow trout have declined steadily since the

Table 5. Fish species of Hauser Reservoir including 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	Abundant
Rainbow trout	No	1934	Decreasing	Abundant
Yellow perch	No	1938	Decreasing	Abundant
Brown trout	No	1931	Increasing	Common
Burbot	Yes	N/A	Increasing	Common
Mountain whitefish	Yes	N/A	Decreasing	Common
Walleye	No	1951	Increasing	Common
Largemouth bass	No	1926	Unknown	Uncommon
Smallmouth bass	No	Unknown	Unknown	Uncommon
Brook trout	No	Unknown	Unknown	Rare
Cutthroat trout	Yes	N/A	Unknown	Rare
Nongame Fish Species				
Carp	No	Unknown	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	Common
Longnose Dace	Yes	N/A	Unknown	Uncommon
Utah Chub	No	Unknown	Decreasing	Uncommon
Flathead Chub	Yes	N/A	Unknown	Rare
Smallmouth Buffalo	Yes	N/A	Unknown	Rare
Stonecat	Yes	N/A	Unknown	Rare



Figire 11. Hauser Reservoir fisheries trends for the three principal game fish: ranibow trout (top), kokanee salmon (middle) and walleye (bottom). Species trends are for the period 1986 through 1998.

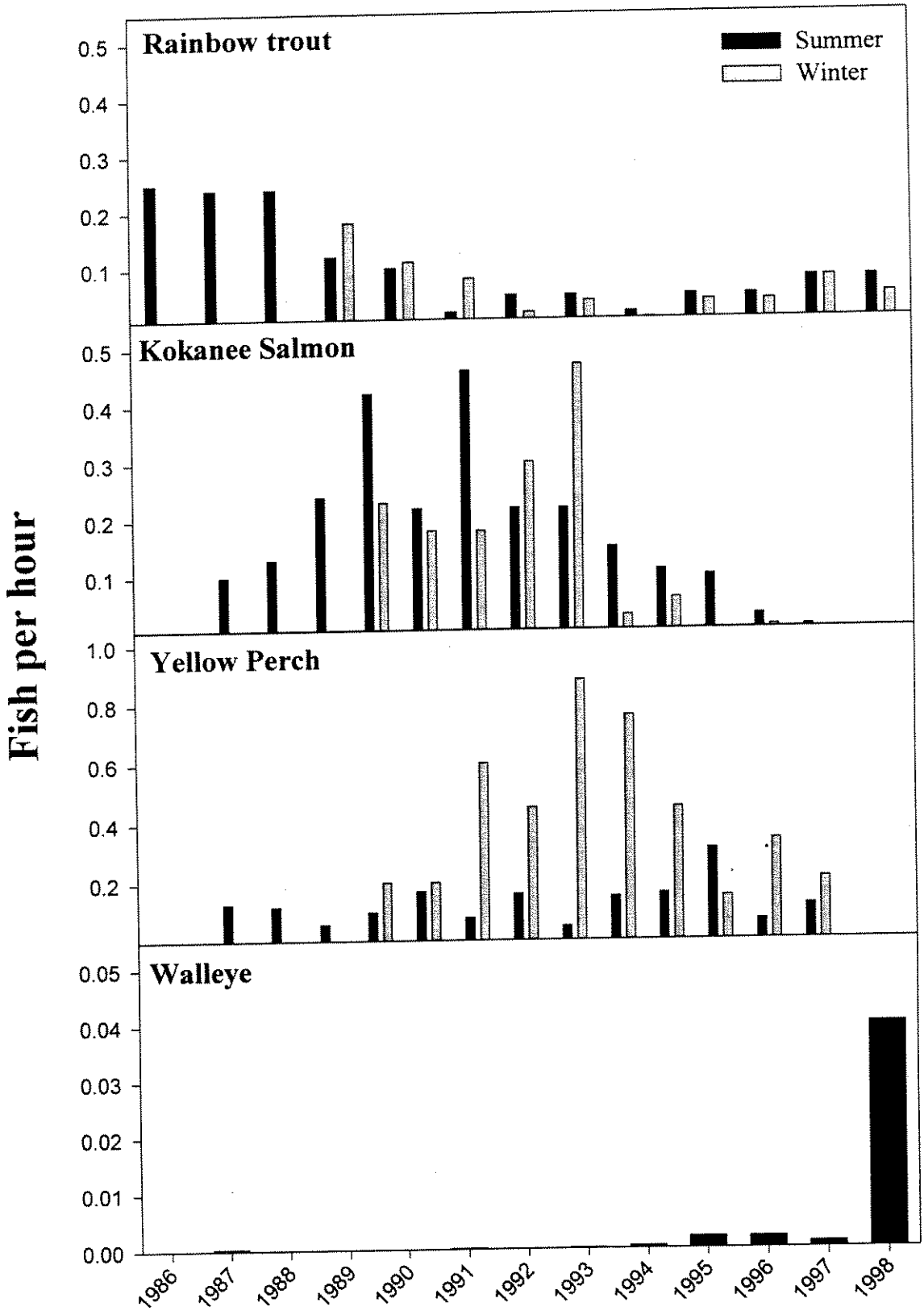


Figure 12. Angler catch rates (fish/hour) for the principal game species in Hauser Reservoir for the period 1986 through 1998. Summer (dark bars) and winter (light bars) are represented.

number of hatchery rainbow stocked into Hauser Reservoir was reduced. From 1991 through 1997, Arlee rainbow were planted after spring runoff in an attempt to minimize losses of fish over the dam when water was spilled.

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 overharvest 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, and the limit for walleye was changed to 5 fish, only one of which could exceed 20 inches. Current regulations allow the harvest of 5 trout and salmon in any combination. Walleye regulations have remained at 5 fish, one over 20 inches.

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, kokanee salmon, walleye and yellow perch.

Until factors limiting fisheries production in Hauser Reservoir are addressed, the fishery will not reach it's full potential. Unfortunately, most of the problems are large in scale, and involve numerous government agencies and private landowners. Resolution of these problems will require cooperation of highly focused 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. The new owners of Hauser and Holter dams, Pennsylvania Power and Light, will probably receive a new federal operating license at some time during this plan. There is hope that the Federal Energy and Regulatory Commission (FERC) will require PP&L to provide funds for the protection, maintenance and enhancement of fisheries resources in Hauser and Holter Reservoirs. It is unknown if any funds will be approved by FERC and when they would be available. Five factors have been identified as limiting fisheries production in Hauser Reservoir:

- Oxygen deficient water (less than 6.5mg/l) is being released annually during August, September and October from Canyon Ferry dam. Low levels of dissolved oxygen 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 dissolved oxygen values extending throughout much of Hauser Reservoir. Impacts specific to the Hauser fishery are yet to be determined. Based on scientific literature, low dissolved oxygen related impacts range from simple avoidance to increased susceptibility to disease or death if fish are exposed to chronically low dissolved oxygen. Each species is affected differently, although salmonids are more sensitive than most cool and warm water species, especially to dissolved oxygen levels less than 5 mg/l. Levels below 5 mg/l are especially critical to aquatic life and are estimated to occur an average 45 days/year in Hauser Reservoir.

  Kokanee salmon may sustain the most severe impact from low dissolved oxygen. Kokanee spawn in the fall immediately below Canyon Ferry when dissolved oxygen values are most extreme. Dissolved oxygen levels are low enough that fall spawning migrations are likely impaired. During the months of August, September and October, the low dissolved oxygen plume encompasses roughly 75% to 80% of the surface area of Hauser Reservoir. The distribution of all species is affected by forcing fish to reside in limited areas of the reservoir where oxygen levels are higher such as in the causeway and in front of Hauser dam. Fish forced into the dam area may be more susceptible to flushing from the reservoir. Flushing losses of fish out of Hauser Reservoir is a chronic limiting factor that may be exacerbated by low dissolved oxygen.

- Fish losses out of Hauser Reservoir from flushing and entrainment (passage through the turbines in the dam) is the primary factor affecting fish populations on an annual basis. Although recommendations were made in the 1989 Hauser fisheries management plan (MFWP, 1989) to investigate flushing losses, no feasibility studies have been conducted and therefore no fish screening devices have been developed for Hauser dam. No money exists to complete this project at the current time. Funds may be made available through the FERC relicencing process.

  All fish species are susceptible to flushing, however kokanee salmon may flush at higher rates because of behavioral tendencies. Rainbow trout and walleye flushing have also been documented. Skaar (1996) documented that flushing losses of hatchery rainbow trout were correlated with high runoff. Fish were flushed 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 the Missouri River below Holter Dam by anglers and MFWP survey crews.

- Walleye flushed from Canyon Ferry Reservoir into Hauser Reservoir is a developing issue that will affect 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. In 1998, field surveys discovered nearly six walleye per test net in Hauser during the fall. This is more than a six-fold increase over average walleye catch rates from 1986 through 1997. Trout and salmon have comprised 43% of the walleye diet on average, while yellow perch comprise up to 13% of the diet in Hauser. This level of consumption by an expanding walleye population will impact the number of yellow perch and hatchery rainbow trout that are available for anglers to harvest as well as impair kokanee salmon recovery efforts.

  No screening devices are in place on Canyon Ferry Dam to limit the number of walleye flushed. The Hauser Reservoir walleye population would not have developed were it not for Canyon Ferry Dam which provides the reservoir habitat for the walleye that are flushed downstream.

- Poor quality spawning tributaries to Hauser Reservoir will continue to limit the production of wild fish and the contribution of wild fish to Hauser. Kokanee salmon has been the only sport fish that has at times had excellent success spawning in Hauser tributaries. Spawning has occurred in the Hauser tailrace and Spokane Creek. Available streams (Trout, McGuire, Soup, Prickly Pear and Silver creeks) have all documented high sediment values, imbeddedness, or seasonal dewatering. 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.

  Spawning and rearing habitat in the principal tributaries to Hauser Reservoir has been degraded through a variety of land use activities. Mining, logging, livestock over-utilization, agricultural dewatering, and urban development have all contributed to the large-scale reduction of productive stream habitat throughout the Hauser watershed. Specific limiting factors include increased amounts of sand and silt, dewatering of channel, channel straightening, fish passage barriers caused by road culverts and large woody debris. Big Prickly Pear Creek may hold the most fisheries potential although this potential is currently limited by water quality problems, which include agricultural dewatering and elevated sediment values. Livestock overutilization in riparian areas has further contributed to the destabilization of the stream banks.

  Yellow Perch spawning habitat in Hauser Reservoir is limited by the lack of structure in the Reservoir. This is a common problem in all reservoirs as submerged wood that is initially inundated following dam construction breaks down over time. Based on the age of Hauser Reservoir (88 years), nearly all of the trees that were initially flooded have decayed.

- Whirling disease is a prominent player in fish management in Montana. Because Hauser Reservoir is reliant on hatchery rainbow trout, this disease will not have as great an impact as it has had on fisheries dependant on wild salmonid reproduction. Rainbow trout are planted into Hauser when they ar 4-5

inches. Fish of this size are not as susceptible to contracting whirling disease as smaller fish. However, wild fish produced from tributary or tailrace spawning have a high chance of exposure to the disease. Silver Creek (tributary to Lake Helena/Hauser) was the first tributary in the Hauser/Holter system to test positive for whirling disease. A 20% infection rate was discovered in brown trout in 1998. Whirling disease testing will continue throughout the reservoir and all principal tributaries.

Management Goals by Species

Rainbow Trout

Goals and Objectives:
Rely on rainbow trout to provide the principal fishery with kokanee salmon furnishing a varying proportion of the harvest.

- Recruit a three-year running average of five rainbow trout per net to fall floating horizontal gill nets.
- Provide a three-year running average angler catch rate of 0.15 to 0.20 fish/hour.

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, MFWP 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 (MFWP, 1989). Since 1995, an average 100,000 fingerlings have been stocked annually with catch rates during this period averaging 0.06 rainbow/hour.

Strategies:

- Increase rainbow plants from approximately 100,000 Arlee rainbow (5-6 inches) to 300,000 Arlee rainbow per year (5-6 inches) beginning in 2000. These fish will be stocked following peak runoff. Stocking rate may be increased further if efforts to restore kokanee salmon fail during the life of this plan. Adaptive management changes in the rainbow stocking plan could also occur in response to walleye predation.
- In an effort to reduce walleye predation on hatchery rainbow trout, fall planting of age zero fish may occur. Age zero fish planted in the fall are larger, thus reducing risk of predation. The additional burden placed on the hatchery system will require adjustments to free up the necessary space to meet this demand could result in a reduction in the ability to raise kokanee salmon.
- Obtain funding to evaluate the use of net pen rearing rainbow trout. Objectives specific to net pens include:
  - Increases the cost-effectiveness of the Hauser fishery by maximizing the return to creel of hatchery rainbow trout.
  - Decrease the likelihood of flushing by holding fish into late fall for release. Based on the success of this effort, more pens could be used in future years if funding was available.
  - Free up hatchery space.
- Obtain funding to evaluate the use of remote site egg incubators (RSI) in Hauser tributaries to raise additional rainbow trout. Objectives specific to the use of RSIs would include:
  - Free up hatchery space for rearing larger fish.
  - Imprint rainbow trout to specific natal streams. Streams that contained quality habitat could provide wild, sustaining runs. Streams with poor quality habitat could be trapped and developed into egg source streams. RSIs could be used extensively if the conversion from Arlee rainbow to a wild strain rainbow was made.
- Evaluate fall release of rainbow trout:
  - Stock rainbow trout at a larger size in the fall to reduce susceptibility to walleye predation and reduce flushing losses.
  - Avoid low dissolved oxygen by waiting until Canyon Ferry Reservoir turns over (generally the first two weeks in October) before stocking fish. Stocking would occur when dissolved oxygen 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 in combination.

- Consider the use of wild strain rainbow (Eagle Lake) to replace all or a portion of the Arlee plant. This would occur following thorough evaluation of the Holter Eagle Lake rainbow-stocking program.

Kokanee Salmon

Goals and Objectives:
Rely on kokanee salmon to provide a supplemental fishery to rainbow trout while attempting to reestablish a self-sustaining, wild fishery.

- Recruit a three-year running average of 20 kokanee salmon (total age one and two) to summer vertical gill nets (July through September).
- Provide a three-year running average angler catch rate of 0.10 fish/hour (average through the summer angling season).

Rationale:
Historically, the kokanee fishery in Hauser has proven to be erratic and heavily influenced by runoff and to a lesser degree, harvest. However, when abundant, the wild-reproducing Hauser Reservoir kokanee population has provided one of the premier fisheries in the Northwest.

Circumstances under which the population developed were unique and unplanned. Over one million kokanee were stocked unsuccessfully in Hauser over a 6-year period in the 1950's. In the 1960's kokanee were stocked in Canyon Ferry Reservoir. Some of these fish were siphoned into the Helena Valley Regulating Reservoir, which was drained for repairs in 1978. Fish were flushed into Hauser Reservoir, apparently providing the necessary spawning stock that developed into the high profile fishery of the late 1980s and early 1990s. There were widely fluctuating population cycles during the 10 to 15-year period that kokanee were established in Hauser.

Kokanee salmon eggs are collected annually from the wild. The current status of the kokanee egg sources is uncertain because the statewide demand for kokanee eggs far exceeds the supply. This may become a perennial problem if the Lake Mary Ronan kokanee fishery continues to decline because of the unauthorized introduction of yellow perch.

Reestablishment of the kokanee will be experimental and will continue through 2004. If the fishery has not met specific criteria by this time, kokanee stocking will be reevaluated. The availability of FERC relicensing money to fund new technologies (screening devices) may make it feasible to continue efforts to reestablish kokanee salmon. Also, the U.S. Bureau of Reclamation may solve the low dissolved oxygen problem with water released from Canyon Ferry which could lead to improved water conditions in Hauser Reservoir and renewed possibilities for reestablishing kokanee salmon.

Strategies:

- Approximately 100,000 to 300,000 (based on availability) kokanee salmon will be planted annually following peak runoff to reestablish this once-wild population.
  - If the objectives are not met by 2005, kokanee reestablishment efforts will be evaluated to determine if continued stocking is cost-effective.
- Alternative kokanee release methods will be evaluated during the reintroduction program.
  - Experimental net pen rearing will be considered. Based evaluations of net pen rearing rainbow trout, net pens may be used to grow kokanee to avoid flushing losses (Appendix C).
  - Obtain funding and evaluate remote site incubators in Hauser tributaries. Objectives would include:
    1. Free up hatchery space for rearing rainbow trout
    2. Attempt to imprint kokanee salmon to specific natal streams. Prior to the kokanee crash, kokanee spawned in Spokane, McGuire, Silver, Prickly Pear and Trout creeks. Remote site incubators would be deployed in the streams with the greatest potential for survival.
- Evaluate the impact of walleye predation on kokanee salmon.
  - If walleye predation becomes excessive, kokanee stocking efforts will be evaluated with the potential to discontinue.

- Maintain current harvest regulations.
  - Although reduction in harvest levels may be prudent during the kokanee reintroduction period, the present fishing regulation of 5 trout or salmon in combination will be maintained. Anglers are generally unable to distinguish between kokanee and a silver color phase rainbow trout. To be effective, the combined rainbow/kokanee limit would need to be reduced, however, it is worth noting that the dramatic expansion of kokanee in the 1980s occurred when the daily limit for kokanee was 10 fish, twice the current limit.

Walleye

Goals and Objectives:
Rely on walleye to provide a balanced, cost-effective fishing opportunity in Hauser.
- Maintain a three-year running average of 2-3 walleye per fall sinking gill net.

Rationale:
Walleye were planted by MFWP 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 1960's and 1970's. Walleye were again stocked in 1989 by MFWP as part of the 1989-1994 Hauser Reservoir Management Plan (MFWP 1989). Approximately 5,000 advanced fingerlings were stocked annually from 1989 through 1998. These plants created a low-density fishery that recruited slightly less than one fish per sinking gillnet. Netting results from 1998 documented nearly a six-fold increase in walleye over 89-97 average levels. Nearly all of these fish are suspected to have originated from Canyon Ferry as young-of-the-year fish and flushed during high water of 1997. Relative weights of these fish have been shown to be poor and substantially less than Holter and Canyon Ferry walleye of similar size. Relative weights for walleye less than 14 inches in Hauser in 1998 were 88 (n=38), while Holter walleye were 98 (n=17) and Canyon Ferry were 101 (n=54).

Fisheries literature reports that walleye populations in run-of-the-river reservoirs such as Hauser are limited by flushing out of the reservoir. Walleye will likely continue to flush out of Canyon Ferry and into Hauser Reservoir on an annual basis.

The stated objective of 2-3 walleyes per sinking fall net is based on the successful multi-species fishery that has historically existed in Holter Reservoir. Holter has provided a sustainable multi-species fishery containing rainbow trout, kokanee salmon, walleye and yellow perch. However, 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 eight days and Canyon Ferry is every 140 days. This has the potential to strongly influence walleye populations and prey availability because of flushing losses. The substantially lower weights of Hauser walleye indicates prey availability is much lower than in adjacent reservoirs.

Strategies:
- Discontinue annual stocking of 5000 advanced walleye fingerlings.
  - Allow the population to naturally reproduce and be supplemented by walleye flushed from Canyon Ferry Reservoir.
  - Reinstate stocking walleye if running average falls below 2-3 per net for three consecutive years.
- Change daily limit regulations from 5 fish, one greater than 20 inches to 10 fish, one greater that 28 inches.
  - Walleye populations are anticipated to achieve densities sufficient to produce a running three-year average of 3.0 or more walleye per fall sinking gillnet during the 2000-2001 fishing regulation cycle which triggers the proposed angling regulation of 10 walleye, one greater than 28 inches.
  - This regulation change standardizes the definition of trophy walleye with Holter Reservoir at 28 inches.
  - This regulation change assumes that a large proportion of walleye in Hauser are products of the 1997 year class produced and flushed from Canyon Ferry. This group of fish has shown poor growth and remains well below both Holter and Canyon Ferry walleye in relative weight. Beach seine data and

recent food habits studies suggest an insufficient level of forage in Hauser Reservoir to sustain current walleye densities. Increased harvest of these fish should enhance growth for the remaining walleye.
  - Current regulations would not allow sufficient harvest when the 1997-year class reaches 20 inches. Current angling regulations would allow anglers to harvest only one of these fish and would fall short of sustainable harvest objectives.
  - Allows for the opportunity to harvest a trophy fish greater than 28 inches.
- Evaluate reductions in angler daily limits if the three-year running average falls below 2-3 walleye per fall sinking gill net for three consecutive years.
- Walleye limits could be removed entirely if population levels continue to exceed management targets and do not respond to liberalized daily limits.
- Monitor the walleye population to determine long-term cycles in relation to Canyon Ferry walleye year class strength and magnitude of water runoff (spill).
- Request that Bureau of Reclamation fund MFWP to determine walleye flushing and entrainment rates from Canyon Ferry Dam.
  - If flushing of walleye is excessive, determine feasibility of screening Canyon Ferry Dam to reduce flushing rates, and evaluate potential impacts on Canyon Ferry Reservoir.

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 one brown trout per sinking gill net.

Rationale:
Evidence suggests that kokanee salmon had a detrimental impact on brown trout populations in Hauser Reservoir. Competition for spawning areas probably reduced brown trout populations. With kokanee populations depressed, brown trout populations may demonstrate 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 anglers target brown trout however, records indicate that prior to the kokanee population explosion, brown trout numbers were higher and represented an important trophy fishery.

Strategies:
- Propose catch and release angling regulations on brown trout from below Canyon Ferry dam to Hauser Dam.
  - Eliminate angler harvest to allow population to rebuild.
  - Provide consistency in the regulations with the Missouri River section below Hauser dam and Holter Reservoir.

Largemouth Bass

Goals and Objectives:
Rely on largemouth bass to continue to provide a low-level, self-sustaining fishery based entirely on wild reproduction. This fishery is exclusive to Lake Helena and the Causeway Arm of Hauser Reservoir.
- No objective. MFWP does not actively sample largemouth bass.

Rationale:
Largemouth bass were first stocked in Hauser Reservoir (Lake Helena) by MFWP in 1938 to establish a viable fishery. Stocking resumed in earnest in 1988 with 20,000 to 30,000 fingerlings stocked annually until 1991. In total, over 317,000 largemouth bass were stocked in Hauser Reservoir. The habitat in Lake Helena and the Causeway Arm was thought to fall within the suitability range of this species, however, angler reports of this species are extremely rare, raising questions about potential limiting factors. Water quality in Lake Helena (controlled in large part by Prickly Pear Creek) may be too poor for year-round bass survival.

Strategies:

- Determine limiting factors for the largemouth bass population in Hauser Reservoir (Lake Helena) and evaluate alternatives for enhancing the fishery.

Yellow Perch

Goals and Objectives:

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

- Maintain a running average of at least 7.0 yellow perch per sinking fall gill net.
- Provide an angler catch rate of 0.10 to 0.15 yellow perch per hour in the summer creel and 0.30 to 0.40 in the winter creel.

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 probably been influenced by flushing, habitat conditions and possible competition with abundant planktivores (kokanee salmon). Populations appear to be driven by environmental conditions rather than by the number of spawning aged adults. For instance, field surveys on Holter Reservoir in 1998 discovered record high production of young-of-the-year perch even though numbers of adult perch were near record lows. Yellow perch will play an important role as forage for predators in Hauser Reservoir.

Yellow perch are commonly the most sought after species by Hauser ice-fisherman and are an important component of the Hauser winter fishery. Catch rates have been variable, averaging 0.45 fish per hour (1989 through 1997). Catch rates peaked in 1993 at 0.88 perch per hour and have been in decline with 1996 documenting the lowest catch rate on record (0.15 perch/hour). Anglers saw a modest rebound in 1997 with catch rates of 0.34 fish per hour.

Strategies:

- Propose a 50 fish limit on yellow perch.
- Focus efforts on enhancing yellow perch spawning and rearing habitat through the deployment of artificial structures. Actively involve angler groups to participate in perch habitat projects and evaluate these structures to determine perch utilization.

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 0.5 to 1.0 burbot per fall sinking gill net.

Rationale:

Burbot (ling) is one of three native game fish in Hauser Reservoir (along with mountain whitefish and westslope cutthroat trout). Interest in native species is increasing statewide and will likely increase throughout the life of this plan. Limited information is known on burbot population dynamics and basic life-history in the Upper Missouri Reservoir complex.

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).

- Consider establishing a sampling regime specifically targeting burbot. This would likely involve deployment of hoop nets in the late winter spawning period.
- Redirect effort during winter creel to determine burbot harvest.

Other Fisheries Management Issues

Low Dissolved Oxygen

Goals and Objectives:

- Raise dissolved oxygen values in Hauser Reservoir so that water released form Canyon Ferry contains at least 5mg/l DO throughout the entire year.

Rationale:

Low levels of dissolved oxygen (less than 6.5 mg/l) were first discovered in 1996 below Canyon Ferry Dam in Hauser Reservoir. Impacts specific to the Hauser fishery are yet to be determined, however, based on scientific literature, dissolved oxygen 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. Impacts of broad environmental stresses such as low dissolved oxygen are manifested through an increased incidence of parasites and disease. Each species is affected differently by low dissolved oxygen, but in general, salmonids are more sensitive than most cool and warm water species to dissolved oxygen levels less than 5 mg/l.

Strategies:

- Beginning in 1999, assist Bureau of Reclamation to determine distribution of fish in Hauser Reservoir related to water quality (temperature, dissolved oxygen, CO_2, total gas supersaturation). Using hydroacoustics technology, determine monthly distribution of fish throughout Hauser Reservoir while concurrently collecting water quality data. Evaluate use of radiotelemetry to monitor rainbow trout movement as they relate to water quality parameters.
- By 2004, determine feasibility of retrofitting Canyon Ferry dam with structures that are capable of elevating dissolved oxygen in water in the Hauser Reservoir tailrace. Consult with "experts" that have dealt with low dissolved oxygen water releases from other facilities. Cooperatively work with U.S. Bureau of Reclamation to conduct "in house" investigation into retrofitting Canyon Ferry.
- Determine effects of low dissolved oxygen on fish flushing out of Hauser Reservoir.
  - In conjunction with #1, determine if low dissolved oxygen forces fish into the forebay of Hauser Reservoir where they are more susceptible to flushing losses.
  - Based on funding and manpower, use hydroacoustics equipment and netting or trapping techniques to determine flushing and entrainment rates out of Hauser dam.

Flushing Losses at Hauser Dam

Goals and Objectives:

Determine 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 the primary factor affecting fish populations. All fish species are susceptible to flushing, however, kokanee may flush at higher rates because of behavioral tendencies, i.e. inhabiting levels that are part of the siphon plume. Kokanee population fluctuations can be largely attributed to age class strength and magnitude of water runoff. Rainbow trout and walleye flushing has also been documented. Skaar (1996) documented that flushing losses of hatchery rainbow trout was correlated with high runoff. Fish were flushed 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 MFWP sampling.

Strategies:

- In conjunction with U.S. Bureau of Reclamation and Pennsylvania Power and Light, quantify entrainment and flushing rates of fish out of Hauser dam. Determine timing and magnitude of flushing losses.
  - Based on logistics, funding and manpower, use hydroacoustics equipment and netting or trapping techniques to determine flushing and entrainment rates out of Hauser dam.
- Following allocation of re-licensing funds, 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. Determine survival of walleye flushed from Canyon Ferry.

Rationale:
Walleye flushing out of Canyon Ferry into Hauser Reservoir will increase as the walleye population in Canyon Ferry increases. Increased walleye densities in Hauser Reservoir will affect the balance of the multi-species fishery with increased predation on trout and yellow perch.

In 1998, field surveys discovered nearly six walleye per net in Hauser Reservoir. This is more than a six-fold increase over average walleye catch rates from 1986 through 1997. A large percentage of these fish are believed to have been flushed from Canyon Ferry during the record high water of 1997. Walleyes eat 43% trout and salmon and up to 13% yellow perch in Hauser Reservoir. This level of consumption by an expanding walleye population will impact the number of yellow perch and hatchery rainbow trout that are available for anglers to harvest as well as impair kokanee salmon recovery efforts.

Strategies:

- Request funding from Bureau of Reclamation to determine walleye flushing rates.

Habitat

Goals and Objectives:
Enhance wild fish spawning opportunities in Hauser Reservoir and in tributary streams to Hauser Reservoir.

Rationale:
Lack of funding has limited the number of projects that have been completed to enhance wild reproduction of Hauser fish. These include yellow perch spawning structure placement (1997) and Spokane Creek channel reconstruction (1999). The Future Fisheries program provides funding for projects targeting enhancement of wild fish and will provide financial assistance for projects in the future. 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 in anticipation of FERC relicencing funding in conjunction with sportsmen's groups and local watershed groups. Prioritize projects that will target the enhancement of wild fish production.

- Complete enhancement projects that will benefit spawning and recruitment of wild fish in Hauser Reservoir.
- Submit future fisheries grant proposals for habitat enhancement projects benefiting Hauser and/or Holter Reservoirs.

Disease

Goals and Objectives:
Monitor Hauser Reservoir and associated tributaries for whirling disease. Whirling disease testing will continue throughout the Reservoir and all principal tributaries.

Rationale:
Whirling disease is a prominent player in fish management in Montana. Because of Hauser Reservoirs reliance on hatchery rainbow trout, this disease will not have as great an impact as it has had on wild salmonid fisheries. Rainbow trout are planted into Hauser when they are 4-5 inches. Fish of this size are not as susceptible to contract whirling disease as smaller fish. However, wild fish produced from tributary or tailrace spawning have a high chance of exposure to the disease.

Strategies:
- Annually collect tissue samples from fish (rainbow trout and kokanee salmon) from Hauser Reservoir and tributaries and submit samples for whirling disease testing. Include whirling disease testing results in annual report.
  - Samples from sixty rainbow trout and kokanee salmon will be collected annually from Hauser Reservoir.
  - Tributary sampling (60 fish) will occur during even numbered years in the following streams: Silver, Big Prickly Pear and Trout creeks. Collections will also be made separately in the Hauser tailrace.
  - Potential streams to be added include: McGuire, Spokane and Upper Ten Mile creeks.
- Conduct on-site exposure testing in Hauser Reservoir.
  - Utilize statewide whirling disease taskforce funding and manpower to conduct *in situ* exposure of fish to determine infection rates and severity.

Derbies/Tournaments

Goals and Objectives:
Manage derbies/tournaments on Hauser Reservoir to minimize conflict with the general angling public and to ensure consistency with fishery management goals and objectives.

Rationale:
Currently two angling tournaments are held on Hauser Reservoir. Increased interest in fishing tournaments is expected to result in additional requests in the future.

Strategies:
- Discourage ice fishing tournaments on Hauser Reservoir for public safety. 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 evaluated and discontinued.
- No more than three derbies/tournaments will be allowed each year. Tournaments would be required to coordinate with BLM for access. MFWP will encourage use of private access facilities and mitigate crowding problems on the reservoir.

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

The free flowing segment of the Missouri River located between Hauser Dam and Holter Reservoir is about 4.6 miles long and 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. 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 and mountain whitefish. Species of fish present in the river are similar to those found in Hauser and Holter Reservoir (Tables 5 and 6). Mountain whitefish and rainbow trout 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. Electrofishing surveys were discontinued because of concerns about potential adverse effects to spawning rainbow and brown trout. 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). Recent population data is not available, however, 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, 1996). Rainbow trout (Skaar, 1996) and walleye flushing (Teuscher and Humphrey, 1996) have been documented along with kokanee salmon. Apparently, fish are flushed both through turbines and over the Hauser Dam spillway. Walleye flushing has been documented through recovery of tagged fish. An increasing number of walleye have been caught in recent years, which corresponds with an increasing Canyon Ferry walleye population and high runoff. Walleye tagged in Hauser Reservoir have been recaptured in Holter Reservoir and the Missouri River below Holter dam by anglers and MFWP survey crews.

This section of the Missouri River has always been managed as a wild trout fishery and, with the exception of the McConaughy 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 1986 and 1987 indicated that approximately 15% of the rainbow population in the river were comprised of hatchery fish. Arlee rainbow planted into Hauser that flushed from Hauser comprised approximately 10.6%, 0.8% and 5.4% of the fall rainbow trout estimate during 1986, 1987 and 1989 respectively. These losses appear to be related to the duration and magnitude of water spilled over Hauser Dam (Lere, 1990).

Historical brown trout population estimates obtained during 1982 and 1983 indicated that 250 to 350 fish were residing in the river throughout the year and that approximately 1,000 migrant spawners entered the river segment every fall. The average size 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. Much of the concern focused on the perception that the incidence of fungal disease on brown trout spawners had increased and that this increase was related to the expanding kokanee

population. Electrofishing data during the period 1985 and 1987 documented that the incidence of fungal infections remained relatively low (approximately 6.5% of the spawning population) and had not increased. Further studies were undertaken to determine if spawning kokanee salmon were constructing redds over existing brown trout redds, but unfortunately, the research was never completed.

Fishing regulations on this segment of river allow for year around angling and differ from Holter Reservoir regulations in four ways:

1) only one rod is allowed compared to two on the reservoir;
2) the river is open to night fishing whereas the reservoir is closed from midnight to 3 A.M.;
3) anglers are allowed to harvest 10 kokanee salmon compared to 5 on the reservoir; and
4) anglers can possess only one rainbow trout over 18 inches whereas there is no upper size restriction on rainbows harvested in the reservoir.

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. Anglers are allowed to harvest three walleye under 18 inches and one over 28 inches, all fish between 18 and 28 inches must be released to protect spawning aged fish. For mountain whitefish, the daily and possession limits are 100 fish.

Management Goals and Limiting Factors

The management goal for the Missouri River below Hauser Dam is to provide a salmonid fishery including wild rainbow trout and brown trout for sport fishing.

Four 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 it's 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 a developing issue that will affect the dynamics of a multi-species fishery. Detailed information on the magnitude of walleye 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 Dam 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 spawning stream that supports substantial runs of rainbow trout. U.S. Forest Service 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 MFWP have removed dams from Beaver Creek without consensus from USFS. High sediment values and imbeddedness further compound spawning success.

- Whirling disease is a prominent player in fish management in Montana. This reach of the Missouri River provides exceptional fishing for wild rainbow trout as well as producing a substantial portion of the wild rainbow trout in Holter reservoir. Wild fish produced in the tailrace and Beaver Creek have a high chance of exposure to the disease. These runs could be adversely impacted if whirling disease is discovered. Whirling disease has not been found in these areas yet and testing will continue throughout the reservoir and tributaries.

- Angling pressure is expected to increase on this section of the Missouri River because of its proximity to the greater Helena area. No conclusive data trends can be determined from the statewide creel survey that has been conducted since the early 1980s, but the increasing population of the Helena valley and Montana in general strongly suggest that pressure on the states natural resources will continue to increase. Surveys quantifying changes in angler catch rates and angler satisfaction (or dissatisfaction) will be important in the management of this unique fishery.

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. MFWP does not actively monitor fish populations and angler harvest in this section of water, therefore it is difficult to establish specific management targets comparable to those developed for the reservoirs.

Rainbow Trout

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

Rationale:
This section of the Missouri River has always been managed as a wild trout fishery and, with the exception of the McConaughy plants (1984 through 1986), has not been supplemented with hatchery fish. Rainbow trout planted into Hauser and Holter reservoirs undoubtedly have an 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.

Strategies:
- Monitor reservoir operating plans to ensure adequate streamflow in this river segment to support fish populations.
- Monitor whirling disease presence and impacts. If whirling disease is discovered in Holter Reservoir, investigate adaptive rainbow planting strategies to minimize the potential impacts on the Holter Reservoir rainbow fishery.
- Encourage the development of wild rainbow trout spawning and recruitment from the Hauser tailrace and Beaver Creek.
  - Extend the closure on Beaver Creek from May 15th to June 15th to protect spawning rainbow trout.
  - Investigate the feasibility of developing the Beaver Creek rainbow run into an egg source.
- Develop a beaver management plan that allows moderate beaver dam and/or beaver removal only in and around the lager dams in the lower 1-2 mile reach of Beaver Creek while allowing beaver activity in the upper reaches to function normally. Additionally, agencies need to investigate the feasibility of fish passage devices that can be installed without removal of the beaver dam.

Brown Trout

Goals and Objectives:
Maintain brown trout at or above current levels.

Rationale:
Brown trout numbers appear to be limited by existing habitat and possibly by competition with kokanee salmon for spawning areas. 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 will be strongly influenced by the outcome of reintroduction efforts in Hauser Reservoir. If stocking and/or natural production of kokanee is successful in building kokanee populations to historic levels, brown trout could be adversely affected. 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, although even this was excessive for the population.

Strategies:

- Maintain the catch and release fishing regulation that was implemented in 1992 for this reach of the Missouri River and Holter Reservoir.

Kokanee Salmon

Goals and Objectives:
Rely on kokanee salmon flushed from Hauser reservoir and any natural reproduction that may occur in Holter reservoir to provide a limited kokanee harvest.

Rationale:
Kokanee salmon have provided an important component of the fishery below Hauser dam although anglers have not experienced the level of success that they have had with the tailwater kokanee fishery below Canyon Ferry Dam. This fishery has been heavily supplemented through annual flushing of kokanee out of Hauser reservoir. Historically, kokanee spawned heavily in this river section but it appears that survival of eggs to hatching is now low.

Strategies:

- Continue efforts to re-establish a self-sustaining population of kokanee salmon in Hauser Reservoir that will supply flushed fish to this section of the Missouri River.
- Determine if kokanee salmon are spawning successfully in the Missouri River below Hauser, and if not, attempt to develop an egg take operation to support re-establishment in Hauser Reservoir. Removal of adult spawning kokanee from the population could further benefit brown trout reproductive success.
  - Explore the use of re-licensing funding to design and build a permanent fish weir below Hauser Dam for the purpose of trapping adult spawning kokanee salmon and collecting eggs.

Walleye

Goals and Objectives:
Rely on walleye flushed from Hauser Reservoir and migratory adults from Holter to provide a limited fishery.

Rationale:
Holter has supported a healthy population of fast growing walleyes that likely originated from fish flushed out of Hauser. Spring gill netting surveys completed in 1999 in Holter Reservoir revealed a record number of small walleyes under 14 inches. This trend was also observed in Hauser Reservoir. Many of these fish are suspected to have been flushed from Canyon Ferry during the record high water year of 1997. Based on historic surveys and recent angler tag return data, many of these flushed walleye appear to remain immediately below the dams from which they are flushed.

Anecdotal angler information suggests that many of the walleye harvested from this section of river in 1998 and 1999 were small, similar in size to those collected in both Hauser and Holter reservoir sampling. This suggests that the many of these fish are transients that have been recently flushed out of Hauser Reservoir. 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).

Strategies:

- Propose changing angler harvest regulations from 3 fish less than 18 inches and only one greater than 28 inches to 5 fish less than 20 inches and one greater that 28 inches. All fish between 20 and 28

inches must be released. This regulation change would be consistent with walleye regulations on Holter Reservoir.

- Following allocation of re-licensing funding, develop a multi-year angler creel program to evaluate the following statistics:
  - Monthly catch rates of walleye;
  - Annual walleye harvest;
  - Percent of walleyes caught and released; and
  - Angler satisfaction.

Other Fisheries Management Issues

Walleye Flushing from Canyon Ferry Reservoir

Goals and Objectives:
Determine walleye flushing rates from Canyon Ferry Reservoir and downstream survival of flushed walleye.

Rationale:
Walleye flushing out of Canyon Ferry into Hauser and Holter Reservoirs will likely increase during high water runoff years. Increased walleye densities in Holter Reservoir and in the Missouri River will affect the balance of the multi-species fishery due to increased predation on trout and kokanee. It is unknown if walleye densities in the Missouri River will increase substantially with increased flushing from upstream. Walleye have historically been caught in low numbers in this reach. Recent walleye increases in upstream waters have brought about increased angler catch rates in this portion of the Missouri River. The majority of these fish have been smaller walleye similar in size to those currently abundant in Hauser Reservoir. No screening devices are in place on Canyon Ferry dam to limit the number of walleye flushed.

Strategies:

- Request funding from the Bureau of Reclamation to determine walleye flushing and downstream survival rates.

Habitat

Goals and Objectives:
Enhance wild fish spawning opportunities in Holter Reservoir tributary streams.

Rationale:
Spawning 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, imbeddedness of substrates, channel straightening (loss of stream length), and loss of large woody debris recruitment. Recent fires and beaver colonization are influencing fisheries production.

Strategies:

- Identify and complete enhancement projects that will benefit spawning and recruitment of wild fish in Holter Reservoir. 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 to facilitate use by wild fish.

Disease

Goals and Objectives:
Monitor Holter Reservoir and principal tributaries for whirling disease.

Rationale:
Wild fish produced in this portion of the Missouri River and from Beaver Creek have a high chance of exposure to whirling disease.

Strategies:
- Annually collect rainbow trout and kokanee salmon tissue samples from this section of the Missouri River and Beaver Creek. Submit samples for whirling disease testing and include whirling disease testing results in annual reports.
  - Tributary sampling (60 fish) will occur during even numbered years in Beaver Creek.
  - Collect 60 fish during even numbered years in the Missouri River section above Holter Reservoir.
- Conduct *in situ* exposure testing in Holter Reservoir and/or Missouri River. Utilize statewide whirling disease funding and manpower to conduct *in situ* exposure of fish to determine infection rates and severity.

Creel Survey

Goals and Objectives:
Determine angler catch rates and satisfaction on this reach of the Missouri River and Beaver Creek before 2009.

Rationale:
The most recent creel surveys in this reach were conducted in the early 1980s and are now outdated.

Strategies:
- Conduct an angler creel survey on the Missouri River and Beaver Creek to monitor the following:
  - Monthly catch rates;
  - Annual harvest;
  - Percent wild and hatchery rainbow trout caught;
  - Percent of walleyes caught and released
  - Angler origin
  -Angler satisfaction
- Determine proportion of walleye that are being flushed from Canyon Ferry and Hauser Reservoir, and the relationship between walleye flushing rates and the magnitude and seasonal flow patterns of discharge from upstream impoundments.

Holter Reservoir

Management History

Species of fish present in Holter Reservoir (Table 6) are similar to those found in Hauser Reservoir. Rainbow trout, walleye and kokanee salmon are the most abundant game species in the reservoir. Suckers and yellow perch 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 only 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, MFWP shifted from Arlee rainbow to Eagle Lake rainbow. On alternating years, age one and age zero rainbows have been 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 has been difficult because of flushing losses in 1996 and 1997. To minimize losses of fish over the dam when surplus water is being spilled, all hatchery fish were planted after high water.

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. 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. Kokanee are spawning unsuccessfully or with limited success in Holter Reservoir. The kokanee population continued to decline following severe flushing losses associated with high water in 1995, 1996 and 1997. The total number of kokanee captured in summer vertical gillnets (July through September) in 1998 was the lowest since surveys began in 1986.

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.

The walleye population in Holter Reservoir likely resulted from the single plant made into Lake Helena in 1951. This population of fast growing walleye has been able to maintain at relatively stable levels with natural reproduction. The fishery has become increasingly popular, requiring more restrictive regulations to limit harvest and enhance the trophy component. Walleye in Holter Reservoir eat up to 45% trout and salmon depending on the season. This level of consumption by an expanding walleye population will impact the number of rainbow trout and kokanee that are available for anglers. 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. Currently, all walleyes between 18 inches and 28 inches must be released.

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. Average numbers of brown trout caught in spring and fall gill nets since 1986 is 0.32 and 0.08 fish per net respectively, however, no brown trout have been collected in either spring or fall sinking nets since 1997. As fall spawners, kokanee were thought to have a negative impact on the brown trout population through competition for available spawning areas 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.

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 1993. In general, perch numbers have been declining since 1993 with severe declines following the high water years of 1995, 1996 and 1997 (Figure 14). Concurrently, angler harvest has fallen by 50% or more every year since 1994. No limits are currently in place on the number of perch anglers can harvest. With declining perch numbers, interest has increased to place a limit on perch with the hope that reduced harvest would assist in recovery of the population. In 1992, when the population and harvest levels were near record highs (Figures 13 and 14), a 25 fish limit would have reduced annual harvest by 35%.

In 1971, anglers were allowed to fish at all hours (both day and night) during the regular season. MFWP received numerous complaints about night anglers exceeding limits in Holter Reservoir and concerns that daytime fishing was being adversely affected. Despite the fact that increased surveillance did not reveal unusual numbers of anglers taking over limits of fish, in the late 1970s the reservoir was closed to fishing between midnight and 5 A.M. to resolve these perceived conflicts. In 1992, the night closure was lifted but was reinstated in 1996 from midnight to 3 A.M. Limited biological data exists to maintain the night fishing closure on Holter and it continues to be a controversial issue.

Table 6. Fish species of Holter reservoir including 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	No	1950	Stable/Decrease	Abundant
Rainbow Trout	No	1941	Stable/Decrease	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/Unknown	Uncommon
Burbot	Yes	N/A	Unknown	Uncommon
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	Stable	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

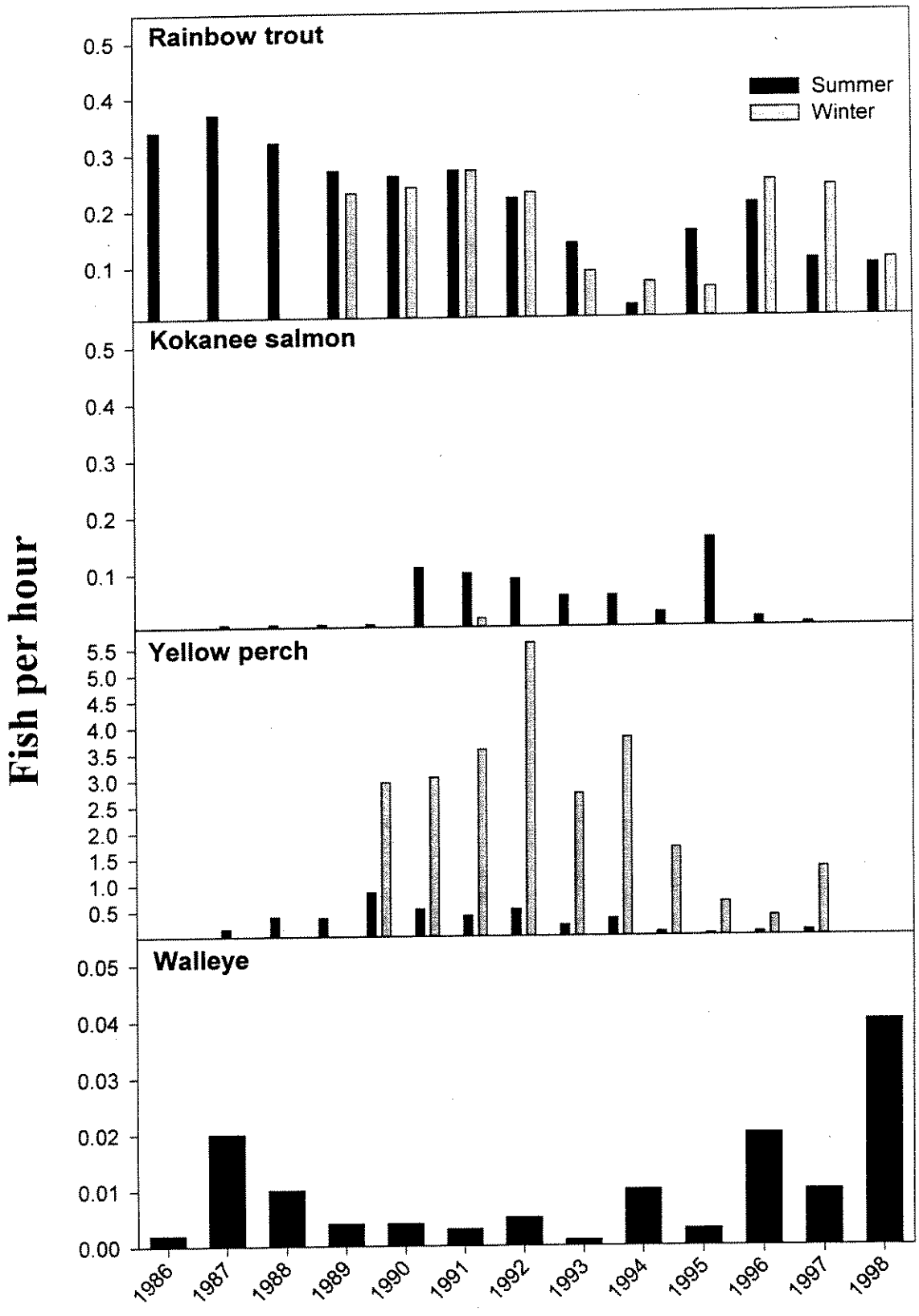


Figure 13. Holter Reservoir fisheries trends for the four principal game species: rainbow trout (top), kokanee salmon (first middle), walley (second middle), and yellow perch (bottom). Species trends are for the period 1986 through 1998.

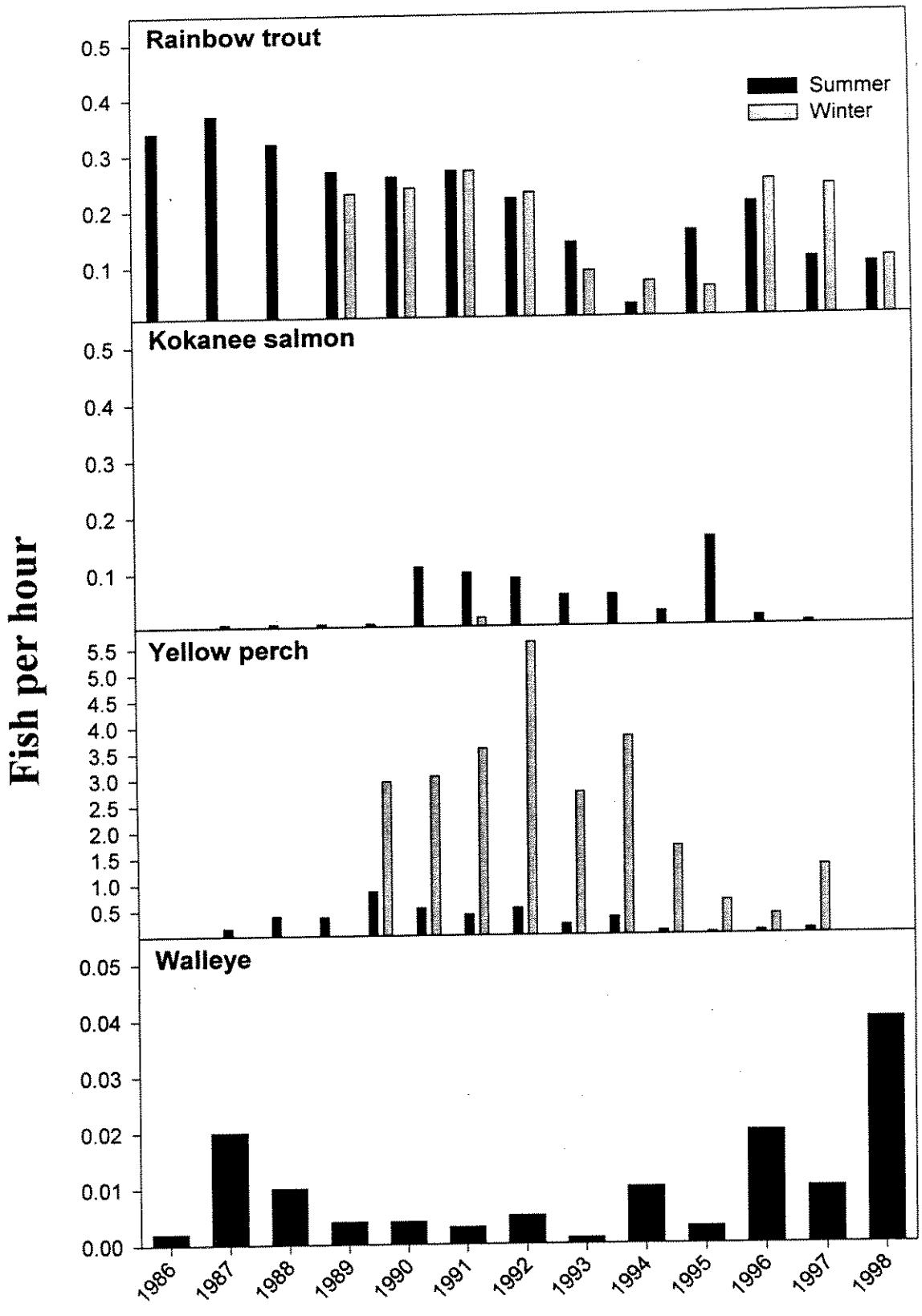


Figure 14. Angler catch rates (fish/hour) for the four principal game species in Hauser Reservoir for the period 1986 through 1998. Summer (dark bars) and winter (light bars) are represented.

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, yellow perch and kokanee salmon.

Four factors have been identified as limiting the fisheries production in Holter reservoir. Until they are addressed, the fishery will not reach it's full potential. Unfortunately, most of 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 highly focused 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. The new owners of Hauser and Holter dams, Pennsylvania Power and Light will probably receive a new federal operating license at some time during this plan. There is hope that the Federal Energy and Regulatory Commission (FERC) will require PP&L to provide funds for the protection, maintenance and enhancement of fisheries resources in Hauser and Holter reservoirs. It is unknown if any funds will be approved by FERC and when they would be available.

- Fish losses out of Holter Reservoir from flushing and entrainment are the primary factor that annually affects fish populations. Although flushing has been identified as a major factor influencing Holter fish populations, no feasibility studies to screen Holter dam have been conducted. No money currently exists to complete this project although funds may be made available through the FERC re-licensing process.

- Walleye flushed from Canyon Ferry Reservoir into Hauser and Holter reservoir (and the river segment below Hauser Dam) is a developing issue that will affect the balance of the multi-species fishery. The number of walleye flushed from Canyon Ferry has the potential to be significant. Holter Reservoir anglers caught a record number of walleye in the summer of 1998. Depending on the season, walleyes eat up to 45% trout and salmon (fall) and up to 50% yellow perch (summer). This level of consumption by an expanding walleye population will impact the number of yellow perch and hatchery rainbow trout that are available for anglers to harvest.

- 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 Elkhorn and Cottonwood creeks, which are located on the MFWP-owned Beartooth Wildlife Management Area.

- Whirling disease is a prominent player in fish management in Montana. Holter Reservoir relies heavily on hatchery rainbow trout, which are generally stocked after the period of high susceptibility. Wild fish produced in the Hauser tailrace and tributary streams comprise up to 14% of the Holter rainbow fishery and have a high chance of exposure to the disease. These runs could be adversely impacted if whirling disease is discovered. Silver Creek, tributary to Lake Helena/Hauser Reservoir, was the first tributary in the Hauser/Holter system to test positive for whirling disease. A 20% infection rate was discovered in brown trout in 1998. Whirling disease testing will continue throughout the reservoir and tributaries.

Management Goals by Species

Rainbow Trout

Goals and Objectives:
Rely on rainbow trout to provide the principal fishery in Holter Reservoir with continued emphasis on maximizing the proportion of wild rainbow trout.

- Attempt to recruit a three-year running average of 8.0 rainbow trout per net to spring and fall floating horizontal gill nets.

- Provide a three-year running average summer angler catch rate of at least 0.25 fish per hour.

Rationale:
Rainbow trout have been stocked in Holter Reservoir since the early 1940s and have provided the principal fishery. In recent years this fishery has been annually supplemented with approximately 325,000 Arlee rainbow trout providing an average annual harvest of 42,400 at 0.23 fish per hour. Wild rainbow trout have comprised 14% 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 runs without success. In 1996, to increase the proportion of wild rainbow trout, MFWP shifted from Arlee rainbow to Eagle Lake rainbow. On alternating years, approximately 100,000 age one and 371,000age zero rainbows are planted to evaluate the most cost effective approach.

Strategies:
- Continue to stock at least 100,000 age one and 350,000 age zero Eagle Lake rainbow on alternating years to determine the most cost effective approach to Eagle Lake rainbow stocking program. To minimize flushing losses, stocking of fish will occur after high water.
  - Continue to investigate which stocking approach (age I+ or age II+) provides the greatest angler return. Specific parameters used to evaluate the stocking approach will include: growth rates, survival rates, flushing rates (quantified following allocation of re-licensing funds), reproductive potential and angler harvest rates.
  - Depending on walleye predation rates and outcome of stocking approach, evaluate late fall release of Eagle Lake or Arlee rainbows.
- Monitor whirling disease presence and impacts. If whirling disease is discovered in Holter, investigate adaptive rainbow planting strategies to minimize the potential impacts on the Holter Reservoir rainbow fishery.
- Encourage the development of wild rainbow trout spawning and recruitment from the Hauser tailrace and principal spawning tributaries (Beaver, Cottonwood and Elkhorn creeks).
  - Extend closure on Beaver Creek from May 15th to June 15th to protect spawning rainbow trout.
  - Develop fish passage management plans with MFWP wildlife division and USFS that incorporates beaver management programs on Beaver, Elkhorn and Cottonwood creeks.
  - Investigate feasibility of developing the Beaver Creek rainbow run into an egg source.

Kokanee Salmon

Goals and Objectives:
Rely on kokanee salmon flushed from Hauser Reservoir and any natural reproduction that may occur in Holter Reservoir to provide limited kokanee harvest.
- No objectives can be established because the success of this fishery is entirely reliant on the outcome of the Hauser Reservoir kokanee reintroduction program.

Rationale:
Kokanee are spawning unsuccessfully or with limited success in Holter Reservoir. Kokanee populations in Holter continue to mirror the kokanee population declines 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 a record low of only four. Of these four fish, three were hatchery kokanee planted into Hauser.

Strategies:
- Reestablish a self-sustaining population in Hauser Reservoir by stocking approximately 100,000 – 300,000 (based on availability) kokanee annually. If environmental conditions are favorable and the kokanee population reestablishes in Hauser, fish will be annually flushed into Holter. Because of poor natural reproduction in Holter, MFWP biologists do not believe kokanee spawning will significantly contribute to the Holter fishery.

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.

- Maintain a running three-year running average of least 3.0 walleye per fall sinking gill net.
- Maintain a three-year running average of at least 30% of the population between 20 and 28 inches in fall sinking gill nets.
- Maintain a running average summer angler catch rate of 0.10 walleye per hour for anglers specifically targeting walleye.

Rationale:
Holter has supported a healthy population of fast growing 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 has become 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. The expanding population of walleye in Canyon Ferry and associated flushing losses will affect the Holter population but the impacts are unclear.

Strategies:

- Revise angler harvest levels from 3 fish less than 18 inches and 1 fish greater than 28 inches to 5 fish less than 20 inches and 1 over 28 inches. All fish between 20 and 28 inches must be released. Walleye populations are anticipated to achieve densities sufficient to produce a running three-year average of 3.0 or mor per fall sinking gill net during the 2000-2001 fishing regulation cycle which triggers the proposed angling regulation change.
  - Assumes that a proportion of small walleye captured in 1998 fall gill nets are products of the 1997 year class produced and flushed from Canyon Ferry. To sustain the multi-species balance, increased harvest is necessary to reduce predation on other sport fish.
  - Spring trap-netting data suggests that the majority of spawning adult walleye are greater than 20 inches. Raising the slot from 18 inches to 20 inches is not expected to impact the spawning population. However, recruitment of fish to spawning size will likely be impacted through increased harvest of smaller fish.
  - Evaluate reductions in angler daily limits and/or adjusting slot limit if running average falls below 2-3 walleye per fall sinking gill net for three consecutive years, or if the proportion of walleye between 18 and 28 inches falls below 30% in fall sinking gill nets.
- Determine how flushing of walleye from Canyon Ferry influences the Holter Reservoir walleye fishery. Annually tag walleye in Canyon Ferry and Hauser 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.
- Intensify enforcement efforts to reduce the proportion of slot limit 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. Determine the feasibility of operating periodic check stations to evaluate regulation compliance.

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 at least 10 yellow perch per fall sinking gill net.
- Provide 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.

Rationale:
Yellow perch have maintained significant population levels in the reservoir entirely through natural reproduction. Historically, perch have comprised a substantial portion of the Holter fishery; principally the winter ice fishery. From 1993 to the present, perch numbers have been declining with severe reductions following high water years of 1995, 1996 and 1997. No limits are currently in place on the number of perch anglers can harvest in Holter Reservoir. Recent declining perch numbers in Hauser, Holter and Canyon Ferry Reservoirs has sparked interest in imposing a limit. A limit would achieve two objectives: 1) reduce the total number of fish harvested by anglers thereby increasing the number of spawning age fish in the population, and 2) recognize that increasing walleye populations in the three reservoirs will have an impact on perch populations. Recognizing that yellow perch are an important component of the walleye diet, a limit may increase the number of perch available as forage.

Strategies:
- Propose a 50 perch limit on Holter Reservoir.
- Monitor perch populations to determine seasonal flushing losses if funding becomes available through FERC re-licensing.
- Continue to evaluate predation impacts by walleye on Holter Reservoir yellow perch populations.
  - Collect walleye stomachs during normal field surveys.
  - Maintain a database on seasonal walleye perch consumption.

Other 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 Holter Dam to reduce flushing losses.

Rationale:
Flushing losses of fish out of Holter Dam is the primary 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. Kokanee population fluctuations in Holter Reservoir can be largely attributed to strength of age class produced in Hauser Reservoir and magnitude of water runoff. Rainbow trout and walleye flushing have also been documented.

Strategies:
- Following allocation of FERC re-licensing funds, 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.

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 will increase as the population in Canyon Ferry increases. Increased walleye densities in Holter Reservoir will affect the balance of the

multi-species fishery with increased predation on trout and yellow perch. Walleye in Holter eat up to 45% trout and salmon and up to 50% yellow perch depending on the season. This level of consumption by an expanding walleye population will impact the number of yellow perch and hatchery rainbow trout that are available for anglers.

Strategies:

- Request funding from the U.S. Bureau of Reclamation to determine walleye flushing rates.

Habitat

Goals and Objectives:
Enhance wild fish spawning opportunities in Holter Reservoir tributary streams.

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 reduction of productive stream habitat throughout the watershed. Specific limiting factors include increased amounts of sand and silt, channel straightening (loss of stream length), and loss of large woody debris recruitment. Recent fires and beaver colonization are also influencing fisheries production.

Strategies:

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

Disease

Goals and Objectives:
Monitor Holter Reservoir and principal tributaries for whirling disease.

Rationale:
Whirling disease is a prominent player in fish management in Montana. Rainbow trout are planted in Holter when they are 4-8 inches and are not as susceptible to contract whirling disease. However, wild fish produced from Beaver Creek or the river section above Holter Reservoir have a high chance of exposure to the disease.

Strategies:

- Annually collect rainbow trout and kokanee salmon tissue samples from Holter Reservoir and tributaries for whirling disease testing. Include whirling disease testing results in annual reports.
  - Pending availability, samples from 60 rainbow trout and kokanee salmon will be collected annually from Holter Reservoir.
  - Tributary sampling from 60 fish will occur during even numbered years in the following streams: Beaver, Cottonwood and Elkhorn creeks.
  - Collect 60 fish during even numbered years in the Hauser tailrace (Missouri River section above Holter Reservoir) for testing.
- Conduct *in situ* exposure testing in Holter Reservoir and/or Missouri River. Utilize statewide whirling disease funding and manpower to conduct *in situ* exposure of fish to determine infection rates and severity.

Derbies/Tournaments

Goals and Objectives:
Manage derbies/tournaments for consistency with fisheries management goals and objectives for Holter Reservoir and to minimize conflicts with the general angling public.

Rationale:
No angling tournaments are currently scheduled on Holter Reservoir. Increased interest in fishing tournaments is likely to result in additional requests to hold tournaments in the future.

Strategies:

- Discourage ice-fishing tournaments on Holter Reservoir. Ice on Holter rarely develops to a level that would allow for safe ice-fishing tournaments.
- Monitor harvest associated with tournaments. If harvest of sport fish is determined to be excessive and detrimental to the population, angling tournaments of this nature will be evaluated with the possibility of discontinuance.
- No walleye tournaments will be authorized on Holter Reservoir because of the slot limits in place.
- No more than two derbies/tournaments will be allowed each year. Proposed tournaments will be required to coordinate access facility use with BLM. Use of private access will be encouraged and mitigation for potential crowding problems will be required.

Plan Implementation

Following public comment, a final Management Plan will be prepared for the Upper Missouri River Reservoir system. This plan will be used for planning activities for the next 10 years 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. Monitoring data will be summarized and presented annually to interested citizens as part of the ongoing public involvement process. Meetings will be held in February or March, and will be widely publicized to solicit participation and input.

Schedule

Action	Dates
Draft Management Plan Public Comment	September through October 22, 1999
Distribute Final Management Plan	December 1999
Monitor Fisheries	On-going, annually
Prepare Annual Report	Fall, annually
Public Meetings	February/March, annually
Review/Revise Management Plan	As needed
Propose Changes to Fishing Regulations	Odd years, as needed

References

Bandow, F. L. 1969. Observation on the life history of the yellow perch and fish population trends in Canyon Ferry Reservoir, Montana. Thesis, Montana State University, Bozeman.

Binkley, K. M. 1996. Habitat Selection of Adult Walleye (*Stizostedion vitreum*) in Holter Reservoir, Missouri River. M.S. Thesis. Montana State University, Bozeman, Montana. 97pp.

Federal Energy Regulatory Commission, 1997. Draft Environmental Impact Statement, Missouri-Madison Hydroelectric Project. (FERC Project No. 2188). Division of Public Information, Federal Energy Regulatory Commission. 888 First Street, NE. Washington, DC 20426.

Lere, M. 1987. Statewide fisheries investigations, mid-Missouri reservoirs study. MFWP, Job prog. Report F-36-R-2, 11-f.

McMahon, T.E. 1992. Potential impacts of the introduction of walleye to the fishery of Canyon Ferry Reservoir and adjacent waters. Prepared for MFWP, Helena, Montana. 49 pp.

Montana, Fish, Wildlife and Parks. 1985. Upper Missouri River Reservoir Operating Guidelines for Fish, Wildlife and Recreation. 38pp.

Montna Fish, Wildlife and Parks, 1992. Canyon Ferry Reservoir/Missouri River Fisheries Management Plan, 1993-1998. 71 pp.

Montana Fish, Wildlife and Parks, 1989. Hauser Reservoir Management Plan. 16pp.

Priscu, J.C. 1986. Environmental factors regulating the dynamics of blue-green algal blooms in Canyon Ferry Reservoir, Montana. Montana State University, Water Research Center Report 159, Bozeman.

Rada, R.G. 1974. An investigation into the trophic status of Canyon Ferry Reservoir, Montana. Dissertation, Montana State University, Bozeman.

Skaar, D and T. Humphrey. 1996. Statewide Fisheries Investigations. Survey and Inventory of Coldwater Lakes (Part B). Flushing Losses of Hatchery Rainbow Trout From Three Mid-Missouri River Reservoirs. Project F-46-R-7. Job II-f. FWP. 54pp.

Thomas, G. 1991. Personal communication. Regional Fisheries Manager, MFWP, Bozeman, Montana.

US Forest Service. 1998. Unpublished Data. Beaver Creek (D-2) Rainbow Trout Redd Survey Report.

Appendix A

FINAL REPORT:
Canyon Ferry, Hauser, Holter
Fisheries Management Work Group

September 1998

Canyon Ferry, Hauser, Holter Fisheries Management Work Group

Business interests
Terry McArdle,

Federal interests
Pete Schendel

General anglers
Fred Easy

Hauser/Holter anglers
Clete Daily

Local Government
Doug Breker

Montana Fish Wildlife & Parks/Region 4
Steve Leathe

Montana Fish Wildlife & Parks/Region 3
Bruce Rich

Montana Power Company
Brent Mabbott

Trout interests
Bill Holdorf

Upstream/downstream angling
Bruce Farling

Walleye interests
Mike Sedlock

TO: FWP Commission Members and Other Interested Parties

FROM: Fish Work Group *(see list at left)*

SUBJECT: Final Work Group Report

DATE: September 30, 1998

Attached is the summary report on our progress as a work group. We met in public work group meetings six times over the past five months, and sponsored two larger public forums on July 15 and September 17.

Our charge was to jointly organize data to convey the baseline fisheries situation to public audiences, and to engage a panel of out-of-state fisheries experts to provide independent insights and commentary on habitat, fish passage and predator-prey issues.

Although we were not charged with reaching consensus on the future of fisheries management for these three reservoirs, several points of agreement did emerge during our work. We are unified in our support for managing the three-reservoir system as a high quality, cost-effective, multi-species fishery, and for improving the implementation, monitoring, and evaluation of the new 10-year plan. We also agree on a number of suggested means to achieve these ends. We understand achieving the goal of a high quality, cost-effective, multispecies fishery over the next 10 years will be a difficult task – the fishery is in a high state of change.

This report presents the results of the five-month work group process. The report has four sections: (1) points of agreement and suggested means to achieve them; (2) documentation an unresolved issue; (3) a brief overview of from the July and September forums; and (4) a summary of our understandings regarding FWP's next steps and schedule for getting public input in the development of the new plan. As appendices to this report we've included the initial letter from Fish Wildlife & Parks leadership; a copy of the charter we jointly adopted to guide our work; and a page of work group definitions for your reference.

The purpose of this document is to give our collective guidance and advice to FWP as the agency develops the draft plan. More comprehensive documentation (such as meeting summaries, data compilations, and other documents) of the work group process is available from the facilitator, Nedra Chandler, at the Montana Consensus Council (phone: 444-4457).

Although this marks the end of this work group effort, we intend to continue participating individually in the development of the new 10-year management plan for these reservoirs. We urge FWP to continue its concerted effort to get a new plan in place. Please don't delay the difficult decisions in front of you. We have appreciated the opportunity to do this work together, and to serve as contact points for others who are also interested.

FINAL REPORT:
Canyon Ferry, Hauser, Holter Fisheries Management Work Group

September 1998

Business interests
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Federal interests
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General anglers
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Montana Power Company
Brent Mabbott

Trout interests
Bill Holdorf

Upstream/downstream angling
Bruce Farling

Walleye Interests
Mike Sedlock

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INTRODUCTION

The work group has had consistent participation over the last five months from 10 interests represented at the table, including 1) business, 2) federal, 3) Hauser/Holter anglers, 4) local government, 5) Fish, Wildlife & Parks fish managers, 6) Montana Power Company, 7) trout interests 8) walleye interests, 9) upstream/downstream angling, and 10) general, multi-species angling (a seat for those who fish for whatever is biting).

The work group attempted to represent all parties with a recognized stake in the fisheries management outcomes, but one structural limitation of the work group has been the absence of general, unaffiliated anglers. These are anglers who, according to FWP's surveys on Hauser/Holter in 1989 and Canyon Ferry in 1991, prefer to fish for trout and salmon. FWP's plan for checking on the current status of preferences as they relate to angler satisfaction aspects of the new 10-year plan is likely to include some additional public survey work. One challenge will be to gauge angler acceptance and satisfaction regarding the increased numbers of walleye in the system.

The participants who have participated in the work group over the past five months have diverse and sometimes conflicting interests in several key areas. Yet all of us agreed on the following end results and the specific means to help achieve those results. Our recommendations reflect the common ground we found.

For any diverse group, the challenge in pointing out areas of agreement is to avoid platitudes and, instead, highlight points of agreement that can be used as a practical matter of implementation. We believe we have done that.

We would like to see evidence that FWP considers these recommendations in the plan. We understand we will receive a brief response to these recommendations from the plan writers once the draft is completed – pointing out where and how our advice was used or not; and if not, why not.

I. Work Group Points of Agreement

The next three pages contain two end results and 12 suggested means to help achieve these ends. These are points of agreement among all ten interested parties represented at the work group table.

END 1: The fisheries management goal for this 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.

Means to Get There/Recommended Actions:

Adaptability

- Give fish managers room to try adaptive approaches to meeting this difficult goal. Ten years is a long time. This is a dynamic system in which cold, cool, and warm water environments meet (see definitions Appendix C). We understand new management approaches could be more costly than the previous primary focus on the (cold water) trout fishery in Canyon Ferry and on kokanee salmon in Hauser/Holter. Try to fit the fishery to the ecological characteristics of the reservoirs–each with its unique qualities, habitat, and water exchange rates, but all interdependent.

Durability

- The new 10-year fisheries plan should provide a clear, durable roadmap for fish managers that has passed Montana Environmental Policy Act review–striking the appropriate balance between being too prescriptive or too vague.

Cost Factors

- Maximize cost-effectiveness of fish management actions in the system.

Vision & Leadership

- At the same time FWP is avoiding excessive costs, it should also look for creative ways to fund the multi-tiered fishery in the reservoir system. FWP should help provide the necessary vision and leadership that will be needed. *(Although the work group does NOT jointly support the following, approaches could include, for example: general license fee increases; a $5 reservoir stamp; or help securing funding or assistance from multiple sources for raising salmon or trout in net pens on an experimental basis.)*

Geographic Scope

- The work group supports FWP's decision to manage all three reservoirs as one system. Given this new arrangement, FWP should consider a staffing structure for the reservoirs that integrates and unifies the day-to-day implementation of the new 10-year plan for the three reservoirs. The point is to provide a functional way to span FWP's artificial regional boundary between the reservoirs.

Habitat

- Evaluate and implement ways to improve fish habitat in all three reservoirs whenever possible and feasible while promoting angler understanding that this is still an unproven management tool. Habitat structures have not been proven to increase fish production, although it is known that fish use them. Evaluate the results of current research when results become available. Proceed accordingly.

Water Level Management

- As recommended by one of the independent panelists, continue to explore the possibilities of water level management as a means to maintain or improve the fisheries in the reservoirs. Recognize that limitations include winter electricity production requirements, spring flood control, and the need to maintain adequate streamflows in the Missouri River below Holter dam.

Forage Fish

- In case of imminent collapse of the forage base FWP will immediately analyze management alternatives to avoid such a collapse. The work group recommends yellow perch be emphasized because they are not only a preferred, high quality forage item, but also a sought-after sport fish.

Ecosystem Values

- Management of the three reservoirs should ensure minimal risk to tailwater fisheries. Fish management should take into serious account larger ecosystem values, including for example, native species, relationships between fisheries, eagles, and riparian health.

Water Quality

- FWP should advocate the maintenance and improvement of water quality as an integral part of the new fisheries plan. A particularly alarming example of the need for this is recent data that indicates low dissolved oxygen in the deeper waters of Canyon Ferry. This presents a serious threat to sport fish in the upper end of Hauser reservoir (particularly spawning kokanee salmon). FWP should work closely with the Bureau of Reclamation, Montana Power Company, and the Montana Department of Environmental Quality's Water Quality Bureau to develop short- and long-term solutions.

END 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.

Means to Get There/Recommended Actions:

Criteria to Judge Success

- Develop objective criteria as part of the new plan against which to publicly judge the success of the plan over the 10-year period. Suggested criteria could include biological, angler use, and economic criteria. For example:
  - ✓ There should be a year-round fishery, for which angler satisfaction, angler days and catch raters should – in trend – stay at current levels or greatly improve. Keep the focus on the long-term fishery condition.
  - ✓ Be clear about the baseline data FWP tracks – in terms of sampling indices that help indicate the relative abundance of fish, and data on available food sources for the fish.

Annual Monitoring & Data Sharing

- FWP should sponsor at least one annual public/town meeting every winter as part of systematic monitoring of the 10-year plan implementation. The purpose is to share data and observations showing trends and report the status. FWP should maintain a comprehensive mailing list for this purpose, including the one developed for this work group process. Coordinate participation from the Bureau of Reclamation, Bureau of Land Management, and marina operators to provide use data.

- From marina operators to general anglers to other activists, people want regular, accessible data on the baseline fisheries situation in the reservoirs for their own knowledge, and to pass along to their customers. FWP should publish annual reports including monitoring data on Canyon Ferry, Hauser, and Holter fish trends. These should be available on request at the Helena Area Resource Office and be available in electronic format on a website. Data should include, for example: angler use of each reservoir (when data is available from this statewide survey now conducted every two years), catch rates, relevant details on fish stocked, and the most recent net counts. We anticipate this type of easy, broad access could help reduce the amount of FWP staff time spent on individual data requests in the future.

No Agreement Exists as to How and When Walleye Got into the System.

When the work group came together, it explicitly avoided the long-standing disagreement about how and why walleye got into the system. Most agreed there is no practical way to resolve the question with finality. At the same time, participants identified this question as a source of conflict. It was assumed to be linked to how FWP will be inclined to treat and manage walleye in the future: as a sport fish that can be managed to coexist with trout, yellow perch, and kokanee in the system, or as a pest that should be controlled.

Some members of the work group are of the opinion that walleye were illegally introduced in Canyon Ferry, although FWP has not been able to prosecute anyone for this felony offense. Other work group members continue to assert that walleye probably came into the system much earlier than FWP records show. The issue of illegal introductions concerns many people statewide. Although FWP continues to investigate illegal stocking of walleye in Canyon Ferry, future walleye management will be based on the goal of maintaining a multispecies fishery in all three reservoirs.

Regarding Canyon Ferry, the work group has agreed to recommend walleye be referred to as an unauthorized species (see Appendix C for definition) in the new fish management plan. This term reflects the acceptance of the work group that walleye were not native in the system, nor were they intentionally introduced by FWP or other authorized agents.

Walleye is now an established sport species in the system. They, and other sport fish, will be managed* according to their role in, and effect within, the fish communities.

* **Fish management** means to enhance, sustain, suppress or control aquatic organisms, habitat, and humans (e.g., fish management actions directed at anglers).

July 15, 1998: Public Forum on Baseline Fisheries Situation

Purpose:

With assistance from the work group members, FWP panelists presented the most relevant FWP data available on the baseline fisheries situation in each reservoir. The goal was to provide a common base of fisheries information and begin to articulate some of the most pressing fisheries management questions that will have to be addressed in the next 10 years. The forum ran from 5:30-9 pm at the Colonial Inn in Helena.

Participants:

Approximately 50 participated in this forum. Thirty participants signed in, and an additional 20 people dropped in for parts of the evening, which included an open house from 4-5:30 pm.

Results:

Work products: summary and unedited videotape of meeting and baseline data packet available from FWP's Montana Environmental Policy Act coordinator for this project – Jim Satterfield at 444-1563. Response to the forum was positive. Participants were asked for their thoughts on what they were taking away from the forum. Things that were noted as positive included compliments for the ample, valuable information presented, the effective format, and the fact that the baseline information clarified many issues. Room for improvement was noted in the following areas: wish for more attendance, wish for more time to digress on the data, the economics of the situation etc., and more time for questions and comments.

September 17, 1998: Jointly-Selected Fisheries Panel

Purpose:

Engage a panel of out-of-state fisheries experts to provide independent insights and commentary on habitat, fish passage, and predator-prey issues. Panelists, and the questions they were asked to address, were jointly selected by the work group to boost the credibility and balance of the perspectives presented. The panel discussion ran from 6:30-9:30 pm at the Colonial Inn in Helena, with a pre-meeting with the panelists earlier in the afternoon from 2-5 pm.

Participants:

44 participants attended the panel discussion.

Results:

Work products: full transcript (144 pages) available from FWP's Montana Environmental Policy Act coordinator for this project – Jim Satterfield at 444-1563. Response to the forum was positive. See agendas for both forums in Appendix D of this report.

IV. Work Group Understanding Regarding FWP's Next Steps and Schedule

Phase 1: November 1997 – September 1998 (COMPLETE)

- ▲ FWP asked the Montana Consensus Council to conduct a situation assessment (and thus begin scoping for the Montana Environmental Policy Act process that followed).
- ▲ 80+ individual interviews conducted to cull out substantive and process suggestions people had for moving forward.
- ▲ Work group convened April 27. Adopted charter document to guide work.
- ▲ Work group delivers final report (this document) to FWP and mails to list of interested public.

Phase 2: October 1998 – Summer/Fall 1999

- ▲ FWP releases draft management plan/environmental document for 60- to 90-day public review and comment.
- ▲ FWP finalizes plan for director's signature.
- ▲ FWP commission acts as body to hear any appeals.

Phase 3: Fall 1999 – Winter 2000

- ▲ FWP begins implementing actions contained in new 10-year plan.

Phase 4: 2000-2010

- ▲ FWP holds annual open meeting to review and monitor the implementation of the new 10-year plan and publicly discuss progress.

APPENDIX A:
COMMITMENT LETTER
FROM FWP LEADERSHIP

Montana Fish, Wildlife & Parks

May 4, 1998

Dear Fish Management Work Group Participants,

We appreciate your willingness to engage in this work group. We are counting on this work group effort to be candid, open, and get to the crux of the fisheries management issues on Canyon Ferry, Hauser and Holter reservoirs. In the past several months, the need to publicly review and build a common base of information by bringing together work group members and other interested people with local, regional, and perhaps national fisheries experts has become clear. We look forward to public workshops designed by this work group, to advance peoples' understanding and contribute to a set of management alternatives for environmental review under the Montana Environmental Policy Act.

The purpose of this letter is to catalog our understandings and make a number of specific commitments to this public consultation effort.

1. Use of Work Group Results

We will listen to, and use, the timely results of this group effort to help develop the future fisheries management alternatives for environmental analysis under the Montana Environmental Policy Act (MEPA). We understand a main work product of this group will be a short *Report on Public Workshops* documenting the questions posed to technical experts on the existing fisheries situation, and listing areas of apparent agreement and disagreement that emerge during the work group process.

2. Work Group Representation

As a result of the first work group organizational meeting on April 27, we understand the following individuals will serve on the work group. Each seat at the table has a designated alternate who has agreed to follow the process and attend meetings as needed.

Montana Fish, Wildlife & Parks	Steve Leathe, Region 4 fish manager: 454-5855 (Great Falls -- Hauser and Holter) and Bruce Rich, Region 3 fish manager: 994-3155 (Bozeman -- Canyon Ferry)
Business Interests	Terry McArdle, 266-5700 (Townsend)
Federal Agencies	Pete Schendel, 475-3310 (Helena)
General Anglers: Multispecies	Fred Easy, 841-3397 (Helena)
Hauser/Holter Anglers	Clete Daily, 227-6413, (Helena)
Local Government	Doug Breker, 266-5279 (Townsend)
Montana Power Company	Brent Mabbott, 497-3408 (Butte)
Trout interests	Bill Holdorf, 494-6023 (Butte)
Upstream/Downstream Interests	Bruce Farling, 543-0054 (Missoula)
Walleye interests	Mike Sedlock, 444-9851 (Helena)

3. Overall MEPA Process

The work group is one element of the overall MEPA process that will result in the 10-year plan. Jim Satterfield, fish management bureau chief (444-1563) will be the MEPA team leader. We commit to carrying out a multifaceted public consultation strategy to provide people with a number of ways to get involved or comment. Any assistance work group members can give us in this broader public consultation work will be greatly appreciated.

All of us have invested time and thought into designing a workable public process to produce a sound and durable 10-year fisheries plan for the upper Missouri reservoirs. We want this process to go forward with purpose and clarity. We look forward to using the results. Thanks again for your interest and involvement.

Patrick Graham, Director

Stan Meyer, Commission Chair

APPENDIX B

CHARTER

for the Fisheries Management Work Group
Canyon Ferry, Hauser, and Holter Reservoirs

Adopted: 4/27/98

1.0 Introduction

1.1 This document is based on the findings presented in Fisheries Management on Canyon Ferry, Hauser, and Holter Reservoirs, a situation assessment prepared by the Montana Consensus Council, comments from interested parties on the situation assessment, and the results of a series of informal caucus meetings held in March 1998.

1.2 The purpose of this charter document is to outline a work plan and a set of ground rules to guide the activities of the participants involved in the work group.

1.3 The work group is a temporary advisory body to the Department of Fish Wildlife and Parks (DFWP) with three main features that set it apart from standard advisory committees:
a) participants are not appointed by the convening authority; they are selected by, or come from, the primary interest they are there to represent;
b) members are expected to represent the points of view of their main interest area or caucus, not perspectives of the individual organization or business from which they come;
c) the work group jointly adopts its charter and has access to a impartial party responsible to all members of the work group. The impartial party, confirmed as acceptable to all members, will help the work group meet the purpose and principles in this charter.

1.4 The work group effort -- to conduct and design a series of public workshops -- is neither a voting nor a consensus process. Issues will be resolved through dialogue. If and where disagreements remain, they will be noted and documented by the work group in each meeting's summary document and in the final report on the public workshops.

1.5 Final decisions on the environmental analysis and the fisheries management plan will be made by DFWP based on what is best for the resource and through systematically considering results of work group/public workshops and broader public consultation carried out under the Montana Environmental Policy Act (MEPA).

1.6 Upon adoption, each member of the work group agrees to this charter, and agrees to abide by the ground rules.

Suggested Work Plan

2.0 **Purpose**

2.1 The purpose of the work group is to design and conduct a series of two or more public workshops. Pending joint discussion by the work group, the general outline for the workshops is likely to include:

A. **Public Workshop 1**: DATA: What is the existing situation surrounding fisheries management in the three upper Missouri River reservoirs? What is the most relevant, existing data in terms of biology, social/administrative, and economic issues? For what, and how, is the fishery currently being managed in each reservoir? What are the outstanding questions or uncertainties on which technical expertise is most needed (DFWP and external experts or scientists)? Specifically who should be sought to deliver these insights and opinions, or what qualities should such an expert have in order to be credible and help provide the necessary balance of perspectives?

B. **Public Workshop 2**: MORE DATA: Information stations put together by the work group and facilitated expert panel discussions.

C. **Public Workshop 3**: RESPONSE TO DFWP'S FIRST OUTLINE OF ALTERNATIVES FOR FUTURE MANAGEMENT (to go forward for environmental analysis). Given the constraints and opportunities identified in workshops 1 and 2, do these alternatives reflect the range of future management options people want to see moved forward for MEPA analysis?

2 To achieve the 3-point purpose noted in 2.1, participants agree to consider and respect the legal, institutional and other constraints or requirements, such as the Montana Environmental Policy Act, available budgets for planning and implementation, existing permitting programs, and federal laws such as the Endangered Species Act

3.0 **Expected Work Products and Schedule**

3.1 This effort is expected to be begin April 27 and be complete by September 30, 1998. With the assistance of the impartial facilitator, all work group participants will jointly prepare the following work products:

A. Final, adopted work group charter document -- a public document available to anyone interested (this document).

B. Agendas, work group milestones chart, and assistance with public notification for each public workshop designed and conducted by the work group.

C. Report on Public Workshops, including documentation of areas of agreement and disagreement for the benefit of the FWP Commission and for other FWP officials who will construct the set of alternatives for MEPA analysis.

3.2 Work group participants agree to assess whether or not the work group is making acceptable progress and jointly determine if it is worth continuing every meeting beginning with the initial meeting of the full work group.

4.0 **Understandings Regarding DFWP Interim Fisheries Management Actions on the Reservoirs**

4.1 The understanding is that DFWP will continue to carry out the 1993 management plan for Canyon Ferry (except where the decision has already been made not to remove spawning walleyes with gill nets in the spring of '98), and the 1989 Hauser Reservoir Fisheries Management Plan. DWFP will not ask the work group for any specific advice on interim management actions in the three reservoirs.

Ground Rules

5.0 **Participants**

5.1 Representatives of the work group will strive to include the perspectives of all individuals and organizations whose interests may be affected by the fisheries management issues at stake.

5.2 The following 11 caucuses have been identified to have a seat at the work group table.

1– Business Interests: Terry McArdle, 266-5700 (Townsend)
2– Federal Agencies: Pete Schendel, 475-3310 (Helena)
3– General Anglers: Multispecies, Fred Easy, 841-3397 (Helena)
4– Hauser/Holter Anglers: Clete Daily, 227-6413 (Helena)
5– Local Government: Doug Breker, 266-5279 (Townsend)
6– Montana Fish Wildlife & Parks: Steve Leathe, 454-5855 (Great Falls, Hauser/Holter -- Region 4)
7– Montana Fish Wildlife & Parks: Bruce Rich, 994-3155 (Bozeman, Canyon Ferry, Region 3)
8– Montana Power Company: Brent Mabbott, 497-3408 (Butte)
9– Trout Interests: Bill Holdorf, 494-6023 (Butte)
10– Upstream/Downstream Angling Interests: Bruce Farling, 543-0054 (Missoula)
11– Walleye Interests, Mike Sedlock, 444-9851 (Helena)

5.3 The concept of seats at the table is that these categories of interests will function as access points for like-minded interests.

5.4 Each caucus is expected to designate a team of at least one consistent participant and, if practical, at least one alternate.

5.5 Because work group members don't want to waste time getting new members up to speed, the expectation is for consistent attendance by designated work group members.

5.6 If there is poor attendance for one of the seats at the table, remaining work group members will jointly determine how to remedy the balance and composition of the work group. If an acceptable balance of perspectives cannot be achieved, the opportunity for any other or all parties to withdraw from the process is open throughout the process (see 7.1 points G and H and 7.3 point B)

5.7 DFWP is both an active participant in the work group effort and the final decision maker/adopting agency for the MEPA analysis/fisheries plan.

6.0 **Open Meetings**

6.1 All meetings of the work group are open to the public -- including any informal meetings leading up to the three public workshops for which the work group is responsible. If citizens have concerns over any item under discussion by the work group, they are encouraged to speak with the participant they feel best represents their interests.

6.2 Any individual, group, or community may, upon request, present and discuss any issue or concern related to the work group's purpose on terms agreeable to the participants.

6.3 Other persons, such as technical experts, will be asked to address the work group, and members of the broader public workshops, on terms agreeable to work group participants.

6.4 Individuals that do not participate in the work group itself may:

A. Serve as resource people; and/or
B. Be kept informed and provide input through caucus representatives.
C. Be kept informed through occasional mailings or press releases.

6.5 Meetings will begin and end on time.

6.6 Brief summaries of work group progress and action items will be promptly prepared by the impartial facilitator and available upon request. Detailed minutes of work group deliberations will not be kept.

7.0 Participant Responsibilities

7.1 Responsibility to Other Participants

A. Each participant and caucus agrees to candidly identify and share their values and interests.
B. Each participant and caucus agrees to listen carefully and respectfully to other participants and share discussion time.
C. Each participant and caucus agrees to offer suggestions with respect and care.
D. Each participant and caucus agrees to communicate with each other directly, rather than through the news media.
E. Each participant and caucus agrees to challenge ideas, not people.
F. Each participant and caucus agrees that views expressed at meetings are for the benefit of the work group and should not be raised by the participants in other circumstances.
G. Each participant and caucus agrees to respect the decision of any participant and/or caucus to withdraw from the forum at any time and for any reason.
H. Each participant and/or caucus agrees to explain to the other participants and caucuses the reason for withdrawal from the process.
I. Each participant agrees to take responsibility for reading and reviewing agreed-upon materials, and come to meetings prepared to discuss the issues at hand.

7.2 Responsibility to Constituencies

A. Each participant agrees to identify the interests of the constituency they represent.
B. Each participant agrees to seek the advice of their constituency throughout the process.
C. Each participant agrees to make every effort to represent and speak for their constituency.
D. Each participant agrees to accurately explain and interpret the process and its proposed outcomes to their constituency.
E. Each participant agrees to keep their constituency informed of the activities and ideas emerging from the process.
F. Each participant agrees to encourage their constituencies to respect and actively engage in this process in a constructive manner.

7.3 Decision Making

A. Each participant agrees issues will be decided through dialogue and not voting. It is possible to agree to disagree and then delineate next steps to attempt to resolve the issue.
B. Each participant and caucus agrees to fully and consistently participate in the process unless they withdraw.
C. Each participant and caucus agrees to fully explore and understand all issues before reaching conclusions.
D. Each participant and caucus agrees to search for creative opportunities to address the interests and concerns of all participants.
E. Each participant and caucus is committed to designing and conducting a series of public workshops. Each caucus has the ability to disagree with any proposed agenda item or expert opinion being sought, but assumes a responsibility to offer a constructive alternative that seeks to accommodate the interests of all the other participants.
F. If the participants cannot reach agreement on certain issues, they agree to document their

disagreements and allow DFWP to attempt to resolve the disagreement. DFWP agrees to respond within 10 business days with guidance or a decision.

G. Subcommittees may be formed by agreement of the full work group provided the subcommittee has a specific task and reports back to the full work group.

H. If an impasse is declared by any party, a impartial party will be available to help the work group resolve the impasse.

I. During a meeting a break can be called by any work group member or the facilitator. Asking for a break is not a signal the meeting is breaking down. It provides an opportunity to briefly discuss issues with another individual, a smaller group, the facilitator, or caucus members in order to come back to the work group and proceed effectively.

8.0 Coordination and Facilitation of the Work group

8.1 As confirmed by work group members at the first organizational meeting on April 27, 1998, Nedra Chandler of the Montana Consensus Council will serve as the impartial facilitator for the work group process ending September 30, 1998.

9.0 Communication with the Media

9.1 From time to time, a jointly-agreed-upon summary statement describing the progress of the work group may be prepared for distribution to the media the general public, and other interested parties (to be coordinated by the impartial facilitator). When discussing the statement, the participants will respond within the spirit of the statement.

9.2 Each participant is free to speak to the media regarding their own views on these issues. No participant may characterize the views of other participants expressed in this process to the media or in other forums. As a point of courtesy and information, if a participant speaks to the media, he or she should contact the facilitator who will let other work group members know.

APPENDIX C

WORK GROUP DEFINITIONS. The following fisheries management terms of reference were clarified and discussed at the work group's June 15, 1998 meeting in order to promote a common understanding.

Fish management means to enhance, sustain, suppress or control aquatic organisms, habitat, and humans (e.g., fish management actions directed at anglers).

An **unauthorized species** means any species of fish present in a body of water which is neither naturally occurring (native) nor intentionally introduced by FWP or other authorized agents. Existence of unauthorized species result from a) illegal introduction, b) natural immigration from adjacent waters, or c) escape from private ponds or hatcheries etc. In answer to the question, "what is FWP's policy on these species," the answer is the agency treats each on an individualized basis. FWP looks at the occurrence of the species; the effect the species is having (can be benign, beneficial, or devastating -- with devastating being the most common); and the agency's ability to control the species (e.g., suppression, angler behavior, and water level management).

Fish species classification according to water temperature preferences are inexact categories to simply note the water temperature in which certain fish species tend to do their best. These temperatures overlap with one another, but generally, when someone refers to **coldwater species**, they mean fish like trout and salmon and other sport fish that do well in 35-60 degree waters (Fahrenheit). **Coolwater species** generally means walleye, sauger, yellow perch, smallmouth bass and others that do well in about 45-70 degree waters. **Warmwater species** such as sunfish, black bass and catfish do well in about 58-80 degree waters.

In addition to water temperature, there are many other influencing factors that contribute to decisions about which fish are going to thrive or not in particular waters. These include: water quality (e.g., presence or absence of dissolved oxygen and turbidity); habitat (e.g., shoreline, zone, structure, and aquatic plants); food/feeding conditions (e.g., available prey, plankton, and water clarity); and fish community composition (e.g., predators, prey and competitors).

The following definition was offered by the facilitator based on material brought to the July 15 work group forum:
Multispecies. In the context of the goal of managing a multispecies fishery in all three reservoirs for the next decade, multispecies connotes an attempt to maintain a high quality fishery with a mix of existing species present. Rainbow trout, walleye, yellow perch, burbot (ling) are the primary sport fish present in relative abundance in Canyon Ferry at this moment in time. Other sport species, for example, brown trout, mountain whitefish, and smallmouth bass are also present, but less common. In Hauser and Holter reservoirs, rainbow trout, yellow perch, kokanee salmon, walleye, and brown trout are the primary sport species present in apparent relative abundance at this moment in time.

APPENDIX D:
FORUM AGENDAS

AGENDA

July 15, 1998
Educational Forum on Canyon Ferry, Hauser, Holter Fisheries Situation
Colonial Inn, Helena, MT
4:00 pm Open House
5:30-9:30 pm Panel Discussions

4:00 pm	Open House	
5:30 pm	Welcome/Introductions	Work Group
5:40 pm	The Need for a New 10-Year Management Plan	Patrick Graham, FWP Director
5:50 pm	Review of Overall MEPA Planning Steps/Schedule and Future Opportunities for Public Input	Jim Satterfield, FWP fish management bureau chief
6:00 pm	Baseline Fisheries Situation in Canyon Ferry – Physical descriptions (e.g., including movement of water, flushing of fish between reservoirs) – Fish species present, FWP monitoring and past management – Angler use and success – Current trends for each species (e.g., populations, hatcheries/stocking, and predator-prey relations – who's eating whom in the reservoirs and tailwaters?) – Economic factors (e.g., what it costs to stock fish, and what has been spent on walleye control on Canyon Ferry)	Ron Spoon, FWP Canyon Ferry biologist, Gary Bertellotti, FWP hatchery bureau chief, and other FWP panelists as needed
6:30 pm	Observations from the fisheries manager on most pressing issues for the immediate future and next 10 years in Canyon Ferry	Bruce Rich, Region 3 fisheries manager
6:40 pm	Public Questions/Work Group Discussion on Canyon Ferry	
7:15 pm	BREAK	
7:30 pm	**Baseline Fisheries Situation in Hauser and Holter** *(general outline of topics shown above on Canyon Ferry)*	Steve Dalbey, FWP Hauser/Holter biologist & other FWP panelists as needed
7:40 pm	Observations from the fisheries manager on most pressing issues for the immediate future and next 10 years in Hauser and Holter	Steve Leathe, Region 4 fisheries manager
7:50 pm	Public Questions/Work Group Discussion on Hauser/Holter	
8:30 pm	Work Group/Participants: wrap up discussion, parting thoughts/evaluation & next steps	Work Group & Moderator
9:30 pm	Adjourn	

AGENDA

September 17, 1998
Expert Panel Discussion on Canyon Ferry, Hauser, Holter Fisheries Situation
Colonial Inn, Helena, MT
6:30-9:30 pm

6:30 pm	Welcome/Introductions/Purpose	Moderator & Work Group
6:40 pm	Fish Wildlife & Parks Introductory Remarks	Larry Peterman, Fisheries Division Administrator
6:50 pm	Panel Remarks/Discussion	Panelists: Al Conder, Wyoming Dept. of Game & Fish; Wayne Hubert, US Geological Survey/University of Wyoming; Ray Duff, Washington Dept. of Fish & Wildlife
8:10 pm	BREAK	
8:20 pm	Public Questions/Comments for panelists or Work Group	Panelists
9:20 pm	Participants: wrap up discussion, parting thoughts/evaluation	Participants
9:30 pm	Adjourn	

Appendix B

Net Pen Feasibility Review
Hauser Reservoir

A review was conduced during the spring of 1999 as to the feasibility of using net pens to rear fish in Hauser Reservoir. The idea of using of net pens was introduced during the management plan development process. The objectives of net pens would be to grow fish (primarily rainbow trout but possibly kokanee salmon) in the reservoirs to a larger size in an effort to reduce predation and hold fish longer to avoid fish flushing losses associated with high spring runoff. Information was gathered from the net pen program on Lake Roosevelt, Washington and from experiences with net pens in the state of Montana.

COSTS: The cost of building a single net pen (20'x 20'x 14') was estimated to be $1000.00. An additional 0.3 to 0.5 FTE would be required annually to clean, feed, build and maintain a net pen program on Hauser Reservoir.
NUMBER OF FISH: Approximately 15,000 young of the year rainbow trout could be reared per pen.
LOGISTICS: Pens would have to be constructed on-site. The most logical location to anchor net pens in Hauser was off shore from the MPC house near the dam. Fish would have to be transported upstream for release. It would require two people for 2-3 days to complete construction.
TIME PERIOD: July 1st through October.
CLEANING: Net pens would require daily cleaning. This would involve two people for two hours (travel time included). One person would need to hold a small boat in position near the pen while the other person used a long-handled scrub brush to remove aquatic plant growth.
FEEDING: Fish would need to be fed daily. Cost of feed through the four-month period was estimated at $500 per pen.
PROBLEMS:

1. Lake Roosevelt listed otters as a problem. This is a real concern at the Hauser site as there is a family of otters that resides near the dam. More importantly, water clarity is only 5 to 10 feet during this period and if an otter did chew a hole in the pen netting, it could go undetected for some time. This could result in the loss of large numbers of fish.
2. Disease. Experts have told us that once the water temperatures reach 58 degrees Fahrenheit, fish become very susceptible to culminaris disease and die (kokanee salmon are even more susceptible to this disease than rainbow trout). Unfortunately, Hauser water temperatures exceed 58 degrees during July, August and September. Surface temperatures during this period can reach as high as 70 degrees making this period (July through September) unfeasible. The Canyon Ferry tailrace is a second location where net pens could be anchored (water temperatures would be colder than the dam site). However, dissolved oxygen values that are unhealthy to aquatic life have been discovered near the dam during this fall period rendering this location unfeasible. The near dam location could be used for net pen rearing fish if the low dissolved oxygen problem is fixed.