HAUSER RESERVOIR

FISHERIES MANAGEMENT PLAN

SEPTEMBER 1989–SEPTEMBER 1994

Montana Department of Fish, Wildlife & Parks

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of
Fish, Wildlife & Parks

HAUSER RESERVOIR MANAGEMENT PLAN

1989 THROUGH 1994

Developed by:

The Montana Department of Fish, Wildlife and Parks

SEPTEMBER 1989

EXECUTIVE SUMMARY

Hauser Reservoir provides a variety of fishing and recreational opportunities to thousands of people each year. This management plan was developed by the Department of Fish, Wildlife and Parks in response to changes in the reservoir fishery and changes in the attitudes of anglers using the reservoir. The plan addresses fisheries management, recreational conflicts and begins to evaluate the need for additional access sites and facilities. The plan contains a description of the physical characteristics of Hauser Reservoir, a description of the current status of the fisheries and a discussion of past and present management activities by the Department. Finally, the plan presents a series of recommended actions for managing Hauser Reservoir over the next five years.

Hauser Dam is a run-of-the-river hydropower plant owned and operated by the Montana Power Company. It is the second in the chain of three dams located on the upper Missouri River. The reservoir has a surface area of about 3,800 acres and stores approximately 98,000 acre-feet of water at full pool. The average depth of the reservoir is 26 feet. Because of the relatively small storage capacity and large inflow, the reservoir has a short retention time with water in the lake being replaced on an average of about every 9 days.

A majority of anglers fishing Hauser Reservoir are from Lewis and Clark County. Angler use averages about 43,000 fishing days per year. Kokanee, rainbow trout and yellow perch were the most commonly caught species during 1988. The kokanee population is relatively new and is continuing to undergo substantial change. It is difficult to predict what direction this fishery will proceed in future years. An estimated 43,000 kokanee, 36,000 rainbow trout and 10,000 yellow perch were harvested from the reservoir in 1988. Brown trout, walleye and smallmouth bass are not commonly caught in Hauser Reservoir.

Recommended management actions for rainbow trout and kokanee include:

1. Continue to rely on a mixed fishery of rainbow trout and kokanee to provide for a harvest level of about 80,000 fish per year.

2. Attempt to provide an average size of at least 14.0 inches for kokanee in the creel during the summer/fall fishery.

3. Reduce the number of rainbow trout stocked into the reservoir from 200,000 fingerlings to 125,000 fingerlings for the summer, 1990 and monitor stocking and angling success.

4. Eliminate the weight limit portion of the fishing regulations for trout and kokanee and utilize a number limit of 10 fish in combination.

5. Establish a "no wake" restriction for motor boat operators from Canyon Ferry Dam to about 0.75 miles downstream (Riverside) to provide for public safety.

Recommended management actions for walleye include:

1. Enhance the walleye fishery in Hauser Reservoir by stocking 3,000 to 5,000 fingerlings per year. The objective is to provide enhanced fishing opportunities for walleye at a level that would continue to be compatible with other fish species in the reservoir. Adjustments in the stocking rate could be made after a three to five year period if monitoring indicated that the walleye objective was not being met or if unacceptable impacts on other sport fish species developed in Hauser Reservoir or in downstream bodies of water (Holter Reservoir or the Missouri River).

2. Utilize the current composition of fish species found in the reservoir to provide forage for any future walleye population that may develop.

3. Continue the daily limit of 5 walleye, only one of which may exceed 20 inches.

Recommended management actions for brown trout include:

1. Maintain the present population level and continue to provide an opportunity to catch large fish.

2. Evaluate brown trout/kokanee interactions on spawning grounds and, if needed, develop solutions to minimize potential competition between the two species.

3. Stock brown trout if other recommended actions prove to be ineffective.

Recommended management actions for Lake Helena include:

1. Attempt to manage Lake Helena for both fisheries and waterfowl.

2. Continue Department efforts to enhance the bass fishery.

Recommended management actions for commercial fishing include:

1. Allow commercial fishing for carp and suckers to continue to take place in both Lake Helena and the Causeway Arm of Hauser Reservoir and monitor the effects on the sport fisheries.

Recommendations addressing access and recreational facility needs on Hauser Reservoir will be deferred until more information becomes available. Recommended management actions will be used for the next five years to ensure Hauser Reservoir continues to provide good fishing opportunities and satisfies public demand. This management plan was approved by the Fish and Game Commission on September 15, 1989.

TABLE OF CONTENTS

INTRODUCTION

Hauser Reservoir provides a variety of fishing and recreational opportunities to thousands of people each year. The reservoir fishery is diverse, providing a good opportunity to catch kokanee, rainbow trout, brown trout and yellow perch, as well as an occasional walleye and mountain whitefish. In addition, specimens of brown trout, rainbow trout and walleye from 5 to 15 pounds provide anglers an opportunity to catch an occasional trophy sized fish. However, fish populations in Hauser Reservoir, as well as attitudes of anglers using the reservoir, are changing. The kokanee population has expanded dramatically since the late 1970's. Because this relatively new population is continuing to undergo significant change, it is difficult to predict what direction the fishery will proceed in future years. In addition, public requests for enhancement of the walleye fishery, protection of the trophy brown trout fishery and maintenance of the rainbow trout fishery have significantly increased in recent years. Changes in the fishery and in angler attitudes are the reasons for the development of this management plan.

The planning process was initiated during the fall, 1988 when a series of public meetings were held in Great Falls, Helena and Bozeman to identify the issues and problems associated with the management of the mid-Missouri Reservoir Complex. Approximately 135 people attended these meetings and numerous comments were made and recorded. In addition, about 40 written comments were received following these meetings. Public comments were directed at fisheries management, habitat management, social conflict and access (See page 8 in Appendix A).

Based on public comment received at these meetings, a document presenting a series of management alternatives for Hauser Reservoir was completed during the winter, 1989. Management alternatives were then revised following review by a committee representing local sportsmen groups, public agencies and private business. The revised "alternatives" document is presented in Appendix A. Finally, approximately 1350 questionnaires addressing the major issues identified in the "alternatives" document were distributed to members of local sportsmen groups (Walleye Unlimited, Trout Unlimited and Prickly Pear Sportsmen); to people who attended the issue scoping meetings or sent written comments; and to reservoir anglers whose names were obtained from creel census work. This questionnaire is presented in Appendix B. Results of the questionnaire, summarized in Appendix C, were used to help select the recommended management actions presented in this plan.

This document addresses fisheries management, recreational conflicts, and begins to evaluate the need for additional access sites and facilities. A more comprehensive recreational access plan will be developed at a later date. The plan contains a description of the physical characteristics of Hauser Reservoir,

a description of the current status of the fisheries, and a discussion of past and present management activities by the Department. Finally, the plan presents a series of recommended management actions that will be used for the next five years to ensure that Hauser Reservoir continues to provide good recreational fisheries and satisfies public demand.

HAUSER RESERVOIR AND FISHERY

Physical Description

Hauser Dam is the second in the chain of three dams located on the upper Missouri River. It is a run-of-the-river hydropower dam that impounds water nearly to the base of Canyon Ferry Dam forming Hauser Reservoir (Figure 1). The dam was constructed in 1911 for the purpose of generating electric power and is owned and operated by the Montana Power Company.

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 approximately 70 feet.

Important tributaries to Hauser Reservoir include Prickly Pear, Trout, Spokane and McGuire creeks. Lake Helena is formed from the inundation of lower Prickly Pear Creek as a result of the of the water impounded in Hauser Reservoir. Lake Helena connects to Hauser Reservoir through the Causeway arm which enters the reservoir about 1.5 miles upstream from Hauser Dam.

In general, Canyon Ferry Dam controls flow patterns in Hauser Reservoir. Annual discharge from Hauser Dam averages about 4.0 million acre-feet. The intake capacity for water into the generators is approximately 4,740 cfs with all remaining water being spilled. Spilling surplus water over Hauser Dam is a common occurrence due to the small size of the generator intakes. Because of a relatively small storage capacity and large inflow, Hauser Reservoir has a short retention time with water in the lake being replaced about every nine days. During spring runoff, retention time can be as brief as only four days.

Water temperatures in Hauser Reservoir tend to be cooler than in Canyon Ferry Reservoir because of deep water releases from Canyon Ferry Dam. Due to the heating effects of shallow Lake Helena, somewhat warmer water enters the reservoir through the Causeway arm. The reservoir exhibits weak thermal layering primarily near the dam during the mid-summer period.

There are 3 developed campgrounds on Hauser Reservoir. Riverside Campground is located near the base of Canyon Ferry Dam, York Bridge Access Site is located at the bridge on highway 280 and Black Sandy Campground is located about 1 mile south of Hauser Dam. Riverside Campground is federally owned by the Bureau of Reclamation. The Department presently manages this site through a memorandum of understanding with the Bureau of Reclamation. Black Sandy Campground and the York Bridge Access Site are owned and managed by the Department. All of these sites receive heavy use during the summer period. In addition to the 3

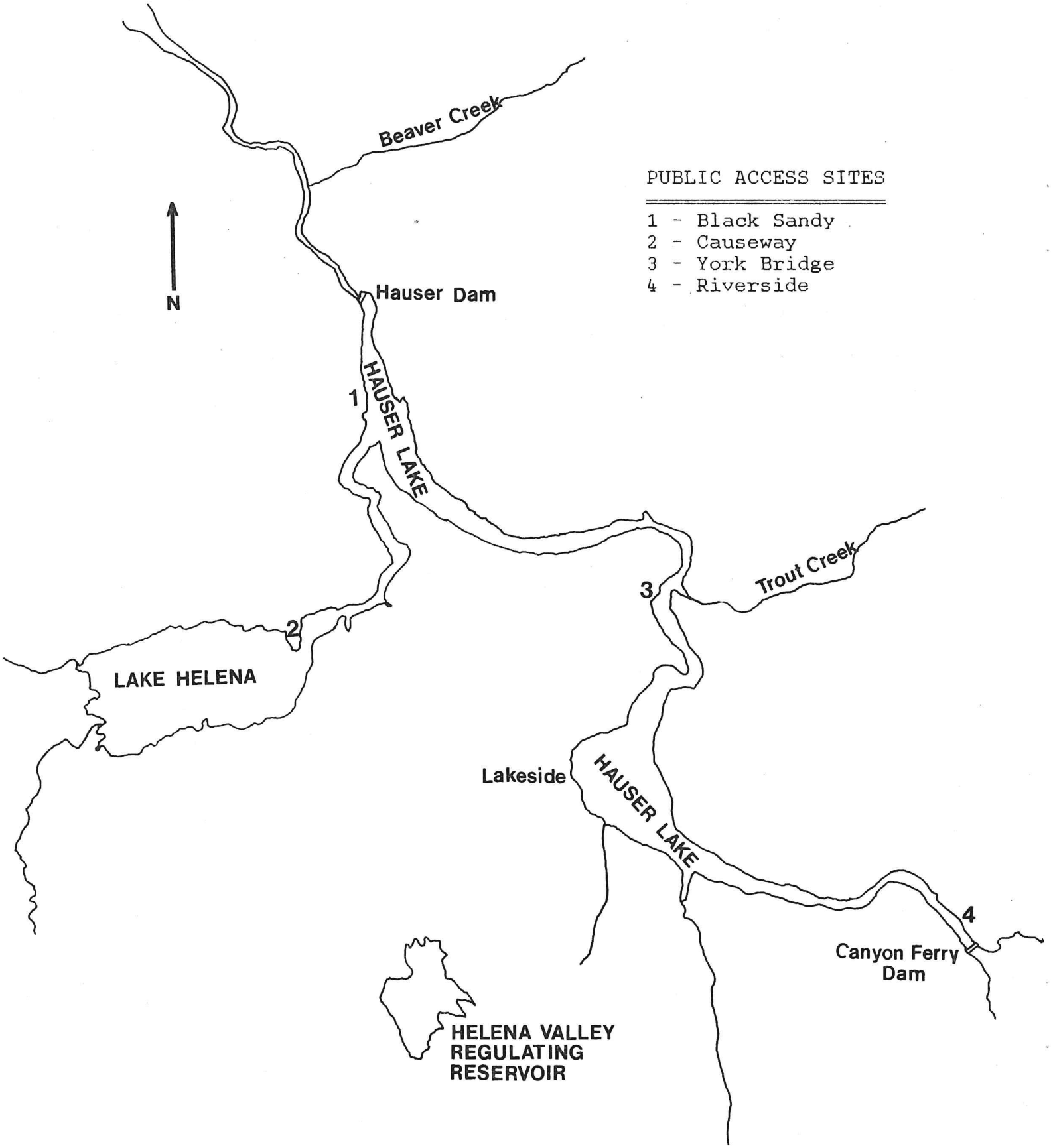


Figure 1. Map of Hauser Reservoir showing existing public access sites.

campgrounds, access to Hauser Reservoir is provided by 1 private marina and 1 day use only area (Causeway). The four boat ramps that serve the reservoir receive heavy use.

Fisheries Description

There are ten game fish species that reside in Hauser Reservoir (Table 1). Rainbow trout and kokanee are the two most abundant game fish found in the reservoir. Suckers and yellow perch are the most abundant non-game species.

Angler use is relatively high on Hauser Reservoir, averaging about 43,000 fishing days per year. This quantity of use is equal to approximately 11.3 fishing days for every surface acre of water in the reservoir. Angler use per surface acre on Hauser Reservoir is intermediate in comparison to Canyon Ferry and Holter reservoirs. An average fishing trip on Hauser Reservoir is about 4.2 hours in length. The trend in angler use appears to be increasing, especially with the increasing interest in the kokanee fishery. A majority of anglers fishing on Hauser Reservoir are from Lewis and Clark County (54%). Only 7% of the reservoir users are from out-of-state. Out of state use appears to be increasing in response to the expanding kokanee population in the reservoir. Trout and kokanee are the most sought after species in the reservoir. In recent years, the number of anglers seeking to catch kokanee has been increasing.

Kokanee, rainbow trout and yellow perch were the most readily caught species during 1988, comprising 47.5, 39.3, and 12.7% of the catch, respectively. The contribution of kokanee to the fishery in Hauser Reservoir has steadily increased over the past several years. Catch rates for kokanee have increased from 0.10 fish per hour in 1986 to 0.24 fish per hour in 1988. The size of kokanee harvested from the reservoir remained relatively unchanged between 1985 and 1988, averaging about 16.2 inches in length. During 1989, the average size of kokanee declined to about 14.5 inches in length. This decline in size is apparently associated with the increase in population density.

Catch rates for rainbow trout have shown a slight decrease over the past three years, ranging from 0.26 fish per hour in 1986 to 0.20 fish per hour in 1988. A majority of the rainbow trout caught in the reservoir are of hatchery origin (90%). The average size of rainbow trout caught in Hauser Reservoir, however, has increased from 13.5 inches in 1986 to 15.8 inches in 1988. Although not clear, the reasons for this size increase may be related to the occurrence of low runoff in recent years. Significant spills of water over Hauser Dam result in a substantial loss of rainbow trout from the reservoir. This loss has been lessened in recent years because of unusually low runoff. Apparently, a greater proportion of the population is comprised of older aged fish and, as a result, more of these larger fish have become available to the angler.

Table 1. Relative abundance of fish species in Hauser Reservoir.

Fish Species	Relative abundance
Rainbow trout (Salmo gairdneri)	Abundant
Cutthroat trout (Salmo clarki)	Rare
Brown trout (Salmo trutta)	Common
Brook trout (Salvelinus fontinalis)	Rare
Kokanee (Oncorhynchus nerka)	Abundant
Mountain whitefish (Prosopium williamsoni)	Common
Yellow perch (Perca flavescens)	Abundant
Walleye (Stizostedion vitreum)	Rare
Smallmouth bass (Micropterus dolomieui)	Rare
Largemouth bass (Micropterus salmoides)	Rare
Burbot (Lota lota)	Common
Stonecat (Noturus flavus)	Rare
Longnose sucker (Catastomus catastomus)	Abundant
White sucker (Catastomus commersoni)	Abundant
Smallmouth buffalo (Ictiobus bubalus)	Uncommon
Carp (Cyprinus carpio)	Abundant
Fathead minnow (Pimphales promelas)	Common
Flathead chub (Hybopsis gracilis)	Uncommon
Longnose dace (Rhinichthys cataractae)	Uncommon
Utah chub (Gila atraria)	Common
Mottled sculpin (Cottus bairdi)	Abundant

An estimated 43,000 kokanee, 36,000 rainbow trout and 10,000 yellow perch were harvested from Hauser Reservoir in 1988. The number of kokanee harvested in 1988 was more than double the estimated kokanee harvest obtained in 1987. Fewer than 300 brown trout and 50 walleye were taken from the reservoir during 1988.

Brown trout, walleye and smallmouth bass are not commonly caught in Hauser Reservoir. Fishing for walleye and smallmouth bass is primarily confined to the Causeway area and only a few specimens are caught each year. 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.

Past and Present Management Activities

In the 1930's, numerous species of fish were introduced into Hauser Reservoir without regard for habitat requirements. These haphazard introductions included bass, bullheads, bluegills, coho salmon, rainbow trout, brown trout and yellow perch. Most of these early introductions failed to produce a fishery. However, rainbow trout, brown trout and yellow perch proved to be relatively successful. Walleye found their way into the reservoir as a result of a plant made into Lake Helena in 1951. Survivors and progeny from this plant drifted into Hauser Reservoir through the Causeway arm. Walleye have been able to maintain only a sparse population in Hauser Reservoir since the original plant. In the early 1950's, kokanee were introduced into Hauser Reservoir. Kokanee plants were unsuccessful in producing a fishery in the reservoir despite stocking approximately one million of these fish over a period of six years.

Since the late 1950's, only rainbow trout have been stocked into Hauser Reservoir and since the 1970's the fishery in the reservoir has been maintained by annually stocking approximately 200,000 3 to 5 inch Arlee rainbow trout. These hatchery fish are stocked after spring runoff in an attempt to minimize losses of fish over the dam when surplus water is being spilled. Annual stocking is required because natural recruitment cannot meet the current fishing demand.

Kokanee that are in the reservoir today apparently originated from plants that were made into Canyon Ferry Reservoir in the late 1960's or from plants made into the Helena Valley Regulating Reservoir in the 1970's. Some of the kokanee stocked in Canyon Ferry Reservoir were siphoned into the Regulating Reservoir where they survived and produced a good fishery. 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 1970's, the kokanee population in Hauser Reservoir has expanded dramatically. This population appears to be continuing to expand with spawners pioneering most of the tributaries to the reservoir in recent years. Because the kokanee population is continuing to undergo significant change, it is difficult to predict what direction this fishery will proceed in future years. For example, the potential effect of substantial spring runoff and associated spill over Hauser Dam on the kokanee population, particularly on young of the year fish, is unknown at this time.

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 limits were 10 fish and 5 fish, respectively. Beginning in 1988, more conservative regulations were implemented to prevent the over-harvest of kokanee and to protect the remnant walleye population. The trout and kokanee limits were combined making the daily and possession limits 10 pounds and one fish not to exceed 10 trout and kokanee in combination. For walleye, the limits were changed to 5 fish, only one of which could exceed 20 inches.

Operation of Hauser Dam can have significant impact on the fishery, wildlife and recreational resources of the reservoir. A steering committee, comprised of Montana Department of Fish, Wildlife and Parks; Montana Power Company; Bureau of Reclamation; irrigators; and sportsmen have formulated operational guidelines for Hauser Dam to optimize recreational values and to minimize impacts to fish and wildlife (Appendix D). This committee meets annually to review dam operations and evaluate guidelines.

Present steering committee guidelines for the operation of Hauser Dam include: 1) Hauser Reservoir should be operated with a stable reservoir level at elevation 3,635.2 ft (+ 0.5 ft); 2) To lessen the loss of fish over the dam, no late season spills should be released from Canyon Ferry Dam after spring runoff; 3) Drawdowns for dam maintenance should be accomplished during non-holiday periods in August and September. Headboards should be installed under the causeway bridge to maintain water levels in Lake Helena during drawdown; 4) Winter water levels in Hauser Reservoir should be stable to prevent weakening of the ice and, as a result, lessen the danger to ice based recreation. Steering committee guidelines can be modified as additional information becomes available.

RECOMMENDED MANAGEMENT ACTIONS

Rainbow Trout and Kokanee

Recommended Actions:

1. Continue to rely on a mixed fishery of rainbow trout and kokanee to provide for a harvest level of about 80,000 fish per year.

2. Attempt to provide an average size of at least 14.0 inches for kokanee in the creel during the summer/fall fishery.

3. Reduce the number of rainbow trout stocked into the reservoir from 200,000 fingerlings to 125,000 fingerlings for the summer, 1990 and monitor stocking success. The stocking rate will be adjusted from year to year in response to changes in the kokanee population.

4. Eliminate the weight limit portion of the fishing regulations for trout and kokanee and utilize a number limit of 10 fish (trout and kokanee in combination).

5. Establish a "no wake" restriction for motor boat operators from Canyon Ferry Dam to about 0.75 miles downstream (Riverside) to provide for public safety and to reduce conflicts among boat anglers and between boat anglers and shore anglers in this heavily used area.

Respondents to the questionnaire (Questions #3 and #4 in Appendix C) indicated that they would like to continue to have a mixed rainbow trout and kokanee fishery in Hauser Reservoir. However, the kokanee population in the reservoir is relatively new and is continuing to undergo significant change. As a result, it is difficult to predict what direction the fishery will proceed in future years. The kokanee that were caught in the reservoir during the summer/fall period in 1989 averaged about 14.6 inches in length. This represents a decline in average size of about 2.5 inches over the past several years. A majority (59%) of respondents to the questionnaire indicated that catching kokanee at an average size of least 14.0 inches in length (Question #6) would be acceptable to them. As a result, it does not appear there is an immediate need to reduce kokanee numbers in order to maintain or increase the average size of fish in the creel. If the average size of kokanee continues to decline, however, actions may need to be taken in the near future to reduce kokanee numbers in the reservoir to maintain an acceptable average size. Keep in mind that the size of kokanee tends to become smaller as the population increases in density.

If and when a need develops the following actions (in order of importance) would be used to reduce kokanee numbers to maintain an acceptable average size:

1. Increase fishing limits for kokanee;

2. Collect kokanee eggs for the use of stocking other waters;

3. Stock a predatory species of fish (such as kamloops rainbow trout, brown trout or walleye) after carefully evaluating the potential for upsetting the balance among fish species in the reservoir and in downstream waters;

4. Physically restrict kokanee from access to some of their spawning habitat.

The first three recommended actions were supported by a majority of respondents from the questionnaire (Question 7b). However, the fourth recommended action (restricting access to spawning habitat) received little support from questionnaire respondents. This action was selected because it probably would be an effective tool for reducing kokanee numbers and would likely not create additional unacceptable impacts to the fishery. A proposal to establish a snagging season received strong opposition from respondents representing all interest groups. Actions taken to reduce the number of kokanee in the reservoir will be used to maintain an average size of at least 14.0 inches for kokanee in the creel. Several of the recommended actions may need to be used at the same time to meet this goal.

Although it is also not necessary at this time, there may be a need to take actions to increase the number of kokanee in the reservoir because of their unstable nature. If and when this need develops, the following actions (in order of importance) would be taken to increase kokanee numbers:

1. Reduce fishing limits for kokanee;

2. Close kokanee spawning areas to fishing;

3. Stock kokanee.

Although not strongly favored by questionnaire respondents, these three recommended actions received more support than opposition (Question 7a). Reducing the kokanee limit was selected first because this action would likely be effective and could be initiated quickly. Closing the Canyon Ferry tailrace and other areas to fishing during the fall spawning season probably would not be as effective as reducing limits. Stocking kokanee is not feasible at this time because the hatchery system is currently operating at capacity as a result of stocking commitments for the Flathead Lake fishery. If and when needed, several of these

recommended actions may be used at the same time to achieve the goal of increasing the kokanee population. Proposals to reduce the length of the fishing season for kokanee or to improve passage to tributary spawning areas received little support from questionnaire respondents.

A 38% reduction in the number of rainbow fingerlings stocked into the reservoir is proposed for the summer, 1990 (200,000 reduced to 125,000) to reduce the potential for competition between rainbow trout and kokanee for food and/or space. Stocking and angling success will continue to be evaluated yearly and stocking rates will be adjusted in response to changes in the kokanee population.

We propose to eliminate the weight limit portion of the fishing regulations for trout and kokanee and utilize a number limit of 10 fish (trout and kokanee in combination). Because kokanee currently average about one pound in weight, this change would have little effect on the number of kokanee anglers could keep. The change is being made to simplify the regulations and was supported by a majority of questionnaire respondents (55% in support vs 22% in opposition - Question #8). Because of the unstable nature of the kokanee population, there may be a future need to re-establish separate limits for kokanee and rainbow trout to allow for better management of the two species. However, this change is not needed at the present time. Public response indicated general support of re-establishing separate limits for trout and kokanee (46% in favor vs 25% in opposition).

A "no wake" restriction is proposed for a short section of Hauser Reservoir located immediately downstream of Canyon Ferry Dam to provide for public safety and to reduce conflicts among boat anglers and between boat anglers and shore anglers in this heavily used area (especially by anglers seeking to catch kokanee). Respondents to the questionnaire were strongly supportive of a "no wake" restriction for the Canyon Ferry tailrace (52% support vs 16% opposition - Question #12). All other actions proposed to resolve bank/boat conflicts received little support.

Walleye

Recommended Actions:

1. Enhance the walleye fishery in Hauser Reservoir by stocking 3,000 to 5,000 fingerlings per year. The objective is to provide enhanced fishing opportunities for walleye at a level which would continue to be compatible with other fish species in the reservoir. Adjustments in the stocking rate could be made after a three to five year period if the walleye objective was not being met of if unacceptable impacts on other sport fish species developed in Hauser Reservoir or in

downstream bodies of water (Holter Reservoir or the Missouri River).

2. Utilize the current composition of fish species found in the reservoir to provide forage for any future walleye population that may develop.

3. Continue the daily limit of 5 walleye, only one of which may exceed 20 inches.

Response to the walleye management question (Question #10) was polarized among the interest groups. A large majority of Walleye Unlimited members favored stocking walleye (90%), with 54% supporting stocking to provide a fishery similar to what is found in Holter Reservoir. A strong majority of Trout Unlimited members were opposed to stocking walleye (67%). Members of Prickly Pear Sportsmen were slightly in favor of stocking walleye (46% in favor vs 41% in opposition) while general users were more opposed to stocking walleye (51% opposed vs 38% in favor).

Although the walleye issue remains divided among sportsmen, we propose to enhance the walleye population in Hauser Reservoir to a level similar to that which currently exists in Holter Reservoir. The walleye population in Holter Reservoir appears to be compatible with existing rainbow trout, brown trout and yellow perch populations. This stability is probably due to relatively low numbers of walleye coupled with a healthy population of yellow perch. Perch are a preferred item in the walleye diet and apparently serve as a buffer to reduce predation on rainbow trout and kokanee. The walleye population in Holter Reservoir is probably limited by flushing losses of fry over or through the dam but may also be influenced by yellow perch predation on walleye fry. The Holter walleye fishery provides good catch rates for anglers and produces large sized fish with good growth rates.

Walleye enhancement in Hauser Reservoir would begin by annually stocking 3,000 to 5,000 walleye fingerlings over a three year period. Walleye stocked into the reservoir would be marked for future identification to evaluate movement, survival, growth and hatchery contribution to the fishery. Success of stocking would be evaluated by creel census and gill netting. A population of catchable sized walleye should begin to develop after the first three years of stocking (1992). Adjustments in the stocking rate could be made after this three year period if monitoring indicated that the walleye population objective was not being met or if unacceptable impacts on other game fish species developed in Hauser Reservoir or in downstream bodies of water (Holter Reservoir or the Missouri River). The stocking rate also may be reduced or eliminated if sufficient natural reproduction began to occur.

The current composition of fish species in Hauser Reservoir will be utilized to provide forage for any future walleye population that may develop. Introductions of new forage species is not recommended because of the strong potential for competition with trout, kokanee and yellow perch for food and space in the reservoir. In addition, introduced species flushed from Hauser Dam may upset the balance among fish populations in Holter Reservoir and the Missouri River.

Because the walleye population in Hauser Reservoir is currently very sparse, fishing regulations have little effect on the walleye harvest. As a result, it is recommended that the current limit for walleye be maintained (5 walleye, only one of which may exceed 20 inches). This regulation may need to be changed in the future as the walleye fishery develops in Hauser Reservoir.

Brown Trout

Recommended Actions:

1. Maintain the present population level and continue to provide an opportunity to catch large fish.

2. Evaluate brown trout/kokanee interactions on spawning grounds and, if needed, develop solutions to minimize potential competition between the two species.

3. Stock brown trout if other recommended actions prove to be ineffective.

The brown trout population will continue to be regulated primarily by natural reproduction. Management efforts will be directed toward the potential competition problem between brown trout and kokanee that may develop in the future. Brown trout and kokanee spawn in the same areas and during the same time of the year. The expanding kokanee population may begin to compete with brown trout for spawning sites at some time in the future. If it was determined to be necessary, we would eliminate kokanee from selected spawning sites to maintain the present brown trout population. Questionnaire respondents were slightly in favor of eliminating kokanee from some spawning grounds if it was determined to be necessary to maintain the brown trout population (Question #9a & #9b - 46% in favor vs 37% in opposition). However, the brown trout population in the reservoir appears to be relatively stable and, as a result, actions to eliminate kokanee from some spawning grounds do not appear to be needed at this time.

Lake Helena

Recommended Actions:

1. An attempt will be made to manage Lake Helena for both fisheries and waterfowl. Seasonal and/or area restrictions will be placed on boat use if it is determined restrictions are needed to prevent conflicts with waterfowl production.

2. Continue Department efforts to enhance the bass fishery.

Lake Helena is an important waterfowl management area and increased fishing use may interfere with waterfowl production and waterfowl hunting. However, a majority of the respondents to the questionnaire (61% - Question #11) favored managing Lake Helena for both fisheries and waterfowl with the prerequisite of placing restrictions on boat use if it was determined to be needed. Boat use may need to be restricted to prevent conflicts with waterfowl production. The prerequisite of boat restrictions was emphasized by the fact that a majority of respondents opposed providing improved boat access to Lake Helena (Question #11 - 50% in opposition vs 27% in favor of boat access). Currently, there are no boat ramps to Lake Helena and access is difficult. As fishing opportunities in Lake Helena are improved, an advisory committee of waterfowl managers, fishery managers and sportsmen may need to be formed if conflicts began to develop between fishing and waterfowl production as a result of increased use by anglers.

Respondents to Question #11 showed support for both continuing to enhance the bass fishery (45% support vs 25% opposition) and for stocking walleye (41% support vs 37% opposition) in Lake Helena. We propose to continue our efforts at enhancing the bass fishery because Lake Helena appears to contain habitat that is more suitable for bass than walleye (warm, shallow lake with large areas of emergent aquatic vegetation) Efforts for enhancing the walleye population will be concentrated in Hauser Reservoir where habitat appears to be more suitable. A proposal to introduce tiger muskellunge into Lake Helena received little support from questionnaire respondents.

Commercial Fishing

Recommended Action:

1. Allow commercial fishing for rough fish to continue to take place in both Lake Helena and the Causeway Arm of Hauser Reservoir and monitor the effects on the sport fisheries. Modify or revoke the permit if adverse impacts to gamefish populations or to waterfowl production are identified.

A small local business has been allowed to commercially fish for carp and suckers on Lake Helena and occasionally the Causeway Arm of Hauser Reservoir for approximately the past 30 years. The Department has no information indicating that this commercial operation harms the sport fishery in Lake Helena or Hauser Reservoir. A majority of questionnaire respondents (64% in support vs 14% opposition - Question 14) favored this recommended action.

Fishing Access Issues

We will defer making recommendations to address facility and access needs on Hauser Reservoir until more information becomes available. Additional information is currently being gathered by Montana Power Company as part of the federal relicensing process for Hauser Dam. A report on access and facility needs will be developed and appended to this plan when more information is available. Respondents to the questionnaire (Question #13) indicated there was a need for more boat ramps (37%), more access to shore fishing areas (35%) and a need to improve enforcement of campground regulations (34%). Needs for additional boat trailer parking and more RV areas were also noted by more than 30% of the respondents.

OTHER RECOMMENDED ACTIONS

1. Monitor fish populations and angler harvest to provide information needed to make management decisions.

2. Encourage compliance with reservoir steering committee guidelines for dam operations to maintain existing fish and wildlife resources. Current guidelines may be modified as additional information becomes available.

3. Evaluate the potential for improving spawning habitat in tributaries to the reservoir.

4. Investigate the feasibility of screening the spillway at Hauser Dam to minimize the loss of both hatchery fish and naturally produced kokanee over the dam.

5. Introduce wild strains of rainbow trout if and when eggs become available to encourage the development of self-sustaining populations.

6. More evenly distribute hatchery rainbow trout around the reservoir at the time of stocking in attempt to increase the survival of newly planted trout.

7. Continue to protect spawning habitat through preparation of instream flow recommendations and through the streambed preservation laws.

8. Allow the existing population level of yellow perch to be maintained through natural reproduction. If determined to be necessary, classify yellow perch as a game fish species to allow the Department to set limits. This action would be taken only if and when an over-harvest problem developed and would need to be approached on a state-wide basis.

APPENDIX A

ALTERNATIVES FOR THE MANAGEMENT OF HAUSER RESERVOIR

Montana Department
of
Fish, Wildlife & Parks

ALTERNATIVES FOR THE MANAGEMENT

OF

HAUSER RESERVOIR

Developed by:

The Montana Department of Fish, Wildlife and Parks

1989 through 1994

TABLE OF CONTENTS

INTRODUCTION

Hauser Reservoir provides a variety of fishing and recreational opportunities to thousands of people each year. The reservoir fishery is diverse, providing a good opportunity to catch kokanee, rainbow trout, brown trout and yellow perch, as well as an occasional walleye and mountain whitefish. In addition, specimens of brown trout, rainbow trout and walleye from 5 to 15 pounds provide anglers an opportunity to catch an occasional trophy sized fish. This document presents a series of management alternatives that could be used to manage the fishery in Hauser Reservoir over the next five years. Following public review, the Montana Department of Fish, Wildlife and Parks will recommend preferred alternatives to the Fish and Game Commission. Selected alternatives will be used to ensure that this reservoir continues to provide good recreational fisheries and satisfies public demand.

Fish populations in Hauser Reservoir, as well as attitudes of the anglers using the reservoir, are changing. The kokanee population has expanded dramatically since the late 1970's. Because this relatively new population is continuing to undergo significant change, it is difficult to predict what direction the fishery will proceed in future years. In addition, public requests for enhancement of the walleye fishery, protection of the trophy brown trout fishery and maintenance of the rainbow trout fishery have significantly increased in recent years. Changes in the fishery and in angler attitudes are the reasons for the development of the management alternatives contained within this document.

This report addresses fisheries management, recreational conflicts, and begins to evaluate the need for additional access sites and facilities. A more comprehensive recreational access plan will be developed at a later date. The document contains a description of the physical characteristics of Hauser Reservoir, a description of the current status of the fisheries, a discussion of past and present management activities by the Department and results of past public meetings. Finally, a series of potential management options and possible Department actions are presented along with associated advantages and disadvantages. A questionnaire that addresses the major issues presented in this document also has been developed to survey public opinion to help select the preferred courses of action. The final management plan will be considered for adoption by the Fish and Game Commission in mid-September, 1989.

HAUSER RESERVOIR

Physical Description

Hauser Dam is the second in the chain of three dams located on the upper Missouri River. Hauser Dam is a run-of-the-river plant that impounds water nearly to the base of Canyon Ferry Dam forming Hauser Reservoir (Figure 1). The dam was constructed in 1911 for the purpose of generating electric power and is owned and operated by the Montana Power Company.

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 approximately 70 feet.

Important tributaries to Hauser Reservoir include Prickly Pear, Trout, Spokane and McGuire creeks. Lake Helena is formed from the impounding of lower Prickly Pear Creek 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.

In general, Canyon Ferry Dam controls flow patterns in Hauser Reservoir. Annual discharge from Hauser Dam averages about 4.0 million acre-feet. The intake capacity for water into the generators is approximately 4,740 cfs with all remaining water being spilled. Spilling surplus water over Hauser Dam is a common occurrence due to the small size of the generator intakes. Because of a relatively small storage capacity, Hauser Reservoir has a short retention time with water in the lake being replaced about every nine days. During spring runoff, retention time can be as brief as only four days.

Hauser Reservoir can be considered slightly productive when compared to other impoundments. Water temperatures tend to be cooler than in Canyon Ferry Reservoir because of deep water releases from Canyon Ferry Dam. Due to the heating effects of shallow Lake Helena, somewhat warmer water enters the reservoir through the Causeway arm. The reservoir exhibits weak thermal layering primarily near the dam during the mid-summer period.

There are 3 developed campgrounds on Hauser Reservoir. Riverside Campground is located near the base of Canyon Ferry Dam, York Bridge Access Site is located at the bridge on highway 280 and Black Sandy Campground is located about 1 mile south of Hauser Dam. Riverside Campground is federally owned by the Bureau of Reclamation. The Department presently manages this site through a memorandum of understanding with the Bureau of Reclamation. Black Sandy Campground and the York Bridge Access

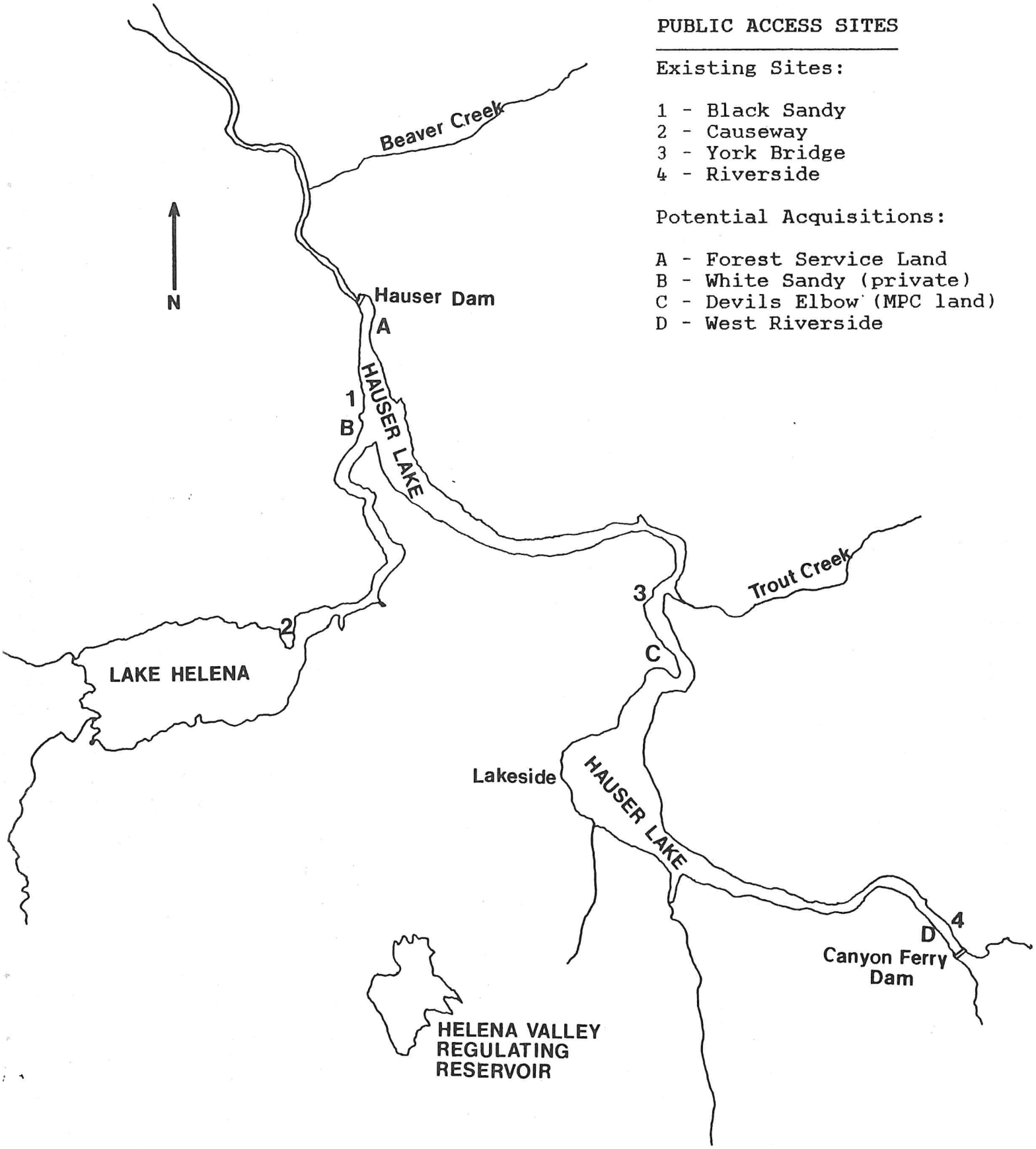


Figure 1. Map of Hauser Reservoir showing existing and potential access sites.

Site are owned and managed by the Department. All of these sites receive heavy use during the summer period.

In addition to the 3 campgrounds, access to Hauser Reservoir is provided by 1 private marina and 1 day use only area (Causeway). The four boat ramps that serve the reservoir receive heavy use.

Fisheries Description

There are ten game fish species that reside in Hauser Reservoir (Table 1). Rainbow trout and kokanee are the two most abundant game fish found in the reservoir. Suckers and yellow perch are the most abundant non-game species.

Angler use is relatively high on Hauser Reservoir, averaging about 43,000 fishing days per year. This quantity of use is equal to approximately 11.3 fishing days for every surface acre of water in the reservoir. Angler use per surface acre on Hauser Reservoir is intermediate in comparison to Canyon Ferry and Holter reservoirs. An average fishing trip on Hauser Reservoir is about 4.2 hours in length. The trend in angler use appears to be increasing, especially with the increasing interest in the kokanee fishery. A majority of anglers fishing on Hauser Reservoir are from Lewis and Clark County (54%). Only 7% of the reservoir users are from out-of-state. Out of state use appears to be increasing in response to the expanding kokanee population in the reservoir. Trout and kokanee are the most sought after species in the reservoir. In recent years, the number of anglers seeking to catch kokanee has been increasing.

Kokanee, rainbow trout and yellow perch were the most readily caught species during 1988, comprising 47.5, 39.3, and 12.7% of the catch, respectively. The contribution of kokanee to the fishery in Hauser Reservoir has steadily increased over the past several years. Catch rates for kokanee have increased from 0.10 fish per hour in 1986 to 0.24 fish per hour in 1988. The size of kokanee harvested from the reservoir remained relatively unchanged between 1985 and 1988, averaging about 16.2 inches in length. This year, kokanee are averaging about 14.5 inches in length.

Catch rates for rainbow trout have shown a slight decrease over the past three years, ranging from 0.26 fish per hour in 1986 to 0.20 fish per hour in 1988. A majority of the rainbow trout caught in the reservoir are of hatchery origin (90%). The average size of rainbow trout caught in Hauser Reservoir, however, has increased from 13.5 inches in 1986 to 15.8 inches in 1988. Although not clear, the reasons for this size increase may be related to the occurrence of low runoff in recent years. Significant spills of water over Hauser Dam result in a substantial loss of both rainbow trout and zooplankton from the reservoir. These losses have been lessened in recent years

Table 1. Relative abundance of fish species in Hauser Reservoir.

Fish Species	Relative abundance
Rainbow trout (Salmo gairdneri)	Abundant
Cutthroat trout (Salmo clarki)	Rare
Brown trout (Salmo trutta)	Common
Brook trout (Salvelinus fontinalis)	Rare
Kokanee (Oncorhynchus nerka)	Abundant
Mountain whitefish (Prosopium williamsoni)	Common
Yellow perch (Perca flavescens)	Abundant
Walleye (Stizostedion vitreum)	Rare
Smallmouth bass (Micropterus dolomieui)	Rare
Largemouth bass (Micropterus salmoides)	Rare
Burbot (Lota lota)	Common
Stonecat (Noturus flavus)	Rare
Longnose sucker (Catastomus catastomus)	Abundant
White sucker (Catastomus commersoni)	Abundant
Smallmouth buffalo (Ictiobus bubalus)	Uncommon
Carp (Cyprinus carpio)	Abundant
Fathead minnow (Pimphales promelas)	Common
Flathead chub (Hybopsis gracilis)	Uncommon
Longnose dace (Rhinichthys cataractae)	Uncommon
Utah chub (Gila atraria)	Common
Mottled sculpin (Cottus bairdi)	Abundant

because of the low runoff. Apparently, more zooplankton has become available for trout food and greater numbers of older aged fish have become available to the angler.

An estimated 43,000 kokanee, 36,000 rainbow trout and 10,000 yellow perch were harvested from Hauser Reservoir in 1988. The number of kokanee harvested in 1988 was more than double the estimated kokanee harvest obtained in 1987. Fewer than 300 brown trout and 50 walleye were taken from the reservoir during 1988.

Brown trout, walleye and smallmouth bass are not commonly caught in Hauser Reservoir. Fishing for walleye and smallmouth bass is primarily confined to the Causeway area and only a few specimens are caught each year. 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.

Past and Present Management Activities

In the 1930's, numerous species of fish were introduced into Hauser Reservoir without regard for habitat requirements. These haphazard introductions included bass, bullheads, bluegills, coho salmon, rainbow trout, brown trout and yellow perch. Most of these early introductions failed to produce a fishery. However, rainbow trout, brown trout and yellow perch proved to be relatively successful. Walleye found their way into the reservoir as a result of a plant made into Lake Helena in 1951. Survivors and progeny from this plant drifted into Hauser Reservoir through the Causeway arm. Walleye have been able to maintain only a sparse population in Hauser Reservoir since the original plant. In the early 1950's, kokanee were introduced into Hauser Reservoir. Kokanee plants were unsuccessful in producing a fishery in the reservoir despite stocking approximately one million of these fish over a period of six years.

Since the late 1950's, only rainbow trout have been stocked into Hauser Reservoir and since the 1970's the fishery in the reservoir has been maintained by annually stocking approximately 200,000 3 to 5 inch Arlee rainbow trout. These hatchery fish are stocked after spring runoff in an attempt to minimize losses of fish over the dam when surplus water is being spilled. Annual stocking is required because natural recruitment cannot meet the current fishing demand.

Kokanee that are in the reservoir today apparently originated from plants that were made into Canyon Ferry Reservoir in the late 1960's or from plants made into the Helena Valley Regulating Reservoir in the 1970's. Some of the kokanee stocked in Canyon Ferry Reservoir were siphoned into the Regulating Reservoir where they survived and produced a good fishery. 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 1970's, the kokanee population in Hauser Reservoir has expanded dramatically. This population appears to be continuing to expand with spawners pioneering most of the tributaries to the reservoir in recent years. Because the kokanee population is continuing to undergo significant change, it is difficult to predict what direction this fishery will proceed in future years. For example, the potential effect of substantial spring runoff and associated spill over Hauser Dam on the kokanee population is unknown at this time.

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 the over-harvest of kokanee and to protect the remnant walleye population. The trout and kokanee limits were combined making the daily and possession limits 10 pounds and one fish not to exceed 10 trout and kokanee in combination. For walleye, the limits were changed to 5 fish, only one of which could exceed 20 inches.

Operation of Hauser Dam can have significant impact on the fishery, wildlife and recreational resources of the reservoir. A steering committee, comprised of Montana Department of Fish, Wildlife and Parks; Montana Power Company; Bureau of Reclamation; irrigators; and sportsmen have formulated operational guidelines for Hauser Dam to optimize recreational values and to minimize impacts to fish and wildlife (Montana Department of Fish, Wildlife and Parks 1985). This committee meets annually to review dam operations and evaluate guidelines.

Present steering committee guidelines for the operation of Hauser Dam include: 1) Hauser Reservoir should be operated with a stable reservoir level at elevation 3,635.2 ft (+ 0.5 ft); 2) No late season spills should be released from Canyon Ferry Dam after spring runoff in order to lessen the loss of fish over the dam; 3) Drawdowns for dam maintenance should be accomplished during non-holiday periods in August and September. Headboards should be installed under the causeway bridge to maintain water levels in Lake Helena during drawdown; 4) Winter water levels in Hauser Reservoir should be stable to prevent weakening of the ice and, as a result, lessen the danger to ice based recreation. Steering committee guidelines can be modified as additional information becomes available.

Scoping Meeting Results

This document was developed by our Department based on public comment received at meetings held in Great Falls, Helena and Bozeman during the fall of 1988. These meetings were held to determine public opinion on what the major management issues and problems were on the segment of Missouri River located between Toston Dam and Great Falls, including Canyon Ferry, Hauser and Holter reservoirs. Approximately 150 people attended these public meetings.

There were 27 comments directed at managing the fisheries in Hauser Reservoir (Appendix A). Numerous comments were directed at kokanee management. Issues dealing with kokanee centered around liberalizing the kokanee limit and continuing to manage for the large average size of kokanee presently found in the reservoir. Others felt the kokanee limit should be restricted and enforcement should be increased to insure compliance. A number of other comments addressed the issue of new species introductions and the need to enhance the walleye population. Several people felt that the fishery in the reservoir needed to be diversified. Others stated that it was important to maintain the rainbow trout fishery and were against new species introductions. The remaining comments on fisheries management centered around fishing regulations.

Only one comment dealt with habitat management. This comment requested that critical fish habitat be identified and protected. Department concerns with habitat management include the loss of fish over the dam during spring spills, limited spawning habitat for game fish and maintaining stable reservoir levels throughout the year.

There were 7 comments that addressed social conflict. Most of these comments related to conflicts that have occurred between bank and boat anglers or among boat anglers in the Canyon Ferry tailrace. Other comments dealt with the need to increase enforcement of regulations at access sites.

Thirteen comments addressed the access issue. There were conflicting opinions dealing with the development of boat access at the causeway. General comments centered around improving present sites, providing handicap access and obtaining additional access sites.

MANAGEMENT OPTIONS AND POSSIBLE DEPARTMENT ACTIONS

RAINBOW TROUT AND KOKANEE

There are three possible management options presented for rainbow trout and kokanee in Hauser Reservoir. Rainbow trout and kokanee are discussed together because management approaches for these two species are closely related. Because the kokanee population is continuing to undergo significant change in Hauser Reservoir, it is difficult to predict what direction this fishery will proceed in future years. The three management options are discussed in detail in pages 15 through 23. These three management options can be summarized as follows:

Option I. Continue present management direction by relying on a mixed fishery of rainbow trout and kokanee to maintain at least current catch rates and harvest levels.

Option II. Manage primarily for a naturally reproducing kokanee fishery.

Option III. Manage primarily for a rainbow trout fishery.

The following possible Department actions apply to all three of the management options presented for rainbow trout and kokanee:

Population Monitoring

A. Monitor salmonid populations and angler harvest to provide information needed to make management decisions.

Explanation: Information is necessary to determine if Department actions are meeting overall objectives. If goals are not being met, information is needed to determine what management changes need to be made. Creel census, gill netting, electrofishing and spawning traps are the methods currently being used to monitor fish populations.

Advantage: Provides basis for management decisions.

Disadvantage: Continued monitoring efforts require Departmental dollars and manpower. It is difficult to monitor changes in the kokanee population because kokanee populations tend to be unstable and can exhibit substantial fluctuations.

Habitat Management

B. Investigate the feasibility of screening the spillway to minimize the loss of both hatchery rainbow trout and naturally produced kokanee over the dam.

Explanation: There is growing evidence that significant spills over the dam may result in a substantial loss of hatchery rainbow trout from the reservoir. It is likely that kokanee fry would also be very susceptible to flushing over the dam. However, the potential effects of reservoir spill on the kokanee population are unknown at this time.

Advantage: Screening the spillway may reduce flushing losses over the dam.

Disadvantage: Screening spillways has been attempted nation-wide on only a few reservoirs. Screening spillways presents engineering difficulties (especially clogging with debris), would likely be costly and should be considered experimental because it can not be guaranteed to be effective. Screening would not prevent flushing losses of kokanee fry because of their small size.

C. Encourage compliance with reservoir steering committee guidelines for dam operations to reduce adverse impacts to fish and wildlife resources.

Explanation: Significant spills from the reservoir and unstable water elevations can harm the reservoir fishery. Guidelines for operation of the dam have been established by committee to lessen these potential conflicts with fishery resources and recreational opportunities. The current guidelines recommend that Hauser Dam be operated with a relatively stable reservoir level. These guidelines may be modified as additional information becomes available.

Advantage: Utilizes a committee of management agencies, dam operators and sportsmen to resolve conflict. Minimizes the impacts of dam operations on aquatic resources.

Disadvantage: Reduces Montana Power Company's and Bureau of Reclamation's ability to produce power.

Population Manipulation

Explanation: The following strategies are directed at controlling an over-population of kokanee if and when it occurs in the reservoir. An over-

population of kokanee would likely diminish the quality of fishing because the size of these fish tend to become smaller as the population increases in density. Actions directed at controlling the kokanee population are untested and may or may not prove to be effective. Under Management Options I and II, these strategies would be implemented only if and when the average length of adult kokanee in the creel decreased below a size considered to be undesirable by most anglers (approximately 15.0 inches). Under Management Option III, these strategies would be implemented only if and when kokanee were found to be significantly competing with rainbow trout for food and space.

D. Physically restrict kokanee from access to spawning habitat.

Explanation: Kokanee spawning might be controlled by trapping the tributaries and by covering the spawning beds with screen in the Canyon Ferry tailrace.

Advantage: May control the potential over-population of kokanee.

Disadvantage: New work would require a re-direction of and/or additional Departmental manpower and dollars. May be very difficult to control kokanee spawning, especially if these fish are utilizing shoreline areas for spawning habitat. Controlling kokanee spawners may also hinder brown trout spawning because they spawn at the same time and in the same areas.

E. Flush kokanee fry from the tailrace area by allowing dam operators at Canyon Ferry to release a substantial quantity of water through the dam during the spring.

Explanation: Operators at Canyon Ferry Dam could release a large quantity of water from Canyon Ferry Dam to flush kokanee fry out of the reservoir during the spring.

Advantage: May help control the potential over-population of kokanee. May improve the ability of dam operators to produce power.

Disadvantage: May flush a substantial number of rainbow trout from the reservoir complex. May result in an excessive reduction in the kokanee population.

F. Allow commercial fishing for kokanee in Hauser Reservoir.

Explanation: Commercial fishing could be used to control the kokanee population. A small local business is

currently fishing for carp and suckers on Lake Helena. A market could easily be developed for kokanee.

Advantage: Allows a small business to commercially fish for kokanee. May help control the potential over-population of kokanee.

Disadvantage: Commercial fishing may adversely affect other sport fisheries in the reservoir and may conflict with recreational anglers.

G. Utilize kokanee spawners as an egg source for the hatchery system.

Explanation: The demand for kokanee eggs in the state is greater than the current supply because of a major effort being undertaken to restore the kokanee population in Flathead Lake. Taking eggs from kokanee without replacing the loss may help to control the potential over-population of kokanee.

Advantage: Provides an additional egg source to the hatchery system.

Disadvantage: New work would require a re-direction of and/or additional Departmental manpower and dollars. Electrofishing kokanee spawners to obtain eggs may also interfere with brown trout spawning by displacing spawners off of their redds.

H. Plant a predatory fish (Kamloops rainbow trout, brown trout or walleye) as a tool to control potential over-population of kokanee.

Explanation: Kamloops rainbow trout are known to be an effective predator on kokanee in the open waters of lakes and reservoirs. Although case studies are not available, brown trout or walleye may also prove to be an effective predator on kokanee. Increased predation may help control the potential over-population of kokanee.

Advantage: May help to control the kokanee population and may provide for a more diverse fishery and/or trophy sized fish. Predatory species might reproduce naturally following introduction.

Disadvantage: Kamloops rainbow have a questionable hatchery supply and difficult disease problems. Stocking success of predatory species may be poor due to flushing losses over or through the dam because it would take several years for these fish to reach a sufficient size to prey on kokanee. Stocking

predatory species of fish increases the potential for predation on yellow perch and trout populations as well as the kokanee population. May result in excessive predation on kokanee. Stocking predatory fish may upset the balance among fish species in downstream waters because of dispersal over or through the dam.

I. Allow snagging if other measures to control the potential over-population of kokanee fail.

Explanation: If needed, a snagging season could be implemented during the fall to increase the harvest of kokanee spawners. Increased harvest may help control the potential over-population of kokanee. Snagging is not specific to one species, however, and may result in the over-harvest of other fish species such as brown trout.

Advantage: Would provide additional recreational opportunities to the fishing public. May help control the potential over-population of kokanee.

Disadvantage: Snagging seasons tend to create enforcement problems. Incidental snagging of other game fish species, such as brown trout, may not be acceptable.

Fishing Regulations

J. Adjust the daily and possession limits for trout and kokanee as needed.

Explanation: Fishing limits for rainbow trout and kokanee will need to be adjusted as population densities change and as angler use varies. Because kokanee populations tend to be unstable, however, it is difficult to predict if regulation changes can be used to effectively manage kokanee numbers in Hauser Reservoir. Under Management Options I and II, adjustment in the kokanee limits would be used to maintain a minimum average length for adult kokanee in the creel that is considered desirable by most anglers (approximately 15.0 inches). Limits would be increased if and when kokanee became over-populated and their average length became smaller than the size desired by most anglers. Limits would be decreased if harvest became excessive and substantially reduced the number of spawners in the reservoir. Limits for rainbow trout may need to be adjusted to more evenly distribute harvest among fishermen if and when angler use increases. Under Management

Option 3, fishing limits for kokanee would need to be liberalized if they were found to be competing with rainbow trout for food and space.

Advantage: Harvest may be an effective tool in controlling a potential over-population of kokanee in the reservoir.

Disadvantage: It is difficult to monitor annual changes in the kokanee population because kokanee populations tend to be unstable and can exhibit substantial fluctuations. As a result, adjustments to fishing regulations in response to population changes may prove to be "too little, too late". Regulations need to be kept relatively consistent to insure compliance and to maintain simplicity.

K. Separate the fishing limits (daily and possession) between trout and kokanee to allow for better management of the two species. Develop an educational program that would help anglers distinguish between rainbow trout and kokanee.

Explanation: Currently, trout and kokanee limits are combined making the limit 10 pounds and 1 fish, not to exceed 10 trout and kokanee in combination. The limits for these two species are combined because some anglers find it difficult to tell kokanee and rainbow trout apart. In addition, the combined limit acts to distribute the harvest among a greater number of anglers. A combination limit for the two species solves the problem of species misidentification by anglers. By separating the limits between the two species, however, the Department would be able to respond to changes in the kokanee population by adjusting regulations without affecting the management of trout. An educational program would be used to help anglers identify the two species.

Advantage: Allows the Department to separately manage for trout and kokanee.

Disadvantage: Some anglers find it difficult to distinguish between rainbow trout and immature kokanee.

L. Simplify fishing regulations by setting straight number limits and eliminate the weight limit.

Explanation: A straight number limit would simplify fishing regulations, making it easier for anglers to comply and easier for enforcement to insure compliance.

Advantage: Simplifies fishing regulations.
Disadvantage: This regulation change could potentially result in the over-harvest of large rainbow trout and brown trout.

M. Increase the possession limit for kokanee.

Explanation: Currently, the possession limit for kokanee is the same as the daily fishing limit. A greater possession limit would allow anglers to keep more fish.

Advantage: Would allow anglers to keep more fish and extend their stay on the reservoir.
Disadvantage: May result in a over-harvest of kokanee. Greater possession limits may also confine the harvest among a fewer number of anglers (anglers that are more skillful in catching fish).

Management Options - Rainbow Trout and Kokanee

Option I. Rely on a mixed fishery of rainbow trout and kokanee to provide for a harvest level of at least 80,000 fish/year. The harvest for rainbow trout will be maintained at least at current levels (40,000 trout/year). The Department would rely on the naturally reproducing kokanee population to provide for the remainder of the fishery. This option essentially represents the current management direction by the Department.

Explanation: It is difficult to predict what direction the kokanee fishery will proceed in future years because this relatively new population is continuing to undergo significant change. Due to the potential competition for food and space between rainbow trout and kokanee, the rainbow population would be enhanced only if the harvest fell below the minimum of 40,000 trout/year or if the kokanee population declined to a level where the overall harvest (combined harvest for rainbow trout and kokanee) was less than 80,000 fish/year. The kokanee population would be allowed to continue to expand unless the average length of adult fish declined below a size considered undesirable by most anglers (approximately 15.0 inches). A mixed rainbow trout/kokanee fishery provides opportunities to both boat anglers and

shore anglers to catch fish. Rainbow trout provide a fishing opportunity to shore anglers but kokanee are not readily caught from shore. In 1988, the catch rate, average length and annual harvest for rainbow trout was 0.20 fish/hour, 15.8 inches and 36,000 fish/year, respectively. For kokanee, the 1988 catch rate, average length and annual harvest was 0.24 fish/hour, 16.3 inches and 43,000 fish/year, respectively.

Possible Department Actions:

Stocking Hatchery Fish

1. Adjust the number of rainbow trout stocked into the reservoir to meet the harvest objectives (40,000 trout/year).

Explanation: The stocking rate for rainbow trout may need to be increased to meet the minimum harvest for trout (40,000 fish/year) or to meet the minimum overall harvest (80,000 fish/year) if the kokanee population happened to decline. The stocking rate for rainbow trout could be decreased if new stocking strategies improved survival of hatchery fish or if the number of self-sustaining wild fish were to increase.

Advantage: Kokanee populations in other state waters have tended to be unstable. An adjustable stocking rate for rainbow trout could be used to react to potential changes in the kokanee population.

Disadvantage: The hatchery system is currently operating at capacity. Increasing the stocking rate for rainbow trout would require expanded hatchery space and/or the stocking rates for other waters would have to be reduced to make more hatchery rainbow available.

2. Introduce wild strains of rainbow trout (Desmet and Eagle Lake) to encourage the development of self-sustaining populations.

Explanation: Only the Arlee strain of rainbow trout has been stocked into the reservoir since the 1950's. This hatchery strain is not known to readily reproduce in the wild. Currently, wild rainbow trout contribute very little to the fishery. Introductions of new "wild" strains may encourage increased natural reproduction thus increasing the number of fish in the reservoir. Additional natural recruitment also may allow for a decrease

in the number of hatchery fish stocked into the reservoir. New rainbow strains may prove to be longer lived than the Arlee strain thus potentially increasing the average size of fish in the creel.

Advantage: May allow for a reduction in the stocking rate for hatchery rainbow trout. May increase the average size of fish in the creel.

Disadvantage: Spawning habitat in the tributaries is limited. Wild rainbow trout may be less catchable than hatchery fish and flushing losses may be more debilitating to a fishery dominated by a naturally reproducing population because of slower growth rates and longer population recovery times.

3. Stock sterile rainbow trout in an attempt to produce larger fish.

Explanation: Sterilized rainbow trout would tend to grow to a larger size because the fish's energy that is normally consumed for developing reproductive products would be re-directed toward growth.

Advantage: May result in a larger sized fish.

Disadvantage: Requires an additional step in the hatchery process. Sterilization has created some health problems in trout in past efforts.

4. More evenly distribute hatchery rainbow trout around the reservoir at the time of stocking.

Explanation: Currently, the reservoir is stocked at only a couple of sites. Improved distribution of hatchery fish may increase the survival of newly stocked trout.

Advantage: May increase the number of rainbow trout in the reservoir.

Disadvantage: Increases stocking costs.

5. Stock a percentage of the rainbow plant earlier in the spring to increase the average size of fish in the creel.

Explanation: Currently, all rainbow trout are stocked following spring runoff (July) in attempt to reduce flushing losses over the dam. By stocking earlier (May), hatchery fish would benefit from having two extra months for growth, resulting in an additional 2.5 to 3.5 inches in length at the end of the first growing season. Stocking some hatchery fish earlier also would likely increase the rate of

return to the creel. To reduce the potential for increased flushing losses, a determination on whether or not to stock early could be made during the spring based on predictions for runoff.

Advantage: May increase the size of rainbow trout in the creel.

Disadvantage: Increases the chance for losing hatchery fish over the dam during spring spill.

6. Stock kokanee into the reservoir to meet the minimum objective for the overall harvest (80,000 fish/year).

Explanation: If the current self-sustaining kokanee population declines, hatchery kokanee could be stocked into the reservoir to meet overall harvest objectives. However, this option is presently unrealistic because of stocking commitments for Flathead Lake. A majority of the kokanee presently raised in the hatchery system are scheduled to be stocked into Flathead Lake over the next several years.

Advantage: May be needed to maintain a mixed rainbow trout/kokanee fishery if, for some reason, the self-sustaining kokanee population collapsed.

Disadvantage: Stocking success may be poor due to flushing losses over or through the dam. The hatchery system is currently operating at capacity. Flushing losses of kokanee over or through the dam may upset the balance among fish species in downstream waters.

Habitat Management

7. Evaluate the potential for improving spawning habitat for rainbow trout in the tributaries to the reservoir.

Explanation: Several tributaries to Hauser Reservoir currently provide limited spawning habitat to migratory rainbow trout. This habitat could be improved by removing barriers to migration, improving spawning gravel and fencing out livestock.

Advantage: Encourages development of a self-sustaining rainbow population. Additional natural recruitment may increase the number of rainbow trout in the reservoir.

Disadvantage: Spawning habitat improvements may be costly and should be considered experimental because they may prove to be ineffective. Private landowners on the tributaries would have to be involved in any work that is conducted.

Option II.	Manage primarily for a naturally reproducing kokanee population to provide for a harvest level of at least 80,000 kokanee/year for fish of a size considered desirable by most anglers (approximately 15.0 inches).
Explanation:	In this option, the Department would primarily manage for kokanee and allow the rainbow population to be regulated through natural reproduction. However, kokanee populations tend to be inherently unstable. As a result, this management option may not be feasible if the kokanee population stunted or declined to a level where the number of fish caught was insufficient to meet angler demand. Managing primarily for kokanee may prevent potential competition between trout and kokanee for food and space. The rainbow population would likely decline because hatchery plants would be reduced or eliminated. The kokanee population would be allowed to expand unless the average length of adult fish decreased below a size considered undesirable by most anglers. Flushing losses of kokanee over or through the dam may upset the balance among fish species in downstream waters. Kokanee would provide additional forage for brown trout and walleye and may improve the trophy fishery. Under this option, fishing diversity would be decreased and shore anglers would have less opportunity to catch a fish because kokanee are not readily taken from shore.

Possible Department Actions:

Stocking Hatchery Fish

1. Hatchery rainbow trout would be stocked in the reservoir only if and when flushing losses of kokanee over the dam were substantial or if the kokanee population decline to a level where the number of fish caught was insufficient to meet angler demand.

Explanation: The potential effect of excessive spring spills over Hauser Dam on the kokanee population is unknown at this time because this newly developing population has not yet experienced a high water year. If flushing losses of kokanee prove to be substantial during high water years, then rainbow trout could be stocked into the reservoir to

supplement the fishery following a major spring spill. Criteria would need to be established to determine when flushing losses are significant enough to require supplemental stocking of rainbow trout.

Advantage: Provides a trout fishery if and when flushing losses substantially deplete the kokanee population.

Disadvantage: Hatchery rainbow scheduled to be stocked elsewhere would have to be diverted to Hauser Reservoir. Rainbow trout stocked into the reservoir after spring spill would not contribute to the fishery until late fall.

2. Stock kokanee into the reservoir to meet the overall harvest objective (at least 40,000 kokanee/year).

Explanation: If the current self-sustaining kokanee population declines, hatchery kokanee could be stocked into the reservoir to meet the overall harvest objective. However, this option is currently unrealistic because of stocking commitments for Flathead Lake. A majority of the kokanee presently raised in the hatchery system are scheduled to be stocked into Flathead Lake over the next several years.

Advantage: May be needed to maintain the kokanee fishery if, for some reason, the self-sustaining kokanee population collapsed.

Disadvantage: Stocking success may be poor due to flushing losses over or through the dam. Flushing losses may upset the balance among sport fish species in downstream waters. The hatchery system is currently operating at capacity.

Habitat Management

3. Identify key spawning habitat for kokanee in the tributaries, shoreline areas and Canyon Ferry tailrace. Protect identified spawning areas from dewatering, dredging and other disturbances.

Explanation: Spawning habitat must be protected if the fishery is going to rely on a self-sustaining population of kokanee.

Advantage: Encourages natural reproduction by kokanee.

Disadvantage: Identification of spawning areas requires a re-direction of and/or additional Departmental dollars and manpower.

Option III.	Manage primarily for rainbow trout to provide for a harvest of at least 55,000 trout/year for 13 to 19 inch fish.

Explanation: In this option, the Department would manage primarily for rainbow trout and allow the kokanee population to be regulated through natural reproduction. The kokanee population would be controlled only if and when they were found to significantly compete with rainbow trout for food and space. However, the population level at which kokanee would begin to compete with rainbow trout is very difficult to determine. Under this option, the average size of kokanee may decrease because of potential over-population.

Possible Department Actions:

Stocking Hatchery Fish

1. Increase the number of hatchery rainbow trout stocked into the reservoir to meet stated harvest objectives (55,000 trout/year).

Explanation: Hauser Reservoir presently receives 200,000 fingerling rainbow per year. At the current rate of return for hatchery plants (18%), an additional 80,000 rainbow trout would have to be stocked into the reservoir to meet the stated harvest objectives.

Advantage: More rainbow trout would be available to the fishery.

Disadvantage: The hatchery system is currently operating at capacity. A greater stocking rate would require expanded hatchery space and/or stocking rates for other waters would have to be reduced to make more hatchery fish available. Management costs would increase.

2. Introduce wild strains of rainbow trout (Desmet and Eagle Lake) to encourage the development of self-sustaining populations.

Explanation: Only the Arlee strain of rainbow trout has been planted into the reservoir since the 1950's. This hatchery strain is not known to readily reproduce in the wild. Currently, wild rainbow trout contribute very little to the fishery.

Introductions of new "wild" strains may encourage increased natural reproduction thus increasing the number of fish in the reservoir. New rainbow strains may prove to be longer lived than the Arlee strain thus potentially increasing the average size of fish in the creel.

Advantage: Additional natural recruitment would increase the number of rainbow trout in the reservoir. May increase the average size of fish in the creel.

Disadvantage: Spawning habitat in the tributaries is limited. Wild rainbow trout may be less catchable than hatchery fish and flushing losses may be more debilitating to a fishery dominated by a naturally reproducing population because of slower growth rates and longer population recovery times.

3. More evenly distribute hatchery rainbow trout around the reservoir at the time of stocking.

Explanation: Currently, the reservoir is stocked at only one site. Improved distribution of hatchery fish may increase the survival of newly planted trout.

Advantage: May increase the number of rainbow trout in the reservoir.

Disadvantage: Increases stocking costs.

4. Stock a percentage of the rainbow plant earlier in the spring to increase the average size of fish in the creel.

Explanation: Currently, all rainbow trout are stocked following spring runoff (July) in attempt to reduce flushing losses over the dam. By stocking earlier (May), hatchery fish would benefit from having two extra months for growth, resulting in an additional 2.5 to 3.5 inches in length at the end of the first growing season. Stocking some hatchery fish earlier also would likely increase the rate of return to the creel. To reduce flushing losses, a determination on whether or not to stock early could be made during the spring based on predictions for runoff.

Advantage: May increase the size of rainbow trout in the creel.

Disadvantage: Increases the chance for losing hatchery fish over the dam during spring spill.

5. Stock sterile rainbow trout in an attempt to produce larger fish.

Explanation: Sterilized rainbow trout would tend to grow to a larger size because the fish's energy that is normally consumed for developing reproductive products would be re-directed toward growth.

Advantage: May result in a larger sized fish.

Disadvantage: Requires an additional step in the hatchery process. Sterilization has created some health problems in trout in past efforts.

Habitat Management

5. Evaluate the potential for improving spawning habitat for rainbow trout in the tributaries to the reservoir.

Explanation: Several tributaries to Hauser Reservoir currently provide limited spawning habitat to migratory rainbow trout. This habitat could be improved by removing barriers to migration, improving spawning gravel and fencing out cattle.

Advantage: Encourages development of a self-sustaining rainbow population. Additional natural recruitment may increase the number of rainbow trout in the reservoir.

Disadvantage: Spawning habitat improvements may be costly and should be considered experimental because they may prove to be ineffective. Private landowners on the tributaries would have to be involved in any work that is conducted.

BROWN TROUT

There are two possible management options for brown trout in Hauser Reservoir. These management options are discussed in detail in pages 25 through 28. The two management options can be summarized as follows:

Option I. Continue the present management direction of allowing the population level to be maintained through natural reproduction.

Option II. Maintain or enhance the present population level and continue to provide an opportunity to catch large fish.

Explanation: Currently, there are about 300 brown trout harvested each year from Hauser Reservoir. Although many anglers find brown trout difficult to catch in the reservoir, this species provides anglers an opportunity to catch a trophy fish. Brown trout and kokanee in Hauser Reservoir spawn in the same areas and at the same time. There is a potential that the expanding kokanee population may adversely affect the brown trout population by competing for spawning sites. However, the Department has no information indicating that a competition problem between the two species exists at this time.

The following possible Department actions apply to both of the management options presented for brown trout:

A. Monitor the brown trout population and angler harvest to provide information needed to make management decisions.

Explanation: Information is necessary to determine if Department actions are meeting overall objectives. If goals are not being met, information is needed to determine what management changes need to be made. Creel census, gill netting, electrofishing and spawning traps are the methods currently being used to monitor fish populations.

Advantage: Provides basis for management decisions.
Disadvantage: Continued monitoring efforts require Departmental manpower and dollars.

B. Protect spawning habitat through preparation of instream flow recommendations and through the streambed preservation laws.

Explanation: Instream flow recommendations for the major tributaries to Hauser Reservoir are being developed as part of the Missouri River basin water reservation application to be submitted to the Montana Department of Natural Resources and Conservation. Minimum instream flows are needed to maintain spawning and rearing habitat. The Natural Streambed and Land Preservation Act of 1975 authorizes conservation districts to protect and preserve streams as much as possible in their natural or existing state. The Stream Protection Act of 1963 authorizes the Department to regulate activities by state and local governments involved with alterations of stream channels.

Advantage: Protects brown trout spawning and rearing habitat.
Disadvantage: Streambed preservation efforts by the Department require manpower and dollars.

C. Prevent over-harvest of spawners via regulations as needed.

Explanation: The Department would reduce limits or close the fall season to fishing for brown trout if it was determined that spawners were being over-harvested. Currently, there is no indication that a problem with over-harvest of brown trout is developing in the reservoir.

Advantage: Prevents potential over-harvest of spawners.
Disadvantage: Fishing restrictions would reduce the opportunity to harvest fish.

Management Options - Brown Trout

Option I. **Allow the population level to be maintained through natural reproduction. This option essentially represents the current management direction by the Department.**

Explanation: Under this option, the brown trout population would be regulated primarily through natural reproduction. Management efforts would not address the potential problem with competition between brown trout and kokanee for spawning

sites. For this option, the Department assumes that if and when a competition problem develops between brown trout and kokanee, it would be very difficult to solve and that management efforts would be better spent on other game fish species in the reservoir.

Possible Department Actions:

1. No special actions would be needed.

Option II. Maintain or enhance the present population level and continue to provide an opportunity to catch large fish.

Explanation: In this option, the brown trout population would be regulated primarily by natural reproduction. Management efforts, however, would address the potential competition problem between brown trout and kokanee for spawning sites that may develop in the future. Under this option, the Department assumes that maintaining an opportunity to catch large brown trout would be worth the additional management efforts and that any potential competition problem that may develop between the two species could realistically be solved. Enhancement efforts may upset the balance among fish species in Hauser Reservoir and in downstream waters.

Possible Department Actions:

1. Evaluate brown trout/kokanee interactions on spawning grounds and, if needed, develop solutions to minimize potential competition between the two species.

Explanation: If kokanee were found to be competing with brown trout for spawning sites, then they could possibly be physically prevented from utilizing brown trout spawning habitat by constructing barriers on important tributaries that might selectively allow only brown trout to pass.

Advantage: May reduce the potential competition for spawning sites between the two species.

Disadvantage: Would likely reduce the kokanee population in the reservoir. May also interfere with brown trout spawning. Evaluation of brown trout/kokanee

interactions would require a re-direction of and/or additional manpower and dollars. Construction and maintenance of selective barriers may prove costly and would be considered experimental because they can not be guaranteed to be effective. Private landowners on the tributaries would have to approve any work that is conducted.

2. Evaluate the potential for improving spawning habitat for brown trout in the tributaries to the reservoir.

Explanation: Several tributaries to the reservoir provide spawning habitat to migratory brown trout. Spawning habitat could be improved in the tributaries by removing barriers to migration, improving spawning gravel, insuring minimum instream flows and fencing out livestock.

Advantage: Additional natural reproduction may increase the number of fish in the reservoir.

Disadvantage: Spawning habitat improvements may be costly and would be considered experimental because they may prove to be ineffective. Private landowners on the tributaries would have to approve any work that is conducted.

3. Stock brown trout if natural reproduction substantially declines as a result of competition with kokanee.

Explanation: If strategies designed to enhance natural reproduction to the reservoir proved to be ineffective, then brown trout eggs could be obtained from wild populations and raised to a fingerling size in the hatchery. The fingerlings could then be stocked in the reservoir. Stocking brown trout would present a potential risk of increased predation on yellow perch, rainbow trout and kokanee populations.

Advantage: May solve potential reproduction problems created from competition between kokanee and brown trout and may increase the number of fish in the reservoir.

Disadvantage: Stocking brown trout may not be effective in producing large fish. Stocking brown trout increases the potential for predation on yellow perch, rainbow trout and kokanee populations. Flushing losses may upset the balance among fish species in downstream waters. A long term monitoring program (4 to 7 years) would need to be conducted to evaluate stocking success and to

determine what effect stocking would have on other game fish populations. Would require a re-direction of and/or additional Departmental manpower and dollars to provide hatchery fish.

4. Develop an educational program to explain the special fishing techniques needed to catch brown trout in the reservoir.

Explanation: Anglers need to use special techniques to properly present bait or lures to brown trout in Hauser Reservoir because these fish tend to be bottom dwellers.

Advantage: Increases the diversity of fishing opportunities.
Disadvantage: Requires a re-direction of and/or additional manpower and dollars to develop an educational program.

WALLEYE

There are two possible management options presented for walleye in Hauser Reservoir. These management options are discussed in detail in pages 30 through 32. The two management options can be summarized as follows:

Option I.	Continue the present management direction and allow the population to maintain itself through natural reproduction.
Option II.	Enhance the walleye population through supplemental stocking.

The following possible Department actions apply to both of the management options presented for walleye:

A. Monitor the walleye population and angler harvest to provide information needed to make management decisions.

Explanation: Information is necessary to determine if current Department actions are meeting overall objectives. If goals are not being met, information is needed to determine what management changes need to be made. Creel census, gill netting, electrofishing and spawning traps are the methods currently being used to monitor fish populations.

Advantage: Provides basis for management decisions.
Disadvantage: Continued monitoring efforts require Departmental manpower and dollars.

B. Continue daily and possession limits of 5 walleye, only one of which may exceed 20 inches.

Explanation: This regulation was implemented in 1988 to protect the walleye populations in Hauser and Holter reservoirs. Very few walleye are harvested in Hauser Reservoir because the population is very sparse. As a result, current regulations have little effect on the walleye harvest in Hauser Reservoir. Regulations may need to be changed in the future if a walleye enhancement option is selected.

C. Encourage compliance with reservoir steering committee guidelines for dam operations to reduce adverse impacts to

fish and wildlife resources.

Explanation: Significant spills from the reservoir and unstable water elevations can harm the reservoir fishery. Guidelines for operation of the dam have been established by committee to lessen these potential conflicts with fishery resources and recreational opportunities. The current guidelines recommend that Hauser Dam be operated with a relatively stable reservoir level. These guidelines may be modified as additional information becomes available.

Advantage: Utilizes a committee of management agencies, dam operators and sportsmen to resolve conflict. Minimizes the impacts of dam operations on aquatic resources.

Disadvantage: Reduces Montana Power Company's and Bureau of Reclamation's ability to produce power.

Management Options - Walleye

Option I. Allow the population to maintain itself through natural reproduction. This option essentially represents the current management direction by the Department.

Explanation: Presently, there are very few walleye residing in Hauser Reservoir. This is most likely due to flushing losses of walleye fry over or through Hauser Dam. Because of a relatively small storage capacity, Hauser Reservoir has a short retention time. Water in the reservoir is replaced about every nine days on average but retention time can be as brief as only four days during spring runoff. Under this option, the walleye population would be allowed to maintain itself through natural reproduction. No effort would be made to enhance the population.

Possible Department Actions:

1. No special actions would be needed.

Option II.	Enhance the walleye population through supplemental stocking.
Explanation:	Currently, the walleye population in Hauser Reservoir is sparse and there is some demand by the public to increase fishing opportunities by stocking the reservoir. In this option, the Department would use supplemental stocking to enhance the walleye population. Stocking success for walleye could be poor because of flushing losses over or through the dam. Flushing losses may be high because retention time for water in Hauser Reservoir is very brief. To minimize flushing losses, walleye plants should be made into the Causeway Arm where walleye habitat appears to be most suitable. Hauser Reservoir is not listed as a high priority water for stocking walleye in the Warmwater Management Plan of 1987. However, more walleye will become available for stocking as the warmwater hatchery at Miles City comes into full production. Walleye planted into the reservoir would have to be marked for future identification to evaluate movement, survival, growth and hatchery contribution to the fishery. A long term monitoring program (4 to 7 years) would need to be conducted to evaluate stocking success and to determine what effect stocking would have on other game fish populations. Fingerling walleye would require 3 to 4 years to reach a catchable size as well as a sufficient size to prey on other game fish species.

Possible Department Actions:

1. Enhance the walleye fishery in Hauser Reservoir by stocking fingerlings to provide a balanced fishery similar to that which currently exists in Holter Reservoir.

Explanation: Holter Reservoir currently has a reasonably balanced population of walleye, rainbow trout, brown trout and yellow perch. This balance is probably due to relatively low numbers of walleye coupled with a healthy population of yellow perch. Perch are a preferred item in the walleye diet and apparently serve as a "buffer" that reduces walleye predation on trout and kokanee. The walleye population is probably limited by flushing losses of fry over or through the dam. The population may also be influenced by yellow perch predation on walleye fry. The Holter

walleye fishery provides good catch rates for anglers and produces large sized fish with good growth rates. Population enhancement in Hauser would begin by annually stocking 3,000 to 5,000 walleye fingerlings. Success of stocking would be evaluated by creel census and gill netting. A population of catchable sized walleye should begin to develop after three years. Adjustments in stocking rates could be made after three years if monitoring indicates that walleye population objective is not being met or if unacceptable impacts on other species occur. If sufficient natural reproduction began to occur, stocking could be reduced or eliminated.

Advantage: Stocking fingerlings should increase the opportunity to catch walleye, add diversity to the reservoir fishery and meet angler requests for an expanded walleye fishery.

Disadvantage: Stocking walleye increases the potential for predation on yellow perch, trout and kokanee populations and might adversely affect the fisheries for these species in Hauser. Walleye flushed past Hauser Dam may upset the existing balance among fish species in Holter Reservoir and the Missouri River.

2. **Stock walleye at high densities and manage Hauser Reservoir primarily as a walleye fishery.**

Explanation: Walleye would be stocked at high levels (20,000 to 50,000 fingerlings) to convert Hauser to a fishery dominated by walleye. Possible adverse impacts to other sport fish populations would not be mitigated and plants of rainbow trout would be discontinued if and when walleye began to dominate the fishery.

Advantage: Stocking walleye should increase the opportunity to catch walleye, add diversity to the reservoir fishery and meet angler requests for expanded walleye fishing. A high stocking rate should make significantly more walleye available to anglers.

Disadvantage: Risk of adverse impacts on other sport fish species would be high because of increased predation. There is also a high probability that walleye flushed from Hauser Dam would upset the existing balance between walleye, yellow perch and rainbow trout in Holter Reservoir and possibly the Missouri River. A high density walleye population may deplete existing forage, resulting in slower growth and smaller walleye.

INTRODUCTIONS OF FORAGE SPECIES

Issue: Although there are several abundant forage fish species already present in Hauser Reservoir, there may be a future need to more closely manage for forage and/or introduce new forage species into the reservoir if and when a walleye fishery is developed. Potential species of fish that could be introduced into the reservoir to provide forage for walleye include cisco, spottail shiners, emerald shiners, alewife and rainbow smelt. Many of these species would likely compete with trout, kokanee and yellow perch for food and space. Any new forage species introduced into Hauser Reservoir will result in the same species of fish being introduced downstream into Holter Reservoir and the Missouri River because of flushing losses over or through the dams.

Possible Department Actions:

1. Utilize the current composition of fish species found in the reservoir to provide forage for any future walleye population that may develop.

Advantage: New forage fish species introduced into the reservoir may compete with trout, kokanee and yellow perch for food and space. New forage species flushed from Hauser Dam may upset the balance among fish species in Holter Reservoir and the Missouri River.

Disadvantage: An expanded walleye population may require additional forage.

2. Utilize the current composition of fish species found in the reservoir to provide forage for any future walleye population that may develop. If the current walleye population is enhanced through supplemental stocking, then a long term monitoring program (4 to 7 years) would be used to evaluate the need for introductions of additional fish species into the reservoir to provide forage for an expanded walleye population. This action would probably be needed only if the option to manage Hauser Reservoir primarily as a walleye fishery was selected.

Advantage: This approach considers introductions of exotic fish species into the reservoir only if it is determined that, after long term monitoring, additional forage was needed for an expanded

walleye population. As a result, this approach reduces the potential risk of introducing exotic species into the reservoir which would compete with resident game fish for food and space.

Disadvantage: Continued monitoring efforts require Departmental dollars and manpower. Any new species introduction would require public review and comment before any action could take place.

YELLOW PERCH

Option I. Allow the existing population level to be maintained through natural reproduction. Maintain the existing harvest level for yellow perch (10,000 to 20,000 fish/year) and maintain an average length of 9 inches in the creel.

Explanation: The population would be allowed to maintain itself through natural reproduction. Unlimited harvest would be allowed to continue unless harvest levels became excessive and were shown to adversely affect the population. The yellow perch population in the reservoir has been able to maintain itself under current levels of harvest.

Possible Department Actions:

1. Monitor the yellow perch population and angler harvest to provide information needed to make management decisions.

Explanation: Information is necessary to determine if current Department actions are meeting overall objectives. If goals are not being met, information is needed to determine what management changes need to be made. Creel census, gill netting and spawning traps are the methods currently being used to monitor fish populations.

Advantage: Provides basis for management decisions.
Disadvantage: Continued monitoring efforts require Departmental manpower and dollars.

2. Encourage compliance with reservoir steering committee guidelines for dam operations to reduce adverse impacts to fish and wildlife resources.

Explanation: Significant spills from the reservoir and unstable water elevations can harm the reservoir fishery. Guidelines for operation of the dam have been established by committee to lessen these potential conflicts with fishery resources and recreational opportunities. The current guidelines recommend that Hauser Dam be operated with a relatively stable reservoir level. These guidelines may be modified as additional information becomes available.

Advantage: Utilizes a committee of management agencies, dam operators and sportsmen to resolve conflict. Minimizes the impacts of dam operations on aquatic resources.

Disadvantage: Reduces Montana Power Company's and Bureau of Reclamation's ability to produce power.

3. Increase public awareness of the fishing opportunities provided by yellow perch.

Explanation: Anglers tend to concentrate their efforts on the game fish species in the reservoir. Yellow perch are fun to catch and excellent to eat.

Advantage: Provides increased fishing opportunities. The population has been able to maintain itself at current levels of harvest.

Disadvantage: None.

4. Classify yellow perch as a game fish species to allow the Department to set fishing limits if needed.

Explanation: A game fish classification would allow the Department to use fishing regulations to better manage this species. The Department would continue to allow unlimited harvest under the game fish classification unless harvest levels became excessive and were shown to adversely affect the population.

Advantage: Provides the Department an additional tool to manage for yellow perch.

Disadvantage: Further complicates the current fishing regulations.

COMMERCIAL FISHING

Issue: A small local business has been allowed to commercially fish for carp and suckers on Lake Helena and occasionally on the Causeway Arm of Hauser Reservoir for approximately the past 30 years. Commercial fishing businesses are required to obtain an annual permit from the Department. In recent years, this commercial operation has requested a permit from the Department to allow fishing for carp and suckers in both Lake Helena and a small area in the Causeway Arm of Hauser Reservoir. A review of historic records indicate that this commercial fishing operation has taken up to one-half million pounds of carp and 3,000 pounds of suckers from Lake Helena in some years. The Department requires the business to release all inadvertently captured game fish back into the lake. A number of people have felt that the removal of carp from the lake has resulted in some improvement in the trout fishery. Other people, however, feel that this commercial fishing operation has adversely affected the sport fisheries and, as a result, do not wish to see the operation expanded into Hauser Reservoir. The Department has no information indicating that this commercial fishing operation harms the sport fishery in Lake Helena or Hauser Reservoir.

Possible Department Actions:

1. Allow commercial fishing to take place both in Lake Helena and the Causeway Arm of Hauser Reservoir and monitor the effects on the sport fisheries. Modify or revoke the commercial permit if adverse impacts are identified.

Advantage: Allows a small business to commercially fish for non-game species such as carp and suckers. A commercial fishing operation may reduce the number of carp and suckers in the reservoir and, as a result, may improve the reservoir sport fisheries. In addition, reduction in the carp population may possibly benefit waterfowl production because turbidity may be reduced resulting in better growth of aquatic plants.

Disadvantage: Commercial fishing in the Causeway Arm of Hauser Reservoir may adversely affect the sport fisheries and may conflict with recreational anglers.

2. Deny permission to commercially fish in the Causeway area. Allow commercial fishing only in Lake Helena and monitor the effects on the sport fisheries. Modify or revoke the commercial permit if adverse impacts are identified.

Advantage: Allows a small business to commercially fish for non-game species such as carp and suckers. Conflicts with anglers would be minimized because recreational use on Lake Helena is currently very low. Removal of carp and suckers may improve the reservoir sport fisheries. May benefit waterfowl production because turbidity may be reduced resulting in better growth of aquatic plants.

Disadvantage: Recreational use on Lake Helena may increase in future years. May adversely affect the sport fisheries and may conflict with recreational anglers.

3. Deny permission to all commercial operations seeking to fish in Lake Helena and Hauser Reservoir.

Advantage: Prevents conflict with recreational anglers and eliminates the potential for incidental catch of sport fish.

Disadvantage: Denies small business permission to commercially fish for non-game species such as carp and suckers in Hauser Reservoir.

SOCIAL CONFLICTS

Issue: **The number of anglers using the Canyon Ferry tailrace area has increased substantially over the past several years as a result of the expanding kokanee fishery. Conflicts between bank and boat anglers, as well as among boat anglers themselves, has grown accordingly.**

Possible Department Actions:

1. Eliminate either bank angling or angling from boats in the Canyon Ferry tailrace area (From the north end of Riverside campground south to the cable in front of Canyon Ferry Dam on both sides of the river).

Advantage: Reduces conflicts among users.
Disadvantage: Reduces fishing opportunities to the general public by eliminating a user group. Requires increased enforcement to insure compliance.

2. Establish a "no wake rule" for the Canyon Ferry tailrace area (area as described in Option 1).

Advantage: Reduces conflicts among users and does not favor one user group over the other.
Disadvantage: Requires increased enforcement to insure compliance.

Issue: **Campgrounds on Hauser Reservoir are commonly crowded. Social conflicts often develop as a result of these crowded conditions. Common problems include loose dogs, over-staying the 14 day camping limit and docking boats near the boat ramps.**

Possible Department Actions:

1. Improve enforcement of campground regulations through better training of Department caretakers and by obtaining additional staff.

Advantage: Reduces conflicts among users.
Disadvantage: Requires additional manpower and dollars.

RESERVOIR ACCESS

Issue: Fishing access sites and camping areas on the reservoir are approaching carrying capacity. To accommodate the trend of increasing use on the reservoir, access sites and camping areas will need to be improved and additional sites will need to be developed.

Explanation: Possible Department actions discussed for access and facility needs in this report are limited and only cover issues in a very general manner. Additional information is currently being gathered by Montana Power Company as part of the federal process for relicensing Hauser Dam. In addition, the Department will be using the questionnaire associated with this report to further identify the need for additional access sites and facilities. A more comprehensive report on access will be developed and appended to the Hauser Management Plan as more information becomes available.

Possible Department Actions:

1. Encourage purchase of additional access sites on the reservoir. Additional access sites identified for potential acquisition are shown in Figure 1.

2. Evaluate the potential for developing boat camps (access only by boat) with docking facilities. There are additional federal lands adjacent to the reservoir that are accessible only by boat.

3. Encourage development of handicap access sites on the reservoir. These sites would provide access to the shoreline to enable the handicapped to fish.

4. Improve boating facilities by constructing additional boat docks at developed campgrounds.

LAKE HELENA

Lake Helena is formed from the impounding of lower Prickly Pear Creek by Hauser Dam. The Causeway Arm, located about 1.5 miles upstream from the dam, connects Lake Helena to Hauser Reservoir. Lake Helena has a surface area of about 2,100 acres and an average depth of about 5 feet. Maximum depth of the lake is only 10 feet. Lake Helena can be considered quite productive compared to other impoundments because of the heating effects of its shallow waters and the nutrient enriched tributaries entering the lake. Tributaries to Lake Helena include Prickly Pear and Silver creeks. Several irrigation drains that enter the lake are used by rainbow trout, brown trout and kokanee for spawning. A majority of the land surrounding Lake Helena is privately owned. Public access to the lake can be obtained at the county bridge that crosses the Causeway Arm, but the lake has no boat ramps. The Department has recently purchased a parcel of land located near the mouth of Silver Creek for the enhancement of waterfowl production.

Angler use is low on Lake Helena, ranging from 1,300 to 3,700 fishing days per year. Rainbow trout and brown trout are the most commonly caught species. Kokanee, walleye, and bass are also occasionally taken by anglers. Numerous species of fish have been introduced into Lake Helena since the 1920's, including sunfish, bluegill, largemouth bass, bullheads and walleye. Fish were not stocked into the lake between 1962 and 1987 because earlier plants failed to produce an acceptable fishery. In 1988, the Department stocked 20,000 fry and 20,000 fingerling largemouth bass. In an attempt to develop this fishery, the Department plans on stocking bass over a 4 or 5 year period to meet angler requests for a more diversified fishery in the reservoir complex.

Issue: **There is no boat access to Lake Helena. Currently, only boats that can be hand carried from the Causeway can be placed into the lake.**

Possible Department Actions:

1. Provide a boat launch and associated parking facilities on the lake.

Advantage: Provides boat access to Lake Helena for fishing and hunting.

Disadvantage: Increased boat use may conflict with waterfowl production objectives and waterfowl hunting opportunities. Number of suitable access sites is

limited. Access site development may not be acceptable to adjacent landowners.

2. Evaluate the feasibility of removing obstructions to boat passage under the Causeway bridge to provide access to Lake Helena.

Advantage: Provides boat access to Lake Helena for fishing and hunting.

Disadvantage: Increased boat use may conflict with waterfowl production objectives and waterfowl hunting opportunities. May not be feasible because of expense or engineering constraints.

Issue: Diversify the fishery in Lake Helena.

Possible Department Actions:

1. Continue Department efforts to enhance the bass fishery.

Advantage: Would provide for a new fishery in a body of water where fishing is currently limited. Bass would likely coexist with trout, kokanee and walleye. Bass would likely be well suited to habitat conditions and forage present in Lake Helena.

Disadvantage: May disperse into Hauser Reservoir and downstream waters. Dispersal out of Lake Helena may upset the balance between walleye, yellow perch and trout in Hauser and Holter reservoirs and the Missouri River.

2. Stock tiger muskellunge (a sterile hybrid between northern pike and muskellunge) in an attempt to develop a trophy fishery in Lake Helena.

Advantage: May provide for a trophy fishery in Lake Helena by utilizing an abundant rough fish population as forage. Predatory impact of tiger muskie would be completely controlled by stocking because they are incapable of reproducing in the wild. Decreases the chance of illegal introductions of northern pike into the lake by providing a similar but more manageable fishery. Tiger muskie would likely be well suited to habitat conditions and forage fish present in Lake Helena.

Disadvantage: If numbers are great enough, tiger muskie may suppress other sport fish populations (trout and bass) because of increased predation. May adversely affect waterfowl production by preying on young ducks. May disperse into Hauser Reservoir and downstream waters. Dispersal out of

Lake Helena may upset the balance between walleye, yellow perch and trout in Hauser and Holter reservoirs and the Missouri River if stocking densities are too high.

3. Stock walleye to develop a new fishery in a body of water where fishing is currently limited.

Explanation: If it is decided to enhance walleye in Hauser Reservoir, then a portion of the walleye plant could be made into Lake Helena rather than the Causeway Arm.

Advantage: Stocking walleye may diversify the fishery in the lake and help meet angler requests for expanded walleye fishing. Stocking walleye in Lake Helena may help meet Hauser management objectives (if a walleye enhancement option is selected) by reducing flushing losses over Hauser Dam.

Disadvantage: Habitat is not as suitable for walleye as it is for tiger muskellunge or bass. If numbers are great enough, walleye may suppress other sport fish populations (trout and bass) because of increased predation. Dispersal out of Lake Helena may upset the balance between walleye, yellow perch and trout in Hauser and Holter reservoirs and the Missouri River.

Issue: Increased fishing use on Lake Helena may interfere with waterfowl management if current efforts to enhance the fishery succeed.

Possible Department Actions:

1. Fishing could be restricted seasonally and/or to specific areas to reduce conflict.

Advantage: Fishing restrictions may be a way to reduce potential conflicts with waterfowl management.

Disadvantage: Restricts fishing opportunities.

2. Form an advisory committee of waterfowl managers, fishery managers and sportsmen to resolve potential conflicts between fishing and waterfowl that may develop.

Advantage: Utilizes a committee of diverse interests to resolve conflict.

Disadvantage: None.

Issue: Commercial fishing. **See Commercial Fishing section on page 37.**

APPENDIX A

Appendix Table A. Comments received from public scoping meetings that were held in November, 1988 in Great Falls, Helena and Bozeman to solicit comment on the future management of Hauser Reservoir (Key: GF = oral comment from Great Falls; HL = oral comment from Helena; BZ = oral comment from Bozeman; W = written comment).

I. HAUSER RESERVOIR

A. Fish Management

1. Continue to manage for the large average size of kokanee. (BZ = ORAL COMMENT FROM BOZEMAN)
2. Enhance the walleye fishery. (BZ)
3. Increase the availability of walleye by introducing walleye into potential habitat. (HL = ORAL COMMENT FROM HELENA)
4. Establish minimum size limit on largemouth bass. (HL)
5. Stock smallmouth bass. (HL)
6. Establish a number limit on fish instead of a weight limit. (HL)
7. Simplify fishing regulations. (HL)
8. Liberalize kokanee limit by splitting the salmon limit from the trout limit. (HL)
9. Set fishing limits to meet sustainable population levels. (HL)
10. Increase the allowable number of rods when trolling. (HL)
11. Increase the limit on kokanee. (GF = ORAL COMMENT FROM GREAT FALLS)
12. Catch and/or sterilize 50% of all young female salmon and put a 30 fish daily possession limit on for kokanee. (W = WRITTEN COMMENT)
13. Put a 1 fish daily possession limit on for brown trout. (W)
14. Salmon are special but keep up the size by not reducing the limit. (W)
15. Restrict the kokanee limit and increase enforcement to insure compliance. (W)
16. Maintaining the rainbow trout fishery should be a major priority on the three reservoirs. Introducing new species should be done with extreme caution and only after studying the potential competition with trout and after appropriate public comment. Expressed concerns over largemouth bass plants made into Lake Helena. (W)
17. Very much against adding new species of fish into the reservoirs unless they were here originally. (W)
18. Restrict the use of fish spawn of any kind or nature except during ice fishing. (W)

19. Advocate and advertise catch and release fishing in all waters for trout under 15 inches in length. (W)
20. Consider closing a reservoir once in a while after planting. (W)
21. Outlaw cowbells and such on all waters that are planted every year. (W)
22. Perch are super. Planted trout are great to catch but what do most people do with them. Cost is high and they have a short life span. Brown trout are good to eat but are hard to catch. Bass are fun to catch but bad to eat. Walleye are the answer. (W)
23. Allow fishermen to use more than one rod while trolling. (W)
24. Out of staters catch way beyond their limits. (W)
25. Goal should include diversifying the fish species in the entire reservoir complex. Start stocking walleye in addition to trout and plant forage fish. (W)
26. Change regulations to allow local sportsmen groups to assist the Department in establishing a diversified fishery. (W)
27. Emphasize diversified fishing opportunities. (W)

B. Habitat Management
1. Identify and protect critical fish habitat. (W)

C. Social Conflict
1. Create boat speed limit in the Canyon Ferry tailrace. (HL)
2. Restrict boat use in the Canyon Ferry tailrace and set aside for bank fishing. (HL)
3. Educate conflicting users about biological impacts. (HL)
4. Alternate the first and second half of each month for boat travel in the Canyon Ferry tailrace so bank fishermen would not be bothered by boats when kokanee fishing. (W)
5. Dog leash laws need to be enforced. (W)
6. Fourteen day camping limit needs to be enforced. (W)
7. Make it illegal to tie up a boat within 25 feet of a boat ramp. (W)

D. Access
1. Improve boat ramp facilities at Riverside campground. (BZ)
2. Design handicap access with appropriate safety precautions. (HL)
3. Make land acquisitions to diversify use. (HL)
4. Acquire boat ramp facilities at the Causeway. (HL)
5. Develop R.V. facilities. (HL)
6. Develop viewing facilities and develop plan for protection of bald eagles feeding on kokanee. (HL)
7. Determine what impacts an expanding fishery in Lake Helena would have on waterfowl. (HL)

8. A boat ramp at the Causeway would result in unneeded congestion. (W)
9. Would like to see more access areas for the general public. (W)
10. Provide at least one handicap spot at each of the Departments boat access sites. (W)
11. Provide safe viewing areas for eagles. (W)
12. Provide additional handicap access. (W)
13. Need to improve boat trailer parking. (W)

APPENDIX B

QUESTIONNAIRE ADDRESSING THE HAUSER RESERVOIR MANAGEMENT PLAN

Montana Department of Fish, Wildlife & Parks

P.O. Box 6609
Great Falls, MT 59406
July 18, 1989

Dear Interested Parties,

The Montana Department of Fish, Wildlife and Parks has recently completed a document that presents a series of management alternatives for Hauser Reservoir. These management alternatives were developed by our Department based on public comment received at meetings held in Great Falls, Helena and Bozeman during the fall of 1988. Although this document already has been reviewed by an advisory committee representing diverse interest groups, we are seeking additional public comment. Preferred alternatives selected from this document will be used to manage the fishery in Hauser Reservoir over the next five years.

Attached, you will find a questionnaire that addresses all of the major issues covered in the document. This questionnaire will be used to help us select preferred courses of action for the management of Hauser Reservoir. Upon completion of this questionnaire, please fold it in thirds with the address on the reverse side showing and then mail. The questionnaire does not require postage. We must have your response to the questionnaire by August 16. The final management plan will be considered for adoption by the Fish and Game Commission in mid-September, 1989. Thank you for your assistance and cooperation.

Sincerely,

Steve Leathe

Steve Leathe
Regional Fisheries Manager

The document containing all the management alternatives can be obtained from the addresses listed below and will be available for public review and comment until August 16, 1989. Many of you may not be interested in reading through this 50 page report.

Fisheries Division
Mt. Dept. FW&P
P.O. Box 6609
Great Falls, MT 59406
Phone: 454-3441

or

Fisheries Division
Mt. Dept. FW&P
1420 East 6th Ave
Helena, MT 59620
Phone: 443-7681

ALTERNATIVES FOR THE MANAGEMENT OF HAUSER RESERVOIR

(Questionnaire addressing the Hauser Reservoir Management Plan)

GENERAL QUESTIONS

---

1. How many fishing trips to Hauser Reservoir do you make in a year?

   __ None
   __ Less than three trips
   __ Between three and seven trips
   __ Between seven and ten trips
   __ More than ten trips

2. When fishing in Hauser Reservoir, how often do you fish from:

	Shore	Boat	Ice
Almost always	__	__	__
Most of the time	__	__	__
Some of the time	__	__	__
Almost never	__	__	__
Never	__	__	__

3. What species of fish do you most often seek to catch in Hauser Reservoir?

   __ Rainbow trout
   __ Brown trout
   __ Kokanee
   __ Yellow Perch
   __ Walleye
   __ Other (Specify _____)
   __ No preference

4. If Hauser Reservoir could be managed to provide good fishing for any of the following species of fish, which species would you prefer to catch? Please rank these in order of preference (1-most preferred; 2-second most preferred; ..... ; 6-least preferred).

   __ Rainbow trout
   __ Brown trout
   __ Kokanee
   __ Yellow Perch
   __ Walleye
   __ Other (Specify _____)

GENERAL QUESTIONS

5. The following is a list of possible management problems that may apply to Hauser Reservoir. Please check the ones, if any, that you feel are major problems with Hauser Reservoir.

__ Diversity of fishing opportunities is poor

__ There are too few fish in the reservoir

__ The rainbow trout that are caught are too small

__ The kokanee that are caught are too small

__ Fishing regulations are too restrictive

__ Fishing regulations are too permissive

__ The kokanee fishery is poor

__ The rainbow trout fishery is poor

__ The walleye fishery is poor

__ The brown trout fishery is poor

__ There are too many anglers

__ There are too many boats

__ Fishing access is inadequate

__ There is too much fishing access

__ Fish habitat is poor

__ Enforcement of fishing regulations is inadequate

__ Other (Specify _____)

6. In general, the size of kokanee tends to become smaller as the population increases in numbers. In Hauser Reservoir, the kokanee population has been expanding and, as a result, the average size of these fish could begin to decline. Kokanee harvested from the reservoir during June and July of this year have averaged 14.2 inches in length. Kokanee harvested during the same time last year (1988) averaged 16.4 inches. Controlling the size of kokanee in Hauser Reservoir may be very difficult. However, if the Department could manage for a specific size of kokanee in Hauser Reservoir, what would be the smallest average length of kokanee that would be acceptable to you? (Keep in mind that more kokanee are likely to become available to catch as the size of these fish decreases).

__ 10.0 inches
__ 11.0 inches
__ 12.0 inches
__ 13.0 inches
__ 14.0 inches
__ 15.0 inches
__ 16.0 inches
__ Greater than 16.0 inches
__ No preference

RAINBOW TROUT AND KOKANEE MANAGEMENT

7a. The kokanee population in Hauser Reservoir has expanded dramatically since the late 1970's. However, because this population is continuing to undergo significant change, it is difficult to predict what direction this fishery will proceed in future years. The kokanee population in Hauser Reservoir may decline to a level where the number of fish caught is insufficient to meet angler demand. If this were to happen, the following Department actions could be used to increase the kokanee population in Hauser Reservoir. Please indicate whether you support, oppose or are not sure about these possible Department actions.

Support	Oppose	Not sure	
___	___	___	Close kokanee spawning areas to fishing.
___	___	___	Reduce the length of the fishing season for kokanee on the reservoir.
___	___	___	Reduce daily fishing limits for kokanee.
___	___	___	Reduce the possession limit for kokanee.
___	___	___	Stock kokanee into the reservoir.
___	___	___	Improve passage to tributary spawning areas (may result in competition with brown trout for spawning sites).

7b. The kokanee population also may increase to a level where the average size of fish caught is unacceptable to most anglers (keep in mind that the size of kokanee tends to become smaller as the population increases in numbers). The following Department actions could be used to reduce the number of kokanee in Hauser Reservoir in order to maintain or increase the average size of fish caught. Please indicate whether you support, oppose or are not sure about these possible Department actions.

Support	Oppose	Not sure	
___	___	___	Establish a snagging season to increase harvest (may adversely affect brown trout because they spawn in the same areas and at the same time as kokanee).
___	___	___	Increase the daily fishing limit for kokanee.
___	___	___	Increase the possession limit for kokanee.
___	___	___	Prevent kokanee from spawning by blocking off spawning areas (may adversely affect brown trout because they spawn in the same areas and at the same time as kokanee).
___	___	___	Collect kokanee eggs (eggs would be used to stock other Montana waters such as Flathead Lake).
___	___	___	Stock a predatory species of fish (Kamloops rainbow trout, brown trout or walleye).

8. Trout and kokanee limits are presently combined making the daily and possession limits 10 pounds and 1 fish, not to exceed 10 fish. Some people find these limits confusing because the two species are combined and because the weight limit often has to be estimated by the angler. These limits are combined because some anglers find it difficult to tell kokanee and rainbow trout apart prior to kokanee developing hooked jaws and spawning colors. The combined limit also acts to more evenly distribute the harvest among a greater number of anglers. Unfortunately, the combined limit reduces the Department's flexibility to manage for naturally reproducing kokanee and hatchery reared rainbow trout. Please indicate whether you support, oppose or are not sure about the following possible Department actions.

Support	Oppose	Not sure	
___	___	___	Maintain the present combined limit (10 pounds and one fish, not to exceed 10 trout and kokanee in combination).
___	___	___	Eliminate the weight limit portion of the fishing regulations and utilize a straight number limit.
___	___	___	Re-establish separate limits for trout and kokanee (even if it means the limit for each species would be smaller than the current combination limit). This would allow more Department flexibility to deal with changes in the kokanee population. Establishing separate limits between rainbow trout and kokanee would require an informational program to help anglers distinguish between the two species.

BROWN TROUT MANAGEMENT

9a. Brown trout and kokanee in Hauser Reservoir spawn in the same areas and at the same time. There is a potential that the expanding kokanee population in Hauser Reservoir may adversely affect the brown trout population by competing for spawning sites. Currently, there are about 40,000 kokanee and 300 brown trout harvested each year from Hauser Reservoir. Brown trout provide anglers an opportunity to catch a trophy fish. It is difficult to predict what direction the kokanee population will proceed in future years because they tend to be unstable. If it was determined to be necessary, would you favor eliminating kokanee from some spawning areas to maintain the brown trout population (opportunity to catch a trophy fish)?

___ Yes
___ No
___ Not sure

9b. If it was determined to be necessary, would you favor eliminating kokanee from some spawning areas to maintain the brown trout population (opportunity to catch a trophy fish) even if it reduced your opportunity to catch kokanee in the reservoir?

___ Yes
___ No
___ Not sure

10. Currently, the walleye population in Hauser Reservoir is sparse and there is some demand by the public to increase fishing opportunities for walleye by stocking the reservoir. In Holter Reservoir, the walleye population maintains itself through natural reproduction and appears to be in reasonable balance with populations of rainbow trout, brown trout and yellow perch. This balance is probably due to relatively low numbers of walleye coupled with a healthy population of yellow perch. Walleye prey on other species of fish, however, and, if walleye numbers are great enough, they can suppress other fish populations. In addition, walleye that are flushed over or through Hauser Dam could potentially upset the balance among fish species in downstream waters (Holter Reservoir and the Missouri River below Hauser and Holter). With this in mind, which do you favor?

___ Stock walleye fingerlings into Hauser Reservoir to provide a balanced fishery similar to that which currently exists in Holter Reservoir. The Holter walleye fishery provides a good fishery and produces large sized fish with good growth rates. The stocking rate would be adjusted up or down based on stocking success and on the effects on other sport fish species as determined from biological monitoring.

___ Stock walleye fingerlings at high levels to convert Hauser Reservoir to a fishery dominated by walleye. Possible adverse impacts to other sport fish populations would not be mitigated and plants of rainbow trout would be discontinued if walleye began to dominate the reservoir.

___ Do not stock walleye into Hauser Reservoir.

___ No opinion.

LAKE HELENA

11. Lake Helena, separated from Hauser Reservoir by a causeway, is formed from the impounding of lower Prickly Pear Creek by Hauser Dam. Angler use is low on this very shallow lake and the fishery is currently limited. Rainbow trout and brown trout are the most commonly caught species. Access to the lake is confined to the Causeway and no boat ramps are present. Lake Helena is an important waterfowl management area and increased fishing use on the lake may interfere with waterfowl production and waterfowl hunting. Please indicate whether you support, oppose or are not sure about the following possible Department actions.

Support	Oppose	Not sure	
___	___	___	Provide boat access to Lake Helena (boat use may conflict with waterfowl production and waterfowl hunting).
___	___	___	Continue Department efforts to enhance the bass fishery. Bass would likely coexist with trout, kokanee and walleye (dispersal of bass out of Lake Helena may upset the balance among fish species in Hauser and downstream waters.
___	___	___	Stock tiger muskellunge (a sterile hybrid between northern pike and muskellunge) in an attempt to develop a trophy fishery. If numbers are great enough, tiger muskie may suppress other sport fish populations and they may eat young ducks. Numbers could be controlled because they are incapable of reproducing in the wild.
___	___	___	Stock walleye. May help meet Hauser management objective (if a walleye enhancement option is selected) by reducing flushing losses over Hauser Dam. If numbers are great enough, walleye may upset the balance among fish species in Hauser and downstream waters.
___	___	___	Manage Lake Helena primarily for waterfowl production and waterfowl hunting.
___	___	___	Manage the lake for both fisheries and waterfowl. Place seasonal and/or area restrictions on boat use if it is determined to be needed to prevent conflicts.

SOCIAL CONFLICT AND FISHING ACCESS ISSUES

12. Conflicts between anglers fishing from the bank and anglers fishing from a boat appear to be increasing in the Canyon Ferry tailrace (area located immediately below Canyon Ferry Dam). Which do you favor?

___ Eliminate angling from boats in the Canyon Ferry tailrace area.

___ Eliminate shore angling in the Canyon Ferry tailrace area.

___ Establish a "no wake rule" for boats in the Canyon Ferry tailrace area.

___ Do nothing at this time.

___ No opinion.

13. The following is a list of management tools that could be used to improve access to Hauser Reservoir. Please check the ones, if any, that you feel are needed for Hauser Reservoir.

___ Develop additional camping areas that are accessible to RV users.

___ Develop boat-in camps (accessible only by boat).

___ Develop access to the reservoir for the handicapped.

___ Increase boat docking facilities.

___ Increase the number of boat ramps to the reservoir.

___ Improve enforcement of campground regulations.

___ Increase boat trailer parking space.

___ Provide more access to shore fishing areas.

___ Other (Specify _____)

COMMERCIAL FISHING

14. A small local business has been allowed to commercially fish for carp and suckers on Lake Helena and occasionally on the Causeway Arm of Hauser Reservoir for approximately the past 30 years. Some people feel that the removal of carp from the lake has improved the sport fishery. Other people feel that this commercial fishing operation has adversely affected the sport fishery. The Department has no information indicating that this commercial fishing operation harms the sport fishery in Lake Helena or Hauser Reservoir. Please indicate whether you support, oppose or are not sure about these possible Department actions.

Support	Oppose	Not sure	
___	___	___	Deny permission to all commercial operations seeking to fish in Lake Helena and Hauser Reservoir even though no adverse affects on the sport fishery have been identified to date.
___	___	___	Allow commercial fishing to take place in both Lake Helena and the Causeway Arm of Hauser Reservoir and monitor the effects on the sport fisheries. Modified the commercial permit if adverse impacts are identified.
___	___	___	Deny permission to commercially fish in the Causeway area. Allow commercial fishing only in Lake Helena and monitor the effects on the sport fisheries. Modify the commercial permit if adverse affects are identified.

15. Do you have any additional comments on fishing and recreation on Hauser Reservoir?

_____

_____

_____

16. Do you want a copy of the final plan? ___ Yes ___ No

Please fold in thirds with the address on the reverse side showing, staple and then mail. Thank you for your cooperation.

Montana Department of Fish, Wildlife & Parks

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 112 HELENA, MONTANA

POSTAGE WILL BE PAID BY ADDRESSEE

Fisheries Division - Hauser Management Plan
Department of Fish, Wildlife and Parks
1420 East Sixth Avenue
Helena, MT 59620

APPENDIX C

A SUMMARY OF THE RESULTS FROM THE QUESTIONNAIRE ADDRESSING THE HAUSER RESERVOIR MANAGEMENT PLAN

Appendix C. A summary of the results from the questionnaire addressing the Hauser Reservoir Management Plan. The questionnaire was distributed to interested parties during August, 1989.

Appendix Table C1. The number of questionnaires that were distributed and returned by interest group.

Organization	Questionnaires		
	Number Returned	Number Sent	Percent Return
Walleye Unlimited & recruits	152	300	50.7
Trout Unlimited	61	177	34.5
Prickly Pear Sportsmen	82	282	29.1
General Users & requests	183	471	38.8
Scoping meetings	38	124	30.6
Total	516	1354	38.1

A total of 38% of the mailed questionnaires were completed and returned. Of the total, 29% were from Helena chapter of Walleye Unlimited, 12% were from the Missouri River chapter of Trout Unlimited, 16% were from Prickly Pear Sportsmen, 35% were from anglers who were interviewed during creel census work on the reservoir and from general requests and 7% were from people who attended or commented during our scoping meetings.

Appendix C2. Questionnaire response by interest group (W.U.=Walleye Unlimited and recruits; T.U.=Trout Unlimited; P. Pear=Prickly Pear Sportsmen Association; Gen. Users=Users contacted by creel census, questionnaire requests and scoping meeting attenders).

*** GENERAL QUESTIONS ***

Question 1. How many fishing trips to Hauser Reservoir do you make in a year?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
None	0.7	31.2	4.9	7.2	7.8
<3	9.2	27.9	22.0	11.3	14.3
3-7	21.7	29.5	32.8	25.8	26.2
7-10	17.8	1.6	12.2	14.5	13.6
>10	50.6	9.8	28.1	41.2	38.1

About 38% of the respondents fish on Hauser Reservoir more than 10 days in a year and approximately 78% fish the reservoir more than 3 days a year.

Question 2. When fishing in Hauser Reservoir, how often do you fish from shore, boat or ice?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Shore					
Always	8.6	19.7	15.9	13.1	13.1
Some	48.6	29.5	45.1	38.5	41.4
Never	42.8	50.8	39.0	48.4	45.5
Boat					
Always	55.3	21.3	31.7	38.5	40.3
Some	34.8	32.7	47.5	40.7	39.2
Never	9.9	46.0	20.8	20.8	20.5
Ice					
Always	8.6	6.6	1.2	9.5	7.6
Some	53.2	19.6	39.0	40.2	41.5
Never	38.2	73.8	59.8	50.3	50.9

About 80% of the respondents fish the reservoir at least some of the time from a boat while 54% fish the reservoir at least some of the time from shore. More than half of the respondents never ice fish on the reservoir.

Question 3. What species of fish do you most often seek to catch in Hauser Reservoir?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Rainbow	38.9	55.7	58.4	53.9	50.3
Brown	14.5	31.0	30.4	19.9	21.3
Kokanee	44.7	26.1	42.5	68.4	52.3
Y. Perch	25.6	11.4	12.1	12.3	16.0
Walleye	38.8	1.6	9.6	5.9	15.7
Other	1.3	0.0	0.0	0.0	0.4
No pref.	15.2	29.5	20.7	13.6	17.0

A majority of the respondents either fish for rainbow trout (50.3%) or kokanee (52.3%). General users target kokanee (68.4%) while members of Trout Unlimited (55.7%) and Prickly Pear Sportsmen (58.4%) target rainbow trout. Members of Walleye Unlimited seek to catch rainbow trout, kokanee and walleye about equally.

Question 4. If Hauser Reservoir could be managed to provide good fishing for any of the following species of fish, which species would you prefer to catch?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Rainbow	13.8	39.3	35.4	25.3	25.2
Brown	4.0	18.0	12.2	8.1	8.7
Kokanee	12.5	13.1	12.2	41.2	24.8
Y. Perch	0.0	0.0	4.9	1.4	1.7
Walleye	68.4	14.8	24.4	14.5	32.0
Other	0.0	0.0	1.2	0.0	1.9

Members of Walleye Unlimited would most prefer to catch walleye (68%), members of Trout Unlimited and Prickly Pear Sportsmen would most prefer to catch rainbow trout (39 and 35%) and general users would most prefer to catch kokanee (41%).

Question 5. The following is a list of possible management problems that may apply to Hauser Reservoir. Please check the ones that you feel are major problems.

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Div. poor	31.6	6.6	12.2	5.4	14.3
Few fish	19.1	3.3	29.3	9.0	14.5
Small Rb	13.8	16.4	26.8	19.5	18.6
Small Kok	18.4	11.5	18.3	23.1	19.6
Res. Rgs.	6.6	0.0	11.0	13.6	9.5
Per. Rgs.	4.6	21.3	6.1	7.7	8.1
Poor Kok	3.9	3.3	7.3	5.0	4.8
Poor Rb	14.5	14.8	22.0	14.9	15.9
Poor WE	81.6	14.8	35.4	33.0	45.5
Poor BR	28.3	26.2	18.3	19.9	22.9
Many ang.	9.9	4.9	13.4	10.9	10.3
Many bts.	14.5	9.8	19.5	17.6	16.1
Poor acc.	35.5	21.3	30.5	26.2	29.1
Much acc.	0.7	0.0	1.2	1.4	1.0
Poor hab.	5.9	3.3	7.3	5.0	5.4
Poor enf.	14.5	14.8	18.3	28.1	20.9
Other	15.1	4.9	4.9	17.2	13.2

The three management problems that were checked the most include: the walleye fishery is poor (45.5%); fishing access is inadequate (29.1%); and the brown trout fishery is poor (22.9%).

RAINBOW TROUT AND KOKANEE MANAGEMENT

Question 6. What would be the smallest average length of kokanee that would be acceptable to you?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. User	Total
10 in.	0.0	3.4	1.2	0.0	0.6
11 in.	1.3	0.0	2.4	0.5	1.0
12 in.	9.9	13.1	18.3	11.8	12.4
13 in	5.3	8.2	0.0	5.0	4.7
14 in.	20.4	21.3	29.3	24.3	23.6
15 in.	12.5	8.2	7.3	14.0	11.8
16 in.	15.1	4.9	12.2	18.6	14.9
>16 in.	13.2	9.8	8.5	7.7	9.7
No pref.	22.3	31.1	20.8	18.1	21.3

About 59% of the respondents would accept kokanee that are at least 14.0 inches in average length. This percentage includes people that have no preference. About 28% would not accept any average size less than 16 inches in length.

Question 7a. The following actions could be used to increase kokanee population in Hauser Reservoir. Please indicate whether you support, oppose or are not sure about these possible Department actions.

Action 1. Close spawning areas to fishing

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	40.8	44.3	52.4	48.4	46.3
Oppose	28.9	16.4	20.7	20.8	22.7
Not sure	30.3	39.3	26.9	30.8	31.0

Action 2. Reduce length of fishing season

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	28.2	32.8	39.0	25.3	29.3
Oppose	42.8	27.9	35.4	40.3	38.7
Not sure	29.0	39.3	25.6	34.4	32.0

Action 3. Reduce daily limits

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	30.3	45.9	54.8	32.6	37.0
Oppose	45.3	19.7	25.6	39.8	36.8
Not sure	24.4	34.4	19.6	27.6	26.2

Action 4. Reduce possession limits

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	28.3	41.0	61.0	29.0	35.3
Oppose	45.3	23.0	20.7	39.3	36.2
Not sure	26.4	36.0	18.3	31.7	28.5

Action 5. Stock kokanee

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	42.7	23.0	35.4	47.5	41.3
Oppose	29.6	34.4	28.1	19.0	25.5
Not sure	27.7	42.6	36.5	33.5	33.2

Action 6. Improve passage to spawning areas

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	20.4	8.2	25.6	29.4	23.6
Oppose	40.8	44.3	39.0	25.3	34.3
Not sure	38.8	47.5	35.4	45.3	42.1

Possible Department actions that could be used to increase the kokanee population were not very popular among respondents. The most popular actions included closing kokanee spawning areas to fishing (46% support vs 22% oppose) and stocking kokanee (41% support vs 26% oppose). It is unclear if closing the C. Ferry tailrace to fishing during the spawning season would be accepted.

Question 7b. The following possible Department actions could be used to reduce the kokanee population in order to maintain or increase average size of fish caught. Please indicate whether you support, oppose or are not sure about these possible Department actions.

Action 1. Snagging season

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	24.3	8.2	23.2	16.3	18.8
Oppose	49.3	62.3	53.7	52.0	52.7
Not sure	26.4	29.5	23.1	31.7	28.5

Action 2. Increase daily limit

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	69.7	50.8	63.4	62.9	63.6
Oppose	13.2	14.8	28.1	18.6	18.0
Not sure	17.1	34.4	8.5	18.5	18.4

Action 3. Increase possession limit

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	69.1	50.8	53.7	62.0	61.4
Oppose	12.5	14.8	31.7	18.1	18.2
Not sure	18.4	34.4	14.6	19.9	20.4

Action 4. Block off spawning areas

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	7.2	6.6	4.9	4.5	5.6
Oppose	63.8	47.5	78.1	62.4	63.6
Not sure	29.0	45.9	17.0	33.1	30.8

Action 5. Collect kokanee eggs

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	61.8	60.7	64.6	62.9	62.6
Oppose	16.4	8.2	11.0	14.0	13.6
Not sure	21.8	31.1	24.4	23.1	23.8

Action 6. Stock predatory species of fish

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	82.9	45.9	56.1	40.7	56.2
Oppose	7.9	13.1	18.3	27.2	18.4
Not sure	9.2	41.0	25.6	32.1	25.4

Respondents supported several possible Department actions that could be used to reduce the kokanee population. These included increasing the daily or possession limits (64 and 61% support); collecting kokanee eggs for use in other waters (63% support); and stocking a predatory fish species (56% support).

Question 8. Please indicate whether you support, oppose or are not sure about the following possible Department actions dealing with limits for trout and kokanee.

Action 1. Maintain present combined limits

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	30.9	27.9	34.2	33.5	32.2
Oppose	40.8	24.6	36.6	39.8	37.8
Not sure	28.3	47.5	29.2	26.7	30.0

Action 2. Eliminate weight limit

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	53.9	34.4	51.2	61.5	54.5
Oppose	23.0	23.0	26.8	18.1	21.5
Not sure	23.1	42.6	22.0	20.4	24.0

Action 3. Re-establish separate limits

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	43.4	47.5	40.2	50.2	46.3
Oppose	27.0	14.8	35.4	23.1	25.2
Not sure	29.6	37.7	24.4	26.7	28.5

Only 32% of the respondents were in favor of maintaining the present limit structure for trout and kokanee. A majority of respondents supported eliminating the weight limit and going to a straight number limit (54.5% support vs 21.5% oppose). Re-establishing separate limits was supported by 46.3% of the respondents while 25.2% were in opposition. There were no significant differences among interest groups.

BROWN TROUT MANAGEMENT

Question 9a. If it was determined to be necessary, would you favor eliminating kokanee from some spawning areas to maintain the brown trout population?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Yes	52.6	63.9	53.7	33.9	46.1
No	32.9	18.0	29.3	47.1	36.6
Not sure	14.5	18.1	17.0	19.0	17.3

A majority of respondents from Walleye Unlimited, Trout Unlimited and Prickly Pear sportsmen favored eliminating kokanee from some spawning sites to maintain brown trout (53, 64 and 54% in support). General users were mostly opposed to this action (47% opposed vs 34% in favor).

Question 9b. If it was determined to be necessary, would you favor eliminating kokanee from some spawning sites to maintain brown trout even if opportunity to catch kokanee was reduced?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Yes	52.0	57.4	50.0	32.1	43.8
No	35.5	23.0	32.9	51.1	40.3
Not sure	12.5	19.6	17.1	16.8	15.9

Response was very similar to that obtained in Question 9a. Walleye Unlimited, Trout Unlimited and Prickly Pear Sportsmen respondents were slightly less in favor of the action than in Question 9a. and general users were slightly more in opposition.

WALLEYE MANAGEMENT

Question 10. What type of walleye management do you favor for Hauser Reservoir?

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Stock for balance	53.9	9.8	37.8	33.0	37.2
High stocking	36.2	4.9	8.5	5.4	14.9
No stocking	6.6	67.2	41.5	50.7	38.2
No opinion	3.3	18.1	12.2	10.9	9.7

Response to this question was polarized among the interest groups. A majority of Walleye Unlimited members favored stocking walleye (90.1%) with 54% supporting stocking to provide a balance similar to what is found in Holter Reservoir and 36% favoring stocking walleye at high levels to convert the reservoir to a fishery dominated by walleye. A majority of Trout Unlimited members were opposed to stocking walleye in the reservoir (67%). Members of Prickly Pear Sportsmen were slightly in favor of walleye stocking (46% in favor vs 41% opposed) and general users were somewhat opposed to walleye stocking (51% opposed vs 38% in favor).

LAKE HELENA

Question 11. Please indicate whether you support, oppose or are not sure about the following possible Department actions for managing Lake Helena.

Action 1. Provide boat access

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	42.1	13.1	26.8	19.9	26.7
Oppose	37.5	59.0	54.9	55.2	50.4
Not sure	20.4	27.9	18.3	24.9	22.9

Action 2. Continue efforts to enhance bass fishery

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	60.5	27.9	43.9	40.3	45.4
Oppose	16.4	34.4	29.3	26.2	24.8
Not sure	23.1	37.7	26.8	33.5	29.8

Action 3. Stock tiger muskellunge

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	32.2	8.2	28.1	17.2	22.3
Oppose	46.7	60.7	48.8	57.5	53.3
Not sure	21.1	31.1	23.1	25.3	24.4

Action 4. Stock walleye

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	78.9	13.1	36.6	24.9	41.3
Oppose	10.5	59.0	37.8	48.4	36.8
Not sure	10.6	27.9	25.6	26.7	21.9

Action 5. Manage primarily for waterfowl

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	17.1	52.5	43.9	41.2	35.9
Oppose	50.7	8.2	25.6	26.2	31.2
Not sure	32.2	39.3	30.5	32.6	32.9

Action 6. Manage for both fisheries and waterfowl

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	75.0	42.6	64.6	54.8	60.9
Oppose	11.2	24.6	13.4	16.7	15.5
Not sure	13.8	32.8	22.0	28.5	23.6

A majority of respondents were opposed to providing boat access (51%) or stocking tiger muskie (53%) but were in favor of managing Lake Helena for both fisheries and waterfowl (61%) and enhancing the bass fishery (45% favor vs 25% opposed). Walleye Unlimited was the only group to support stocking walleye (79%).

SOCIAL CONFLICTS AND FISHING ACCESS ISSUES

Question 12. What actions do you favor to reduce conflicts between boat versus bank anglers at the Canyon Ferry tailrace.

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
No boat fishing	11.2	21.3	17.1	19.5	16.9
No shore fishing	2.0	1.6	1.2	2.3	1.9
No wake	55.9	50.8	47.6	51.1	51.9
Do nothing	23.0	3.3	19.5	13.1	15.9
No opinion	7.9	23.0	14.6	14.0	13.4

A majority of the respondents supported establishing a "no wake" regulation (52%). There were no significant differences among interest groups.

Question 13. The following is a list of management tools that could be used to improve access to Hauser Reservoir. Please check the ones that you feel are needed.

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
More RV camping	27.6	26.2	34.1	35.7	32.0
Boat-in camps	25.7	27.9	28.0	24.4	25.8
Handicap access	28.3	23.0	20.7	26.7	25.8
Boat docks	33.6	18.0	22.0	30.8	28.7
Boat ramps	46.1	21.3	34.1	35.7	36.8
Enforce-ment	27.6	32.8	36.6	37.6	33.9

Question 13. continued.

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Trailer parking	37.5	16.4	19.5	32.6	30.0
Shore access	30.9	32.8	42.7	34.4	34.5
Other	9.2	3.3	11.0	9.5	8.9

The three management actions that were checked the most include: increasing the number of boat ramps to the reservoir (36.8%); providing more access to shore fishing areas (34.5%); and improving enforcement of campground regulations (33.9%).

COMMERCIAL FISHING

Question 14. Please indicate whether you support, oppose or are not sure about the following possible Department actions on commercial fishing.

Action 1. Deny permission to all commercial operations

	Percent of questionnaires				
	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	9.9	3.3	6.1	9.1	8.1
Oppose	55.9	50.8	70.7	48.0	54.3
Not sure	34.2	45.9	23.2	42.9	37.6

Action 2. Allow commercial fishing and monitor

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	59.9	63.9	68.3	66.1	64.3
Oppose	20.4	6.6	14.6	10.9	13.8
Not sure	19.7	29.5	17.1	23.0	21.9

Action 3. Allow commercial fishing only in Lake Helena and monitor

	W.U.	T.U.	P. Pear	Gen. Users	Total
Support	23.7	23.0	25.6	25.8	24.8
Oppose	33.6	18.0	32.9	27.6	29.1
Not sure	42.7	59.0	41.5	46.6	46.1

A majority of respondents favored allowing commercial fishing to take place in both Lake Helena and the Causeway Arm and modify the permit if adverse impacts are identified (64% in favor vs 14% opposed). There was no significant difference among interest groups.

APPENDIX D

UPPER MISSOURI RIVER RESERVOIR OPERATING GUIDELINES FOR FISH, WILDLIFE AND RECREATION

UPPER MISSOURI RIVER

RESERVOIR OPERATING GUIDELINES
FOR
FISH, WILDLIFE AND RECREATION

Montana Department of Fish, Wildlife and Parks

Revised
April 1985

BACKGROUND

The Missouri River from Toston to Great Falls offers a remarkable variety of fishing, hunting, boating, and other recreational opportunities. This reach contains three major reservoirs and over 100 miles of free-flowing river. Its importance as a fishery resource is clearly evident; one of every seven angler days occurs on this reach. Other recreational attributes are also important.

The three reservoirs in this area are Canyon Ferry, Hauser, and Holter. Canyon Ferry, the uppermost of the three reservoirs, is a large storage reservoir operated by the Bureau of Reclamation. It controls seasonal flow patterns downstream. Hauser and Holter Dams are run-of-river reservoirs operated by Montana Power Company. They can influence daily flows but are too small to influence seasonal flow patterns. The operation of the reservoirs can have a significant impact on the fishery, wildlife, and recreational resources in this reach of the Missouri River. This document is intended to identify reservoir water levels and flow release patterns which optimize these recreational values and minimize impacts on fish and wildlife in each area.

SUMMARY

Canyon Ferry Reservoir

Canyon Ferry Reservoir is a large storage reservoir upstream from Hauser and Holter reservoirs. Since both Hauser and Holter are run-of-river reservoirs, the releases from Canyon Ferry generally determine the flow patterns in downstream reaches.

Fisheries, wildlife and recreational values are affected by the seasonal pattern of reservoir water level fluctuations. Recommended reservoir operations to protect these resource values are summarized below.

Fisheries

There is strong evidence that excessive spills through the radial spillway gates may result in a significant loss of fish from Canyon Ferry Reservoir. Because of this, it is recommended that, whenever possible, spills through the radial spillway gates be restricted to the normal high flow period and, limited to a duration of 30 days and a maximum discharge of 4000 ft^3/s.

Desirable reservoir elevations during spring and fall are between 3,785 and 3,792 ft. elevation. Reservoir elevations during winter should be stable to moderately receding.

Wildlife

Reservoir elevations affect the wildlife management area waterfowl ponds at the upper end of the reservoir. Water elevations above 3,797.5 should be avoided. Fall reservoir elevations should be between 3,788 ft and 3,792 ft. Winter reservoir elevations between 3,782 ft and 3,786 ft are recommended.

Recreation

Reservoir levels for recreation during summer months (May 21-Sept. 30) can range from 3,790 ft to 3,798 ft. Optimum is near 3,795 ft. Desirable winter elevation for developed recreation areas and other developed shorelines is 3,786 ft and ranges from 3,782 ft to 3,790 ft.

It should be noted that reservoir levels for recreation are based on whether or not physical facilities and structures at recreation sites are functional. Most recreation sites are designed to accommodate a range of water levels. Generally, recreation sites can accommodate a wider range of fluctuations than other resource values.

Hauser Reservoir

Hauser is operated as a run-of-river reservoir and therefore this area experiences a fairly constant water elevation. Development along the lake shore has occurred and is dependent upon this relatively constant water level. Fluctuations in Hauser Reservoir could have a significant impact upon many developments surrounding the lake due to the shallow nature of the developed shorelines and the open connection with Lake Helena.

It is recommended that Hauser Reservoir be operated with a stable reservoir level at elevation 3,635.2 ft. ± 0.5 ft. There should be no daily reservoir level fluctuations during the winter period. Drawdowns of Hauser Reservoir associated with repair or maintenance should be accomplished during the non-holiday periods in August and September.

Missouri River Below Hauser

Fall and winter flows in the Missouri River below Hauser Dam should be stable at 4,100 CFS. This would insure adequate conditions for trout and salmon spawning, incubation, and hatching.

If hydropower or dam maintenance requires partial dewatering of the Hauser tailrace area, it should be done from late July through September 15 during non-holiday periods.

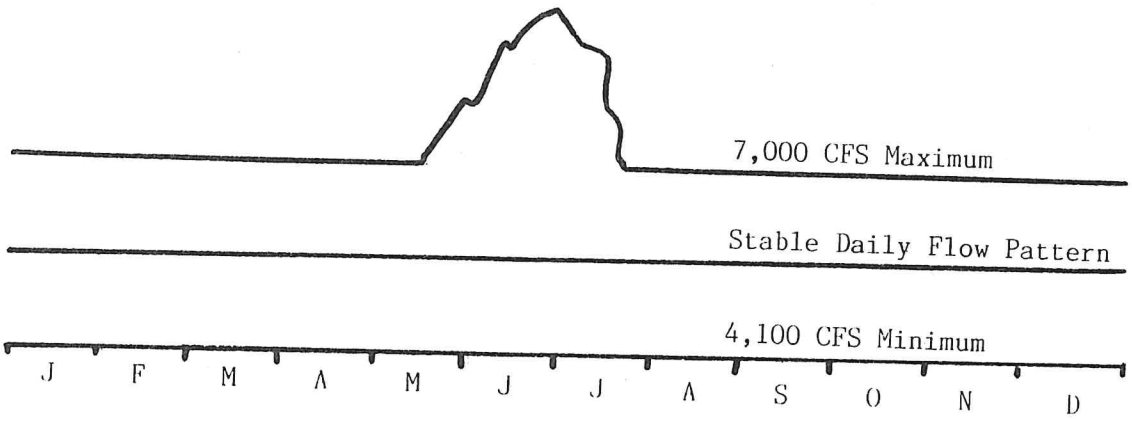
Holter Reservoir

Holter is operated as a run-of-river reservoir and therefore this area experiences a fairly constant water level. It is recommended that Holter be operated in a stable manner at the normal operating elevation of 3,578 ft. Variations in reservoir elevation should not exceed 0.5 ft above or 1.0 ft below elevation 3,578 ft.

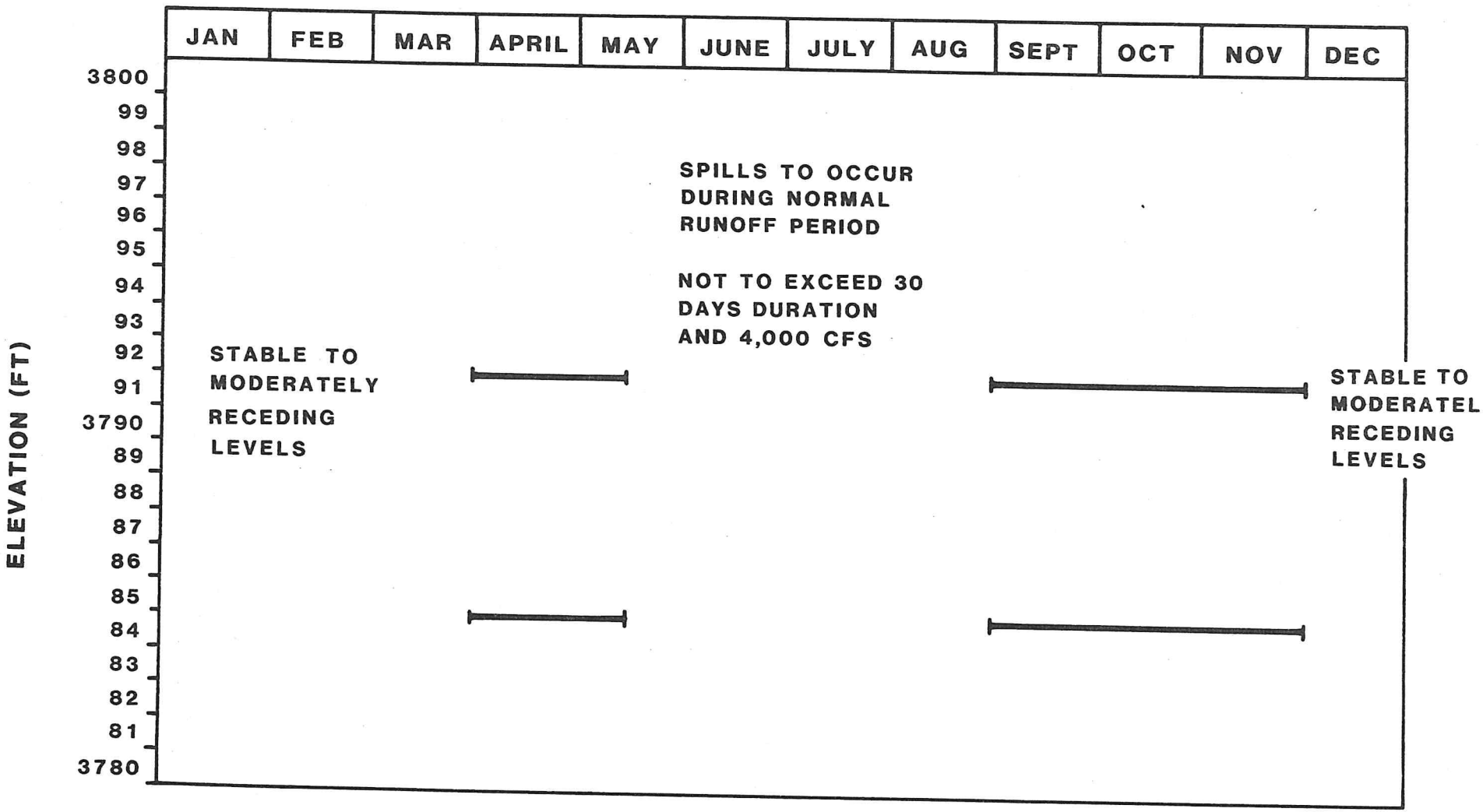
If hydropower structure maintenance calls for drawdown on Holter Lake, it should be done in April or September during non-holiday periods. Flows should not be altered beyond recommended limits in the Missouri River below Holter to accommodate evacuation or refilling of the reservoir. Spills in the magnitude of 10,000 CFS (total turbine and spill) should not occur in August or September. These spills cause serious loss of newly stocked fish in the reservoir.

Missouri River Below Holter

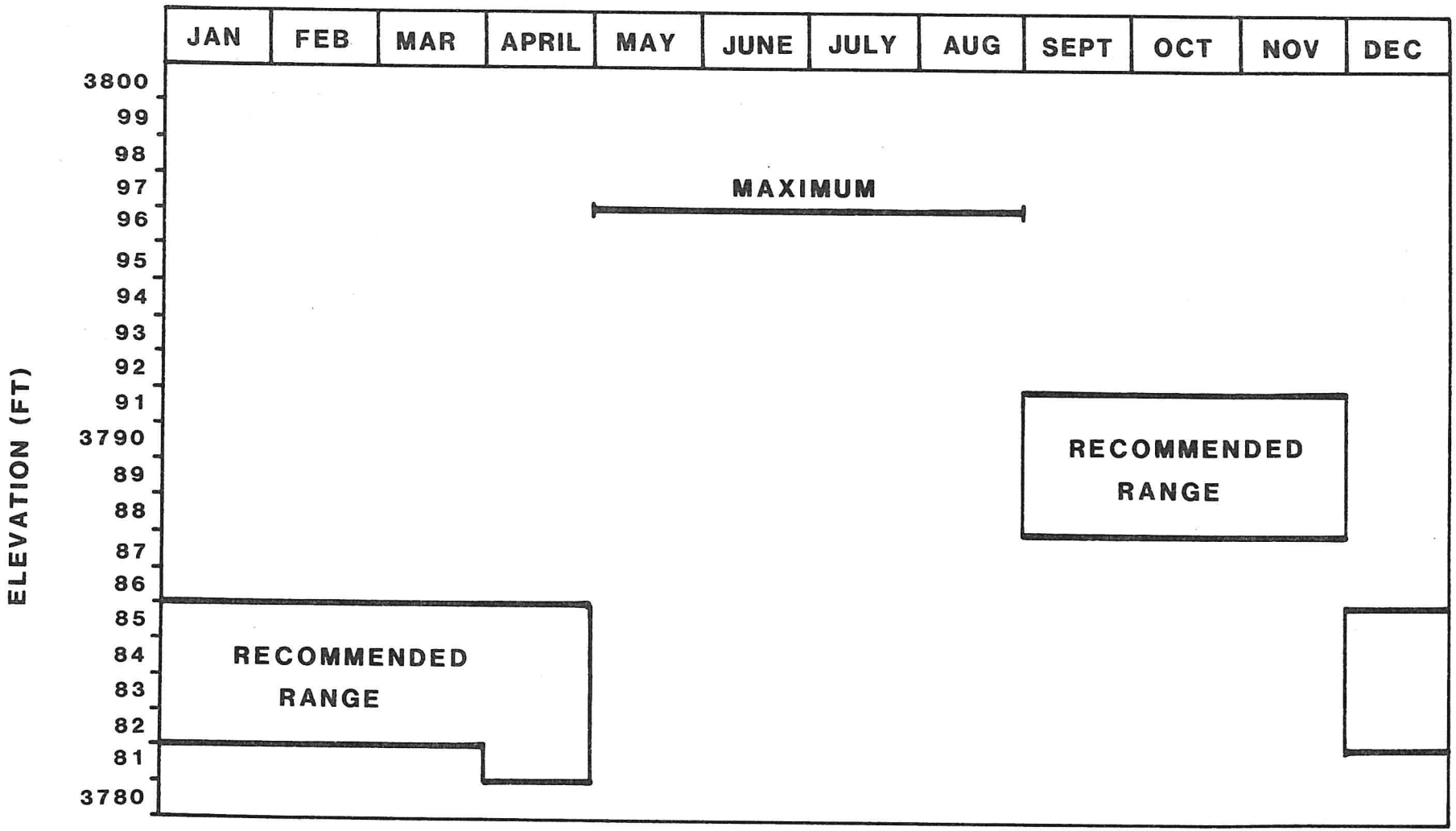
Holter Dam should be operated as a run-of-river hydropower facility with stable daily flow releases. The minimum release from Holter should be 4,100 CFS year round. After spring runoff subsides flows should not be greater than 7,000 CFS.



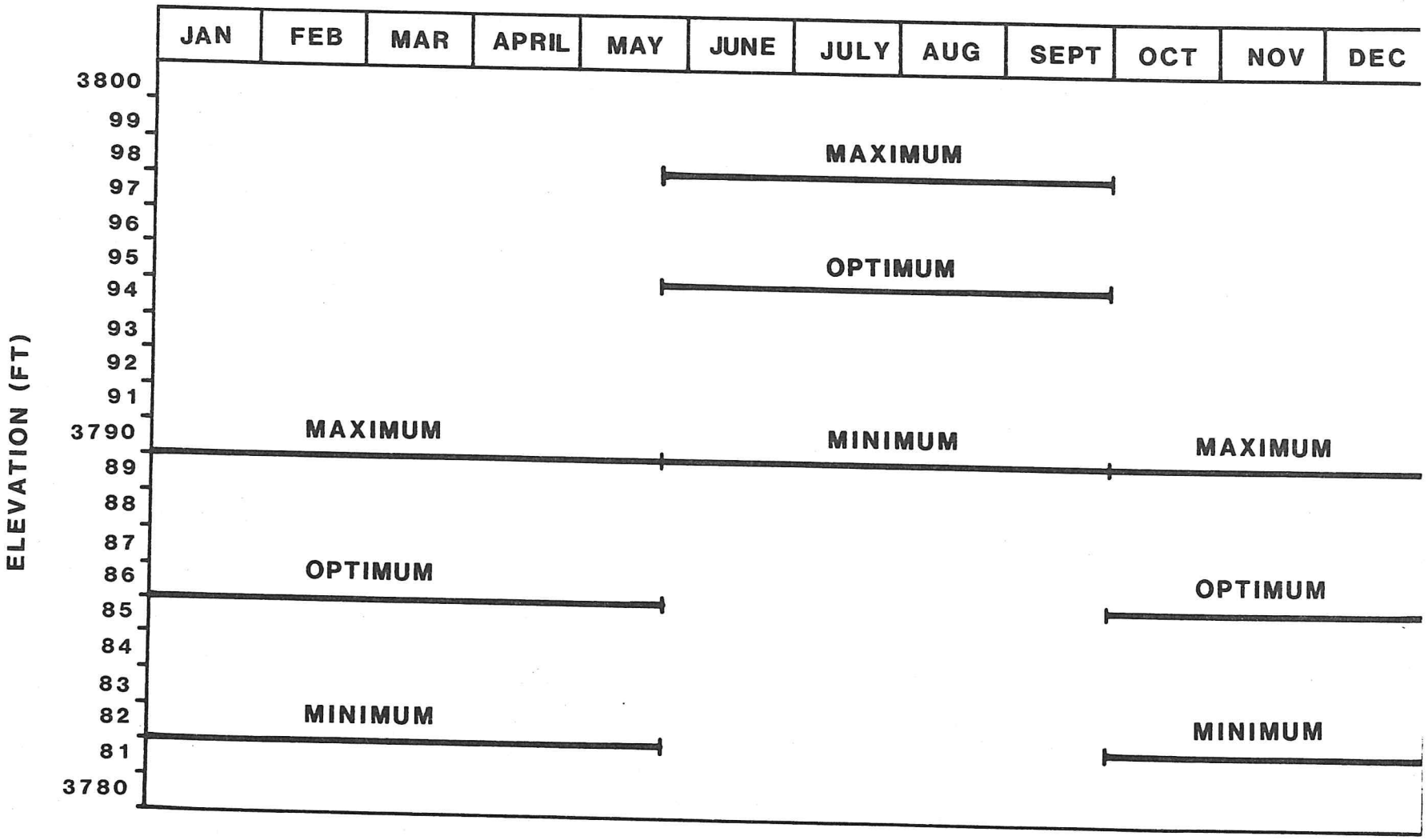
FISHERIES - Canyon Ferry Reservoir Levels



WILDLIFE-Canyon Ferry Reservoir Levels



RECREATION-Canyon Ferry Reservoir Levels



SUPPORTING STATEMENTS

Missouri River--Toston to Canyon Ferry

The Missouri River from Toston to Townsend contains good resident fish populations and supports a substantial fishery. In addition, the river below Toston Dam provides spawning areas for fish populations residing in Canyon Ferry Reservoir. A rainbow trout spawning run enters this reach in the spring and fall of most years. A major brown trout spawning run occurs every year, and fish usually concentrate in large numbers below Toston Dam. These fish are very large and provide an important and popular trophy brown trout fishery.

This 20-mile reach is popular for floating in the summer months, offering an all day float if the entire reach is floated, or a half day float by utilizing the Deep Dale Fishing Access Site. Waterfowl hunting is popular in the fall throughout the entire reach. The islands and riparian zones also offer hunting opportunities for deer and pheasant during the fall season.

An important aspect of providing recreational opportunities in this reach is the maintenance of adequate instream flows. The Montana Department of Fish, Wildlife, and Parks (MDFWP), under provisions of 1969 legislation (Sec. 89-801, RCM, 1947) filed for an instream flow right for this reach of 3,000 CFS. The Department has reclaimed this right under the statewide adjudication process, and the claim is currently under review by the water courts.

As stated previously, flows and water levels in the Missouri River from Toston Dam to the Townsend Bridge are not affected by the operation of Canyon Ferry Reservoir. However, because this reach provides spawning grounds for Canyon Ferry fish, reservoir operations which tend to diminish reservoir fish populations would lead to depressed spawning runs. This, in turn, would reduce angling opportunities from Toston Dam downstream.

Canyon Ferry Reservoir

Fisheries

Canyon Ferry Reservoir is one of the most heavily-fished bodies of water in the state. In 1983, for example, 118,000 fisherman days were spent on this reservoir. The most sought-after sport fish include rainbow and brown trout and yellow perch. Trolling and bank fishing occupy the summer months while winter ice fishing is experiencing increasing popularity.

The bulk of the reservoir rainbow trout population is supported by annual plants of hatchery subcatchables. The reservoir brown trout population is sustained through natural recruitment. Under proper conditions, excellent populations of rainbow trout can develop in the reservoir and provide exceptional angling opportunities. Good reservoir trout populations not only provide angling opportunities in the reservoir, but also enhance the fishery in the Missouri River upstream from Canyon Ferry during the spring and fall spawning runs. During those years when rainbow trout populations are low in Canyon Ferry, rainbow spawning runs in the Missouri are noticeably less, and angling opportunities considerably reduced.

There are three aspects of reservoir management which can potentially affect the fishery in Canyon Ferry. First and probably most important, are the magnitude and duration of the spill as related to fish escapement. Second is the reservoir level in the spring and fall and its influence on the use by fishermen of the delta area. Third is the effect of winter reservoir operation on ice conditions and, subsequently, the ice fishery.

1. Spill conditions and fish escapement. The rainbow trout fishery in Canyon Ferry is supported almost entirely with hatchery fish planted as subcatchables (4-6 inches long). The strain of fish stocked is fast growing, but fairly short lived. Annual plants are necessary to sustain this fishery.

   Escapement of stocked fish from the three reservoirs has been identified as a problem as far back as the mid 1960's. As a result, stocking policies have changed over the years, and current practice is to stock subcatchables after the normally occurring high flow period.

   Even with stocking after high water, problems have been noted in various years with unsuccessful plants and low year class strengths in subsequent years. The problem was highlighted in 1982 and 1983 when the rainbow population was at a very low level. A more intensive study of fish escapement from Canyon Ferry was

initiated at that time. Initial findings of this study indicate that:

a) the fish most susceptible to escapement from Canyon Ferry Reservoir are the newly stocked subcatchable rainbow trout. Adult escapement is, at the present time, considered to be of minor importance,

b) the magnitude and duration of the spill has an important effect on escapement. Spills of less than 4,000 CFS and 25 days duration have little effect on escapement. Spills greater than 4,000 CFS and 30 days duration produce moderate to severe levels of escapement, and

c) late summer spills after the normal stocking period can produce high levels of escapement. The spill conditions during late August and September produced an estimated 30% level of escapement.

Recommendation: Spills should only occur during the normal high-flow period. Spills should be less than 30-days duration and 4,000 CFS.

2. Missouri River Delta Area. The delta area at the head end of Canyon Ferry Reservoir is a popular and productive area to fish during the spring and fall. High reservoir levels limit access to the islands and gravel bars in the delta area and make fishing difficult.

Recommendation: During the spring (April-Mid May) and fall, (September-November) desirable reservoir elevations to maintain fishability of the delta area are between 3,785 and 3,792 ft.

3. Winter Ice Conditions. There is very popular ice fishery on Canyon Ferry Reservoir for rainbow and brown trout and yellow perch. This fishery is dependent on safe, relatively stable ice conditions.

Recommendation: Stable or moderately receding reservoir levels are desired. Sudden reservoir level drops or rises should be avoided since both situations contribute to unstable or dangerous shoreline ice conditions.

Wildlife

Description of Resource

The Canyon Ferry Wildlife Management Area is located on the south end of Canyon Ferry Reservoir approximately 1 mile north of Townsend. The area has been administered by the MDFWP under a

contractual agreement with the Bureau of Reclamation since the mid-1950's. Intensive development associated with the dust abatement program began in 1973, and major construction of the dike system was completed in 1978.

The dike system includes four subimpoundments (ponds) and approximately 11 miles of dike. Approximately 300 plus nesting islands have been constructed within the ponds. The ponds vary in size from 400 to 500 acres and total about 1,800 surface acres when combined. There are two diversion headgates on the Missouri River. Water control structures at these points control flows into the eastside and westside canals which deliver water to the pond system.

Approximately 5,000 acres of riparian and upland habitat are included within the management area. This also contains about 1.5 miles of river bottom and extends into the delta area. A total of 1,100 acres is managed under agricultural leases to adjacent landowners. The basic format is a barley-alfalfa hay crop rotation. Some livestock grazing also occurs.

The remainder of the reservoir has some well developed riparian areas associated with the lower end of the larger tributary streams (Duck, Confederate, and Avalanche creeks). Riparian zones are developing along the east shore and have been enhanced by the elimination of livestock grazing in these areas. The reservoir also provides important loafing areas for spring and fall migrant waterfowl. Nesting by Canada Geese along the main reservoir is occurring, but secure nest sites are limited.

Status of Associated Wildlife Populations

The most dramatic increase in local waterfowl population units has been that documented with the resident flock of Canada Geese. The number of active nesting pairs increased from less than 50 pairs in 1974 to 223 in 1983. The majority of this increase has been associated with the islands within the pond system. The number of nests observed on the river islands has declined during this period which is an indication of the attractiveness of the pond system to nesting geese. This trend on the river will probably begin to reverse itself once the density of nests on the ponds becomes saturated.

Quantified data from 1982-1984 indicate an increase in the duck nesting effort on the pond system. Forty duck nests, most of which were mallards, were recorded during the 1984 field season. The response by ducks has been limited by their more restrictive nest site requirements. In fact, ducks may represent a more sensitive barometer to the ecological changes that are occurring on the project. The main key to these changes is the stabilization of water levels and the corresponding establishment of the different vegetation zones.

Many other species (shorebirds, gulls, cormorants, and pelicans) have established seasonal use patterns on this system. Use by both breeding and nonbreeding components of these groups is increasing.

Waterfowl hunting accounted for the following use during the opening weekend period in 1984. An estimate of 233 hunters harvested approximately 300 ducks and 107 geese. These estimates are based on hunter bag checks and contacts made during the Saturday-Sunday period.

Upland species that receive management emphasis are ring-necked pheasants and white-tailed deer. Trend information is collected annually for both, and pheasant numbers appear stable (with potential for increase) while whitetails are continuing to increase.

Check station work during the 1984 opening weekend of the pheasant season resulted in the following information. Approximately 103 pheasants were harvested by an estimated 258 hunters.

Furbearers are common on the management area. Trapping is restricted to permits only and the project has been divided into five trapping units. Trappers must apply for a permit and, if successful, must trap in a designated unit.

Chronology of Waterfowl Breeding Biology

Geese begin returning to the area any time from mid-February on, with specific arrival dates dependent upon weather conditions. Mallard, pintail, goose, and swan numbers generally peak at the end of March through the first week in April. Numbers of birds typically observed during this period include 50,000 to 60,000 ducks, 1,000 geese, and 1,000 swans.

Geese begin selecting island nesting sites and initiating nests during April, and the broods begin coming off by mid-May. Most duck nesting occurs during late April, May, and June.

Molt migrant geese leave the area by the first part of June and move up into the NW Territories. Breeding birds and their young are usually flightless into mid-July. Late summer staging by ducks begins to occur in August, and goose numbers generally peak in mid to late September. Prior to the 1984 hunting season (September 29th) an estimated 2,500 geese and 5,000 ducks were present on the project. Duck and goose numbers generally decrease until freeze-up of the ponds occurs in mid-November and the reservoir in December.

Critical Aspects of Water Level Management (Seasonal)

Spring. Adequate water levels are imperative at this time (April) to insure that islands are attractive to nesting birds

and that the islands provide security from nest predators. In the pond system, water elevations in the range of 3,796 ft to 3,796.5 ft are desirable. Pool elevation in the reservoir during the spring period ranges typically from 3,781 ft to 3,786 ft with river flows in the 5,000 CFS category. This generally provides adequate security for river island nesting geese. During this period the water is restricted to the channels, and the river flows would be the critical factor.

Late Spring-Early Summer. Objective is to avoid pond elevations that would flood nests, and the same applies to the river system. Elevations in excess of 3,797.5 ft in the ponds are detrimental to island stability (wave action will cause severe erosion), nest success, and vegetation establishment. The distribution of the emergent vegetation zone on the ponds is quite limited, and during the period of establishment, these stands of cattail and bulrush are quite susceptible to high water.

Peak runoff and maximum storage in the reservoir impact the physical condition of the dikes. Pool elevations in excess of 3,797+ will also force seepage into the ponds, causing the pond elevation to rise above optimum conditions.

Summer. Late summer reservoir elevations (mid-July to mid-August) are critical to water elevation management in the pond system. If the reservoir pool elevation exceeds 3,797 ft during July and August, the pond elevations cannot be drawn to desired levels. This results in excessive water depths and reduces the productivity of the submergent vegetation at a time when the plants would normally be adapted to a drawdown.

Minimum flows would be required to insure that river water could be diverted into the canal system. This has not been a problem for the last 5 years.

Fall. Fall reservoir pool elevations should provide adequate gravel bars in the delta area in order to provide loafing areas for ducks and geese. These elevations would also maintain some exposed shoreline along the remainder of the reservoir with the same objective in mind. Once the birds have been hunted on the ponds, they switch to the lake. In order to hold the birds on the reservoir and in the area, these loafing sites are critical. An estimated range of reservoir elevations that would accomplish this would be 3,788 ft to 3,792 ft.

Winter. A drawdown of the reservoir during the winter period is part of the routine operation plan. Because of seepage and the fact that the canal system is typically shut down, the ponds experience a general overwinter drawdown. The extent of this drawdown is dependent upon the gradient between the ponds and the lake.

Freeze-up of the reservoir at an unusually high elevation (3,797 ft Fall/1983) could magnify the potential for ice jams on the

river just above the lake. If large chunks of ice are retained on the interior portions of the river islands, goose nesting is negatively impacted.

Optimum winter elevations would be in the 3,782-3,786 ft range.

Recreation

Canyon Ferry Reservoir is one of the most heavily utilized recreation areas in the state. It is the first major storage reservoir on the Missouri River and experiences large seasonal fluctuations in water levels. Winter drawdown levels may be anywhere from 3 to 14 ft below summer elevations. Various elements of the recreational resource at Canyon Ferry are influenced by reservoir water elevations. To assess the impact of various reservoir elevations on recreation opportunities, seven resource types were evaluated. These are as follows:

-Boat ramps
-Powerboating, waterskiing, sailing
-Camping-overnight use
-Picnicking-day use
-Swimming & scuba diving
-Cabin sites & residences
-Winter use; snowmobiling skating & cross-country skiing

Each use was evaluated with respect to the effect of various reservoir elevations on that use and recommendations developed which define an optimum and range of elevations. These are discussed below.

Boat ramps. There are seven boat ramps currently in existence. These are developed on 8-9% grades and are located at: Yacht Basin Marina, Kim's Marina, Hellgate Campground, Goose Bay Marina, Silos Campground (2 ramps), and White Earth Campground.

1983 boating use on Canyon Ferry was estimated at 71,660 visitor hours. An estimated 45,000 vehicles came into the area with boats.

Effect of water levels: Water levels that are unusually high or low will cause problems with the boat ramps. High water will give the recreationist trouble when trying to load and unload boats. Low water levels may cause the ramp to be above the water level, making it unusable.

Optimum water level: The desirable range of summer reservoir elevations is 3,790 ft-3,798 ft. The optimum summer elevation is 3,794 ft.

Power boating, waterskiing and sailing. Open lake available consists of 35,181 acres. There are two boat-access-only areas maintained.

1983 boating use on Canyon Ferry was estimated at 71,660 visitor hours. Breakdown:

Motorboat cruising or fishing	53%
Sailing	20%
Raft or Canoe	4%
Waterskiing	23%
Total	100%

Effect of water levels: High water levels tend to cause a problem with floating debris in the lake. Low water levels cause the exposure of rocks and sandbars that pose a potential hazard to boaters, especially those in motorboats or waterskiers. These become hazardous at approximately 3,792 ft.

Optimum water level: The desirable range of summer reservoir elevations is 3,791 ft-3,798 ft. The optimum summer elevation is 3,795 ft.

Camping-overnight use. There are 12 developed campgrounds with approximately 620 individual units. They are located at Court Sheriff, Ponderosa, Chinaman's Cave Bay, Jo Bonner, Hellgate, Goose Bay, Silos, White Earth, Overlook, Fish Hawk, and Shannon.

Total visitation in the study area in 1983 was 428,000.

Effect of water levels: High water levels will cause flooding of major camping areas. Low water levels will have no significant effect although there are indirect effects to be considered. Most campers are in the area for other purposes in conjunction with camping. If the other activities are affected, the camping activity is also.

Optimum water levels: The desirable range of summer reservoir elevations is 3,790 ft-3,797 ft. The optimum summer elevation is 3,795 ft.

Picnicking-day use. A total of 16 day use sites are currently in existence, with 4 day use only areas. These include Lorelei, Lewis and Clark, Orchard, and Crittendon. Twelve sites are included as developments within camping areas.

Available for day use are 76 miles of shoreline and 1 mile of streambed acreage.

Visitor hours spent picnicking in 1983 totaled 153,247. Visitation on the West Shore in 1983 was 57,700, and total visitation in the study area was 428,000.

Effect of water levels: High water levels may cause flooding of these areas. Low water levels create a larger proportion of beach area.

Optimum water levels: Desirable range of summer reservoir elevations is 2,790 ft-3,796.5 ft. The optimum summer elevation is 3,794 ft.

Swimming and scuba diving. There are nine currently designated swimming areas located at Court Sheriff, Ponderosa, Chinaman's, Kim's Marina, Hellgate, Crittendon, Orchard, Lewis and Clark, and Lorelei.

The visitor hours spent swimming in 1983 were 76,624. Total visitation in the study area in 1983 was 428,000.

Effect of water levels: Low water levels create a larger beach area and may cause hazardous diving conditions. High water will often eliminate beaches and flood the surrounding landscape.

Optimum water levels: The desirable range of summer reservoir elevations is 3,791 ft-3,797.5 ft and the optimum summer elevation is 3,795 ft.

Cabin sites and residences. There are 265 cabin sites surrounding the reservoir with 167 located on the East Shore and 98 located on the West Shore. These sites receive heavy weekend use. Some are summer homes while others are designed as permanent residences.

Effect of water levels: High water levels may cause flooding, septic problems, and dock movement. Low water levels create problems as some water supplies are being taken directly from the lake. These levels also have an effect on the docks.

Optimum water levels: The desirable range of summer reservoir elevations is 3,791 ft-3,797 ft. The optimum summer elevation is 3,795 ft.

Winter use-snowmobiling, skating, cross-country skiing. When frozen, 35,181 acres are available for use on the lake itself, with 76 miles of shoreline access and surrounding area.

Winter use figures were unavailable.

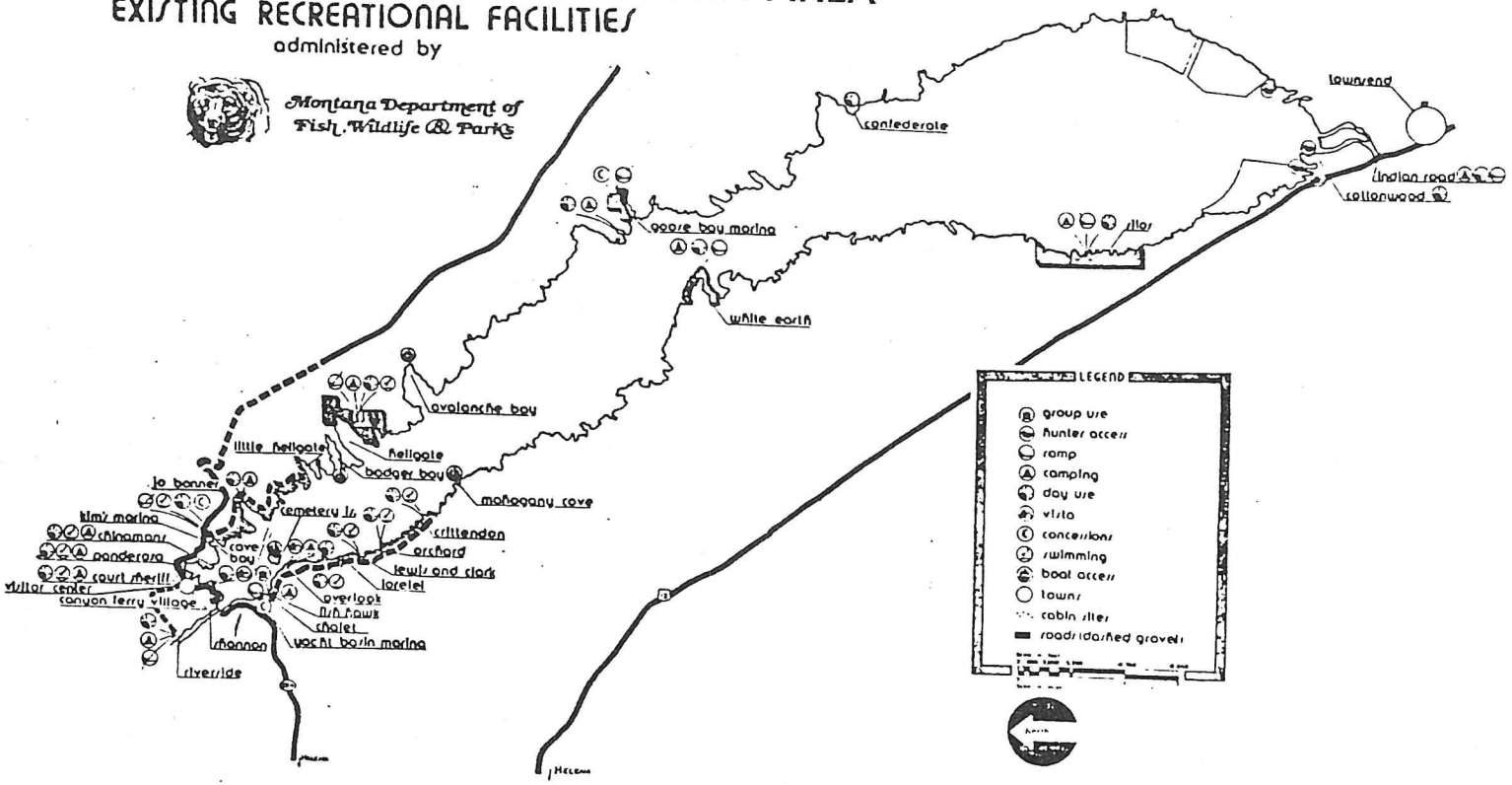
Effects of water levels: High levels may cause problems with docking facilities. Low water levels are desirable in the winter to allow docks to winter on dry land. Low water levels cause no real problems for recreation during this time although some steep banks may become inaccessible. Rapid fluctuations will cause problems due to the weakening of the ice.

Optimum water levels: The desirable range of winter reservoir elevations is 3,782 ft-3,790 ft. Optimum winter elevation is 3,786 ft.

Summary of optimum water levels for all resource types at Canyon Ferry. The desirable range of all summer elevations is 3,790-3,798 ft. The optimum summer elevation (May 21 to Sept. 31) is 3,795 ft. The desirable range of all winter elevations is 3,782-3,790 ft, and the optimum winter elevation is 3,786 ft.

CANYON FERRY STATE RECREATION AREA
EXISTING RECREATIONAL FACILITIES
administered by

Montana Department of Fish, Wildlife & Parks



Hauser Reservoir

Fisheries

Hauser Dam impounds the Missouri River nearly to the base of Canyon Ferry Dam. Hauser Reservoir is 15.5 miles in length, has a surface area of 3,800 acres with a storage capacity of about 98,000 acre feet.

Common fish species in the reservoir are rainbow trout, brown trout, kokanee salmon, yellow perch, carp, white sucker, and long-nose sucker. Small populations of mountain whitefish, walleye, and cutthroat trout are also present in the reservoir.

The sport fishery in Hauser Reservoir is supplemented by annually stocking 200,000, 5-inch rainbow trout after spring runoff or when discharge from Canyon Ferry Dam drops to less than 7,000 CFS. These trout begin entering the angler's creel in late fall and winter as 9 to 11 inch fish and comprise the bulk of the fishery the following summer as 12 to 15 inch fish.

All species of fish found in Hauser Reservoir complete all or a portion of their life history in the reservoir or associated tributary streams. The salmonids (rainbow, brown, and cutthroat trout, mountain whitefish, and kokanee) all require moving water for successful spawning. They spawn in gravels in the tailrace of Canyon Ferry Dam, or migrate into tributary streams. Rainbow trout spawning runs occur in the spring in Trout Creek and Tenmile Creek. Brown trout spawning runs occur in the fall in Trout Creek, Spokane Creek, and lower Big Prickly Pear Creek. Kokanee spawning occurs mainly in the tailrace area in the fall but some spawning also occurs in Silver Creek. The few cutthroat trout found in Hauser Reservoir are primarily transients that have drifted into the lake from Silver Creek or from tributaries in the Tenmile Creek drainage.

Walleye spawn in the spring over gravel-rubble substrate along shallow shoreline areas. These areas are very limited because most of the shoreline of Hauser Reservoir is steep or contains unsuitable substrate. Yellow perch spawning occurs in early spring in aquatic vegetated areas or on submerged debris within the reservoir.

Newly hatched fry of all species require plankton as first food. Salmonid fry feed on these microscopic plants and animals till they are large enough to supplement their diets with insects or other small fish. Plankton remains are an important food item throughout the life of rainbow trout and kokanee in Hauser Reservoir. Brown trout also feed on plankton but greatly supplement their diet with fish as they grow larger. Yellow perch and walleye feed on plankton and also supplement their diet with insects and small fish as they grow larger. Walleye become

very cannibalistic and may utilize any species of fish readily available to them.

Fishing pressure is relatively high on Hauser Reservoir with about 42,500 angler days expended during the 1982-83 fishing season. Natural reproduction of sport and game fish is not great enough to provide good fishing under existing pressure. Therefore, the game fish population is supplemented by annually stocking rainbow trout.

Approximately another 7,000 angler days are spent on the short flowing section of the Missouri River below Canyon Ferry Dam. Sport fish catches in this segment are the same species as found in Hauser Lake.

Composition of angler catches reveal rainbow trout contribute the bulk of the fish harvested, followed in order by lesser numbers of yellow perch, brown trout, kokanee and walleye. The sizes of rainbow trout creeled vary from 8 to 20 inches with an average of about 13 inches. Brown trout are not commonly caught, but trophy specimens from 5 to 15 pounds are occasionally taken. Kokanee have increased in the reservoir the past few years and are not uncommon in anglers' creels. They range from 12 to 18 inches in length. Good catches of 6 to 8 inch yellow perch are frequently taken by both summer and winter anglers. Occasional walleye up to 3 or 4 pounds are taken.

Lake Helena, separated from Hauser Reservoir by a causeway and a short bridge, covers an area of 2,100 acres and has an average depth of 5 feet. Some trout and kokanee move through Lake Helena to spawn in tributary streams entering the west end of the lake. Water temperatures warm rapidly in this shallow impoundment in the spring (May and June) and attract thousands of spawning carp from Hauser Reservoir. A commercial fisherman occasionally harvests 40 to 50 tons of carp from Lake Helena in the fall.

The causeway area is a popular fishing spot in the winter. Anglers fish through the ice on both sides of the causeway, primarily for trout and perch. Approximately 3,200 angler days were estimated on Lake Helena in 1982-83, with most occurring during the winter months.

Recommendations: Stable shoreline with steady inflow and outflow from the Hauser system would provide optimum conditions for fishery resources. However, the spring runoff event precludes the possibility of steady flow through the system. Occasional maintenance of hydropower structures also causes some shoreline fluctuation. To avoid problems with aquatic resources and recreational opportunity, the following recommendations should be followed:

1. After spring runoff, no late season spills should be released from Canyon Ferry Reservoir. We stock Hauser

Reservoir after spring runoff to lessen fish movement over the dam.

2. Fall flow should be stable to accommodate spawning conditions for brown trout and kokanee in the Canyon Ferry tailrace.

3. Hydro-structure maintenance drawdowns should be accomplished during non-holiday periods in August and September. A flow of at least 4,100 CFS should be maintained below Canyon Ferry and Hauser dams. Headboards should be installed under the causeway bridge to maintain water elevations in Lake Helena during drawdown.

4. Winter water levels in Hauser Reservoir should be steady to prevent ice fracture, thereby lessening the danger to ice-based recreation opportunity.

Wildlife

Lake Helena empties into the Lake Helena area of Hauser Reservoir through a narrow outlet at the causeway. During periods of stable Hauser reservoir elevations, Lake Helena is at the same elevation as Hauser. The causeway outlet is quite narrow. Consequently, during rapid water level fluctuations in Hauser, a gradient develops at the outlet of Lake Helena and water flows into or out of Lake Helena at a rapid rate.

Lake Helena is an important waterfowl area. The upper end is used for nesting by Canada Geese and ducks and is used for brood rearing as well. The area is a popular waterfowl hunting spot. Waterfowl utilize Lake Helena as a resting area during their fall migration.

The potential for increasing waterfowl production on Lake Helena is high. Production is currently limited by a scarcity of suitable nest sites. Increasing the number of nesting sites on the lake would dramatically increase waterfowl production.

Water level fluctuations in Hauser that affect Lake Helena levels are of particular concern during the waterfowl nesting season. Waterfowl can suffer serious losses during the nesting season if water levels are lowered to the point where predators gain access to the nest sites.

Recommendations:

1. There should be no water level fluctuations in Hauser which would affect Lake Helena during the waterfowl nesting season.

2. Water level fluctuations in Lake Helena due to maintenance related drawdowns of Hauser Reservoir during the waterfowl nesting season should be minimized by placement of boards in

the causeway structure. Response to water level fluctuations in Lake Helena at other times of the year should be coordinated with the Helena Valley Irrigation District.

Recreation

The normal year round elevation is approximately 3,635 ft.

Hauser is operated as a run-of-river reservoir and therefore this area experiences a fairly constant water elevation. Development along the lake shore has occurred and is dependent upon this relatively constant water level. Fluctuations in Hauser Lake could have a significant impact upon many developments surrounding the lake due to the small gradients on several of the developed shorelines. The developed recreation resources at Hauser Lake were evaluated on a site-by-site basis.

Riverside. Located at the base of Canyon Ferry Dam, this site is occasionally impacted by releases from Canyon Ferry Dam.

The resources present at this site include 1 boat ramp, 20 camp sites, and 5 day use parking lots. The boat ramp becomes non-functional at high water levels. Five of the campsites and one day use parking lot were flooded during high water in 1984.

The 1983 visitation totaled 38,500, which was measured by traffic counter. Fisherman and day use account for almost 2/3 of use in this area. The boat ramp is used by approximately 1/2 of the visitors.

Effect of water levels: As mentioned previously, this area is unable to tolerate high water levels. River flows of more than 18,500 cubic feet per second from the Canyon Ferry Dam begin to flood the area. Low water levels are acceptable and would cause little damage.

Optimum water levels: The optimum elevation is 3,635.20 feet. Discharge levels from Canyon Ferry Dam are measured in cubic feet per second. These are also given. The acceptable range of discharge from Canyon Ferry is 3,500 CFS-18,000 CFS, and optimum discharge level is approximately 5,500 CFS.

Lakeside. There is considerable recreational development, both commercial and private on Hauser Reservoir in the vicinity of Lakeside. Many private docks are found along the shoreline and a commercial marina is located at Lakeside. This area is very popular for summer water-based recreation. In addition, many permanent homesites are located along the shoreline.

Reservoir fluctuations associated with past power peaking tests indicated that daily water level fluctuations over 1.0 feet in magnitude seriously impact the boating facilities in this area.

Optimum water conditions for this area are stable water elevations at elevation 3,635.2 ft.

Causeway. The resources present at this site include one unpaved boat access for small boat use, and parking spaces for day use and fishing. This area is located at the man-made causeway connecting Hauser Lake and Lake Helena. It is on a shallow, narrow bay which has a number of private homes surrounding it. Some of these homes are on the same elevation as the recreation site.

This area and the adjoining causeway receive high use by fishermen. The visitation for 1983 totaled 1,200 which was measured by traffic counter. All of the use at this area is day use and fishing. The area receives heavy use during the winter months.

Effect of water levels: The developed area could not tolerate water levels that would be higher than average. As it currently exists, there is very little bank area.

Low water levels would have an effect on recreation. The bay is very shallow, and low levels would create a large mud flat in this area. Very slight fluctuations causing the water level along the shoreline to rise could be tolerated although they may cause damage to the already eroded shoreline. Any water fluctuations during the winter months would weaken ice conditions and make winter use very hazardous.

Optimum water levels: The desirable range of elevations is 3,634.7 to 3,635.7, and the optimum elevation is 3,635.20 feet.

White Sandy. This area is located on the lower portion of Hauser Lake approximately 1 1/2 miles from the Montana Power Dam.

The resources present at this site include two unpaved boat ramp lanes, three parking areas, and ten camp sites.

This area is unique as it has very good sand conditions. The banks surrounding the lake are fairly steep and easily impacted by erosion.

Visitation in 1983 was 17,300, which was measured by traffic counter. Much of the use is day use with some overnight camping and use by boaters. This area also receives heavy use during the winter.

Effect of water levels: This area may be able to tolerate a greater range of water levels than other areas around Hauser Lake due to the steep banks in this area. Low water levels would have little or no effect in this area.

Optimum water levels: The desirable range of elevations is 3,634 ft-3,637 ft, and the optimum elevation is 3,635.20 ft.

Black Sandy. This area is located on the lower portion of Hauser Lake approximately 1 mile from the Montana Power Dam. The resources present at this site include 1 paved boat ramp, 50-60 camping sites, and 3 parking areas with picnic facilities. This area is a well developed camping area complete with scenic overlooks and maintained lawns.

The visitation in 1983 was 58,200, which was measured by traffic counter. Much of the use is overnight use with some day and fishing use. The boat ramps are used heavily.

Effect of water levels: Much of this area is located on a fairly shallow gradient. High water levels would flood large portions of this site and cause the boat ramps to become non-functional. Low water levels would have little or no effect. Fluctuations during winter months would cause weakening of the ice and hazardous conditions.

Optimum water levels: The desirable range of elevations is 3,633 ft-3,636 ft, and the optimum elevation is 3,635.20 ft.

Summary of optimum water levels for all sites at Hauser Lake: Desirable range of elevations is 3,634.7 ft-3,635.7 ft, and optimum elevation is 3,635.2 ft.

Missouri River Below Hauser Dam

Fisheries

The short, free-flowing segment of the Missouri River between Hauser Dam and Holter Lake is about 3 1/2 miles in length. This "Blue Ribbon" segment of the Missouri supports excellent populations of rainbow trout, brown trout, and mountain whitefish. Kokanee are seasonally abundant during fall spawning. Other species inhabiting the area include a few cutthroat trout, yellow perch, walleye, carp, and large numbers of white and longnose suckers.

This segment of the Missouri River is very important for brown trout and rainbow trout spawning. In fact, it presents the only significant spawning beds for brown trout that inhabit Holter Lake or live in the river year around. Holter Lake brown trout begin moving into the river in late September to spawn on gravel beds below Hauser Dam, near the mouth of Beaver Creek and in the river channel below Beaver Creek. Peak spawning occurs in October and November. Population estimates indicate between 1,000 and 1,500 brown trout over 18 inches in length are present in the area during the spawning season. Brown trout do not appear to migrate into Beaver Creek, a small tributary to the river about 2 miles below Hauser Dam. However, Beaver Creek does support a resident population of brown trout.

Rainbow trout utilize the river and Beaver Creek for spawning in the spring. A significant movement of adult rainbows move up Beaver Creek to spawn in late March and April. Many of these fish move into the area from Holter Lake.

A number of mountain whitefish inhabit the Missouri River below Hauser Dam. They complete their complete life history in the short river segment since very few are ever noted in Holter Reservoir. Whitefish spawn over gravelly areas in the fall, primarily in the first half mile of river below Hauser Dam.

Kokanee also move into the river segment below Hauser Dam to spawn in the fall. They select gravel areas similar to those utilized by brown trout. Kokanee appear to be increasing in the system.

This area of the Missouri River is a very popular fishing water. Fishing pressure estimates reveal 12,000-14,000 angler days are expended yearly in this river segment. Rainbow trout comprise the bulk of the catch, followed by nearly equal numbers of brown trout, mountain whitefish, and kokanee. A few cutthroat trout, yellow perch, and walleye are also taken. The area has special interest by those anglers seeking trophy brown trout during the fall spawning season. Brown trout 5 to 12 pounds are frequently taken.

Most of the rainbow trout caught in this river are of hatchery origin. Although the river is not stocked, they move into the area from Holter Reservoir or flush over Hauser Dam. Rainbow trout caught by anglers vary from 8 to 24 inches. Early spring fishing is enhanced by spawning rainbow trout moving into the area from Holter Reservoir. A few trophy rainbows in the 3 to 5 pound range are taken.

Recommendations: The Missouri River below Hauser Dam is an important brown trout spawning area. It receives very heavy fishing pressure nearly year around. In order to provide suitable spawning and rearing conditions for brown trout and recreational opportunity, the following recommendations should be followed:

1. Fall and winter flow should be steady and a minimum of 4,100 CFS. This would insure spawning and hatching conditions for brown trout and kokanee.

2. If hydro-structure maintenance calls for partial dewatering of the Hauser tailrace area, it should be done from late July through early October during non-holiday periods.

Recreation

The river between Hauser Dam and Upper Holter reservoirs receives recreational use by floaters and hikers; however, the predominant recreation activity is fishing. The 3 1/2 miles of river below Hauser Dam contain excellent trout populations and offer an outstanding trophy brown trout fishery. It is rated as a Class I stream.

Discharge patterns which would damage the fishery resource or impact the fishability would affect the largest segment of recreational use in that reach of water. Flows necessary to maintain that fishery are addressed in the Fishery discussion.

Flows which are either too high or too low can impact floating. Low flows uncover obstacles and rocks which can become hazardous. This applies to approximately the upper 1 1/2 miles where stream gradients are relatively high. High flows also cause safety problems for floaters. The point at which flows become a problem, however, has not been identified.

Holter Reservoir

Fisheries

Holter Reservoir is about 25 miles in length, has a surface area of 4,800 acres, and contains about 240,000 acre feet of water. Shoreline features of this reservoir are similar to that of Hauser Reservoir, i.e. steep high banks, sharp dropoff and stable water levels.

Species of fish present in Holter Reservoir are the same as found in Hauser Reservoir, and their life histories are similar. Spawning facilities are inadequate to maintain a sport fishery as demanded by the fishing public. Salmonid spawning habitat to the reservoir proper is limited to two small tributaries, Cottonwood and Willow creeks. Spawning waters are also available in the Missouri River and Beaver Creek, which were discussed previously.

The sport fishery in Holter Reservoir is now supplemented by stocking 325,000, 5-inch rainbow trout yearly. The fish are stocked after spring runoff drops to 7,000 CFS spill from Holter Dam. The trout grow rapidly to about 10-11 inches in length by November and to 15-18 inches by the end of the following summer. Fishing pressure estimates reveal about 94,000 angler days are expended yearly in Holter Reservoir.

Spring flood spills at times cause severe losses of fish over Holter Dam. Duration and magnitude of the spill both have a factor in determining fish loss. Such occasions occurred in 1975, 1976, and 1981. In 1975, a spill of over 10,000 CFS occurred for 43 days of which 13 days exceeded 20,000 CFS. In 1976, a spill over 10,000 CFS occurred for 79 days of which 13 days exceeded 15,000 CFS. Then again in 1981, a spill over 10,000 CFS occurred for 36 days of which 20 days exceeded 20,000 CFS. Considerable fish loss again occurred in 1984 but flow figures are not yet available.

Recommendations: Flood spills greatly affect the sport fishery in Holter reservoir. Excessive spills should be avoided whenever possible.

If power plant or dam maintenance calls for a drawdown of Holter Lake, it should be accomplished in April or September after Labor Day. Flows should not be altered beyond those recommended in the Missouri below to accomodate evacuation or refilling of the reservoir.

Recreation

The normal summer elevation is 3,580 feet.

This reservoir is located approximately 4 1/2 miles downriver from Hauser Dam. Much of the shoreline is under private ownership. The shoreline gradient ranges from steep canyon walls on the north end to flat grasslands on the southern shore.

This area receives heavy recreational use during the summer months. A privately owned visitor center is maintained, and boat tours of the river between Upper Holter Lake and the Gates of the Mountains are conducted during the summer months. Also maintained in this area are 120 privately owned boat docks.

The US Forest Service maintains two campgrounds downriver from the lake. These receive heavy use by floaters and boaters on the river. Although the State of Montana maintains no recreation areas here, a brief evaluation was done at Upper Holter and the campgrounds along the river.

Upper Holter Reservoir--Gates of the Mountains Boat Club and Tours. The resources present at this site include 1 paved boat ramp, 1 privately owned visitor center, 120 privately owned boat docks, and mooring facilities for 2 large tour boats.

This area receives high boating use. Fishing and cruising are primary boating activities. The visitor center and boat tours attract a large number of tourists to the area.

The actual numbers of visitors in the area are not maintained. Number of people using the boat tours in 1984 was 27,000.

Effect of water levels: High water levels would tend to cause flooding in this area. There would also be problems with the boat ramp and mooring facilities. Low water levels create problems with mud flats appearing near the shoreline. This will affect the boating use on the lake. Drops in the water level will also have an effect on the actual boat tours. The large tour boats would be unable to get to the mooring area or to let tourists off at the stopping place on the river during the tour.

Optimum water levels: The desirable range of elevations is 3,579 feet-3,581 feet. The optimum elevation is 3,580.

Meriwether Campground (FS). The resources present at this site include one permanent boat dock, picnic facilities, shelter, and camping facilities.

This campground is located on the side of the river which creates the border to the Gates of the Mountains Wilderness. It receives heavy use by boaters and backcountry hikers. It is the campground that is utilized by the Boat Tours as a mid-tour stopping place. The permanent dock facility is designed for this purpose.

Effect of water levels: High water levels may cause flooding of the area. The permanent mooring facility would become

nonfunctional. Low water levels would cause the mooring facility to be too far out of the water to be functional.

Recommended water levels: The desirable range of elevations is 1 foot above and 1 foot below the normal operating elevation. The optimum elevation is the normal operating elevation.

Coulter Campground (FS). Resources present at this site include undeveloped boat mooring, camping facilities, and picnicking facilities.

This campground is located on the side of the river which creates the border to the Gates of the Mountains Wilderness. Like Meriwether campground, it receives use by boaters and backcountry hikers. It is less developed than Meriwether.

Effect of water levels: High water levels may cause flooding in this area. The high water may make the beach and mooring area to be nonfunctional. Low water levels would create a larger beach area but would also make boating in the area hazardous.

Recommended water levels: The desirable range of elevations is 1 foot above and 1 foot below the normal operating elevation, and the optimum elevation is the normal operating elevation.

Holter Lake

Recreation

The normal summer elevation of Holter Lake is 3,578 feet. This lake was created by the second of two Montana Power Dams on this section of the Missouri River. It is located approximately 22 miles downstream from Upper Holter Lake.

The area surrounding this lake receives heavy recreational use during the summer months. There are four campgrounds along its east shore. The southern end borders on the Beartooth Game Management Area and receives heavy hunting and fishing use.

There are many privately owned cabins along the east shore. A privately owned marina and lodge are also present. The largest campground on Holter Lake is maintained by the Bureau of Land Management and is included in this report.

The following four recreation sites were evaluated: Holter Lake (BLM), Juniper Bay (SRA), Log Gulch (SRA), and Departure Point (SRA).

Holter Lake (BLM). This campground is located at the north end of the lake. It is a well developed and maintained campground that receives heavy use during the summer months.

The resources present at this site include 1 large paved boat ramp, 1 permanent boat dock, approximately 60 camping sites, and paved parking areas for picnic and day use.

This area appears to be well maintained. It is a paved and highly developed camping area.

The Bureau of Land Management recorded 398,808 visitor hours spent in this campground in 1983.

Effect of Water levels: This area is located fairly high above the high water mark in the lake. It appears that high water levels would cause little or no problems with recreational use in the area. Low water levels could be tolerated within limits. There may be problems with the boat ramp coming out of the water if the water levels drop too low.

Recommended water levels: The desirable range of elevations is 3,576 feet-3,580 feet, and the optimum elevation is 3,578 feet.

Juniper Bay (SRA). This area is located on the east shore of Holter Lake. It is approximately 4 miles from the BLM campground.

The resources present at this site are two parking lots for camping and picnicking use and a large beach area. The presence of the beach area makes this an ideal area for swimming and picnicking. The area also receives fairly heavy fishing use.

Visitation for 1984 was 61,536. This figure represents visitation at Log Gulch, Departure Point, Juniper Bay, and the Beartooth Game Range.

Effects of water levels: Due to the location of this area, high water levels would not be tolerated. They would rapidly flood the beach area and the picnic area that is located close to the water. Low water levels would create a larger beach area and may cause problems with boat use.

Recommended water level: The desirable range of elevations is 3,576 feet-3,578.5 feet, and the optimum elevation is 3,578 feet.

Log Gulch. The resources present at this site include 1 paved boat ramp, one unloading and loading courtesy dock, 2 large parking lots for boat trailers, and 50-60 camping sites.

This area is located approximately 1 mile further around the east shore of the lake from Juniper Bay. It is a large campground that is designed for the use of boats. A portion of the property is leased from the Montana Power Company.

Visitation for 1984 was 61,536 vehicles. This figure represents visitation at Log Gulch, Departure Point, Juniper Bay, and the Beartooth Game Range, and was measured by traffic counter.

Effects of water levels: This area is located away from the lake shore itself. High water levels would create some problems with the dock. Low water levels would cause problems with both the boat ramp and dock, and use of the campground would drop.

Recommended water levels: The desirable range of elevations is 3,577 feet-3,579 feet, and optimum elevation is 3,578 feet.

Departure Point. The resources present at this site include (camping), and (day use parking), and beach area.

This area is located approximately 1/2 mile further down the east shore from Log Gulch. The parking area is used for camping. The area has a fairly large beach area that receives heavy use from fishing and picnicking.

Visitation for 1984 was 61,536 vehicles, which was measured by traffic counter. This figure represents visitation at Log Gulch, Departure Point, Juniper Bay, and the Beartooth Game Range.

Effect of water levels: High water levels would create problems in this area as the beach would become flooded very rapidly. This would most likely reduce use levels here because most users

come to the area for the beach. Low water levels would increase the amount of beach available and would have little effect on recreation in the area. Fishing would become somewhat more difficult.

Recommended water levels: The desirable range of elevations is 3,577 feet-3,579 feet, and the optimum elevation is 3,578 feet.

Summary of Recommended Water Levels for All Sites on Holter Lake. The desirable range of elevations is 3,577 feet-3,578.5 feet, and the optimum elevation is 3,578 feet.

Missouri River--Holter Dam to Great Falls

The Missouri River from Holter Dam to Great Falls is a popular and heavily utilized recreation area. Activities include fishing, floating, boating, picnicking, camping, and hunting. The river contains excellent trout populations and is classified as a Class I stream from Holter Dam downstream to Sheep Creek. Below Sheep Creek, it is a Class II stream. Deer and pheasants occupy the riparian zone, and the river experiences seasonal use by waterfowl. Fishing is by far the dominant recreational activity in this reach.

Fisheries

This free-flowing reach of the Missouri River is about 88 miles in length. Stream gradient averages only about 2 feet/mile and varies from 7.84 feet/mile at Halfbreed Rapids to 0.52 feet/mile near Ulm. The principal tributaries entering the Missouri River in this reach are the Dearborn, Smith, and Sun rivers; Little Prickly Pear, Sheep, Rock, Stickney, Hardy, and Wegner creeks. The tributaries add considerable flow to the Missouri during spring runoff, but they contribute very little flow during the remainder of the year.

Present day flow regimens of the Missouri River are not entirely natural because of regulation and storage at several dams in the drainage upstream from the study area. Flow is largely controlled by Canyon Ferry Reservoir, the largest of three consecutive upstream reservoirs. Canyon Ferry was completed in 1953, and is operated by the US Bureau of Reclamation for irrigation, hydropower, flood control, recreation, and supplemental water supply for the city of Helena. Hauser and Holter reservoirs lie downstream of Canyon Ferry Dam and provide head for power generation. Hauser and Holter dams are owned and operated by Montana Power Company.

The 61.5 mile reach of the Missouri River from Holter Dam to the confluence of the Smith River is classified by the Montana Fish and Game Commission as a blue ribbon trout fishery (Brown et al. 1959). This is one of the longest single reaches of blue ribbon trout stream in Montana, and it represents 14 percent of the state's original 452 miles of blue ribbon water. An excellent fishery exists in this area for trophy-sized rainbow and brown trout. Many trout from 5 to 10 pounds are taken by anglers each year as well as a good number of trout larger than 10 pounds. Fish larger than 10 pounds are predominately brown trout. Mountain whitefish are several times more abundant than trout and provide an important winter fishery. A few burbot and walleye are found in the river; however, they are not nearly as abundant as trout and whitefish. Longnose and white suckers, carp, longnose dace, and mottled sculpin are the prevalent nongame species.

The 27 mile reach from the mouth of the Smith River to Great Falls does not contain the quality sport fishery as the upper river segment, but still offers opportunity for some excellent fishing. Access is very limited which detracts from recreational opportunity in this reach of river.

A creel survey conducted from April through October, 1980, on the sport fishery of the Missouri River indicated anglers caught 0.36 rainbow trout per man-hour (trout/hr) and 0.02 brown trout/hr (Berg 1981 b). The catch rate ranged from a low of 0.21 trout/hr during the runoff peak in June to a high of 0.77 trout/hr in August. Boat fishermen caught 0.90 trout/hr while bank fishermen caught 0.31 trout/hr. Other fish species taken in the creel in 1980 included mountain whitefish, brook trout, cutthroat trout, walleye, yellow perch, burbot, longnose and white suckers, and carp. About 65 percent of the anglers interviewed in 1980 were from Great Falls, 27 percent were from other parts of Montana, and 8 percent were from out-of-state.

An estimate of statewide fishing pressure was compiled for the 1975-76 fishing season by the Montana Department of Fish and Game (MDFG 1976). Results of the survey indicated about 69,500 angler days were expended on the 61.5 mile reach of the Missouri River from Holter Dam to the confluence of the Smith River. This amounts to an average of 1,130 angler days per river mile. By comparison, fishing pressure on 102 miles of the Madison River averaged 957 angler days per river mile during the same fishing season. The Madison is regarded as one of Montana's premier trout rivers.

The best method of determining instream flow needs for fish is to derive flow recommendations based on field study of the biological requirements of key fish species. Rainbow and brown trout are the most important game fish in the Missouri River, and they comprise the bulk of the sport fishery.

Research studies conducted on the Missouri River indicate side channels around islands are vital for rearing of young-of-the-year rainbow and brown trout from early July until about mid-October. Considerably greater numbers of young trout utilize habitat associated with the side channels than in the main river channel.

Brown trout appear to prefer spawning habitat associated with side channels. This preference is apparently related to more suitable depth, velocity, substrate, and adjacent cover characteristics than offered by the main river channel.

Brown trout initiate spawning in about mid-October with peak spawning in early November. Rainbow trout spawning also occurs in side channels, in late March and early April. Based on these conditions, adequate flow must be maintained in side channels for trout spawning and egg incubation from mid-October through mid-May.

Eleven side channels of the Missouri River between Holter Dam and the confluence of the Smith River were intensively studied to evaluate the amount of flow required to maintain suitable conditions in the side channels for rainbow and brown trout spawning, incubation, and rearing. Habitat conditions (mean channel depth, water velocity, and flow) were very good, and trout utilization of side channels for spawning and rearing remained consistently high when flows were 4,000 CFS or higher in the Missouri River. However, habitat conditions and utilization of the side channels for spawning and rearing declined precipitously when flows receded below 4,000 CFS. At a flow of 4,100 CFS, 64 percent of the side channels contained adequate flow for trout spawning, incubation, and rearing, while at 3,600 CFS only 9 percent of the side channels contained adequate flow.

Recommendations: The segment of the Missouri River from Holter Dam to Great Falls is one of the most popular trout fishing rivers in Montana. It contains productive water, has good access, and high aesthetic value. It is important that aquatic habitat preservation be given high priority to maintain the excellent recreational opportunity offered on the river. To maintain this opportunity, the following flow recommendations should be met:

1. Maintain a minimum flow of 4,100 CFS for trout spawning and juvenile trout rearing from mid-October through mid-May.

2. The fall minimum flow base should be established before brown trout spawning activity commences in mid-October. If flow is dropped after brown trout spawning occurs, many redds or eggs may be exposed or located in areas unsuitable for proper incubation.

3. Maintain steady flow releases under 7,000 CFS after spring runoff recedes. Flow in the Missouri River below Holter Dam greater than 7,000 CFS simulates mini-flooding patterns, affects timing of aquatic insect hatches in August and September, and restricts optimum angler use during the peak fly fishing season.

Wildlife

There are considerable wildlife values associated with the Missouri River from Holter Dam to Great Falls. Sizable beaver and muskrat populations occur on the river. Interest in trapping is very high, especially when pelt prices are good. River otters are also present.

The ecosystem provides nesting habitat for peregrine falcons, osprey, and bald eagles. The Missouri River below Holter is a winter concentration area for bald eagles and is heavily used by bald eagles during spring and fall migration. A large great blue heron rookery is located approximately 5 miles above Cascade.

Canada goose nesting is an important consideration on the Missouri River below Great Falls. During the course of a 5 year inventory and planning study on the Missouri River, 629 Canada goose nests were located. All nests were found on islands within the river.

Maintaining adequate flows around these islands is necessary to insure that the nests are protected from mammalian predators. Under extreme low flow conditions these predators have easy access to the islands and can significantly reduce goose production. The security of the islands is a primary factor in their selection as nest sites by geese. This security is provided by adequate side channel flows which are a function of depth, width, and velocity. A study during 1980 determined that a minimum flow of 3,550 CFS, as measured at the USGS gage below Holter Dam, is necessary to maintain secure nesting sites in most of the typical nesting islands.

The Canada goose nesting season on the Missouri River extends from mid-March to the first of June with the peak in nest initiation occurring during the first week of April and the hatching peak occurring during the first week of May. Unseasonably high flows during this period can cause nest flooding. Studies were not done, however, to determine the maximum flow levels. Until such studies are accomplished, a maximum flow of 7,000 CFS is recommended.

Recommendation: For the period from March 15 to June 1, flows in the Missouri River should be stable between a minimum of 3,550 CFS and a maximum of 7,000 CFS.

Recreation

The Missouri River from Holter Dam to Great Falls is heavily used for recreation. A frontage road parallels the river and has been designated as a Recreation Road. The section downstream from Wolf Creek Bridge contains eight state and one fishing access sites. From Cascade and below to Great Falls, there are two more fishing access sites and one more state recreation area.

Almost all recreational use along the river is influenced by river flows. Eighty to ninety percent of the existing recreational use is attributed to fishing. Floating has also become a popular sport in recent years and now accounts for approximately 50 percent of the use. Floating and fishing are often combined. Picnicking, scenery viewing and camping are additional recreational uses in this area.

Since the bulk of the recreational use in this area is fishing, flows which influence fish populations and fishing success are the most important flows influencing overall recreation use. These will be discussed in greater detail in the Fisheries Section. This section discusses flows which directly influence

the functioning and desirability of various recreation areas along the river.

Wolf Creek Bridge. The resources present at this site include one paved boat ramp, day use parking lot, and an interpretive area.

This area is located at the end of the road coming from Holter Lake. It is used as a put-in point for river floaters and is a popular fishing area. The area is approximately 6 feet above the flood stage of the river.

Visitation for 1984 was 24,100 vehicles, which was measured by traffic counters.

Craig. Resources present at this site include one paved boat ramp, a parking area for day use, and a picnic area.

This area is located on the west side of the river at Craig. It is heavily used as both a take-out and put-in area for floaters. Fishing use is also high. Much of the area is located approximately 4 feet above river flood stage.

The visitation for 1984 was 17,350 which was measured by traffic counter.

Stickney Creek. The resources present at this site include one paved boat ramp, a parking area, and five camping spaces.

This area is located on the east shore of the river approximately 5 miles from Craig. It receives use by picnickers, campers, and fishermen. The area is approximately 6 feet above flood level.

The visitation in 1984 was 7,232 vehicles which was measured by traffic counter.

Spite Hill. The resources present at this site include unpaved boat access, and fishing area parking.

This area is located approximately 1 mile downstream from Stickney Creek on the east bank. Much of the area is located directly on the river shoreline. This portion could easily become flooded. The area is used primarily by fishermen and floaters.

Visitation in 1984 was 4,085 vehicles.

Dearborn. The resources present at this site include a small camping area, and a picnic area.

This area is located on a small area adjacent to a large section of private property. The river banks in this area are extremely steep and erosion appears to be a problem. Access to the river

is limited and hazardous. The area appears to primarily be used for camping and picnicking.

Visitation in 1984 was 1,190 vehicles, which was measured by traffic counter.

Mid Canon. Resources present at this site include fishing access parking.

This area is located downstream from Dearborn and is located on the east bank. It is maintained as a fishing access site with no facility development.

No use figures are available.

Mountain Palace. The resources present at this site include a parking area, picnic area, three camp sites, and river access.

This area is located on the east bank of the river downstream from Mid Canon FAS. It is designated as a day use and picnicking area. Use is primarily fishing. Some floating use is also seen.

Visitation for 1984 was 4,400 vehicles, which was measured by traffic counter.

Hardy Bridge. Resources present at this site include fishing access and a parking area.

This area is located downstream from Mountain Palace. It is used primarily as a fishing access and floating access. The main parking area is approximately 100 feet above the river. A road leads down to the river level.

Visitation in 1984 was 3,000 vehicles, which was measured by traffic counter.

Prewett Creek. Resources present at this site include a camping area with 5 camp sites, a picnic area and access to the river.

Site is located on the Recreation Road 3 miles south of the I-15 Hardy Exit. Much of the area is located directly on the river shoreline, which becomes flooded during high water. This area is very popular with picnickers, campers and fishermen.

Visitation for 1984 was 10,224 which was measured by a traffic counter.

Cascade Bridge. Resources present at this site include a graveled boat ramp, fishing area parking and access to the river.

Site is located at the edge of the Cascade townsite on secondary 330, one mile east of the I-15 Cascade exit. Much of the area is located directly on the river shoreline. This portion is easily

flooded during high water. The area is used primarily by floaters and fishermen.

It is estimated that this site receives about 1,500 vehicles per year.

Wing Dam. This site provides river access.

Site is located one mile north of Cascade on the Cascade - Ulm frontage road. Much of the area is located on the river shoreline and experiences occasional flooding during high water. This area is very popular with fishermen. Estimates of use at this site are not available.

White Bear Island. This site provides river access.

Site is located at Great Falls. Much of the area is located directly on the river shoreline and experiences occasional flooding during high water. Site has not yet been developed and estimates of use are not available.

Summary of river flows for all areas along the Missouri River between Holter Dam and Great Falls. The desirable range of river flows is 4,100 CFS-7,000 CFS, and the optimum flow was 5,400 CFS-5,800 CFS.

306/5