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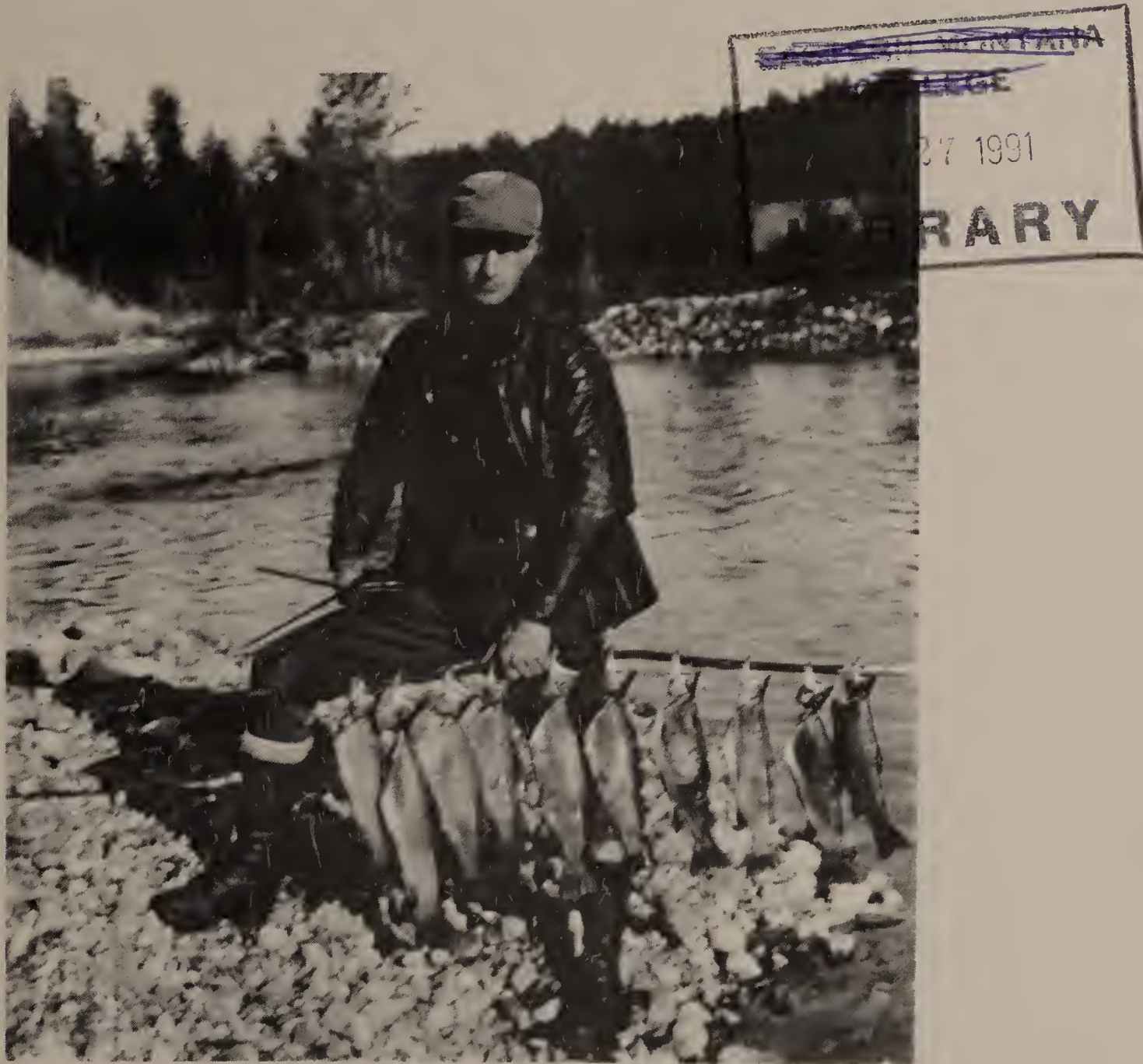
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## FISHERIES MANAGEMENT PLAN

FOR THE

## SOUTH FORK FLATHEAD RIVER DRAINAGE

including Hungry Horse Reservoir, and the  
South Fork Flathead River upstream from Hungry Horse Reservoir



**MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS**

In cooperation with a citizen committee on  
South Fork fisheries management and the  
U.S. Forest Service

May 1991

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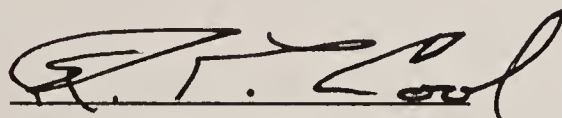
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**Developed by:**

**The Montana Department of Fish, Wildlife and Parks,  
U.S. Forest Service,  
and a  
Citizen Committee**

**approved May 10, 1991 by the**  
**Montana Fish, Wildlife and Parks Commission**



**K. L. Cool, Director  
Montana Department of Fish,  
Wildlife and Parks**

**Cover photo: Angler with westslope cutthroat trout, South Fork Flathead River, 1927.**



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## EXECUTIVE SUMMARY

This plan outlines fisheries management direction for the South Fork Flathead River drainage from the headwaters to Hungry Horse Dam. The Montana Department of Fish, Wildlife and Parks (the Department) developed the plan in cooperation with a citizen and agency management committee after extensive scoping and public involvement. The plan sets fisheries management direction from 1991-1996.

The South Fork of the Flathead River and Hungry Horse Reservoir support a high quality fishery for native westslope cutthroat trout and bull trout, both considered species of special concern. Drainage-wide fisheries management goals include: (1) maintain self sustaining fish populations; (2) maintain and improve the genetic integrity of westslope cutthroat trout; (3) emphasize a quality fishery over quantity of harvest; and (4) manage the fishery consistent with wilderness management guidelines.

The preferred objective for westslope cutthroat trout on the South Fork Flathead River is to manage for a moderate increase in fish size. On Hungry Horse Reservoir, the preferred objective for westslope cutthroat is to manage for a moderate increase in fish numbers and size. Management actions which could be used to achieve these objectives include:

- o increase enforcement of angling regulations through cooperative agency efforts;
- o improve habitat and fish passage in tributaries for adult westslope cutthroat in Hungry Horse Reservoir; implement reservoir level controls;
- o maintain the wilderness limit of three fish, none over 12 inches and the catch-and-release angling regulations;
- o Extend the wilderness lake limit of 3 fish to Hungry Horse Reservoir;
- o Educate anglers to use barbless hooks, artificial flies and lures only; encourage sound catch-and-release techniques. Education efforts will include direct contacts and an annual newsletter.

The preferred objective for bull trout in the drainage is to manage for a moderate increase in fish size and numbers. Management actions addressing reservoir habitat and enforcement of angling regulations will help to achieve this objective. In addition, education efforts will be focused on voluntary use of single, barbless hooks or lures.

The preferred objective for mountain whitefish in the drainage is to increase harvest through public education and involvement. This will be achieved by producing pamphlets and news releases, and by contacting anglers through other education efforts.

We will monitor the populations of westslope cutthroat and bull trout under our Hungry Horse mitigation project and Limits of Acceptable Change monitoring program. This information will help us evaluate the success of various actions in meeting fisheries management objectives. Funding may limit the implementation of some management actions.



## INTRODUCTION

This plan outlines fisheries management direction for the South Fork Flathead River drainage from the headwaters to Hungry Horse Dam. Major geographic components include Hungry Horse Reservoir and tributaries, and the South Fork River and tributaries upstream of the reservoir. The South Fork Flathead below the dam will be managed consistent with this plan and the Upper Flathead System Fisheries Management Plan, prepared by the Montana Department of Fish, Wildlife and Parks (the Department) and the Confederated Salish and Kootenai Tribes. This fisheries management plan for the South Fork drainage stands as a companion document to the Upper Flathead System Management Plan.

The Department developed this plan in cooperation with a citizen/agency management committee. The committee included citizen representatives of various user groups and U.S. Forest Service representatives who indicated interest in serving during the initial scoping process. The committee met three times in 1990 to outline important issues and develop options for fisheries management objectives and strategies for the South Fork drainage.

The Department's fisheries management in the South Fork drainage focuses on two species of special concern, the westslope cutthroat trout and the bull trout. Public input has strongly supported careful management of these species in the drainage. This plan complements other ongoing efforts including the Limits of Acceptable Change management plan for the Bob Marshall Wilderness Complex (an amendment to the Flathead Forest Long Range Management Plan), the westslope cutthroat recovery planning process, and mountain lakes management planning.

This plan addresses fisheries and habitat information in the drainage, states drainage-wide fisheries management goals, reviews fish population status and species-specific management objectives and strategies, and incorporates public input and scoping. An appendix document contains the results of the scoping and management committee process. The Department and management committee has designed the plan to guide fisheries management in the drainage from 1991-1996.

## DESCRIPTION OF THE AREA

The upper South Fork Flathead River originates at the confluence of Danaher and Youngs creeks and flows north for 57 miles into Hungry Horse Reservoir. The upper 50 miles of the South Fork from the headwaters to the Spotted Bear River is classified a Wild River under the National Wild and Scenic Rivers Act of 1976; the lower reach,

downstream to the reservoir, is classified as a Recreational River. Elevations range from 3,560 feet msl at HHR during full pool to tall peaks ranging from 8,700 to 9,400 feet. Relief from mountain top to valley floor exceeds 5,000 feet throughout the drainage. Major tributaries of the South Fork include Youngs, Danaher, Gordon, Bunker, Big

Salmon, and Little Salmon creeks, and the White and Spotted Bear rivers.

Land within the South Fork drainage is almost entirely within the Flathead National Forest and administered by the U.S. Forest Service. The upper 40 miles of the South Fork lies within the Bob Marshall Wilderness. The mountain range along the eastern shore of HHR is in the Great Bear Wilderness and the majority of the Jewel Basin hiking area, west of Hungry Horse Reservoir, lies in the South Fork drainage. Annual precipitation ranges from about 30 inches around the reservoir to 90 inches on the highest ridge tops. Average flow into the reservoir (1964-1980) was 2,301 cubic feet per second. Low nutrient concentrations, transparent water and low algal biomass are related to the basin's geology and relatively pristine nature, and result in lower fisheries productivity than in many areas of Montana. The reservoir supports native fish species, including westslope cutthroat, bull trout, and mountain whitefish.

Hungry Horse Dam was completed in 1952 on the South Fork five miles upstream from its confluence with the main stem Flathead River. The dam was constructed and is operated and maintained by the U.S. Bureau of Reclamation. The reservoir reached full pool (3,560 feet msl) for the first time in 1953, flooding 35 miles of the river channel and 42 miles of tributary streams. Maximum surface area is 23,813 acres, containing 3,465,718 acre feet of water. Active storage between full and minimum pool (3,336 feet msl) includes 2,982,000 acre feet or 86 percent of full pool volume. Hungry Horse Reservoir provides 16.4 percent of total United States flood storage in the Columbia River dam

system. The maximum drawdown on record, 178 feet during 1988, reduced the volume to 22.6 percent of full pool capacity.

The operation of Hungry Horse Dam is controlled by demands for hydro-electrical generation, flood control, recreational use of the reservoir, resident fish flows in the Flathead River and downstream water needs including anadromous fish passage and irrigation in the Columbia River drainage. The reservoir is drafted during late summer and fall to provide advance power for direct service industries. Increased energy demand during the cold months dictates water releases from December through March. Water is also drafted for flood control during high water years. Minimum pool generally occurs in mid-April, then water is retained through spring runoff as the reservoir refills. The reservoir usually fills by the end of July and remains at or near full pool until after Labor Day to provide summer recreational opportunities.

Temperature and water fluctuations are the two main impacts on the biological system caused by dam operation. Hungry Horse Dam has a single water withdrawal depth; outflowing water temperatures remain between 38 and 41° F all year. High summer discharges cause drastic temperature fluctuations in the 47 river miles of "semi-regulated", lower Flathead River, affecting insect populations and fish growth. Water level fluctuations subject huge expanses of river and reservoir bottom to drying, freezing and erosion, killing aquatic insects, and changing species composition. Fish eggs in the fluctuation zone may be dewatered, limiting reproductive success. Woody debris, important habitat for insects and fish security cover, dries, washes loose and is lost. In the reservoir, these effects

eliminate a large portion of the spring food supply for gamefish. Failure to refill the reservoir during the growing season reduces fish food production and the volume of warm water necessary for rapid fish growth and survival. The dam blocks fish migrations to and from the Flathead Lake system.

Mitigation options to offset these losses are presently being negotiated through the Northwest Power Planning Council.

These options include reservoir level control, installation of a selective withdrawal structure on the dam to control downstream temperatures, habitat improvement, and hatchery supplementation.

Land use in the drainage includes timber harvest, hunting, fishing, recreational rafting and boating, hiking, camping, berry picking, snowmobiling, skiing, wildlife viewing, and rock climbing.

## THE FISHERY

The South Fork of the Flathead River and Hungry Horse Reservoir support a high quality fishery for native species. Westslope cutthroat and bull trout are designated Species of Special Concern in Montana because of limited distribution and threats to their populations. Because of this designation, the Department affords special protection to these species. Fisheries management direction in the drainage has emphasized a quality fishery with restrictive limits, rather than a high-harvest production fishery for bull trout and westslope cutthroat species. Large numbers of mountain whitefish inhabit the river and reservoir, but few anglers take advantage of this sport potential and food source.

Statewide creel surveys have estimated that the South Fork Flathead River, upstream from the Reservoir, supports from 5,000-12,000 angler days each year. No reliable estimates exist for total harvest of westslope cutthroat, bull trout, or mountain whitefish. However, the Department conducted creel surveys in 1983, 1988, and 1989, and tabulated information on catch rates and angler characteristics.

In 1983, anglers caught 1.5 cutthroat trout per hour on the South Fork. Anglers within the wilderness kept only 8 percent of the fish they caught, while anglers outside the wilderness kept 42 percent of their catch (this was prior to establishment of a catch and release section). Anglers fished an average of 3-4 hours per day. Anglers caught bull trout at a rate of .05 fish/hour.

The South Fork Flathead River supports a popular float-fishery. The most common points where floaters begin their trip include the junction of Danaher and Youngs creeks, Big Salmon Creek, Gordon Creek, Harrison Creek, and Spotted Bear. In 1985 and 1986, the U.S. Forest Service estimated that about 600 and 800 people, respectively, floated the South Fork above Spotted Bear. In 1983, the Department estimated that float anglers and bank anglers each caught about half of the total cutthroat harvested.

In 1988 and 1989, the Department, in cooperation with the USFS, surveyed anglers on the South Fork Flathead within the Bob Marshall Wilderness. Anglers caught 2.6 to 4.1 cutthroat per hour of

fishing. About one-fourth of these fish were greater than 12 inches in length. Anglers kept seven percent of their catch. Catch rates for bull trout were .01 to .02 fish/hour; however, most anglers were not fishing for bull trout specifically. Anglers caught .09 mountain whitefish/hour and kept 31 percent of their catch. Most anglers on the South Fork Flathead River use flies, lures, or a combination of tackle, and about two-thirds reside in Montana.

The fishery in Hungry Horse Reservoir is supported by a native fish assemblage, unique for a man-made water body. The Montana Department of Fish, Wildlife and Parks surveyed anglers in 1985, 1988, and 1989, and found that westslope cutthroat supported most of the angling pressure. Anglers caught cutthroat at a rate of .16 to .26 fish per hour. Bull trout and mountain whitefish catch rates ranged from .03 to .08 fish per hour. Catch rates of cutthroat and whitefish in tributaries

to the reservoir were more than double these figures. Westslope cutthroat, bull trout, and mountain whitefish caught in the reservoir averaged 12.7, 18.3, and 12.1 inches, respectively. Anglers kept most of the fish they caught.

About two-thirds of all anglers on the reservoir boated. Over 95 percent of all anglers reside in Montana. Most anglers used lures, bait, or a combination of the two.

According to statewide creel surveys, Hungry Horse Reservoir supports from 5,000 to 10,000 angler days each year. Reservoir drawdown significantly reduces recreational use on the Reservoir. In 1989, the Bureau of Reclamation estimated a loss of 32,000 recreation days (all forms of recreation, including angling) and a loss of \$1.5 million to the local economy due to a large drawdown.

## SCOPING PROCESS RESULTS

In late June, 1989, approximately 800 questionnaires on the South Fork drainage fishery were mailed to anglers or made available at the Department and U.S. Forest Service offices. The Department received 135 return questionnaires.

People were asked to give their opinions on the fishery in the South Fork Flathead River, Hungry Horse Reservoir and tributaries. Anglers listed their opinions on fish species preferences, problems facing the fisheries, and fisheries management direction. Also, the survey asked anglers if they would consider serving on a committee to address management issues in the

drainage and guide preparation of a fisheries management plan.

Detailed results from the questionnaires appear in the appendix report. Anglers wanted to fish for westslope cutthroat in the South Fork drainage, followed by bull trout. Anglers expressed little desire to fish for mountain whitefish. Anglers wanted to catch larger westslope cutthroat in the South Fork Flathead River, but were satisfied with the catch rate. In Hungry Horse Reservoir, anglers preferred to catch larger fish and preferred a higher catch rate as well. Most anglers were satisfied with the current catch rate and size

of bull trout, although many would prefer larger fish.

Respondents listed poaching, overharvest, fish size, and too many floaters as the major problems facing the fishery in the South Fork Flathead River upstream of Hungry Horse Reservoir. Major problems listed for Hungry Horse Reservoir included reservoir drawdowns caused by Hungry Horse Dam, low catch rates, threat of non-native fish species, and fish size. Many anglers wrote detailed comments concerning the fishery (see Appendix Report). Anglers specifically mentioned overharvest of westslope cutthroat in tributaries of Hungry Horse Reservoir, hooking mortality of catch and released fish, lack of enforcement, and poaching.

Most anglers felt that the fishery for bull trout and mountain whitefish has remained about the same during the period they had fished in the drainage. Anglers felt that fishing for westslope cutthroat had declined.

Thirty-five respondents indicated that they would consider serving on an ad hoc committee to guide preparation of a fisheries management plan. Meetings were held in February, March (synopses in Appendix Report), and June, 1990. Fifteen people, including outfitters, anglers, interested citizens, and representatives of the U.S. Forest Service participated in the process. In addition, representatives of Fish, Wildlife and Parks worked as part of the committee during all or a portion of the meetings.

At the first meeting, the committee discussed goals of the process, fish

management survey results, and biological information on the South Fork Flathead drainage. The group outlined important problems and issues concerning the fishery in each portion of the drainage.

During the second meeting, the Department enforcement officials discussed some of the concerns the group raised during the first meeting. The committee then generated information on: (1) system-wide goals; (2) options for objectives by species, and; (3) strategies to address the objectives.

The Montana Department of Fish, Wildlife and Parks relied on information and guidance provided by the committee to prepare an initial draft management plan. At the June, 1990 meeting, the committee reviewed the plan and suggested revisions which were incorporated into a second draft, released in July, 1990. A six month comment period followed.

The Appendix Report contains the responses of the public to a questionnaire concerning the July, 1990 draft. We used these results to help shape the final draft.

On April 4, 1991, the Department hosted an open house and committee meeting to discuss the final draft. Seventeen people participated in a round-table discussion, ranked specific management actions and refined final management direction. The Department used the results of the open house and other information from the scoping process to finalize the plan.

## DRAINAGE-WIDE FISHERIES MANAGEMENT GOALS

The Department will manage the South Fork drainage fishery consistent with the following goals:

1. Maintain self-sustaining fish populations, emphasizing species of special concern. The system supports populations of unique native species that should be protected from human impacts.
2. Prevent hybridization of native species; improve genetic integrity.
3. Provide a recreational fishery emphasizing quality of the angling experience over quantity of harvest, maintaining consistency with the above goals.
4. Manage the fishery consistent with the U.S. Forest Service Limits of Acceptable Change, Management Plan, wilderness management guidelines, other Forest Service plans, the Department Upper Flathead System Fisheries Management Plan, and the Northwest Power Planning Council's 1987 Fish and Wildlife Plan.

## SPECIES-SPECIFIC MANAGEMENT DIRECTION

### Westslope Cutthroat

#### Life History

Westslope cutthroat trout exhibit three life history patterns in the South Fork Flathead drainage. Adfluvial fish grow to maturity in Hungry Horse Reservoir and migrate into tributaries to spawn. Cutthroat spawn at four to six years of age. Young fish live from one to three years in tributaries before returning to the reservoir. Fluvial fish live as adults in the South Fork Flathead River and spawn in tributaries. Adfluvial and fluvial cutthroat adults range from 12 to 17 inches in length. Resident fish complete their entire life cycle in tributaries, and seldom attain lengths greater than ten inches. Biologists do not know if the major difference between fish exhibiting these life history patterns is genetic or environmental. The Department of Fish,

Wildlife and Parks has classified westslope cutthroat as a Class A species of special concern because of reductions in numbers and distribution statewide.

In tributaries, westslope cutthroat trout eat aquatic and terrestrial insects. In the reservoir, cutthroat eat terrestrial and aquatic insects in spring through fall, and zooplankton during the winter.

Tagging studies conducted by the Department have shown that most cutthroat trout in the upper South Fork Flathead River (above the White River) are fluvial, meaning that the adults reside in the river and spawn in tributaries. However, a proportion of fish tagged in this area moved downstream; several moved downstream to below Meadow Creek Gorge. One cutthroat tagged below Meadow Creek Gorge was recaptured above the gorge. In managing

westslope cutthroat trout in the drainage, it is important to fully consider the interconnected nature of populations in the river, reservoir and tributaries.

Genetic testing has shown that most cutthroat in the South Fork Flathead River are pure westslope in origin. All of a sample of 23 cutthroat trout collected in the river near Big Prairie in 1981 tested genetically pure. Of 30 cutthroat collected from the same area in 1985, 29 tested genetically pure; one fish was a Yellowstone/westslope cutthroat hybrid. This single fish could have drifted into the river from a lake system containing Yellowstone cutthroat trout. Testing of 26 fish from lower Gordon Creek, and 26 fish from Danaher Creek in 1989, indicated these stream sections support pure westslope cutthroat trout.

Populations of westslope cutthroat trout in the South Fork Flathead River have remained predominantly pure despite past stocking of undesignated cutthroat trout. Department of Fish, Wildlife and Parks records show that nearly 800,000 cutthroat were planted in the river (exact location unknown) from 1926 to 1947. Nearly 500,000 undesignated cutthroat were planted in tributaries from Twin Creek to Gordon Creek during the same period. Cutthroat and rainbow were introduced into many high mountain lakes in the drainage during the same period.

Department of Fish, Wildlife and Parks sampling has shown that tributaries to Hungry Horse Reservoir with high mountain lakes containing non-native species at their origin generally support hybrid populations of cutthroat in the stream system below the lake. Conversely, tributaries with no lake at

the headwaters generally support pure westslope cutthroat trout.

### **Abundance and Size**

Cutthroat densities in the drainage are generally highest in tributaries. Some tributaries of the South Fork Flathead River support up to 1,000 cutthroat trout per mile. These tributary fish may be a mix of resident, fluvial, and adfluvial stocks.

The South Fork Flathead River supports from 300 to 1,000 cutthroat trout per mile. Estimates in the river near Harrison Creek and in the river near Gordon Creek have been near the lower end of this range; the river near Black Bear supports a population near the upper end of the range. Lower numbers of trout per mile in the lower and upper river sections as compared to the middle river section may be related to fish habitat factors. However, cutthroat trout are very vulnerable to angling, so populations could be affected by harvest and catch-release mortality.

In 1984, the Department established a catch-and-release regulation on the South Fork Flathead River from Meadow Creek footbridge to Spotted Bear footbridge. Social acceptance of the regulation has been very good. According to samples of fish measured in 1984, 1985, 1989, and 1990, this regulation may be increasing the number of larger fish in the section. The percentage of fish greater than 12 inches increased from 2.0 in 1984 and 1985, to 6.0 in 1989 and 8.0 in 1990. The numbers of fish greater than 10.0 inches per 0.6 miles of stream were 20 in 1984, 28 in 1985, and 59 in 1990. Populations in the Black Bear section within the wilderness complex did

not show an increase in size and numbers from 1985 to 1989.

The Department of Fish, Wildlife and Parks conducted mark-recapture estimates in 1989 which estimated that Hungry Horse Reservoir supports approximately 40,000 westslope cutthroat trout greater than seven inches in length. Sonar estimates indicated that approximately 15,000 of these fish are adults greater than 12 inches. The Department monitored adult and juvenile westslope cutthroat in Hungry Horse Creek in the 1960s, 1970s, and 1980s. Adult spawning runs into the creek averaged about 1,000 fish, 700 fish and 300 fish in the three time periods. The decline in number of spawners may be related to reservoir drawdowns and harvest of fish by anglers. Adult spawners average 14 to 15 inches in length. The number of young, mostly two and three year old fish leaving the creek and entering the reservoir, has ranged from 1,000-2,000 fish. These young fish average five to six inches in length.

### Past Management

Before the 1983 angling season, cutthroat trout limits on the South Fork Flathead River were the same as the general stream limit. From 1939 through 1954, the limit was 15 fish. From 1955 through 1958, the cutthroat limit was 10 fish. From 1959 through 1981, the limit was 10 pounds and one fish, or 10 fish, whichever was reached first. The 1982 limit was five cutthroat, and in 1983, the limit was five cutthroat, only one fish over 14 inches. Beginning with the 1984 angling season, the Department implemented more restrictive limits to reduce harvest in the cutthroat fishery. Limits included three fish, none

over 12 inches within the wilderness area, and the catch-and-release section from Meadow Creek footbridge to Spotted Bear footbridge.

In Hungry Horse Reservoir, anglers were limited to five cutthroat prior to 1957. From 1957 to the late 1960s, the limit was 10 fish or 10 pounds and one fish, a 300-foot closure at the mouths of spawning streams, and a June 15 opening. From the late 1960s to present, the limit was set at five cutthroat, and the tributary mouth closure and June 15 opening were dropped. In 1988, the Department set tributary limits at 3 fish, none over 12 inches.

Recent management of westslope cutthroat in the South Fork Flathead drainage has focused on emphasizing a quality fishery and maintaining and improving genetic integrity of populations. Beginning in 1986, the Department planted pure westslope cutthroat in several lakes with non-native species to "swamp out" or dilute the non-native genes. The Department of Fish, Wildlife and Parks made these plants in lakes draining into Hungry Horse Reservoir and the South Fork Flathead River. For these and other efforts, the Department developed a pure brood stock comprised of genetically tested westslope cutthroat, mostly from tributaries to Hungry Horse Reservoir.

Recent management has also included an important effort on Hungry Horse Reservoir aimed at establishing reservoir levels and habitat to protect and enhance the cutthroat population. Drawdown of the reservoir in the fall, winter and early spring affects important fish food sources and habitat. The migratory nature of cutthroat populations in the drainage requires that all



components of the system be protected. The Department and the Confederated Salish and Kootenai Tribes have recommended to the Northwest Power Planning Council a protection and enhancement program to reduce impacts of reservoir operations.

### Management Concerns

1. Pure westslope cutthroat trout stocks must be maintained.
2. Spawning and rearing habitats in tributaries around Hungry Horse Reservoir and rearing habitat in the reservoir are affected by human activities such as poor culvert placements, reservoir drawdown, and timber harvest.
3. Westslope cutthroat trout are vulnerable to harvest.
4. Anglers may be reducing the spawning runs to the reservoir by overharvesting fish in tributaries and bays.
5. Limits in the river, tributaries, mountain lakes, and reservoir are not consistent.
6. Many anglers are not informed of regulations; regulations may be too complex.
7. The current level of enforcement is inadequate to protect the cutthroat population.
8. The reservoir is often difficult to access because of drawdown conditions, restricting fishing opportunities.

### Management Direction

Westslope cutthroat populations in the reservoir, river, and tributary system are to some degree interconnected. However, because of the distinction in geography and fisheries issues, this section addresses management strategies separately for the river and reservoir. This plan assumes a stable level of recreational use and angling pressure through the period. If conditions change, the plan may have to be modified.

***Objective: Manage for a moderate increase in average length (up to one inch) of westslope cutthroat in the South Fork Flathead River system; manage for a moderate increase in numbers and size of westslope cutthroat in Hungry Horse Reservoir.***

### Specific Management Actions

The objectives for westslope cutthroat will be attained through the following specific management actions:

- o Include the following in the fall, 1991 tentative fishing regulation process: extend the wilderness limit of three fish, any size to Hungry Horse Reservoir and all lakes in the South Fork drainage. This regulation would accomplish the goal of reducing harvest on spawners in Hungry Horse Reservoir and reduce the need for bay closures and other regulations which are more difficult to enforce.
- o Pursue habitat improvement, fish passage improvement, and water level controls on Hungry Horse

Reservoir; implement the Department's recommendations on mitigating the effects of Hungry Horse Dam on the reservoir fishery. This action will aid the upstream river population because of the migratory nature of some reservoir trout.

- o Increase enforcement patrols in the drainage. During the 1991 angling season one warden will be assigned to patrol the Hungry Horse Reservoir area from the dam to Meadow Creek. This represents a very substantial commitment to increase enforcement efforts. Results of this program in 1991 will be used to plan future enforcement needs.
- o Increase public education efforts on catch and release methods, voluntary use of single, barbless hooks, and general resource ethics. This will be accomplished by enforcement personnel, biological crews and an annual newsletter or brochure produced cooperatively by the Department, U.S. Forest Service, and other groups.
- o Maintain the 3-fish, none over 12 inches angling limits on streams in the drainage and the catch-and-release section on the South Fork Flathead River from Meadow Creek to Spotted Bear. These regulations appear to be effective and have gained social acceptance.

## Bull Trout

### Life History

Bull trout are a land-locked form of the smaller, coastal Dolly Varden. They are the largest fish native to the drainage, attaining a length up to three feet and a weight up to 16 pounds. Hungry Horse Dam isolated the bull trout population in the South Fork from the Flathead Lake system. Migratory bull trout which once grew to maturity in Flathead Lake, now mature in Hungry Horse Reservoir and migrate into the headwaters of tributaries to spawn. Juveniles live in their natal tributaries for one to four years before entering the reservoir. The bull trout has been designated a species of special concern in Montana because of restricted distribution and threats to spawning habitat and the possibility of hybridization with brook trout (access of brook trout to the South Fork is limited and none have been captured in recent years).

The diet of bull trout in Hungry Horse Reservoir consists almost entirely of fish. Northern squawfish, suckers and mountain whitefish are the most important food items. Suckers comprise a larger proportion of the diet of adults. Cutthroat can make up one-fifth of the diet of juvenile bull trout. Adult bull trout rarely eat cutthroat.

Bull trout enter the reservoir at about eight inches in length and grow two to four inches per year. Unlike cutthroat which have a rapid growth spurt during their first year in the reservoir, bull trout growth peaks during their fifth and sixth year of life.

Most bull trout mature at six years of age (ranging from 20 to 36 inches in length) and, beginning in April or May, embark on a spawning run to the headwaters. In the Flathead, most bull trout enter tributaries during July and August, hold in streams for one month or more, and spawn in September and October, when water temperatures drop below about 50° F. Adults excavate nests, or "redds," in clean, uncompacted gravel with ample groundwater inflow or upwelling. These specific habitat requirements restrict the range of spawning within the drainage. Preferred spawning streams in the South Fork have not been surveyed in detail. Redds have been observed in four reservoir tributaries and migrant adults have been observed in wilderness tributaries including Gordon, Youngs, Danaher, Little Salmon, Big Salmon, Holbrook, White River, and Spotted Bear River.

Eggs hatch in January and fry emerge from the gravel in April. Survival of incubating eggs and sac fry is reduced by siltation and other streambed disturbances. Downstream emigration of juveniles from their natal streams occurs from June through August.

### Past Management

The Department of Fish, Wildlife and Parks has managed the bull trout as a unique trophy species since the early 1950s when a daily creel limit of two fish was implemented.

In 1982, the Department reduced the creel limit on bull trout to one fish daily and in possession. An 18-inch minimum size limit was discontinued in 1983, because the

one fish limit was considered adequate protection.

Considerable management and research has focused on this species. In cooperation with the U.S. Forest Service, the Department has monitored the effects of timber harvest on spawning and rearing habitat in the Middle and North Fork drainages, and worked to protect spawning areas from disturbance. In addition, the Department has monitored the species abundance through reservoir surveys and angler creel census above and below the wilderness boundary.

### Abundance

Trends in bull trout abundance have been monitored in Hungry Horse Reservoir since the early 1970s with sinking gill nets. Average catch per net during the period from 1983 through 1987 were similar to those obtained in the early 1970s. More recently, spring and fall catches during 1988 and 1989 indicate an increase in bull trout numbers.

A population estimate using a dual-beam echosounder was completed during May 1989. Based on species relative abundance and depth distributions during the survey, approximately 47,000 bull trout, ten inches or longer, were present in the reservoir.

Bull trout support an important trophy fishery in the South Fork. Based on a 1989 creel census, four percent of all anglers sought bull trout specifically and 31 percent had no preference as to the species of gamefish they caught. Anglers fished about ten hours for each bull trout landed.

The largest bull trout on record from the South Fork was 36 inches long and weighed 16 pounds.

### Management Concerns

1. Bull trout mature in the reservoir and travel to the headwaters of the South Fork to spawn. Therefore, fish in the Wilderness and in Hungry Horse Reservoir belong to the same population.
2. Natural reproduction of the species is extremely sensitive to streambed siltation.
3. Spawning adults are visible and, therefore, vulnerable to poaching and angling pressure.
4. Bull trout are predators and a portion of their diet is composed of other gamefish including mountain whitefish and westslope cutthroat.

### Management Direction

*Objective: Manage for a moderate increase in numbers and size of bull trout in the drainage.*

### Specific Management Actions

- o Increase enforcement patrols, particularly in the wilderness, which focus on suspected bull trout poaching sites. Increase cooperation between Department and U.S. Forest Service enforcement personnel.

- o Focus education efforts on voluntary use of single barbless hooks when fishing for bull trout, particularly in the South Fork Flathead River system.

- o Concentrate a portion of hydropower mitigation efforts on bull trout. If populations of other fish species on Hungry Horse Reservoir are increased, bull trout (a predator) will benefit.

- o Other specific management actions listed for westslope cutthroat will indirectly benefit bull trout by providing more prey.

If these actions fail to reach the stated management objective, other actions (such as closing of spawning tributaries to angling) could be implemented.

## **Mountain Whitefish**

### Life History

Mountain whitefish are native to the South Fork Flathead drainage and are the most abundant fish in the drainage. Individuals grow to about 19 inches in length. Whitefish exhibit seasonal movements associated with feeding, overwintering, and spawning behavior. In the river system, whitefish overwinter in deep pools. In the spring, whitefish gradually move into some tributaries to feed. Whitefish mature at 3 to 5 years of age and spawn from October through December, broadcasting their eggs over gravel and small rocks in shallow, fast-flowing, midstream areas. Whitefish are prolific; one female can produce from 3,000

to 8,000 eggs. After hatching in spring, fry rear in shallow riffles, backwaters and stream margins, then move to deeper water as they grow. Juveniles that move to the reservoir, generally emigrate from their natal tributary during their first year of life.

Whitefish grow nearly five inches during their first year. Growth decreases with age to less than a one inch increase in length between age four and five.

Mountain whitefish are typically a bottom feeder consuming primarily zooplankton and aquatic insect larvae. When bottom food is less abundant, whitefish will eat suspended zooplankton and insect pupa and insects in the surface film.

### Past Management

Regulations have focused on increasing angler use of this highly abundant and under-utilized fish. Daily creel limits are 100 whitefish per day and in possession.

### Abundance

Mountain whitefish are the most abundant fish in the South Fork drainage. Population estimates in the Wilderness headwaters revealed whitefish densities as high as 1,624 fish per mile, or about five times that of cutthroat. A survey in 1989 in Hungry Horse Reservoir estimated that whitefish compose 32 percent of all fish within the impoundment.

### Angler Use and Harvest

Based on a 1989 creel census on the reservoir, two percent of all anglers actively

sought mountain whitefish. Another 31 percent had no preference as to the species of gamefish they caught. Regardless of this lack of interest in whitefish, many are caught because of their abundance. Catch rates averaged as high as 1.4 fish per hour, yet only 9 percent are kept by anglers. Some anglers fish for spawning whitefish in reservoir tributaries during the fall.

### Management Concerns

1. Mountain whitefish compete for food and space with other gamefish that are more popular with anglers.
2. Mountain whitefish are an important prey species of bald eagles.
3. The species is greatly under-utilized relative to its abundance. Mountain whitefish provide anglers with an alternative fishing experience and food source. Reducing the whitefish population will reduce potential competition with more popular gamefish for food and space.

### Management Direction

*Objective: Increase the harvest of mountain whitefish through public education and involvement.*

### Specific Management Actions

- o Produce and dispense pamphlets and news releases to encourage angling and harvest of mountain whitefish. Include an article in the first newsletter describing angling techniques and recipes for whitefish.

## MONITORING AND EVALUATION

The Department will monitor the populations of westslope cutthroat and bull trout under our Hungry Horse mitigation project periodic fish population estimates, and Limits of Acceptable Change monitoring program. This information will help us evaluate the success of various actions in meeting fisheries management objectives.

We will evaluate the success of strategies desired to increase harvest of mountain whitefish through periodic creel

surveys. These surveys are part of the Limits of Acceptable Change monitoring program.

The management committee will meet annually in April to review monitoring information and management strategies. If changes in management actions are needed during the five-year period, the Department will notify the Fish, Wildlife and Parks Commission, notify the public, and ask for comment on the changes.

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