SOUTH FORK FLATHEAD RIVER DRAINAGE

BULL TROUT STATUS REPORT

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prepared for:

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by:

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EXECUTIVE SUMMARY

Bull trout are one of four native salmonid species distributed throughout the Flathead River drainage. They were widespread throughout the interconnected system, but the construction of Hungry Horse Dam in 1953 cut off the South Fork and isolated the fish community above the dam from that of the main river and Flathead Lake. Formed by the dam, the reservoir extends 32 miles upstream and ranges from less than one to five miles wide. The South Fork of the Flathead River extends over 50 miles upstream from Hungry Horse Reservoir to its headwaters in the Bob Marshall Wilderness Area. Migratory fish now reach maturity in Hungry Horse Reservoir or the South Fork Flathead River and spawn and rear in tributaries to these waters.

The South Fork Flathead River drainage, upstream from Hungry Horse Dam, is the most intact native fish ecosystem remaining in western Montana. The threat of illegal fish introductions, results of which may be highly variable depending on species, is the greatest single threat to the long-term well-being of bull trout in this watershed. Existing threats are primarily tied to impacts from forestry practices in the nonwilderness portion of the watershed. In addition, there is some concern over the uncertainty associated with the impacts of extreme water level manipulations in the artificial lake environment of Hungry Horse Reservoir. Illegal harvest is also a problem in this drainage, due to the high level of remote backcountry use during the fall spawning season (hunting in the Bob Marshall).

Key Watersheds

Core areas are drainages that currently contain the strongest remaining populations of bull trout. They are usually relatively undisturbed. These watersheds need to have the most stringent levels of protection as they will potentially provide the stock for recolonization. Core areas in the South Fork include the entire drainages of tributaries to the Reservoir (Wounded Buck, Wheeler, and Sullivan creek drainages), as well as to the river upstream (Spotted Bear River, Bunker Creek, Little Salmon Creek, White River, Gordon Creek, Youngs Creek, and Danaher Creek), and the South Fork of the Flathead River upstream from Gordon Creek.

Nodal habitats are waters which provide migratory corridors, overwintering areas, or are otherwise critical to the population at some point during its life history. Nodal habitats for this population are provided by the South Fork of the Flathead River downstream from Gordon Creek, including Hungry Horse Reservoir.

"Disjunct" bull trout populations exist in Big Salmon Lake and Doctor Lake. Core areas for these populations are Big Salmon Creek upstream of Big Salmon Lake and Doctor Creek upstream of Doctor Lake. Nodal habitats are provided by the lakes themselves.

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INTRODUCTION

In January, 1994, the Governor of Montana established a Bull Trout Restoration Team to develop restoration or conservation plans for bull trout (*Salvelinus confluentus*) in Montana. The Restoration Team created a Scientific Group to provide guidance on technical issues related to restoration.

The Scientific Group reviewed the status of bull trout and the risks to the survival of the species in Montana. In addition, the Scientific Group prepared reports on three significant issues in bull trout restoration: Land use impacts, removal and suppression of introduced species, and the use of hatcheries and transplants in restoration. Because the threats facing bull trout vary widely in western Montana, separate reports were prepared for each of twelve major recovery areas. Delineation of these recovery areas was largely based on the fragmentation of historically connected systems. Loss of interconnectivity resulted from migration barriers or other habitat changes such as dams, altered thermal regimes or stream dewatering. Each of the twelve recovery areas presently contains core areas and nodal habitats for bull trout.

This report addresses historic and current status and distribution, and identifies major threats, core areas and associated nodal habitats for bull trout in the South Fork of the Flathead River drainage upstream from Hungry Horse Dam (Figure 1). This population's present range includes Hungry Horse Reservoir and its immediate tributary system as well as the

South Fork of the Flathead River drainage upstream from the reservoir.

Other "disjunct" populations of bull trout in the basin are also described. "Disjunct" populations are defined as those in Big Salmon and Doctor lakes that appear to be self-reproducing and functionally isolated from the Hungry Horse portion of the system. In both cases, fish probably pass downstream from these "disjunct" populations into the South Fork Flathead River and/or Hungry Horse Reservoir. Migration from the South Fork upstream into these lakes is physically possible but appears to occur infrequently.

Big Salmon Lake supports a migratory bull trout population which utilizes Big Salmon Creek for about 5.5 miles upstream from the lake to a barrier falls for spawning and rearing. Differences in water temperatures below the outlet of Big Salmon Lake likely discourage upstream movement of spawners from Hungry Horse Reservoir or the South Fork.

Doctor Lake also supports a bull trout population. Little is known about this population. The spawning/rearing area has not been identified but is suspected to be in a short reach of Doctor Creek upstream from the lake.

Most of the bull trout information available in this drainage is on the migratory life form occupying Hungry Horse Reservoir or the South Fork of the Flathead River as adult fish. These fish migrate into tributary drainages to spawn. The juvenile fish rear from one to four years before moving back downstream to the river or reservoir where sub-adults reside several additional years prior to maturity. The resident life form, which spends its entire life cycle in a tributary stream, has not been documented in the South Fork. However, extensive surveys have not been conducted.

Land ownership is entirely within the Flathead National Forest. Reservoir tributaries and the lower third of the South Fork drainage are managed timberlands while the upper two-thirds of the South Fork drainage lies within the Bob Marshall Wilderness Area.

The South Fork has a drainage area of 1,663 mi^2 and an average annual discharge of 3,522 cfs, measured at Hungry Horse Dam (USGS 1995). Water stored in Hungry Horse Reservoir is used for power production, irrigation, recreation, and most recently to provide downstream flows for salmon passage in the lower Columbia River. The usable capacity of the reservoir is 3,451,000 acre-ft., which allows for substantial flood control storage in the headwaters of the Columbia River system.

Pendant creeks above the Barrier Falls in the Big Salmon drainage. It was noted that, in 1938, Graves Creek "above the falls" was "still barren of fish." A 1995 stream survey conducted by Montana Fish, Wildlife and Parks included a walking reconnaissance of Emery Creek from the Reservoir to the headwaters. No falls were encountered. It is uncertain whether a falls occurs below the Reservoir pool level (T. Weaver, Montana Fish, Wildlife and Parks, Kalispell, pers. comm.).

Current Distribution

Originally the South Fork was an integral part of the Flathead Lake and River system utilized by bull trout. The construction of Hungry Horse Dam isolated the South Fork fish populations upstream of the dam from those in the lower river. The reservoir formed by the dam extends for 32 miles upstream and ranges from less than one to five miles wide. The South Fork of the Flathead River extends over 50 miles upstream to its headwaters in the Bob Marshall Wilderness Area (Figure 1). Migratory fish reach maturity in Hungry Horse Reservoir or the South Fork Flathead River.

Gillnet catch rates of bull trout in recent years are similar to those observed historically. Records date back to 1958. Mean catch in sinking gill nets ranged from 4.7 to 6.3 bull trout per net in May and from 2.0 to 6.7 bull trout per net in fall collections. The mean catch rate in the upper reservoir area has been consistently higher than in the areas closer to the dam. The lengths of bull trout captured in gill nets have ranged from 7-to-36 inches (May et al. 1988).

Most of the spawning and rearing habitats for the South Fork bull trout population are located in backcountry areas, so there has not been a great deal of survey work completed. Field crews conducted systematic spawning site inventories for the first time in 1993 (Table 1). All tributaries suspected of providing spawning habitat were surveyed. A total of 366 bull trout redds were observed in the South Fork Flathead drainage. Crews counted 64 redds in non-wilderness tributaries. Wounded Buck, Wheeler, and Sullivan creeks and the Spotted Bear River contained the majority of these redds. Crews observed 302 redds in wilderness tributaries. Little Salmon, Big Salmon, White River, Gordon and Youngs creeks contained the majority of the redds. However, Bunker, Babcock, Danaher, and Rapid creeks provided additional bull trout spawning. No spawning was observed in 21 of the 36 streams surveyed in 1993 (Weaver 1993b).

Based on these findings, eight streams were recommended for a long-term monitoring program. These include Little Salmon, White River, Gordon, Youngs, Wounded Buck, Wheeler, and Sullivan creeks and the Spotted Bear River. Counts in these tributaries were repeated during 1994 (Table 2) (Weaver 1994).

Table 1. Number of bull trout redds observed in South Fork tributaries during spawning site inventories conducted in fall, 1993. Streams listed in upstream order. Total redds counted were 366 (79 in non-wilderness tributaries, 287 in wilderness tributaries).

Stream	Number of Redds	Stream	Number of Redds
Doris	0	SF White River	0
Wounded Buck	22	Gordon	35
Wheeler	12	Youngs	40
Clark	0	Hahn	0
Sullivan	25	Otter	0
Quintonkon	5	Cabin	0
Lower Twin	--[1]	Marshall	0
Spotted Bear	13	Babcock	4
Bunker	2	Jenny	0
Harrison	0	Danaher	9
Mid	0	Camp	0
Black Bear	0	Basin	0
Little Salmon	56	Foolhen	0
Big Salmon	92	Rapid	12
Holbrook	0	Spring	0
Burnt	0	Calf	0
Bartlett	0	Bar	0
White River	39	Limestone	0

[1] incomplete count

KEY WATERSHEDS FOR BULL TROUT IN THE SOUTH FORK FLATHEAD RIVER DRAINAGE

Core areas are drainages that currently contain the strongest remaining populations of bull trout. They are usually relatively undisturbed. These watersheds need to have the most stringent levels of protection as they provide the highest quality spawning and rearing habitat.

Core areas in the South Fork include the entire drainages of tributaries flowing directly into Hungry Horse Reservoir (Wounded Buck, Wheeler, and Sullivan creeks), as well as tributaries to the South Fork upstream from the reservoir (Spotted Bear River, Bunker Creek, Little Salmon Creek, White River, Gordon Creek, Youngs Creek, and Danaher Creek), and the South Fork itself upstream from Gordon Creek.

Nodal habitats are waters which provide migratory corridors, overwintering areas or are otherwise critical to the population at some other point during its life history. Nodal habitat for this population is provided by the South Fork downstream from Gordon Creek, including Hungry Horse Reservoir.

"Disjunct" bull trout populations exist in Big Salmon Lake and Doctor Lake. Core areas for these populations are Big Salmon Creek upstream of Big Salmon Lake and Doctor Creek upstream of Doctor Lake. For the latter, further confirmation of the spawning and rearing area needs to be obtained. Nodal habitats are provided by the lakes themselves.

Table 3. Risks to bull trout in the South Fork Flathead River drainage.
* = High risk; ** = Very high risk.

RISK	CURRENT/HISTORIC	CONSERVATION
Environmental instability:		
Drought		
Landslide/geology		
Flood/rain on snow		
Fire		
Introduced species		
Private ponds		
Agency stocking		
Illegal introductions		**
Sport fish management		
Barriers		
Culverts		
Diversions		
Thermal		
Dams		
Habitat		
Rural residential develop.		
Mining		
Grazing		
Agriculture		
Dam operations	*	**
Forestry	*	**
Recreational developments		
Transportation		
Population		
Population trend		
Distribution/fragmentation		
Abundance		
Biological sampling		
Angling		
Illegal harvest	*	*

this practice has been discontinued, hybridized populations are known to exist in many of these lakes and their outlet streams. Present stocking is limited to native westslope cutthroat trout in high mountain lakes. Westslope cutthroat have also recently been experimentally stocked in tributaries to Hungry Horse Reservoir as part of a program designed to mitigate for losses resulting from dam construction and operation.

Illegal introductions (high risk)

With the exception of the illegal brook trout plant in Devine Lake, there have been few illegal introductions. However, the future threat is judged to be high. The problems created by illegal fish introductions are the same as those discussed above under agency stocking. The difference is that these illegal efforts are not subjected to environmental analysis, are almost always detrimental, and generally involve warmwater species (bass, perch, pike, walleye) and\or nongame species (minnows, suckers, carp, bullheads). In part, the agency stocking efforts of the past have contributed to this problem by providing closer sources of many of these species for transplant stock. This problem occurs mainly in lakes, and is currently out of control in the Flathead basin. Despite stepped up educational and enforcement efforts the problem has not abated.

Lake trout, walleye, northern pike, brook trout, yellow perch or other species could easily be illegally planted in Hungry Horse Reservoir and could have negative impacts on the bull trout population. The recent proliferation of illegal introductions (over 100 illegal introductions in MFWP Region 1 in the last 20 years) is a major concern of fisheries managers, especially in situations such as the South Fork drainage where populations of native species are still viable (J. Vashro, Montana Fish, Wildlife, and Parks, Kalispell, Montana, personal communication). There is also the potential for introduction of disease through illegal stocking.

The closure of Hungry Horse Reservoir to angling for bull trout may result in an increased likelihood of an illegal introduction in the future. If anglers no longer have the potential to catch a trophy bull trout, individuals may introduce some other species to provide this opportunity.

Fisheries management

Fisheries management in the South Fork Flathead drainage is directed by a management plan compiled in cooperation with a group of citizens who expressed willingness to participate in the planning process. The plan is targeted toward native species management, emphasizing quality, not quantity (MFWP 1991b).

representative of South Fork stocks that existed there historically.

Habitat (Risk Factors)

Rural residential development

There are only a few small tracts of private land and scattered mining claims in the South Fork. Therefore, very limited rural residential development is possible upstream from Hungry Horse Dam.

Mining

The only mining which has occurred in the South Fork Flathead drainage is recreational gold panning. There are, however, a few scattered mining claims (e.g. Baptiste), none of which are currently active.

Grazing

There is no grazing in the South Fork Flathead drainage above Hungry Horse Dam with the exception of stock used by outfitters and recreationists. In some instances, stock grazing is impacting water quality and streambank stability. The trail system in the wilderness is extensive and grazing problems are created in high use areas.

Agriculture

There is no agricultural development in the South Fork Flathead drainage upstream from Hungry Horse Dam.

Dam operations (high risk)

Operation of Hungry Horse Dam has resulted in excessive drawdown during recent years. Montana Fish, Wildlife and Parks has recommended a maximum drawdown of 85 feet based on biological considerations. Since 1988, this recommendation has been exceeded during five of the seven years, as the U.S. Bureau of Reclamation was forced to release water as required to meet the Pacific Northwest Coordinated Agreements for critical water years. Research has shown that reduced reservoir volume directly impacts the size of the aquatic environment for all organisms in the food web. Production of phytoplankton, zooplankton, and aquatic insects are all reduced when drawdowns are extreme. Reduction in the food base reduces the prey available for predator species like bull trout. Reservoir volume can also be greatly reduced, forcing bull trout and other fish species into riverine habitats. Due to the steep slopes in the reservoir, a volume reduction of approximately 80 percent occurs at drawdowns of 180 feet. Montana Fish, Wildlife, and Parks biologists are concerned that the bull trout population in Hungry Horse Reservoir will be damaged by continuing deep drawdowns (MFWP 1993b).

Trend

Available data suggests a stable trend. However, data are limited and a longer period of record is required before the risks due to population trend can be fully assessed.

Distribution/fragmentation

This population's historic distribution has been fragmented by Hungry Horse Dam. Disruption of migratory corridors may lead to the loss of the migratory life form. Impacts to the Flathead Lake population would likely be greater than to the Hungry Horse Reservoir/South Fork population. The dam currently prevents introduced fish species in the main Flathead system from entering the South Fork drainage.

Abundance

The abundance risk is based on the concept that, everything else being equal, populations with few individuals are at higher risk of extinction than populations with many individuals. Without additional information, we cannot assess risk due to abundance. The total adult population of bull trout in Hungry Horse Reservoir was estimated to be approximately 3,000 fish (MFWP unpublished file data). It is suspected that the total number of bull trout, including rearing juveniles and sub-adults, exceeds 10,000 individuals.

Biological sampling loss

As a result of research on the impacts of electrofishing on fish, electrofishing techniques and equipment have been modified to minimize electrofishing risk. There is also a MFWP policy limiting the use of electrofishing in waters containing Species of Special Concern. Annual gillnetting of Hungry Horse Reservoir is estimated to result in mortality of approximately 20 bull trout per year. Overall, the risk of loss of bull trout due to sampling was judged to be minimal.

Angling

Angling regulations for bull trout in the Flathead drainage have been gradually tightened over the past 40 years. The earliest regulations allowed an aggregate limit of 15 trout, but imposed an 18-inch minimum size limit on bull trout. Spawning stream closures first occurred in 1953 in the North Fork and in 1962 in the Middle Fork, but not until recently in the South Fork. In 1985, bull trout were assigned a separate limit of one fish and the minimum length was dropped. Since early 1995, it has been illegal to harvest bull trout in the portion of the South Fork drainage discussed in this report. The closure was instituted by the Fish, Wildlife and Parks Commission as an emergency precaution, due to the continuing excessive drawdowns of Hungry Horse Reservoir.

Creel surveys conducted by interviewing anglers about their completed fishing trips showed bull trout "catch rates" (include

Summary of Risk Factors

The South Fork Flathead River drainage upstream from Hungry Horse Dam is the most intact native fish ecosystem remaining in western Montana. The threat of illegal fish introductions, results of which may be highly variable depending on species, is the greatest single threat to the long-term well-being of bull trout in this watershed. Existing threats are primarily tied to impacts from forestry practices in the nonwilderness portion of the watershed. In addition, there is some concern over the uncertainty associated with the impacts of extreme water level manipulations in the artificial lake environment of Hungry Horse Reservoir. Illegal harvest is also a problem in this drainage, due to the high level of remote backcountry use during the fall spawning season (hunting in the Bob Marshall).

SOURCES OF UNCERTAINTY, DATA NEEDS

Contingency planning

There is a need to address various scenarios if bull trout numbers decline. We need contingency planning that may include angling regulations, water level management, suppression of introduced species, transplanting or taking some fish into the hatchery for a genetic reserve (see the Scientific Group Issue Paper - "The Role of Hatcheries and Fish Transplants in Bull Trout Recovery"), etc.

Resident fish

There are numerous uncertainties about the habitat needs of resident fish and whether or not South Fork tributary streams now contain, or are suitable for, the establishment of resident bull trout populations. In addition, we do not understand the mechanisms by which migratory fish become resident and how long this transition may take. A radio telemetry study in Youngs Creek or elsewhere in the drainage might shed some light on these issues.

Distribution and Abundance

We need to expand the information available on the status and trend of bull trout in the main population. In the two "disjunct" populations in Big Salmon and Doctor lakes we need to develop status and trend information and learn more about whether they are truly isolated. We also need a better understanding of the importance of these "disjunct" populations and the downstream corridors to the migratory South Fork population. Finally, we need to evaluate the primary threats to each of the populations and establish appropriate conservation and/or restoration goals for them.

There is a need to establish a baseline population index (redd counts) for long-term monitoring of the population. Our knowledge would be enhanced by establishing juvenile monitoring programs in selected tributary streams and evaluating these populations to see how they respond to habitat conditions under managed and unmanaged situations.

Food webs

We need to better understand food web interactions in Hungry Horse Reservoir and how water level fluctuations in the reservoir affect the ecology of bull trout.

Hydropower

The impact of hydropower operations, and resulting reservoir fluctuations on fish populations are not well understood.

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