FISHERIES INVESTIGATIONS IN THE YELLOWSTONE AND SHIELDS RIVER BASINS, SECOND REPORT, 1996

Progress Report for Federal Aid
Project F-78-R-2

by

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ABSTRACT

Rainbow and cutthroat trout abundance in the Corwin Springs and Mill Creek Bridge areas of the Yellowstone river was similar this year to estimates for the last six years. Brown trout abundance may have declined slightly in 1995 and 1996.

Cutthroat, rainbow, and brown trout abundance in the Ninth Street and Springdale sections of the Yellowstone river remains stable. Increasing rainbow abundance suggested for this area last year now seems unlikely.

The abundance of brown trout sampled near the mouth of the Shields river was slightly less in 1996 compared to spring estimates in 1995. Brown trout abundance in a new section near Clyde Park was similar to numbers in the Convict Grade section.

Cutthroat trout abundance in Mill creek was 58 fish, 80 fish, and 143 fish/1,000 feet in the redefined Logjam, Control, and Pool sections, respectively. Mountain whitefish abundance was 34 fish, 8 fish, and 13 fish/1,000 feet in these same three sections. These estimates are based in most cases on very small sample sizes.

One rainbow trout among 124 collected for disease testing from the Yellowstone river in 1996 was positive for Myxobolus cerebralis. This test result is the first indication that this parasite may be present in this river drainage. To date, the abundance of rainbow trout between six and twelve inches in the Ninth Street section remains stable compared to numbers estimated from sampling each year since 1990.

Cutthroat trout were planted in Ferrell lake in August, 1996. This plant supports a Forest Service effort in Park County to establish native fish and a recreational fishery in what was formerly a fishless lake.

OBJECTIVES

Funds for this project are provided by grants from the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 777-777k) supporting the Montana Statewide Fisheries Management Program. This program consists of two elements: Fisheries Management in Montana, and Statewide Program Coordination. The Fisheries Management element includes four activities, each with associated objectives:

Program Activities and Objectives

1. Survey and Inventory
   To survey and monitor the characteristics and trends of fish populations, angler harvest and preferences, and to assess habitat conditions in selected waters.

2. Fish Population Management
   To implement fish stocking programs and/or fish eradication actions to maintain fish populations at levels consistent with habitat conditions and other limiting factors.

3. Technical Guidance
   To review projects by government agencies and private parties which have the potential to affect fisheries resources, provide technical advice or decisions to mitigate effects on these resources, and provide landowners and other private parties with technical advice and information to sustain and enhance fisheries resources.

4. Aquatic Education
   To enhance the public's understanding, awareness and support of the state's fishery and aquatic resources and to assist young people to develop angling skills and appreciate the aquatic environment.

These statewide activities and objectives are addressed locally by ongoing fisheries investigations and management activities intended to enhance aquatic habitat and recreational fisheries in the upper Yellowstone drainage. For Montana state fiscal years 1995 and 1996, the Yellowstone/Shields drainage area workplans (state project 3301) included six objectives (project objectives):

Project Objectives

1. Determine the abundance, size composition, age composition, mortality rates, and angler harvest or catch rates of wild trout and other fish species in the Yellowstone and Shields rivers for the purpose of maintaining populations at existing levels and attempting to improve the present numbers of native Yellowstone cutthroat trout [1].

2. Determine the abundance, size composition, age composition, mortality rates, recruitment rates and spawning success of Yellowstone cutthroat trout in the primary tributary streams of the Yellowstone river and the Shields river for the purpose of improving or maintaining small tributary populations and possibly improving mainstem river numbers, plus enhancing some tributary populations using imprint plants of young-of-the-year and eyed eggs.

3. Determine the abundance, species structure and natural spawning success of fish populations in high mountain lakes to determine those capable of supporting selfsustaining populations: in those that do not, determine the level, species and frequency of supplemental stocking of fish that is essential to maintain a quality fishery.

4. Determine the abundance, species structure and natural spawning success of fish populations in Dailey lake and their relationship to lake water levels to insure maintenance of a stable quality fishery.

5. Provide public education and training programs and meetings to enhance the public's understanding of general environmental issues; fisheries issues; use of fisheries habitat protection laws and use of special angling regulations to insure the maintenance of the fisheries resource.

6. Provide private landowners with stream management techniques and information necessary to maintain or enhance fisheries habitat on waters within private lands.

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1. Common names for fish are used throughout this report. Scientific names are listed in Appendix A. All fish lengths in this report are total lengths (TL).

Project objectives guide continuing efforts to maintain and enhance local fisheries. Portions of this work during fiscal years 1995 and 1996 were detailed in an earlier report (Tohtz 1996). In addition to that report, and in further support of ongoing fisheries efforts in the upper Yellowstone and Shields river basins, the following data collections, compilations, and analyses are reported here under separate headings:

A. Estimates of trout abundance in the Yellowstone river based on spring sampling in 1996.

B. Estimates of brown trout abundance in the Shields river based on spring sampling in 1996.

C. Estimates of cutthroat trout and mountain whitefish abundance in three sections of Mill creek based on mark recapture sampling in August 1996.

D. Fish collections to test for whirling disease in the Yellowstone river in 1996.

E. Fish planting in Ferrell lake.

In this report, project objectives 1 and 2 are addressed under headings A through D. Project objective 3 is addressed under heading E. Project objectives 5 and 6 are addressed on an ongoing basis by meetings with various angler groups, school groups, local journalists, and the public. In 1996, these meetings included committee and public sessions concerning flood damage from spring runoff, a proposed warmwater fish management plan for FWP Region Three, educational seminars for local elementary school children, meetings with Trout Unlimited and the Yellowstone Flyfishers to discuss a variety of fisheries topics, and meetings with Walleye Unlimited to discuss fish management at Dailey lake. Landowner contacts and consultations occurred routinely each month in conjunction with administration of the Montana Natural Streambed and Land Preservation Act and the Montana Stream Protection Act.

PROCEDURES

A. Estimates of trout abundance in the Yellowstone river based on spring sampling in 1996.

This spring we sampled fish abundance in the same four areas of the Yellowstone river that we sampled last year (Tohtz 1996; Table 1). However, this year we intentionally shocked fewer river miles (Figure 1) compared to annual surveys that have been conducted in these areas since at least 1982 (e.g., Clancy 1984; Clancy 1987; Shepard 1992). After comparing abundance estimates

Table 1. Spring survey sections on the Yellowstone river: 1996.

Section name	Length (feet)	Location\1
Corwin Springs	20,592	T8S, R7E, S2,3,11,12,13,24 T8S, R8E, S19,30
Mill Creek Bridge	26,620	T5S, R9E, S4,5,8 T4S, R9E, S28,32,33
Ninth Street	12,104	T2S, R10E, S5,7,18 T2S, R9E, S24
Springdale	18,876	T1S, R12E, S21,22,28,29,32 T2S, R12E, S5,6

1. Township, Range, Section

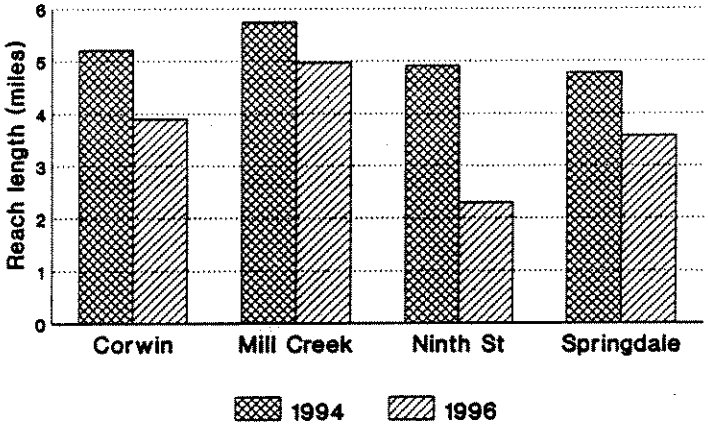

Figure 1. Spring survey section lengths sampled in 1994 compared to lengths sampled in 1996 on the Yellowstone river. The 1994 lengths illustrate miles shocked in most surveys prior to 1996: almost six miles less were shocked in 1996.

generated from data from portions of each sampling section with similar estimates from data collected from the entire historic length, I decided that it was not necessary to continue to shock as much river as we had shocked in the past. Reducing reach length (therefore reducing the number of fish caught in each section) does increase standard errors of the estimates. However, slightly larger confidence intervals are more than acceptable considering that these data are collected primarily to monitor large-scale fish population trends. We now shock fewer fish and other aquatic organisms and still meet our information needs from this sampling.

Fish were sampled with electrofishing gear mounted on an aluminum hulled jet boat. This gear included a 5,000 watt generator and a Coffelt Model VVP-15 rectifying unit. Anodes were metal hoops with stainless steel droppers suspended from twin booms at the bow of the boat. The boat hull served as the cathode.

Fish were collected in live cars, identified, measured to the nearest 0.1 inch, and weighed to the nearest 0.01 pound. Trout were marked with fin clips and returned to the river after marking. Recapture sampling was conducted about two weeks later in each section.

Fish abundance was estimated using a log-likelihood model available in software developed by the Montana Department of Fish, Wildlife and Parks (FWP; Anon. 1994). This model attempts to compensate for different probabilities of capture that exist for small and large fish when using electrofishing gear. It also incorporates statistical tests that help determine whether or not the model is appropriate for data used to generate the estimates. In all cases in this report, statistical significance is determined at alpha = 0.05. Fish were separated into one inch length groups for these abundance analyses.

B. Estimates of brown trout abundance in the Shields river based on spring sampling in 1996.

Fish were sampled this spring in the Shields river at two locations (Table 2). The Convict Grade section has been sampled routinely (usually each spring) since 1986. The Todd section was newly established this year. Sampling was intended to continue trend information in the Convict Grade section, and to provide baseline fisheries information for a side channel habitat improvement project scheduled to be implemented this fall in the Todd section by the Natural Resource Conservation Service (formerly the Soil Conservation Service).

Table 2. Spring survey sections on the Shields river: 1996.

Section name	Length (feet)	Location\1
Todd	7,500	T2N, R9E, S33
Convict Grade	7,724	T1S, R10E, S22,23

1. Township, Range, Section

Fish were sampled in both sections with electrofishing gear mounted on a small drift boat. This gear included a 4,500 watt generator and a Leach direct current rectifying unit. The cathode was a steel plate attached to the bottom of the drift boat; the anode was a single hand held (mobile) electrode connected to the power source by about 30 feet of cable.

Fish were collected in live cars, identified, measured to the nearest 0.1 inch, and weighed to the nearest 0.01 pound. Trout were marked with fin clips and returned to the stream. Recapture sampling was conducted about two weeks later in each section.

Data were analyzed using MR4, a computer program developed by FWP for processing electrofishing records (Anon. 1994). Fish numbers were estimated using the log-likelihood model.

C. Estimates of cutthroat trout and mountain whitefish abundance in three sections of Mill creek based on mark recapture sampling in August 1996.

Fisheries information was collected in three sections of Mill creek to help evaluate a habitat enhancement project scheduled to be implemented by the Forest Service this fall (Table 3). The Forest Service had previously constructed several habitat features in these same areas of Mill creek (Shepard 1993a), and FWP was already involved with monitoring fish population trends in the modified sections of stream (Tohtz 1996). Exceptionally high spring discharge in 1996 undid most of the previous habitat work. Although located in similar areas of the creek and called by the same names, sample sections this year were adjusted slightly to better represent areas of the creek directly to be influenced by the new habitat manipulations. The Control and Logjam sections were lengthened this year compared to previous surveys (e.g., Tohtz 1996); starting and end points of the Logjam and Pool sections were adjusted so that the sections would include all of the newly constructed habitat features.

Table 3. Three sections of Mill creek sampled in August, 1996.

Section name	Length (feet)	Location\1
Control	1,584	T6S, R10E, S19DD
Logjam	1,900	T6S, R10E, S19CD
Pool	1,000	T6S, R10E, S29BC

1. Township, Range, Section

Fish were sampled with electrofishing gear mounted on a small utility boat. This gear included a hand held (mobile) electrode, a 3800 watt generator, and a Coffelt VVP-15 rectifying unit.

Fish were collected in live cars, identified, measured to the nearest 0.1 inch, and weighed to the nearest 0.01 pound. Cutthroat trout and mountain whitefish were marked with fin clips and returned to the river after marking. Recapture sampling was conducted one week later in each of the three sections involved in this study.

Data were analyzed using MR4, a computer program developed by FWP for processing electrofishing records (Anon. 1994). Fish numbers were calculated using the Chapman (1951) modification of the Petersen estimator.

D. Fish collections to test for whirling disease in the Yellowstone river in 1996.

In fall 1995 and spring 1996 we again collected fish from the Yellowstone river to test for the presence of Myxobolus cerebralis, a protozoan that causes whirling disease in many salmonids (Hallidy 1976; Hoffman 1990). M. cerebralis was first detected in Montana in rainbow trout sampled from the upper Madison river (Anon. 1995). The parasite has since been discovered in many drainages of the state.

To test for M. cerebralis, we captured young fish from four locations between Corwin Springs and Springdale (Table 4). We focused our effort this year primarily on young rainbow trout, the species that seems most susceptible to infection by M. cerebralis (Markiw 1992). Heads were removed from each fish, placed in plastic bags, and frozen. Samples were later mailed to the Washington Animal Disease Diagnostic Laboratory at Washington State University, Pullman, to be examined for M. cerebralis.

Table 4. Number of trout less than seven inches (TL) collected from the Yellowstone river in 1996 that were tested for the presence of Myxobolus cerebralis.

		Number of fish		
Sample location/1	Sample date	RB	LL	YCT/2
Corwin Springs	04/26/96	4	4	0
Mill Creek Bridge	04/23/96	24	0	0
Ninth Street	10/03/95	13	2	2
	04/05/96	40	0	0
Springdale	04/01/96	43	0	0

1. Township, range, and sections are listed with Table 1.
2. RB=rainbow, LL=brown, YCT=cutthroat trout.

E. Fish planting in Ferrell lake.

In March, 1996, FWP proposed to plant 500 two inch yellowstone cutthroat trout in Ferrell lake, a small lake in the Tom Miner creek basin, a tributary of the Yellowstone river. These fish were to be stocked to help the Gardiner Ranger District of the Gallatin National Forest (USDA - Forest Service) establish a self-sustaining fish population in a formerly fishless lake (Ferrell Lake Enhancement Project; Appendix B).

An environmental assessment (EA) of this proposal was completed in March, 1996 (Ferrell Lake EA; Appendix C). After a 30 day public comment period, FWP issued a decision notice to plant fish as proposed (Attachment D). Results are reported below.

RESULTS AND DISCUSSION

A. Estimates of trout abundance in the Yellowstone river based on spring sampling in 1996.

Data for rainbow, brown, and cutthroat trout from each of the four sections sampled in 1996 fit the log-likelihood model well. No probability value was less than 0.05, the value below which estimates would have been considered unreliable (Table 5).

Table 5. Trout/mile in four sections of the Yellowstone river based on spring sampling in 1996. Estimates are for fish seven inches (TL) or longer.

Section (mark date):			Overall model			Pooled model		
Species	N	SD	DF	Chi-square	P	DF	Chi-square	P \1
Corwin Springs (April 10):								
RB	402	41.1	9	7.05	0.63	7	7.04	0.42
LL	243	32.4	9	10.31	0.33	6	10.00	0.12
YCT	307	39.5	5	8.20	0.15	5	8.20	0.15
Mill Creek Bridge (April 9):								
RB	195	37.2	12	5.17	0.95	5	4.38	0.50
LL	246	29.4	10	6.32	0.79	8	4.87	0.77
YCT	177	93.8	4	1.97	0.74	0	----------	
Ninth St (April 5):								
RB	1398	131.1	9	13.06	0.16	8	13.05	0.11
LL	278	28.1	11	05.44	0.91	8	4.81	0.78
YCT	100	48.6	2	4.00	0.14	0	----------	
Springdale (April 4):								
RB	322	43.8	8	7.08	0.53	5	5.88	0.32
LL	250	33.2	11	13.47	0.26	9	10.30	0.33
YCT	180	72.0	2	3.26	0.20	1	1.89	0.17

1. Species: RB=rainbow; LL=brown; YCT= cutthroat trout; N=estimated number; SD=standard deviation; DF=degrees of freedom; P=probability value.

Rainbow and cutthroat trout numbers this year in the Corwin Springs and Mill Creek Bridge sections were similar to estimates from the six previous years (Figure 2; Figure 3). Although overall trout abundance has been very stable here recently, brown trout abundance in both sections may have declined slightly in 1995 and 1996 (Figure 4). Sampling difficulties encountered in 1995, particularly in the Mill Creek Bridge section (Tohtz 1996), did not occur in 1996: lower numbers of brown trout seem less likely to be an artifact of sampling and may reflect genuine population adjustments occurring in these areas of the river.

Factors influencing this adjustment are unclear at this time.

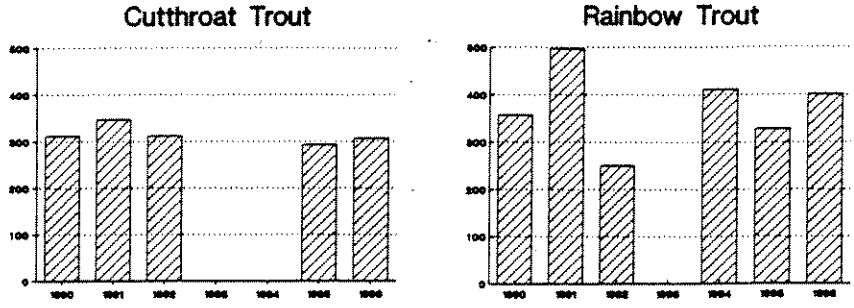

Figure 2. Cutthroat and rainbow trout abundance in the Corwin Springs section of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scales are fish/mile.

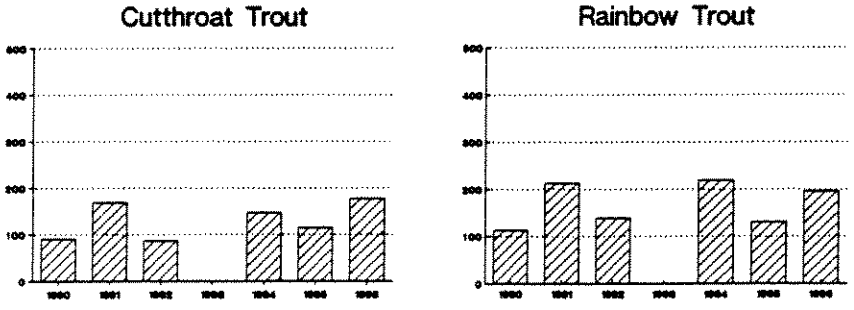

Figure 3. Cutthroat and rainbow trout abundance in the Mill Creek Bridge section of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scales are fish/mile.

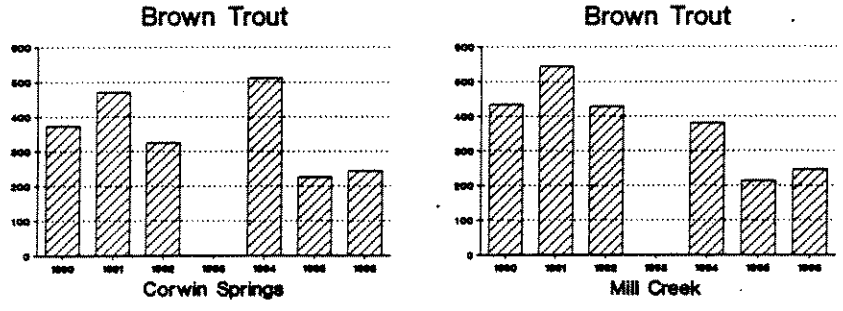

Figure 4. Brown trout abundance in the Corwin Springs and Mill Creek Bridge sections of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scales are fish/mile.

Cutthroat, rainbow, and brown trout abundance in the Ninth Street and Springdale sections in 1996 was similar in all cases to estimates from the six previous years (Figure 5; Figure 6; Figure

7). A slight increase in rainbow trout abundance suggested for this area of the river last year, particularly in the Springdale section (Tohtz 1996) appears now more likely to be an artifact of sampling combined with the usual small-scale variations in fish abundance that occur annually in the river.

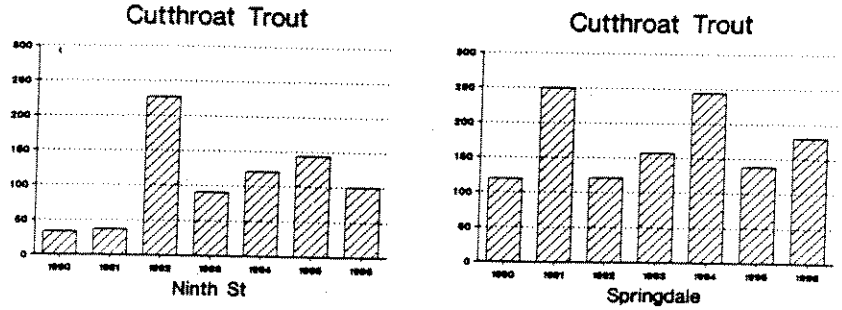

Figure 5. Cutthroat trout abundance in the Ninth Street and Springdale sections of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scales are fish/mile.

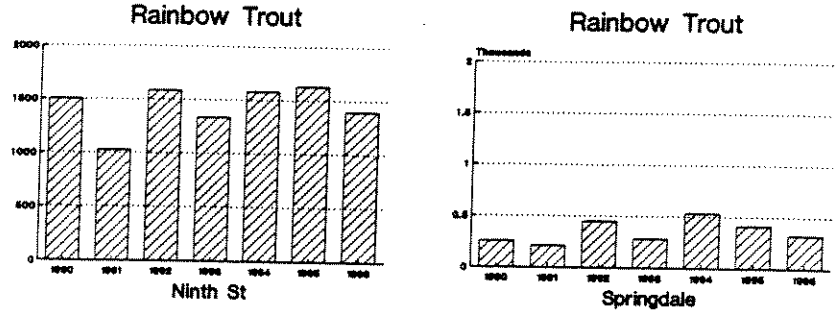

Figure 6. Rainbow trout abundance in the Ninth Street and Springdale sections of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scales are fish/mile.

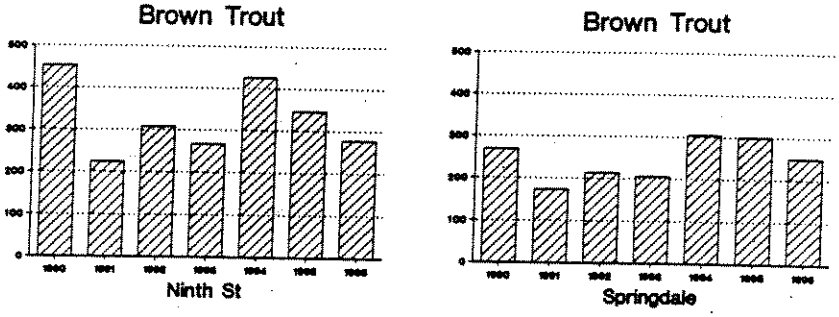

Figure 7. Brown trout abundance in the Ninth Street and Springdale sections of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scales are fish/mile.

The number of rainbow trout between six and ten inches in the Ninth Street section of the Yellowstone river (the section of the upper river with the highest abundance of whirling disease susceptible rainbow trout) is similar this year to numbers estimated each year since 1990 (Tohtz 1996; Figure 8). Healthy recruitment and survivorship of young fish that was apparent last year (Tohtz 1996) continues in this area of the river.

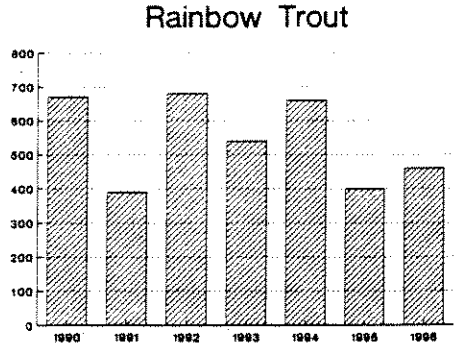

Figure 8. Abundance of rainbow trout between six and ten inches (TL) in the Ninth Street section of the Yellowstone river based on spring sampling from 1990 to 1996. Vertical scale is fish/mile.

B. Estimates of brown trout abundance in the Shields river based on spring sampling in 1996.

Numbers of brown trout greater than seven inches in the Convict Grade section (Table 6) were less in 1996 compared to spring estimates in 1995 (e.g., Tohtz 1996). Shepard (1993) observed

Table 6. Brown trout number/1,000 ft in two sections of the Shields river based on spring sampling in 1996. Estimates are for fish seven inches (TL) or longer.

Reach (mark date):			Overall model			Pooled model		
Species	N	SD	DF	Chi-square	P	DF	Chi-square	P \1
Todd (March 19):								
LL	37	17.2	4	7.14	0.13	1	0.44	0.51
Convict Grade (March 20):								
LL	31	8.3	4	5.20	0.27	3	5.20	0.27

1. Species: LL=brown trout; N=estimated number; SD=standard deviation; DF=degrees of freedom; P=probability value.

that fish less that 14 inches were declining in this area of the Shields river based on estimates of fish abundance made between 1989 and 1993. Although sampling in 1995 indicated that total brown trout abundance may have stabilized (Tohtz 1996), lower numbers this spring suggest that population declines continue. Lower numbers of brown trout in 1996 can be attributed to fewer fish in size classes less than 12 inches compared to the 1995 sample (Figure 9). Factors affecting recruitment and

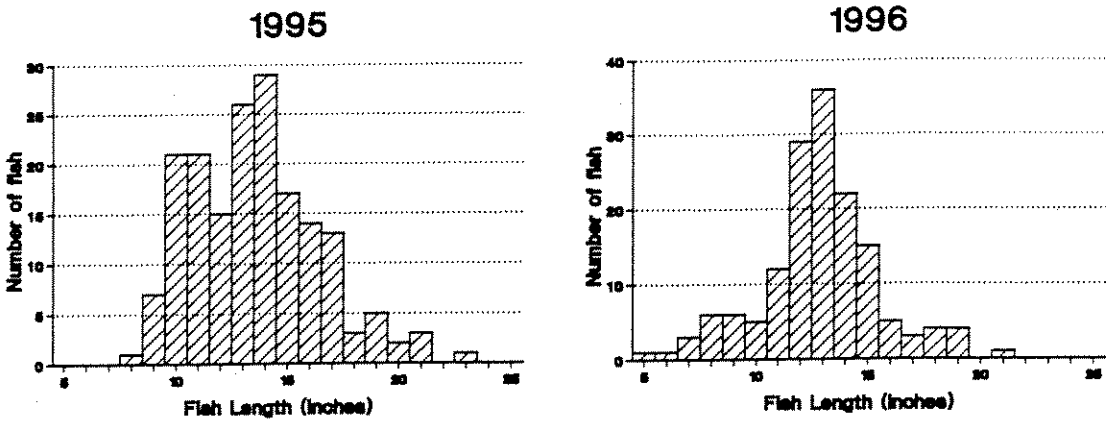

Figure 9. Length frequency distributions of brown trout caught in the Convict Grade section of the Shields river in 1995 and 1996.

survivorship of young fish in this portion of the river are unclear at this time, particularly considering that flow levels have been excellent in recent years.

The number of brown trout greater than seven inches in the Todd section was similar this year to numbers in the Convict Grade section (Table 6). Length frequency distributions of the two samples were also similar (Figure 10). Because both sections lack younger fish, it appears that brown trout populations are sustained in these sections by recruitment from other river areas. For this reason, the new side channel development in the Todd section should be very beneficial: it will provide nearby spawning and rearing opportunities for brown trout and other fish. The Todd section will be monitored for several years to assess whether or not changes can be detected at the population level in the river that might be attributed to the new availability of this side channel habitat.

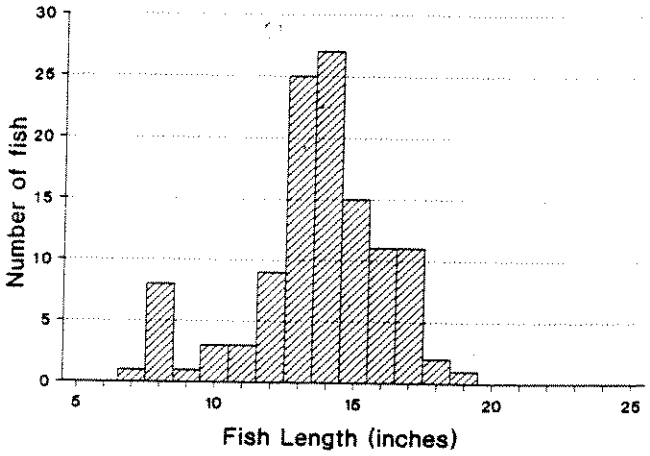

Figure 10. Length frequency distribution of brown trout caught in the Todd section of the Shields river in 1996.

C. Estimates of cutthroat trout and mountain whitefish abundance in three sections of Mill creek based on mark recapture sampling in August 1996.

All model outputs are reported below (Table 7). Estimates are questionable in several cases because of the low number of recaptured fish, or the low number of fish captured overall. Catch information should provide a basis for comparing population changes after stream habitat structures have been constructed. Fish size distributions in the samples from each section are provided below for this reason (Figure 11; Figure 12; Figure 13).

Table 7. Estimates of cutthroat trout and mountain whitefish abundance in three sections of Mill creek sampled in August 1996.

Species	Section	M	C	R	N/1000 ft	SD \1
Cutthroat trout	Logjam	42	30	9	58	15.8
	Control	31	32	4	80	19.4
	Pool	35	32	8	143	20.2
Mountain whitefish	Logjam	21	18	10	34	4.0
	Control	9	3	1	8	1.1
	Pool	11	8	6	13	12.6

1. M=number of fish marked initially; C=number of fish captured during the recapture survey; R=number of fish caught in the recapture survey that were marked; N=estimated number; SD= standard deviation of the estimate.

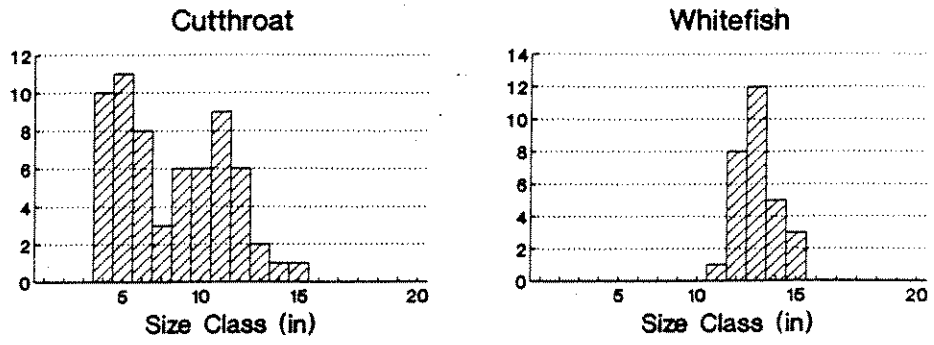

Figure 11. Length frequency distributions of cutthroat trout and mountain whitefish caught in the Logjam section of Mill creek in August, 1996. Vertical scales are number of fish.

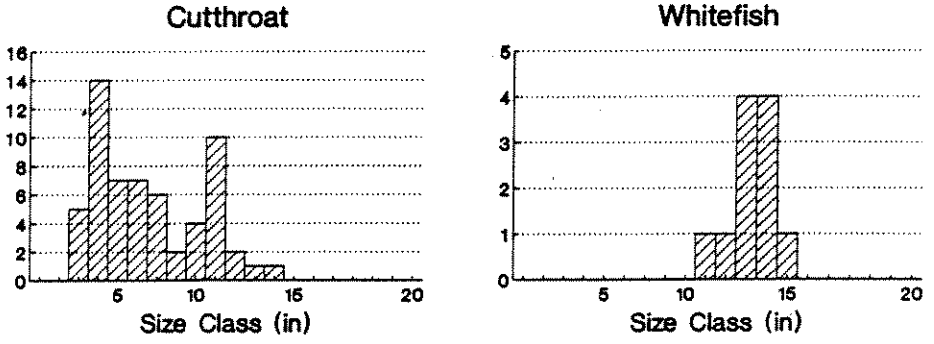

Figure 12. Length frequency distributions of cutthroat trout and mountain whitefish caught in the Control section of Mill creek in August, 1996. Vertical scales are number of fish.

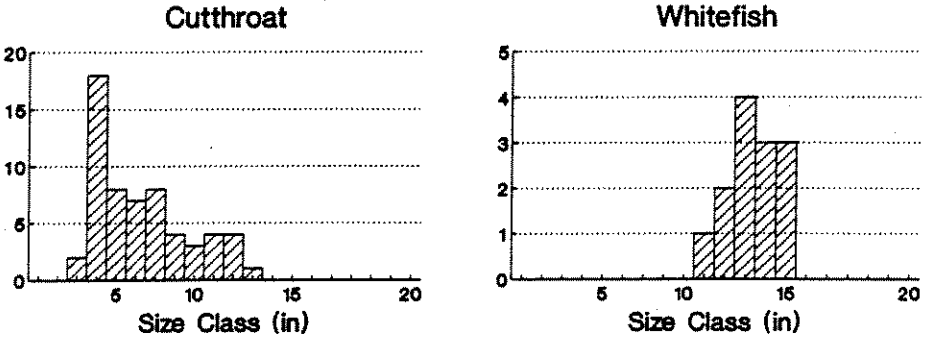

Figure 13. Length frequency distributions of cutthroat trout and mountain whitefish caught in the Pool section of Mill creek in August, 1996. Vertical scales are number of fish.

D. Fish collections to test for whirling disease in the Yellowstone river in 1996.

A single rainbow trout from the Ninth Street section tested positive for Myxobolus cerebralis this year, the first time that this parasite has ever been detected in the Yellowstone river. The intensity of infection in this single fish was low; more samples will need to be analyzed to confirm the identity of the spore. However, the possibility exists that M. cerebralis is now present in the Yellowstone river. For this reason, sampling to monitor fish health will continue in conjunction with all seasonal fish population surveys in the Yellowstone drainage.

E. Fish planting in Ferrell lake.

Five hundred cutthroat trout were planted by helicopter in Ferrell lake on August 13, 1996. When stocked, these fish averaged 2.3 inches. Total fish weight was 2.1 pounds. Survival has been excellent through October 1, 1996.

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Tohtz, J. 1996. Fisheries investigations in the Yellowstone and Shields river basins, Park county, Montana. Progress report for federal aid project F-78-R-1 and F-78-R-2. Montana Department of Fish, Wildlife and Parks, Bozeman.

APPENDIX A: Common and scientific names for fish referred to in this report.

Common name	Scientific name
Brown trout	Salmo trutta
Mountain whitefish	Prosopium williamsoni
Rainbow trout	Oncorhynchus mykiss
Yellowstone cutthroat (cutthroat)	Oncorhynchus clarki bouvieri

APPENDIX B: Ferrell Lake Enhancement Project: USDA-Forest Service, Gallatin National Forest, Gardiner Ranger District, Park County, Montana; May 18, 1994.

2600

Ferrell Lake Enhancement Project

USDA-Forest Service
Gallatin National Forest
Gardiner Ranger District
Park County, Montana

PROPOSED ACTION

The Gardiner Ranger District, Gallatin National Forest, proposes to enhance water and habitat quality in Ferrell Lake (T7S, R6E, Sec 26) in order to establish a self-sustaining fish population. Currently the lake does not support a fishery because high water temperatures during summer months and low dissolved oxygen concentrations during summer and winter months approach and sometimes exceed lethal limits for trout. Enhanced water and habitat quality will be accomplished by diverting a constant flow of cold, oxygenated water from Ferrell Creek into the lake. This project is proposed to begin in June, 1994.

Activities associated with the proposed lake enhancement include:

1. Remove the existing headgate at Ferrell Creek (T7S, R6E, SE 1/4-SW 1/4-SE 1/4 of Sec 26). The headgate will be replaced with an 8 ft. section of 10 in. corrugated metal pipe (CMP) that will serve as a water collection basin. The CMP will be buried beneath the stream bed along the channel margin and backfilled with clean drainrock and gravel. A 6 in. flange coupler will be mounted to the CMP and fitted with a screened intake and gate valve for flow regulation. The gate valve assembly will be protected from vandalism by a vertical 12 in. steel pipe with a hinged cover plate with hasp and lock. The collection basin is designed to be functional during winter months.

2. Bury approximately 1650 ft. of 6 in. schedule 40 PVC pipe via the route of the existing contour ditch to the lake. The pipeline will be fitted to the collection basin and buried 2-3 ft. deep along the length of the existing ditch. The 6 in. pipe will be reduced to a smaller diameter for the last 200 ft. to increase pressure. The higher water pressure will provide maximum aeration and surface turbulence during winter months. A vertical venturi tube will be mounted to the pipeline to increase aeration potential.

3. Construct an inlet spawning channel (construction planned for summer 1996).

4. Add approximately 20 ft. to existing outlet pipe at the toe of the dam. Construct a small (50 sq. ft.) plunge basin at the outlet to dissipate energy of overflow water in order to reduce the risk of headcutting and damage to the dam. Construction of the plunge basin is tentative depending on the hydraulic and structural dynamics of the overflow water and outlet structure.

5. Coordinate stocking of Yellowstone cutthroat trout with the Montana Department of Fish, Wildlife and Parks. Ferrell Lake would be added to the 1994 state stocking schedule.

6. In order for the proposed enhancements to be viable, the Gallatin National Forest will exercise existing water right 43B-W-193976-00 during the specified period of use (April 15 through August 19). Furthermore, the Forest will apply for an additional water use permit from the Montana Department of Natural Resources. Comments and issues regarding the water permit application will be dealt with through the DNRC water permitting process.

SCOPING AND PUBLIC INVOLVEMENT

Public involvement began when a letter describing the project proposal was mailed 3/21/94 to the Montana Department of Fish, Wildlife and Parks, four special interest groups, landowners in the project area and other individuals. The letter requested individual comments on the proposal. The letter contained a detailed description of the proposed action and its purpose and need, maps and preliminary issues. The project was listed on the District's Monthly Newsletter for March, April, and May, 1994 and was also included in the Gallatin National Forest's Proposed Project Listing for April 1 through June 30, 1994. Two responses (written) had been received as of 5/9/94.

The issues determined to be significant for the analysis of this project include effects of the proposed activities on: cultural resources, recreation (ice safety), noxious weed introduction, water quality, and maintenance.

CATEGORICAL EXCLUSION

This project is limited in scope and magnitude and is, therefore, categorically excluded from documentation in an environmental impact statement (EIS) or environmental assessment (EA) under 40 CFR 1508.4 and 1508.27. Reasons for this are:

1) The project involves minimal land disturbance along an existing contour ditch.

3) Modification or maintenance of stream or lake aquatic habitat improvement structures using native materials or normal practices have been categorically excluded by the Chief of the Forest Service under FSH 1909.15 Sec 31.2.7.

4) No extraordinary circumstances exist pertaining to the proposed action. The following findings indicate that the action will not have significant effects on the human environment:

   a) The action has beneficial environmental effects. Adverse effects are not significant.

   b) The proposed action will not affect public health. There are minor safety concerns associated with the proposed action. First, inflow water during winter months may result in localized areas with thin ice. To minimize the risk associated with this hazard, signs will be posted to warn the public. Second, an issue regarding dam safety was identified during scoping. Dam safety concerns were dismissed after an inspection was completed by a regional dam safety inspector. Precautions have been taken to ensure overflow water will not jeopardize the structural integrity of the dam.

   c) The proposed action will not affect prime farmlands, wetlands, wild and scenic rivers, Yellowstone National Park, the Absaroka-Beartooth Wilderness, or other ecologically critical areas.

   d) This proposal would not create any environmental effects that are likely to be highly controversial.

   e) The proposed project does not involve highly uncertain, unique, or unknown risks.

   f) The proposed action does not establish a precedent for future actions with significant effects.

   g) The proposed action, individually or with other related actions, will not have cumulatively significant impacts. Effects contributed by this project are immeasurable or very minor.

   h) The proposed action will not cause loss or destruction of any scientific, cultural, or historical resources. Cultural resource surveys have been conducted and clearance has been approved.

i) The project site is located within occupied grizzly bear habitat (Management Situation 2). The findings are that the project will have no effect on the grizzly bear and there will be no effect to other threatened, endangered, or sensitive species.

j) The proposed action would not violate any federal, state, or local laws or requirements imposed for the protection of the environment.

FINDINGS REQUIRED BY OTHER LAWS

The proposed action is consistent with the Gallatin Forest Plan (FEIS/Record of Decision signed 9/23/87) in Chapter II and Appendix G, Grizzly Bear Standards and Guidelines.

The proposed action meets National Forest Management Act consistency and management requirements, the Montana Water Quality Act, Endangered Species Act, National Historic Preservation Act, and others.

DECISION

I have decided to approve the Ferrell Lake Enhancement Project. All applicable mitigation and protection provisions listed in this document are required for this project. In making this decision, I considered the following:

1) The proposed action will achieve its objective of enhancing water and habitat quality in Ferrell Lake which should then support a self-sustaining fishery. The proposed action will also further state and federal agency goals for managing sensitive Yellowstone cutthroat trout.

2) The proposed action is in compliance with the Gallatin Forest Plan and other applicable laws and regulations.

3) Any adverse environmental effects are minimal and acceptable.

IMPLEMENTATION

Pursuant to 36 CFR 215.8 (a)(4), this decision is not subject to a higher level of review. The Ferrell Lake Enhancement Project may be implemented no sooner than seven days after the date this decision is published in the Bozeman Daily Chronicle.

CONTACT PERSON

For additional information regarding the proposed action or this decision, please contact Scot Shuler at:

Gardiner Ranger District
P.O. Box 5
Gardiner, MT 59030
Phone: 406/848-7375

JOHN R. LOGAN
District Ranger

18 May 1994
Date

APPENDIX C: Environmental review of a proposed fish introduction, Ferrell lake, Park county, Montana: March 25, 1996.

Montana Fish, Wildlife & Parks

ENVIRONMENTAL REVIEW OF A PROPOSED FISH INTRODUCTION
FERRELL LAKE, PARK COUNTY, MONTANA

PROPOSED ACTION:

The Montana Department of Fish, Wildlife and Parks proposes to plant 500 two inch yellowstone cutthroat trout in Ferrell lake in September, 1996. These fish will be stocked to assist an effort by the Gardiner Ranger District of the Gallatin National Forest (USDA - Forest Service) to establish a self-sustaining fish population in the lake. The primary benefits intended from this action are to expand the current range of yellowstone cutthroat trout to this lake in the Ferrell creek drainage, and to provide a recreational fishery in an accessible lake that does not have a fish population at this time. A summary environmental assessment is provided below.

SPONSORING AGENCY:

Montana Department of Fish, Wildlife & Parks in cooperation with the Gallatin Ranger District, USDA - Forest Service.

LAKE LOCATION:

Park County, Montana (Township 7S, Range 6E, Section 26).

DRAINAGE:

Ferrell creek drainage, a tributary of the Yellowstone river.

FISH SPECIES PROPOSED FOR INTRODUCTION:

Yellowstone cutthroat trout (Oncorhynchus clarki bouvieri).

IS THIS SPECIES LEGALLY PRESENT IN THE DRAINAGE ?

Yellowstone cutthroat have not been sampled from the Ferrell creek drainage, although the species is native to the area.

RISKS:

The following questions were considered in assessing the environmental effects of planting Yellowstone cutthroat trout in Ferrell lake:

1) POTENTIAL FOR IMPACTS TO THE GENETIC STRUCTURE OF EXISTING FISH POPULATIONS ?

Evaluation: Minor.

Comments: Fish populations in Ferrell lake would be physically unable to pass to the Ferrell creek drainage. Only unhybridized cutthroat trout will be stocked, eliminating any genetic risk to native species, even if fish were illegally transported to new locations within the drainage. Rainbow trout (Oncorhynchus mykiss) and brook trout (Salvelinus fontinalis) are both found in the Ferrell creek drainage. Cutthroat trout that escape from Ferrell lake could hybridize with rainbow trout. The likelihood of this escape occurring is small, and mitigated by the fact that rainbow-cutthroat hybrids are already present in the mainstem Yellowstone river and many of its smaller tributaries at this time.

2) IMPACTS TO ANY LIFE STAGE OF EXISTING FISH POPULATION DUE TO COMPETITION AND/OR PREDATION ?

Evaluation: None.

Comments: There are no fish in Ferrell lake at this time.

3) IMPACTS TO OTHER FORMS OF AQUATIC LIFE THAT MAY BE CAUSED BY THIS INTRODUCTION ?

Evaluation: Minor.

Comments: Presumably stocked fish will eat invertebrates and other small aquatic organisms established in the lake. New population equilibria will be established after fish are introduced. However, predation effects from fish are not expected to cause measurable (significant) reductions in any prey item, or to significantly harm the lake's existing community composition.

4) POTENTIAL FOR THE PROPOSED NEW SPECIES TO REPRODUCE IN THIS LOCATION ?

Evaluation: Natural reproduction is likely to occur.

Comments: Fish are likely to reproduce in Ferrell lake, provided that temperature and dissolved oxygen limitations have been successfully remedied by recent construction at the lake. The primary goal of planting these fish is to establish a naturally reproducing population of cutthroat trout. An inlet spawning channel has been provided specifically to encourage natural reproduction.

5) IF NECESSARY, WOULD IT BE FEASIBLE TO REMOVE THIS SPECIES AFTER IT HAS BEEN STOCKED ?

Evaluation: Removing fish would be very easy to do.

Comments: To kill all fish in the lake, all that is required is to turn off the existing flow enhancement system. No toxins or other hazardous materials would be required to remove fish if the need arises in the future.

6) WOULD THIS INTRODUCTION RESULT IN IMPACTS THAT ARE INDIVIDUALLY LIMITED, BUT CUMULATIVELY CONSIDERABLE ?

Evaluation: No.

Comments: Cumulative impacts would primarily result from increased recreational use of the site once a fish population is established in the lake. However, total anticipated use is light. Damage to the site, if it occurs, could be mitigated by seasonal restrictions and road closures if excessive levels of use develop in the future.

DESCRIBE REASONABLE AND PRUDENT ALTERNATIVES TO THIS ACTION, IF ANY (INCLUDING NO ACTION):

The no action alternative would leave Ferrell lake without fish. No action would preserve the existing ecological status of the lake, but would also forgo recreational benefits and the opportunity to expand the native cutthroat range in this drainage at very low risk.

DESCRIBE AND EVALUATE MITIGATION, STIPULATIONS, OR OTHER CONTROL MEASURES ENFORCEABLE BY THE AGENCY, IF ANY:

Stocked species will be Yellowstone cutthroat only. FWP is authorized to remove illegal introductions and to set harvest regulations for the population as it becomes

established in the lake.

LIST AGENCIES OR INDIVIDUALS NOTIFIED OF THIS PROPOSAL:

Governor's Office, Glenn Marx, Room 204, State Capitol, POB 200801, Helena, MT 59620-0801

Environmental Quality Council, Capitol Building, Room 106, POB 201704, Helena, MT 59620-1704

Dept. of Environmental Quality, Director's Office, Metcalf Building, POB 200901, Helena, MT 59620-0901

Dept. of Fish, Wildlife & Parks
- Director's Office
- Parks Division
- Fisheries Division
- Wildlife Division
- Lands Section
- Design and Construction
- Legal Unit
- FWP Commissioners

Montana Historical Society, State Historic Preservation Office, POB 201202, Helena, MT 59620-1202

Montana State Library, 1515 E. Sixth Ave., POB 201800, Helena, MT 59620-1800

Wildlife Federation, POB 1175, Helena, MT 59624

Jim Jensen, Montana Environmental Information Center, POB 1184, Helena, MT 59624

Janet Ellis, Montana Audubon Council, POB 595, Helena, MT 59624

George Ochenski, POB 689, Helena, MT 59624

Jerry DiMarco, POB 1571, Bozeman, MT 59771

Glen Hockett, 745 Doane Road, Bozeman, MT 59715

Scot Shuler, USDA-FS, POB 5, Gardiner, MT 59030

Park County Commissioners, 414 E. Callender, Livingston, MT 59047

Bob Raney, 212 South 6th, Livingston, MT 59047

Wayne Hurst, POB 728, Libby, MT 59923

BASED ON THIS EVALUATION, IS AN EIS REQUIRED ?

Planting these fish in this lake is a limited proposal posing virtually no risk to existing fish populations in the drainage. Fish could easily be removed from the lake if necessary without using toxins or other hazardous materials. No conflict or controversy regarding this action is anticipated now or in the future.

This evaluation is adequate to identify all major issues and concerns about the fish introduction. This evaluation is also consistent with findings in the USDA Forest Service Decision Memo (May 1, 1994) concerning the Ferrell Lake Enhancement Project, a document that provides an additional level of environmental review (see attached). For all of these reasons, an environmental impact statement (EIS) is not required: this environmental assessment is an appropriate level of analysis for this proposed action.

EA PREPARED BY: Joel Tohtz, Montana Fish, Wildlife and Parks, Box 1414, Livingston, MT 59047.

Comments on this proposal will be accepted until April 19, 1996. Comments should be sent to Joel Tohtz at the address given above.

APPENDIX D: Decision notice, Ferrell lake fish plant, May 20, 1996.

DECISION NOTICE
FERRELL LAKE FISH PLANT
Prepared by Region 3, Montana Fish, Wildlife & Parks
May 20, 1996

PROPOSAL

The Montana Department of Fish, Wildlife and Parks (FWP) proposes to stock 500 cutthroat trout (Oncorhynchus clarki bovieri) in Ferrell Lake. These fish will be stocked to assist an effort by the Gardiner Ranger District of the Gallatin National Forest (USDA - Forest Service) to establish a self-sustaining fish population in the lake. The primary benefits intended from this action are to expand the current range of yellowstone cutthroat trout to this lake in the Ferrell creek drainage, and to provide a recreational fishery in an accessible lake that does not have a fish population at this time.

MONTANA ENVIRONMENTAL POLICY ACT (MEPA) PROCESS

MEPA requires FWP to assess the potential consequences of this proposed action for the human and natural environment. The proposal, and a no action alternative, were described in an Environmental Assessment (EA) completed by FWP on March 25, 1996. A 30 day public comment period for this EA ended April 19, 1996.

ISSUES RAISED IN THE ENVIRONMENTAL ASSESSMENT

Two primary issues were identified in the proposal to plant cutthroat trout in Ferrell Lake: the consequences of adding fish to what was previously a lake without fish, and the appropriateness of the cutthroat species for the lake and associated drainage.

GENERAL SUMMARY OF PUBLIC COMMENTS

We received only four comments on this proposal during the EA comment period. Three respondents addressed the issue of introducing fish directly; all supported FWP's proposed action.

SPECIFIC SUMMARY OF COMMENTS

The Montana Historical Society concurred with the proposal and noted that properties eligible for the National Register of Historic Places do not likely exist in the project area.
A representative of the Gardiner Ranger District of the Gallatin National Forest informed us that road closures would not be possible to control access to the lake as was incorrectly stated in the EA document.

A real estate agent from Livingston stated that he and many of his clients supported stocking Ferrell Lake with cutthroat trout.

One individual from Helena questioned the methodology and expense of supporting fish in this lake using the flow system developed by the Forest Service.

SPECIFIC QUESTIONS AND FWP RESPONSE

1) An individual wanted to know if FWP had examples of the flow system designed by the Forest Service working in other "similarly situated, similarly affected, similar-sized lakes ??" and asks for an addendum to the EA providing sufficient information for public comment on the projects viability.

Department response: FWP does not have these examples. The respondent correctly identifies the project as an experiment to establish fish in a lake with no existing fish population. However, the respondent fails to distinguish FWP involvement (planting fish) from Forest Service actions (designing and implementing the flow system modifications). The viability of the project was subject to review under the National Environmental Protection Act. The Forest Service had responsibility for this review as the agency sponsoring this portion of the project. The flow system is already in place; planting fish now is a separate question from whether or not the system that was constructed is the best solution to the problem of establishing fish in this lake. Since this question is beyond the much more limited scope of the Ferrell Lake EA, no addendum will be provided.

DECISION

After review of this proposal and the corresponding public support, it is my decision to plant cutthroat trout in Ferrell Lake as proposed in the Ferrell Lake EA. This limited action poses virtually no risk to existing fish populations in the drainage. Fish could easily be removed from the lake if necessary without using toxins or other hazardous materials.

I find there to be no significant impacts associated with this action and conclude an Environmental Impact Statement is not needed. The completed Environmental Assessment is an appropriate level of analysis.

APPEALS

This decision can be appealed by any person who has commented to FWP on the proposed project, or who can provide new evidence that would otherwise change the proposed plan. An appeal must be submitted in writing to the Director of FWP in Helena. An appeal must be postmarked or received within 30 days of the date of this decision notice.

Stephen L. Lewis
Regional Supervisor
Bozeman, MT
May 20, 1996