MONTANA FISH, WILDLIFE & PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE:	MONTANA	PROJECT TITLE:	STATEWIDE FISHERIES INVESTIGATIONS
PROJECT NO.:	F-46-R-7	STUDY TITLE:	SURVEY AND INVENTORY OF COLDWATER LAKES
JOB NO.:	II-a, II-a (partial)	JOB TITLE:	NORTHWEST MONTANA COLDWATER STREAM INVESTIGATIONS, SPECIES OF SPECIAL CONCERN SEGMENT

PROJECT PERIOD: JULY 1, 1993 THROUGH JUNE 30, 1994

ABSTRACT

Twenty-two streams and one lake were sampled for presence-absence information on bull trout (*Salvelinus confluentus*) and westslope cutthroat trout (*Oncorhynchus clarki lewisi*) in the lower Clark Fork of the Columbia River Drainage. Pure westslope cutthroat trout (Wct) were found in seven streams. Bull trout (Dv) were found in four streams, all tributary to Thompson River. Rock Lake, a headwater of Rock Creek near Noxon, Montana contained a hybrid swam of Wct and Yellowstone cutthroat trout (*O. clarki bouvieri*). Bull trout were collected from two streams for genetic analysis. Negotiations with the U.S. Fish and Wildlife Service to obtain funds for redband rainbow trout (*O. mykiss subspp.*) surveys were successful. These funds will be used to help pay for collection and genetic analysis of fish samples from the Kootenai River Drainage.

BACKGROUND

Historically the westslope cutthroat trout and the bull trout were native to most of western Montana, living in both sympatric and allopatric relationships. Redband rainbow trout (Rb) and westslope cutthroat trout may have been native to much of the Kootenai River drainage below Kootenai Falls and existed in both allopatric and sympatric conditions. These native species have been displaced, replaced or hybridized with other fish species throughout much of their original range.

Genetic identification of fish populations was started in 1982 when Montana Fish, Wildlife & Parks committed to rebuilding its Wct hatchery broodstock using wild fish. Since 1982, electrophoretic genetic analysis has been a major tool to identify species make-up of stream and lake dwelling salmonids throughout northwest Montana. This job has identified fish from about 50 mountain lakes, 5 lowland lakes and 200 streams using starch gel electrophoresis with analysis done by University of Montana Wild Trout and Salmon Genetics Laboratory.

OBJECTIVES AND DEGREE OF ATTAINMENT

Objectives included one from the Northwest Montana Coldwater Lakes Investigation (F-46-R-5, I-a) and one from the Northwest Montana Stream Investigations (F-46-R-5, II-a). These objectives were:

Northwest Montana Coldwater Lakes Investigations,

7. Manage regulations and stocking to protect or expand species of special concern.

Northwest Montana Coldwater Streams Investigations,

7. To maintain or expand populations of species of special concern [westslope cutthroat trout, bull trout and inland (redband) rainbow trout].

These objectives were attained.

PROCEDURES

Collection for Electrophoretic Analysis

Collection of fish from streams was accomplished by electrofishing, angling or explosives (M-80 firecrackers) while fish from lakes were caught by angling or gill netting. Fish caught were retained whole, packed in wet ice or dry ice shortly after capture and frozen within 48 hours after capture. The samples were then transported to University of Montana Wild Trout and Salmon Genetics Laboratory, stored in -80° C freezers and analyzed using starch gel electrophoresis by laboratory personnel.

Cost of analysis of cutthroat trout caught from streams and lakes in Kootenai National Forest was paid by Kootenai National Forest. Cost of analysis of other samples was borne by the FWP, or by monies contributed by Washington Water Power Company and American Smelting and Refining Company. Each private entity contributed $4,000 for starch gel electrophoresis and DNA analysis of bull trout. Lengths, weights and scales for age-growth analysis were collected from most samples.

RESULTS AND DISCUSSION

Redband Rainbow Trout

A petition was filed with the U.S. Fish and Wildlife Service in April 1994 to list the redband rainbow trout under the Endangered Species Act. This petition asks for listing of this subspecies of rainbow trout in the Kootenai River Drainage in Montana and Idaho. Genetic analysis of fish

from the Kootenai River Drainage in Montana collected by FWP and the Kootenai National Forest in the late 1980s and early 1990s suggest that the redband are native to some of the Kootenai River Drainage below Kootenai Falls.

However, analysis of rainbow trout collected from various streams above Kootenai Falls included populations that contained some redband rainbow trout genetic material. It is the author's belief that this redband genetic material resulted from planting of hatchery rainbow trout in the Kootenai River Drainage prior to the early 1960s. Genetic analysis (done in the mid-1980s) of rainbow trout from Bitterroot Lake in the Clark Fork River Drainage and Lake Mary Ronan in the Flathead River Drainage showed that fish from both lakes contained both coastal and redband genetic material. These two lakes were used as hatchery brood lakes for rainbow trout eggs from at least the mid-1910s through the late 1950s, and fish from these two sources were planted throughout much of Montana.

It is not known how redband rainbow trout genes got into the Lake Mary Ronan and Bitterroot Lake rainbow trout. Review of old Montana hatchery records (1910-1915) indicates that Bitterroot Lake was first planted with rainbow trout by the federal hatchery at Bozeman, Montana, and that the lake may have been planted an unknown number of years before 1910. Lake Mary Ronan may have been first planted with rainbow trout in the early 1910s from either Montana's Anaconda or Somers hatchery. The fish source could not be ascertained, but in the 1910s Montana did obtain rainbow trout eggs from Michigan, Wisconsin, Utah and possibly Oregon, from the federal hatchery at Bozeman, Montana, and from several commercial operations within the state.

Inquiries were made of Michigan as to their source of rainbow trout and they indicated that the original plants were from the Mt. Shasta, McCloud area of California and most likely were coastal rainbow trout. Skimpy hatchery correspondence after 1915 seemed to indicate that most rainbow trout planted in Montana came from instate sources include a few commercial operators. One of these commercial sources was named "Rainbow Ranch" located near Troy, Montana. Troy, Montana is downstream from Kootenai Falls and within the "native range" of redband rainbow trout. This commercial operation does not exist at this time but was active in the mid-1930s. It is planned to interview several "oldsters" who lived in the Troy area in the 1930s.

A brief review of available redband genetics information was prepared for distribution to the general public following the petition for listing submittal. A proposal for funding of genetics work was submitted to the U.S. Fish and Wildlife Service; this was approved for $8,000, and when combined with FWP and Kootenai National Forest funds will total at least $45,000 for genetics work in fiscal year 1995. The 1995 work is aimed primarily at determining the true exterior borders of redband rainbow trout distribution in the Kootenai River Drainage.

Presence-Absence Surveys, Lower Clark Fork River Drainage

Montana Fish, Wildlife & Parks, Washington Water Power Company and Kootenai National Forest are corroborating on a physical and biological survey of all tributaries of Cabinet Gorge

and Noxon Rapids reservoirs. This survey includes genetic analysis of suspected Wct populations within each stream and often times within individual stream reaches. Data collected from suspected Wct include lengths and scale samples for age-growth analysis. Other fish collected are denoted by species with lengths recorded and scale samples taken for age-growth analysis.

The genetic survey of the Bull River Drainage was done in 1993 and results presented in the Job I-a, II-a, Project F-46-R-6 report. Genetic survey of the remaining tributaries of Cabinet Gorge Reservoir and Rock Lake, a headwater lake, and some tributaries of Noxon Rapids Reservoir was completed in fiscal year 1994. Montana Fish, Wildlife & Parks, with assistance from WWP, also did presence-absence surveys on Clark Fork River tributaries near Plains, Montana, and selected tributaries of Thompson River. The presence-absence surveys were intended to determine those streams containing bull trout; however, suspected cutthroat trout were collected and analyzed by the genetics laboratory. Results of those surveys are presented in Table 1.

Bull Trout Genetics

Bull trout from two streams were collected for genetic analysis. These waters were West Fork Fishtrap Creek which is tributary to Fishtrap Creek and Thompson River and East and North Fork Bull River which are tributary to Bull River and Cabinet Gorge Reservoir. Both samples included bull trout thought to be migratory fish and resident fish.

Bull trout collected from West Fork Fishtrap Creek were from two stream sections about three miles apart. The upper area was above a series of old beaver dams that appeared to be barriers and fish taken included some individuals six or seven inches long that were ripe males. The lower area was within 200 yards of the Fishtrap, West Fork junction and similar sized fish could not be sexed using external characteristics. Fifty bull trout were dissected and kidney and spleen samples taken for disease analysis; analysis done by the U.S. Fish and Wildlife Service, Ft. Morgan, Colorado laboratory. Disease testing was negative. However, dissection and examination of sex organs showed that most fish from the upper area longer than six inches were mature males or females while fish from the lower area were difficult to sex at the same size.

Bull trout collected from the East and North forks Bull River also included what appeared to be resident and migratory fish based upon sex characteristics. Starch gel electrophoretic analysis of both types showed no differences between resident and migratory fish. No determination has been made about differences between the West Fork Fishtrap sample and the East Fork Bull River sample. The West Fork Fishtrap sample contains fluvial fish from Thompson River while the East Fork Bull River sample contains fish from Cabinet Gorge Reservoir.

A redd count was made October 7, 1993 on the lower three miles of West Fork Fishtrap Creek and about seven miles of Fishtrap Creek starting about one mile above the West Fork Fishtrap Creek junction. The redds found were old and hard to distinguish but were all at least 20-24 inches long indicating fish larger than the six-inch long resident fish. One redd was found in West Fork Fishtrap Creek near the mouth, two were found in Fishtrap Creek above the West Fork and six were located downstream of the West Fork to Basin Gulch.

Table 1. Results from presence-absence survey.

Stream	Tributary To	Genetic Analysis[1/]	Other Salmonid Species[2/] Present	Remarks
Seigal Creek	Clark Fork	Wct	Eb	Eb limited to lower ¼ mile
Swamp Creek	Clark Fork	Wct	LL, Eb, Rb	Eb found throughout drainage, LL, Rb in lower 2 miles
Lynch Creek	Clark Fork	---	Eb, Rb, LL, Ct	Ct are uncommon
Weeksville Creek	Clark Fork	Wct x Rb	Eb	
West Fork Thompson River	Thompson River	---	Dv, Ct, Rb	Dv may be residents and fluvials from Thompson River
Fishtrap Creek	Thompson River	---	Dv, Ct, Rb	Dv likely fluvials from Thompson River
Beatrice Creek	Fishtrap Creek	---	Dv, Ct	Dv likely fluvials from Thompson River
West Fork Fishtrap Creek	Fishtrap Creek	---	Dv, Ct, Rb	Dv likely residents and fluvials from Thompson River
Blacktail Creek	Cabinet Gorge Res.	---	---	No fish captured
East Fork Blue Creek	Cabinet Gorge Res.	Wct	---	
West Fork Blue Creek	Cabinet Gorge Res.	Wct	---	Upper creek in Idaho
Government Creek	Cabinet Gorge Res.	Wct x Rb	LL, Eb	Up to RR culvert; above unknown
Deadhorse Creek	Cabinet Gorge Res.	Wct x Rb	--	Up to Hwy. 200 culvert; above culvert pure Wct
Elk Creek	Cabinet Gorge Res.	---	Eb, LL	had Ct and Eb in 1960s, Winchester Bridge to mouth
Pilgrim Creek	Cabinet Gorge Res.	Wct x Rb	Rb, Eb	
West Fork Pilgrim Creek	Pilgrim Creek	Wct	---	Very small number of fish analyzed

Stream	Tributary To	Genetic Analysis[1/]	Other Salmonid Species[2/] Present	Remarks
Engle Creek	Rock Creek Cabinet Gorge Res.	---	Eb, Ct	two Ct caught in 850 feet sampled
Orr Creek	Rock Creek Cabinet Gorge Res.	Wct	---	
Rock Lake	Rock Creek Cabinet Gorge Res.	Wct x Yct	---	24 fish were all hybrids
Tuscor Creek	Noxon Rapids Res.	Wct	Eb	
White Pine Creek	Beaver Creek	Wct x Rb	Rb	15 Rb and 1 Wct x Rb at mouth
White Pine Creek	Beaver Creek	Wct	---	6 miles above mouth
Big Beaver Creek	Beaver Creek	---	Eb	At USFS boundary
West Fork Elk Creek	Elk Creek	---	Eb	

[1/] Wct listed are 100 percent pure.

[2/] Other species abbreviations are: Dv = bull trout, Eb = brook trout, LL = brown trout, Rb = rainbow trout, Ct = cutthroat trout, not tested usually because of low numbers and/or presence of identifiable rainbow trout.

RECOMMENDATIONS

1. Cutthroat trout from the remaining tributaries of Noxon Rapids Reservoir will be collected in summer 1995 and analyzed by University of Montana for genetic purity.

2. Fish from about 14 streams in the Kootenai River Drainage will be collected for genetic analysis to determine exterior boundaries of redband rainbow trout native range.

3. Fish from four lakes within the Jewel Basin Special Management area, from three-four lakes in the Bob Marshall Wilderness and at least three streams tributaries to Hungry Horse Reservoir will be collected for genetic analysis. Purpose of this genetic work is to continue evaluation of the "swamp-out" technique to restore westslope cutthroat trout in mountain lakes and their outlet streams.

4. Redd counts should be made in the Fishtrap Creek Drainage.

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Key Words: Genetic analysis, redband rainbow trout, westslope cutthroat trout, bull trout.

Waters Referred to:

Bull Trout

East Fork Bull River	05-2272
Fishtrap Creek	05-2800
Beatrice Creek	05-0368
West Fork Fishtrap Creek	05-7952
West Fork Thompson River	05-8080

Redband Rainbow Trout

Bitterroot Lake	07-7300
Lake Mary Ronan	07-7700

Westslope Cutthroat Trout

Blue Creek, East Fork	05-2256
Blue Creek, West Fork	05-7856
Orr Creek	05-5408
Siegal Creek	05-6320
Swamp Creek	05-7088
Tuscor Creek	05-7472
West Fork Pilgrim Creek	05-8032
White Pine Creek	05-8176

Others

Big Beaver Creek	05-0480
Blacktail Creek	05-0688
Deadhorse Creek (below MT 200)	05-1840
Elk Creek	05-2560
West Fork Elk Creek	05-7920
Engle Creek	05-2624
Government Creek	05-3168
Lynch Creek	05-4272
Pilgrim Creek	05-5584
White Pine Creek	05-8176
Weeksville Creek	05-7808
Rock Lake	05-9424