MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-46-R-6 STUDY TITLE: SURVEY AND INVENTORY OF COLDWATER STREAMS

JOB NO.: I-a, II-a (Partial) JOB TITLE: NORTHWEST MONTANA COLDWATER STREAM INVESTIGATIONS (SPECIES OF SPECIAL CONCERN SEGMENT)

PROJECT PERIOD: JULY 1, 1992 THROUGH JUNE 30, 1993

ABSTRACT

Electrophoretic identification was made of fish collected from eight new streams and three new lakes. Evaluation was made of an ongoing effort to replace a coastal rainbow trout (Oncorhynchus mykiss) population with westslope cutthroat trout (Oncorhynchus clarki lewisi) in Necklace Lake which is in the Bob Marshall Wilderness. The status of redband rainbow trout in the Yaak River Drainage was investigated and sources of cutthroat hybridization were identified along with potential management solutions.

BACKGROUND

Historically the westslope cutthroat trout (Wct) was the only Oncorhynchus species present in most of Montana with the exceptions of the Yellowstone River Drainage and the Kootenai River Drainage below Kootenai Falls. Yellowstone cutthroat trout (Yct), O. clarki bouvieri, are native to the Yellowstone River Drainage while redband rainbow trout (Rb) are native to parts of the Kootenai River Drainage below Kootenai Falls. It is likely that the Wct and Rb coexist in some parts of the Kootenai River Drainage. These native species have been displaced, replaced or hybridized with other fish species throughout much of their original ranges.

Electrophoretic identification of fish populations was started in 1982 when the Department committed to rebuilding its Wct hatchery broodstock. Since then, this technique has been utilized to identify species make-up of most of the fish populations in the South Fork Flathead River Drainage, almost all stream populations in the North Fork Flathead River Drainage, and to identify make up of stream and lake populations in other major drainages outside the Flathead Drainage. One major discovery was the identification of genetically pure or nearly pure redband rainbow trout in the Yaak River Drainage above Yaak Falls.

OBJECTIVES AND DEGREE OF ATTAINMENT

Objectives included one from the Northwest Montana Coldwater Lakes Investigation (F-46-R-4, I-a) and one from the Northwest Montana Stream Investigations (F-46-R-4, 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 Lakes Investigations,

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

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 Population Genetics Laboratory, stored in -80° C freezers and analyzed using starch gel electrophoresis by laboratory personnel.

Cost of analysis of fish 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 Department either under contract or part of a Masters Degree program. Lengths, weights and scales for age-growth analysis were collected from most samples.

RESULTS AND DISCUSSION

Evaluation of "Swamp Out"

Necklace Lake located in the headwaters of Big Salmon River Drainage in the Bob Marshall Wilderness was first surveyed in 1987 and found to contain only coastal rainbow trout. Search of old planting records indicated this lake had been planted with rainbow trout in the late 1920s through early 1930s. Prior to planting, this lake was undoubtedly barren of fish life. Neighboring lakes, Lena and Woodward, and Big Salmon River upstream from Pendant Cabin were also found to contain only rainbow trout.

Necklace Lake has been planted with about 3,000 young-of-the-year Wct annually since 1988. A fish sample was collected by gill net from this lake in August 1992 and genetic analysis disclosed that 9 were rainbow and 22 were westslope cutthroat trout. Size range of rainbow trout varied from 6 to 14 inches while cutthroat ranged from 6 to 15 inches long. These limited data clearly show that the planted Wct are successfully competing with the resident Rb.

Wct Genetic Surveys

The Department, Washington Water Power Company and the Kootenai National Forest corroborated on a physical and biological survey of the Bull River Drainage located near Noxon, Montana. This survey included genetic analysis of cutthroat collected from eight streams. Waters in the drainage found to contain pure Wct included Napoleon Gulch, Star Gulch, Dry Creek, Beray Creek and Middle Fork, East Fork and South Fork Bull River. Cutthroat collected from North Fork Bull River were 99 percent Wct and 1 percent Yct, while fish from Copper Creek were 98.5 percent Wct and 1.5 percent Rb. Not enough cutthroat could be collected from main stem Bull River for genetic analysis. The analysis of fish from most of the drainage would strongly suggest that main stem fish would be pure or nearly pure Wct.

The native Wct in the drainage have maintained their genetic integrity in spite of man's inadvertent efforts to compromise this integrity. From 1932 through 1959 about 551,000 Yellowstone cutthroat and 72,000 rainbow trout were planted in Bull River, the East Fork and North Fork. The Bull River Drainage is the major stream tributary to Cabinet Gorge Reservoir and is open to spawning fish from this reservoir. From 1953 to 1980 about 1.7 million Yct and 1.1 million Rb were planted in Cabinet Gorge. At the present time, reservoir fish spawning in Bull River is limited to bull trout (Salvelinus confluentis) and brown trout (Salmo trutta).

Redband Rainbow Trout

Redband rainbow trout are known to exist in several tributaries of the Yaak River upstream from Yaak Falls. Streams found to contain pure or nearly pure redband included Seventeen Mile Creek, the North Fork and East Fork Yaak rivers. The North Fork Yaak River in both Montana and British Columbia appears to be populated by only redband rainbow trout. Seventeen Mile Creek contains redbands slightly hybridized with westslope cutthroat trout in the lower stream reach while pure westslope cutthroat inhabit the upper portion of the stream. Westslope drifting downstream into the lower creek probably accounts for the slight degree of hybridization. Fish collected from the lower half of the East Fork Yaak River Drainage were either redband rainbow trout or Rb x Wct hybrids. Fish collected from the upper half of the drainage above Basin Creek and in the upper end of Basin Creek were redband rainbow trout.

A review of Department planting records indicates that Wct have never been planted in the Yaak River or its tributaries but have been planted in lakes. Two of these lakes, Upper Fish Lake and Mt. Henry Lake drain into the East Fork Yaak River. Survey of the Fish lakes and Mt. Henry Lake was done by a University of Montana geneticist and two Yaak valley residents in summer 1992. Their findings were as follows: North Fish Lake is in the Windy Creek Drainage which enters the East Fork Yaak River near the junction of the East Fork and the North Fork. The surveyors could find no active outlet channel connecting North Fish Lake to Windy Creek and considered the lake to be isolated from Windy Creek and definitely isolated from the Middle and South Fish lakes. Electrophoretic analysis of fish collected from North Fish Lake showed a population of pure Wct. Presence of Wct in this lake should be no threat to redband rainbow trout in the Yaak River if it is a landlocked lake.

Analysis of fish collected from Middle Fish Lake which is connected to South Fish Lake and to the Yaak River via Vinal Creek included 13 coastal rainbow and 6 Wct, but no hybrids of these two species. Fish were not collected from South Fish Lake but it is assumed composition is similar to Middle Fish Lake. Analysis of fish from streams nearby to Vinal Creek and from a Vinal Creek tributary above a barrier falls indicates that Wct were the native fish species in Vinal Creek and possibly South and Middle Fish lakes.

The outlet of Mt. Henry Lake flows into Basin Creek about a mile downstream from the junction of the East and West forks Basin Creek about five miles upstream from the junction of Basin Creek and East Fork Yaak River. Survey of Mt. Henry Lake did show a surface outlet but no surface inlets. No potential inlet or outlet spawning areas were visible. Analysis of fish collected showed that all were pure Wct and all fish were 11.5-12.5 inches long. Mt. Henry Lake was last planted with 2,000 young-of-the-year Wct in summer 1987. It had also been planted with Wct in 1983 and 1978. It is very likely that no reproduction takes place in Mt. Henry Lake and that all fish caught in 1992 were from the 1987 planting.

As mentioned earlier, fish analyzed from locations below East Fork Basin Creek junction included some hybridization between redband rainbow and westslope cutthroat while fish from East Fork above Basin Creek, Porcupine Creek and East and West fork Basin Creek were pure redband. These data strongly suggest the source of westslope cutthroat contaminate is Mt. Henry Lake.

RECOMMENDATIONS

1. Evaluation of the "swamp-out" technique. Most of the planting of Wct into lakes in or near the Jewell Basin area was terminated in 1990 after 5-6 years of annual stocking. Several of these lakes should be resampled in summer 1994-95 including Tom Tom, Black, Blackfoot, Wildcat, Lower Bighawk and Clayton lakes. Streams that should be resampled include Graves Creek above the falls above Handkerchief Lake and Wheeler Creek above and below the falls.

2. Evaluation of the "swamp-out" technique. Planting of lakes within the Bob Marshall Wilderness was started in 1988 and is scheduled to terminate in 1994. Fish populations of several of these lakes should be resampled in summer 1993-94. Lakes that should be resampled include Lick, Sunburst, Lena, George, Pyramid and Woodward. Sunburst, Pyramid and Woodward lakes are planted using pack animals and collection of fish could be combined with fish planting.

3. The Department should continue to act cooperatively with Washington Water Power Company and the U.S. Forest Service on stream surveys in the Lower Clark Fork River Drainage. These stream surveys should result in considerable genetic information on stream populations of sensitive species, ie. bull trout and Wct.

4. Planting of other than redband rainbow trout should be terminated in the North Fork and East Fork Yaak River Drainages. Since the only water currently being planted that appears to affect these streams is Mt. Henry Lake, acceptance of this recommendation should have minimal effects upon the angling public. However, Mt. Henry Lake is fished by Yaak area residents since it is only about a three mile hike and is one of the few lakes in the drainage. If the Department desires to continue planting this lake, two sources of redband may be available. These are: (1) capture and transplant redband rainbows from know pure stocks into the lake, or; (2) British Columbia may have broodstocks of redband rainbow trout within their hatchery system.

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Date: 3/22/93

Waters Referred to:

Beray Creek	05-0432
Copper Creek	05-1648
Dry Creek	05-2144
East Fork Bull River	05-2272
Middle Fish Lake	11-9173
Middle Fork Bull River	05-4736
Mt. Henry Lake	11-9250
Napoleon Gulch	05-5104
Necklace Lake	08-9360
North Fish Lake	11-9297
North Fork Bull River	05-5200
South Fork Bull River	05-6640
Star Gulch	05-6928

Key Words: Genetic analysis of westslope cutthroat trout, redband rainbow trout