Montana Fish and Game Report

In Cooperation with U. S. Army Corps of Engineers

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Fisheries Division

Job Progress Report

# ANNUAL PROGRESS REPORT - HABITAT DEVELOPMENT OF YOUNG CREEK, TRIBUTARY TO LIBBY RESERVOIR, 1969 - 1970.

a. Stream Fish Population Determinations and Migration Patterns, Young Creek.

by

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Reservoir Investigation Project

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would be done if needed. Planting of large numbers of migratory adfluvial cutthroat trout into the drainage would be followed by a complete evaluation of the program's success as the final step.

This report describes work done on biological survey of the fish population of Young Creek and enumeration of the spawning run of fluvial cutthroat trout. Information is presented concerning the downstream movement of young fluvial cutthroat trout. Fluvial cutthroat trout are described as those fish that move from running water into running water for spawning; in this case cutthroat trout that move from the Kootenai River into Young Creek for spawning. Adfluvial fish are those that move from still water (a lake or reservoir) into a stream to spawn.

## DISCUSSION

### Fish Population of Young Creek

Young Creek contains a good population of brook trout and cutthroat trout. Cutthroat trout likely to be fluvial juveniles are believed to be the predominant species found in the lower three miles of Young Creek. Brook trout are the most numerous fish found in the next four miles upstream. Cutthroat trout, thought to be resident non-migratory stream fish, are the most abundant fish in the five miles immediately upstream of the brook trout area. The uppermost headwaters of Young Creek contain only resident cutthroat trout.

It was noted that few of the cutthroat trout were sexually mature whereas many of the brook trout were mature in the lower seven miles of Young Creek. This may indicate that many of these fish were young fluvial cutthroat trout. Many small but adult cutthroat trout were taken in the upper end of Young Creek.

Rainbow trout, Dolly Varden, mountain whitefish and dace were found in limited numbers in the lower mile of the creek. Dace are native residents of this creek. Dolly Varden, mountain whitefish, and rainbow trout are thought to be transient fish from the Kootenai River.

Some scales were taken for analysis of growth patterns of cutthroat and brook trout collected in 1969. These data are presented in Table 1 below. Growth exhibited would give an indication of what might be expected from the migratory cutthroat trout when introduced into the drainage.

Table 1. Growth of cutthroat and brook trout taken from Young Creek in 1969.

| | Length in Inches at Annulus | | | |
|---|---|---|---|---|
| Species | I | II | III | IV |
| Cutthroat trout | 2.3 (88)* | 4.1 (30) | 5.8 (7) | 7.6 (1) |
| Brook trout | 2.6 (57) | 4.8 (23) | 7.3 (3) | |

* Number in parentheses is size of sample

These data may indicate that cutthroat trout and brook trout have a slow rate of growth in Young Creek.

Construction of Fish Barrier-Trap

Montana Fish and Game Department and Corps of Engineers designed and constructed a fish barrier-trap for Young Creek, which was completed by the Corps of Engineers October 15, 1969. The upstream fish trap was completed October 1, 1969 but not installed until April 1, 1970. A modified Wolf Trap was constructed and installed April 1, 1970 to catch downstream migrants. These traps are semi-permanent structures which can be removed when not in use.

It was anticipated that the upstream trap would be fished during the months of September, October, and November to collect fall spawning salmonids entering the stream. It would also be fished during the months of April, May and June to collect spring spawning salmonids as they entered Young Creek. The downstream trap would be fished from April continuously through November to collect both young and mature fish moving out of the drainage. The upstream and downstream traps constitute a fish barrier when these two structures are in operation. When neither of the traps are in operation, the barrier structure can still be operated to block all fish from moving into Young Creek from the Kootenai River.

Fluvial Fish Population of Young Creek

Information collected from population sampling and from landowners along Young Creek indicated that this creek historically supported a spawning run of fluvial cutthroat trout from Kootenai River. Landowners reported that in years past a few Dolly Varden had also spawned in Young Creek. Neither source of information gave any indication that mountain whitefish from Kootenai River spawned in Young Creek.

The Young Creek barrier-trap was operated as a barrier during the fall and winter months of 1969-70. No fish were caught moving upstream and observations of the stream below failed to disclose any indication that whitefish entered the stream for spawning during the 1969 spawning period.

The upstream trap was installed April 1, 1970 and fished continuously through June 9, 1970. Catch of adult fluvial cutthroat totaled 21 fish of which 9 were females and 12 were males. Female fish averaged 12.4 inches total length and ranged from 9.1 to 15.5 inches. Males averaged 11.1 inches total length and ranged from 8.0 to 15.5 inches. The first adult fish was trapped May 5th, the last June 3rd. Eight of the 21 fish were trapped May 17th and the remainder entered the trap sporadically. The fish captured by the upstream trap were weighed, measured, scale samples collected, marked by fin-removal and then passed on upstream.

Recapture of spent adult fish moving out of Young Creek was accomplished by the downstream trap. Recaptured spent fish included both marked and unmarked adults indicating that some spawning fish were able to get past the upstream trap. Maintenance of the upstream collection box and trap leads failed to discover that holes had developed allowing some fish access to the stream above the trap without being counted.

Estimation of the total number of spawning fluvial cutthroat trout entering Young Creek is difficult. A mile of stream is available for spawning below the trap in addition to an unknown number of fish that escaped enumeration at the trap. Observations by project personnel and information from angler catches indicate a number of fish do spawn below the trap. An estimate of total numbers of fluvial cutthroat spawning in Young Creek above and below the trap is a minimum of 50 and a maximum of 100 fish.

The downstream trap was installed April 1, 1970 and fished continuously throughout the month. Operation of this trap from May 1 through May 30 was sporadic. High water carried large amounts of debris during this period and made continual operation very difficult and screen cleaning was required every one to four hours. The downstream trap was inoperable most nights, unfortunately the downstream moving cutthroat trout move most noticeably during the hours of midnight to 6 a.m. The downstream trap was placed into continuous operation May 31st and remained throughout the month of June. Screen cleaning dropped from once every four hours in early June to once every two days in late June.

The downstream movement of juvenile cutthroat trout during April, May and June is summarized in Table 2.

Table 2. Juvenile cutthroat from the downstream trap, Young Creek in April, May and June 1970.

| | April | May | June |
|---|---|---|---|
| Ave. no. per day | 1 | ? 1/ | 12.7 |
| Total number | 11 | 29 | 381 |
| Ave. length (inches) | 2.9 | 4.7 | 6.4 |
| Size range (inches) | 1.9-5.6 | 2.3-8.1 | 1.9-8.7 |

1/ Trap inoperative some days due to high water

It should be noted for the June average daily catch for the first 13 days was 3.0 fish per day and for the last 17 days was 20.1 fish per day. These data would seem to indicate that the juvenile cutthroat move out of Young Creek after the adult fluvial fish have moved upstream.

Stream volume and temperature were measured periodically during the time of trapping operations. Work on Hungry Horse Reservoir tributaries has shown that spawning cutthroat trout could be expected as soon as the daily minimum stream temperatures rose to 40° F. This correlation between fish movement and water temperatures also held true in Young Creek. Stream volume seems to have little effect upon upstream fish movement if water temperatures are at or above 40° F. Fluvial spawners were caught before, during and after peak spring flows. Flow April 1, 1970 was estimated at 5 cfs, flow increased during May to average about 40 cfs and dropped to 7 cfs by June 30.

Considering that an adult female cutthroat trout 11 inches in length would contain about 800 eggs and assuming a 99 percent mortality from eggs to six inch fish, the number of fish spawning above the Young Creek barrier in 1970 had the potential of producing about 150 juvenile fluvial cutthroat that would return to the Kootenai River in 1972. The April 1 through June downstream catch was 411 juvenile fluvial cutthroat which seems to indicate the numbers of adult fish in the 1968 spawning run were much larger than the 1970 spawning run.

Development work proposed for Young Creek included chemical suppression of the fish population to create non-competitive environment for the adfluvial cutthroat trout to be planted. The confirmed presence of a run of fluvial cutthroat trout into this stream casts doubt on the need for suppression of the fish population of all of Young Creek. Survey information, both physical and biological, indicates that the lower seven miles of Young Creek serves as both spawning and rearing area for these fluvial fish.

Further work is planned for July 1970 to determine the extent which Young Creek is used by fluvial cutthroat trout and this work will indicate to what extent Young Creek will be chemically treated. That portion of Young Creek below Section 15 T37N R28W will not be chemically treated. If in future years it is felt that competition between brook trout and cutthroat trout is detrimental to cutthroat trout, then mechanical suppression of brook trout will be undertaken.

## RECOMMENDATIONS

Work for fiscal year 1970-71 should include continued operation of the upstream and downstream traps during expected fish runs. Data will be acquired and processed on numbers, size, age, sex and maturity by species.

Removal of stream barriers to migrating cutthroat trout should be done during the summer's low water period.

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