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STUDY R-1

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ARCTIC GRAYLING TANANA RIVER DRAINAGE

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FISH AND GAME
ALASKA DEPARTMENT
OF FISH AND GAME

James W. Brooks, Commissioner

Sport Fish Division

Support Building
JUNEAU, ALASKA

STATE OF ALASKA

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Annual Performance Report for

DISTRIBUTION, ABUNDANCE AND
NATURAL HISTORY OF ARCTIC GRAYLING
IN TANANA RIVER DRAINAGE

by

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TABLE OF CONTENTS

STUDY NO. R-I	Page
Abstract	1
Recommendations	1
Techniques	2
JOB NO. R-I-A	
Objectives	4
Findings	4
Population Estimates	4
Annual Survival Rate	4
Badger Slough Study	8
Effects of Alternating Current Electrofishing Techniques on Arctic Grayling	11
JOB NO. R-I-B	
Objectives	18
Findings	18
Badger Slough	18
Chena River Creel Census	18
JOB NO. R-I-C	
Objectives	25
Findings	25
Literature Cited	26

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations
of Alaska
Project No.: F-9-8
Study No.: R-I Study Title: DISTRIBUTION, ABUNDANCE, AND
NATURAL HISTORY OF THE ARCTIC
GRAYLING IN THE TANANA RIVER
DRAINAGE

Period Covered: July 1, 1975 to June 30, 1976

ABSTRACT

A population estimate in Chena River study Section 6 revealed 191 grayling, Thymallus arcticus (Pallas), per kilometer.

Recruitment of Age Class III grayling in the lower Chena River was low (24.7%) for the second year in succession. Though not as low as the 1974 recruitment of 12.1%, it was well below the 60.5% in 1973.

A spring study of Badger Slough revealed a strong migration of grayling into the stream beginning in early April and continuing through the remainder of April. All sizes of grayling were present but adults were more abundant early in the migration, whereas yearlings became more abundant later in April. Spawning grayling were observed in the stream above the Peede Road crossing on May 12.

The delayed effects of capturing grayling with a boat mounted electro-fishing unit were tested by holding captured grayling for 72 hours. After 72 hours grayling dead or near death ranged from 5% to 8% and those injured ranged from 12% to 42%.

A low intensity creel census covering most of the accessible areas of the Chena River gave an estimate of 40,000 man-hours of angling with a yield of 26,500 grayling from May through August.

RECOMMENDATIONS

It is recommended that:

1. Recruitment rates for grayling in the Chena River be determined with as much refinement as possible.

2. Studies be continued to evaluate the effectiveness and effects on dc and pulsed dc electrofishing on Arctic grayling.
3. Creel census programs be continued on the Chena River with emphasis on obtaining statistically based catch data.

TECHNIQUES

The Chena River sections referred to in this report are the same as in previous years and are repeated here for convenience (Table 1).

A boat mounted electrofishing unit described by Van Hulle (1968) and Roguski and Winslow (1969) was used to capture Arctic grayling for population estimates, age frequency studies, and in the shocker evaluation studies.

Population estimates were made using the techniques of Schumacher-Eschmeyer as described in Ricker (1958). Calculations of survival rates also follow those outlined in Ricker.

Grayling scales used for age determination were mounted on 20 mil acetate, using a heated press at 35,000 pounds pressure for 20 seconds. The scales were individually cleaned prior to mounting. The scales were read on a Bruning 200 Microfiche Reader.

Table 1. Chena River Study Sections.

Section Number	Section Name	River Miles*	Section Length	
			km	mi
1	River Mouth to University Ave.	0-6 (0-9.7)	9.7	6
2a	University Ave. to Peger Road	6-8 (9.7-12.9)	3.2	2
2b	Peger Road to Wendell Street	8-11 (12.9-17.7)	4.8	3
3	Wendell St. to Wainwright RR Bridge	11-14.5 (17.7-23.3)	5.6	3.5
4	Wainwright RR Bridge to Badger Slough	14.5-21.5 (23.3-34.6)	11.3	7
5	Badger Slough		26.6	16.5
6	Badger Slough to Little Chena	21.5-25	5.6	3.5
7	Little Chena River		99.0	61.5
8	Little Chena to Nordale Slough	25-31.5 (40.3-50.7)	10.5	6.5
9a	Nordale Slough to Bluffs	31.5-55.5 (50.7-89.4)	38.6	24
9b	Bluffs to Bailey Bridge	55.5-63 (89.4-101.4)	21.1	7.5
10	Bailey Bridge to Hodgins Slough	63-79 (101.4-127.2)	25.8	16
11	Hodgins Slough to 90 Mi. Slough	79-90 (127.2-144.9)	17.7	11
12	90 Mi. Slough to First Bridge	90-92 (144.9-148.1)	3.2	2
13	First Bridge to Second Bridge	92-94.5 (148.1-152.1)	4.0	2.5
14	Second Bridge to North Fork	94.5-102 (152.1-164.2)	12.1	7.5
15	North Fork of Chena River		56.4	35
16	East Fork of Chena River		99.8	62

* km in parentheses

R-I-C The Winter Ecology of the Arctic Grayling in the Tanana River
Drainage with Special Emphasis on the Chena River System.

OBJECTIVES

1. Determine movements and migrations of Chena River Arctic grayling during the winter.
2. Further define the limits of winter distribution of Arctic grayling in the Chena River.

FINDINGS

No work was done on this job during fiscal year 1976.

The short term experiments, limited as they were in extent and refinement, were adequate to show the relatively great stress to grayling captured by ac electroshocking equipment commonly used in some areas of Alaska by the Department of Fish and Game. The 5.4% observed mortality would probably exceed 10% if the holding time were extended or revealed by autopsy data. Autopsy also linked the numerous black marks observed on ac shocker captured grayling with the rupture of underlying blood vessels. Internal hemorrhage, broken spines, clouded eyes and loss of equilibrium were other signs of the severe shock received by some captured grayling.

These findings dictate that the ac shocker be restricted in its use to small scale collection of specimens. However, the effectiveness of the boat mounted electrofishing unit in Alaskan rivers is too great to abandon it at this point. There is considerable evidence that dc and pulsed dc systems are much less harmful to fish than ac (Pratt, 1955; Spencer, 1967).

Long term holding experiments designed to test the effects of ac electroshock as well as handling procedures associated with tag and recapture population studies began in 1974 (Tack, 1975). During June, 1974, 525 grayling were captured by seine and electroshocker and further treated with various combinations of tagging, marking and anesthetizing techniques, then were stocked in a fallow lake to grow for one year.

The long term holding experiments failed because of insufficient returns (81 of 525). Since the fish recovered represented nearly all groups entered and were in excellent condition, it is possible that illegal angling in the test lake accounted for the low returns. The usefulness of the returns was reduced further because 16 had no evidence of their tag, 7 had fin clips but had lost all sign of a tag, 15 had lost their Floy juvenile tag, and 5 had lost their Floy internal anchor tag, leaving only 38 identifiable fish.

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