

FEDERAL AID IN FISH RESTORATION
STUDY R-1

ALASKA

ARCTIC GRAYLING TANANA RIVER DRAINAGE

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FISH AND GAME
ALASKA DEPARTMENT
OF FISH AND GAME

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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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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

JOB R-I-B Creel Census of the Sport Fishery in the Tanana River Drainage

OBJECTIVES

1. Determine the fishing pressure and catch in the upper Chena River and Badger Slough to evaluate the fishery from year to year.
2. Determine the age and size make up of the catch.

FINDINGS

Badger Slough

Badger Slough, tributary to the Chena River at km 34, provides the first opportunity for grayling fishing in the Chena River basin because the many springs that feed it melt the ice away long before break-up occurs on the main river. In 1975, the first grayling were caught April 9. By May 31 fishing effort had dropped to a low level and the creel census was terminated. The estimate of angler hours was obtained by a stratified system of random counts. The fishery statistics were obtained from interviews with anglers having completed their trip.

The results (Table 8) show nearly 6,000 angler hours of effort, yielding 5,600 grayling in the two months censused. Since the average length of angler trip was 1.79 hours, there were about 3,300 angler trips. About 60% of the anglers were local residents with the remaining 40% being military personnel.

Table 9 summarizes creel census results on Badger Slough since 1968. The number of angler hours was the lowest ever recorded but the harvest was about average due to the high catch rate of 0.95 grayling per angler hour. All indications are that the Badger Slough grayling run is maintaining itself under the present fishing pressure.

Chena River Creel Census

The Chena River Creel census was stratified into three areas: I The 15 km adjacent to Fairbanks and Fort Wainwright, called 'town'; II The immediate vicinity around the Eielson campground, known as the 'Bailey Bridge site'; and III The approximately 50 km of river adjacent to the Chena Hot Springs Road, known as the 'upper Chena River'. Due to restricted manpower, only three week days and three weekend days per month were censused in Areas II and III. In Area I all days were weighted equally, based on previous work (Tack, 1973) and six days were sampled per month. The number of periods sampled each day was also reduced from previous years when less area was covered. This less intense, more wide ranging creel census made it difficult to obtain interviews from anglers who had completed their trip. The results that follow have been affected by error introduced by some angler response on the basis of incomplete fishing trips.

Table 8. Creel Census of the Badger Slough grayling fishery, 1975.

Angler Hours

April 9-30	2,097
May 1-31	<u>3,850</u>
Total angler hours	5,947

<u>Fishery Statistics</u>	<u>April</u>	<u>May</u>	<u>Totals</u>
No. anglers interviewed	43	56	99
Mean hr. fished/angler interviewed	1.91	1.70	1.79
Total GR kept by anglers interviewed	91	82	173
GR kept/angler hour	1.11	0.86	0.95
Total calculated GR harvest	2,328	3,311	5,639

Angler Composition

Local resident	28	32	60
Military	15	24	39
Tourist	0	0	0

Table 9. Summary of Creel Census results for Badger Slough 1968 to 1975.

Year	Inclusive Dates of Census	Days	Total Angler Hrs	Total GR Harvest	GR/day	GR per Angler Hr
1968*	4/17-5/31	45	8,970	7,355	163	0.82
1969**	4/12-5/31	50	6,929	5,542	111	0.80
1970***	5/1-5/31	31	6,206	2,669	86	0.43
1971	No Census					
1972****	4/8-5/24	47	7,174	6,170	131	0.86
1973*****	4/5-5/31	57	8,511	9,958	175	1.17
1974	No Census					
1975	4/9-5/31	53	5,947	5,639	106	0.95

* Roguski and Winslow, 1969
 ** Roguski and Tack, 1970
 *** Tack, 1971
 **** Tack, 1973
 ***** Tack, 1974

The results of the town portion of the Chena River creel census appear in Table 10. Because the counts during June and July were made only at road access points, the estimates of angler hours are probably considerably lower than the actual angler hours. August is normally a slower fishing month than June or July as shown by the 1972 data (Tack, 1973).

The Bailey Bridge portion of the Chena River creel census showed a low angler effort of about 3,000 angler hours (Table 11). The 1974 creel census estimated about 5,500 angler hours for the same period (Tack, 1975). The sampling intensity in 1974 was about the same as 1975, both being six days per month, so the indicated drop in effort is thought to be real. The interview information is primarily from anglers not having completed their trips, so is probably not very reliable.

The Upper Chena River along the Chena Hot Springs Road received an estimated 22,600 man-hours of angling effort during June, July, and August (Table 12). More than half of the angling pressure came during July, with June only slightly busier than August. The fishery statistics shown in Table 12 are presented more to show the great differences resulting from using interviews from anglers not having completed their trip than for their informative value. It is clear that interviews from anglers having completed their trips are the only reliable sources of data for calculation of fishery statistics.

Table 10. Creel Census of the Chena River fishery adjacent to Fairbanks and Fort Wainwright, 1975.

Period	Angler Hours		Total
	5am - 11pm	11pm - 5am	
June	855*	0	855
July	1,369*	0	1,369
August	<u>5,720**</u>	<u>0</u>	<u>5,720</u>
Total	7,944	0	7,944

Fishery Statistics

	June		July		August		Total	
	C***	I****	C	I	C	I	C	I
No Anglers Interviewed	2	12	0	30	2	18	4	60
Mean Hr. Fished/ Angler Interviewed	1	0.8	...	1.7	1.0	1.2	2	1.2
Total GR Kept by Anglers Interviewed	0	0	...	14	...	22	0	36
GR Kept/Angler-Hour	...	...	...	0.27	...	1.0	...	0.5
Total Calculated GR Harvest	...	...	...	370	...	5,720	...	6,090
Mean GR Size	...	...	...	9 1/2"	...	6 3/4"	...	...

Angler Composition

Local Resident	6	15	2	16
Military	2	6	12	2
Tourist		3		

* Counts made using a truck on the road system

** Counts made from a boat

*** Based on interviews of anglers having completed their trip

**** Based on interviews of anglers not having completed their trip

Table 11. Chena River Creel Census at Bailey Bridge, 1975.

Period	Angler Hours			Total
	Weekdays	Weekends	11pm - 5am	
June	199	1,728	0	1,927
July	310	305	0	615
August	<u>210</u>	<u>191</u>	<u>0</u>	<u>401</u>
Total	719	2,224	0	2,943

Fishery Statistics

	June		July		August		Total	
	C*	I**	C	I	C	I	C	I
No. Anglers Interviewed	0	18	4	8	0	10	4	36
Mean Hr. Fished/ Angler Interviewed		1.57	8	1.5	0.32		8	1.13
Total GR Kept by Anglers Interviewed		11	10	2	0		10	13
GR Kept/Angler-Hour		0.39	0.31	0.16			0.31	0.28
Total GR Harvest		752	191	64			921	824
Mean GR Size			9"	9"				

Angler Composition

Local Resident	15	4	2	8
Military	3		6	
Tourist				2

* C-Based on interviews of anglers having completed their trip

** I-Based on interviews of anglers not having completed their trip

Table 12. Creel Census of the grayling fishery on the Upper Chena River adjacent to Chena Hot Springs Road, 1975.

Period	Angler Hours			Total
	Weekdays	Weekends	11pm-5am	
June	3,780	1,824	240	5,844
July	2,980	9,545	0	12,525
August	<u>1,701</u>	<u>2,587</u>	<u>0</u>	<u>4,288</u>
Total	8,461	13,956	240	22,657

Fishery Statistics

	June		July		August		Total	
	C*	I**	C	I	C	I	C	I
No Anglers Interviewed	0	43	36	34	0	27	36	104
Mean Hr. Fished/ Angler Interviewed		1.69	3.5	2.7	2.3		3.5	2.2
Total GR Kept by Anglers Interviewed		7	80	13	11		80	31
GR Kept/Angler Hr.		0.10	0.62	0.14	0.18		0.62	0.14
Total GR Harvest		567	7,773	1,630	772		14,047***	3,171***
Mean GR Size		10.25"	8.5"	9.5"	11.5"			

Angler Composition

Local Resident	58%	...	88%
Military	25%	...	0
Tourist	17%	...	12%

* C-Based on interviews of anglers having completed their trip

** I-Based on interviews of anglers not having completed their trip

*** Calculated using the two overall GR Kept/Angler Hr. values.