

STATE OF ALASKA

*Jay S. Hammond, Governor*



Annual Performance Report for

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

by

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## BACKGROUND

Because of close proximity to Fairbanks and easy access from the adjacent road systems, the upper Chena River and Badger Slough offer the public an excellent opportunity to fish Arctic grayling. Creel census programs began in 1968 and were designed to monitor both the harvest and pressure placed upon these fisheries. During the past 10 years many changes have taken place that have affected Fairbanks and surrounding areas, of which construction of the Trans-Alaska Pipeline would lead all lists. Projects such as this have caused marked increases in human populations, and as the oil pipeline becomes history the talk of the gas line becomes a reality. The Chena River is undergoing the installation of a flood control structure which in time of floods will impound huge quantities of water and rechannel its flow directly into the Tanana River, bypassing Fairbanks and the lower Chena, until levels recede. Any significant effect these factors have on the Chena River fishery would show up in the creel, thus it becomes pertinent that these programs continue.

## 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.

## TECHNIQUES

Estimates of angler usage of Badger Slough and the upper Chena River area were made utilizing randomized angler counts. The creel census was conducted on a randomly selected two weekdays and one weekend day per week. Only interviews with those anglers having completed their trip were used to compute the catch statistics and angler profile information.

Grayling scales used for age determination were individually cleaned and mounted on 20 mil acetate using a Carver press at 20,000 psi, heated to 200°F for 30 seconds. The scales were read on a Bruning 200 microfiche reader.

## FINDINGS

### Badger Slough Creel Census:

Badger Slough is a 16 mile (26 km) spring-fed tributary that flows into the Chena River at km 34. Because of the warm spring action parts of the stream become ice-free and provide angling opportunities as early as the middle of April.

In 1977 the creel census program began on April 25 and continued until May 28 when fishing pressure here was greatly reduced. Creel census data collected during the 34 day period are summarized in Table 9. It shows that nearly 4,000 angler hours of effort produced 3,594 grayling. The catch success was 0.9 fish/hr and was down slightly from 1.02 fish/hr recorded in 1976 (Hallberg, 1977). A summary of creel census results on Badger Slough since 1968 is shown in Table 10.

Length frequency of grayling sampled from the creel on Badger Slough in 1977 appears in Table 11. The percent of adult grayling (greater than 270 mm, Roguski and Tack 1970) caught in Badger Slough, 22.5%, is much greater than that in the upper Chena, 6.4%. This may be part of the adult spawning migration that was observed by Tack (1975). Age and length composition of grayling sampled from both census areas is presented in Table 12. Age Class III grayling were the highest represented age with 44.5%. This percentage is the same as for age III grayling captured during the population estimates, (Table 5). Age III, IV and V grayling comprised 81% of the total sample, and ranged from 170 to 330 mm (6.5"-13.5") fork length.

#### Upper Chena River

The grayling fishery on the upper Chena River, where the river and the Chena Hot Springs Road parallel one another from mile 26-56, usually begins about the end of May. A creel census program to monitor the fishing pressure in this area began on June 1 and continued through August 31. The procedures used here were the same as those used on the Badger Slough. In 1977 a total of 13,536 angler hours was expended to catch nearly 9,500 grayling (Table 13). Grayling caught per angler hour was 0.71, a significant increase over the 0.36 grayling per hour from 1976 (Table 14). Effort was also significantly increased over 1976.

No single explanation can be given for such fluctuations. One possible reason for the increase in effort is that the work force on the Trans-Alaska Pipeline during the summer months was greatly reduced. This gave many people much more time to spend on recreation.

Length frequency of 62 grayling entering the sport harvest is presented in Table 11. The average size grayling caught and kept by anglers on the Upper Chena was 208 mm (8 1/4").

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Table 9. Creel census results from Badger Slough, April 25 - May 28, 1977.

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Angler hours	
Weekdays	2,142
Weekends	<u>1,851</u>
Totals	<u>3,993</u>
Fishery statistics	
Number of completed anglers interviewed	81
Mean hours fished/angler interviewed	1.19
Total grayling kept by angler interviewed	86
Grayling kept/angler hour	0.9
Total grayling harvest	3,594
Mean grayling fork length (mm)	238
Angler composition (%)	
Local resident	74.1
Military	22.7
Tourist	3.2
Male	91.3
Female	8.7
Adult	78.3
Youth	21.7
Gear (%)	
Fly fisherman	22.1
Spinning gear	77.9
Lure (%)	
Bait (shrimp, salmon egg, corn, etc.)	38.7
Artificial lure (spoon, spinner, etc.)	39.2
Artificial fly (mosquito, black gnat, etc.)	22.1

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Table 10. Summary of creel census results for Badger Slough, 1968-1977.

Year*	Inclusive Dates of Census	Days	Total Angler Hours	Total GR Harvest	GR/Day	GR/ Angler Hour
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
1976	5/1-5/31	31	3,056	3,117	100	1.02
1977	4/25-5/28	34	3,993	3,594	105	0.90

\* Data prior to 1976 from Tack (1976).

Table 11. Length frequency (in percent of sample) of angler caught grayling sampled from creel census areas, Chena River, 1977.

Fork Length (mm)	Upper Chena River	Badger Slough
100-109		
110-119		
120-129		
130-139	1.6	
140-149	1.6	
150-159	1.6	
160-169	3.2	
170-179	14.5	3.2
180-189	6.4	3.2
190-199	25.9	4.8
200-209	9.7	6.4
210-219	4.9	1.7
220-229	4.9	8.0
230-239	6.4	9.7
240-249	9.7	14.5
250-259	1.6	12.9
260-269	1.6	12.9
270-279	1.6	9.7
280-289		
290-299	1.6	3.2
300-309	1.6	3.2
310-319		3.2
320-329		
330-339	1.6	1.7
340-349		1.7
n	62	62
$\bar{x}$	208	238
Range	130-330	170-340

Table 12 . Age and length composition of 119 grayling sampled from creel census on Badger Slough and upper Chena River, 1977.

Length (mm)	Age Class							Total No.	Length Frequency %
	I	II	III	IV	V	VI	VII		
140-149	1							1	0.8
150-159		1						1	0.8
160-169		2						2	1.7
170-179		5	4					9	7.6
180-189		3	3					6	5.0
190-199		2	16					18	15.2
200-209		1	8					9	7.6
210-219		1	3					4	3.3
220-229			6	2				8	6.7
230-239			7	3				10	8.4
240-249			6	9				15	12.6
250-259				7	2			9	7.6
260-269				4	5			9	7.6
270-279				1	6			7	5.9
280-289									
290-299					2	1		3	2.5
300-309					1	2		3	2.5
310-319					1	1		2	1.7
320-329									
330-339					1	1		2	1.7
340-349							1	1	0.8
350-359									
n	1	15	53	26	18	5	1	119	
Age Frequency %	0.8	12.6	44.5	21.8	15.1	4.5	0.8		100.0
$\bar{x}$ Fork Length mm	140	180	208	247	276	308	340		228

Table 13. Creel census of grayling fishery on the upper Chena River adjacent to Chena Hot Springs Road, 1977.

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<u>Period</u>	<u>Angler Hours</u>		<u>Total</u>
	<u>Weekdays</u>	<u>Weekends</u>	
June	2,068	1,750	3,818
July	2,562	3,486	6,048
August	1,626	2,044	3,670
Total	6,256	7,280	13,536

  

<u>Fishery statistics</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>Total</u>
Number of completed angler interviews	38	68	23	129
Mean hours fished/angler interviewed	1.6	3.0	2.6	2.4
Total GR kept by angler interviewed	27	126	53	206
GR kept/angler hour	.44	.61	1.1	.71
Total GR harvest	1,680	3,689	4,037	9,406
Mean GR fork length				208 mm

  

<u>Angler composition (%)</u>	
Local resident	82.3
Military	7.6
Tourist	10.1
Male	79.6
Female	20.4
Youth	28.3
Adult	71.7

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Table 14. Summary of creel census results for the upper Chena River, 1970-1977.

Year	Inclusive Dates of Census	Days	Total Angler Hours	Total Grayling Harvested	Grayling per Angler/Hour
1970*	5/1-5/38 7/14-8/29	78	12,518	6,770	0.54
1974**	7/ -7/31	62	11,680	18,049	1.55
1975***	6/1-7/31	92	22,657	14,067	0.62
1976	7/1-8/31	92	10,762	4,161	0.39
1977	7/1-8/31	92	13,536	9,406	0.69

\* Tack, 1971  
 \*\* Tack, 1975  
 \*\*\* Tack, 1976

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