

Fishery Data Series Number 98-5

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Species Occurrence, Length Frequency and Age  
Distribution of Resident Fish Collected from Rivers  
Within Togiak National Wildlife Refuge, Alaska, 1997

Rob MacDonald

and

Mark J. Lisac

April 1998

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United States Department of the Interior  
Fish and Wildlife Service  
Togiak National Wildlife Refuge



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**Keywords:** rainbow trout, lake trout, Arctic grayling, char, northern pike, whitefish, coho salmon, Amanka Lake, Arolik River, Gechiak Creek, Izavieknik River, Kanektok River, Kashaik Creek, Kinegnak River, Kulukak River, Kwethluk Pass Lake, Matogak River, Goodnews River, Ongivinuck River, Ongoke River, Osviak River, Pungokepuk Creek, Pungokepuk Lake, Togiak River, Trail Creek, Togiak National Wildlife Refuge, Bristol Bay, Kuskokwim Bay, southwest Alaska

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**Species Occurrence, Length Frequency and Age Distribution of Resident Fish  
Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1997**

**ABSTRACT** - The Togiak National Wildlife Refuge (Refuge) fisheries program emphasizes conducting annual resident fish inventories. The purpose of this report is to continue the annual compilation of fisheries biological data to make it available to fisheries biologists and managers. All raw data summarized in this report are available in electronic format archived with the Alaska Department of Fish and Game and this office. Collections of age, weight and length (AWL) data previous to 1997 are compiled in other Togiak Refuge reports (Lisac 1996; Lisac and MacDonald 1995a; Lisac and MacDonald 1995b; Lisac and MacDonald 1996; MacDonald 1996a; MacDonald 1996b; MacDonald 1997a; MacDonald 1997b; MacDonald and Lisac 1998).

Baseline AWL sampling of resident fish species was conducted by U.S. Fish and Wildlife Service (USFWS) field crews on eighteen lakes, creeks or rivers within the Togiak National Wildlife Refuge in 1997. A total of 1,039 rainbow trout *Oncorhynchus mykiss*, 683 Arctic grayling *Thymallus arcticus*, 648 char *Salvelinus* species, 35 northern pike *Esox lucius*, 1 whitefish *Coregonus* species, and 1 lake trout *Salvelinus namaycush* were sampled. Most fish species were collected with hook and line methods (12 rainbow trout were collected by minnow trap) with the level of effort ranging from 2 to 42 angler days per waterway. Rainbow trout in all creeks and rivers were marked with individually numbered Floy™ spaghetti tags. In addition, char sampled in the Kinegnak and Osviak Rivers were tagged. In 1997 there were 113 recaptured rainbow trout recorded. An analysis of the movements of these fish and previous year's recapture data will be presented in a forthcoming report. Survey observations resulted in sixteen nominations to the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes.

Tissue (fin clip) was collected from most rainbow trout, Arctic grayling, and char sampled and are archived with the U.S. Fish and Wildlife Service's Fisheries Genetics Lab in Anchorage. DNA micro-satellite analysis has been initiated for rainbow trout and preliminary results indicate a high likelihood of discrete spawning populations throughout the Refuge and even within the Togiak River drainage (Spearman, personal communication).

## INTRODUCTION

The Togiak National Wildlife Refuge (Refuge) encompasses approximately 4.7 million acres in southwest Alaska (Figure 1). Fourteen major river drainages ranging in area from 130 to 5,200 km<sup>2</sup> (50 to 2,000 mi<sup>2</sup>) flow from the Refuge into Bristol and Kuskokwim Bays. One of the primary objectives of the Refuge is to conserve fish and wildlife populations and habitat in their natural diversity.







Freshwater fishes and anadromous salmon are important commercial, sport, and/or subsistence fishery resources within the Refuge. Rainbow trout *Oncorhynchus mykiss*, Arctic grayling *Thymallus arcticus*, Dolly Varden *Salvelinus malma*, Arctic char *Salvelinus alpinus*, northern pike *Esox lucius*, whitefish *Coregonus* species, lake trout *Salvelinus namaycush* and the five species of Pacific salmon *Oncorhynchus* species are found throughout the Refuge. The Fisheries Management Plan (FMP) for the Refuge (USFWS 1990) documented known species distribution throughout the Refuge and identified baseline species distribution and biological data gaps for resident species and anadromous char. The U.S. Fish and Wildlife Service has an extensive field program centered around the major waterways of the Refuge and throughout the ice-free season personnel make an effort to collect biological data from fishes caught by hook and line methods. Survey trips have been undertaken since 1984 to document baseline fisheries resource data. Resident species data has been presented for the Togiak River drainage (Lisac and MacDonald 1996), Arolik River (Lisac and MacDonald 1995a), Negukthlik and Ungalikthluk Rivers (Lisac 1996), from 21 lakes within the Refuge (MacDonald 1996b) and from the Refuge as a whole (MacDonald 1997b). In addition, surveys have collected age, sex and length samples from chinook salmon (MacDonald 1997a; MacDonald and Lisac 1998) and genetic tissue samples from coho salmon (Spearman, personal communication).

The objectives of this report are to:

1. Document the age, weight, and length distribution of rainbow trout, Arctic grayling, and other resident species in Refuge rivers vulnerable to sport fishing gear.
2. Compile this data on an annual basis and make available to resource managers in a standard format archived in the State Research and Technical Services (RTS) system.

## METHODS

Age, weight and length (AWL) data were collected from rainbow trout, Arctic grayling, char, northern pike, whitefish, and lake trout. Rainbow trout were of primary interest with other species sampled opportunistically. Fish were caught using hook and line and measured using standard AWL sampling as outlined in Clutter and Whitesel (1956). Scales from rainbow trout and Arctic grayling were collected from the left side of the fish in the preferred area (Jearld 1983). No scales were taken from char, pike, whitefish, or lake trout. No attempt was made to differentiate between Dolly Varden and Arctic char. Dolly Varden and Arctic char are difficult to positively identify without sacrificing and are reported here together as char.

The sampling emphasis was primarily on the Arolik River and the Togiak River drainage. Areas were selected due to previous sampling locations, emphasis directed by the Refuge Public Use Management Plan (USFWS 1991), access, and the availability of a helicopter.

Fork length was measured to the nearest millimeter (mm), and weight was recorded to the nearest 25 grams (g). Generally only rainbow trout having a length of 300 mm or greater



were marked with individually numbered Floy™ spaghetti tags. Char sampled in the Kinegnak and Osviak Rivers were also marked with Floy™ tags. Recaptured fish were measured for length and weight and scale samples were collected from the right side of the fish to avoid regenerated scales from the area where scales were previously collected. All data (species, length, weight, sex, date of sample, time of catch, tag number, river sampled, latitude, longitude, gear used, collector, and comments) and any distinguishing characteristics were recorded on individual scale envelopes. Locations were determined by a Garmin™ 45 handheld GPS.

Rainbow trout ages were determined from acetate impressions of scales (Dery 1983; Riffe 1994) using a Canon PC 70M microfiche copier with a forty-power lens via methods outlined in Mosher (1969), Coggins (1994), and Lux (undated). The scale reader made three independent age determinations of the selected scale for each fish reporting the modal age (Coggins 1994). Samples with no modal age are treated as unreadable and included with regenerated scales as age unknown.

Data were transferred to Alaska Department of Fish and Game (ADFG) Standard Age Weight Length Mark-Sense Data Forms Version 1.1 (ADFG 1990) and sent to ADFG Research and Technical Services where they were optically scanned to produce electronic data files. Each data set was assigned a file number which corresponds to the State fisheries management area, the species sampled, and the year of collection and are archived in a Statewide database available to all (Heineman 1989a) (Appendix A). Completed data sets were analyzed using a crosstabulation program BBX2 (Heineman 1989b) which produces unweighted estimates of mean length and percentage by age group and the associated standard error estimates following procedures outlined by Sokal and Rohlf (1981) (Riffe 1994).

Individual fish capture and recapture locations (latitude and longitude) were recorded with a Garmin™ 45 GPS and plotted on digitized USGS maps (1:63,360 scale). Distance (km) was determined by tracing the direct path of the river course between the initial capture and recapture locations. The number of days between capture events is reported.

Genetic tissue samples (fin clips) were collected from rainbow trout, grayling and char, stored in scale envelopes and sent to the U.S. Fish and Wildlife Service's Fisheries Genetics Lab for archiving. Currently the rainbow trout tissue samples are being used to develop DNA micro-satellite markers to determine if it is possible to identify discrete spawning populations (Lisac et al. 1998).

## RESULTS

In 1997, 1,039 rainbow trout, 683 Arctic grayling, 648 char, 35 northern pike, 1 whitefish, and 1 lake trout were captured and sampled from eighteen rivers or lakes within the Togiak National Wildlife Refuge (Table 1, Table 2, Appendix A). Length frequency distributions for species by river with sample sizes greater than 20 are presented as Figures 2-12. The areas surveyed include three Kuskokwim Bay drainages (Arolik, Kanektok, and Kinegnak Rivers),



Table 1. Species caught and effort (angler days) by area surveyed and date, Togiak National Wildlife Refuge, Alaska, 1997.

Location	Trip Dates	Effort (angler days)	Rainbow trout		Arctic Crayling	Char	Northern Pike	Whitefish	Lake trout
			Number Caught	Number Marked					
<b>Kuskokwim Bay drainage</b>									
Arolik River	7 - 12 June	24	96	73	21	0	0	0	0
	27 Aug - 1 Sep	18	29	20	20	23	0	0	0
	28 Aug	a	4	0	0	0	0	0	0
Goodnews River	30 Sep - 3 Oct	8	0	0	0	2	0	0	0
Kanektok River	23 - 29 July	42	172	0	3 b	0 c	0	0	0
Kinegnak River	14 - 16 July	6	0	0	19	45	0	0	0
Kwethluk Pass Lake	14 July	2	0	0	2	0	0	0	1
<b>Nushagak Bay drainage</b>									
Amanika Lake	13 July	2	0	0	0	0	1	0	0
Ongoke River	30 June - 3 July	8	1	1	194	17	0	0	0
<b>Togiak Bay drainage</b>									
Kulukak River	9 - 12 Sep	12	0	0	0	11	0	0	0
Matogak River	16 - 21 Sep	12	0	0	0	0	0	0	0
Osviak River	17 - 20 July	8	10	7	106	36	0	0	0
	21 - 25 Sep	10	3	2	2	0	0	0	0
<b>Togiak River drainage</b>									
Gechiak Creek	30 May - 2 June	8	122	106	0	1	0	0	0
	19 - 23 June	10	245	174	1	10	0	0	0
	19 - 22 Aug	8	173	114	1	47	0	0	0
	19 - 21 Aug	a	8	0	0	0	0	0	0
Izavieknik River	16 - 18 July	6	0	0	0	0	0	0	0
Kashiak Creek	21 - 24 July	8	19	17	73	78	0	0	0
Ongvinnuck River	24 - 27 June	12	11	9	84	65	0	0	0
	6 - 9 Aug	8	5	4	81	96	0	0	0
Pungokepak Creek	20 - 23 May	8	34	26	22	5	10	0	0
	7 - 10 July	8	77	47	36	1	11	1	0
	12 - 15 Aug	8	26	20	13	37	11	0	0
	2 - 4 Sep	6	4	2	1	0	2	0	0
Togiak River	20 Aug	d	0	0	0	2	0	0	0
Trail Creek	14 - 16 July	6	0	0	4	47	0	0	0

a These samples were caught with minnow traps

b An additional 18 grayling were reported as caught and released in the Kanektok River without being sampled

c An additional 105 char were reported as caught and released in the Kanektok River without being sampled

d These fish were mortalities from another project where the data was not used.











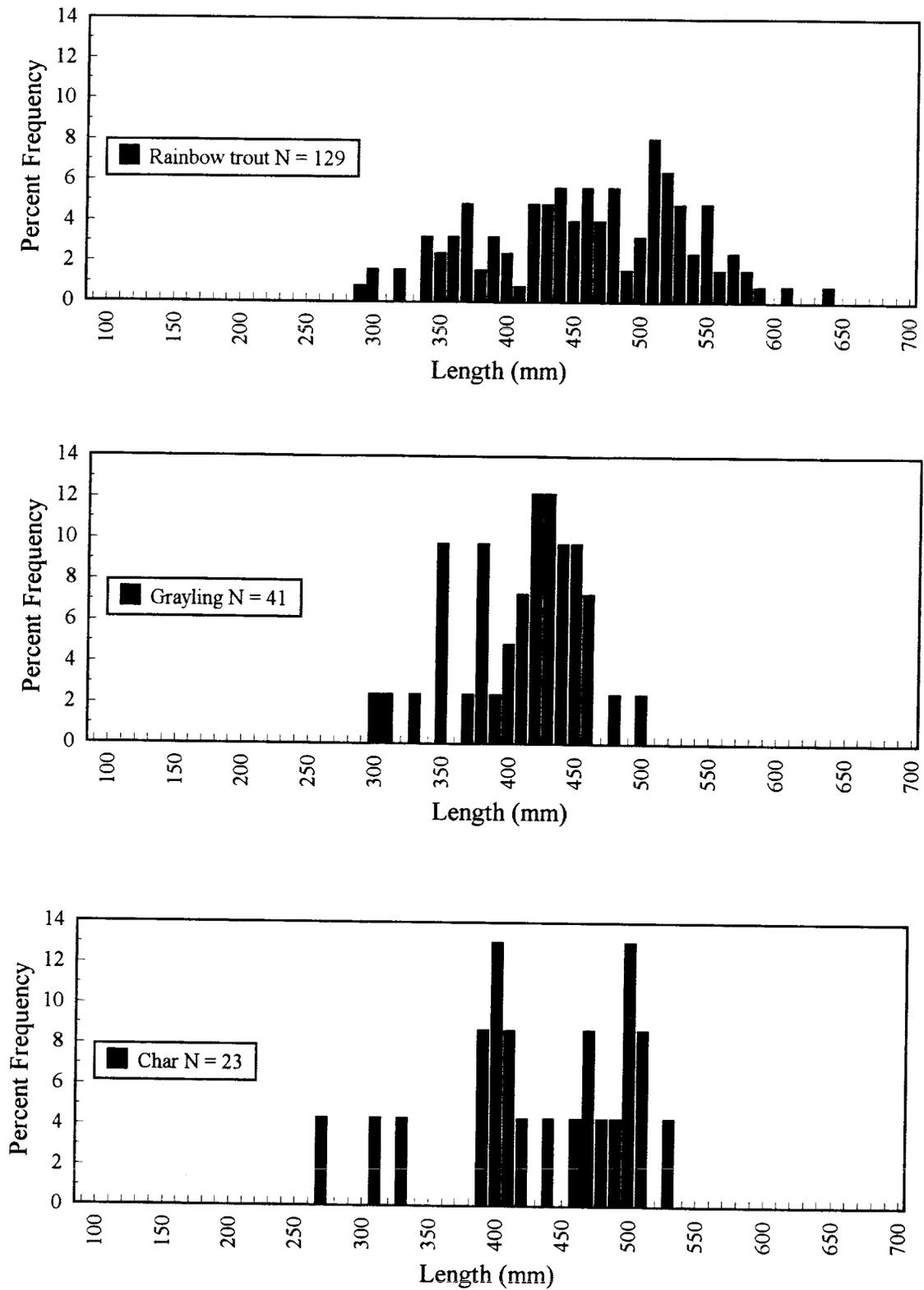


Figure 2. Fork length frequency distribution for rainbow trout, grayling and char in the Arolik River, Togiak National Wildlife Refuge, Alaska, 1997.



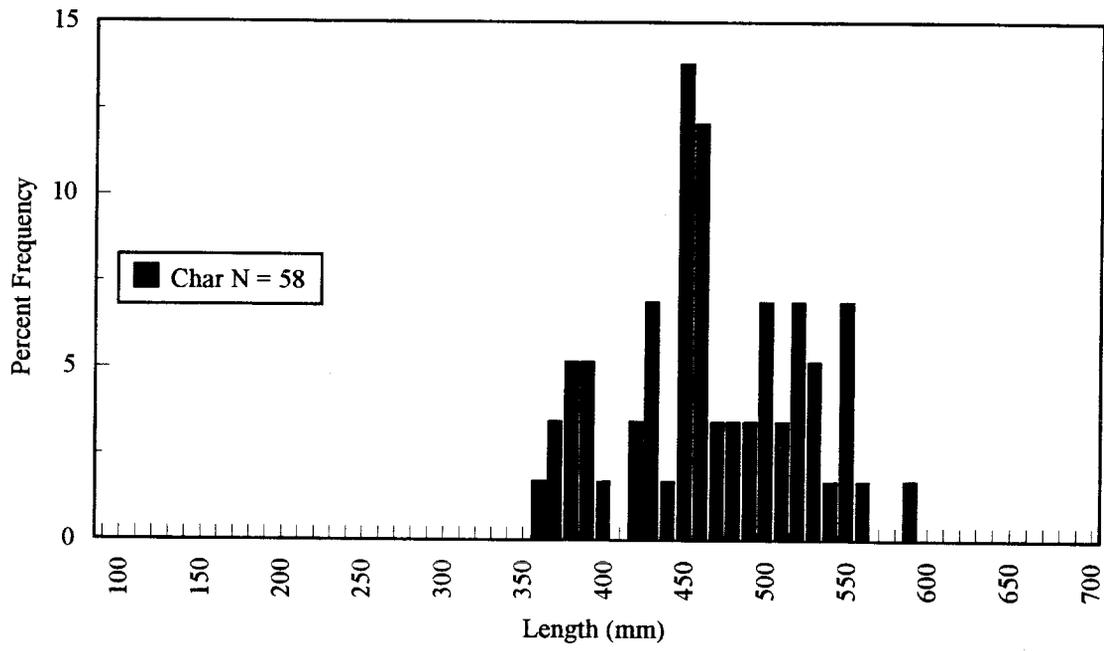
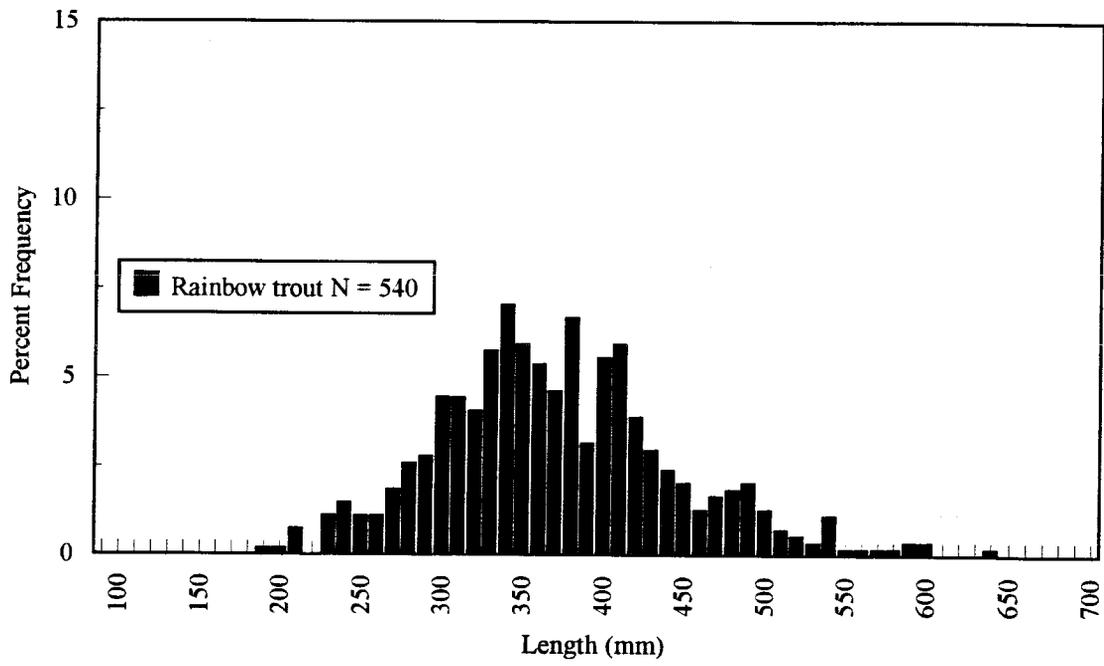


Figure 3. Fork length frequency distribution for rainbow trout and char in Gechiak Creek, Togiak National Wildlife Refuge, Alaska, 1997.



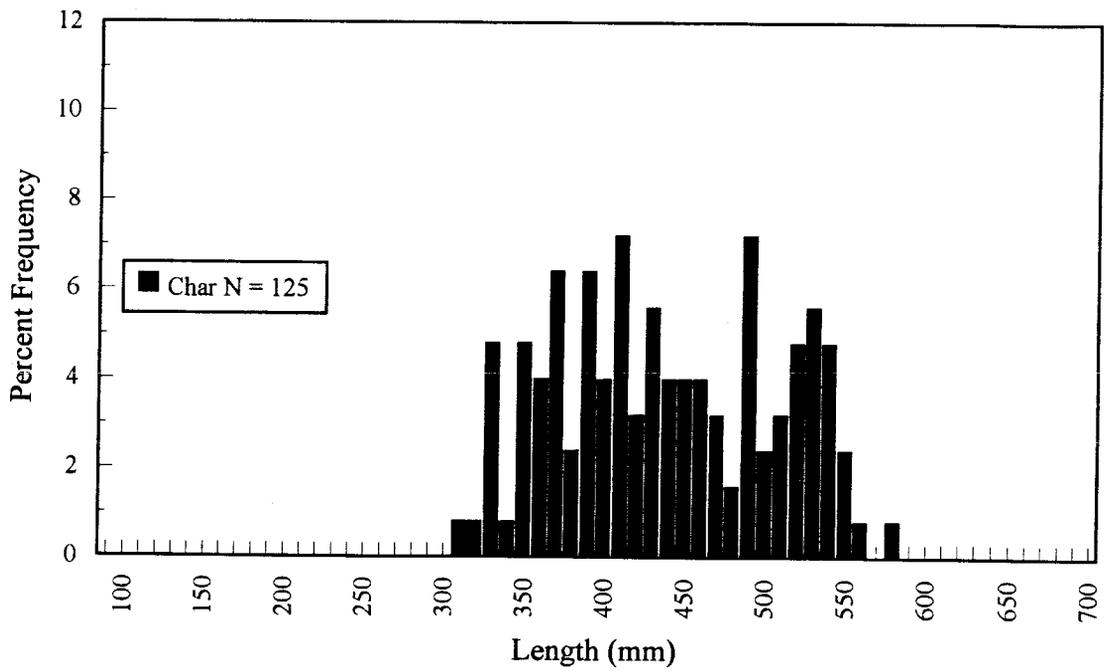


Figure 4. Fork length frequency distribution for char in the Izavieknik River, Togiak National Wildlife Refuge, Alaska, 1997.

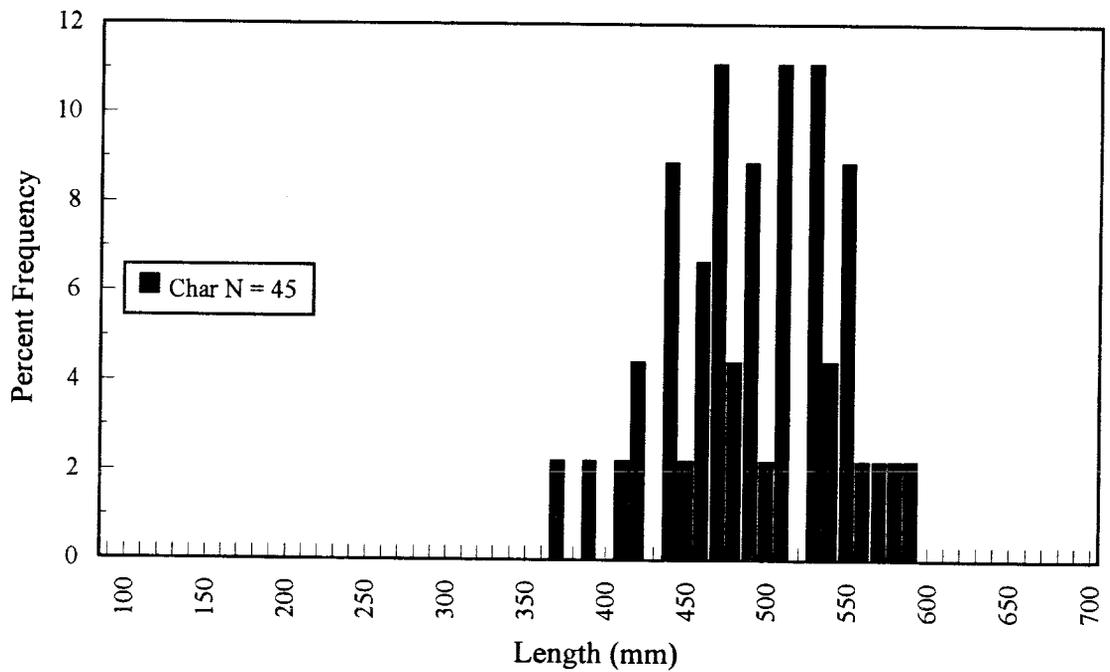


Figure 5. Fork length frequency distribution for char in the Kinegnak River, Togiak National Wildlife Refuge, Alaska, 1997.



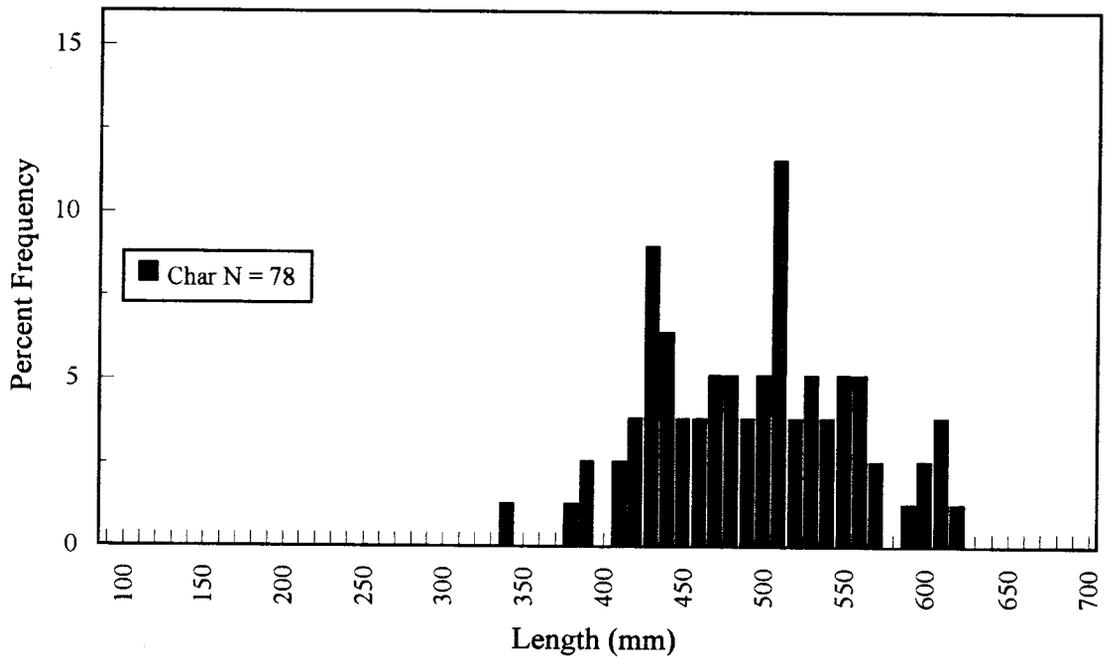
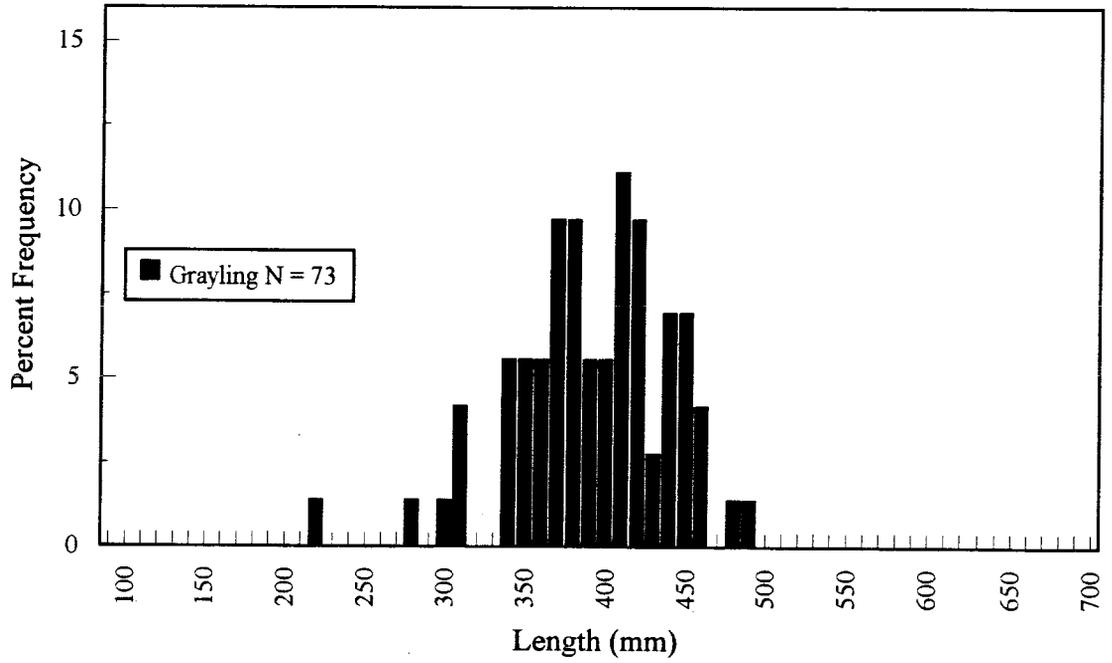


Figure 6. Fork length frequency distribution for grayling and char in Kashaik Creek, Togiak National Wildlife Refuge, Alaska, 1997.



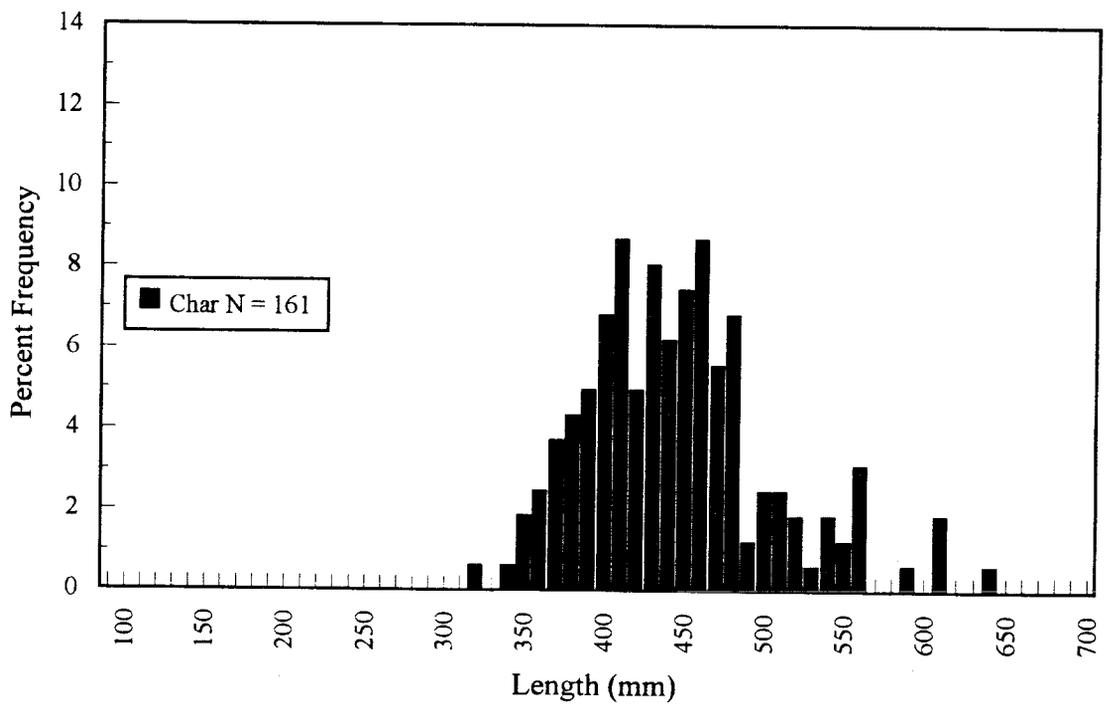
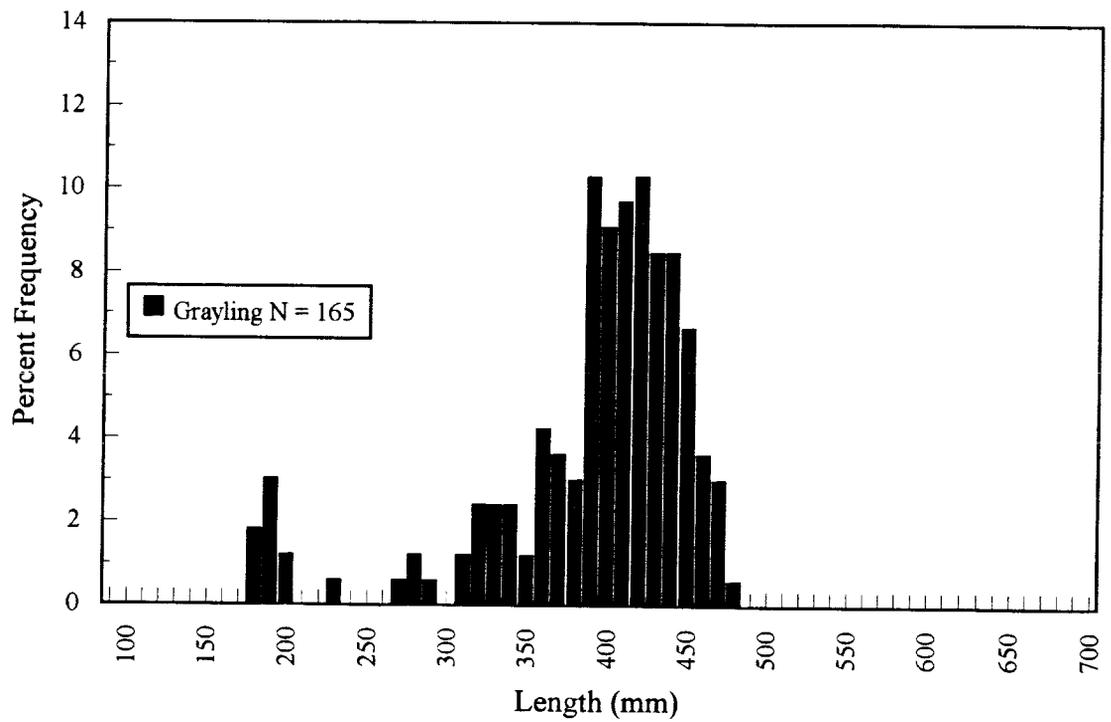


Figure 7. Fork length frequency distribution for grayling and char in the Ongivinuck River, Togiak National Wildlife Refuge, Alaska, 1997.



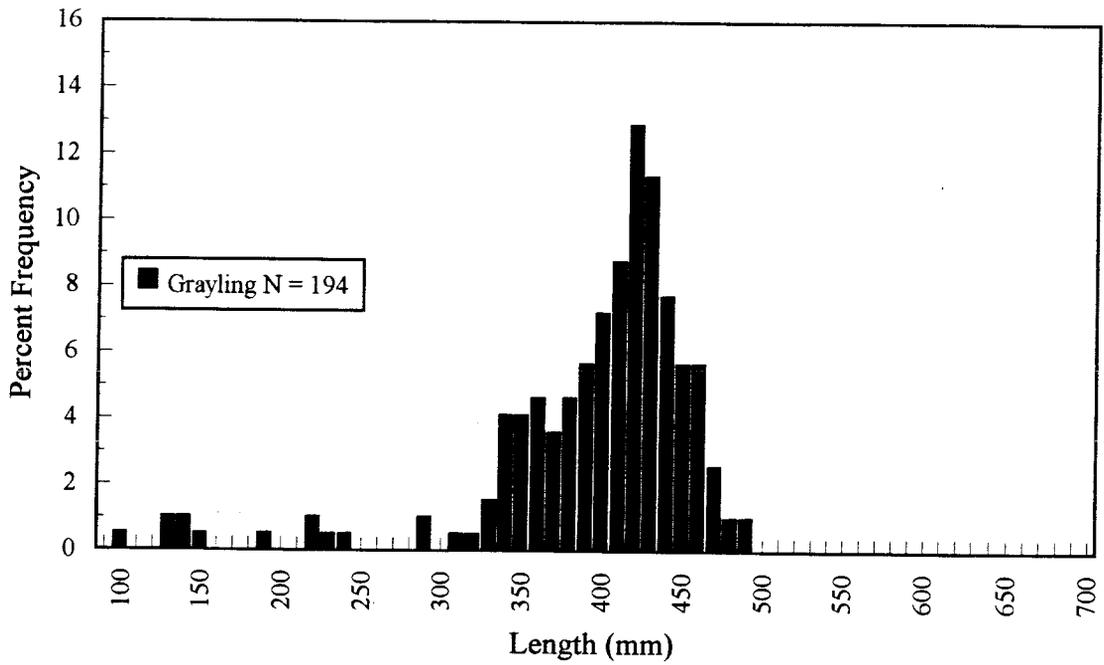


Figure 8. Fork length frequency distribution for grayling in the Ongoke River, Togiak National Wildlife Refuge, Alaska, 1997.

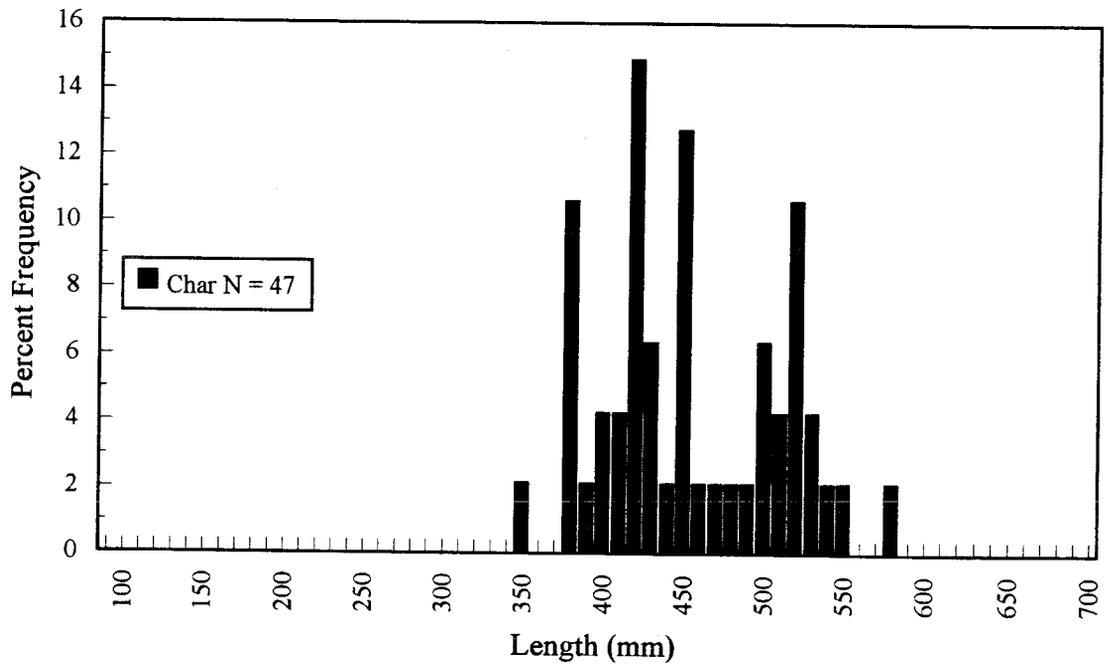


Figure 9. Fork length frequency distribution for char in Trail Creek, Togiak National Wildlife Refuge, Alaska, 1997.



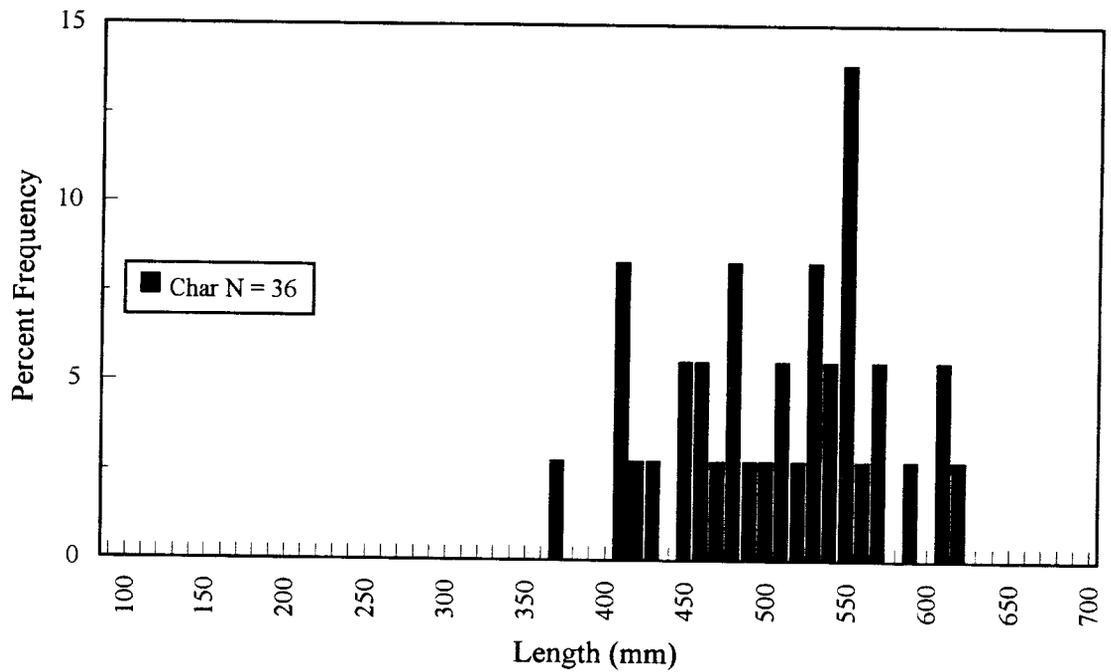
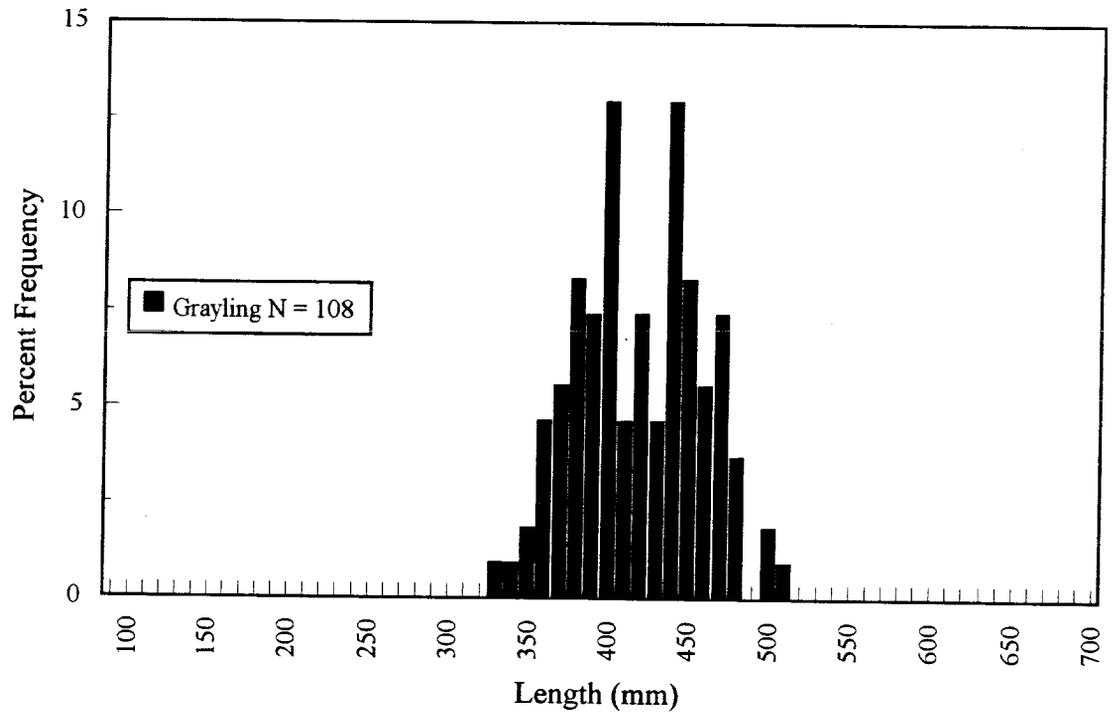


Figure 10. Fork length frequency distribution for grayling and char in the Osviak River, Togiak National Wildlife Refuge, Alaska, 1997.



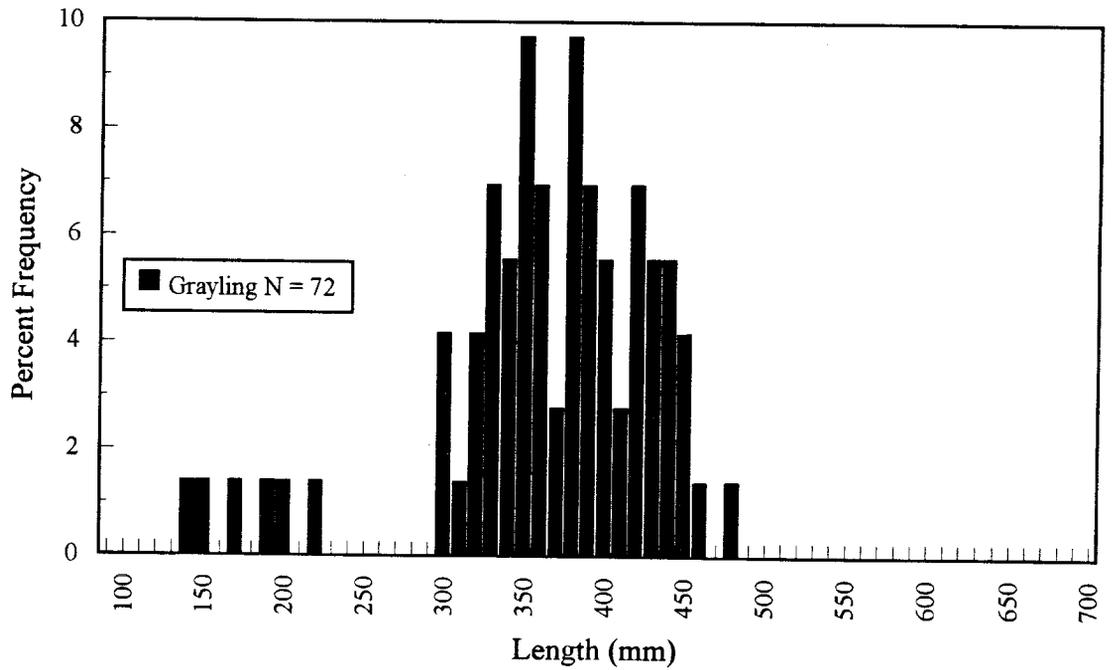
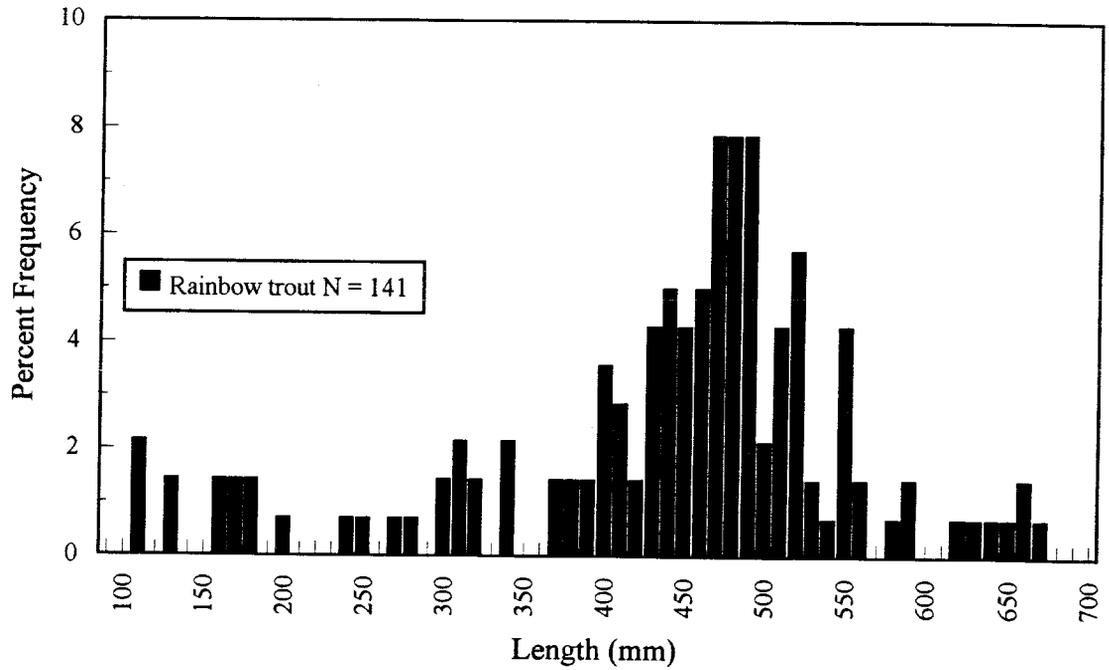


Figure 11. Fork length frequency distribution for rainbow trout and grayling in Pungokepuk Creek, Togiak National Wildlife Refuge, Alaska, 1997.



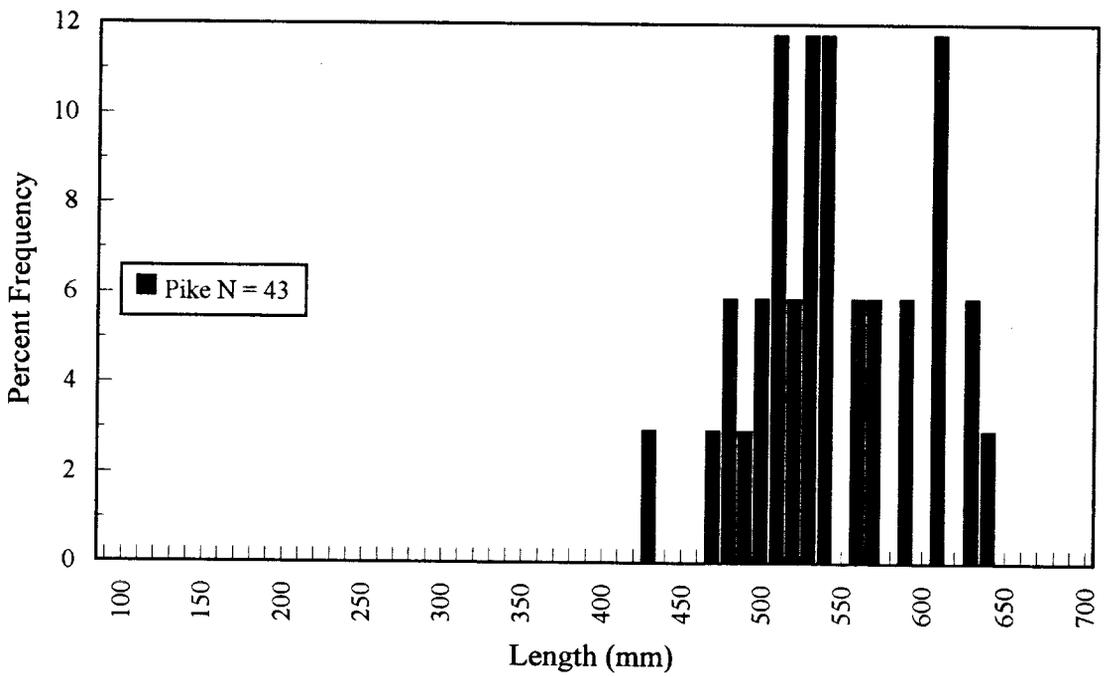
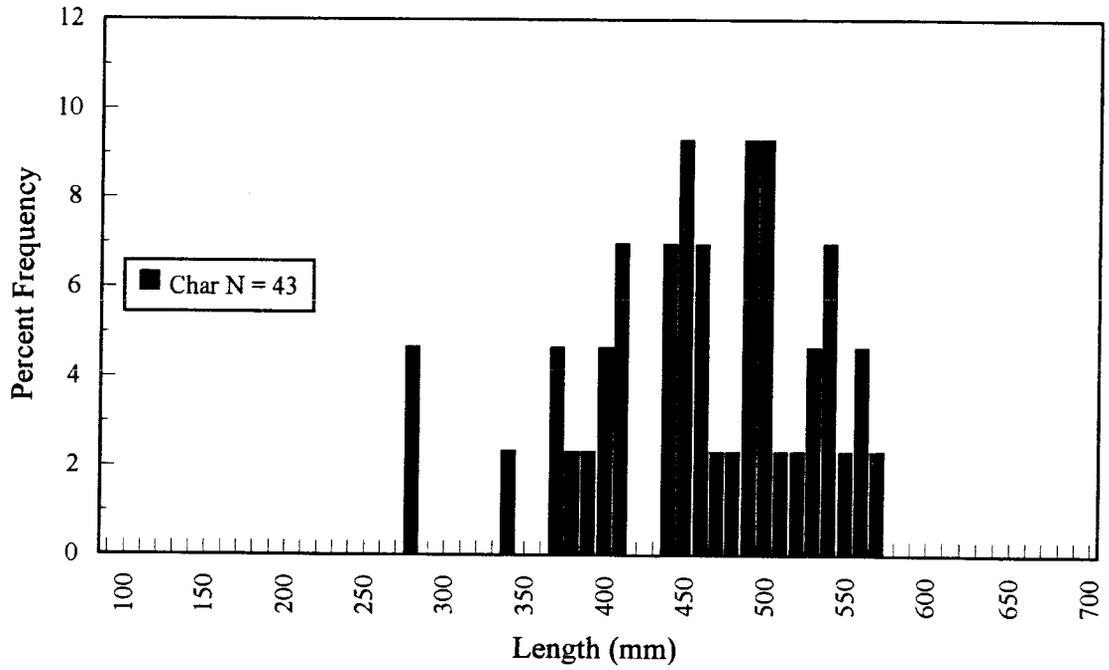


Figure 12. Fork length frequency distribution for char and pike in Pungokepuk Creek, Togiak National Wildlife Refuge, Alaska, 1997.



one tributary to Nushagak Bay (Ongoke River), three first order rivers which drain into Togiak Bay (Kulukak, Matogak and Osviak Rivers), and six tributaries to the Togiak River (Gechiak, Kashaiak, Pungokepuk and Trail Creeks and the Izavieknik and Ongivinuck Rivers). The Kulukak River was primarily surveyed to collect genetic tissue samples from coho salmon, however, resident species were caught. The Matogak River was also surveyed primarily to collect genetic tissue samples from coho salmon, though no resident species were caught. Samples collected incidentally or during other work are reported (Amanka and Kwethluk Pass Lakes and the Goodnews and Togiak Rivers).

The level of effort ranged from 2 to 42 angler days during survey trips (Table 2). Most surveys were conducted as scheduled while some were opportunistic. Descriptions of most rivers surveyed are provided previously (USFWS 1990; USFWS 1991; Lisac and MacDonald 1996; MacDonald 1997b). Additional descriptions are provided by field crew trip reports written after all sampling trips were completed documenting fisheries notes, wildlife notes and observations regarding river characteristics (Refuge files).

Sixteen observations of previously undocumented occurrence of salmon were nominated to update the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes (Appendix B). Surveys of the Ongivinuck, Pungokepuk, and Ualik Lakes, Trail and Pungokepuk Creeks, and the Arolik, Goodnews, and Kinognak Rivers revealed salmon species present that have not previously been documented by ADFG. Chinook salmon were documented in Trail Creek, the Kinognak River and in the Goodnews River upstream of Goodnews Lake. Sockeye salmon were documented in an inlet tributary to Pungokepuk Lake, in three unnamed tributaries to Ualik Lake, and in the Kinognak River. Chum salmon were documented in Trail Creek, the upper Arolik River, and in the Kinognak River. Coho salmon were documented in the inlet tributary to Ongivinuck Lake, an inlet tributary to Pungokepuk Lake, in a tributary to Pungokepuk Creek, the Goodnews River upstream of Goodnews Lake, and the Kinognak River.

## DISCUSSION AND RECOMMENDATIONS

Rainbow trout were found in all but five (Trail Creek and the Izavieknik, Kinognak, Kulukak, and Matogak Rivers) of the tributaries surveyed in 1997. Previous surveys of Trail Creek and the Izavieknik and Matogak Rivers were also unsuccessful in sampling rainbow trout (Lisac and MacDonald 1996; MacDonald 1997b). Rainbow trout sample sizes were large from the Arolik River and from Gechiak and Pungokepuk Creeks. Large sample sizes have been acquired from these waters each of the past years they have been surveyed (Lisac and MacDonald 1995a; Lisac and MacDonald 1996; MacDonald 1997b). This was the first survey of the Kinognak and Kulukak Rivers. It is not known if there is truly a lack of rainbow trout in these drainages or if this is a result of sampling methods or timing. The Kulukak and Matogak Rivers were surveyed for coho salmon genetic tissue collection and the methods did not target capture of rainbow trout.

A survey down the Ongoke River in 1996 did not produce any rainbow trout, however, a



single rainbow trout was sampled on the Ongoke River in 1997. Sample sizes of rainbow trout were also small from Kashaik Creek and the Ongivinuck and Osviak Rivers.

Rainbow trout sampled in 1997 have similar ranges of age and length as previous Refuge collections (Lisac and MacDonald 1995a; Lisac and MacDonald 1996; MacDonald 1997b), and to rainbow trout from tributaries of Kuskokwim Bay (Alt 1977). Only one of the eighteen Osviak River rainbow trout were small (262 mm; the rest were 560 mm or larger) leading us to think there may be another area in the drainage where rainbow trout spawn and reside. Due to the size of these fish the scale patterns were checked to see if it was possible that the fish were anadromous. Scale pattern analysis according to Mosher (1969) did not show this to be the case.

Arctic grayling were found in all but three (the Izavieknik, Kulukak and Matogak Rivers) of the tributaries sampled in 1997. It is not known if grayling are present in these waters or if this is a result of sampling methods or timing. The Matogak and Kulukak Rivers were surveyed to collect genetic tissue and the sampling method did not target grayling. Grayling have been previously caught in the Izavieknik River, but in low numbers (Lisac and MacDonald 1996).

In previous years sample sizes in most tributaries were small and did not indicate a large grayling population. This may have been related to environmental conditions, fishing pressure or sampling techniques. Rainbow trout are the target species during survey trips with grayling and other resident species caught and sampled incidentally which likely reduces the grayling catch. The grayling catch in 1997 was fairly large in six of the tributaries sampled. Sample sizes acquired in the Ongivinuck, Ongoke, and Osviak Rivers were large with 165, 194, and 108 grayling, respectively. Arctic grayling sampled in Refuge drainages in 1997 have similar ranges of age and length as grayling sampled previously (Alt 1977; Lisac and MacDonald 1996; MacDonald 1997b; Refuge files).

Char were caught in each Refuge tributary sampled in 1997 except one. There were no char sampled in the Matogak River in 1997 though 25 were sampled in 1996 (MacDonald 1997b). The Matogak River was surveyed for coho salmon genetic tissue samples and the sampling methods may have hindered sampling char. This supports previous known occurrence and distribution of char throughout Refuge drainages (USFWS 1990), throughout the Togiak River drainage (Lisac and MacDonald 1996; MacDonald 1997b), the Arolik River (Refuge files), and observations made during a survey of tributary lakes conducted from 1987 to 1988 (MacDonald 1996b). Char are sampled opportunistically and due to their normal abundance are avoided for capture in most systems.

All char sampled in 1997 had similar size ranges as the char sampled previously on the Refuge (Lisac and MacDonald 1996; MacDonald 1996b; MacDonald 1997b) and to char sampled in tributaries of the Kuskokwim River (Alt 1977). No comparison of ages can be made between char with other drainages because aging structures were not collected. Scales from char are difficult to use to determine ages and sacrificing the fish to collect otoliths was not a desired objective of this survey.



Northern pike were sampled only in Pungokepuk Creek and Amanka Lake. They are reported to occur in several other tributaries and lakes within the Togiak River drainage (USFWS 1990) but were not found in the other tributary study areas. However, no sampling occurred in the lower Togiak River drainage where numerous unnamed lakes and ponds occur. During a survey of Refuge lakes in 1987 and 1988 (MacDonald 1996b) northern pike were sampled only in Pungokepuk Lake and West Togiak Lake. West Togiak Lake has not been surveyed since then.

Northern pike sampled at the outlet of Pungokepuk Lake in 1997 were slightly larger than pike sampled previously in 1993 and 1995 (Lisac and MacDonald 1996), and in 1988 (MacDonald 1996b) but range of lengths resembled the data collected in 1996. No comparison of length at age can be made between Pungokepuk Creek pike with other drainages because aging structures were not collected. Growth and age determinations from northern pike scales is made very difficult as a result of local conditions, rate of growth, circuli number and presence of several types of false circuli (Scott and Crossman 1973).

Documenting salmon species occurrence during survey trips contributes to keeping ADFG's statewide anadromous fishes database current. Sixteen observations of previously undocumented occurrence of salmon were nominated to update the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes in 1997 and several others have been submitted the past two years.

These surveys continue to establish the baseline distribution of species occurrence throughout the Togiak National Wildlife Refuge in a cost effective manner. Much of this survey effort is accomplished by opportunistic logistics and existing staff. Recommendations for future surveys include: (1) continued sampling throughout the Refuge to replicate age, weight, and length frequencies for resident species; (2) increasing sample sizes for all resident species; (3) establish a protocol to systematically sample char; (4) using radio telemetry to determine if rainbow trout in the tributaries are discrete populations; (5) collection and comparison of multiple aging structures (otoliths, scales and fin rays) to assess the potential of using other non-lethal sampling methods that may provide more reliable age estimates; (6) tagging all fish to determine movements, age, and growth of future recaptured fish; and (7) more effort on educating the public about recaptured fish and reporting their catch.



## ACKNOWLEDGMENTS

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**APPENDIX A - 1997 Sample Sizes and Electronic File Numbers by Species by River.**

<u>Location</u>	<u>Sampling Method</u>	<u>Number of Fish Sampled</u>	<u>RTS Data File Number</u>
<u>Amanka Lake</u>			
Northern pike	hook & line	1	T1130BAA
<u>Arolik River</u>			
Rainbow trout	hook & line	125	V0880BBA
Rainbow trout	minnow trap	4	V0880BCA
Grayling	hook & line	41	V0880BEA
Char	hook & line	23	V0880BDA
Chinook salmon <sup>1</sup>	escapement	3	V0880BAA
Coho salmon	hook & line	80	na
Coho salmon	minnow trap	200	na
<u>Gechiak Creek</u>			
Rainbow trout	hook & line	540	T1400BBA
Rainbow trout	minnow trap	8	T1400BCA
Grayling	hook & line	2	T1400BEA
Char	hook & line	58	T1400BDA
Chinook salmon <sup>1</sup>	escapement	13	T1400BAA
Coho salmon	minnow trap	200	na
<u>North Fork Goodnews River</u>			
Char	hook & line	2	V0040BBA
Chinook salmon <sup>1</sup>	escapement	103	V0040BAA
Coho salmon	minnow trap	300	na
<u>Izavieknik River</u>			
Char	hook & line	125	T1470BAA
<u>Kanektok River</u>			
Rainbow trout	hook & line	1	V0030BBA
Chinook salmon <sup>1</sup>	escapement	275	V0030BAA
<u>Kashaiak Creek</u>			
Rainbow trout	hook & line	19	T1420BAA
Grayling	hook & line	73	T1420BCA
Char	hook & line	78	T1420BBA
<u>Kinegnak River</u>			
Grayling	hook & line	19	V2650BAA
Char	hook & line	45	V2650BBA
<u>Kulukak River</u>			
Char	hook & line	11	T1160BAA
Coho salmon	hook & line	127	na

<sup>1</sup> These samples were collected in 1997 but are reported in MacDonald (1998).



**APPENDIX A - 1997 Sample Sizes and Electronic File Numbers by Species by River.  
(continued)**

<u>Location</u>	<u>Sampling Method</u>	<u>Number of Fish Sampled</u>	<u>RTS Data File Number</u>
<u>Kwethluk Pass Lake</u>			
Grayling	hook & line	2	V2810BBA
Lake trout	hook & line	1	V2810BAA
<u>Matogak River</u>			
Coho salmon	hook & line	100	na
<u>Ongivinuck River</u>			
Rainbow trout	hook & line	16	T1310BBA
Grayling	hook & line	165	T1310BDA
Char	hook & line	161	T1310BCA
Chinook salmon <sup>1</sup>	escapement	5	T1310BAA
Coho salmon	minnow trap	244	na
<u>Ongoke River</u>			
Rainbow trout	hook & line	1	T1500BAA
Grayling	hook & line	194	T1500BCA
Char	hook & line	17	T1500BBA
<u>Osviak River</u>			
Rainbow trout	hook & line	13	T1550BAA
Grayling	hook & line	108	T1550BCA
Char	hook & line	36	T1550BBA
Coho salmon	hook & line	94	na
<u>Pungokepuk Creek</u>			
Rainbow trout	hook & line	141	T1320BBA
Grayling	hook & line	72	T1320BDA
Char	hook & line	43	T1320BCA
Northern pike	hook & line	34	T1320BFA
Whitefish	hook & line	1	T1320BEA
Chinook salmon <sup>1</sup>	escapement	11	T1320BAA
Coho salmon	minnow trap	349	na
<u>Pungokepuk Lake trib</u>			
Coho salmon	minnow trap	190	na
<u>Togiak River</u>			
Char	hook & line	2	T0060BBA
Chinook salmon <sup>1</sup>	escapement	77	T0060BAA
<u>Trail Creek</u>			
Grayling	hook & line	4	T1490BBA
Char	hook & line	47	T1490BAA

<sup>1</sup> These samples were collected in 1997 but are reported in MacDonald (1998).



**APPENDIX B - 1997 Anadromous Stream Catalog Nominations**

Submissions to the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes.

**East Fork Arolik River**

Anadromous Waters Catalog (AWC) Volume: Western Region  
 USGS Quad: Goodnews Bay B-6  
 Anadromous Waters Catalog Number of Waterway: 335-00-10650-2401

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Chum salmon	8/27/97			1	XX

A raft trip down the Arolik River was performed to sample resident fish species for age, weight, and length with hook and line. A single dead chum salmon was observed at 59° 28.33N 161° 07.32W. This species for nomination was observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.

**Goodnews River (Inlet river to Goodnews Lake)**

Anadromous Waters Catalog (AWC) Volume: Western Region  
 USGS Quad: Goodnews Bay C-4  
 Anadromous Waters Catalog Number of Waterway: 335-00-10850

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Coho salmon	10/2/97		300		XX
Chinook salmon	10/2/97		1		XX

Minnnow traps were used in the Goodnews River inlet to Goodnews Lake to collect juvenile coho salmon for fin clips to send to the U.S. Fish and Wildlife Service's Fisheries Genetics Lab for a statewide baseline coho salmon project. A total of 300 rearing coho salmon and 1 chinook salmon juveniles were sampled and released. These salmon species were documented at a location below the Goodnews River confluence with the Igmiumanik River. These species for nomination were observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.



**APPENDIX B - 1997 Anadromous Stream Catalog Nominations (continued)**

Submissions to the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes. (continued)

**Kinegnak River**

Anadromous Waters Catalog (AWC) Volume: Western Region  
 USGS Quad: Hagemeister D-5  
 Anadromous Waters Catalog Number of Waterway: 335-00-11000

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Chum salmon	7/14/97			1	XX
Chinook salmon	7/14/97			1	XX
Sockeye salmon	7/15/97			1	XX
Coho salmon	7/15/97		75		XX

A raft trip down the Kinegnak River was performed to sample resident fish species for age, weight, and length with hook and line. One chum salmon and one chinook salmon were observed at 58° 55.87N, 161° 31.52W, and one sockeye salmon was observed at 58° 54.22N 161° 32.40W. At 58° 57.32N 161° 35.11W minnow traps caught 75 coho salmon juveniles. These species for nomination were observed by Mark Lisac, Fisheries Biologist and submitted to ADFG on 23 November 1997.

**Inlet stream to Ongivinuck Lake**

Anadromous Waters Catalog (AWC) Volume: Southwestern Region  
 USGS Quad: Goodnews Bay C-1  
 Anadromous Waters Catalog Number of Waterway: 326-00-10400-2108

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Coho salmon	8/7/97		65		XX

Minnow traps were used in the inlet stream to Ongivinuck Lake to collect juvenile coho salmon for fin clips to send to the U.S. Fish and Wildlife Service's Fisheries Genetics Lab. A total of 65 rearing coho salmon juveniles were sampled and released. The minnow traps were set up to a location of 59° 34.24N 159° 19.56W. This species for nomination was observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.



**APPENDIX B - 1997 Anadromous Stream Catalog Nominations (continued)**

Submissions to the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes. (continued)

**Unnamed tributary to Pungokepuk Creek**

Anadromous Waters Catalog (AWC) Volume: Southwestern Region  
 USGS Quad: Goodnews Bay B-3  
 Anadromous Waters Catalog Number of Waterway: 326-00-10400-2058-3026

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Coho salmon	9/3/97		220		XX

Minnow traps were used in the first unnamed tributary to Pungokepuk Creek to collect juvenile coho salmon for fin clips to send to the U.S. Fish and Wildlife Service's Fisheries Genetics Lab for a statewide baseline coho salmon project. A total of 220 rearing coho salmon juveniles were sampled and released. The minnow traps were set up to a location of 59° 16.58N 159° 54.43W. This species for nomination was observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.

**Unnamed inlet tributary to Pungokepuk Lake**

Anadromous Waters Catalog (AWC) Volume: Southwestern Region  
 USGS Quad: Goodnews Bay B-3  
 Anadromous Waters Catalog Number of Waterway: No AWC number for this tributary

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Coho salmon	9/4/97		190		XX
Sockeye salmon	9/4/97		1		XX

Minnow traps were used in the inlet tributary to Pungokepuk Lake located in the lake's southwest corner to collect juvenile coho salmon for fin clips to send to the U.S. Fish and Wildlife Service's Fisheries Genetics Lab for a statewide baseline coho salmon project. A total of 190 rearing coho salmon and 1 sockeye salmon juveniles were sampled and released. These fish were sampled at 59° 17.55N 159° 52.48W. These species for nomination were observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.



**APPENDIX B - 1997 Anadromous Stream Catalog Nominations (continued)**

Submissions to the Alaska Department of Fish and Game's Atlas of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes. (continued)

**Trail Creek**

Anadromous Waters Catalog (AWC) Volume: Southwestern Region  
 USGS Quad: Goodnews Bay D-2  
 Anadromous Waters Catalog Number of Waterway: 326-00-10400-2189-3031

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
Chinook salmon	7/14/97			9	XX
Chum salmon	7/15/97			1	XX

A raft trip down Trail Creek was performed to sample resident fish species for age, weight, and length with hook and line. There were 9 chinook salmon holding in a deep pool at 59° 53.77N 159° 41.82W. One chum salmon was observed at 59° 49.98N 159° 34.44W. These species for nomination were observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.

**Unnamed tributaries to Ualik Lake**

Anadromous Waters Catalog (AWC) Volume: Southwestern Region  
 USGS Quad: Goodnews Bay A-2  
 Anadromous Waters Catalog Number of Waterway: No AWC number for this tributary

Species	Date (s) Observed	Spawning	Rearing	Migration	Anadromous
1 - Sockeye salmon	7/10/97		200		XX
2 - Sockeye salmon	7/10/97		150		XX
3 - Sockeye salmon	7/10/97		30		XX

An inflatable Zodiac raft was used on Ualik Lake to collect various physical, biological, and chemical parameters for a lake survey project. Sockeye salmon were observed migrating up 3 tributaries to Ualik Lake. Tributary #1 is at 59° 07.37N 159° 27.52W, Tributary #2 is at 59° 06.48N 159° 29.01W, and Tributary #3 is at 59° 03.56N 159° 28.33W. These species for nomination were observed by Rob MacDonald, Fisheries Biological Technician and submitted to ADFG on 23 November 1997.

