ANADROMOUS WATERS CATALOG/ATLAS
CORRECTION FORM

CORRECTION TO: ATLAS X CATALOG _____

REGION: SOUTH WEST

MAP: ILLIAMNA C-3 D-2, D-3,

WATERWAY NUMBER: 324-10-10150-2402 & ALL TRIBS.

DESCRIBE CHANGE(S): CHANGE ARCTIC CHAR DESIGNATION TO DOLLY VARDEN ON ILIAMNA RIVER & ALL TRIBUTARIES.

CHANGE REQUESTED BY: Ed Jennings 6/7/01 DATE

DRAFTED/DIGITIZED BY: Carol Kaufmann 12/3/01 DATE

REVISION CODE: E-7

NOMINATION NUMBER: 01 242

** ATTACH THIS FORM TO EXISTING NOMINATION FORM IN THE FILE **

(Rev. 4/96)

Ed Weiss

From: Dan Dunaway [dan_dunaway@fishgame.state.ak.us]
Sent: Thursday, June 07, 2001 9:28 AM
To: 'Mike Jaenicke'; 'Jason E Dye'; 'Craig J. Schwanke'; 'Robert E Minard'
Cc: 'Edward W Weiss'; 'Meldrum, Janis NPS'
Subject: RE: Dolly Varden in Iliamna River

As Mike says, I never made it over to Iliamna River. I defer to all others.

Ed, is this related to inquiries from the National Park Service, regarding species distribution in the Katmai Park and Preserve? I had a long talk with a Jennifer ?? of NPS and suggested she look into our Anadromous Stream Catalog.

-----Original Message-----
From: Mike Jaenicke [mailto:mike_jaenicke@fishgame.state.ak.us]
Sent: Thursday, June 07, 2001 8:57 AM
To: Dan O Dunaway; Jason E Dye; Craig J. Schwanke; Robert E Minard
Cc: Edward W Weiss
Subject: FW: Dolly Varden in Iliamna River

Hello Dan, Jason, Craig, and Mac,

I'm not sure if there genetic samples (e.g., fin clips) were ever taken from the char on Iliamna River. However, I do know that based on my personal experience with seeing and identifying char (Dolly Varden and Arctic char) on the Naknek River, Wood River, Agulowak River, Ugashik Narrows, Kvichak River, and Iliamna River, as well as catching the Dolly Varden over here in Southeast and bull trout in British Columbia, that those char in the Iliamna River were Dolly Varden (key indicators: thick caudal peduncle, thick bodies instead of thin, no yellowish coloration on belly, pink spots on back with white halos) and not Arctic char.

However, I think it best that one of you folks (Dan, Jason, Craig, or Mac) contact Ed Weiss regarding this subject. Jason and Craig spent far more time than I on the Iliamna River, so their insight on this particular subject will probably be more helpful to Ed. I know Mac was over there as well a few times for re-supply/help with sampling missions, so he probably has some insight as well. I'm not sure if Dan made it out to the Iliamna River during the two-year project, but with his many years as Assistant Area Biologist and now Area Biologist for Southwest Alaska (a.k.a., Land of Anglers Paradise) he will also have information on this matter.

Cheers,
Mike Jaenicke
Fisheries Biologist
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-----Original Message-----
From: Ed Weiss [mailto:ed_weiss@fishgame.state.ak.us]
Sent: Wednesday, June 06, 2001 5:07 PM
To: Mike J Jaenicke
Cc: Steve P Morstad
Subject: Dolly Varden in Iliamna River

Mike, I read through your Fisheries Data Series Report No. 99-25 on the Dolly Varden and Rainbow Trout Populations in the Iliamna River. Currently in the AWC we have the anadromous char in the Iliamna listed as Arctic Char. Did you come up with any data that would confirm that we should change our anadromous Arctic Char designations on the Iliamna to anadromous Dolly Varden?

Edward W. Weiss
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6/7/01

Fishery Data Series No. 99-25

Survey of the Dolly Varden and Rainbow Trout Populations in the Iliamna River, 1996 and 1997

by

Michael J. Jaenicke

October 1999

Alaska Department of Fish and Game

Division of Sport Fish

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used in Division of Sport Fish Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications without definition. All others must be defined in the text at first mention, as well as in the titles or footnotes of tables and in figures or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
metric ton	mt
milliliter	ml
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
ounce	oz
pound	lb
quart	qt
yard	yd

Spell out acre and ton.

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
hour (spell out for 24-hour clock)	h
minute	min
second	s

Spell out year, month, and week.

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.
All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.
and	&
at	@
Compass directions:	
east	E
north	N
south	S
west	W
Copyright	©
Corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
et alii (and other people)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.,
id est (that is)	i.e.,
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
number (before a number)	# (e.g., #10)
pounds (after a number)	# (e.g., 10#)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)

Mathematics, statistics, fisheries

alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	F, t, χ^2, etc.
confidence interval	C.I.
correlation coefficient	R (multiple)
correlation coefficient	r (simple)
covariance	cov
degree (angular or temperature)	°
degrees of freedom	df
divided by	÷ or / (in equations)
equals	=
expected value	E
fork length	FL
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
mideye-to-fork	MEF
minute (angular)	'
multiplied by	x
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
standard length	SL
total length	TL
variance	Var

FISHERY DATA SERIES NO. 99-25

SURVEY OF THE DOLLY VARDEN AND RAINBOW TROUT POPULATIONS IN THE ILIAMNA RIVER, 1996 AND 1997

by

Michael J. Jaenicke,
Division of Sport Fish, Dillingham

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
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October 1999

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The Fishery Data Series was established in 1987 for the publication of technically-oriented results for a single project or group of closely related projects. Fishery Data Series reports are intended for fishery and other technical professionals. Distribution is to state and local publication distribution centers, libraries and individuals and, on request, to other libraries, agencies, and individuals. This publication has undergone editorial and peer review.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Baseline biological data for Dolly Varden and rainbow trout in the Iliamna River were collected during mid-July through late August of 1996 and 1997. The most effective sampling gear was hook and line. Hoop nets were only marginally successful and beach seining did not work effectively in the generally shallow, rapid water of the Iliamna River. More Dolly Varden were captured and sampled in 1997 (n = 361) than in 1996 (n = 126). The mean length and weight of Dolly Varden sampled in 1996 was 477 mm (SE = 7) and 1,458 g (SE = 64), respectively; in 1997, mean length was 532 mm (SE = 30) and mean weight was 1,828 g (SE = 30). The mean length and weight of rainbow trout sampled in 1996 was 439 mm (SE = 12) and 1,128 g (SE = 92), respectively, with a modal age of 7 years. The mean length and weight of rainbow trout sampled in 1997 was 478 mm (SE = 9) and 1,543 g (SE = 84), respectively, and the modal ages were 5 and 6 years old. Visual surveys provided an index of abundance of Dolly Varden in the navigable section of the Iliamna River: 380 Dolly Varden in 1996 and 272 Dolly Varden in 1997. These indices obviously underestimated the total abundance. A survey conducted in April 1997 of residents of the Pedro Bay community indicated that no subsistence harvest of Dolly Varden in the Iliamna River occurred during 1 April 1996 to 31 March 1997.

Key words: Dolly Varden, *Salvelinus malma*, rainbow trout, *Oncorhynchus mykiss*, biological composition, visual survey index, subsistence survey, Iliamna River, Southwest Alaska.

INTRODUCTION

Resident sport fish species, such as Dolly Varden *Salvelinus malma*, Arctic char *S. alpinus*, and rainbow trout *Oncorhynchus mykiss*, provide excellent sport fishing opportunities for anglers in the drainages of Southwest Alaska (Mills 1982-1994, Howe et al. 1995-1996). One location which historically had, according to local inhabitants (Karl Jensen, Pedro Bay Native Corporation member, Pedro Bay, Alaska, personal communication; and Ted Gerkin, owner of Iliaska Lodge, Iliamna, Alaska, personal communication), large and abundant populations of char and rainbow trout, was the Iliamna River, located on the east end of Lake Iliamna (Figure 1). Public concern for the apparent decreasing abundance of char in the Iliamna River was first expressed to the department in 1994 (Minard 1995). Growing public and department concern about a possible decline in abundance of Arctic char/Dolly Varden in the Iliamna River prompted the department to issue emergency orders in 1996 and 1997 to reduce bag and possession limits to zero, essentially creating a catch-and-release fishery. At the Alaska Board of Fisheries meeting in November 1997, a proposal to manage the char fishery in the Iliamna River as a catch-and-release fishery was adopted as a codified sport fish regulation.

Very little information is available on the Dolly Varden/Arctic char or rainbow trout in the Iliamna River. A few length, weight, and scale samples were collected from rainbow trout in 1969 (n = 10), 1970 (n = 5), and 1971 (n = 1), but no population estimates of either char or rainbow trout in the Iliamna River exists. Anecdotal information (Karl Jensen, Pedro Bay Native Corporation member, Pedro Bay, Alaska, personal communication) suggests that char populations were once in the thousands of fish. To gather information on the current status of the char population in the Iliamna River, this project was conducted from mid-July to late August during 1996 and 1997.

Some residents of the Lake Iliamna area believe the char in the Iliamna River are Arctic char. However, the morphological characteristics and spawning coloration of the char captured and sampled by the field crews in 1996 and 1997 indicated that these char were Dolly Varden. Henceforth, in this report, the char sampled at Iliamna River will be referred to as Dolly Varden.

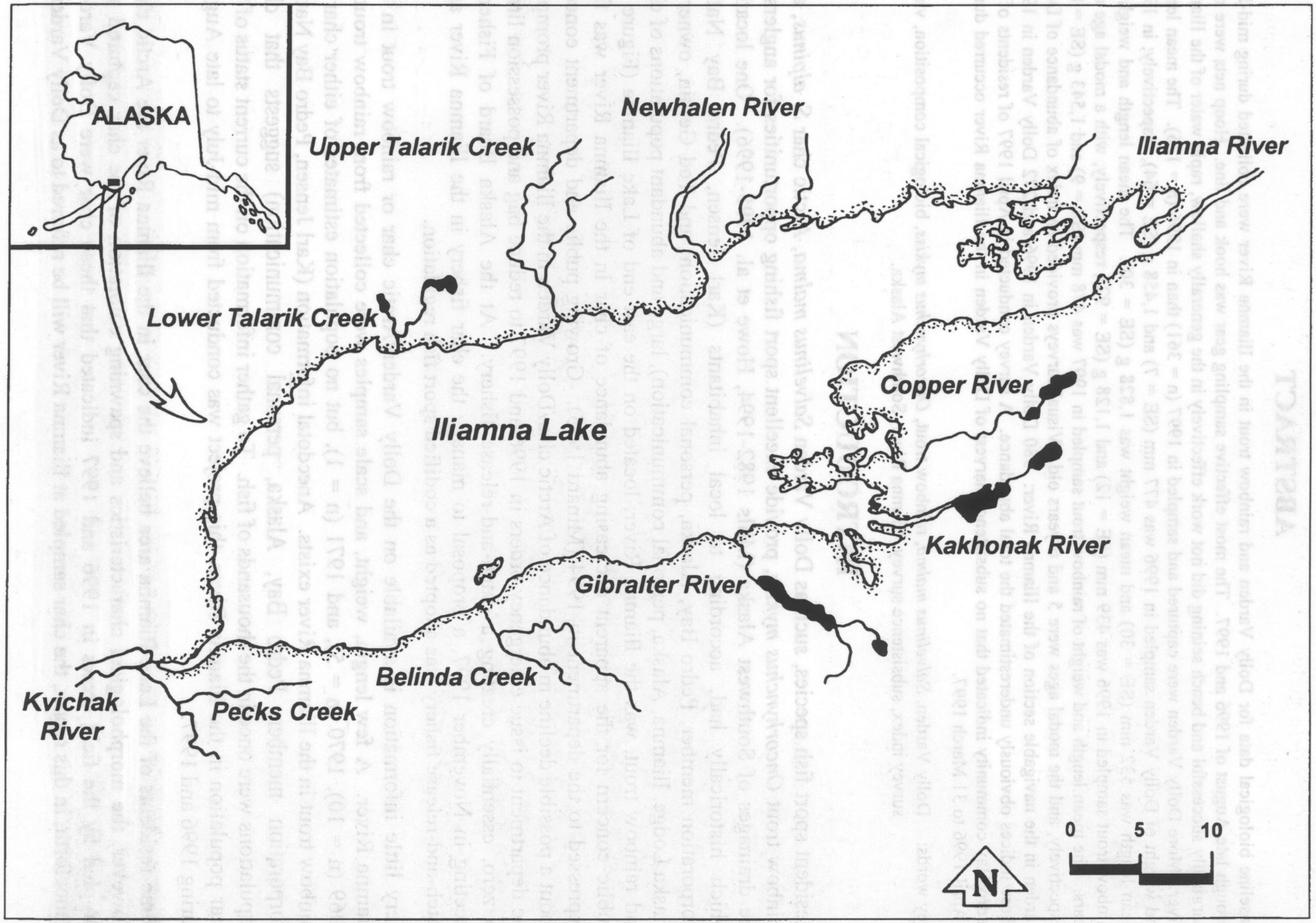


Figure 1.-Map of Iliamna Lake area.

Objectives of this field study were two-fold. The primary objective was to collect information on the length and weight composition of Dolly Varden and length, weight, and age composition of rainbow trout in the Iliamna River during July through August, 1996 and 1997. Additionally, visual surveys were conducted to provide an index of abundance of Dolly Varden in the Iliamna River during the same time period.

In addition to this field project, personnel from the Alaska Department of Fish and Game (ADF&G), Division of Subsistence conducted a subsistence survey in the village of Pedro Bay during April 1997. The objective of the subsistence survey was to estimate the harvest and use of various fish species, such as Dolly Varden, by the community of Pedro Bay during 1 April 1996 to 31 March 1997 (Kenner et al. *In press*).

METHODS

STUDY AREA

The Iliamna River drainage is located on the extreme eastern section of Lake Iliamna (Figure 1). The mouth of the Iliamna River, where it flows into Lake Iliamna, is approximately 3 miles west of the community of Pile Bay (Figure 2). Although the Iliamna River is approximately 28 miles in length, only the lower 15 miles of the river were accessible by riverboat during 1996 and 1997 due to low water levels (Figure 2). The upper end of the survey area on the Iliamna River was characterized by a wide, open flood plain area with a relatively steep gradient, large cobble substrate, and shallow water (approximately 6 inches deep). The old main channel of the Iliamna River is evident in this area, as there is a large cobble field that extends away from the river to the southwest.

The field crew used an 18-foot Sea Nymph flatbottom riverboat with a 40 horsepower Yamaha jet motor. The 2 to 3 person crew was housed at a closed-down sport fishing lodge located approximately 2.25 miles upstream from the mouth of the Iliamna River (Figure 2). The 1996 field season was conducted during 21 July to 27 August. The 1997 field season was conducted during 20 July to 23 August.

BIOLOGICAL COMPOSITION

The field technicians attempted to capture fish with three gear types: hook and line, hoop nets, and beach seines. Fish captured with hook-and-line gear were collected from either sport anglers on the river (hereafter referred to as "sport fish hook and line") or caught by the field technicians while they were actively fishing to collect samples (hereafter referred to as "test fish hook and line"). The hoop net traps were approximately 2 m in length when the spreader bars were attached, 0.5 m in diameter, and had dark-colored 1.5 inch stretch mesh. Hoop traps were baited with salmon roe. The beach seine was approximately 50 m in length, 2.5 m in depth, and had 1.5 inch stretch mesh. Sample effort was distributed throughout the navigable portion of the Iliamna River to avoid concentrating sample effort on only a few distinct locations. This improved chances that fish susceptible to capture by the respective gear have an equal probability of capture and that a representative sample of fish was captured.

All captured Dolly Varden and rainbow trout were measured to the nearest millimeter and weighed to the nearest 50 grams. All captured fish were examined for presence of tags, finclips, and tag scars. Sex could not be accurately determined from external characteristics for either

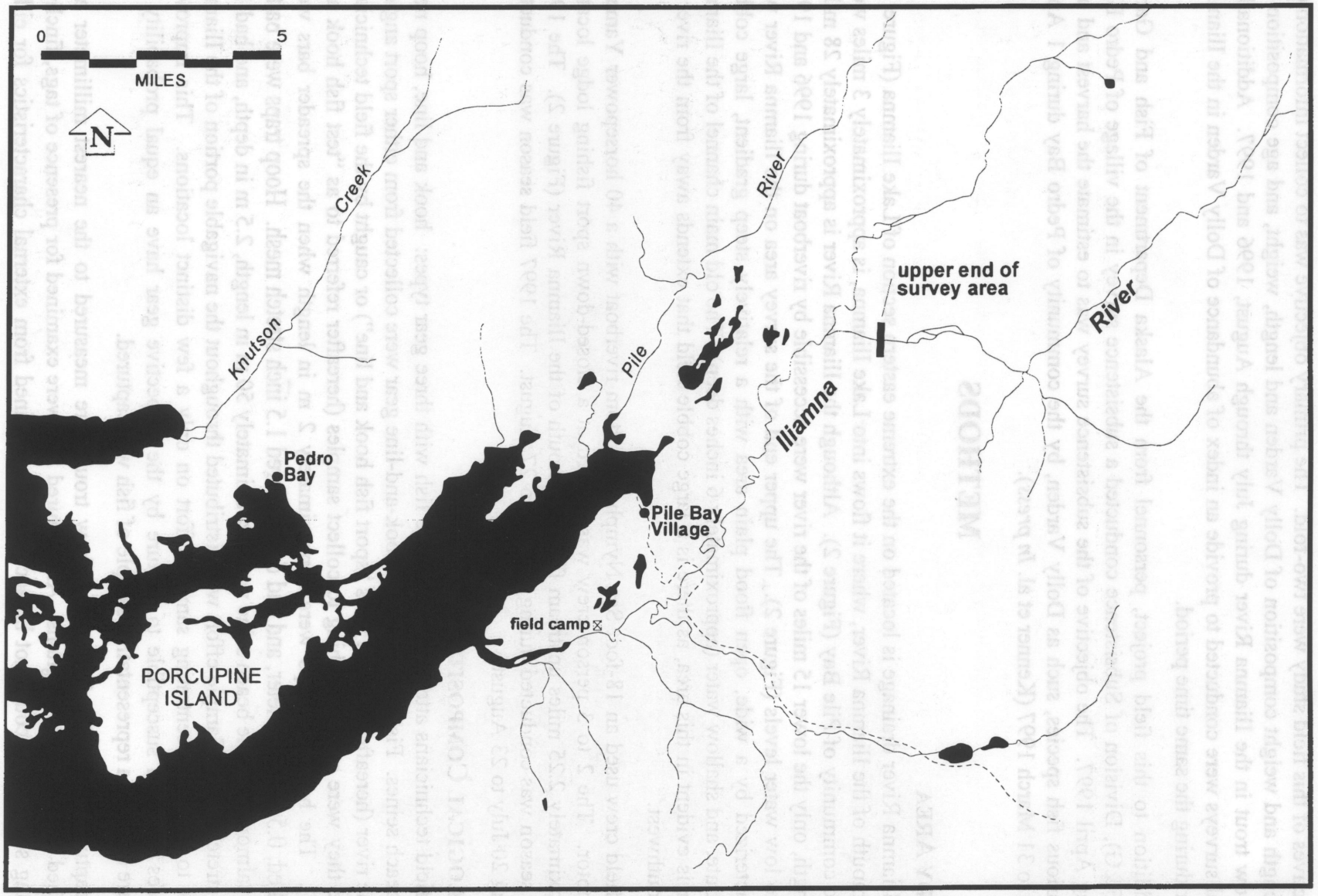


Figure 2.-Map of Iliamna River study area.

species during summer. Otoliths were not taken to determine Dolly Varden ages because that would have required sacrificing fish. For age determination of rainbow trout, a scale smear of 10 to 15 scales was taken from captured rainbow trout from the preferred area (Alvord 1954, Maher and Larkin 1955) to maximize the chances of obtaining non-regenerated scales. Scales were placed inside coin envelopes. Dolly Varden captured during both years and rainbow trout larger than 200 mm captured in 1997 that were robust and healthy (e. g., not lethargic, no gaping wounds or scars, no gill bleeding) were tagged with a numbered Floy anchor tag. After sampling and tagging, all fish were released unharmed. The location of capture (river section) was recorded in 1997, but not during 1996.

At the end of the field season, scale smears from rainbow trout were sorted under a microscope and the three or four best scales mounted on adhesive-coated cards. The mounted scales were pressed against acetate cards in a heated hydraulic press and the resulting scale impressions displayed on a microfiche projector for age determination (Jerald 1983). Utilizing the procedure described by Coggins (1994), the scale impressions were read three separate times, and only those readings which had at least two out of the three age determinations matching were considered as a known age. The occurrence of aging error; i.e., no modal ages, regenerated scales, inverted scales, or missing scales, was recorded.

Data on captured fish were recorded either on write-in-the-rain field notebooks for Dolly Varden or on the scale coin envelopes for rainbow trout. At the end of each day, the data recorded on the notebooks or envelopes were transferred to Age-Weight-Length (AWL) mark-sense forms (Heineman 1991). Separate mark-sense forms were used for each species and gear type (e.g., Dolly Varden caught in hoop net traps, Dolly Varden caught on hook-and-line gear in the sport fishery, etc.). The field crew maintained a daily tally of the number of Dolly Varden and rainbow trout caught and sampled, and noted the hours worked and any equipment problems.

VISUAL SURVEY INDEX

At least 1 day each week the field crew traveled the entire study area and visually counted Dolly Varden. The visual survey index began near the mouth of the river, and continued on up to the farthest point in the river that was reachable with the riverboat. Each visual survey took approximately 1 to 1.5 hours to complete. The ideal survey conditions are clear water and a partly cloudy day with no wind to disrupt the water surface (Jaenicke 1997). The water clarity of the Iliamna River was usually excellent, except during periods of flooding.

Each survey was done from a slowly moving boat to minimize disruption and movement of fish. A tally whacker was used to record the number of fish counted while traveling upriver. The crew wore polarized glasses to assist in observing fish in the river. Dolly Varden that moved in the direction of travel of the boat were not counted to minimize the chance of double counting fish. The visual survey index represents the number of fish observed during the upstream survey that could be identified as a Dolly Varden. While both rainbow trout and Dolly Varden were present and both species have greenish coloration on their dorsal side, the Dolly Varden's lighter green/grayish coloration was easily distinguished from the darker green coloration of the rainbow trout.

Counts were biased low because all Dolly Varden were not seen during a survey. Therefore, counts are only an index of abundance. The number of Dolly Varden counted during each visual

survey index was recorded in a field notebook, along with the date, start and end time, weather conditions, and any additional comments.

SUBSISTENCE SURVEY

Personnel from the Division of Subsistence visited Pedro Bay in November 1996 to present the proposed survey to community residents, obtain village council approval, and conduct preliminary interviews with several community residents. The household surveys were conducted during 15 April to 19 April 1997 (Kenner et al. *In press*).

DATA ANALYSIS

BIOLOGICAL COMPOSITION

Mean length and weight and their associated variances were estimated using normal procedures. The proportion of Dolly Varden and rainbow trout of each weight or length class (p_i), and their associated variances, were estimated as a binomial proportion by (Cochran 1977):

$$\hat{p}_i = \frac{c_i}{c}, \tag{1}$$

and

$$\hat{V}(\hat{p}_i) = \frac{\hat{p}_i(1-\hat{p}_i)}{c-1}, \tag{2}$$

where:

c_i = number of fish in weight or length class i, and

c = total number of fish sampled.

A Kolmogorov-Smirnov test (test statistic = D, Sokal and Rohlf 1981) or an Anderson-Darling k-sample test (test statistic = T_{akn}, Scholz and Stephens 1987), at a significance level of $\alpha = 0.05$, was used to test the null hypotheses that the length distributions of sampled Dolly Varden and rainbow trout did not differ over time by gear type and between captured versus recaptured fish. These tests were conducted separately for each year. To detect change over time, the data were divided into 2 groups of equal, or nearly equal, numbers of fish sampled. If no difference was detected by these series of tests, then the sample should provide unbiased estimates of the length and probably the age distribution of the catchable population. If the length distributions were different between the groups, then the data were poststratified. Visual inspection of plots of the cumulative length frequency was also conducted to evaluate differences in length distributions.

Computer files and software used to produce this report are listed in Appendix B1.

VISUAL SURVEY INDEX

The number of Dolly Varden observed during a visual survey was used as an index of abundance of Dolly Varden in the Iliamna River. On days when two visual surveys were conducted, mean number of Dolly Varden counted was estimated using normal procedures.

RESULTS

BIOLOGICAL COMPOSITION

Hook and line was the most effective gear for capturing Dolly Varden and rainbow trout during both 1996 and 1997 (Tables 1 and 2, Appendices A1 and A2). Beach seining was attempted during both years, but proved inefficient for this particular river system and with the number of field crew present. Hoop net gear had only marginal success during both years.

Dolly Varden Biological Data

Tests for differences in length composition over time were only possible for the hook-and-line samples. The inadequate sample size precluded testing of samples obtained by other capture methods (Table 1).

Table 1.-Number of Dolly Varden sampled in the Iliamna River using various gear (test fish hook and line, sport fish hook and line, hoop nets, and beach seine) in 1996 and 1997.

Sampling Gear	Total Captures	Tagged	Recaptured
1996			
Hook-and-line Test Fisheries	110	104	6
Hook-and-line Sport Fisheries	11	11	0
Hoop Nets	11	10 [a]	0
Beach Seine	0	0	0
Total	132	125	6
1997			
Hook-and-line Test Fisheries	407	320 [b]	77 [c]
Hook-and-line Sport Fisheries	29	27 [d]	2 [e]
Hoop Nets	0	0	0
Beach Seine	0	0	0
Total	436	347	79

[a] One Dolly Varden captured and sampled, was not tagged due to poor condition of the fish.

[b] An additional 14 char tagged in 1996 were caught in 1997, but not retagged.

[c] Recapture of fish tagged in 1996: 14 unique fish, one recaptured twice in 1997. Recapture of fish tagged in 1997: 63 unique fish; 54 recaptured once, 8 recaptured twice, and 1 recaptured three times.

[d] An additional Dolly Varden tagged in 1996 was caught in 1997, but not retagged.

[e] Recapture of fish tagged in 1996: one unique fish recaptured once. Recapture of fish tagged in 1997: one unique fish recaptured once.

Table 2.-Number of rainbow trout sampled in the Iliamna River using various gear (test fish hook and line, sport fish hook and line, hoop nets, and beach seine) in 1996 and 1997.

Sampling Gear	Total Captures	Tagged	Recaptured
1996			
Hook-and-line Test Fisheries	42	0 [a]	1 [b]
Hook-and-line Sport Fisheries	0	0	0
Hoop Nets	3	0 [a]	0
Beach Seine	0	0	0
Total	45	0 [a]	1 [b]
1997			
Hook-and-line Test Fisheries	79	73 [c]	5 [d]
Hook-and-line Sport Fisheries	6	5	1 [e]
Hoop Nets	0	0	0
Beach Seine	0	0	0
Total	85	78 [c]	6

[a] Rainbow trout captured and sampled during 1996 were not Floy tagged.

[b] A rainbow trout originally Floy tagged at Igiugig in April 1994 was recaptured at the Iliamna River in August 1996.

[c] One additional rainbow trout was captured and sampled, but the fish escaped before it could be tagged.

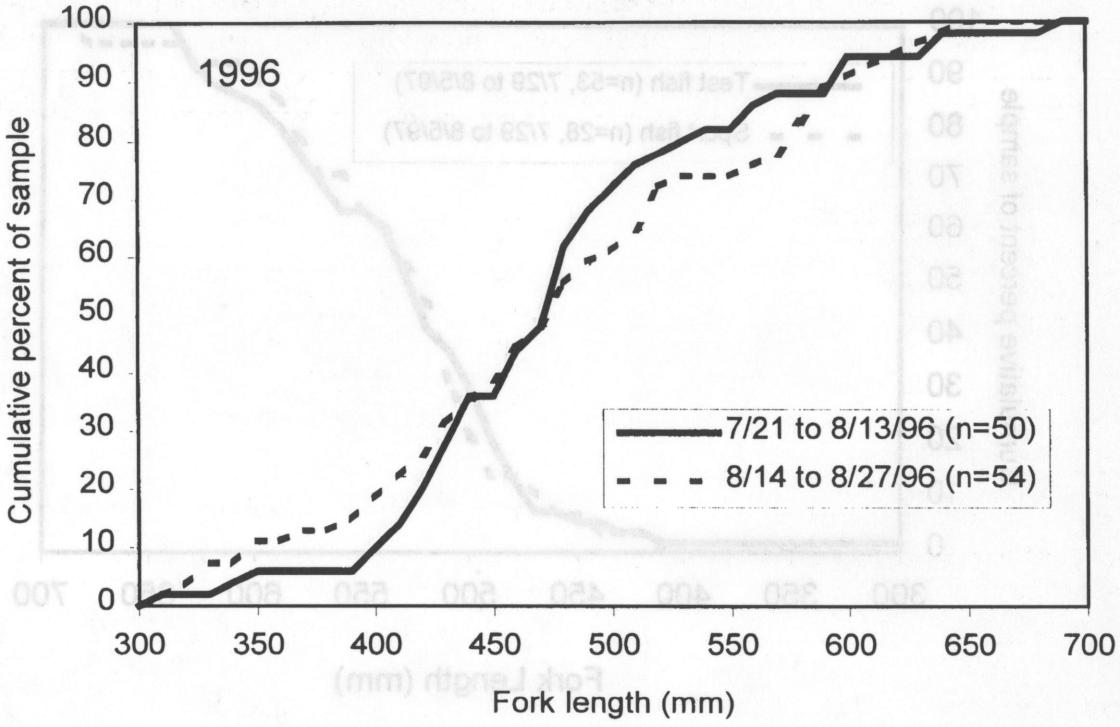
[d] Five unique rainbow trout tagged in 1997 were recaptured once in the 1997 test fishery.

[e] One unique rainbow trout tagged in 1997 recaptured once in the 1997 sport fishery.

No significant temporal change in length distribution of the Dolly Varden from the test fish hook-and-line sampling was observed in either 1996 ($D = 01.2$, $n_1 = 50$, $n_2 = 54$, $P = 0.39$) or 1997 ($D = 0.11$, $n_1 = 165$, $n_2 = 169$, $P = 0.12$). The visual inspection of the plots of the cumulative length distribution for 1996 and 1997 (Figure 3) also indicates similar distributions.

In 1997, there was no significant difference in the length distribution of test fish versus sport fish hook-and-line samples during the same temporal period of 29 July to 5 August ($D = 0.12$, $n_1 = 53$, $n_2 = 28$, $P = 0.45$). The visual inspection of the cumulative length distribution (Figure 4) also indicates that the size distributions of fish sampled in the test and sport fisheries were nearly identical.

In 1997, there was no significant difference in length distribution of initially captured fish versus recaptured fish (Figure 5, $D = 0.07$, $n_1 = 361$, $n_2 = 64$, $P = 0.48$).



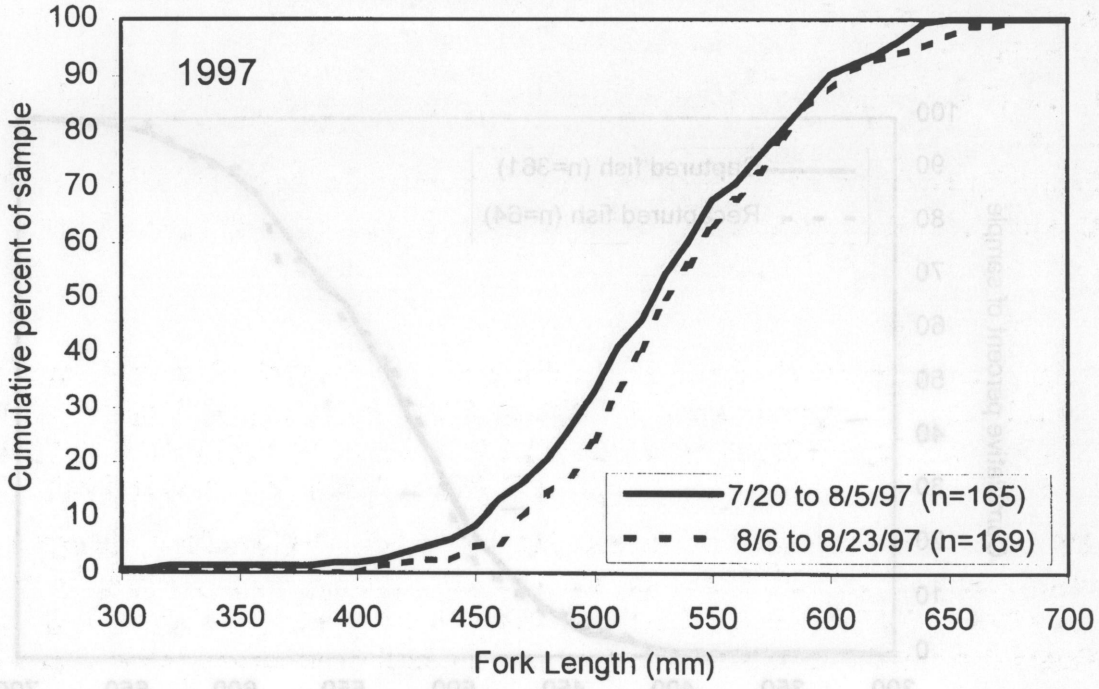


Figure 3.-Cumulative length frequency of Dolly Varden sampled with test fish hook-and-line gear in the Iliamna River during 1996 and 1997, with length data partitioned into two temporal groups to test for differences in length composition over time.

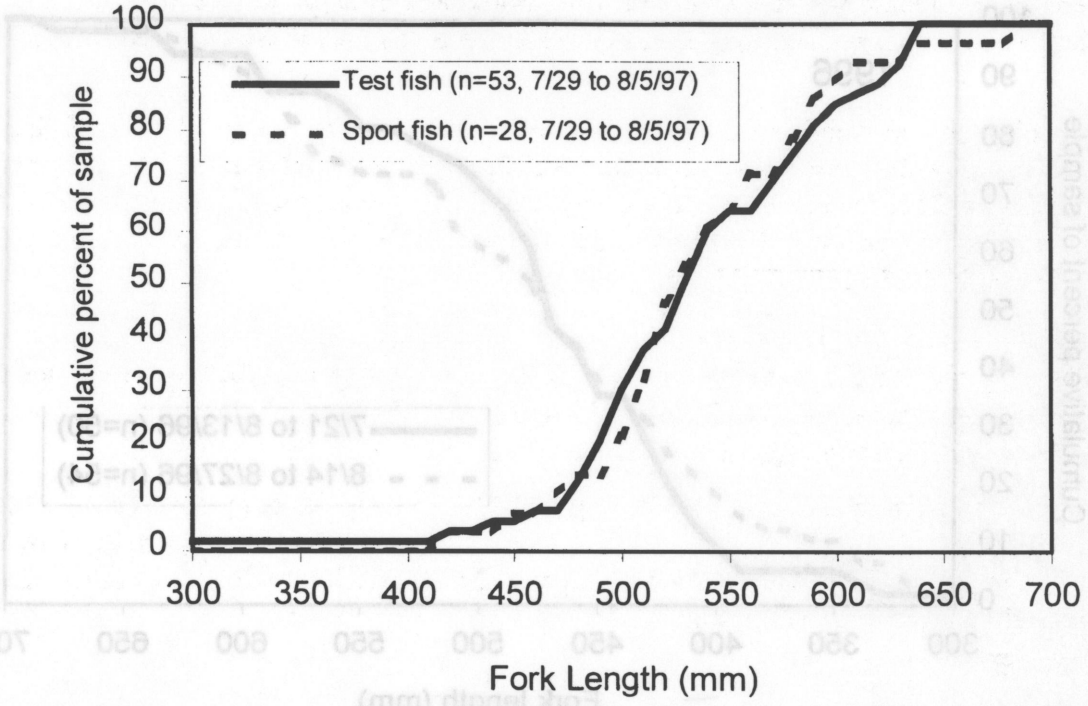


Figure 4.-Cumulative length frequency of Dolly Varden sampled with test fish hook and line and sport fish hook and line in the Iliamna River, 1997.

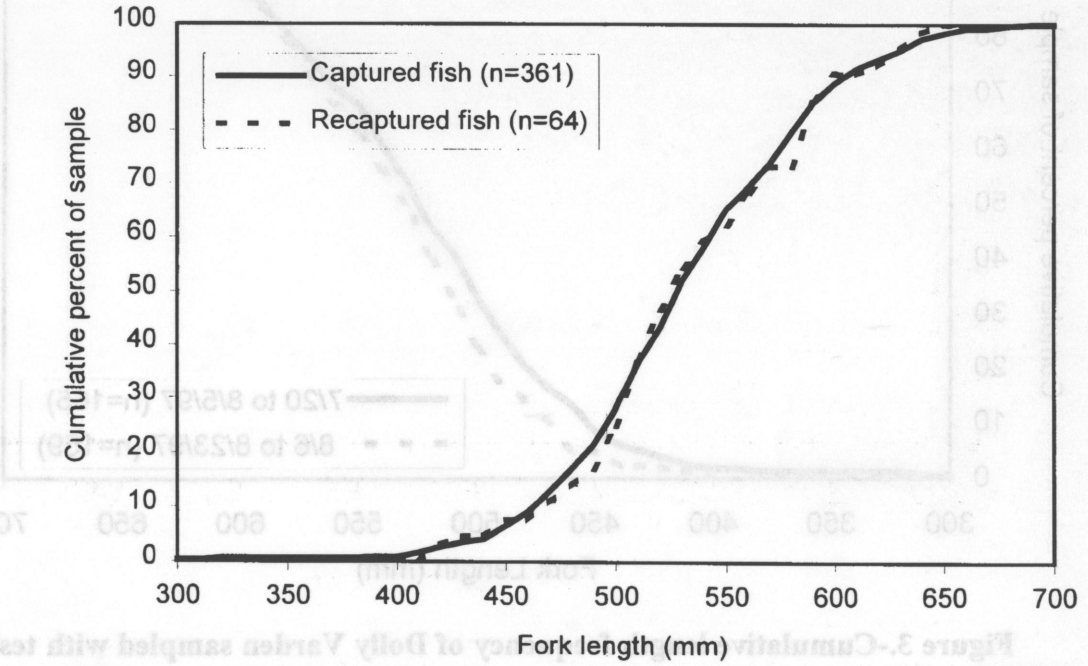


Figure 5.-Cumulative length frequency of Dolly Varden in 1997 that were initially captured versus recaptured later in the season.

The lengths of Dolly Varden captured with hook and line in the 1997 test fishery were significantly larger (D = 0.42, n_1 = 104, n_2 = 334, P = 0.45) than those captured in 1996 (Figure 6).

The mean length and weight of the Dolly Varden captured in the test fish hook-and-line fishery were 477 mm (n = 104, SE = 104, minimum = 302, maximum = 687) and 1,461 g (n = 94, SE = 70, minimum = 350, maximum = 3,200), respectively, in 1996, and 531 mm (n = 334, SE = 3, minimum = 294, maximum = 674) and 1,839 g (n = 333, SE = 32, minimum = 333, maximum = 4,400), respectively, in 1997 (Table 3).

Rainbow Trout Biological Data

The vast majority of the rainbow trout (93% in both 1996 and 1997) were captured in the hook-and-line test fishery (Table 2). As with the Dolly Varden, only hook-and-line test fishery data provides sufficient samples to test differences in length distribution by time.

The rainbow trout sampled in the test fishery in 1996 were significantly smaller (D = 0.40, n_1 = 20, n_2 = 22, P = 0.02) during the latter part of August than early August (Figure 7). However, no significant temporal difference (D = 0.16, n_1 = 37, n_2 = 37, P = 0.26) was observed with the length distribution in 1997 (Figure 7).

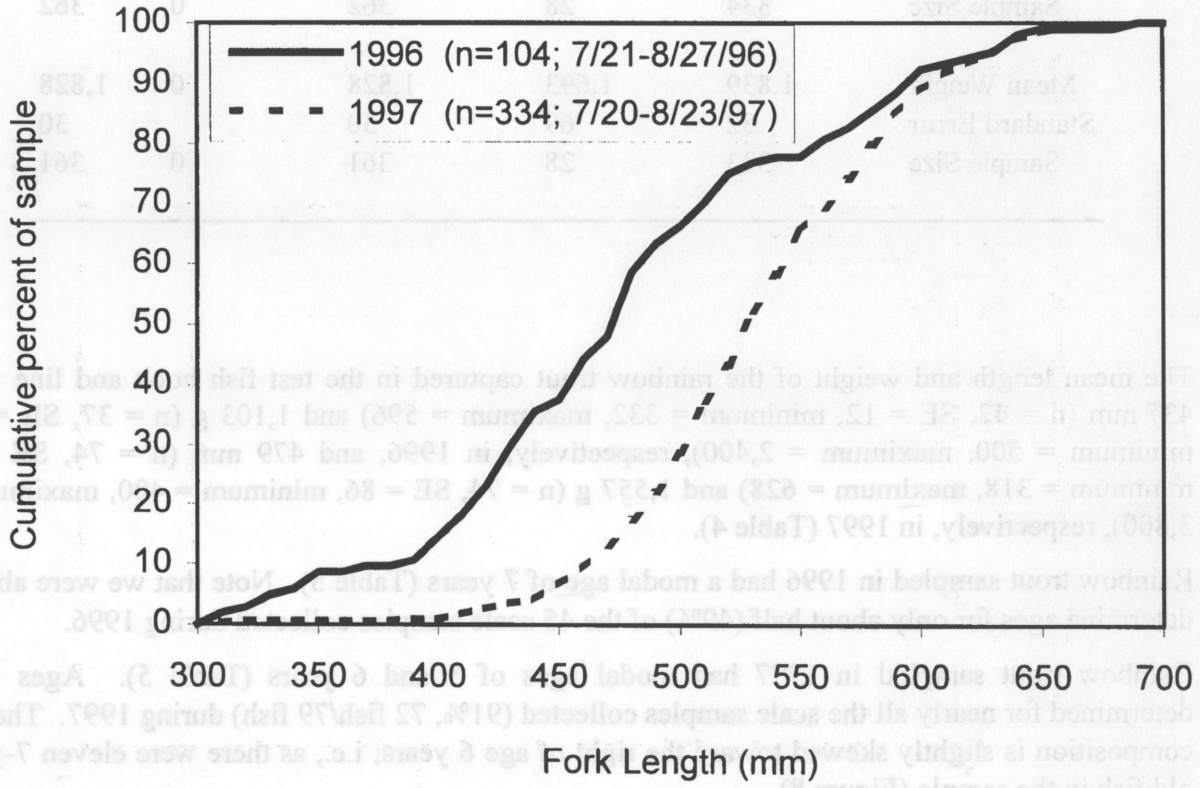


Figure 6.-Cumulative length frequency of Dolly Varden sampled during test fisheries in the Iliamna River during 1996 and 1997.

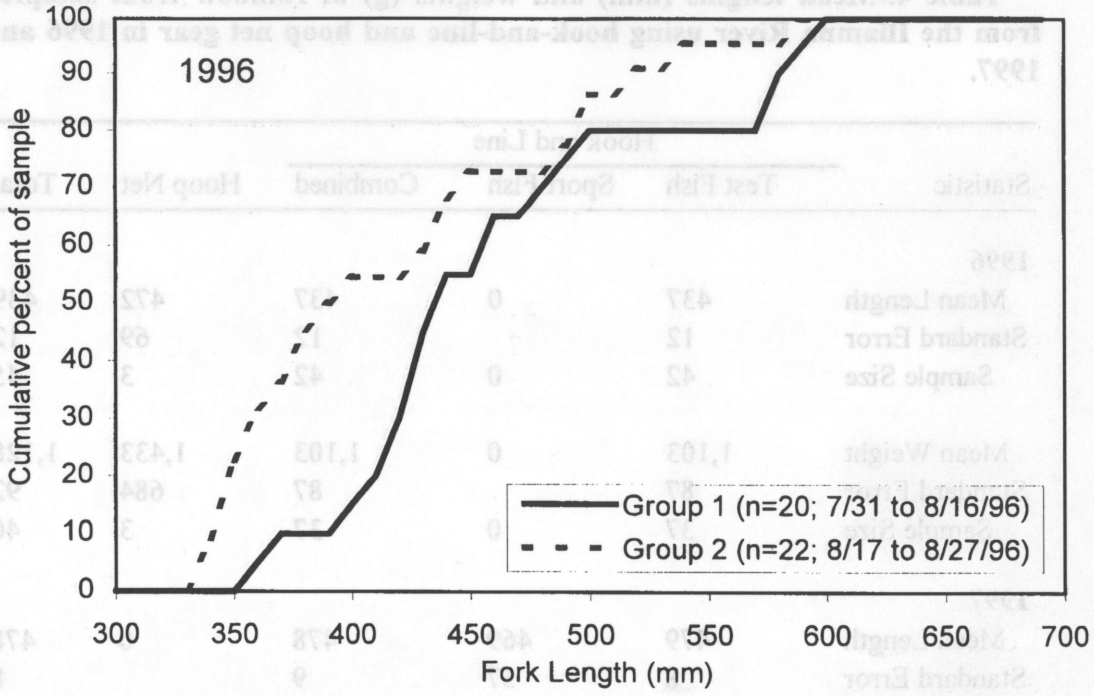
Table 3.-Mean lengths (mm) and weights (g) of Dolly Varden sampled from the Iliamna River using hook-and-line and hoop net gear in 1996 and 1997.

	Hook and Line				
Statistic	Test Fish	Sport Fish	Combined	Hoop Net	Total
1996					
Mean Length	477	503	479	451	477
Standard Error	8	24	8	29	7
Sample Size	104	11	115	11	126
Mean Weight	1,461	1,655	1,481	1,236	1,458
Standard Error	70	202	66	223	64
Sample Size	94	11	105	11	116
1997					
Mean Length	531	536	532	0	532
Standard Error	3	11	3		3
Sample Size	334	28	362	0	362
Mean Weight	1,839	1,693	1,828	0	1,828
Standard Error	32	69	30		30
Sample Size	333	28	361	0	361

The mean length and weight of the rainbow trout captured in the test fish hook and line were 437 mm (n = 42, SE = 12, minimum = 332, maximum = 596) and 1,103 g (n = 37, SE = 87, minimum = 500, maximum = 2,400), respectively, in 1996, and 479 mm (n = 74, SE = 8, minimum = 318, maximum = 628) and 1,557 g (n = 74, SE = 86, minimum = 400, maximum = 3,800), respectively, in 1997 (Table 4).

Rainbow trout sampled in 1996 had a modal age of 7 years (Table 5). Note that we were able to determine ages for only about half (49%) of the 45 scale samples collected during 1996.

Rainbow trout sampled in 1997 had modal ages of 5 and 6 years (Table 5). Ages were determined for nearly all the scale samples collected (91%, 72 fish/79 fish) during 1997. The age composition is slightly skewed toward the right of age 6 years; i.e., as there were eleven 7-year-old fish in the sample (Figure 8).



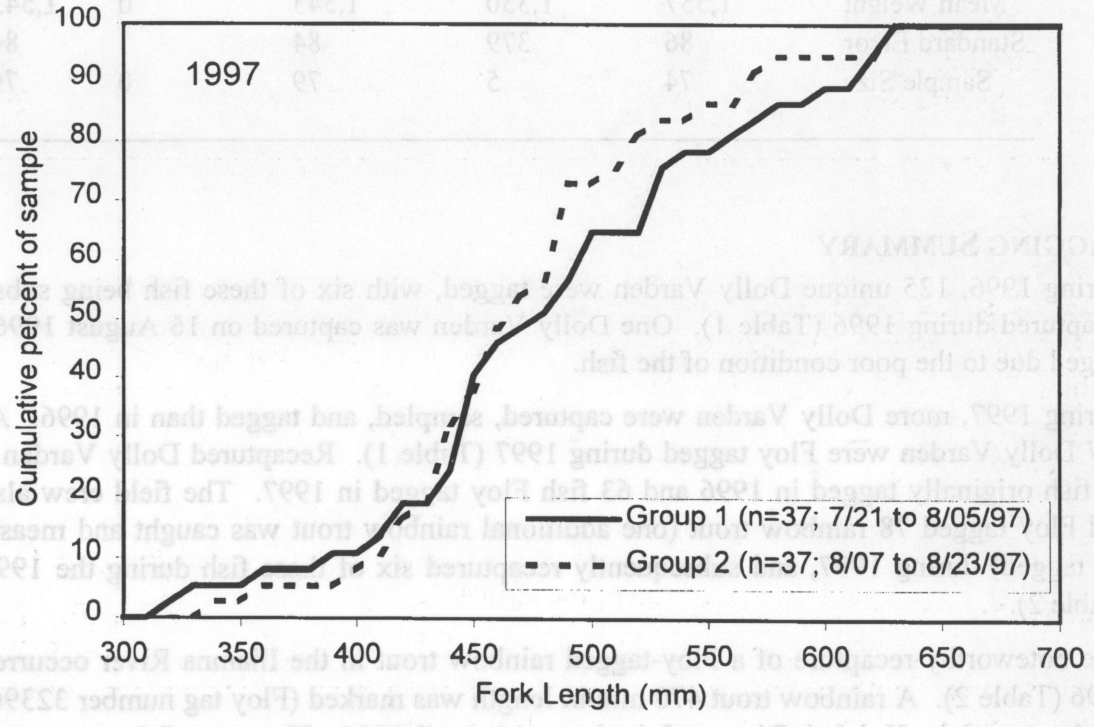


Figure 7.-Cumulative length frequency of rainbow trout sampled with test fish hook-and-line gear in the Iliamna River during 1996 and 1997, with length data partitioned into two temporal groups to test for differences in length composition over time.

Table 4.-Mean lengths (mm) and weights (g) of rainbow trout sampled from the Iliamna River using hook-and-line and hoop net gear in 1996 and 1997.

	Hook and Line				
Statistic	Test Fish	Sport Fish	Combined	Hoop Net	Total
1996					
Mean Length	437	0	437	472	439
Standard Error	12		12	69	12
Sample Size	42	0	42	3	45
Mean Weight	1,103	0	1,103	1,433	1,128
Standard Error	87		87	684	92
Sample Size	37	0	37	3	40
1997					
Mean Length	479	469	478	0	478
Standard Error	8	57	9		8
Sample Size	74	5	79	0	79
Mean Weight	1,557	1,330	1,543	0	1,543
Standard Error	86	379	84		84
Sample Size	74	5	79	0	79

TAGGING SUMMARY

During 1996, 125 unique Dolly Varden were tagged, with six of these fish being subsequently recaptured during 1996 (Table 1). One Dolly Varden was captured on 16 August 1996, but not tagged due to the poor condition of the fish.

During 1997, more Dolly Varden were captured, sampled, and tagged than in 1996. A total of 347 Dolly Varden were Floy tagged during 1997 (Table 1). Recaptured Dolly Varden included 14 fish originally tagged in 1996 and 63 fish Floy tagged in 1997. The field crew also caught and Floy tagged 78 rainbow trout (one additional rainbow trout was caught and measured, but not tagged) during 1997, and subsequently recaptured six of these fish during the 1997 season (Table 2).

One noteworthy recapture of a Floy-tagged rainbow trout in the Iliamna River occurred during 1996 (Table 2). A rainbow trout 470 mm in length was marked (Floy tag number 323960) at the headwater of the Kvichak River at Igiugig on 14 April 1994. The same fish was captured with hook-and-line gear on the Iliamna River on 15 August 1996, and had a length of 596 mm. The

Table 5.-Mean lengths (mm) and weights (g) of rainbow trout, by age group, from samples collected from the Iliamna River in 1996 and 1997.

	Age Group										
	Unknown	3	4	5	6	7	8	9	10	11	Total
1996[a]											
Sample Size		0	0	0	3	8	5	1	3	2	22
Percent		0	0	0	14	36	23	5	14	9	100
Standard Error					8	11	9	5	8	6	0
Mean Length	428				363	418	430	453	556	602	439
Standard Error	16				12	14	8		23	7	12
Sample Size	23	0	0	0	3	8	5	1	3	2	45
Mean Weight	1,118				567	917	1,000		1,600	2,550	1,128
Standard Error	119				33	138	63		100	250	92
Sample Size	22	0	0	0	3	6	5	0	2	2	40
1997											
Sample Size		2	3	25	25	11	4	2	0		72
Percent		3	4	35	35	15	6	3	0		100
Standard Error		1.95	2.37	5.65	5.65	4.27	2.72	1.95			0
Mean Length	535	330	370	449	471	519	573	619			478
Standard Error	44	9	35	10	8	17	19	9			8
Sample Size	7	2	3	25	25	11	4	2	0		79
Mean Weight	1,929	550	783	1,336	1,360	2,059	2,438	2,575			1,543
Standard Error	449	50	205	113	69	255	318	475			84
Sample Size	7	2	3	25	25	11	4	2	0		79

[a] Includes samples from hook and line (n = 42) and hoop net (n = 3).

scale samples from the fish in 1994 indicated the fish was 9 years old, and the scale samples collected in 1996 indicated an age of 11 years old. The fish had grown approximately 126 mm (5 in) during the 2.3 year period.

VISUAL SURVEY INDEX

Visual counts of Dolly Varden in the Iliamna River were conducted during 6 different days (n = 8 surveys, due to two counts on 2 of these days) in 1996 and 5 different days (n = 10 surveys, two counts per day) in 1997 (Table 6). The basic assessment is that the Dolly Varden population in the navigable lower 15 miles of the Iliamna River during the period 18 July to 28 August 1996 ranged from 150 to nearly 400 fish; and 200 to nearly 300 fish during 18 July to 27 August 1997 (Table 6).

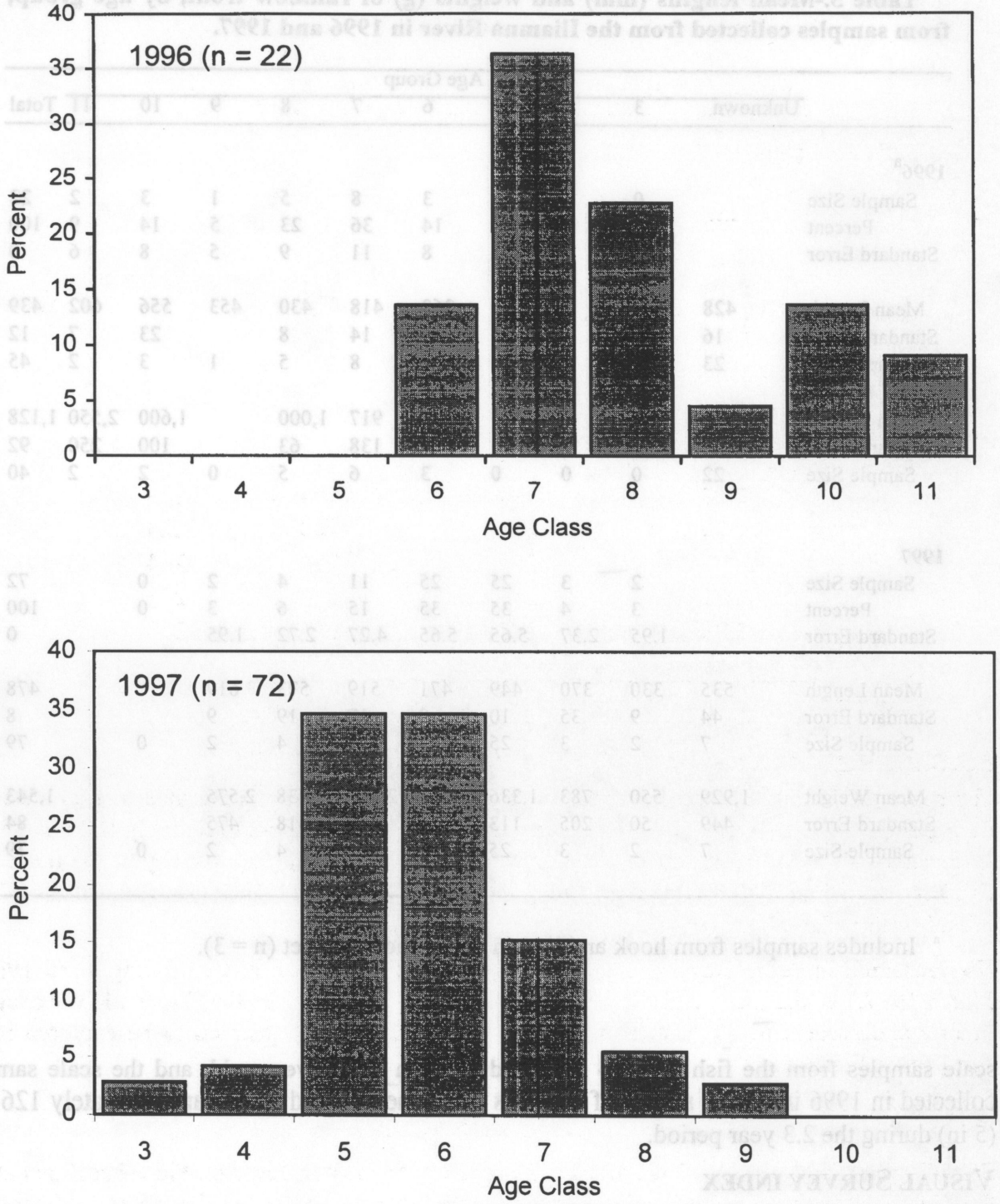


Figure 8.-Age comparison of rainbow trout captured in the Iliamna River in 1996 and 1997.

Table 6.-Summary of the visual survey indices of Dolly Varden in the Iliamna River conducted in 1996 and 1997.

Date	Survey Index 1	Survey Index 2	Average
1996			
8/3	132	102	117
8/6	244		
8/12	141		
8/13	262	274	268
8/17	258		
8/18	380		
1997			
7/27	189	203	196
7/29	239	208	223
8/2	257	271	264
8/7	219	227	223
8/23	272	264	268

SUBSISTENCE SURVEY

The survey indicated that no household in Pedro Bay had subsistence fished at Iliamna River during April 1996 to March 1997 (Kenner et al. *In press*). There was relatively little harvest of freshwater fish by the residents of the Pedro Bay community, and the majority of the freshwater fish harvest (primarily Dolly Varden/Arctic char) occurred via ice fishing in front of the village of Pedro Bay (Table 7).

No household in Pedro Bay reported capturing Floy-tagged Dolly Varden during April 1996 to March 1997. While the actual Floy tagging of 125 Dolly Varden in the Iliamna River occurred in July and August of 1996, there was potential for these Dolly Varden to be captured in the subsistence fisheries during August 1996 through March 1997.

DISCUSSION

Sampling conducted during 1996 and 1997 in the lower Iliamna River provides baseline data on the biological composition (length and weight) of Dolly Varden. The historical biological data of rainbow trout captured in the Iliamna River are very sparse; therefore, the 1996 and 1997 biological data also represented a baseline look at the current rainbow trout population in the lower Iliamna River.

It is unfortunate that no historical information is available with which to compare the biological data collected during 1996 and 1997. However, residents of Pedro Bay and the nearby

Table 7.-Estimated harvest of fish other than salmon by species, gear type, and season of harvest in Pedro Bay during April 1996 to March 1997.

Gear Type	Number of Households Harvesting	Season[a]				
		Spring	Summer	Fall	Winter	Total
Dolly Varden						
Ice Fishing	4	83	0	48	44	175
Rod & Reel	1	0	1	0	0	1
Set Net	3	0	22	32	0	54
Total[b]	9	83	23	80	44	231
Lake Trout						
Ice Fishing	1	10	0	0	34	44
Rod & Reel	1	7	0	0	22	29
Total[b]	3	18	0	0	56	73
Sucker						
Set Net	1	6	0	0	0	6
Rainbow Trout						
Ice Fishing	3	13	0	0	34	47
Rod & Reel	3	7	3	0	22	32
Total[b]	6	20	3	0	56	79
Unknown Trout						
Ice Fishing	1	95	0	0	0	95
Set Net	1	44	0	0	0	44
Total[b]	3	139	0	0	0	139

Source: Table 7 of Kenner et al. *In press*. Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1997.

[a] All harvests took place in Area 4, "Pedro Bay."

[b] Due to rounding error, totals may not equal the sum of the columns.

community of Iliamna believe that a substantial decline in the number of char in the Iliamna River drainage occurred in the 1980s. At this point, it is unlikely that a decline can be substantiated and that the cause of such a decline can be determined.

The difference in number of fish captured in 1996 versus 1997 (132 Dolly Varden and 45 rainbow trout captured in 1996 versus 436 Dolly Varden and 85 rainbow trout captured in 1997) may be attributable to several things:

1. the 1996 field season consisted of learning the distribution of fish and ideal methods of capturing fish in the Iliamna River, and
2. field technicians in 1997 were more experienced and efficient anglers.

Discussion with Jason Dye (field crew leader in 1997 and field crew member in 1996) indicated that more efficient fishing methods were utilized in 1997, such as drifting a pegged bead through riffle areas. Due to the plentiful food supply in the Iliamna River such as numerous sockeye salmon depositing eggs in the riffles areas, successful fishing required near-perfect presentation of fishing gear mimicking natural food.

The length composition of Dolly Varden in 1997 was significantly shifted to the larger fish when compared to 1996. It is unlikely that the length composition could shift so suddenly from one year to the next. It is not known if the 1997 length distribution is more representative of the Dolly Varden population in the river, or if for some reason the 1997 field crew simply caught larger fish on average than in 1996.

The abnormally hot and dry spring and summers of 1996 and 1997 resulted in record low water levels in many Southwest Alaska river drainages. The water levels on the Iliamna River during 1996 and 1997 were similar (Jason Dye, ADF&G, Division of Sport Fish, field crew leader, Iliamna River char project, Dillingham, Alaska, personal communication), and could be characterized as being below-average. Thus, Dolly Varden and rainbow trout probably did not have a different distribution pattern in the lower Iliamna River between 1996 and 1997.

The field crew attempted to sample fish from sport anglers on the Iliamna River, but generally found this to be an unproductive method of acquiring biological data. Generally one or two boats with guided or local anglers were present on the Iliamna River approximately 3 out of every 7 days (Jason Dye, ADF&G, Division of Sport Fish, field crew leader, Iliamna River char project, Dillingham, Alaska, personal communication). During both 1996 and 1997, one of the field technicians would occasionally remain with a group of sport anglers for several hours and collect biological data and tag fish being released. Low catch rates generally occurred with the sport anglers, especially during 1996. The uncertainty of when sport anglers would be present on the river, as well as the generally higher sampling rate which occurred with the test fishery, resulted in sport anglers only being sampled for 6 days during 1996 and 5 days for 1997 and few sport fish hook-and-line samples in either year.

Capturing Dolly Varden and rainbow trout with hoop nets was attempted during both 1996 and 1997 (Appendices A1 and A2), but with very limited success. Hoop nets were set in a variety of areas, such as pools, riffles, cutbanks, and submerged logs and were deployed during the day as well as overnight. Hoop nets were set in areas with fish present, as well as in areas without fish. Trap avoidance by Dolly Varden and rainbow trout may have been occurring, as the black mesh

of the netting was easily seen in the clear water of the Iliamna River; however, fish rarely entered the traps even during the darkness of the overnight sets. Due to the plentiful food supply present in the Iliamna River (sockeye salmon eggs floating downstream), it may be that the salmon roe used as bait in the hoop net traps was not sufficient to attract the fish to enter the traps. Occasionally spawning sockeye salmon were caught by the hoop net traps, either inside the traps or outside the trap when their teeth became entangled in the mesh. Additionally, the numerous brown bears in the Iliamna River drainage occasionally located and damaged the hoop net traps.

Capturing Dolly Varden with beach seines on the Iliamna River also proved ineffective. Due to the extreme clarity of the water, fish could easily detect the net and would rapidly swim away. If seining is to be attempted in the Iliamna River in the future, it is recommended that four to six people participate in the netting event, and that two beach seines be utilized. The beach seines could be stretched across the relatively narrow river (usually less than 20 m) above and below a group of fish. Then by slowly walking the upstream net down the river, the fish could be forced down to the lower net and easily encircled and caught. This was not an option during 1996 and 1997, as the field crew size was only two to three people. Furthermore, this method may not be very productive if large schools of sockeye salmon are present.

The results from the visual surveys provided an index of the number of Dolly Varden in the lower section of the Iliamna River during 1996 and 1997. Even when weather and river conditions were ideal (little or no wind to cause waves on water surface, overcast skies, and clear water), the possibility of missing fish existed due to inability to see fish in some of the deeper pools, faster riffles, or hidden by underwater structures. The fact that 347 unique Dolly Varden were Floy tagged in 1997, and that an additional 125 unique Dolly Varden were tagged during the 1996 field season and were presumably still in the Iliamna River in 1997, indicates that the visual survey indices underestimated Dolly Varden abundance. However, in the same manner that aerial surveys for salmon escapement are used as indices for management purposes, the visual survey of Dolly Varden in the Iliamna River can provide a useful index of abundance as well.

It is recommended that future projects be conducted on the Dolly Varden population in the Iliamna River, to expand upon the baseline information gathered during 1996 and 1997. If possible, a radiotelemetry project designed to track the seasonal movement of the Dolly Varden in the Iliamna River drainage and possible movement into Lake Iliamna would provide valuable information on this population. Additionally, a mark-recapture project to estimate the abundance of Dolly Varden in the Iliamna River would be beneficial.

ACKNOWLEDGMENTS

The success of this project was made possible by the field and logistic support of many individuals. Special thanks go to the owners of the Iliamna River Lodge, for making available their facility for a basecamp for our field crew during the field seasons. Additionally, thanks go to Karl Jensen and other members of the Pedro Bay community, for providing logistic support to and from the Pedro Bay airstrip. Deep appreciation goes to the field personnel conducting the biological sampling on the Iliamna River: Fisheries Technicians Brandon Cherry, Ed Lester, and Jason Dye in 1996, and Jason Dye and Craig Schwanke in 1997. The field crews collected the project's data in an efficient and accurate manner. The expedient work of Jason Dye, Fisheries

Technician, of mounting and aging the rainbow trout scale samples from the Iliamna River was greatly appreciated. Finally, the guidance on the data analysis section and text editing provided by Jim Hasbrouck was a great help.

LITERATURE CITED

Alvord, W. 1954. Validity of age determinations from scales of brown trout, rainbow trout, and brook trout. Transactions of the American Fisheries Society 83:91-103.

Cochran, W. G. 1977. Sampling Techniques, third edition. John Wiley and Sons, New York.

Coggins, L. G., Jr. 1994. Precision of ages estimated from scales for rainbow trout in Bristol Bay, Alaska. Alaska Department of Fish and Game, Fishery Data Series No. 94-26, Anchorage.

Heineman, G. H. 1991. Instructions for using sport fish creel survey and biological mark-sense forms, 1991. Alaska Department of Fish and Game, Division of Sport Fish, Research and Technical Services, Anchorage.

Howe, A. L., G. Fidler, A. E. Bingham, and M. J. Mills. 1996. Harvest, catch, and participation in Alaska sport fisheries during 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-32, Anchorage.

Howe, A. L., G. Fidler, and M. J. Mills. 1995. Harvest, catch, and participation in Alaska sport fisheries during 1994. Alaska Department of Fish and Game, Fishery Data Series No. 95-24, Anchorage.

Jaenicke, M. J. 1997. Memorandum to Mac Minard in Dillingham, Alaska regarding the Iliamna River Arctic char Project, 1996, dated March 3, 1997.

Jerald, A., Jr. 1983. Age determination. Pages 301-324 in L. A. Nielsen, editors. Fisheries techniques. The American Fisheries Society, Bethesda, Maryland.

Kenner, P.C., M. B. Chythlook, J. A. Fall, L. Brown, and C. J. Utermohle. In press. Harvests of fish other than salmon by the communities of Pedro Bay and Levelock, Southwest Alaska, April 1996-March 1997. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 247. Juneau.

Maher, F. P. and P. A. Larkin. 1955. Life history of the steelhead trout of the Chilliwack River, British Columbia. Transactions of the American Fisheries Society 84:27-38.

Mills, M. J. 1982. Alaska statewide sport fish harvest studies (1981). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1981-1982, Project F-9-14, 23 (SW-1-A), Juneau.

Mills, M. J. 1983. Alaska statewide sport fish harvest studies (1982). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1982-1983, Project F-9-15, 24 (SW-1-A), Juneau.

Mills, M. J. 1984. Alaska statewide sport fish harvest studies (1983). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1983-1984, Project F-9-16, 25 (SW-1-A), Juneau.

Mills, M. J. 1985. Alaska statewide sport fish harvest studies (1984). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1984-1985, Project F-9-17, 26 (SW-1-A), Juneau.

Mills, M. J. 1986. Alaska statewide sport fish harvest studies (1985). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1985-1986, Project F-10-1, 27 (RT-2), Juneau.

Mills, M. J. 1987. Alaska statewide sport fisheries harvest report 1986. Alaska Department of Fish and Game, Fishery Data Series No. 2, Juneau.

Mills, M. J. 1988. Alaska statewide sport fisheries harvest report 1987. Alaska Department of Fish and Game, Fishery Data Series No. 52, Juneau.

Mills, M. J. 1989. Alaska statewide sport fisheries harvest report 1988. Alaska Department of Fish and Game, Fishery Data Series No. 122, Juneau.

LITERATURE CITED (Continued)

Mills, M. J. 1990. Harvest and participation in Alaska sport fisheries during 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-44, Anchorage.

Mills, M. J. 1991. Harvest, catch, and participation in Alaska sport fisheries during 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-58, Anchorage.

Mills, M. J. 1992. Harvest, catch, and participation in Alaska sport fisheries during 1991. Alaska Department of Fish and Game, Fishery Data Series No. 92-40, Anchorage.

Mills, M. J. 1993. Harvest, catch, and participation in Alaska sport fisheries during 1992. Alaska Department of Fish and Game, Fishery Data Series No. 93-42, Anchorage.

Mills, M. J. 1994. Harvest, catch, and participation in Alaska sport fisheries during 1993. Alaska Department of Fish and Game, Fishery Data Series No. 94-28, Anchorage

Minard, R. E. 1995. Memorandum to Kelly Hepler in Anchorage, Alaska on the Iliamna River Arctic char stock status, dated July 17, 1995. Available at: Alaska Department of Fish and Game, P.O. Box 230, Dillingham, AK 99576-0230.

Scholz, F. W. and M. A. Stephens. 1987. K-sample Anderson-Darling tests. Journal of the American Statistical Association 82:918-924.

Sokal, R. R. and F. J. Rohlf. 1981. Biometry, second edition. W. H. Freeman and Company, New York.

APPENDIX A

Appendix A1.-Daily summary of sampling and tagging effort for Dolly Varden and rainbow trout on the Iliamna River during mid-July to late August 1996.

	DOLLY VARDEN							RAINBOW TROUT						
	Test Fish Hook and Line			Sport Fish Hook and Line		Hoop Net[b]		Test Fish Hook and Line			Sport Fish Hook and Line		Hoop Net[b]	
Date	Caught	Tagged	Recaptured[a]	Caught	Tagged	Caught	Tagged	Caught	Tagged	Recaptured	Caught	Tagged	Caught	Tagged
7/21	2	2	0											
7/22	1	1	0											
7/23[c]	7	7	0											
7/24	1	1	0											
7/25	7	7	0											
7/26														
7/27	3	3	0											
7/28														
7/29				1	1									
7/30	5	5	0											
7/31[c]	1	1	0					1	1	0				
8/01	2	2	0					1	1	0				
8/02								1	1	0				
8/03	4	4	0					1	1	0				
8/04														
8/05	2	2	0											
8/06	4	4	0											
8/07								2	2	0				
8/08	2	2	0					3	3	0				
8/09														
8/10	2	2	0	2	2	0							0	
8/11	4	4	0			0		2	2	0			0	
8/12	2	2	0			0							0	
8/13	1	1	0			0							0	
8/14	5	5	0			1	1	4	4	0			0	
8/15	5	4	1	2	2	0		3	2	1[d]			0	
8/16						10	9[e]	2	2	0			3	3
8/17	5	5	0			0		2	2	0			0	
8/18	13	11	2			0		8	8	0			0	
8/19	3	3	0					2	2	0				
8/20	13	10	3					1	1	0				
8/21	2	2	0			0		1	1	0			0	
8/22	9	9	0					2	2	0				
8/23														
8/24	1	1	0	6	6			3	3	0				
8/25														
8/26	2	2	0			0							0	
8/27	2	2	0					3	3	0				
TOTAL	132	126	6	11	11	11	10	42	41	1			3	3

a Tagged Dolly Varden and rainbow trout were recaptured only with test fish hook and line gear.

b Hoop net trapping occurred on dates with 0 or more catches.

c Beach seining attempted on 7/23 and 7/30/96, but deemed ineffective.

d Rainbow trout previously Floy tagged on April 14, 1994 at Igiugig.

e One of the captured char was in poor condition, so the fish was not tagged.

Appendix A2.-Daily summary of sampling and tagging effort for Dolly Varden and rainbow trout on the Iliamna River during mid-July to late August 1997.

	DOLLY VARDEN							RAINBOW TROUT						
	Test Fish Hook and Line			Sport Fish Hook and Line		Hoop Net[b]		Test Fish Hook and Line			Sport Fish Hook and Line		Hoop Net[b]	
Date	Caught	Tagged	Recaptured[a]	Caught	Tagged	Caught	Tagged	Caught	Tagged	Recaptured[a]	Caught	Tagged	Caught	Tagged
7/20	4	4	0											
7/21	3	3	0					7	7	0				
7/22	14	12	2 – O					3	3	0				
7/23	13	12	1 – N					3	3	0				
7/24	10	10	0					3	3	0				
7/25	26	24	2 – O					3	3	0				
7/26	22	17	2–O, 3–N			0							0	
7/27	15	15	0			0		3	2[c]	0			0	
7/28	9	9	0			0		1	1	0			0	
7/29	6	6	0	6	6	0		2	2	0			0	
7/30[d]	4	3	1-N	6	4 (1-O,1-N)	0		0	0	0			0	
7/31	4	4	0			0		1	1	0			0	
8/01	16	16	0			0		4	4	0			0	
8/02	14	13	1-N			0		5	5	0			0	
8/03	8	6	2-N	8	8	0		1	1	0	2	1, (1 R)	0	
8/04						0							0	
8/05	7	5	2-N	9	9	0		1	1	0	4	4	0	
8/06	6	5	1-N			0		0	0	0			0	
8/07	10	9	1-N			0		1	1	0			0	
8/08	25	20	1-O, 4-N					3	3	0				
8/09														
8/10														
8/11														
8/12	10	6	1-O, 3-N					2	2	0				
8/13	14	9	5-N					1	1	0				
8/14	20	17	3-N					2	2	0				
8/15	8	4	2-O, 2-N					1	1	0				
8/16	22	17	1-O, 4-N					4	4	0				
8/17	14	10	4-N					4	4	0				
8/18	28	22	6-N					1	1	0				
8/19	18	11	7-N					5	5	0				
8/20	2	2	0					1	0	1				
8/21	29	18	1-O, 10-N					7	5	2				
8/22	15	7	1-O, 7-N					8	7	1				
8/23	9	4	5-N					2	1	1				
8/24														
8/25														
8/26														
TOTAL	405	320	13-O, 72-N	29	27 (1O,1N)			79	73	5	6	5		

[a] For recaptured fish, "O" represents old (i.e., fish tagged in 1996), and "N" represents new (i.e., fish tagged in 1997).

[b] Hoop net trapping occurred on dates with 0 or more catches.

[c] One of the captured rainbow trout was in poor condition, so the fish was not tagged.

[d] Beach seining attempted on 7/30/97, but deemed ineffective.

APPENDIX B

Appendix B1.-Computer files and software used to produce this report.

Data files:

S1200abba.dta	Iliamna River rainbow trout AWL data in 1997 [includes Test Fish and Sport Fish samples]
S120abaa.dta	Iliamna River char AWL data in 1997 [includes Test Fish and Sport Fish samples]
S1200ba6.dta	Iliamna River char AWL data from test fishery (n=110) in 1996
S1200bb6.dta	Iliamna River char AWL data from sport fishery (n=11) in 1996
S1200bc6.dta	Iliamna River char AWL data from hoop nets sampling (n=11) in 1996
S1200bd6.dta	Iliamna River rainbow trout AWL data from test fishery (n=42) in 1996
S1200be6.dta	Iliamna River rainbow trout AWL data from hoop net samples (n=3) in 1996
S1200b69.dta	Iliamna River rainbow trout AWL data from sport fishery (n=11) in 1969
S1200b70.dta	Iliamna River rainbow trout AWL data from sport fishery (n=5) in 1970
S1200b71.dta	Iliamna River rainbow trout AWL data from sport fishery (n=1) in 1971

Analysis programs:

KS2M.EXE	A program developed by ADF&G Sport Fish Division, Research and Technical Services staff for conducting Kolmogorov-Smirnov two sample tests.
BBXP.EXE	A series of programs that used biological files to produce tables of mean length and weight by sex and age group. The program also produces a data set which may be used in Excel (tm) to create graphs.